Specifications
Transmitter for Optical transmission method torque transducer

1. General
This is the transmitter for optical transmission method torque transducer.

2. Specifications
- Supply voltage for rotor: DC24 V ± 2 V, 2 A
- Applicable transducer: Optical transmission method torque transducer
- Input signal: Signal of torque Frequency input 5 kHz ~ 15 kHz
- Output signal
  Analog output (Standard): DC ± 10 V (at · rated torque ~ + rated torque)
  Load resistance: 2 kΩ or more
  Output capacitance load: 0.1 μF or less
  (Select at the time of the order) Current output, Frequency output for torque
  Voltage output, Current output, Frequency output for rotation speed
  Digital output (Option): Select one from RS-232C, RS-422/485, PROFIBUS or CANopen.
  * The standard model is not equipped with.
- Zero adjustable range: ± 2 %R.O.
- Digital compensation
  Asymmetry compensation: ± 10 %R.O.
  Linearize compensation: 10 points at the maximum (5 points between 0 and + rated output. 5 points between 0 and - rated output)
  Twist direction reversing compensation: The direction of the twist and the output signal are reversed.
  (The standard is + (plus) output by a left twist.)
- Non-linearity: 0.01 % F.S. (Voltage output)
- CHECK: Approx. 80 % of rated output (Set by function)
- Frequency response range: DC ~ 1 kHz (with filter W/B)
  (Changeable to 1 Hz, 10 Hz, 30 Hz, 50 Hz, 100 Hz, 300 Hz, 500 Hz or 1 kHz) Above is 10 Hz ~ 1 kHz : -3 dB±1 dB, 1 Hz : -3 dB±3 dB
- Sampling rate: 10 000 times/s
- Torque display section
  Display of output: 0 ~ ± 99 999 digital display (Green LED)
  Display of over: [-OL] display at minus over, [OL] display at plus over.
  Display type: Analog output, Torque
  Display of decimal point: Changeable to No display, 10, 10², 10³ or 10⁴
  Condition display: A/Z, LOCK, CHECK, H, M, ERROR
  Display of unit: Changeable to V, Nm or kNm
  Display rate: Approx. 20 times/s (Changeable to 4 times/s)
- Supply voltage for detector: DC12 V ± 2 V
- Applicable rotational detector: MP-9820 (by ONOSOKKI Co., Ltd)
- Non-linearity: 0.01 % F.S.
- Frequency response range: 10 Hz (Changeable to 1 Hz)
  Above is 10 Hz : -3 dB±1 dB, 1 Hz : -3 dB±3 dB
### Specifications

**OPT-563B**

<table>
<thead>
<tr>
<th>Spec. No.</th>
<th>EN351563B-D</th>
</tr>
</thead>
</table>

#### Rotation speed display section
- **Display of output**: 0 ~ ± 27,500 digital display (Green LED)
- **Display of over**: [-OS] display at minus over, [OS] display at plus over.
- **Display type**: Rotation speed
- **Condition display**: LOCK
- **Display of unit**: r/min
- **Display rate**: Approx. 20 times/s (Changeable to 4 times/s)

#### Function of sheet key switch of front panel
- ▲: Carry up the set value / A/Z ON
- ▼: Carry down the set value / A/Z OFF
- ▲: Increment the set value
- ▼: Decrement the set value
- **CHECK**: CHECK value
- **FUNC**: Changeover the function mode
- **ENTER**: Entry key

#### External control input signal
- **A/Z**: Same as A/Z key
- **A/ZOFF**: Same as A/Z OFF key
  - *Above are pulse input, and effective only once at the pulse width of 100 ms or more.*
- **LOCK**: Prohibit the operation by key.
  - *Above is level input, and effective during the input of short for 100 ms or more.*
- **Rotation POL.**: Inverting input of the rotating direction.

#### External control output signal
- **ERROR**: Open collector turns ON when various errors occur.
- **Rated capacity of open collector**: $V_{CE} = DC35$ Vmax, $I_c = DC40$ mAmax
  - *An internal circuit and the photo-coupler are insulated.*
  - *COM. 1 and COM. 2 are insulated.*

![Circuit Diagram](image)

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*An internal circuit and the photo-coupler are insulated.*

*COM. 1 and COM. 2 are insulated.*
Specifications

- Various function
  - Digital filter: Data is stabilized by the arithmetic processing in CPU
  - Sheet key lock: The operation by an arbitrary key is prohibited.
  - Changeover of calibration data: Four kinds of calibration datas are memorized, and they can be selected by the function.
  - Indication of luminous energy decrease: LED in the condition display section lights depending on the status of luminous energy in torque transducer. (H, M, ERROR)

3. General specifications

- Operating temperature and humidity range
  - Temperature: -10 ℃ ~ 50 ℃
  - Humidity: 85 %RH or less (Non condensing)

- Power supply
  - Power supply voltage: AC100 V ~ AC240 V (Permissible variable range: AC85 V ~ AC264 V)
  - Power supply frequency: 50/60 Hz
  - Power consumption: Approx. 60 VA (at AC100 V)

- Insulation resistance: DC500 V, 100 MΩ or more between the power supply line and a case.

- Withstand voltage: AC1 500 V, 1 min period between power supply line and case.

- Outline dimensions: (W x H x D): 68 mm x 209 mm x 252 mm (Excludes protruding parts)

- Weight: Approx. 2 kg

4. Accessories

- Instruction manual: 1 piece
- Time-lag fuse: 1 piece (5 A)
- I/O connector for external control: 1 piece (plag: MC_1.5 / 13-ST-3.81)
- Connector for torque transducer and rotation detector: 1 piece (plag: MC_1.5 / 13-ST-3.81)
- Connector for analog output: 1 piece (plag: MC_1.5 / 8-ST-3.81)
- Minus screwdriver: 1 piece
5. Outline dimensions

Front

Side

Rear side

Panel cut size

Unit: mm
## Specifications

### OPT-563B

<table>
<thead>
<tr>
<th>Spec. No.</th>
<th>EN351563B-D</th>
<th>5/11</th>
</tr>
</thead>
</table>

6. Select at the time of the order

6-1. Analog output for torque

- **Current output**
  - **Part No.** OPT563B-T2 (at torque zero ~ + rated torque)  
  OPT563B-T3 (at - rated torque ~ + rated torque)
  - **Output** DC 4 mA ~ DC20 mA
  - **Load resistance** 510 Ω or less
  - **Resolution** 1/12 000 or more
  - **Non-linearity** 0.05 %R.O.
  - **Over range** [-OL] display under DC2.4 mA, [OL] display over DC21.6 mA

* Internal circuit and photo-coupler are insulated.

- **Frequency output**
  - **Part No.** OPT563B-T4
  - **Output** 5 kHz ~ 15 kHz (at - rated torque ~ + rated torque)
  - **Resolution** 0.5 Hz or more
  - **Non-linearity** 0.01 %R.O.
  - **Over range** [-OL] display under 4 kHz, [OL] display over 16 kHz

* Internal circuit and photo-coupler are insulated.

* The frequency output convert the torque input signal from the sensor into 0 to 5 V of the logic signal. OPT563B cannot calibrate the zero point and sensitivity.

* The analog output for torque can be selectable up to two points at the maximum from among voltage output, current output or the frequency output.

(The standard is a combination of the voltage output and current output.)
### Specifications

**OPT-563B**

<table>
<thead>
<tr>
<th>Spec. No.</th>
<th>EN351563B-D</th>
<th>6/11</th>
</tr>
</thead>
</table>

#### 6-2. Analog output for rotation speed

**• Voltage output**

<table>
<thead>
<tr>
<th>Part No.</th>
<th>Output DC ± 10 V (at · rated rotation speed ~ + rated rotation speed)</th>
<th>Load resistance 2 kΩ or more</th>
<th>Load Capacity 0.1 µF or less</th>
<th>Resolution 1/12 000 or more</th>
<th>Non-linearity 0.05 % R.O.</th>
<th>Over range [-OS] display under DC -11 V, [OS] display over DC11 V</th>
</tr>
</thead>
<tbody>
<tr>
<td>OPT563B-R1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td><em>Internal circuit and photo-coupler are insulated.</em></td>
</tr>
</tbody>
</table>

**• Current output**

<table>
<thead>
<tr>
<th>Part No.</th>
<th>Output DC4 mA ~ DC20 mA</th>
<th>Load resistance 510 Ω or less</th>
<th>Resolution 1/12 000 or more</th>
<th>Non-linearity 0.05 % R.O.</th>
<th>Over range [-OS] display under DC2.4 mA, [OS] display over DC21.6 mA</th>
</tr>
</thead>
<tbody>
<tr>
<td>OPT563B-R2</td>
<td>(at rotation speed zero ~ + rated rotation speed)</td>
<td></td>
<td></td>
<td></td>
<td><em>Internal circuit and photo-coupler are insulated.</em></td>
</tr>
<tr>
<td>OPT563B-R3</td>
<td>(at · rated rotation speed ~ + rated rotation speed)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**• Frequency output**

<table>
<thead>
<tr>
<th>Part No.</th>
<th>Output 50 000 Hz (at rotation speed of 25 000 rpm)</th>
<th>Non-linearity 0.01 %R.O.</th>
</tr>
</thead>
<tbody>
<tr>
<td>OPT563B-R4</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*The frequency output outputs the input signal from the rotation detector directly.

OPT-563B cannot calibrate the zero and the sensitivity.

*The analog output on the rotational detecting function can be selected by the combination of either the voltage output or the current output and whether an frequency output exists.
Specifications

7. Options

7-1. RS-232C interface

Part No. OPT563B-P74

Specifications

Baud rate Selectable from 1 200, 2 400, 4 800, 9 600, 19 200, 38 400, 57 600 or 115 200 bps

Data bit length Selectable from 7 bit or 8 bit

Parity bit Selectable from none, even or odd number

Stop bit Selectable from 1 bit or 2 bit

Terminator Selectable from CR + LF or CR

Communication method Half duplex

Synchronous method Start-stop synchronous method

Transmission data ASCII code

Pin configuration of RS-232 connector

Pin No. Signal name
1 CD
2 TXD
3 RXD
4 N.C.
5 S.G.
6 N.C.
7 RTS
8 CTS
9 N.C.

* Plug for connector is not attached.
* The engagement fixation screw is inch type.
* Do not connect with N.C. pin.
* The internal circuit and the photo-coupler are insulated.

Functions

1) Reads out the torque value
2) Reads out the rotation speed value
3) Reads out the condition
4) Change of condition (A/Z, A/Z OFF, CHECK)
5) Reads out the function data
6) Change of function data
7) Communication error code (Error code for the communication)
Specifications

7-2. RS-422/485 interface

<table>
<thead>
<tr>
<th>Specifications</th>
<th>Part No.</th>
<th>OPT563B-P76</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baud rate</td>
<td>Selectable from 1 200, 2 400, 4 800, 9 600, 19 200, 38 400, 57 600 or 115 200 bps</td>
<td></td>
</tr>
<tr>
<td>Data bit length</td>
<td>Selectable from 7 bit or 8 bit</td>
<td></td>
</tr>
<tr>
<td>Parity bit</td>
<td>Selectable from none, even or odd number</td>
<td></td>
</tr>
<tr>
<td>Stop bit</td>
<td>Selectable from 1 bit or 2 bit</td>
<td></td>
</tr>
<tr>
<td>Terminator</td>
<td>Selectable from CR+ LF or CR</td>
<td></td>
</tr>
<tr>
<td>Communication method</td>
<td>Half duplex</td>
<td></td>
</tr>
<tr>
<td>Synchronous method</td>
<td>Start-stop synchronous method</td>
<td></td>
</tr>
<tr>
<td>Address</td>
<td>Select one from 0 to 31</td>
<td></td>
</tr>
<tr>
<td>Transmission data</td>
<td>ASCII code</td>
<td></td>
</tr>
<tr>
<td>Cable length</td>
<td>Approx. 1 km</td>
<td></td>
</tr>
<tr>
<td>Numbers of connectable units</td>
<td>32 unit at the maximum</td>
<td></td>
</tr>
<tr>
<td>Termination</td>
<td>Built-in (Selects the presence by the connection of terminal board.)</td>
<td></td>
</tr>
<tr>
<td>Changeover of RS-422 and RS-485</td>
<td>Set by function</td>
<td></td>
</tr>
<tr>
<td>Equipped with the LED for I/O monitor</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Terminal configuration of RS-422/485

<table>
<thead>
<tr>
<th>Terminal</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SDA</td>
<td>Differential output</td>
</tr>
<tr>
<td>SDB</td>
<td>Differential output</td>
</tr>
<tr>
<td>RDA</td>
<td>Differential input</td>
</tr>
<tr>
<td>RDB</td>
<td>Differential input</td>
</tr>
<tr>
<td>TRM</td>
<td>Termination resistance</td>
</tr>
<tr>
<td>S.G.</td>
<td>Signal ground</td>
</tr>
</tbody>
</table>

* The internal circuit and the photo-coupler are insulated.

Functions

1) Reads out the torque value
2) Reads out the rotation speed value
3) Reads out the condition
4) Change of condition (A/Z, A/Z OFF, CHECK)
5) Reads out the function data
6) Change of function data
7) Communication error code (Error code for the communication)
7-3. PROFIBUS interface

<table>
<thead>
<tr>
<th>Part No.</th>
<th>OPT563B-P70</th>
</tr>
</thead>
<tbody>
<tr>
<td>Version</td>
<td>PROFIBUS DP</td>
</tr>
<tr>
<td>Specifications</td>
<td></td>
</tr>
<tr>
<td>Baud rate</td>
<td>Selectable from 9.6 k, 19.2 k, 93.75 k, 187.5 k, 500 k, 1.5 M, 3 M, 6 M or 12 Mbps</td>
</tr>
<tr>
<td>Communication type</td>
<td>RS-485 bus</td>
</tr>
<tr>
<td>Station address</td>
<td>Select one from 0 to 125</td>
</tr>
<tr>
<td>Cable length</td>
<td>Baud rate (bps)</td>
</tr>
<tr>
<td>9.6 k</td>
<td>1 200 or less</td>
</tr>
<tr>
<td>19.2 k</td>
<td>1 200 or less</td>
</tr>
<tr>
<td>93.75 k</td>
<td>1 000 or less</td>
</tr>
<tr>
<td>187.5 k</td>
<td>1 000 or less</td>
</tr>
<tr>
<td>500 k</td>
<td>400 or less</td>
</tr>
<tr>
<td>1.5 M</td>
<td>200 or less</td>
</tr>
<tr>
<td>3 M</td>
<td>100 or less</td>
</tr>
<tr>
<td>6 M</td>
<td>100 or less</td>
</tr>
<tr>
<td>12 M</td>
<td>100 or less</td>
</tr>
<tr>
<td>Connectable cable</td>
<td>Use the special cable for PROFIBUS</td>
</tr>
<tr>
<td>Connectable connector</td>
<td>Use the special cable for PROFIBUS</td>
</tr>
<tr>
<td>Termination</td>
<td>Use the connector with termination resistance.</td>
</tr>
<tr>
<td>Status LED</td>
<td>The state of the communication is indicated by two LED. (OP and ST)</td>
</tr>
</tbody>
</table>

Pin configuration of PROFIBUS connector

<table>
<thead>
<tr>
<th>Pin No.</th>
<th>Signal name</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>N.C.</td>
</tr>
<tr>
<td>2</td>
<td>N.C.</td>
</tr>
<tr>
<td>3</td>
<td>RXD / TXD-P</td>
</tr>
<tr>
<td>4</td>
<td>CNTR-P</td>
</tr>
<tr>
<td>5</td>
<td>DGND</td>
</tr>
<tr>
<td>6</td>
<td>VP</td>
</tr>
<tr>
<td>7</td>
<td>N.C.</td>
</tr>
<tr>
<td>8</td>
<td>RXD / TDX-N</td>
</tr>
<tr>
<td>9</td>
<td>N.C.</td>
</tr>
</tbody>
</table>

* Plug for connector is not attached.
* Please use the connector, cable, etc., recommended by the PROFIBUS Organization.
* Do not connect with N.C. pin.
* The internal circuit and photo-coupler are insulated.

Functions

1) Reads out the torque value
2) Reads out the rotation speed value
3) Reads out the condition
4) Change the condition (A/Z, AZ OFF, CHECK)
5) Reads out the function data
6) Change of the function data
7) Communication error code (Error code for the communication.)
Specifications

7-4. CANopen interface

Part No. OPT563B-P71
Specifications

<table>
<thead>
<tr>
<th>Baud rate</th>
<th>Selectable from 10 k, 20 k, 50 k, 100 k, 125 k, 250 k, 500 k, 800 k or 1 Mbps</th>
</tr>
</thead>
<tbody>
<tr>
<td>Node ID</td>
<td>Select one from 1 to 127.</td>
</tr>
<tr>
<td>Cable length</td>
<td>Baud rate(bps)</td>
</tr>
<tr>
<td>10 k</td>
<td>1000 or less</td>
</tr>
<tr>
<td>20 k</td>
<td>1000 or less</td>
</tr>
<tr>
<td>50 k</td>
<td>1000 or less</td>
</tr>
<tr>
<td>100 k</td>
<td>600 or less</td>
</tr>
<tr>
<td>125 k</td>
<td>500 or less</td>
</tr>
<tr>
<td>250 k</td>
<td>250 or less</td>
</tr>
<tr>
<td>500 k</td>
<td>100 or less</td>
</tr>
<tr>
<td>800 k</td>
<td>50 or less</td>
</tr>
<tr>
<td>1 M</td>
<td>25 or less</td>
</tr>
</tbody>
</table>

Connectable cable Use the special cable for CANopen
Connectable connector Use the special cable for CANopen
Termination Use the connector built-in termination resistance.
Status LED The state of the communication is indicated by two LED. (RUN and ERR)

Pin configuration of CANopen connector

<table>
<thead>
<tr>
<th>Pin No.</th>
<th>Signal name</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>N.C.</td>
</tr>
<tr>
<td>2</td>
<td>CAN_L</td>
</tr>
<tr>
<td>3</td>
<td>CAN_GND</td>
</tr>
<tr>
<td>4</td>
<td>N.C.</td>
</tr>
<tr>
<td>5</td>
<td>CAN_SHLD</td>
</tr>
<tr>
<td>6</td>
<td>N.C.</td>
</tr>
<tr>
<td>7</td>
<td>CAN_H</td>
</tr>
<tr>
<td>8</td>
<td>N.C.</td>
</tr>
<tr>
<td>9</td>
<td>N.C.</td>
</tr>
</tbody>
</table>

* Plug for connector and cable are not attached.
* Use the connector and the cable conformed to CANopen standard CiA DR-303-1.
* Do not connect with N.C. pin.
* The internal circuit and photo-coupler are insulated.

Functions

1) Reads out the torque value
2) Reads out the rotation speed value
3) Reads out the condition
4) Communication error code (Error code for the communication.)
7-5. Combination of the options

OPT-563B—***—***—***—***

1) T2: Current output for torque (at torque zero ~ + rated torque )
T3: Current output for torque (at - rated torque ~ + rated torque )

T4: Frequency output for torque
T24: Current output for torque (at torque zero ~ + rated torque ) + Frequency output for torque
T34: Current output for torque (at - rated torque ~ + rated torque ) + Frequency output for torque

2) R1: Voltage output for rotation speed
R2: Current output for rotation speed (at rotation speed zero ~ + rated rotation speed )
R3: Current output for rotation speed (at - rated rotation speed ~ + rated rotation speed )
R4: Frequency output for rotation speed
R14: Voltage output for rotation speed + Frequency output for rotation speed
R24: Current output for rotation speed (at rotation speed zero ~ + rated rotation speed ) + Frequency output for rotation speed
R34: Current output for rotation speed (at - rated rotation speed ~ + rated rotation speed ) + Frequency output for rotation speed

3) P70: PROFIBUS interface
P71: CANopen interface
P74: RS-232C interface
P76: RS-422/485 interface

The analog output for torque can be selectable up to two points at the maximum from among voltage output, current output or the frequency output. (The standard is the voltage output.)
The analog output on the rotational detecting function can be selected by the combination with either the voltage output or the current output and whether an frequency output exists.
The digital output, one point is selectable from PROFIBUS, CANopen, RS-232C, RS-422/485 interface.

* Specifications and outline dimensions and so on which have printed may subject to change for the purpose of improvement without notice.