

Specifications

Special transmitter for optical transmission torque transducer

OPT-564

Spec. No. EN351564B 1/12

1. General

This is the special transmitter for optical transmission torque transducer.

2. Specifications

- Transducer power supply 24 VDC±2 VDC, 2 A
- Applicable transducer Optical transmission torque transducer

Model No.	Cable	Setting in OPT-564	Remark
TMHS	CAC-176B-**M	F-54=0 (10 kHz±5 kHz)	
TMHSA	CAC-176C-**M CAC-176B-**M	F-54=0 (10 kHz±5 kHz)	
TMHSB	CAC-176D-**M CAC-176G-**M	F-54=1 (240 kHz±120 kHz)	
TMOFB	CAC-169B-**M	F-54=0 (10 kHz±5 kHz)	Required power conversion box (DBX-001) to connect.
TMHFB	CAC-169B-**M	F-54=0 (10 kHz±5 kHz)	Required power conversion box (DBX-001) to connect.

- Input signal
 - Torque signal
 - Frequency input 120 kHz ~ 360 kHz (at F-54 = 1)
 - Frequency input 5 kHz ~ 15 kHz (at F-54 = 0)
 - Rotation speed signal
 - Frequency input 0 kHz ~ 50 kHz (at 120 teeth)
 - Frequency input 0 kHz ~ 100 kHz (at 240 teeth)
 - Frequency input 0 kHz ~ 150 kHz (at 360 teeth)
- Output signal
 - Analog output (Standard) ±10 VDC (at [negative rated torque] ~ [positive rated torque])
 - Load resistance 2 kΩ or more
 - Output capacitance load 0.1 μF or less
 - (Select at the time of order) Current output and frequency output for torque
Voltage output, Current output, and 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.
- A/Z effective range within ±10 %R.O.
- Digital compensation
 - Non-symmetry ±10 %R.O.
 - Linearization Up to 10 points
(5 points for 0 to positive rated output. 5 points for 0 to negative rated output)
 - Torsion direction reversal Reverses torsion direction and output signal.
(Standard is positive output for counterclockwise direction.)
- Non-linearity 0.01 %F.S. (Display and voltage output)
0.05 %F.S. (Current output)
- CHECK Approx. 80 % of rated output (Set by default function)
- Frequency response range DC ~ 6 kHz (when F54 = 1)
DC ~ 1 kHz (when F54 = 0)

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- Torque analog output filter 1 Hz, 10 Hz, 30 Hz, 50 Hz, 100 Hz, 300 Hz, 500 Hz, 1 kHz, and 6 kHz
(when F-54 = 1)
1 Hz, 10 Hz, 30 Hz, 50 Hz, 100 Hz, 300 Hz, 500 Hz, and 1 kHz
(when F-54 = 0)
Above is 10 Hz ~ 6 kHz : -3 dB±1 dB, 1 Hz : -3 dB±3 dB
- Torque analog output delay time 270 μs (Typ.),
when 6 kHz of low pass filter and 1 time of moving average samples
- Rotation speed analog output delay time 24 ms (Typ.)
when 10 Hz of low pass filter and 1 time of moving average samples
- Sampling rate Torque : 60 000 times/s (when F-54 = 1)
Torque : 10 000 times/s (when F-54 = 0)
Rotation speed : 10 000 times/s
- Torque display section
 - Output display 0 ~ ±99 999 digital display (Green LED)
 - Out-of-range display [-OL] appears for minus overflow, [OL] appears for plus overflow.
 - Display format Analog voltage / Torque
 - Decimal point display Changeable to No display, 10¹, 10², 10³ and 10⁴
 - Condition display A/Z, LOCK, CHECK, H, M, ERROR
 - Unit display Changeable to V, Nm and kNm
 - Display frequency Approx. 20 cycles/s (Changeable to 4 cycles/s)
 - Calibration number 1 to 4 (display the selected calibration number.)
- Rotation detector
 - Power supply for rotation detector 12 VDC±2 VDC
 - Applicable rotation detector MP-9820 (made by Ono Sokki Co., Ltd.)
 - Non-linearity 0.01 %R.S. (display, voltage output, frequency output, digital output)
0.05 %F.S. (Current output)
 - Frequency response range 10 Hz (changeable to 1 Hz)
Above is 10 Hz : -3 dB±1 dB, 1 Hz : -3 dB±3 dB
 - Number of teeth for rotation detector 120 teeth, 240 teeth, 360 teeth
 - Display section of rotation speed
 - Output display 0 ~ ±27 500 digital display (green LED)
 - Out-of-range display [-OS] appears for minus overflow, [OS] appears for plus overflow.
 - Display format Rotation speed
 - Unit display r/min
 - Display frequency Approx. 20 cycles/s (Changeable to 4 cycles/s)
- Function of sheet key switch of front panel
 - ◀ Next setting digit up / A/Z ON
 - ▶ Next setting digit down / A/Z OFF
 - ▲ Increment the set value
 - ▼ Decrement the set value
 - CHECK CHECK value
 - FUNC Changeover the function mode
 - ENTER Entry key
 - ERROR RESET ERROR RESET key

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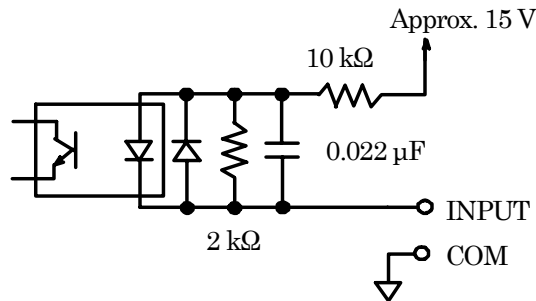
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- External control input signal

A/Z	Same as A/Z key
A/ZOFF	Same as A/Z OFF key
* Above are pulse input, and effective only once with pulse input width of at least 100 ms.	
LOCK	Prohibit the operation by key.
* Above is level input, and effective during the input of short-circuit of at least 100 ms.	
Rotation POL.	Rotation direction reversed input.
SEL1	Changeover the calibration data
SEL2	Changeover the calibration data

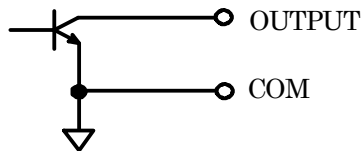
ERROR OUT	Release the ERROR status.
ERROR IN	Detect the error of torque transducer



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

- External control output signal

ERROR IN	Open collector turns ON when various errors occur.
ERROR OUT	Release the error in torque transducer (corresponds only to TMHSB.)



Rated capacity of open collector $V_{CE} = 35 \text{ VDCmax}$, $I_c = 40 \text{ mADC max}$

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

- Various function

Digital filter	Stabilizes data using calculation processing inside CPU
Sheet key lock	Locks specified key operations.
Calibration data selection	Allows four types of calibration data to be stored and then selected using functions.
Indication of luminous energy decrease.	The status display LEDs vary in illumination according to the torque transducer light level. (H, M, ERROR)
Error code display	Display the error code corresponding to the occurring error. * When the error occurs, it releases with the release key or the display is maintained as long as not released by an external control input. * Neither the back-up nor the logging function of the error are provided.

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3. General specifications

- Operating temperature and humidity range
 - Temperature -10 °C ~ 50 °C
 - Humidity 85 %RH or less (Non condensing)
- Used elevation Under 2 000 m
- Pollution degree Under 2
- Overvoltage category Category II
- Power supply
 - Power supply voltage 100 VAC ~ 240 VAC (Permissible variable range : 85 VAC ~ 264 VAC)
 - Power supply frequency 50/60 Hz
 - Power consumption Approx. 60 VA (at 100 VAC)
Approx. 80 VA (at 240 VAC)
- Insulation resistance 500 VDC, 100 MΩ or more between the power supply line and a case.
- Withstand voltage 1 500 VAC, 1 min period between power supply line and case.
- Outline dimensions (WxHxD): 68 mm x 209 mm x 252 mm (Excludes protruding parts)
- Weight Approx. 2 kg

4. Accessories

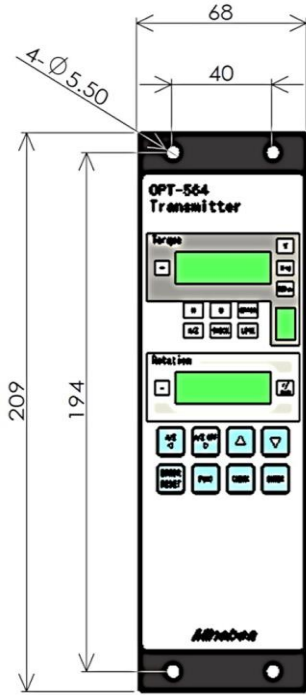
- Instruction manual 1 piece
- Time-lag fuze 1 piece (T5A 250V)
- I/O connecter for external control
1 piece (plug : MC1.5/9-ST-3.81)
- Connector for torque transducer and rotation detector
1 piece (plug : MC1.5/16-ST-3.81)
- Connector for analog output 1 piece (plug : MC1.5/8-ST-3.81)

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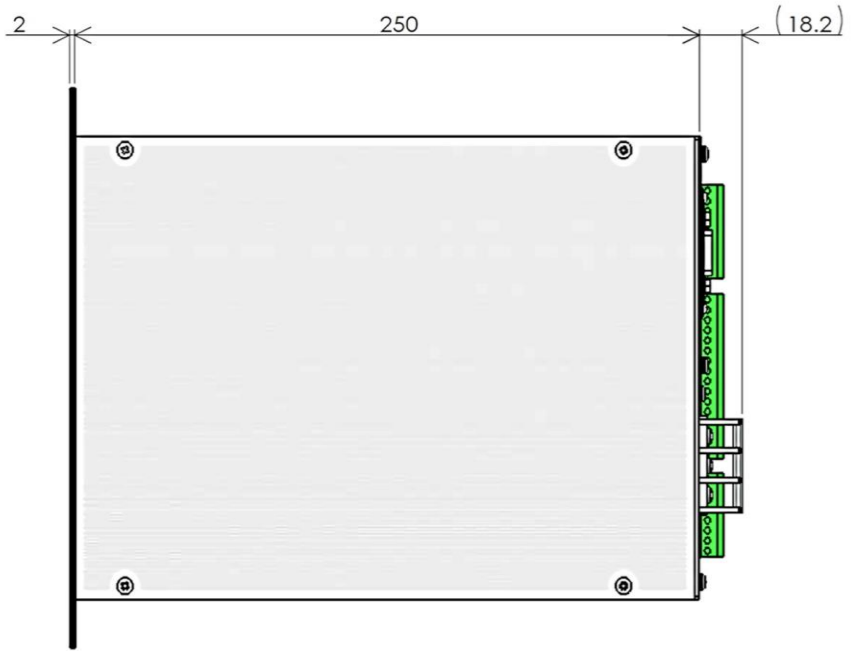
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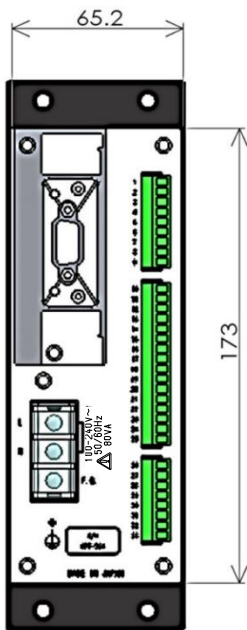
5. Outline dimensions



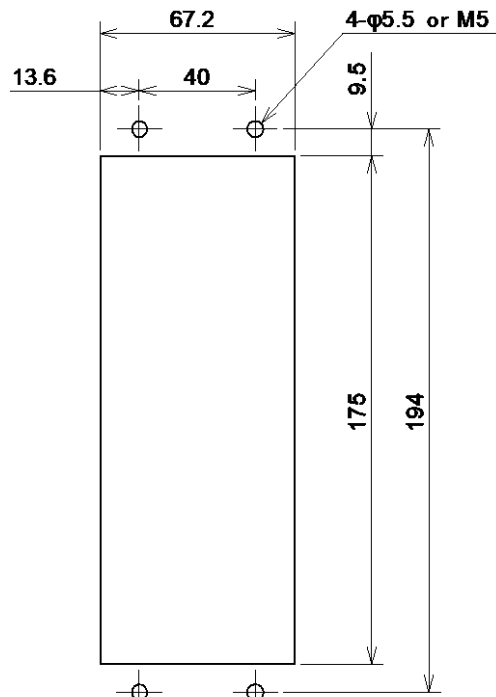
Front



Side



Rear



Panel cut size

Unit: mm

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6. Select at the time of the order

6-1. Analog output for torque

- Current output

Part No.	OPT564-T2 (at torque zero to + rated torque) OPT564-T3 (at - rated torque to + rated torque)
Output	4 mADC ~ 20 mADC
Load resistance	510 Ω or less
Resolution	1/12 000 or more
Non-linearity	0.05 %R.O.
Over range	[-OL] display under 2.4 mADC , [OL] display over 21.6 mADC * Internal circuit and photo-coupler are insulated.

- Frequency output

Part No.	OPT564-T4
Output	120 kHz ~ 360 kHz (at - rated torque to + rated torque, when F-54 = 1) 5 kHz ~ 15 kHz (at - rated torque to + rated torque, when F-54 = 0)
Over range	[-OL] display at 108 kHz , [OL] display at 372 kHz, when F-54 = 1 [-OL] display at 4.5 kHz , [OL] display at 15.5 kHz, when F-54 = 0 * 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.
OPT-564 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 unit select the voltage output.)

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6-2. Analog output for rotation speed

- Voltage output

Part No.	OPT564-R1
Output	±10 VDC (at - rated rotation speed to + rated rotation speed)
Load resistance	2 kΩ or more
Load Capacity	0.1 μF or less
Resolution	1/12 000 or more
Non-linearity	0.05 % R.O.
Over range	[-OS] display under -11 VDC, [OS] display over 11 VDC

*Internal circuit and photo -coupler are insulated.

- Current output

Part No.	OPT564-R2 (at rotation speed zero to + rated rotation speed) OPT564-R3 (at - rated rotation speed to + rated rotation speed)
Output	4 mADC ~ 20 mADC
Load resistance	510 Ω or less
Resolution	1/12 000 or more
Non-linearity	0.05 % R.O.
Over range	[-OS] display under 2.4 mADC , [OS] display over 21.6 mADC

*Internal circuit and photo -coupler are insulated.

- Frequency output

Part No.	OPT564-R4
Output	50 000 Hz (at rotation speed of 25 000 rpm)
Non-linearity	0.01 %R.O.

* The frequency output outputs the input signal from the rotation detector directly.
OPT-564 cannot calibrate the zero and the sensitivity.

* 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.

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7. Options

7-1. RS-232C interface

- Part No. OPT564-P74
- Specifications
 - Baud rate Selectable from 1 200 bps, 2 400 bps, 4 800 bps, 9 600 bps, 19 200 bps, 38 400 bps, 57 600 bps, 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
Applicable plug : DE-9S-NR (by JAE)

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)

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7-2. RS-422/485 interface

- Part No. OPT564-P76
- Specifications
 - Baud rate Selectable from 1 200 bps, 2 400 bps, 4 800 bps, 9 600 bps, 19 200 bps, 38 400 bps, 57 600 bps, 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
 - Address Select one from 0 to 31
 - Transmission data ASCII code
 - Cable length Approx. 1 km
 - Numbers of connectable units
32 unit at the maximum (RS-422 : 10 units)
 - Termination Built-in (Selects the presence by the connection of terminal board.)
 - Changeover of RS-422 and RS-485
Set by function
 - Equipped with the LED for I/O monitor

- Terminal configuration of RS-422/485

SDA	Differential output
SDB	Differential output
RDA	Differential input
RDB	Differential input
TRM	Termination resistance
S.G.	Signal ground

* 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)

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7-3. PROFIBUS interface

- Part No. OPT564-P70
- Version PROFIBUS DP
- Specifications
 - Baud rate Selectable from 9.6 kbps, 19.2 kbps, 93.75 kbps, 187.5 kbps, 500 kbps, 1.5 Mbps, 3 Mbps, 6 Mbps or 12 Mbps
 - Communication type RS-485 bus
 - Station address Select one from 0 to 125
 - Cable length

Baud rate (bps)	Total extension length (m)
9.6 k	1 200 or less
19.2 k	1 200 or less
93.75 k	1 000 or less
187.5 k	1 000 or less
500 k	400 or less
1.5 M	200 or less
3 M	100 or less
6 M	100 or less
12 M	100 or less
 - Connectable cable Use the special cable for PROFIBUS
 - Connectable connector Use the special cable for PROFIBUS
 - Termination Use the connector with termination resistance.
 - Status LED The state of the communication is indicated by two LED. (OP and ST)

• Pin configuration of PROFIBUS connector

Pin No.	Signal name
1	N.C.
2	N.C.
3	RXD / TXD-P
4	CNTR-P
5	DGND
6	VP
7	N.C.
8	RXD / TDY-N
9	N.C.

* 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, A/Z OFF, CHECK)
- 5) Reads out the function data
- 6) Change of the function data
- 7) Communication error code (Error code for the communication.)

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7-4. CANopen interface

- Part No. OPT564-P71
- Specifications
 - Baud rate Selectable from 10 kbps, 20 kbps, 50 kbps, 100 kbps, 125 kbps, 250 kbps, 500 kbps, 800 kbps or 1 Mbps
 - Node ID Select one from 1 to 127.
 - Cable length

Baud rate(bps)	Total extension length (m)
10 k	1 000 or less
20 k	1 000 or less
50 k	1 000 or less
100 k	600 or less
125 k	500 or less
250 k	250 or less
500 k	100 or less
800 k	50 or less
1 M	25 or less
 - 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

Pin No.	Signal name
1	N.C.
2	CAN_L
3	CAN_GND
4	N.C.
5	CAN_SHLD
6	N.C.
7	CAN_H
8	N.C.
9	N.C.

- * 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.)

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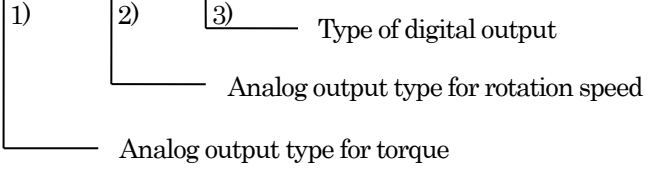
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7-5. Combination of the options

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- 1) {
- T2: Current output for torque (at torque zero to + rated torque)
 - T3: Current output for torque (at - rated torque to + rated torque)
 - T4: Frequency output for torque
 - T24: Current output for torque (at torque zero to + rated torque) + Frequency output for torque
 - T34: Current output for torque (at - rated torque to + rated torque) + Frequency output for torque

- 2) {
- R1: Voltage output for rotation speed
 - R2: Current output for rotation speed (at rotation speed zero to + rated rotation speed)
 - R3: Current output for rotation speed (at - rated rotation speed to + 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 to + rated rotation speed) + Frequency output for rotation speed
 - R34: Current output for rotation speed (at - rated rotation speed to + 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.