

Contents

USER MANUAL

| | |
|---------------------------------------|----|
| 1. Warning | 2 |
| 2. Product Feature | 3 |
| 3. Product Components | 4 |
| 4. Product Appearance & Configuration | 5 |
| 5. LCD Display | 7 |
| 6. Device Connection | 8 |
| 7. Product Rating | 9 |
| 8. Operation Method | 10 |
| 9. Relay Element Testing Method | 15 |

1. Warning

Thoroughly read user manual before usage for safe use and to fully understand features of OCR TESTER. Please keep user manual near the OCR TESTER.

- Symbols used on product and in user manual represents following warnings:
- Warning** Appears when instruction are violated, and there is possibility of serious injury or death.
 - Caution** Appears when instruction are violated, and there is possibility of minor injury or product damage.
 - Appears under certain condition where there is risk of danger and user should pay attention.

Warning

- Do not operate, check or install alone.
- Do not carry out a test when ACB or MCCB is powered or while operating.
 - If it may cause electric shock or malfunction of ACB or MCCB
 - Do not carry out a test if the bus is in live-wire. It may cause electric shock and the changing voltage of current transformer may be damaged or cause fire.
 - Do not carry out a test when ACB or MCCB control is powered.
 - If it may cause electric shock or malfunction of ACB or MCCB
 - Do not disassemble the product even when unpowered.
 - Internal charging current of the product may cause electric shock.
 - Do not install or operate with wet hands. It may cause electric shock.
 - Do not use if the sheath of cable is damaged. It may cause electric shock.
 - Phase wear necessary protection for usage.
 - Please attach safety caution before operating.

Caution

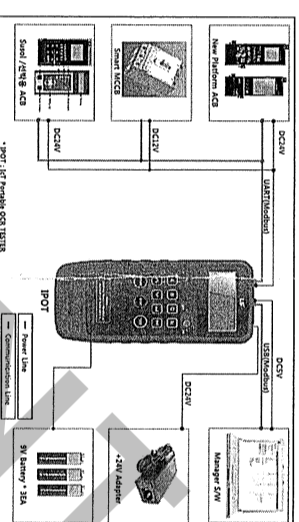
- Precaution for installation and terminal wiring.
 - Please apply correct power which suits rating of power terminal.
 - Do not allow screws or other metal materials, water, oil or other substances enter inside the product.
 - If any of the caution may cause product damage or fire.
 - Please check the direction before connecting the connector to terminal input/output.
 - Violation of the caution may cause product damage or fire.
 - Do not use the product after the following damage or fire.
- Checklist before handling power.
 - Check voltage and polarity of control power.
 - Check cable direction of tester and device.
 - Please change the battery if product fails to operate without additional power supply.
 - Precautions for storage and handling.
- Phase store in area where there is no moisture
 - Do not throw or add strong force when moving.
 - Precautions for disposal.
 - When disposing, treat it as industrial waste disposal.

2. Product Feature

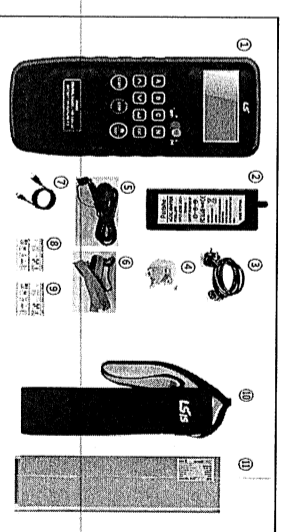
- Calibration : OCR TESTER's calibration function corrects the generated error using the output value set in TESTER and current data of device, and updates the correction coefficient.
- Device H/W Setting: It consists of setting the H / W value and time of the device and setting the language and time of the OCR TESTER itself.
- Relay Setting: It consists of checking the current relay of the device and setting the relay.
- Relay Test: It is composed of MANUAL / AUTO / USER TEST to perform various relay test.

- Control: It provides the function of clearing or resetting the data of the device and controlling the DO and CS.
- System Information: It consists of a part that displays the system information of the device, the relay status, and the system information of the OCR TESTER.

- Test History: It consists of a part to check the test history stored in the OCR TESTER and a part to delete the stored history information.

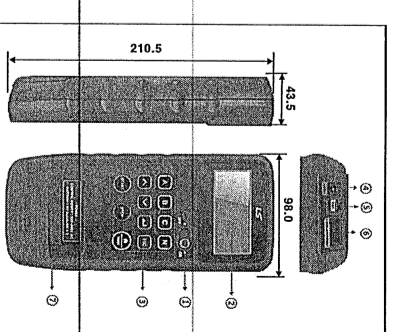


3. Product Components



| Num. | Contents | Feature |
|------|-----------------|--|
| 1 | OCR TESTER | IPOT/ICT Portable OCR TESTER Product |
| 2 | Adapter | AC100~240V, DC24V, 2.5A Adapter |
| 3 | Power Cable | Power Cable for Adapter |
| 4 | Socket | Power Compatible Socket(Only Overseas) |
| 5 | Signal Cable #1 | Signal Cable for New ACB & MCCB (Black molded cable) |
| 6 | Signal Cable #2 | Signal Cable for existing ACB (Gray flat cable) |
| 7 | USB Cable | USB Cable(Mini-B) |
| 8 | Manual(Korean) | Korea Manual for User |
| 9 | Manual(English) | English Manual for User |
| 10 | Bag | Bag for Product and Components |
| 11 | Box | Product Box |

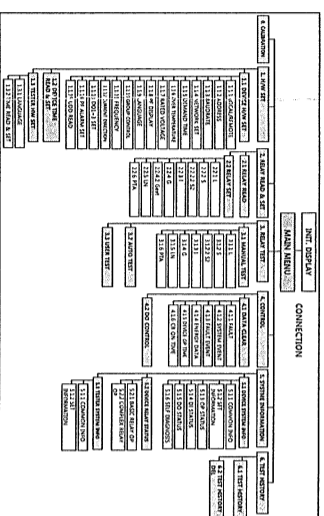
4. Product Appearance & Configuration



| Num. | Contents | Feature |
|------|------------------|--|
| 1 | Power Switch | Power ON/OFF Switch |
| 2 | LCD | 256 x 128 Graphic LCD |
| 3 | KEY PAD | Buttons for Menu Navigation, Setup and Operation |
| 4 | Adapter Terminal | DC24V/Adapter Terminal |
| 5 | USB Terminal | USB communication connector with PC (USB2.0) |
| 6 | Signal Port | Device Testing Port |
| 7 | Battery | 9V Alkaline Battery(x 3aa) |

5. LCD Display

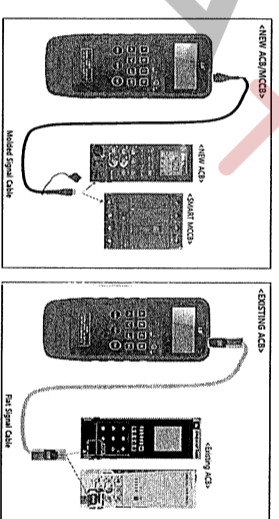
The configuration of the LCD consists of seven large items from calibration (0) CALIBRATION) to the test history (6) TEST HISTORY).



| Num. | Button | Function |
|------|--------|--|
| 1 | A | Phase A selected Button |
| 2 | B | Phase B selected Button |
| 3 | C | Phase C selected Button |
| 4 | M | Phase N selected Button |
| 5 | ↑ | "INCREASE" Button |
| 6 | ↓ | "DECREASE" Button |
| 7 | ← | "ENTER" Button |
| 8 | → | "ESC" Button |
| 9 | ↻ | "START" Button for generating waveform |
| 10 | ⏻ | "STOP" Button for stopping waveform |
| 11 | ⏪ | HOME/TEST SWITCH Button |

6. Device Connection

Connect the signal cable to the signal output terminal on the top of the OCR TESTER, then connect the other signal cable to the OCR. - OCR TESTER can be used by connecting both existed ACB and MCCB. However, please refer to below picture for connecting cable.



Note(1) New ACB/MCCB

- Do not connect the test signal cable when the OCR control power is applied.
- Connect the OCR and TESTER using the supplied SIGNAL CABLE. At this time, do not apply the control power of OCR when connected.
- After connecting the OCR and TESTER, turn on the power of TESTER and press any button to connect the OCR automatically.
- When the test is completed, press STOP button for about 3 seconds to stop control power generation of OCR. After that, turn off the power switch of TESTER.

Note(2) Existing ACB

- Do not connect the test signal cable when the OCR control power is applied.
- Connect the OCR TESTER and the supplied SIGNAL CABLE to the unit. At this time, do not apply the control power of OCR when connected.
- How to use after this is the same as above.

7. Product Rating

7-1. Standard Usage Environment

- Unless there was a special condition mentioned, please follow the standard conditions below,
- Temperature
 - Standard using temperature : -10℃ ~ 55℃
 - Storage temperature : -25℃ ~ 70℃
 - Humidity : Then Humidity should be less than 80% where there's no dew anytime.
 - Using environment condition
 - Altitude : below 2,000m.
 - Area where there is no abnormal vibration or shock.
 - The surrounding air should be clean.

7-2. Product Input Rating

| Classification | Applied Limits | Note |
|-------------------|-----------------------|------|
| Rated Frequency | 60Hz or 50Hz | |
| Rated Voltage | AC100 ~ 240V | SMPS |
| BATTERY | DC9V Alkaline Battery | 3aa |
| Power Consumption | Under 10W | |

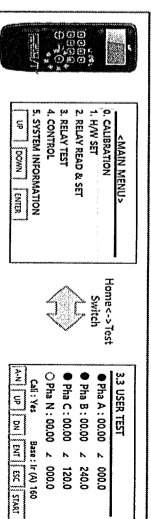
7-3. Product Certification

- Product Name : OCR TESTER
- Model Name : POT
- Certification Number : R-R-LSR-POT

8. Operation Method

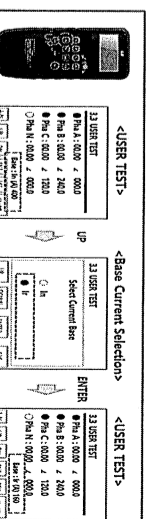
8-1. Operation Method

The device test is a simple test method using the "H/T" button, which is the home & test switch button. The device test is performed by the user setting in the state of the relay element set in the <3.3 USER TEST> screen.



- Base Current Selection
 - The base current is to select a reference current of the current to be output.
 - The example below is an example of changing the reference current from the I_r reference to the I_n reference.

- In the user relay test screen of the figure, press the "UP" button to switch to <Base current selection> screen, select "I_n" by using "UP / DOWN" button in < Base current selection > screen and input "ENTER".
- In the user test screen, you can check the changed I_r value (Base: In (A), 400 -> Base: I_n (A), 160).

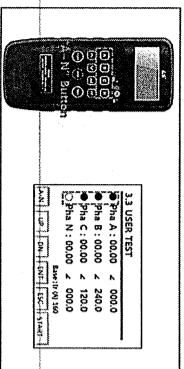


Similarly, the same method can be used to change the reference current from In to Ir. In the figure depends on the set value of each device.

8. Operation Method

8-1. Operation Method

8-1-2. Output Amplitude Setting



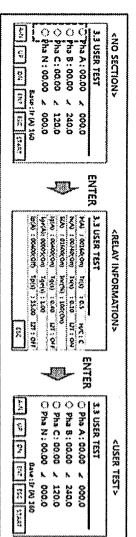
- Select the output amplitude and phase, first use 'A ~ N' button to select the image to be output.

- In the user relay test, press the 'A ~ N' button for each phase to show the activation / deactivation status.
 - Active status, ; Inactive status

- Use the 'A ~ N' button to select the output phase and press the 'ENT' button to select the output size and phase
 - Only one Selection of the 'A ~ N' buttons : Amplitude and phase Setting
 - Multiple Selection of the 'A ~ N' buttons : Only Amplitude Setting
 - No Selection of the 'A ~ N' buttons : Relay Information of Device

- 8-1-2-1. No Selection - Relay Information of device

User Relay Test If there is NO selection of 'A ~ N' buttons in '<3.3 USER TEST>', you can check relay information set in the device.



11. LSELECTRIC

9. Relay Element Testing Method

9-2. Short Time(3.3 USER TEST)

- Change ACB/MCCB Setting value.
 - Set other relay element's I / Isd / Ii to OFF.
 - (When Test is performed with 3.2 MANUAL TEST/3.2.2 S, then relay element other than S relay element is automatically turned OFF in TESTER.)
- Change OCR TESTER Setting Value
 - refer to Standard Table for Short Time Relay before setting.
- Press 'START' button.
- Repeat steps 9-1.(4) to (7).

Standard Table for Short Time Relay

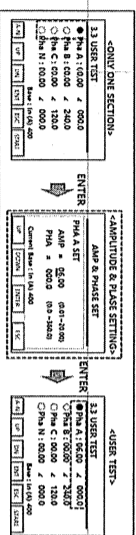
| No. | Setting Condition | | | TESTER (Base In) | Operation Time (Sec) |
|-----|-------------------|-----|------|------------------|----------------------------------|
| | ACB | P/S | MCCB | | |
| 1 | 0.5 | 0.8 | 0.4 | 4 | 2.125 ~ 2.875 (2.420 ~ 3.530) |
| 2 | 0.5 | 0.8 | 0.4 | 4 | 0.944 ~ 1.277 (1.075 ~ 1.613) |
| 3 | 0.5 | 0.8 | 0.4 | 4 | 0.320 ~ 0.480 (0.387 ~ 0.580) |
| 4 | 0.5 | 0.8 | 0.4 | 4 | 0.280 ~ 0.440 (0.350 ~ 0.500) |
| 5 | 1.0 | 1.0 | 1.0 | 1 | 0.330 ~ 0.531 (0.447 ~ 0.671) |
| 6 | 1.0 | 1.0 | 1.0 | 1 | 0.180 ~ 0.240 (0.193 ~ 0.290) |
| 7 | 1.0 | 1.0 | 1.0 | 1 | 0.060 ~ 0.140 (0.070 ~ 0.140) |

8. Operation Method

8-1. Operation Method

8-1-2-2. Only one selection- Amplitude & Phase

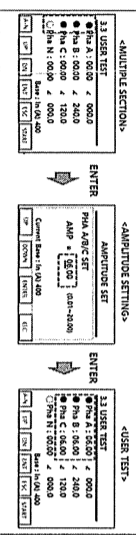
Output and phase setting screen in '<AMP & PHASE SET>' using 'ENTER' button, you can select the value to output by using 'UP / DOWN' button and set the value by moving BAR. After setting the last phase, press 'ENTER' button. Press to switch to the user test screen '<3.3 USER TEST>' screen.



- AMP : 0.01 to 21.00(MCCB - 0.01 ~ 12.00) In 0.01 unit
- PHA : 0.0 to 360.0 in 0.1 degree

8-1-2-3. Multiple selection- Only Amplitude

ex) The output value is set to 6 times by selecting the A, B, C phase using the 'A ~ N' buttons. First, activate the A, B, C phase by using the 'A ~ N' buttons in the user test screen '<3.3 USER TEST>' and press the 'ENTER' button to switch to the screen to set the output amplitude. To set 6 times, set it to 06.00, move BAR to the second decimal place and press 'ENTER' again to switch to user test screen.



- AMP : 0.01 to 21.00 (MCCB : 0.01 ~ 12.00) in 0.01 unit

12. LSELECTRIC

9. Relay Element Testing Method

9-3. Instantaneous Time(3.3 USER TEST)

- Change ACB/MCCB Setting value.
 - Set other relay element's I / Isd / Ii to OFF.
 - (When Test is performed with 3.2 MANUAL TEST/3.2.3 I, then relay element other than I relay element is automatically turned OFF in TESTER.)
- Change OCR TESTER Setting Value
 - refer to Standard Table for Short Time Relay before setting.
- Press 'START' button.
- Repeat steps 9-1.(4) to (7).

Standard Table for Instantaneous Time Relay

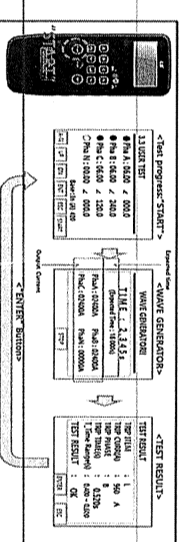
| No. | Setting Condition | | | TESTER (Base In) | Operation Time (Sec) |
|-----|-------------------|-----|------|------------------|----------------------|
| | ACB | P/S | MCCB | | |
| 1 | | | | 2 | 2.1 |
| 2 | | | | 2 | 10.0 |
| 3 | | | | 3 | 4.2 |
| 4 | | | | 4 | 4.2 |
| 5 | | | | 6 | 10.5 |
| 6 | | | | 8 | 9.0 |
| 7 | | | | 10 | 10.5 |
| 8 | | | | 12 | 13.0 |
| 9 | | | | 12 | 14.5 |
| 10 | | | | 15 | 15.7 |

8. Operation Method

8-2. Relay Test

8-2-1. Relay Test

The device test is a simple test method using the 'H / T' button, which is the home & test switch button. The device test is performed by the user setting in the state of the relay element set in the '<3.3 USER TEST>' screen.



- Press the 'START' button on the user test screen (3.3 USER TEST) to perform the relay test. The output waveform screen (WAVE GENERATOR II) shows the running test, estimated operation time and output current value.

- The output current is indicated by the current (= magnitude * base current) (A). If the value is not displayed in the expected operation time, the current or relay setting that does not perform the relay operation is set to the 'NOT USE' state and the relay is not operated.

- If you want to stop the test, press the 'STOP' button to stop the test immediately.

- When TRIP occurs in the device, OCR TESTER displays the test result by switching the output value to the stop and test result screen (TEST RESULT).

- Pressing the 'STOP' button on the 'TEST RESULT' screen will reset the instrument relay operation status. If you press the 'ENTER' button, you can switch to the user test screen (3.3 USER TEST). Press 'ESC' button to switch to the menu test list screen.

13. LSELECTRIC

9. Relay Element Testing Method

9-4. Ground(3.3 USER TEST)

- Change ACB/MCCB Setting value.
 - Set other relay element's I / Isd / Ii to OFF.
 - (When Test is performed with 3.2 MANUAL TEST/3.2.4 G, then relay element other than G relay element is automatically turned OFF in TESTER.)
- Change OCR TESTER Setting Value
 - refer to Standard Table for Ground Relay before setting.
- Press 'START' button.
- Repeat steps 9-1.(4) to (7).
- The ground trip test applies current only to one of the A / B / C / N phases.

Standard Table for Ground Relay

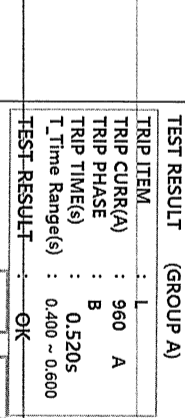
| No. | Setting Condition | | | TESTER (Base In) | Operation Time (Sec) |
|-----|-------------------|-----|------|------------------|----------------------------------|
| | ACB | P/S | MCCB | | |
| 1 | | | | 0 | 0.080 ~ 0.140 (0.070 ~ 0.140) |
| 2 | | | | 0 | 0.160 ~ 0.240 (0.150 ~ 0.250) |
| 3 | | | | 2 | 0.340 ~ 0.480 (0.300 ~ 0.500) |
| 4 | | | | 0 | 0.280 ~ 0.340 (0.240 ~ 0.350) |
| 5 | | | | 0 | 0.080 ~ 0.140 (0.080 ~ 0.140) |
| 6 | | | | 0 | 0.340 ~ 0.480 (0.300 ~ 0.500) |

8. Operation Method

8-2. Relay Test

8-2-2. Relay Test Result

The test results show the type of TRIP generation, generated current, phase, operating time, minimum / maximum time of occurrence and test result.



- TRIP ITEM : Long time(L), Short time(S1), Short time(S2), Instantaneous Time(I), Inner Ground(G), Neutral Long time(LN), PTA
- TRIP CUR(A) : The largest value among the A to N phase currents applied in the test with trip current
- TRIP PHASE : A, B, C, N in trip phase, G represents Ground trip
- TRIP TIME(S) : Relay operation time
- T_Time Range(s) : Trip time range of relay
- TEST RESULT : 'OK' is displayed during the relay operation within the relay operation time range (T_Time Range). If the relay operation time range is exceeded, 'FAIL' is displayed. Also, after waiting 10 seconds after the maximum operation time. Even if there is no operation, 'FAIL' is displayed.

* The test results are stored in the memory of the OCR TESTER and can be reported to the test result in PDF using the PC Manager software.

14. LSELECTRIC

9. Relay Element Testing Method

9-5. PTA(for Marine)

- Change ACB for marine Setting value.
 - Set other relay element's I / Isd / Ii to OFF.
 - (When Test is performed with 3.2 MANUAL TEST/3.2.6 PTA, then relay element other than PTA relay element is automatically turned OFF in TESTER.)
- Change OCR TESTER Setting Value
 - refer to Standard Table for PTA Relay before setting.
- Press 'START' button.
- Repeat steps 9-1.(4) to (7).

Standard Table for PTA Relay

| No. | Setting Condition | | | TESTER (Base In) | Operation Time (Sec) | |
|-----|-------------------|-----|------|------------------|----------------------|---------------|
| | ACB | P/S | MCCB | | | |
| 1 | | | | 0.7 | 5 | 1.278 ~ 1.917 |
| 2 | | | | 0.8 | 10 | 0.827 ~ 0.940 |
| 3 | | | | 0.85 | 20 | 1.416 ~ 2.124 |
| 4 | | | | 0.9 | 35 | 1.000 ~ 1.500 |
| 5 | | | | 0.95 | 40 | 1.272 ~ 1.910 |
| 6 | | | | 1 | 40 | 0.980 ~ 1.470 |
| 7 | | | | 1.05 | 45 | 1.215 ~ 1.823 |
| 8 | | | | 1.1 | 45 | 0.480 ~ 0.720 |

※ When PTA relay element test and long relay relay factor test are performed at the same time, trip information is displayed after PTA trip information display according to relay setting.

※ MCCB does not support PTA relay element function.

9. Relay Element Testing Method

9-1. Long Time(3.3 USER TEST)

- Change ACB/MCCB Setting value.
 - Set other relay element's I / Isd / Ii to OFF.
 - (When Test is performed with 3.2 MANUAL TEST/3.2.1 L, then relay element other than L relay element is automatically turned OFF in TESTER.)
- Change OCR TESTER Setting Value
 - refer to Standard Table for Long Time Relay before setting.
- Press 'START' button.
- The expected time is displayed in the LCD window.
- Check whether the relay element is operating with the LCD window.
- After completing the relay operation status.
- If you want to continue testing, press 'ENTER' button to switch to the relay test screen (3.3 USER TEST).

Standard Table for Long Time Relay

| No. | Setting Condition | | | TESTER (Base In) | Operation Time (Sec) |
|-----|-------------------|-----|------|------------------|--------------------------------------|
| | ACB | P/S | MCCB | | |
| 1 | 0.5 | 0.8 | 0.4 | 0.5 | 10.157 ~ 12.414 (9.028 ~ 13.543) |
| 2 | 0.5 | 0.8 | 0.4 | 0.5 | 0.400 ~ 0.600 (0.400 ~ 0.600) |
| 3 | 0.5 | 0.8 | 0.4 | 16 | 4.577 ~ 6.838 (4.577 ~ 6.838) |
| 4 | 1.0 | 1.0 | 1.0 | 0.5 | 1.900 ~ 2.322 (1.689 ~ 2.533) |
| 5 | 1.0 | 1.0 | 1.0 | 16 | 12.800 ~ 19.200 (12.800 ~ 19.200) |

15. LSELECTRIC

LSELECTRIC Customer Center - Global Responsive Service, Excellent Technical Support
 Specifications in this instruction manual are subject to change without notice due to continuous products development and improvement.

Head Office : 127, Ls-ro, Dongan-gil, Anyang-si, Gyeonggi-do, Korea
 Telephone : +82(2) 2034-4870 Fax : +82(2) 2034-4713

Purchase Enquiry

Seoul Sales Team TEL : (02)2034-4553 FAX : (02)2034-4555
 Busan Sales Team TEL : (051)310-6821~24 FAX : (051)310-6827
 Changwon Sales Office TEL : (055)282-4812 FAX : (055)282-4352
 Ulsan Sales Office TEL : (052)261-1585 FAX : (052)261-4205
 Daegu Sales Team TEL : (053)603-7711~13 FAX : (053)603-7777
 Pohang Sales Office TEL : (054)286-4528 FAX : (054)286-2813
 Gwangju Sales TEL : (052)510-1881~22 FAX : (052)528-7884
 Jeonju Sales Office TEL : (053)271-4014~16 FAX : (053)271-2813
 Daejeon Sales TEL : (042)820-4201~07 FAX : (042)820-4298

Technology Enquiry

Customer Center TEL : 1544-2080 FAX : (041)550-8600

A/S Enquiry

Seoul Service TEL : 1544-2080 FAX : (02)3680-7021
 Busan Service TEL : (051)310-6827 FAX : (051)310-6827
 Changwon Service TEL : (055)282-2080 FAX : (055)282-4352
 Ulsan Service TEL : (052)261-1585 FAX : (052)261-4205
 Daegu Service TEL : (053)603-2081~2 FAX : (053)603-7777
 Pohang Service TEL : (054)286-4528 FAX : (054)286-2813
 Gwangju Service TEL : (052)527-2080 FAX : (052)528-7884
 Jeonju Service TEL : (053)271-2613 FAX : (053)271-2613