21.06A

NITTAN Instruction Manual

Remote Tester/ Smoke Detector Sensitivity Tester MTT-E

Thank you for purchasing this product. This manual provides the overview and feature of the Remote Tester/Smoke Detector Sensitivity Tester MTT-E and describes the correct usage of the product. Before using the product, ensure to read the manual thoroughly for proper use.

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Introduction

Please Note

1. This manual is to provide all the information required for appropriate operation, service and maintenance of the MTT-E.

The manual does not give any information on repair or dismantlement. Please contact us about a repair.

2. The product specification and the information in this document are subject to change without prior notice.

1. General Description

MTT-E is a remote tester to perform various tests and settings for detectors supporting test function, such as "Address Setting", "Remote Test",

"Contamination Level Indication", "Communication Test", "Status Indication", "Detector Data Indication", "Fire Alarm Test for Location Check", "Double Address Indication", and "Fire Alarm Test".

It also provide the sensitivity test function, which can remotely perform "Sensitivity Test" and "All Sensitivity Test".

2. For Your Safety

Criteria of Warning and Caution Markings

WARNING

CAUTION

There is a risk of endangering the health or life of the user, or causing a significant damage to the product when the product is mishandled. There is a risk of causing minor injuries, damage to the product, or a trouble to the product when the product is mishandled.



- Do not get the product wet. If it gets wet or water enters inside the product, remove batteries and disconnect an AC adapter from an outlet immediately. Otherwise it may cause fire, electric shock or fault.
- ●If you notice smoke or unusual odor, immediately power off the MTT-E. Otherwise it may cause fire or electric shock.
- Use a power supply that meets the specification at the end of the manual. Otherwise it may cause fire, electric shock or fault.
- Ensure that the polarities of batteries are correct. Otherwise it may cause the leakage, damage, or explosion of battery.
- If batteries leak, avoid contact with skin or eyes. It may cause damage to skin or loss of sight. Never touch eyes with a hand that may contact with the fluid. In the event of contact with skin, clothes, or eyes, wash immediately with plenty of water and seek immediate medical attention.



- In the event of swallowing a battery, or if it is suspected, seek immediate medical attention.
- If the cable of AC adapter is damaged (such as exposed core wire and cable break), immediately disconnect the AC adapter from an outlet. Otherwise it may cause fire or electric shock.
- In the test using the MTT-E, the control panel reports a fire alarm. Prior to test, take measures not to activate sounders, fire hydrant or smoke control system, and not to transfer an alarm signal to other equipment. Otherwise during test other devices/equipment will be activated.
- •When completing the test, confirm that any zone is not activated. Restore the condition of each sounder/fire hydrant or smoke control system/transmission to other equipment.
- •During test, if any detector is unintentionally activated, stop the test immediately and check the field.

•Do not leave the product in a place exposed to direct sunlight or close to heating equipment, or in a closed car.

Otherwise it may cause malfunction, deformation, or discoloration. •Do not apply excessive impact or vibration to the product.

Otherwise it may cause malfunction.

•Do not touch the power supply cable or connect to peripheral equipment, when thunder is heard. A lightning strike can cause electric shock.

Insert the AC adapter into an outlet firmly. For removal, ensure to hold the AC adapter and pull it out of the outlet. Do not unplug the adapter by pulling the power cable. Damaged cable can cause fire or electric shock.

CAUTION •Re

- Remove the batteries if the MTT-E will not be used for a long time. Battery leakage may happen and cause damage to the product.
 Do not use different types of batteries together or mix new and used batteries. Otherwise it may cause malfunction.
- •Ensure correct wiring (refer to "6-3. Each Method"). Otherwise it may cause malfunction.
- ●Use the product within specified temperature (0-40°C) and humidity range (under 85%RH), and avoid sudden temperature change. Otherwise it may cause malfunction.

 After turning off the power, wait for at least three seconds before turning it on again. Otherwise it may cause malfunction.

 Remote Test cannot be performed without connecting the control panel.

Communication Test cannot be performed if connecting the control panel.

 \bullet 00 to 32 can be assigned to address in decimal.

 During Address Setting, do not remove the detector, or power off the MTT-E. It may cause malfunction.

•If power is turned off during test, restart the test from the beginning.



•Ensure to connect the connection cable CW2 to the module correctly before starting test. After test, disconnect the cable from the module. Otherwise it may cause malfunction.

●If testing with the control panel that does not output a reset pulse automatically, after each test, restore the control panel manually with the reset switch. (Refer to "6-4 Note on Control Panel Operation").

•Keep batteries out of reach of small children. Put them up high or locked away in cabinets fitted with locks.

 Ensure to use an AC adapter within the rated voltage (output: DC9V). Otherwise it may cause fire or fault.



•For an optional AC adapter, use only an adapter marked with the conformity to local product safety legislation and standards, or UL listing, and suitable for Information Technology Equipment.

3. Contents of Package

MTT-E (Main Unit) · · · · · ·			 \cdot \cdot \cdot \cdot \cdot \cdot 1 pc
Connection cable (CW2) · · · ·			 \cdot \cdot \cdot \cdot \cdot 1 pc
Installation cable (CW3) · · · ·			 \cdot \cdot \cdot \cdot \cdot 1 pc
* Refer to "9. Specification" on	page 22	<u>)</u> .	

4. Names of Parts



①Modular JackTo connect the enclosed connection (CW2) and installation cable (CW3)②Tester BaseTo connect a detector head.③FZ-010Attachment for testing 2KH7-LS.④LCD DisplayTo indicate test result, low battery warning, etc.	n cable voltage
② Tester Base To connect a detector head. ③ FZ-010 Attachment for testing 2KH7-LS. ④ LCD Display To indicate test result, low battery warning, etc.	voltage
③ FZ-010 Attachment for testing 2KH7-LS. ④ LCD Display To indicate test result, low battery warning, etc.	voltage
④ LCD Display To indicate test result, low battery warning, etc.	voltage
Operation Button : Back To go back to the previous screen.	
⑤ Operation Button : △ / ☑ To scroll addresses or menu items.	
Operation Button : Enter To select menu items.	
Indicator LEDUpon powering on, the LED illumin green.: [Power LED]It blinks during the warning of low supply voltage occurs.	ates in power
Indicator LEDWhen detecting a detector in alarm, to illuminates in red.	he LED
Indicator LEDWhen detecting the activation of P tendetector connected to the Tester Back LED illuminates in red. ※ P Terminal LED also illuminates in red. 2KH7-LS is activated.	minal of ase, the ed when
⑦Power SwitchTo power ON/OFF the MTT-E.	
Image: Book with the second state w	
Image: Second state Image: Second state Imag	ries.
10 Label MTT-E product label	

%1 Please ensure that the operating voltage of AC adapter is correct for your local supply.

5. Compatible Device

5–1. Compatible Detector and Available Function

O: Applicable / \times : Not applicable

							Fun	ction	List						
	tting		etting	est	All Sensitivity	Test	el Indication	in Test	ation	ndication	ocation Check	Indication	Sensitivity	Test	Test
Model Name /Type	Address Se	Reset and Restart C	LED Mode S	Remote T	Tester Base	Remote by cable	Contamination Lev	Communicatic	Status Indic	Detector Data Ir	Fire Alarm Test for Lo	Double Address	Tester Base	Remote by cable	Fire Alarm
PK2B-P-021 / Photo smoke	0	×	Х	0	0	0	0	0	0	0	0	0	0	0	0
PK2B-DP-006 / Dual-photo smoke	0	×	×	0	0	0	0	0	0	0	0	0	0	0	0
PCTD-60PHW-010 / Heat waterproof	0	×	×	0	×	×	×	0	0	0	0	0	×	×	0
PC1D-70PHW-011 / Heat waterproof	0	×	×	0	×	×	×	0	0	0	0	0	×	×	0
PS2D-PHW-012 / Heat waterproof	0	×	×	0	×	×	×	0	0	0	0	0	×	×	0
PCTB-60PH-013 / Fixed 60 deg	0	×	\times	0	×	\times	×	0	0	0	0	0	\times	×	0
PS2B-PH-014 / Rate of rise	0	×	×	0	×	×	×	0	0	0	0	0	×	×	0
2KH7-LS / Photo smoke	×	0	0	×	×	×	O ※ 1	×	O ※ 1	O ∦ 1	O ∦ 1	×	0	×	×
PR2B-P-009 / Dual infrared	0	×	×	0	×	×	×	0	×	0	0	0	×	×	0

*1 The function is available only when placing the detector onto the Tester Base of MTT-E. (Refer to "6–3. Each Method")

5–2. Compatible Module

Product Name	Model Number	Description		
	LPO1/O	For 1 zone, drip-proof		
Remote Station	LP01/1	For 1 zone		
	LP02/0	For 4 zones		

6. Test Item and Method

6–1. General Description

Function	Description
Address Setting	Set detector address.
Reset and Restart Compensation (Unique Control)	(Dedicated for 2KH7-LS) Reset contamination data and perform compensation.
LED Mode Setting	(Dedicated for 2KH7-LS) Set detector LED flashing mode in standby, to ON (flashing green) or OFF.
Remote Test	Check whether or not a detector operates without trouble. Check each detector group per 10 units by activating them in order from smaller address.
All Sensitivity Test	Check the sensitivity of photoelectric smoke detectors. Conduct sensitivity test in sequence for the detectors connected to the same zone circuit. Upon the completion of each test, the detector is activated. (It takes approximately 20 minutes for test of 32 detectors connected.)
Contamination Level Indication	Indicate the contamination level of selected photoelectric smoke detector.
Communication Test	Indicate the status of detectors and wiring connection, before connecting detectors to control panel.

Function	Description
Status Indication	Indicate the status (normal/fault) of the detector of selected address.
Detector Data Indication (Sensor Info)	Indicate the type and class of the detector of selected address.
Fire Alarm Test for Location Check (Force Active)	Activate the detector of selected address to confirm installation location.
Double Address Indication	Indicate duplicated address of detectors connected to the same circuit. (It takes approximately 30 minutes for test with 32 detectors connected.)
Sensitivity Test	Check the sensitivity of photoelectric smoke detectors. Conduct Sensitivity Test for the detector of selected address. At the end of each test, check that the detector is activated.
Fire Alarm Test	Check that a detector operates without trouble. If an address selected detector is normal, the detector is activated.
Setting of Main Unit	Set the buzzer and select a measurement unit for Sensitivity Test.

6–2. Function and Connection Method

Different connection is required according to each test.

Refer to the figures of method ((1–4)) and the list below for correct connection.

O: Applicable / X: Not applicable

F ormation	Connection Method							
Function	Method 1	Method 2	Method 3	Method ④				
Address Setting	0	×	×	0				
Reset and Restart Compensation (Unique Control)	0	×	×	×				
LED Mode Setting	0	×	×	×				
Remote Test	×	×	0	×				
All Sensitivity Test	×	0	0	×				
Contamination Level Indication	0	0	0	×				
Communication Test	×	0	×	×				
Status Indication	0	0	0	0				
Detector Data Indication (Sensor Info)	0	0	0	0				
Fire Alarm Test for Location Check (Force Active)	0	0	0	0				
Double Address Indication	×	0	0	×				
Sensitivity Test	0	0	0	×				
Fire Alarm Test	0	0	0	0				

6–3. Each Method

•Method ①

≻Placing a detector onto the Tester Base



Detector (Other than waterproof type)

•Method 2

>Checking the connection of detectors before installing the control panel



•Method ③

➤Test remotely through the Remote Station without removing detectors from the ceiling

Remote Station



•Ensure to take the following steps on the control panel before test.

- Cut off correlation to sounders
- Cut off transmission to other equipment
 - Cut off activating smoke control systems, hydrants and others
- ≻Turn on the test reset switch of the control panel.
 - The control panel restores the fire state of the detector and control panel.
 - \cdot When testing with the control panel that does not output a reset pulse automatically, refer to "6–4 Note on Control Panel Operation" .
- ≻When finishing test, restore each setting after confirming that any zone is not in the active condition.
- ≻Ensure to connect the MTT-E to the module correctly before starting test. After test is completed, disconnect the MTT-E from the module.

•Method ④

 \succ Connecting a detector (waterproof type) through the installation cable (CW3)



6–4. Note on Control Panel Operation

- Despite setting the control panel to test reset mode, if the panel does not output reset pulse automatically, follow the steps below to reset the detectors. (Applicable Test)
 - Remote Test, All Sensitivity Test, Sensitivity Test and Fire Alarm Test
 - (1) When zone windows illuminate, operate the reset switch within 20 seconds, to perform reset manually.
 - ②After operating the reset switch, confirm that the zone windows turn off.③If the zone windows turn on again after operating the reset switch, wait for five seconds and operate the reset switch again.

(4) Repeat "③" above until the zone windows turn off.

2. It is not possible to test multiple zones at the same time by using multiple MTT-Es. Perform test for zones one by one.

(Applicable Test)

- Remote Test, All Sensitivity Test, Sensitivity Test and Fire Alarm Test
- 3. Test is not possible for zones in which a noise filter is installed.
- 4. The zone windows on the control panel may blink during test. This does not affect the test result and fire monitoring during test.
- 5. For compatible control panels, please contact us.

7. Before Use

7-1. Type of Power Source

Two types of power source can be used for the MTT-E.

(1) Batteries (local procurement)

Open the cover of battery housing of the MTT-E, place four of LR6/AA type alkaline batteries and close the cover. Ensure that the polarity is correct (+/-) . If an AC adapter is connected to the DC Jack, remove the adapter from

the jack. Batteries cannot be used when an AC adapter is connected to the DC Jack.

(2) AC adapter (local procurement)

Insert the plug of AC adapter to the DC Jack of MTT-E, and connect to an outlet. For the specification of AC adapter, refer to "9. Specification".

WARNING	 If you notice smoke or unusual odor, immediately power off the MTT-E. Otherwise it may cause fire or electric shock. If the cable of AC adapter is damaged (such as exposed core wire and cable break), immediately disconnect the AC adapter from an outlet. Do not place heavy objects on or heat the cable. It may cause fire or electric shock. Use a power supply that meets the specification at the end of the manual.
	 Remove the batteries if the MTT-E will not be used for a long time. Battery leakage may happen and cause damage to the product. Use the MTT-E within specified temperature (0-40°C) and humidity range (under 85%RH), and avoid sudden temperature change. Otherwise it may cause malfunction.

7-2, Power ON/OFF

(1) How to power on

Turn on the Power Switch.

After about one second, the buzzer sounds for one second, and the program version of MTT-E is indicated on the LCD.

Confirm that the [Power LED] illuminates in green.

Example of LCD display (Program version V1.01)

After the program version is displayed, the state of power supply is indicated on the LCD.

* * >	* * *	* *	* * * *
A C	DDR	SE	Т

"*" indicates the state of power supply as follows.

(State of power supply)

- POWER AC : The voltage of AC adapter is normal.
- POWER ERR : The voltage of AC adapter is abnormal. Check the AC adapter.
- BATTERY FULL : The battery voltage is normal.
- BATTERY MID : The battery voltage is decreasing.
- BATTERY LOW : The batteries are depleted. Please replace the batteries.
 W Upon power-on, "BATTERY LOW WARNING" is displayed on the LCD.
- (2) Battery voltage is low

Upon power-on, if batteries are depleted, the voltage state is indicated on the LCD, while the program version is not displayed.

- ●Low battery voltage
 - Power LED : Blink in green (LCD display)

BATTERY LOW WARNING

If pressing **Back**, the display goes back to the menu, but the battery voltage is low. <u>Replace with new batteries early.</u>

Battery voltage fault

• Power LED : Blink in green for 10 seconds and turn off

(LCD display)

BATTERY	LOW
FAULT	

"BATTERY LOW FAULT" is displayed on the LCD, but after 10 seconds, the LCD turns off and the MTT-E stops the operation. Replace with new batteries.

(Note)

* Battery state may change depending on the operating environment /conditions.

- After the low battery warning or low battery voltage fault is indicated, if turning off the power and after a while turning on the power again, the battery voltage can be recovered temporarily. However, the error message will be indicated soon if the battery voltage has been reduced.
- If a detector is activated without connecting the control panel, it will consume the battery capacity significantly, and the low battery warning or low battery voltage fault can be displayed instantly.

(3) How to power off Turn OFF the Power Switch.

7–3. Stand-by Function

If the LCD screen does not change for three minutes without any operation, the LCD display will be automatically turned off to save battery life. Press **Back** for redisplay.

* During the use with AC adapter, the stand-by function is not enabled.

7–4. Select Menu

Select the menu by pressing \bigtriangleup / \bigtriangledown , and press Enter to execute it.

Press **Back** to show the previous screen.

Refer to "8. Setting and Test" for the details of each menu.

7–5. Error Case and Buzzer

If an error occurs during any setting or test, an error message is displayed on the LCD and the buzzer sounds. Confirm the error message. To go back to operation screen, press **Back** during the error is displayed.

If an active detector is found, "DETECTOR ACTIVE" is displayed on the LCD, and the buzzer keeps sounding. The buzzer stops by pressing **Back**, Δ / ∇ , or **Enter**. When the buzzer stops, press **Back**. After "IN PROGRESS" is shown, the display goes back to the operation screen.

8. Setting and Test

8—1. Address Setting

(1) Contents to check before setting

1 For applicable detectors for this function, refer to "5–1. Compatible Detector and Available Function" .

②Refer to "6-3. Each Method" for connecting method.

(2) Operation procedure

①Place only one detector onto the Tester Base, then select "ADDR SET" on the menu, and press **Enter**.

② "PLEASE WAIT" is displayed on the LCD, and the address selection screen is shown.

 \bigtriangledown



③Select an address by pressing \bigtriangleup / \bigtriangledown , and press ${\rm Enter}$ to change the address.

When setting address is successful, the buzzer will sound and the current address on the left will change to the address selected, as follows.

ADDR	SET	
01	=>	01

⁽⁴⁾Press **Back** and remove the detector.

If setting the address of another detector, repeat the procedure from (2)-(1).

(3) Error case

①Connected detector is not subject to the control or connection is incorrect (LCD display)

NO RESPONSE

(Cause and Troubleshooting)

- Check the detector and connection (cable break) . After checking, repeat the procedure from (2)–(1).

©Control panel is connected



※ CP:Control Panel

(Cause and Troubleshooting)

• Address setting is not available if the control panel is connected. Disconnect the control panel and repeat the procedure from (2)-1.

3Two or more detectors are connected

(LCD display)



(Cause and Troubleshooting)

• Place only one detector head onto the Tester Base, and repeat the procedure from (2)–(1).

(4)Communication error

(LCD display)

COMM ERROR

(Cause and Troubleshooting)

• Setting is stopped by a communication error. Check the detector and connection.

After checking, repeat the procedure from (2)-(1).

5Detector is in alarm

(LCD display)

DETECTOR ACTIVE

(Cause and Troubleshooting)

• The detector under setting is in alarm. Check the state of the detector, and repeat the procedure from (2)-1.

8-2. Reset and Restart Compensation (Unique Control)

(1) Contents to check before setting

TFor applicable detectors for this function, refer to "5–1. Compatible Detector and Available Function" .

2 Refer to "6-3. Each Method" for connecting method.

(2) Operation procedure

①After placing the 2KH7-LS onto the Tester Base, select "UNIQUE CONT" on the menu, and press **Enter**.

② "PLEASE WAIT" is displayed on the LCD, and the control selection screen is shown.

UNIQ	UE	CONT
CAL	STA	RT

③Press Enter to go to the confirmation screen for the control selection.

CAL START	• "YES"
YES/NO	• "NO"

- "YES" :Enter "NO" :Back
- ④Press Enter, after "PLEASE WAIT" is displayed, compensation value is calibrated. After the compensation process is completed, the buzzer sounds and "COMPLETE" is displayed on the LCD.

COMPLETE

6Press Back to go to the control selection screen.

- (3) Error case
 - (1) The connection is incorrect

(LCD display)

NO RESPONSE

(Cause and Troubleshooting)

- Check the detector and connection (cable break) . After checking, repeat the procedure from (2)–(1).

©Control panel is connected

(LCD display)

CAN	INOT	TEST
СР	FOUN	١D

* CP : Control Panel

- (Cause and Troubleshooting)
- Compensation control is not available if the control panel is connected. Disconnect the control panel and repeat the procedure from (2)-(1).

③Two or more detectors are connected

CA		ЭΤ	TEST	
2	OR	M	DRE	

(Cause and Troubleshooting)

4 Communication error

(LCD display)

COMM ERROR

(Cause and Troubleshooting)

• Setting is stopped by a communication error. Check the detector and connection.

After checking, repeat the procedure from (2)–(1).

[•] Place only one detector head onto the Tester Base, and repeat the procedure from (2)-(1).

©Connected detector is not subject to the control

(LCD display)

NOT APPLICABLE

(Cause and Troubleshooting)

Incompatible detector is connected.

Place a detector subject to setting (2KH7-LS) onto the Tester Base, and repeat the procedure from (2)-(1).

6Detector is in alarm

(LCD display)

DETECTOR ACTIVE

(Cause and Troubleshooting)

• The detector under setting is in alarm. Check the state of the detector, and repeat the procedure from (2)–(1).

8–3. LED Mode Setting

(1) Contents to check before setting

Terms applicable detectors for this function, refer to "5–1. Compatible Detector and Available Function" .

2 Refer to "6-3. Each Method" for connecting method.

(2) Operation procedure

(1) After placing the detector 2KH7-LS onto the Tester Base, select "MODE SET" on the menu, and press $\ensuremath{\text{Enter}}$.

- 2 "PLEASE WAIT" is displayed on the LCD, and the display shows the current LED mode (ON/OFF) .
- Current setting is "LED ON" mode
 (LCD display)
 Current setting is "LED OFF" mode
 (LCD display)



(Note)

% In the screen showing the current LED mode, if the LED mode setting is not necessary to be changed, press △ / ∇ . When "OK" is displayed on the confirmation screen, press Enter.

③Press Enter for setting to the other mode.

●To set to "LED ON" mode
(LCD display)
MODE SET
* LED ON

"*" is displayed on the left bottom of screen, after selecting the LED mode.

Press \bigtriangleup / \bigtriangledown to find the screen below before setting is completed.



⁽⁵⁾Press **Enter**, and "PLEASE WAIT" is displayed on the LCD. The buzzer sounds and the screen shows selected LED mode.

 "LED OFF" mode is set (LCD display)
 MODE SET LED OFF • "LED ON" mode is set (LCD display)



6 Press Back to go to the menu screen.

(3) Error case

OFF

(1) The connection is incorrect

(LCD display)

(Cause and Troubleshooting)

• Check the detector and connection (cable break) . After checking, repeat the procedure from (2)-1.

2 Control panel is connected

(LCD display)



* CP : Control Panel

(Cause and Troubleshooting)

• The LED mode setting is not available if the control panel is connected. Disconnect the control panel and repeat the procedure from (2)-(1).

3 Two or more detectors are connected

(LCD display)

CA		ЭΤ	TEST
2	OR	MC	DRE

(Cause and Troubleshooting)

• Place only one detector head onto the Tester Base, and repeat the procedure from (2)–(1).

4 Communication error

(LCD display)



(Cause and Troubleshooting)

• Setting is stopped by a communication error. Check the detector and connection.

After checking, repeat the procedure from (2)-(1).

©Connected detector is not subject to the setting

(LCD display)



(Cause and Troubleshooting)

• Incompatible detector is connected.

Place a detector subject to the setting (2KH7-LS) onto the Tester Base, and repeat the procedure from (2)–(1).

6 Detector is in alarm

(LCD display)

DETECTOR ACTIVE

(Cause and Troubleshooting)

• The detector under setting is in alarm. Check the state of the detector, and repeat the procedure from (2) - (1).

8-4. Remote Test

•Remote Test is not available without connecting the control panel. Ensure to connect the control panel prior to the test.

(1) Contents to check before testing

①For applicable detectors for this function, refer to "5–1. Compatible Detector and Available Function".
②Refer to "5–2. Compatible Module" for connectable modules.

③Refer to "6-3. Each Method" for connecting method.

(2) Operation procedure

After connecting a detector, select "REMOTE TEST" on the menu, and press $\fbox{}$ Enter .

②Select the detector by pressing \triangle / $\overline{\bigtriangledown}$ on the address menu, and press **Enter** for start.



X During the Remote Test, 10 detectors are tested at a time. Each Remote Test takes about two minutes.

③If test result is normal, the alarm LED of detector illuminates, the Alarm LED of MTT-E illuminates in red, and the buzzer sounds.



④At the end of test, the buzzer sounds for one second. Confirm that all the detectors have been tested, by referring to the "connected detector list" on the Remote Station label.

"O" : Normal	"×"∶Fault	"
RMT	01- 10	
0000×	0000-	

- -": Not connected or no response • [01–04] [06–09] : Normal
- [05] : Fault
- [10] : Not connected or no response

01 02 03 04 05 06 07 08 09 10

(6)For conducting next Remote Test, press **Back** and repeat the procedure from (2)-(2).

(3) Error case

①Control panel is not connected

(LCD display)



※ CP ∶ Control Panel

(Cause and Troubleshooting)

• The control panel is not connected.

Check the wiring and connect the control panel, and repeat the procedure from (2)-(2).

2 Detector cannot be restored

(LCD display)

TEST ERROR CANNOT RESET

(Cause and Troubleshooting)

• The detectors under test cannot be reset. Stop the test immediately, and check the site condition.

3Detector is in alarm

(L	CD	disp	lay)

DETECTOR	
ACTIVE	

(Cause and Troubleshooting)

• A different detector from the detector under test is in alarm. Stop the test immediately, and check the site condition.



Ensure to connect the connection cable CW2 to the module correctly before starting the test. After the test, disconnect the cable from the module. Otherwise it may cause malfunction.
If testing with the control panel that does not output a reset pulse automatically, after each test, restore the control panel manually with the reset switch. (Refer to "6-4. Note on Control Panel Operation")

8—5. All Sensitivity Test

- (1) Contents to check before testing
 - TFor applicable detectors for this function, refer to "5–1. Compatible Detector and Available Function" .

②Refer to "5-2. Compatible Module" for connectable modules.

③Refer to "6-3. Each Method" for connection method.

 $\textcircled{\sc 0}$ The sensitivity unit of test result can be selected either [%/m] or [V]. Refer to "8.14 Setting of Main Unit (2) Operation procedure" .

(2) Operation procedure

The the term of term of

②After "PLEASE WAIT" is displayed on the LCD, detectors available for the Sensitivity Test are searched among connected detectors automatically.
※ It takes approximately five minutes to search 32 detectors.

③After the search is completed, the display shows the number of detectors which are connected to the zone.

X The number of tested detectors increases when testing of each detector is completed.



 "△△" : Number of detectors that completed test
 "□□" : Total number of detectors

(4)If tested detector is normal, the alarm LED of detector illuminates, the Alarm LED of MTT-E illuminates in red, and the buzzer sounds.

TEST	ONGOING
	01/ 32

* The indication on the LCD blinks until test finishes.

©At the end of test, the buzzer sounds for one second, and the test result is displayed on the LCD.

"O"∶Normal "×"∶Fault	"—" : Not connected or no response
TEST 01- 10 0000× 0000-	 [01-04] [06-09] : Normal [05] : Fault [10] : Not connected or no response

01 02 03 04 05 06 07 08 09 10

©Test result can be switched by pressing \bigtriangleup / \bigtriangledown , either for each detector or 10 detectors.

* Press and hold \triangle / \bigtriangledown for fast forward. TEST 01-10 TEST 31-32

000	0× 0000-	•	00	0.01
"NG": F	ail	-	"OK": Pass	•
【 ** NG □	】 CLASS∆ □. □【%/m】	+	[**] ok dd.	CLASS∆ □【%∕m】

O Confirm the test result for each detector by referring the criteria below.

Class	Normal Sensitivity Range		
Class 1	2.5%/m – 7.5%/m 0.50V – 1.50V		
Class 2	5.0%/m — 15.0%/m 1.00V — 3.00V		
Class 3	7.5%/m — 22.5%/m 1.50V — 4.50V		

Normal sensitivity case

"OK"	٠	Dace
Or	•	r ass

[:	* *]	CLASSA
ΟK	$\Box\Box$.	□【%/m】

•Abnormal sensitivity case ①

NG · Fall	
[**]	CLASSA
NG 🗆.	□【%∕m】

X Alarm sensitivity is not normal. Please replace the detector.

 Abnormal sensitivity case 	e
"NG": Fail	

	1 GII	
【 *	*) CLAS	SS∆
NG	INACTIV	/E

% The detector is not activated due to abnormal sensitivity. Please replace the detector.

•Abnormal sensitivity case ③

"NG": Fail

(>	k *]	CLA	SS∆
NG	CON	1M E	RR

- * Test is stopped by a communication error. Check the detectors and connection. After checking, conduct the test again.
- [®]To clear the display of test result, press **Back**. The screen asks whether the test result should be cleared. Press **Enter**, and the test result is cleared and the screen goes back to the menu. Press **Back** to show the test result again.





(Note)

With the use of batteries, if no operation is made for three minutes, the LCD display will automatically turn off, as stand-by function is activated. Press Back to show the test result again.
If the MTT-F is powered off the test result is cleared.

If the MTT-E is powered off, the test result is cleared.

"**": Detector address

" Δ " : Class (Class 1/Class 2/Class 3) " \Box " : Alarm sensitivity (3) Error case

①Applicable detector for the Sensitivity Test is not found (LCD display)

	piu)/		
CAN	INOT	TEST	
NO	DETE	ECTOR	

(Cause and Troubleshooting)

• Any applicable detector for the test function is not connected. Place a detector subject to the test, and repeat the procedure from (2)-①.

2 Detector cannot be restored

(LCD display)

TEST	ERROR
CANNO	OT RESET

(Cause and Troubleshooting)

• The detectors under test cannot be reset.

Stop the test immediately, and check the site condition.

3Detector is in alarm

(LCD display)

DETECTOR	
ACTIVE	

(Cause and Troubleshooting)

• A different detector from the detectors under test is in alarm. Stop the test immediately, and check the site condition.



Ensure to connect the connection cable CW2 to the module correctly before starting the test. After the test, disconnect the cable from the module. Otherwise it may cause malfunction.
If testing with the control panel that does not output a reset pulse automatically, after each test, restore the control panel manually with the reset switch.

(Refer to "6-4. Note on Control Panel Operation")

8–6. Contamination Level Indication

(1) Contents to check before testing

(1) For applicable detectors for this function, refer to "5-1. Compatible Detector and Available Function".

②Refer to "5-2. Compatible Module" for connectable modules.

- ③Refer to "6-3. Each Method" for connection method.
- (2) Operation procedure

①After connecting a detector, select "CONTAM LV" on the menu and press Enter.

②Select the detector by pressing \triangle / ∇ on the address menu, and press **Enter** for start.

CONTAM LV ADDR ** "* *": Detector address (The address of 2KH7-LS is 00)

% Press and hold \triangle / \bigtriangledown for fast forward.

③After "PLEASE WAIT" is displayed on the LCD, the buzzer sounds, and contamination level is shown.



"**": Detector address

" Δ " : Contamination level

"□": Condition of detector

Contamination level	LCD display	Condition of detector
-20 or less +20 or more	TROUBLE	Trouble in sensitivity %1
-19 to -10 +10 to +19	REPLACE	Compensation limit ※2
-09 to +09	NORMAL	Normal

- %1 A detector of "TROUBLE" should be replaced immediately. In the Remote Test, "TROUBLE" is indicated as " \times ".
- *2 A detector of "REPLACE" is recommended to be replaced shortly. In the Remote Test, "REPLACE" is indicated as "O".
- (4)To conduct another Contamination Level Indication, press **Back**, and repeat the procedure from (2)-2.

(3) Error case

①Either the address or connection is incorrect (LCD display)



(Cause and Troubleshooting)

- Check the detector and connection (cable break) . After checking, repeat the procedure from (2)–(2).

2 Communication error

(LCD	display)
------	----------



(Cause and Troubleshooting)

- Test is stopped by a communication error. Check the detector and connection.
- After checking, repeat the procedure from (2) (2).

③Connected detector is not subject to test

(LCD display)

NOT	
APPLICABLE	

(Cause and Troubleshooting)

- Incompatible detector is connected.
- Place a detector subject to test onto the Tester Base, and repeat the procedure from (2)–(2).

4 Detector is in alarm

(LCD display)

DETECTOR	
ACTIVE	

(Cause and Troubleshooting)

• A different detector from the detector under test is in alarm. Stop the test immediately, and check the site condition.

8-7. Communication Test

•Communication Test is not available if connecting the control panel. Ensure to disconnect the control panel prior to the test.

(1) Contents to check before testing

Terms applicable detectors for this function, refer to "5–1. Compatible Detector and Available Function" .

②Refer to "6-3. Each Method" for connecting method.

- (2) Operation procedure
 - ①After connecting a detector, select "COMM TEST" on the menu and press Enter.
 - ⁽²⁾ "PLEASE WAIT" is displayed on the LCD. After about 30 seconds, the number of detectors connected is displayed. If EOL device (CRE) or terminating resistor cannot be detected, open circuit is displayed.

In the normal monitoring condition



" $\Delta \Delta$ " : Number of detectors

In the open circuit condition

COMM QTY AA CABLE BREAK " $\Delta \Delta$ " : Number of detectors

(3) It is possible to switch addresses by every 10 units, by pressing \triangle / ∇ during the test result is displayed.

"O":Normal "×":Fault	"—" : Not connected or no response
COMM 01- 10 0000× 0000-	 [01-04] [06-09] : Normal [05] : Fault [10] : Not connected or no response

01 02 03 04 05 06 07 08 09 10

(Note)

% If CRE is used, it can happen that communication is not stable depending on the wiring condition. In that case, replace the CRE with a terminating resistor ($10k\Omega$) to conduct the test.

⁽⁴⁾During the number of detectors are displayed, if placing a detector, "INCREASED" is displayed. If removing a detector, "REMOVED" is displayed.

Detector is newly added



" $\Delta\Delta$ " : Number of detectors



" $\Delta \Delta$ " : Number of detectors

⑤Press Back to go to the menu screen.

(3) Error case

①Control panel is connected

(LCD display)

REMOVED



*CP : Control Panel

(Cause and Troubleshooting)

• Communication Test is not available if the control panel is connected. Disconnect the control panel and repeat the procedure from (2) - (1).

2Detector is in alarm

(LCD display)

DETECTOR ACTIVE

(Cause and Troubleshooting)

• A detector is in alarm.

Stop the test immediately, and check the site condition.

8-8. Status Indication

(1) Contents to check before testing
①For applicable detectors for this function, refer to "5–1. Compatible Detector and Available Function".
②Refer to "5–2. Compatible Module" for connectable modules.
③Refer to "6–3. Each Method" for connection method.

(2) Operation procedure

After connecting a detector, select "STATUS" on the menu and press $\fbox{}$ Enter .

@Select the detector by pressing riangle / ar
abla on the address menu, and press

Enter to execute it.	
STATUS	
ADDR	* *

"**": Detector address (The address of 2KH7-LS is 00)

* Press and hold \triangle / ∇ for fast forward.

③After "PLEASE WAIT" is displayed on the LCD, the buzzer sounds, and the status is shown.

STATUS	* *	UP

"**": Detector address

"□": Detector status

% When "UP" is shown on the right top, there are multiple states as the result. Press Δ / ∇ to display other status.

Detector	LCD Display Condition of Detector		
	NORMAL	Normal	
Fixed temperature heat detector	OUTPUT ERROR	Output fault (Thermistor open circuit)	
	MEMORY ERROR	Internal data memory fault	
	NORMAL	Normal	
Rate of rise heat detector	OUTPUT ERROR	Output fault (Thermistor open circuit)	
	MEMORY ERROR	Internal data memory fault	
	NORMAL	Normal	
	COMP LIMIT	Compensation limit	
Photoelectric smoke	SENS ERROR	Sensitivity fault (Contamination fault)	
Gelecion	LEVEL DROP	Output fault (Light receiving/emitting circuit at fault)	
	MEMORY ERROR	Internal data memory fault	

(4)To display the status of another detector, press \fbox{Back} , and repeat the procedure from (2)–(2).

(3) Error case

①Either the address or connection is incorrect (LCD display)

NO RESPONSE

(Cause and Troubleshooting)

• Check the detector and connection (cable break) . After checking, repeat the procedure from (2)-2.

©Communication error



(Cause and Troubleshooting)

• Test is stopped by a communication error. Check the detector and connection.

After checking, repeat the procedure from (2) - (2).

3Detector is in alarm

LCD	display)
-----	----------

DETECTOR	
ACTIVE	

(Cause and Troubleshooting)

• A different detector from the detector under test is in alarm. Stop the test immediately, and check the site condition.

8–9. Detector Data Indication (Sensor Info)

(1) Contents to check before testing
①For applicable detectors for this function, refer to "5–1. Compatible Detector and Available Function".
②Refer to "5–2. Compatible Module" for connectable modules.

③Refer to "6-3. Each Method" for connection method.

(2) Operation procedure

①After connecting a detector, select "SENSOR INFO" on the menu and press Enter.

②Select the address of the detector by pressing \triangle / ∇ on the address menu, and press **Enter** to execute it.

SENSOR	INFO
ADDR	* *

"* *" : Detector address (The address of 2KH7-LS is 00)

% Press and hold \triangle / \bigtriangledown for fast forward.

③After "PLEASE WAIT" is displayed on the LCD, the buzzer sounds, and detector information is shown.

INF	0		* *
V①	22h	33	(4)

"* * ": Detector address

"①": Communication version

"②": Type of detector

"③": Class

"④": Rated alarm temperature

No.	ltem	LCD Display and Meaning
1	Communication version	V2 (Detector communication version)
2	Type of detector	00 (fixed temp) / 10 (rate of rise) / 40 (smoke) /41 (dual smoke) / 42 (smoke) /81 (dual infrared)
3	Class	00 (Special) / 01 (Class 1) / 02 (Class 2) / 03 (Class 3)
4	Rated alarm temperature (only for fixed temperature) heat detector)	□□ (Rated alarm temperature)

 $\textcircled{\sc 4}$ To check another detector information, press $\fbox{\sc Back}$, and repeat the procedure from (2)–(2).

(3) Error case

(DEither the address or connection is incorrect (LCD display)

NO RESPONSE

(Cause and Troubleshooting)

• Check the detector and connection (cable break) . After checking, repeat the procedure from (2)-(2).

②Communication error

(LCD display)

COMM ERROR

(Cause and Troubleshooting)

• Test is stopped by a communication error. Check the detector and connection. After checking, repeat the procedure from (2)-2.

3Detector is in alarm

(LCD display)

DETECTOR	
ACTIVE	

(Cause and Troubleshooting)

• A different detector from the detector under test is in alarm. Stop the test immediately, and check the site condition.

8–10. Fire Alarm Test for Location Check (Force Active) (1) Contents to check before testing \bigcirc For applicable detectors for this function, refer to "5-1. Compatible Detector and Available Function". $^{(2)}$ Refer to "5–2. Compatible Module" for connectable modules. ③Refer to "6-3. Each Method" for connection method. (2) Operation procedure (1)After connecting a detector, select "FORCE ACTV" on the menu and press Enter ②Select the address of the detector by pressing \triangle / $\overline{\bigtriangledown}$ on the address menu, and press Enter to execute it. "* * ": Detector address FORCE ACTV (The address of 2KH7-LS is 00) ADDR ** 3 After "PLEASE WAIT" is displayed on the LCD, the buzzer sounds, the alarm LED of detector illuminates, and the Alarm LED of MTT-E illuminates in red "* * ": Detector address FORCE ACTV * * 4 After confirming the location of the detector, press Back "IN PROGRESS" is displayed on the LCD, until the detector is restored. After the detector is restored, the screen of the procedure 2 for address setting is displayed on the LCD. (Note) % If setting the control panel to test reset, the alarm LED of detector flashes by receiving the reset signal from the control panel. * Even though the detector is restored, unless pressing Back, the control panel continues to send the Alarm Command for Location Check to activate the detector again. © To conduct another the Fire Alarm Test for Location Check, press Back and repeat the procedure from (2) - (2)

(3) Error case

(1) The detector is at fault, or, the address or connection is incorrect. (LCD display)

INACTIVE

(Cause and Troubleshooting)

· Check the detector and connection (cable break). After checking, repeat the procedure from (2)-(2).

⁽²⁾Detector is in alarm

(LCD display)

DFTFCTOR ACTIVE

(Cause and Troubleshooting)

• A different detector from the detector under test is in alarm. Stop the test immediately, and check the site condition.

8–11. Double Address Indication

(1) Contents to check before testing

(1) For applicable detectors for this function, refer to "5-1. Compatible Detector and Available Function".

²Refer to "5–2. Compatible Module" for connectable modules.

③Refer to "6-3. Each Method" for connection method.

(2) Operation procedure

(1)After connecting a detector, select "DOUBLE ADDR" on the menu and press Enter .

- ②After "PLEASE WAIT" is displayed on the LCD, the MTT-E automatically searches for duplicate addresses among connected detectors.
- * The test time is approximately one minute per address. (when 32 detectors are connected)
- 3During the test, the LCD flashes, and displays the ongoing results for duplicate addresses and the number of those detectors.

It is available to check ongoing results (one screen 10 units info) by pressing Δ / ∇

"O" : Normal "X" : Duplicate CHECK 01- 10 000X	"-": Not connected or no response • [01-03]: Normal • [04]: Duplicate • [05-07]: Not connected or no response
01 02 03 04 05 06 07 08 09 10	



At the end of test, the buzzer sounds for one second, and the test result is displayed on the LCD.

•Result ①

"O" : Normal	"×": Duplicate
CHECK	01- 10
000×-	000
04 00 00 04 00	

- "-": Not connected or no response
- [01-03] [08-10] : Normal
- [04] : Duplicate
- [05–07] : Not connected or no response

01 02 03 04 05 06 07 08 09 10

Result 2

CHECK	OK :	28
	NG :	01

- OK : Number of addresses without duplication
- NG : Number of duplicated addresses

(Note)

* If duplicate address is detected, those detectors with the address can be located by the Fire Alarm Test for Location Check.



6 Press **Back** to go to the menu screen.

(3) Error case

①Detector is in alarm (LCD display)

DFTFCTOR ACTIVE

(Cause and Troubleshooting)

• A different detector from the detector under test is in alarm. Stop the test immediately, and check the site condition.

8-12. Sensitivity Test

- (1) Contents to check before testing
 - (1) For applicable detectors for this function, refer to 5-1. Compatible Detector and Available Function".

⁽²⁾Refer to "5–2. Compatible Module" for connectable modules.

③Refer to "6-3. Each Method" for connection method.

(4) The sensitivity unit of test result can be selected as [%/m] or [V].

Refer to "8-14. Setting of Main Unit (2) Operation procedure".

(2) Operation procedure

①After connecting a detector, select "SENS TEST" on the menu, and press Enter

②Select the detector by pressing Δ / ∇ on the address menu, and press



ADDR

"**": Detector address (The address of 2KH7-I S is 00)

* * \times Press and hold \triangle / \bigtriangledown for fast forward.

③After "PLEASE WAIT" is displayed on the LCD, confirm the sensitivity. Sensitivity unit : [%/m]



"* * ": Detector address

"∆" : Class (Class 1/Class 2/Class 3) "
—": Sensitivity during measurement

* The sensitivity value increases during the test.

* The test takes about 40 seconds



SENS TEST





* The sensitivity value increases during the test.

* The test takes about 40 seconds

When reaching the alarm threshold of detector, the detector is activated, and the buzzer of MTT-E sounds for one second. Until the detector is restored, "IN PROGRESS" is displayed on the LCD. After the detector is restored, the test result is displayed.

5 Check the sensitivity test result.

Class	Normal Sensitivity Range
Class 1	2.5%/m – 7.5%/m 0.50V – 1.50V
Class 2	5.0%/m — 15.0%/m 1.00V — 3.00V
Class 3	7.5%/m - 22.5%/m 1.50V - 4.50V

Normal sensitivity case ① "OK" : Pass CLASSA [**] OK □□. □ [%/m]

•Normal sensitivity case ② "OK" : Pass [**] CLASSA OK \Box . $\Box \Box$ $[\vee]$

• Abnormal sensitivity case 2 ($\times1$)

NG \Box . $\Box \Box$ [V]

**] CLASSA

"NG" : Fail

• Abnormal sensitivity case (1) ($\times 1$) "NG" : Fail

[**]	CLASSA	
NG 🗆.	□【%∕m】	

X1 Alarm sensitivity is not normal. Please replace the detector.

Abnormal sensitivity case ③ (※2) "NG":Fail

[*	*] CLASS	\triangle
NG	INACTIVE	

*2 The detector is not activated due to abnormal sensitivity. Please replace the detector.

6 If conducting another Sensitivity Test, press **Back** and repeat the procedure from (2) - (2).

(3) Error case

①Either the address or connection is incorrect (LCD display)

NO RESPONSE

(Cause and Troubleshooting)

- Check the detector and connection (cable break) . After checking, repeat the procedure from (2)–(2).

②Connected detector is not subject to test

(LCD display)

NOT APPLICABLE

(Cause and Troubleshooting)

Incompatible detector is connected.

Place a detector subject to test onto the Tester Base, and repeat the procedure from (2)-(2).

3Communication error

(LCD display)

COMM ERROR

(Cause and Troubleshooting)

• Test is stopped by a communication error. Check the detector and connection. After checking, repeat the procedure from (2)–(2).

④Detector cannot be restored

(LCD display)

TEST	ΕR	ROR
CANNC	ЭТ	RESET

(Cause and Troubleshooting)

The detector under test cannot be reset.
 Stop the test immediately, and check the site condition.

⑤Detector is in alarm

(LCD display)

DETECTOR	
ACTIVE	

(Cause and Troubleshooting)

• A different detector from the detector under test is in alarm. Stop the test immediately, and check the site condition.

8–13. Fire Alarm Test

(1) Contents to check before testing

TFor applicable detectors for this function, refer to "5–1. Compatible Detector and Available Function" .

②Refer to "5-2. Compatible Module" for connectable modules.

③Refer to "6-3. Each Method" for connection method.

(2) Operation procedure

①After connecting a detector, select "ALARM TEST" on the menu, and press Enter.

②Select the detector by pressing \triangle / $\overline{\bigtriangledown}$ on the address menu, and press **Enter**

ALARM	TEST
ADDR	* *

"* * " : Detector address

③ "PLEASE WAIT" is displayed on the LCD. After about 30 seconds, the buzzer sounds for one second, the alarm LED of detector illuminates, and the Alarm LED of MTT-E illuminates in red.

ACTIVE

- (4) Press **Back**, and "IN PROGRESS" is displayed until the detector is restored, The screen of Operation Procedure (2) is displayed after the detector is restored. If conducting another Fire Alarm Test, repeat the procedure from (2).
- (3) Error case
 - (1) The detector is at fault, or, the address or connection is incorrect. (1 CD display)

(Cause and Troubleshooting)

⁻ Check the detector and connection (cable break) . After checking, repeat the procedure from (2)–(2).

2 Detector cannot be restored

(LCD display)

TEST	ERROR	
CANNO	DT RESET	

(Cause and Troubleshooting)

• The detector under test cannot be reset. Stop the test immediately, and check the site condition.

3Detector is in alarm

(LCD display)

DETECTOR ACTIVE

(Cause and Troubleshooting)

• A different detector from the detector under test is in alarm. Stop the test immediately, and check the site condition.

8—14. Setting of Main Unit

(1) Setting item

1)Buzzer setting

• Buzzer setting is selectable either ON or OFF.

* The default setting is buzzer ON.

②Smoke density unit setting

- The unit is selectable from smoke density level [%/m] or voltage [V].
 % The default setting is [%/m].
- (2) Operation procedure

①Select "MTT SETTING" on the menu, and press Enter

•Buzzer setting

O Select "BUZZER $\$ SET" on the setting selection screen and press \fbox{Enter}



3)Select the state to be set by pressing \bigtriangleup / $\overline{\bigtriangledown}$



@Press Enter to change the display, and the setting can be changed.



•Buzzer setting OFF BUZZER SET OFF

5Press Back to go to the setting selection screen.

(Note)

% It goes back to the default setting by powering off the MTT-E. During test, the setting cannot be changed.

•Smoke density unit setting

②Select "DENSITYUNIT" on the setting selection screen and press Enter.





⁽⁴⁾Press **Enter** to change the display, and the setting can be changed.



6Press Back to go to the setting selection screen.

(Note)

% It goes back to the default setting by powering off the MTT-E. During test, the setting cannot be changed.

9. Specification

Specification

Product Name	Remote Tester/Smoke Detector Sensitivity Tester	
Model Number	MTT-E	
Rated Voltage	LR6/AA alkaline batteries x 4	DC6V
	AC adapter (%1)	Output : DC9V 2A
Operating Temperature	0°C to 40°C	
Maximum humidity	Up to 85%RH (Non-condensing environment)	
Weight	Approx. 360g (excluding batteries)	
Accessory	CW2 : Connection cable	
	CW3 : Installation cable	

%1 Please ensure that the operating voltage of AC adapter is correct for your local supply.

Size (mm)

117





10. Warranty

- 1. Nittan warrants to the customers that :
 - (a) all products supplied hereunder will be of merchantable quality and will comply with any specification agreed between Nittan and customer.
 - (b) it is not aware of any rights of any third party in the market which would or might render the sale of the products, or the use of any of the trade marks on or in products, or the use of any of the trade marks on or in relation to the products, unlawful.
- 2. In the event of any breach of the Nittan's warranty in Clause 1. (a) whether by reason of defective materials, production faults or otherwise, Nittan's liability shall be limited to :
 - (a) replacement of the products in question; or
 - (b) at the Nittan's option, repayment of the price where this had been paid. And the warranty period is three (3) years from the shipment from Nittan's factory.
- 3. Notwithstanding anything to the contrary in this warranty terms, Nittan shall not be liable to the customer by reason of any representation or implied warranty, condition or other term or any duty at common law, or under the express terms of this warranty terms, for any consequential loss or damage whether for loss of profit or otherwise and whether occasioned by the negligence of Nittan or its employees or agents or otherwise, arising out of or in connection with any act or omission of Nittan relating to Nittan or supply of the products, their use by any customer.
- 4. Customer shall indemnify Nittan against all loss, damages, liabilities, costs and expenses which Nittan may suffer or incur as a result of or in connection with any breach by customer of this warranties terms or any laws or regulations of any jurisdiction or any rules of any governing authorities.



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