FM REMOTE SIGNAL TORQUE WRENCH

FM96MCU

OPERATION MANUAL

TOHNICHI

Precaution

1. Place the Unit apart form the metallic structure.
2. Do not place the receiver and the transmitter where the antenna contacts with metal or electric wire.
3. Do not cut or curl the antenna or the receiver.
4. Do not use the Unit where the electromagnetic noise takes place by welding machines, electrical discharge machines, PC, etc.
5. If there are any questions, place contact Tohnichi sales office or Tohnichi authorized distributor.

FCC Regulatory Compliance Statement

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) This device must accept any interference received, including interference that may cause undesired operation.

Caution:

Any changes or modifications not expressly approved by the party responsible for product compliance could void the user's authority to operate the equipment.

Canada Regulatory Compliance Statement

This Class B digital apparatus complies with Canadian ICES-003.

Cet appareil numériqué de la classe B est conformé à la norme NMB-003 du Canada.

For Customers in Canada

This device complies with RSS 210 of Industry Canada (IC).
Operation is subject to the following two conditions:
(1) this device may not cause interference, and
(2) this device must accept any interference, including interference that may cause undesired operation of this device.

L’ utilisation de ce dispositif est autorisée seulement aux conditions suivantes :
(1) il ne doit pas produire de brouillage et
(2) l’ utilisateur du dispositif doit étre prêt à accepter tout brouillage radioélectrique reçu, même si ce brouillage est susceptible de compromettre le fonctionnement du dispositif..

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1. Outline

The FM Remote Signal Torque Wrench integrates a wireless signal generator that counts down the number of bolts or nuts after tightened. The signal transmitter can be installed onto TOHNICHI torque wrenches, such as Models QSP, CSP, PQL, PCL, SP, RSP, etc.

It is easy to set the required channel on customer side. 96 channels are available for the Receiver and 16 channels for the Transmitter.

The receiver can be connected to the CNA-4mk2 Count Checker to provide complete tightening assurance system to eliminate missed tightening.

2. Features

This Remote Signal Type torque wrench sends the tightening completion signal to the Receiver far from the wrench through FM-wave. Tone frequency of FM-wave can be easily set. This feature reduces the number of the Remote Signal torque wrenches for spare and a few torque wrenches enable the more tightening control applications.

3. Construction

Receiver	R-FM96D	1 Set
	Antenna	1 Set
Transmitter	Torque Wrench+F-FM96MCU (Battery Incorporated)	1 Set
Instruction manual		1 Set

4. Specification

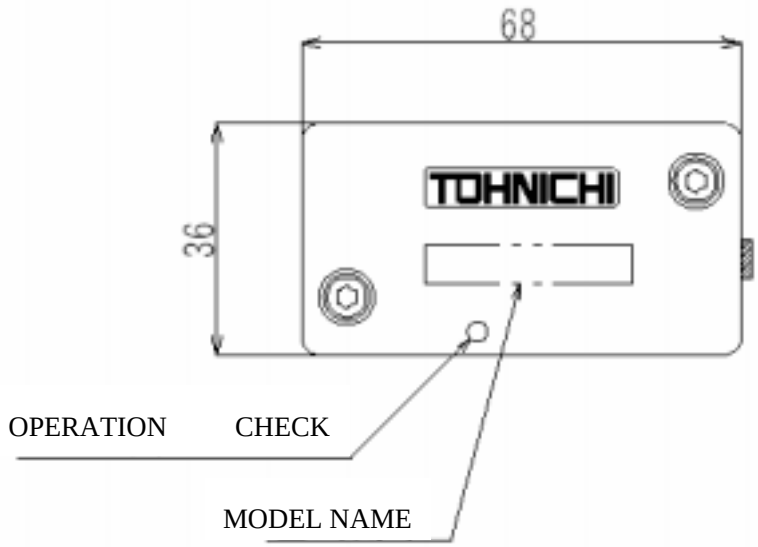
Table 1　FM96MCU Specification

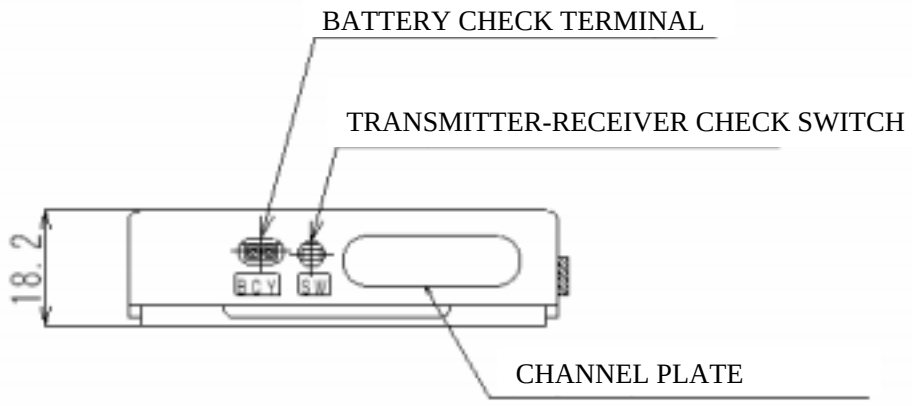
	Transmitter	Receiver
Model	F-FM96MCU	R-FM96D
Frequency Band	41MHz Band (41.025~41.300MHz、25kHz Space、12 Types)	
Wave Type	FM (F3E)	
Channel Change (by DIP Switch)	Radio Frequency (Fixed) 1ch Tone Frequency 16 Channels Selection	**Radio Frequency** A series: 6 Channels Selection B series: 6 Channels Selection **Tone Frequency** A, B series: 6 Channels Selection
Channel ／Unit	16ch	96ch
Total Channel	192ch	
Identification Signal	Dual Tone System	
Signal Output		No-Voltage Contact Output(1a) DC30V 1A,　AC125V 0.3A
Power	DC1.5V R3 (Alkaline Battery)	AC100～115V±10%
Antenna	Wire	1/4λ whip
Operating Temperature Range	0~40℃	
LED Lamp	Operating Check Lamp	Power, Receiving Lamp
Check Function	Battery Check Terminal Transmitting	
Dimension	18.2×36×68(H×W×D)	51×150×210(H×W×D)

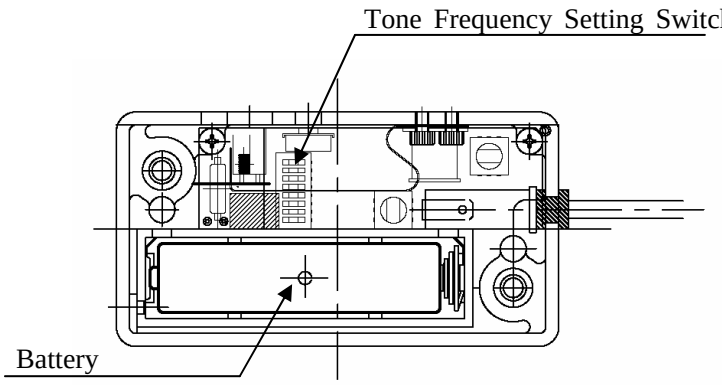
Note 1 : A series frequency of the Receiver is not compatible with B series frequency of the Receiver.

Note 2 : Refer to the bale 3, 4 & 5 for the combination for radio frequency and tone frequency.

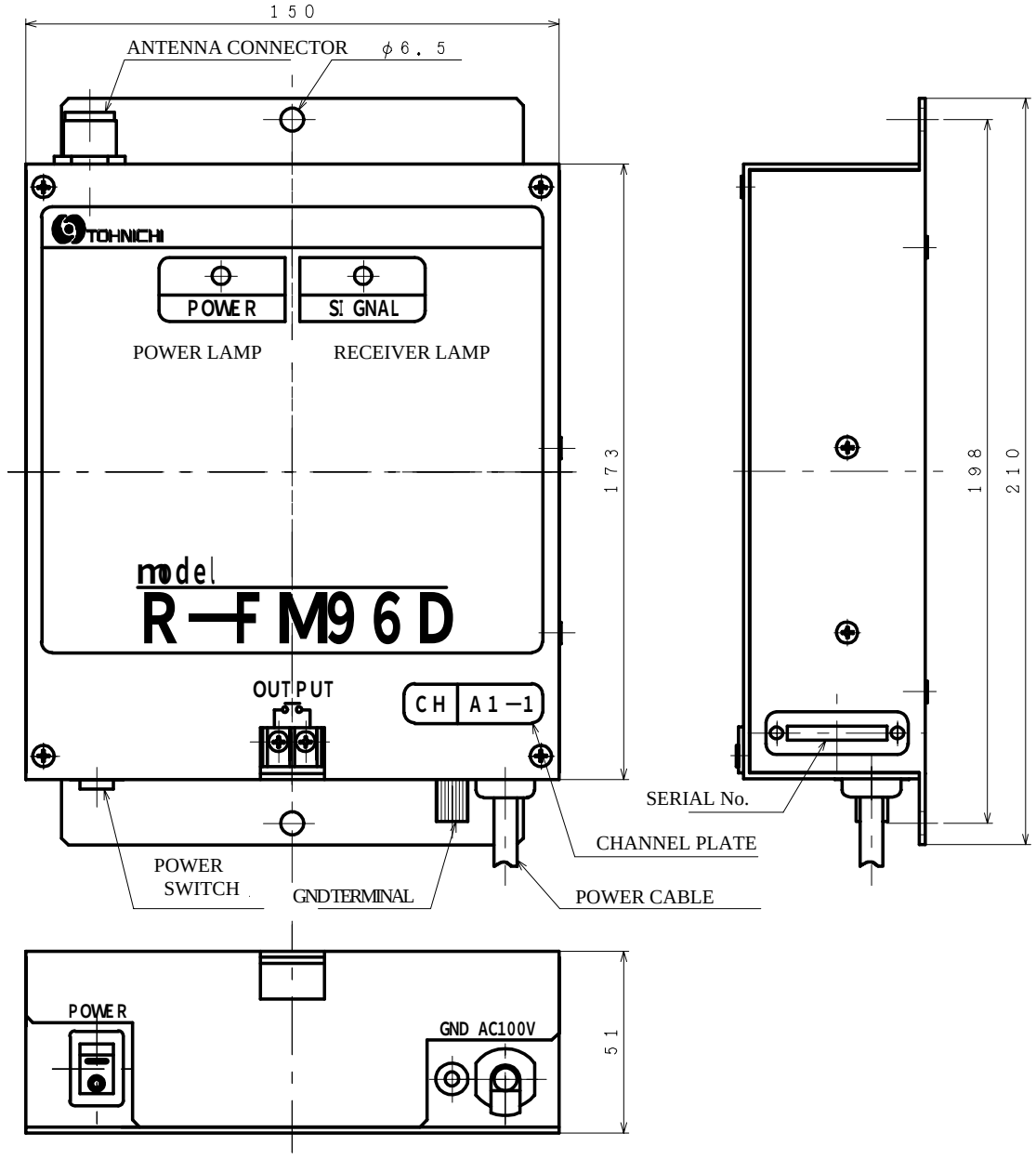
5. Transmitter-appearance and components







6. Receiver-appearance and components



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7. Precaution

1 Power Supply

Use 100～115VAC±10%(50/60Hz)power source for the Receiver. Use the constant-voltage transformer where the power supply is not constant.

Always use LR03 Alkaline battery for the Transmitter.

2. Placing FM Receiver

Avoid placing the antenna near the steel columns or other metal pipes, which will affect the receiving condition.

Press the Transmission check Button, then confirm that operation check LED for Transmission turns on and the “SIGNAL” lamp for Receiver turns on.

3. Connection with Other Apparatus.

Verify that both the Receiver and the equipment are turned off.

Connect the equipment to the output terminal of the Receiver with a two-core shielded wire.

(Connect a separate shielded wire to the GND terminal.)

First, turn on the Receiver, and then the equipment.

8. Operation

1. Precaution

Handle the torque wrench with care.

Read the Operation Manual before operation.

2. Replacing Battery for Transmitter

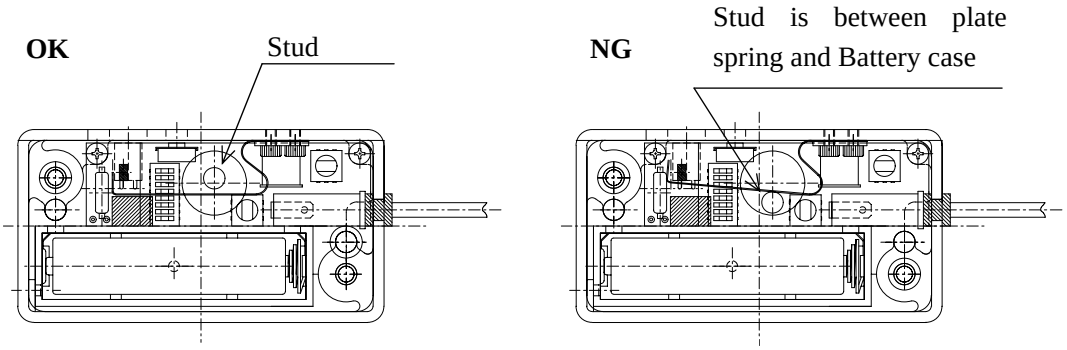
Loosen two screws of top cover and remove the Transmitter.

Remove the empty Battery, and insert a new one.

Always use an R3 Alkaline Battery.

Install the Transmitter, and tighten the screws. Tightening torque T=270cN・m）

※ Stud, which comes from wrench, should not be between plate spring and the Battery case when installing the Transmitter.

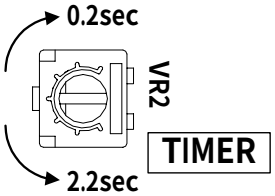


3. Setting the Time to Avoid Double Counting

The Timer is set to 1 second when delivered.

To change the time setting, turn the variable resistance (VR2) on the Receiver board. (Refer to 13. Circuit Diagram for the Receiver in page 14.)

The time can be set between 0.2 sec. and 2.2 sec. as shown below.



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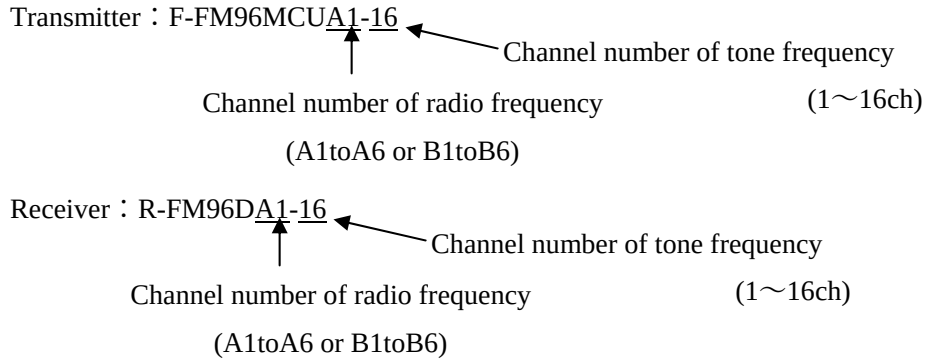
4. Battery Check

Set the switch of the Battery Checker FM-BCY (Option) to BC side. Insert the plug of the Battery Checker to the battery terminal of the Transmitter. The battery should be serviceable if within “OK” range. If the indicator shows the yellow range, replace the battery. If the indicator shows “NG”, replace the battery. Refer to 8-2 Replacing the Transmitter Battery when replace the battery.

5. Channel Setting

Turn off the receiver. To change the current channel, change the position of the dip switches on the board of the Transmitter and the Receiver. (Refer to the Table 3～5.) Channel indication is as follows.



Ex. 1：Change of the Transmitter Channel (only tone frequency)

(1) Remove the Transmitter cover.

(2) Change the position of the DIP switches, referring to the Table 3.

(3) Put the transmitter back.

Ex. 2：Change of the Receiver Channel

(1) Remove the front cover.

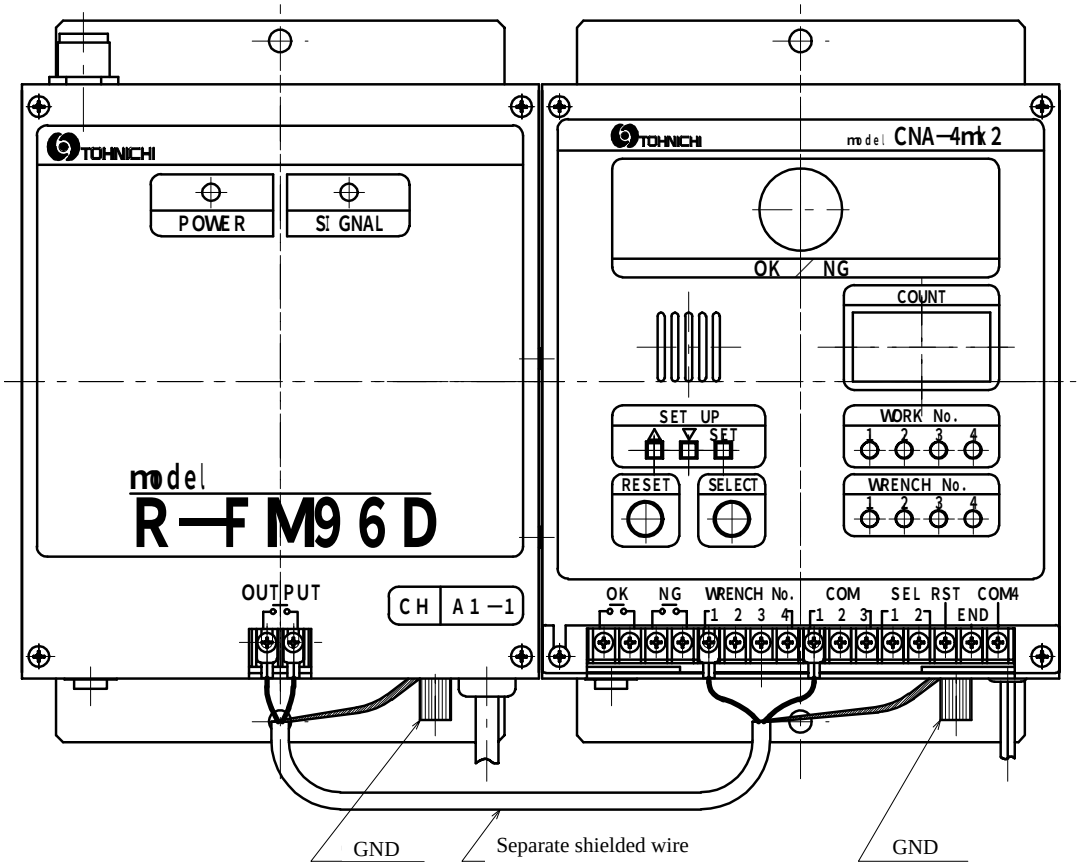
(2) Change the position of the DIP switches located upper part of the Transmitter for the radio frequency, referring to the table4. (6 DIP switches)

(3) Change the position of the DIP switch SW 2 located lower part of the Transmitter for the tone frequency, referring to the table 5. (4 DIP switches)

(4) Put the front cover back.

9. Connecting to CNA-4mk2

The CNA-4mk2 Count Checker can be used together with the Receiver, using a two-core shielded wire, which is connected between the output terminals of the Receiver and the “WRENCH No.” and “COM” terminals. (Connect separate shielded wire to the GND terminals。)



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10. Frequency list

Table 2 Applicable frequency

CHANNEL	FREQUENCY (MHz)
A1	41.025
A2	41.050
A3	41.075
A4	41.100
A5	41.125
A6	41.150
B1	41.175
B2	41.200
B3	41.225
B4	41.150
B5	41.275
B6	41.300

11. Setting Channel of the Transmitter

NOTE : OFF position unless stated.

Table 3 Tone Frequency Setting

CH	DS-1	DS-2	DS-3	DS-4	DS-5	DS-6	DS-7	DS-8
1	ON							ON
2		ON						ON
3			ON					ON
4	ON						ON	
5		ON					ON	
6			ON				ON	
7	ON					ON		
8		ON				ON		
9			ON			ON		
10		ON			ON			
11	ON				ON			
12			ON		ON			
13				ON				ON
14				ON			ON	
15				ON		ON		
16				ON	ON			

12. Setting Channel of the Receiver

NOTE : OFF position unless stated.

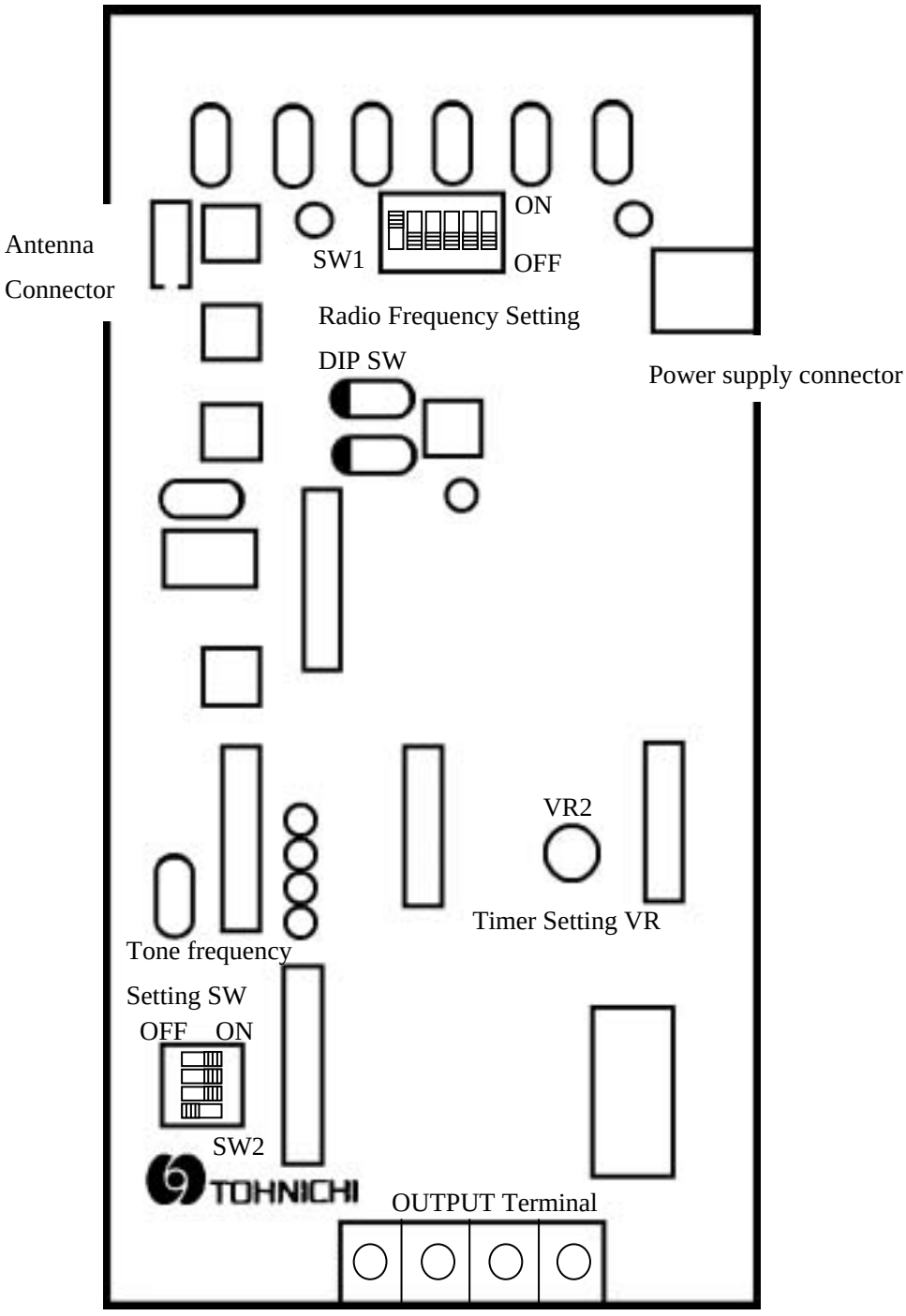
Table 4 Radio Frequency Setting

CH	SW1-1	SW1-2	SW1-3	SW1-4	SW1-5	SW1-6
1	ON					
2		ON				
3			ON			
4				ON		
5					ON	
6						ON

Table 5 Tone Frequency Setting

CH	SW2-1	SW2-2	SW2-3	SW2-4
1	ON	ON	ON	
2	ON	ON		ON
3	ON	ON		
4	ON		ON	ON
5	ON		ON	
6	ON			ON
7	ON			
8		ON	ON	ON
9		ON	ON	
10		ON		ON
11		ON		
12			ON	ON
13			ON	
14				ON
15				
16	ON	ON	ON	ON

13. Receiver Board



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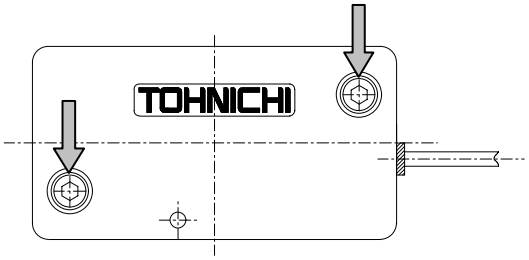
14. FM Board Replacement Procedure

Preparation

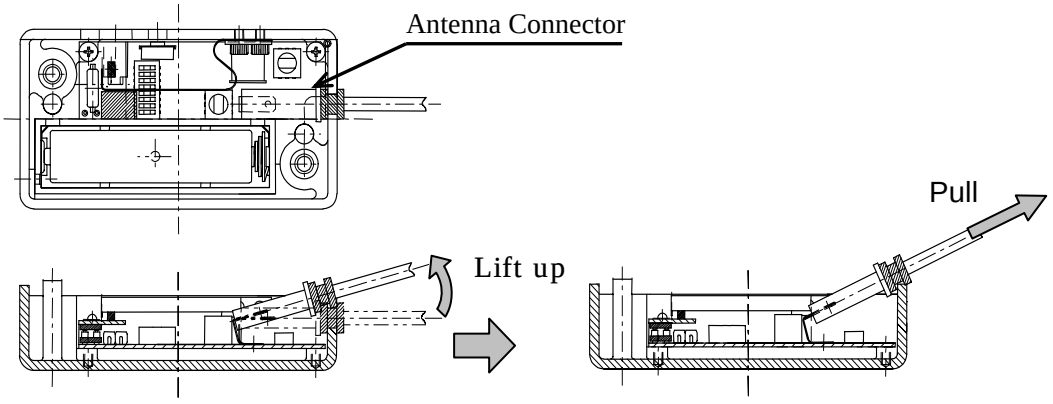
1. RTD500CN
2. Hexagon Bit, size 3mm
3. F-FM96MCU, FM transmitter
5. R-FM96D, FM receiver

1 Loosen two bots and remove the outer cover.

Note : Covered bolt will not leave from cover.

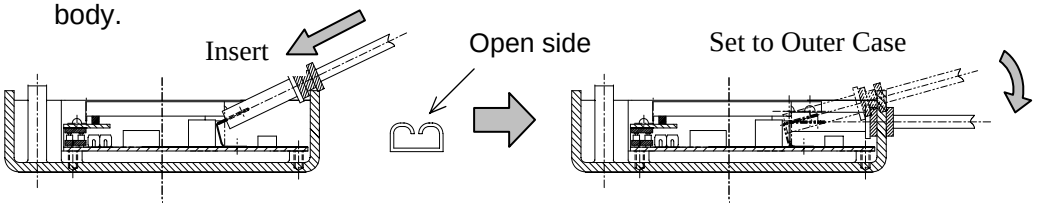


2 Remove antenna connector.



3 Set Antenna Connector.

Insert the antenna connector, as open side must face to torque wrench body.



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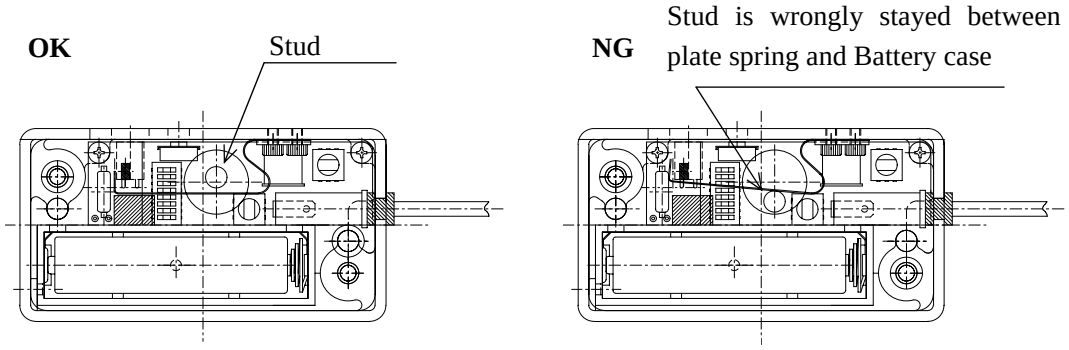
4 Set Antenna Connector

Set AAA battery in the cell, and fit the outer cover with two screws.

Tightening Torque : 270cN.m

Note : FM stud must be located as below drawing shown.

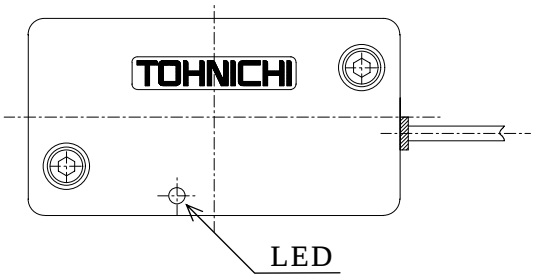


5 Check of Operation

Check to make sure that the Light Emitting Diode turns on when the toggle is depressed and it makes a “click “sound, then perform the following tests.

A. Twist the torque wrench right and left in a no load state to make sure the LED does not light up.

B. Twist the torque wrench right and left in the state in which the goggle is the LED should remain ON.



6 Final Check

Perform test to check whether or not the receiver unit, R-FM96D receives the FM transmission when a bolt is tightened and wrench clicks.

15. Optional Unit

1. FM-ANT, whip antenna
   Antenna, directly connected to the receiver
2. FM-CNT, connector
   Connector, in order to use the antenna away from the receiver.

Ex. Where the separate antenna is required due to bad receiving condition.

3. FM-MBX, magnet for fixing the antenna
   Magnet, in order to fix the antenna away from the receiver.
4. FM-COD, antenna extension wire
5. FM-BCY, battery checker
   Checker, in order to check the battery and the condition of FM-wave transmission.

Ex.1 Turn the FM-BCY switch to BC side and insert the plug of the FM-BCY into the check terminal of the transmitter to check the battery condition.

Ex.2 Turn the FM-BCY switch to RC side, insert the plug of the FM-BCY into the check terminal of the transmitter and press the transmission check bottom. If the FM-Wave is transmitted, the red lamp on the FM-BCY lights.

16. Trouble Shooting

Phenomenon	Possible Cause	Check Point	Action
Not Receiving	Wrong channel setting on transmitter or receiver	Dip Switch on receiver and transmission	Correct the channel
	Low battery of the transmission	Check by battery checker	Replace battery if NG
	Battery installed in a wrong position	Check the polarity of the battery	Set the battery in the right position horizontally in the case.
	Battery misplaced in the case	Check the battery position	
	Noise	Check the receiving condition	Keep away the transmitter and the receiver from the noise source.
Short Transmission distance	Loose or disconnected transmitter antenna and connector.	Check the antenna and connectors.	Plug the antenna firmly. Replace the antenna if disconnected.
	Insulation failure of the transmitter antenna and connector.		
	Failure of receiver placing	Any steel columns or metal pipes near the receiver?	Remove the receiver or use FM-COD and FM-MBX
	Noise	Check the receiving condition	Keep away the transmitter and the receiver from the noise source.

Please check a transceiver state periodically.
If there are any questions, please contact a Tohnichi authorized distributor or Tohnichi office.