



TC80-D3V

Quick Manual

01DEC2022REV.1.02

UNIPULSE

Safety Precautions

For safety reasons, please read the following safety precautions

Installation, maintenance and inspection of the TC80 should be performed by personnel having technical knowledge of electricity. Notes indicated here are the serious contents related to safety. Please use TC80 after understanding the contents.

[Warning] Hazards that could result in serious injury or fatality might occur if TC80 is incorrectly handled

Warning on design

- For the entire system to function safely when the TC80 becomes faulty or malfunctions, provide a safety circuit outside the TC80.
- Before using the TC80 as described below, make sure to consult with our sales personnel.
 - Use in environments not described in the operation manual
 - Use greatly impacting human lives and assets, such as medical devices, transport devices entertainment devices, and safety devices.

Warning on installation and wiring


- Do not disassemble, repair, or modify the TC80. Doing so may cause a fire or an electric shock.
- Do not install in the following environments.
 - Places containing corrosive gas or flammable gas.
 - Where the product may be splashed with water, oil or chemicals.
- Be sure to ground the protective ground terminal.
- Before performing a wiring work, make sure that no power is applied.

Warning during startup and maintenance.

- Do not touch any signal input/output terminal while applying power. Doing so may cause electric shocks or malfunctions.
- In the case of smoke, an abnormal smell or strange sound, immediately turn off the power and disconnect the power cable.

[Caution] Hazards that could result in personnel injury or property damage might occur if TC80 is incorrectly handled

Caution on installation and wiring

- Since TC80 is defined as an open type(built-in device), it should be used to install and fix to a panel,etc.
- Do not install in the following environments.
(Where the temperature/humidity exceeds the range of the specifications. Where the temperature changes remarkably or there is a danger of freezing or condensing. Outdoors or where the altitude exceeds 2000m. Places containing large quantities of salt or iron powder. Where the main body is directly affected by vibrations or shocks.)
- Take adequate shielding measures when using at the following locations.
(Near a power line. Where a strong electric field or magnetic field is formed. Where static electricity, relay noise or the like is generated.)
- Install the TC80 as far away from devices generating high frequency, high voltage, large current, surge, etc., as possible. Also, carry out wiring separately from their power lines. Do not carry out parallel wiring and common wiring.
- Use shield cables for UTMⅢ, encoder, external input/output, D3V.
- Be sure to ground the frame ground terminal().

Caution during startup and maintenance

- For turning ON/OFF the power, be sure to keep intervals of 5 seconds or more. After power-on, make sure to warm up the TC80 for at least 30minutes before use.
- When performing maintenance, disconnect the power. Do not wipe with a wet rag, or with benzene, thinner, alcohol, etc.

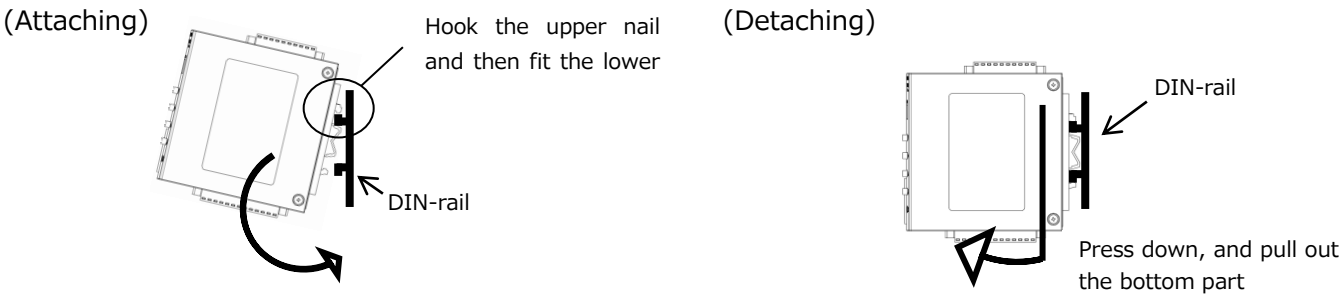
Caution during disposal

- If you dispose of the product, handle it as industrial waste.

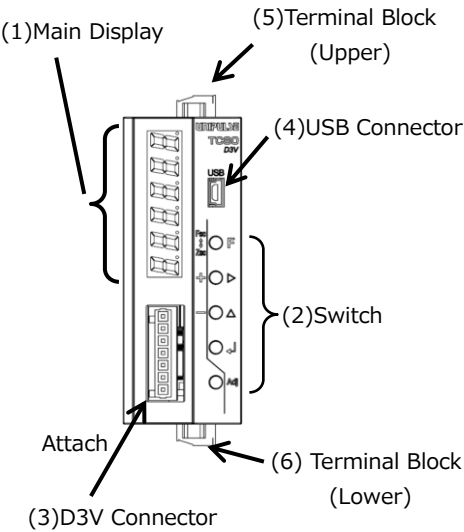
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INSTALLATION•CONNECTION

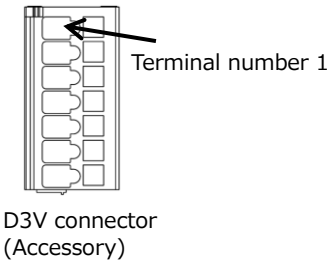
1-1. Mounting TC80 to DIN-rail / Unmounting TC80 from DIN-rail



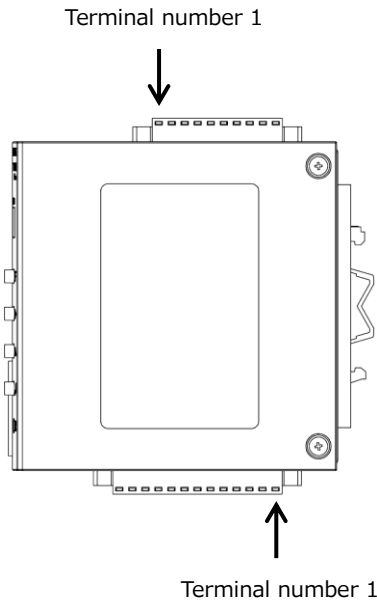
1-2. Front panel / Terminal block



Name	Description	
(1)Main Display	1)Indicated value display 2)Over scale / error display 3)Setting value display	Displays indicated values (torque/rotation speed/power/angle) Displays over scale/other errors Displays various setting values
(2)Switch	F FNC ▶ HOLD △ ZERO ↺ ENT(tr / rp / Po / An) Adj Adjust	Switches to the setting mode Hold operation/setting operations Digital zero/setting operations Display switching /setting operations Go into the D3V output adjustment mode.
(3)D3V Connector	Connects with a D3V cable.	
(4)USB Connector	Connects with a USB cable.	
(5)Terminal Block (Upper)	Connects with external I/O and rotary encoder.	
(6)Terminal Block (Lower)	Connects with the power supply/ signal input/pulse input/RS-485.	



No	Terminal name	Description
1	ch1(+)	Voltage output terminal of ch1(torque)
2	ch1(-)	Ground terminal of ch1 (torque)
3	ch2(+)	Voltage output terminal of ch2(rotation speed)
4	ch2(-)	Ground terminal of ch2(rotation speed)
5	ch3(+)	Voltage output terminal of ch3(power/angle)
6	ch3(-)	Ground terminal of ch3(power/angle)
7	SLD	Shield terminal




Terminal block (upper)

No	Use	Terminal name	Description
1	Input terminal	IN1	Terminal for input signals.
2	Output terminal	OUT1	Terminals for output signals.
3		OUT2	
4	Ground for I/O signals	COM	Common terminal of I/O signals.
5	Power supply for rotary encoder(+5V)	PWR(+5V)	Power supply Terminals for rotary encoder.
6	Power supply for rotary encoder (Ground)	PWR(GND)	
7	Encoder input (A phase)	A	Terminals for rotary encoder (A,B,Z phase).
8	Encoder input (B phase)	B	
9	Encoder input (Z phase)	Z	
10	Shield	SLD	Terminal for SHIELD

Terminal block (lower)

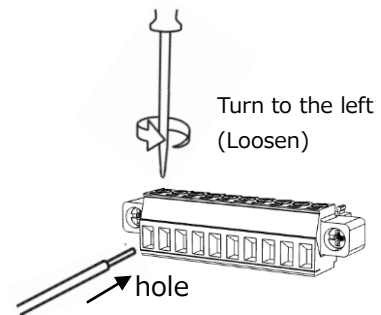
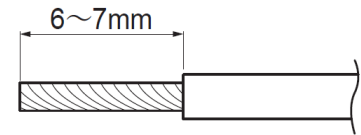
To connect RS-485 of UTMIII, connect TX+ & RX+ of torque meter to B+ of TC80, then connect TX- & RX- to A- of TC80.

No	Use	Terminal name	Description
1	RS-485	SG	Terminals for connecting with the RS-485 interface.
2		B+	
3		A-	
4	Unused	N.C.	
5	Analog input	- SIG(GND)	Terminals for Analog input.
6		+ SIG	
7	Pulse input	PULSE IN	Terminals for Pulse input for rotation speed.
8		PULSE GND	
9	Power supply for UTM	PWR(+24V)	Drive power supply terminals for UTM.
10		PWR GND	
11	Power supply input		Connects with the TC80 power supply (DC24V).
12		+	
13		-	

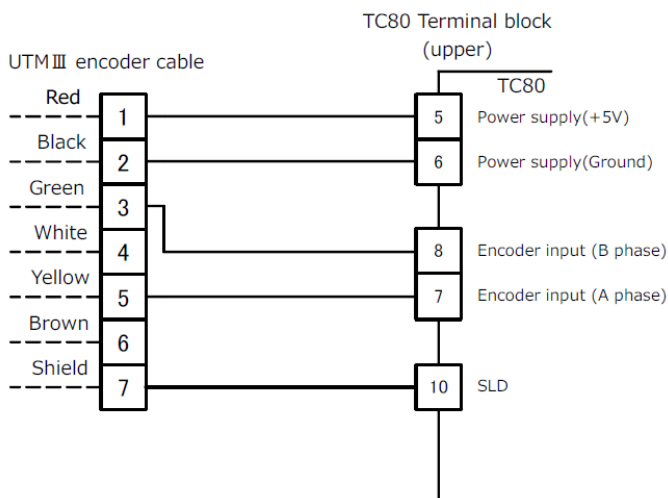
1-3. Connection to the terminal blocks

1. Peel off 6 to 7 mm of coating of the electric wire to be connected, and twist the tip enough so it does not spread.
2. Loosen the screw with a screwdriver and open the hole.
A flathead screwdriver with a shaft diameter of 2.0mm is recommended. (Precision screwdrivers etc.)
3. Check the wiring of the equipment to be connected in the pin assignment table in 1-5, and insert the electric wire into the hole, making sure that the tip does not spread.
4. Tighten the screw with a screwdriver.
5. Pull the electric wire slightly to check that it has been securely clamped.

* Electric wires between 0.08 to 1.31mm² can be connected (AWG16 to 28). The recommended tightening torque value is 0.31 to 0.37 N·m.



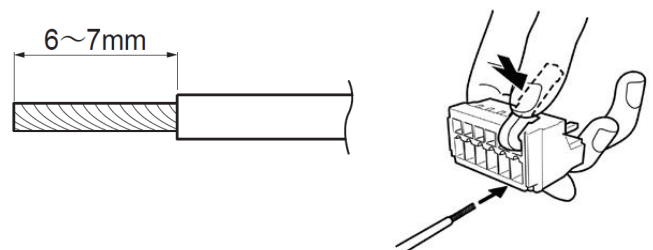
< Connection to UTMIII dedicated rotary encoder >



<Connection to the D3V connector>

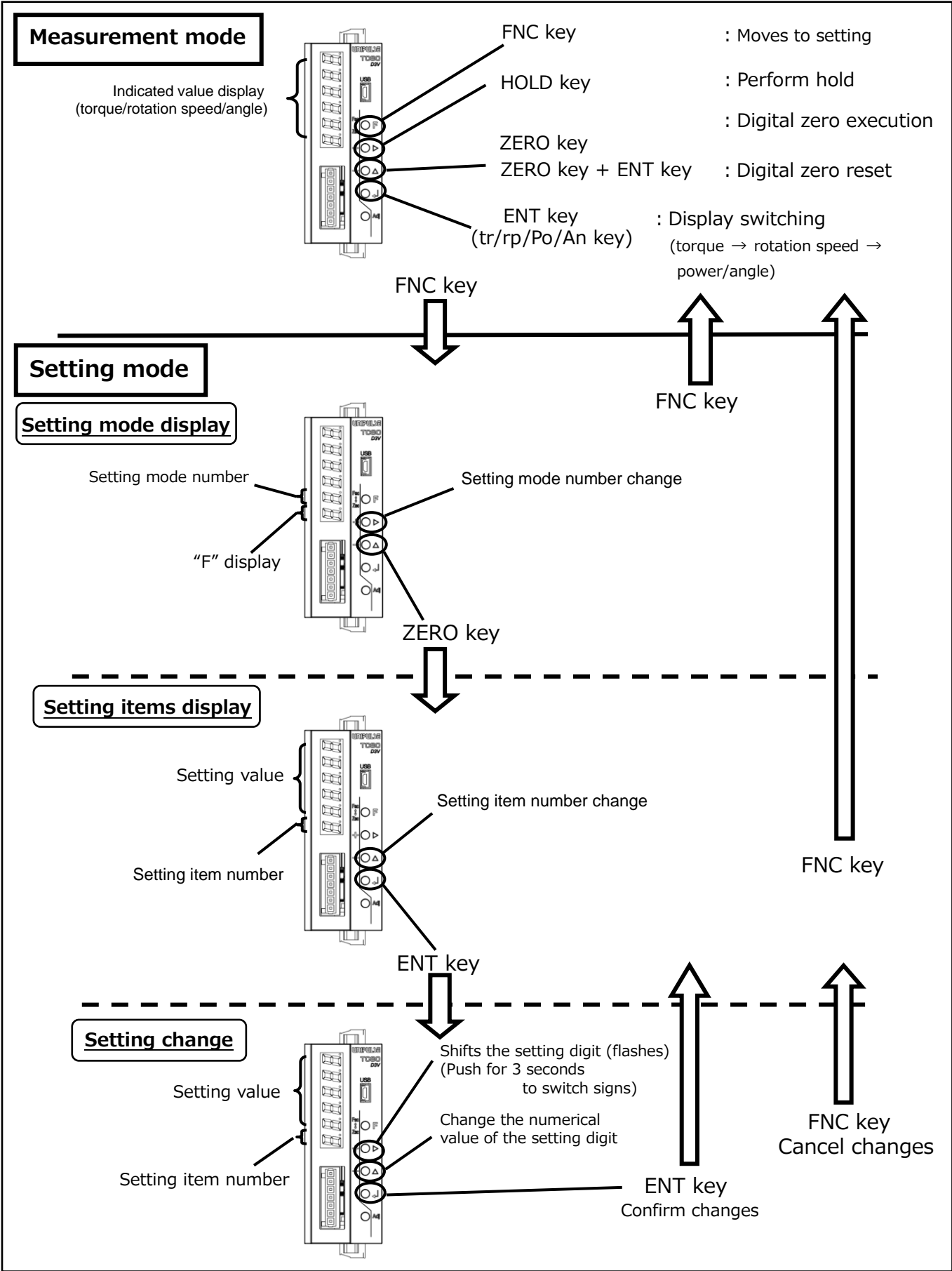
1. Peel off 6 to 7 mm of coating of the electric wire to be connected, and twist the tip enough so it does not spread.
2. Press the operating tool attached to the operation slot at the upper part with a finger and push down the spring.
3. While pressing the operating tool, insert the electric wire in to the insertion opening until it hits the wall.
4. Pull the electric wire slightly to check that it has been securely clamped.

* Electric wires between 0.08 to 1.5mm² can be connected (AWG14 to 28).



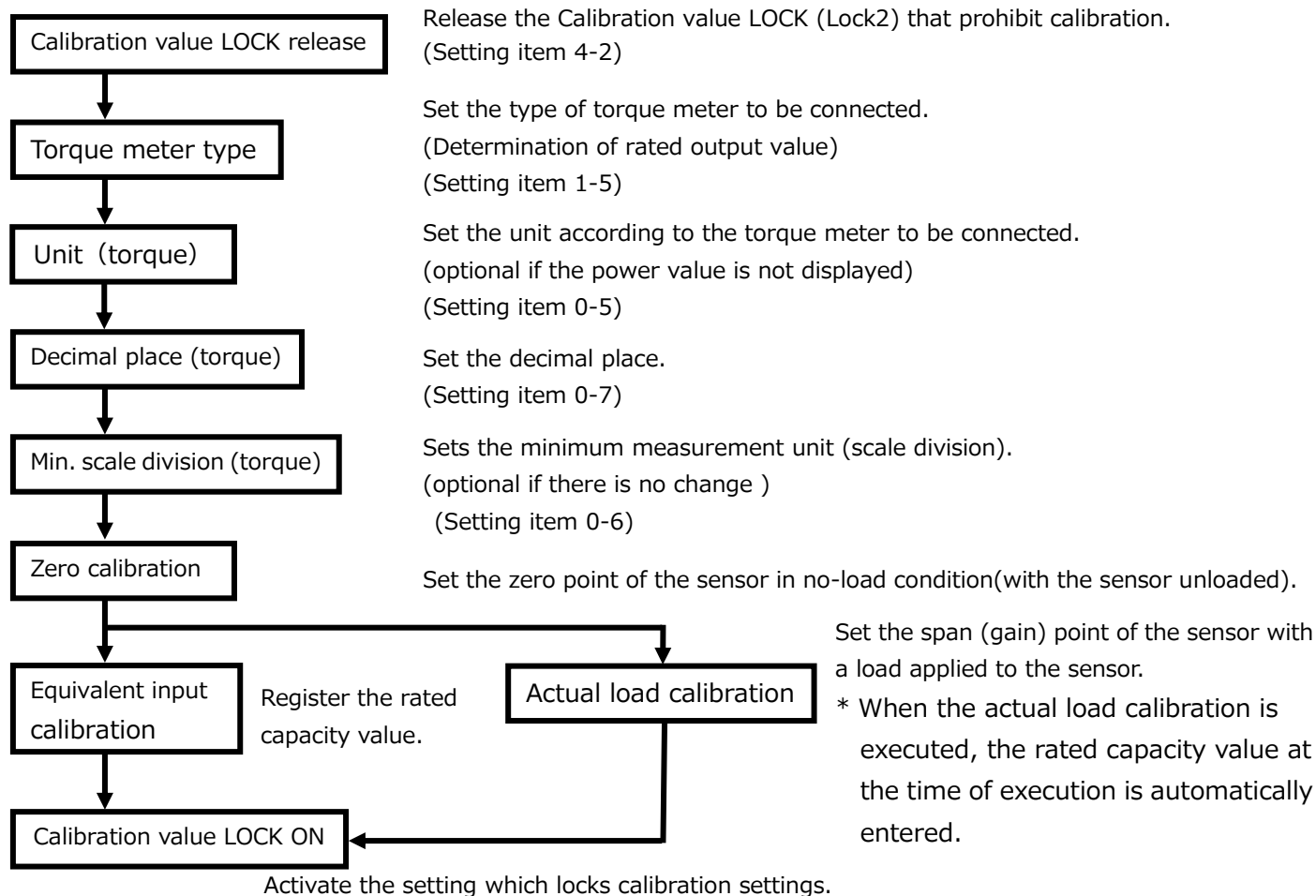
2 Settings/operations

Refer to the following and change the setting items for the required setting modes.



3 Calibration procedures

3-1. Calibration procedures for torque



3-2. Settings/operations related to calibration for torque

■ Zero calibration

Register the default zero point.

- (1) Select setting item 9-1
- (2) Confirm that there is no unnecessary load applied to the torque meter.
- (3) Press the ENT key to start zero calibration
- (4) "CAL-ZE" is displayed while calibration is in progress
- (5) Returns to indicated value display, and zero calibration is complete

[Zero calibration]	(Setting item 9-1)
<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>	
No setting value input ("0" is displayed)	

■ Actual load calibration

Apply the actual load to the torque meter and register the span (gain).

- (1) Select setting item 9-2
- (2) Apply the actual load to the torque meter.
- (4) Press the ENT key to start actual load calibration
- (5) "CAL-SP" is displayed while calibration is in progress
- (6) Returns to indicated value display, and actual load calibration is complete

[Actual load calibration]	(Setting item 9-2)
<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>	
(Input range:-99999 ~ 99999)	

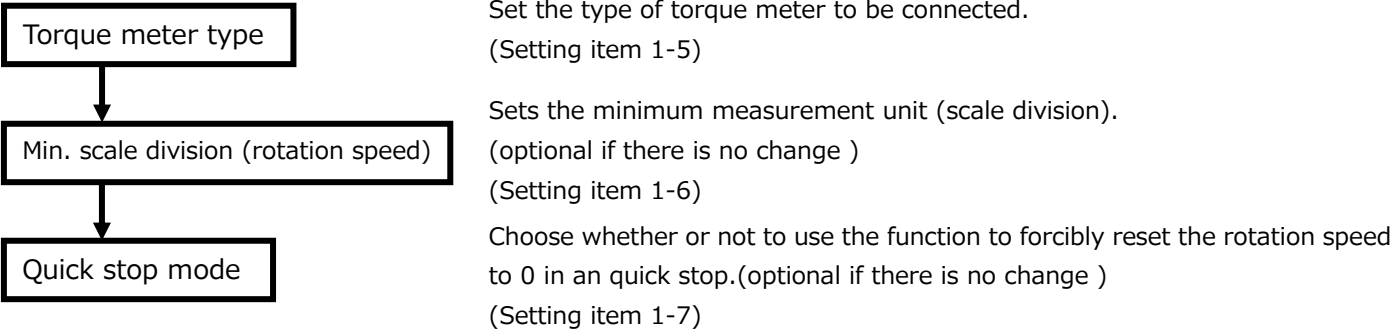
■ Equivalent input calibration

Register the value (rated capacity) to be displayed at the rated output.

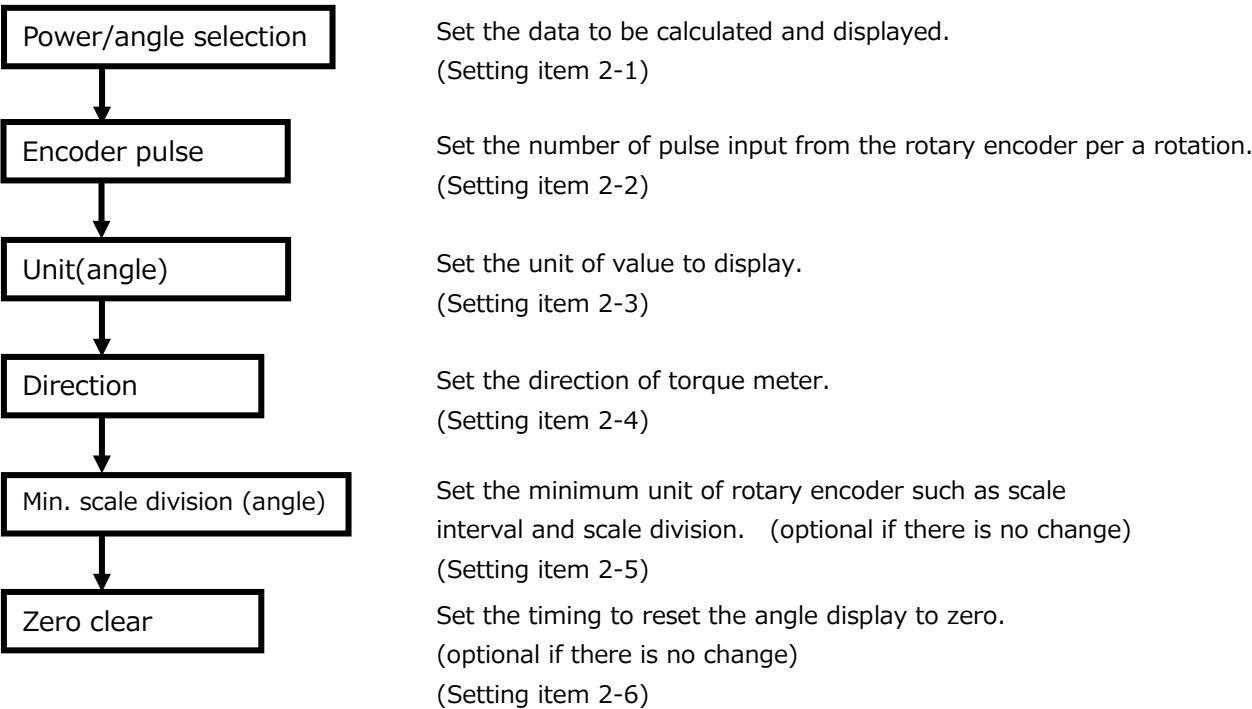
- (1) Select setting item 9-3
- (2) Set the rated capacity value.
- (3) Execute equivalent input calibration by confirming the input value
- (4) Returns to indicated value display, and equivalent input calibration is complete

[Equivalent input calibration]	(Setting item 9-3)
<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>	(Input range:1 ~ 99999)

3-3. Settings/operations related to calibration for rotation speed



3-4. Settings/operations related to calibration for rotary encoder
(Only when using the rotary encoder)



3-5. Setting relevant to power

■ Power setting

Setting relevant to power value.

•Min. scale division (power)

Set the minimum unit of power value.

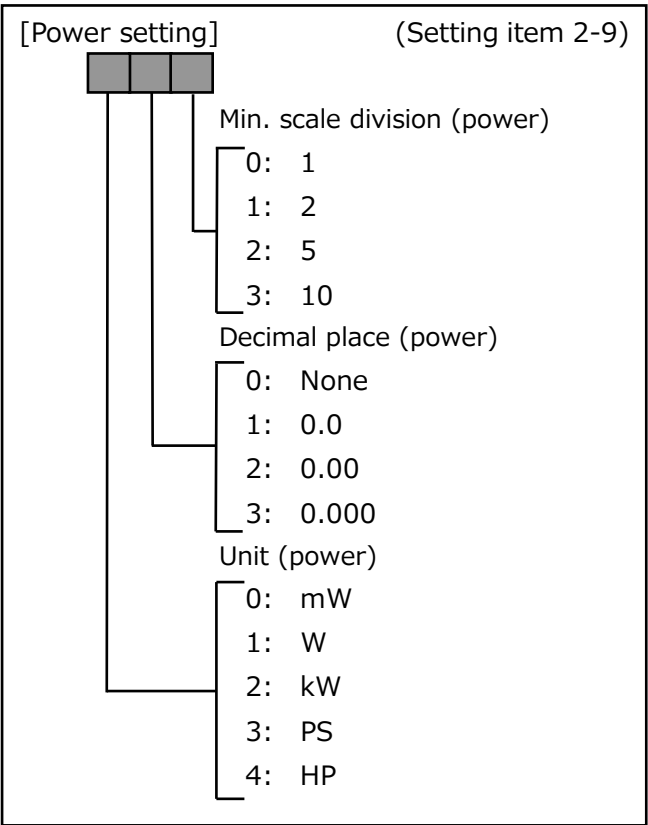
•Decimal place (power)

Set the decimal place of power.

•Unit (power)

Set the unit of power value.

※if you want to display the power, set
[Setting item 2-1 power/angle selection]
to 0.



4 SPECIFICATIONS

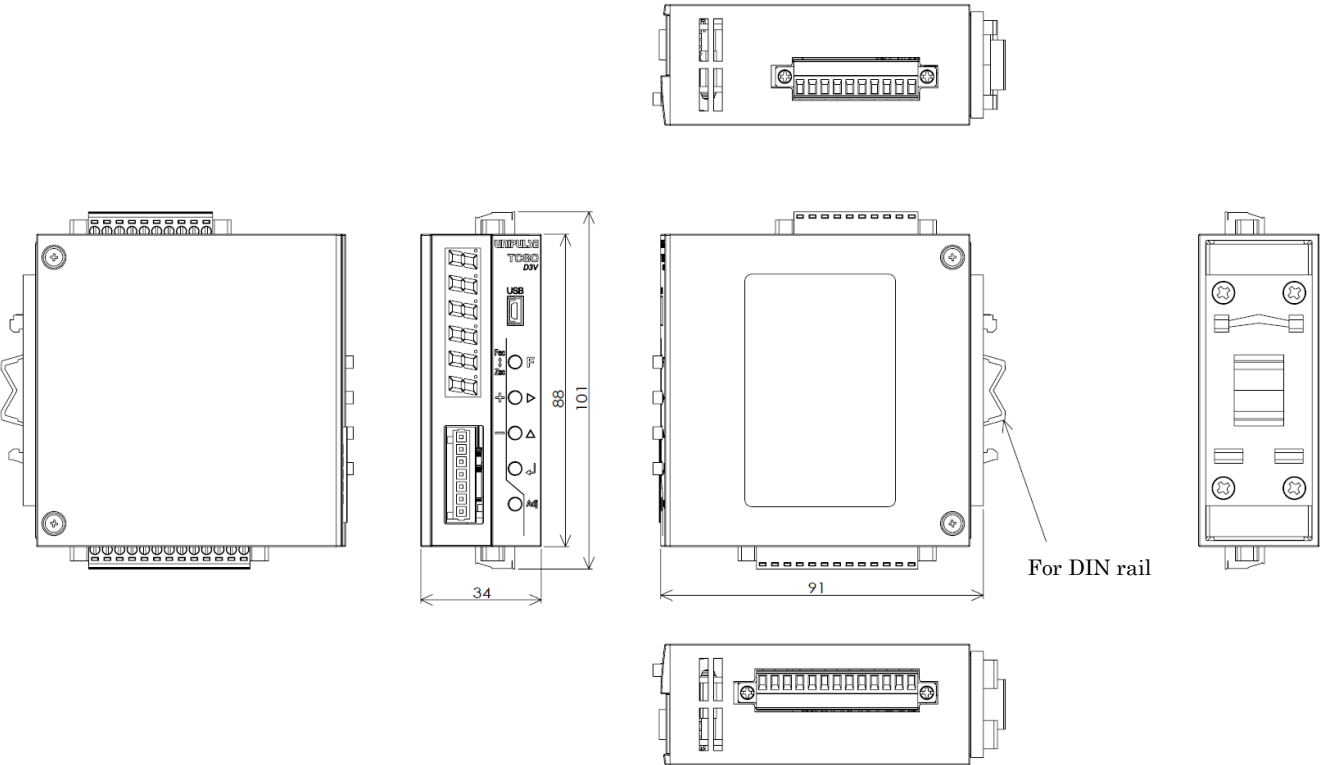
4-1. General specification

Power supply voltage	DC24V(±15%)		
Power consumption	6W		
Operation condition	Temperature	Operation temperature	-10 ~ 50℃
		Storage temperature	-20 ~ 85℃
	Humidity	Less than 85%RH (non-condensing)	
External dimension	34(W) × 88(H) × 91(D) mm (Not including protrusions)		
Weight	Approx. 230g		

4-2. Contents of the package

Small driver for terminal block	1 pc
Terminal block (10pin)	1 pc
Terminal block (13pin)	1 pc
D3V connector	1 pc
Operating tool (D3V connector)	1 pc
Quick manual	2 pcs

4-3. External dimension



Unit:mm

4-4. Compliance with EC directives

■ EMC Directive

EN61326-1 :2013

EN55011 :2009,A1:2010 Group1,Class A

EN61000-4-2:2009

EN61000-4-3:2006,A1:2008,A2:2010

EN61000-4-4:2012

EN61000-4-5:2006

EN61000-4-6:2009

EN61000-4-8:2010