

CT/PT RATIO(TURN) ERROR TESTER

유민테크
U-MinTech

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01 CT/PT TESTER 제품 개요

PLC와 SCADA (HMI) SYSTEM 활용하여 CT/PT 시험품의 PT VT 사양 (Pri.v / Sec.v,Burden, Type)입력 또는 CT 사양(Pri.v / Sec.v,Burden, Class) 입력 → 결선 → 동작 "ON" → 결과 DISPLAY 및 DATA저장 → 출력 등의 일련의 과정을 자동으로 처리, CT 또는 PT VT 제품의 결선비,연산 제어를 가능하도록 설계 개발된 제품입니다.

CT TEST(Current Transformer Ratio Error Test)

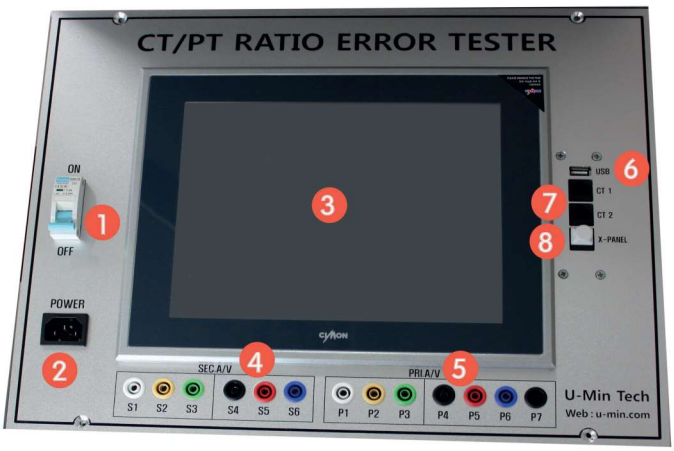
1) 관통형 변류기(CT)및 직접접속식(DIRECT)변류기(CT)단상 1~3대까지 단자를 연결 또는 3상 (3P3W, 3P4W)에 1차측을 관통후 2차측 단자를 연결하여 각 상별 순차적으로 시험을 할 수 있습니다.
2) 2차 출력 0.1A, 0.25A, 0.5A, 1A, 5A 등 제품도 시험을 할 수 있습니다.
3) 공통사항 : DISPLAY표시 : RATIO / ERROR / OUTPUT – 1차측 입력기준 2차측 출력표시CT BURDEN 측정은 여자전류시험으로 시험이 가능합니다.

PT TEST(Potential Transformer Ratio Error Test)

1. 단상(1P2W) 제품 1~3대까지 연결후 순차적으로 측정 할 수 있습니다.
2. 단상의 TAP전압 제품 2TAP~3TAP까지 연결하여 순차적으로 측정할 수 있습니다.
3. GPT(접지형변압기) 제품 1차 – 2차 – 3차 단자를 연결하여 순차적으로 측정 할 수 있습니다.
4. 3상의 제품(1P3W, 3P3W, 3P4W) 각 단자를 연결하여 각 상별 순차적으로 측정 할 수 있습니다.
5. 공통사항 : DISPLAY표시 : RATIO / ERROR / OUTPUT – 1차측 입력기준 2차측 출력표시

※ 휴대용 변류기 여자전류 및 코어특성시험기 특허등록 : 2020. 11.11
※ 휴대용 변류기 권선비 시험기 등록 : 2020. 12.10
※ 휴대용 변압기 시험기 등록 : 2020. 12.17

02 HARDWARE



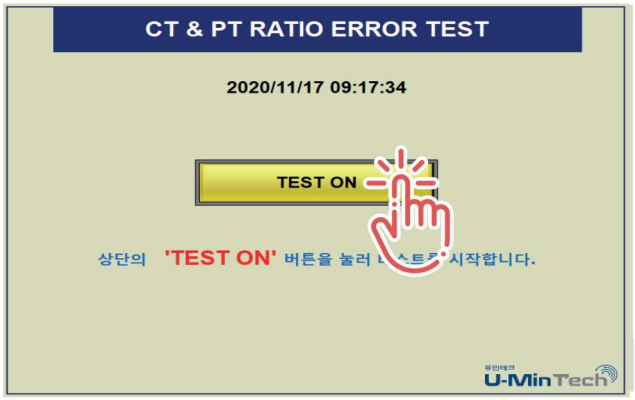
구성품 : 본체, 프로브, 전원 케이블

1. 전원 스위치
2. AC220V 전원 단자
3. 터치 디바이스
4. 2차측 전압측정 단자
5. 1차측 전압측정 단자
6. 데이터 저장용 USB PORT
7. 관통형 CT전용 PORT
8. 제조사용 PORT

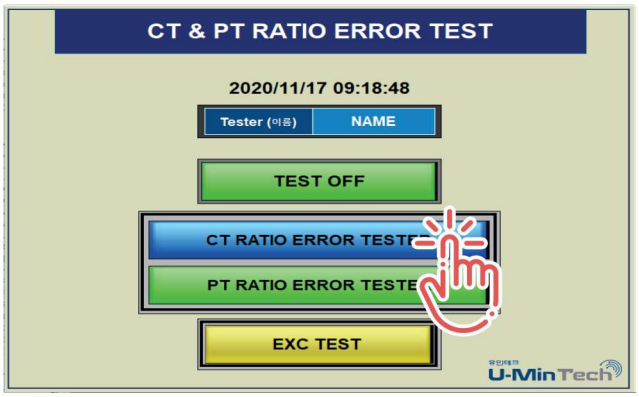
03 CT RATIO TEST QUICK GUIDE /

3-1 관통형 1P2W 2EA TEST

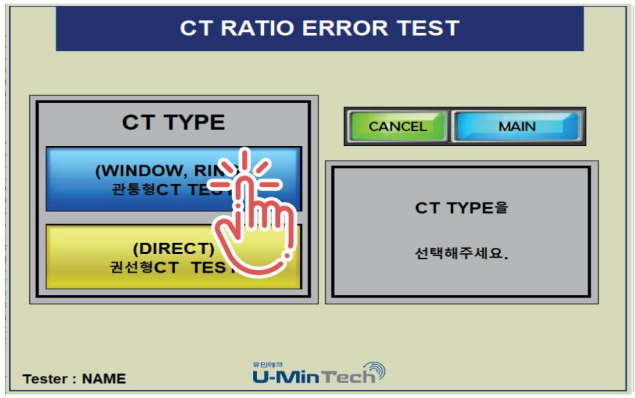
1. 전원을 220V 단자에 연결한 후 전원스위치를 켭니다.
2. 모든 CT 테스트는 QUICK GUIDE 예시와 같은 방식으로 동작합니다.



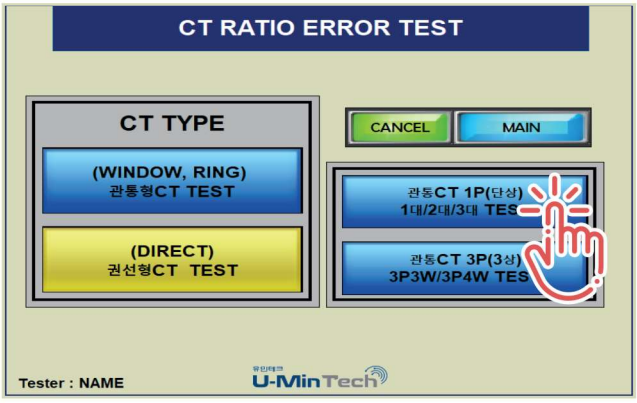
1. TEST ON버튼을 터치



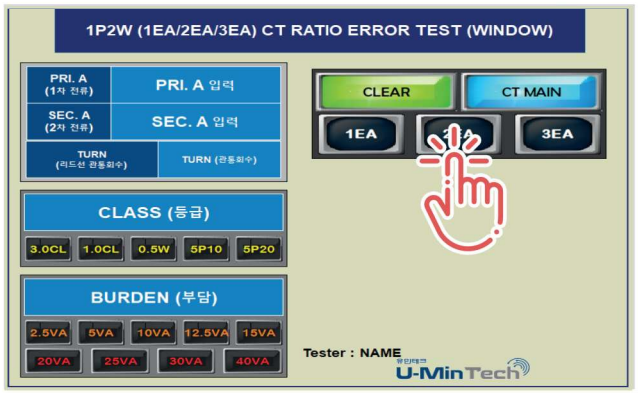
2. CT 테스트를 터치



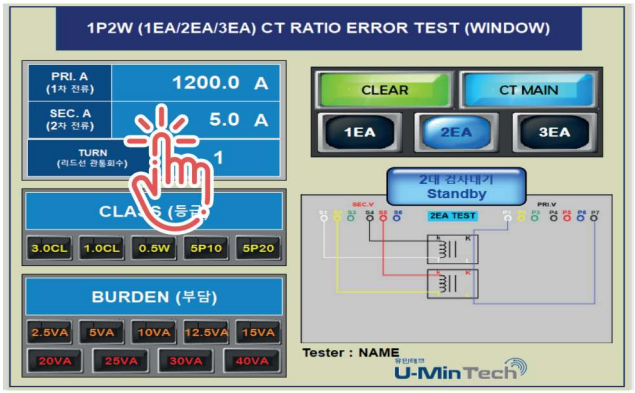
3. 관통형 CT 버튼을 터치하여 하위메뉴 오픈



4. 우상단의 단상 버튼 터치하여 페이지 이동

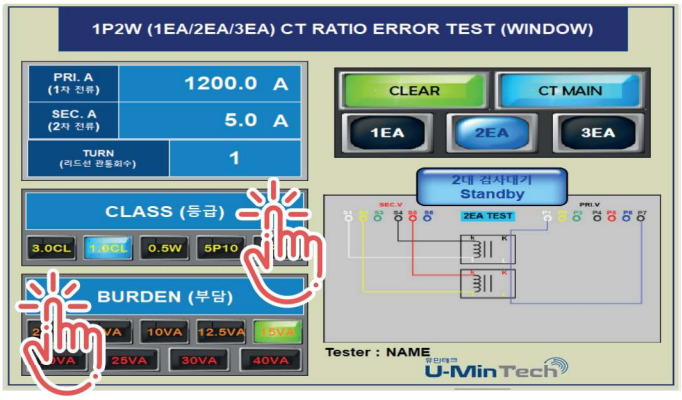


5. 원하는 검사 대수 터치(1/2/3EA) - 2EA

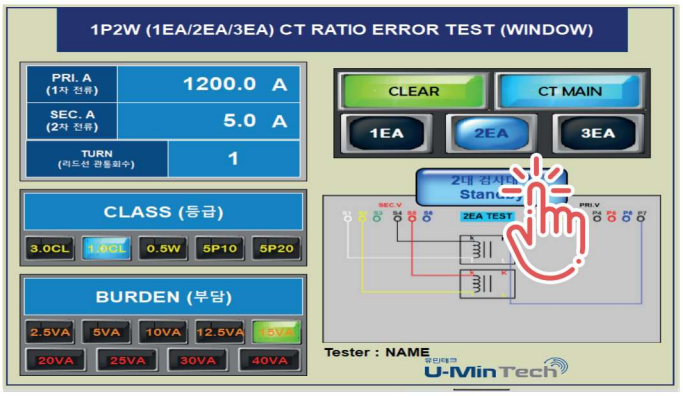


6. 터치하여 PRI.A, SEC.A, 턴수 입력

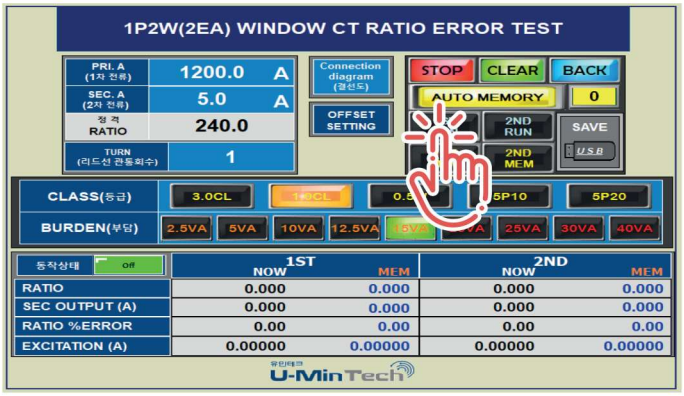
※ 주의 : TURN 관통회수를 입력하지 않으면 Data Display 되지 않음



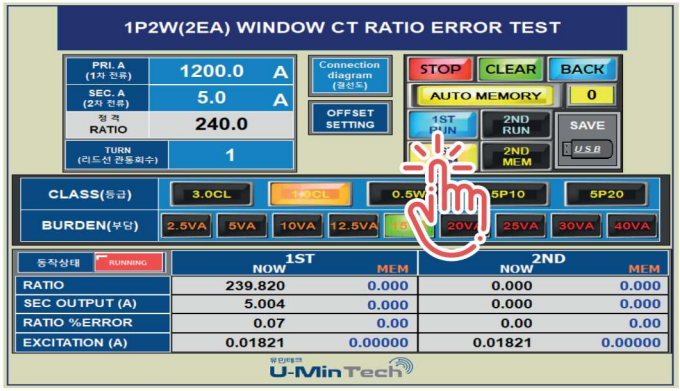
7. CLASS(등급), BURDEN(부담) 터치



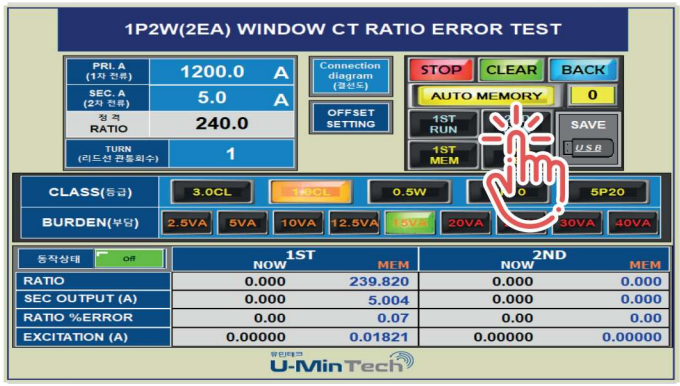
8. 결선 후 STANDBY 터치하여 다음페이지 이동



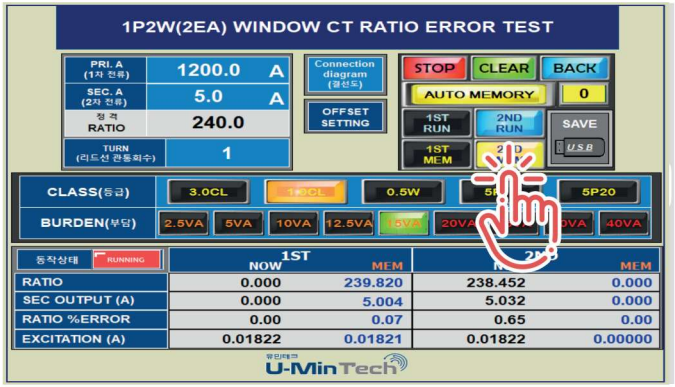
9. 모든 파라메터 확인 후 1ST RUN 터치로 동작



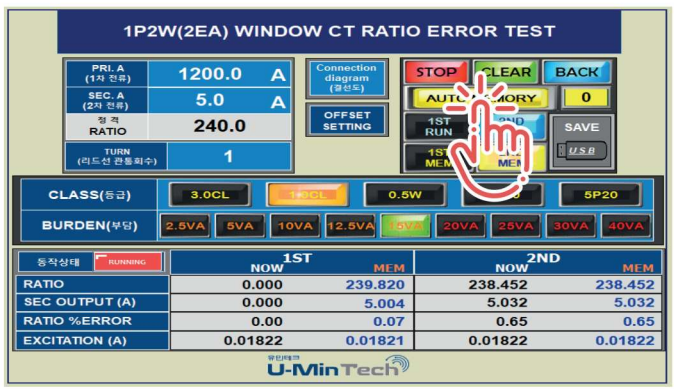
10. 동작 중 1ST MEM버튼 터치하여 데이터 임시저장



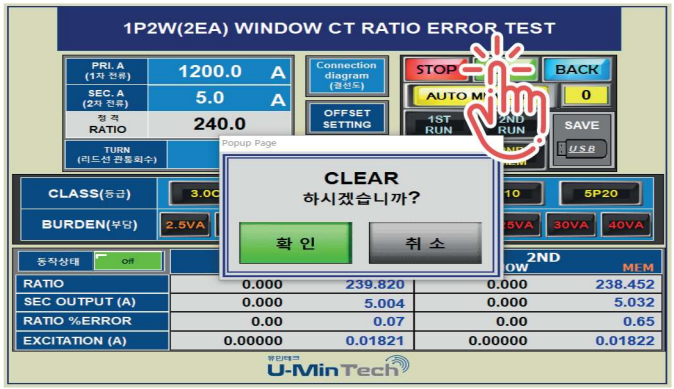
11. 2ND RUN 터치로 2번 시험체 검사



12. 동작 중 2ND MEM버튼 터치하여 데이터 임시저장



13. AUTO MEMORY 버튼 터치 시 9번~12번까지 동작



14. CLEAR 버튼 터치 시 RESET

03 CT RATIO TEST QUICK GUIDE /

3-2 관통형 CT 검사를 위한 결선방법

관통형 CT는 원형 홀 사이를 관통하는 결선 방식으로 1차측 전압을 측정합니다.

제공되는 테스트 프로브(* 8 turn line prove)를 활용하여 정밀도 상승 및 높은 Ratio 값 최대 8,000 Ratio 까지 측정이 가능합니다. 해당 장비의 활용 방법은 아래와 같습니다.

1. 관통형 CT를 관통하여 제공되는 전용프로브를 감고 잭 부분을 장비에 연결한다.
2. 감은 Turn 수 만큼 리드선 Turn 관통회수를 터치하여 값을 입력한다.
3. CT의 RATIO는 입력된 Turn 수를 기준하여 측정에 반영됩니다.

주의! 제공되는 전용 프로브 이외의 리드 선을 이용할 경우 제대로된 결과값을 얻을 수 없습니다.



1TURN : 8T



2TURN : 8T x 2 = 16T

04 CT TEST LIST

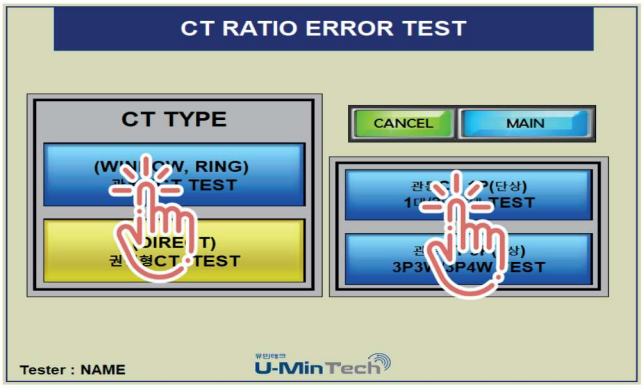
4-1 관통형 CT TEST

4-1-a(1) 단상 TEST(1 PHASE) 1EA, 2EA, 3EA

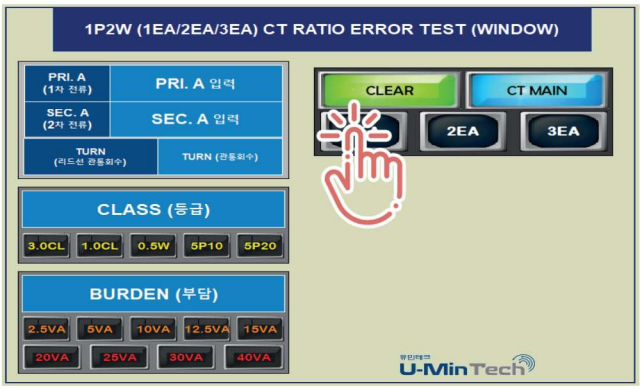
관통형1P2W CT RATIO 테스트입니다. 최대 3대까지 동시에 순차적으로 검사가 가능합니다.

관통형 CT를 측정하기 위해서는 크로스케이블 방식의 LAN 케이블이 필요합니다.
제품의 오른쪽 CT1 과 CT2 라고 명기된 LAN 포트 한쪽에 LAN케이블을 장착,
관통형 CT에 케이블을 통과시킨 후 나머지 포트에 LAN 케이블을 장착하는 방식으로
테스트 리드를 연결 할 수 있습니다

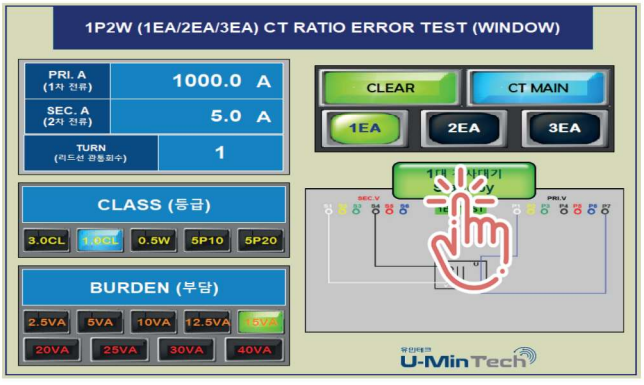
4-1-a(1) 1P2W 1EA TEST



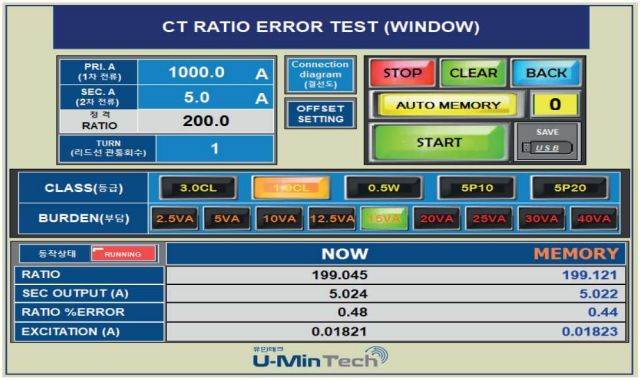
1. 1P2W 1EA TEST



2. 사양 입력(터치)후 1EA터치

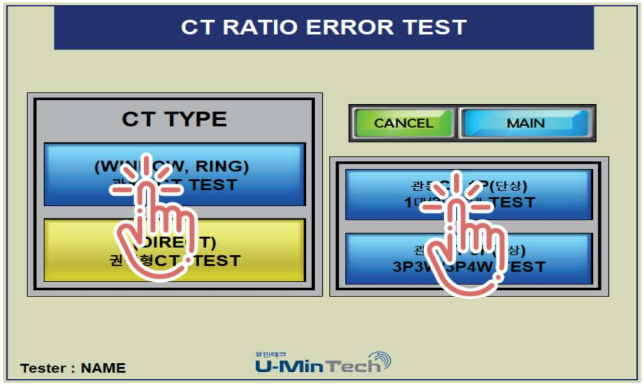


3. 사양 입력 및 결선 후 "Standby" 터치

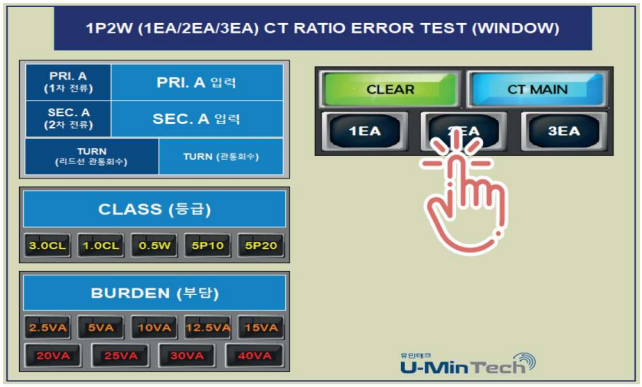


4. 1P2W 1EA 시험 Data Display

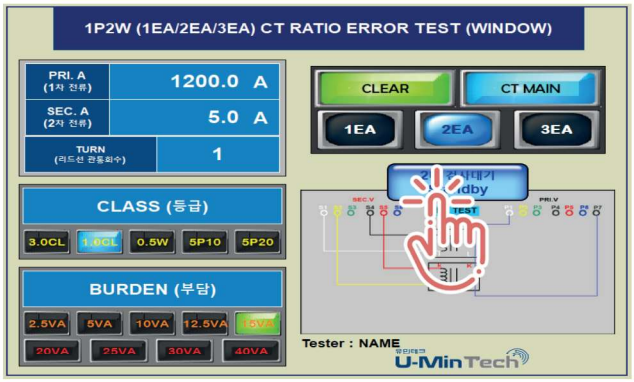
4-1-a(2) 1P2W 2EA TEST



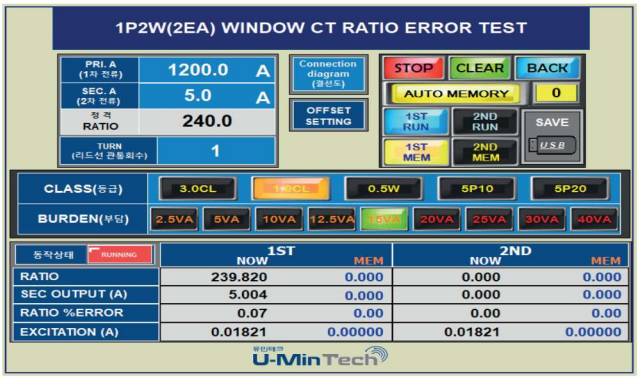
1. 1P2W 2EA TEST



2. 사양 입력(터치)후 2EA터치

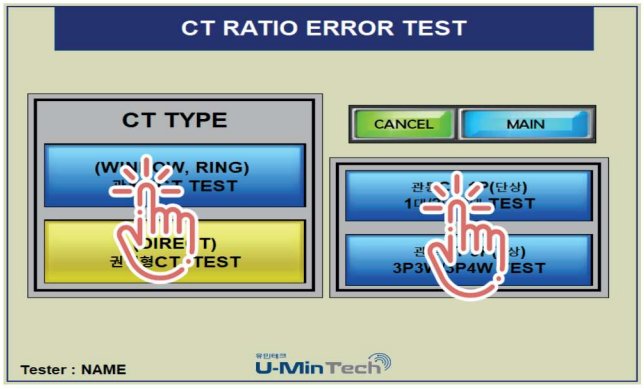


3. 사양 입력 및 결선 후 "Standby" 터치

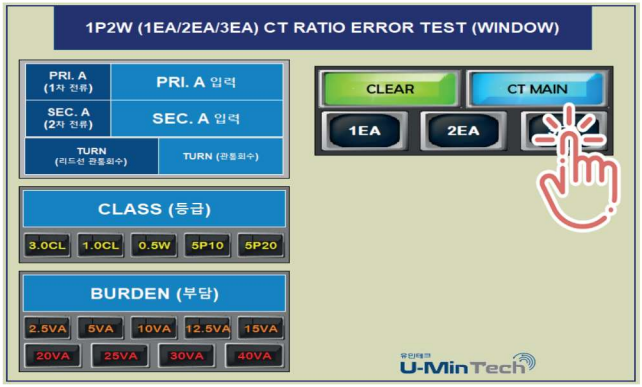


4. 1P2W 2EA시험 Data Display

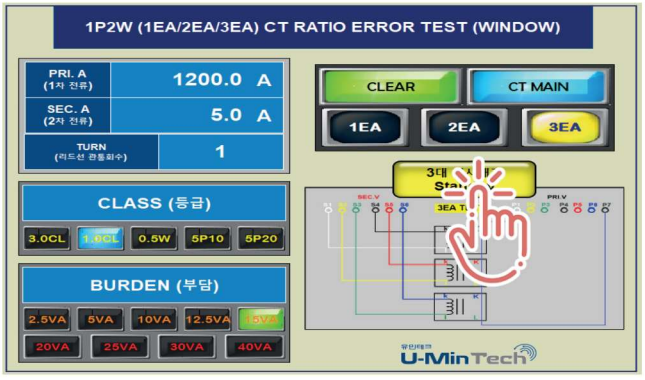
4-1-a(3) 1P2W 3EA TEST



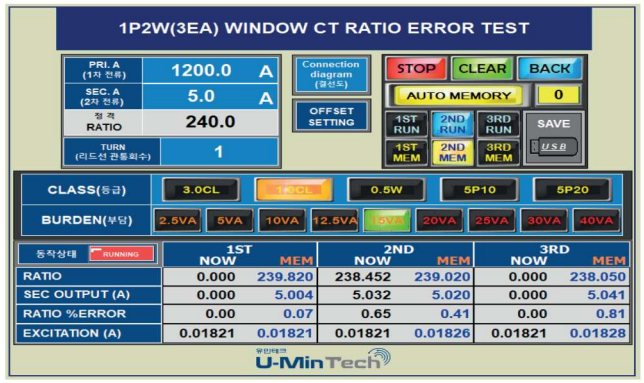
1. 1P2W 3EA TEST



2. 사양 입력(터치)후 3EA터치



3. 사양 입력 및 결선 후 "Standby" 터치

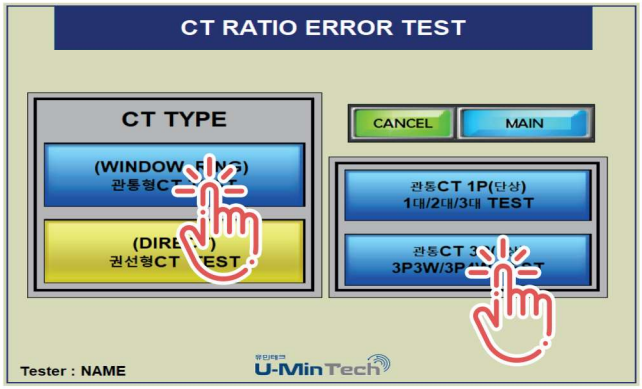


4. 1P2W 3EA시험 Data Display

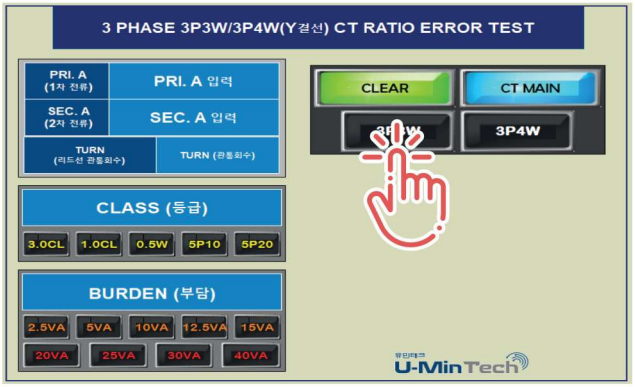
4-1-b 3상(3 PHASE) TEST

관통형 3상 (3P3W, 3P4W)CT Ratio&Error 테스트입니다. 각 상별로 순차적으로 검사가 가능합니다.

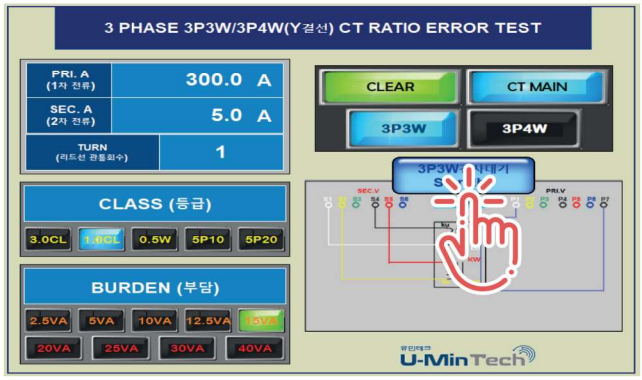
4-1-b(1) 3P3W TEST



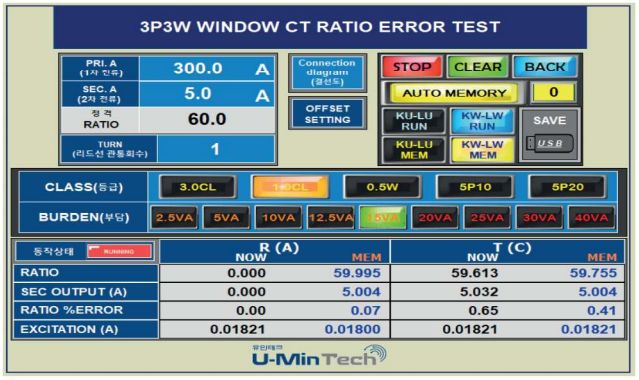
1. 3P3W TEST



2. 3P3W 사양 입력(터치)후 3P3W 터치

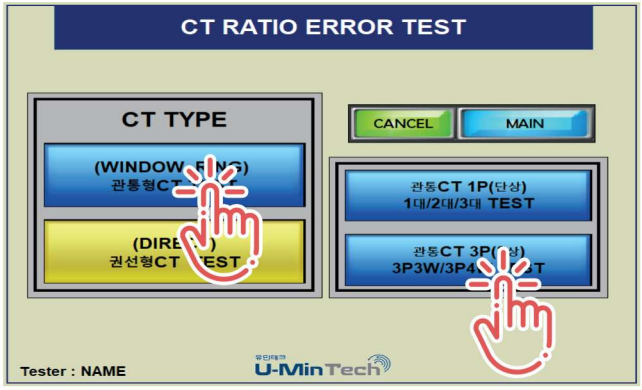


3. 사양 입력 및 결선 후 "Standby"터치 (결선방법 1장 참조)

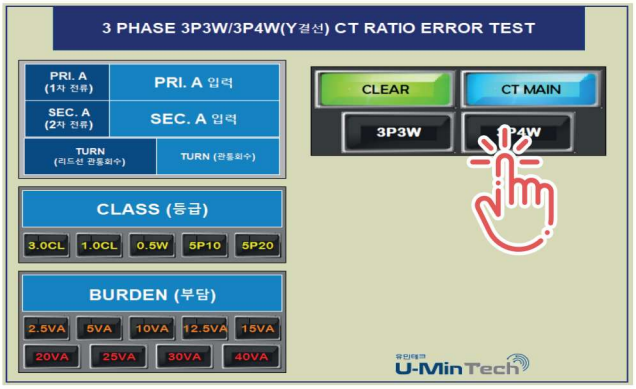


4. 3P3W 시험 Data Display

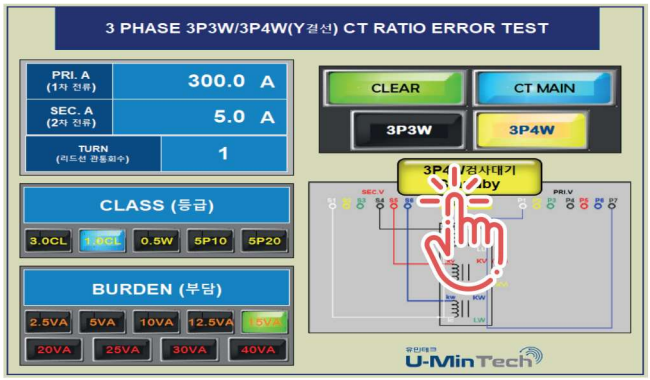
4-1-b(2) 3P4W TEST



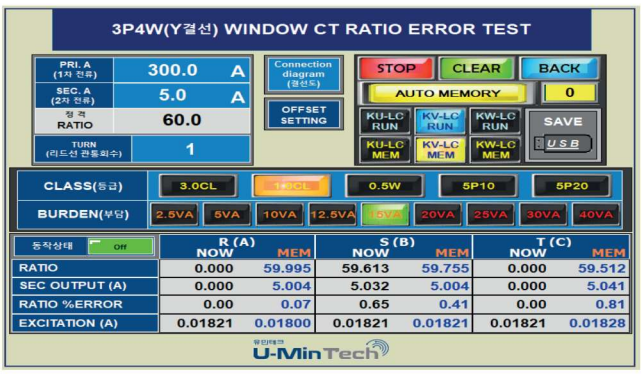
1. 3P4W TEST



2. 3P4W 사양 입력(터치)후 3P4W 터치



3. 사양 입력 및 결선 후 "Standby"터치



4. 3P4W 시험 Data Display

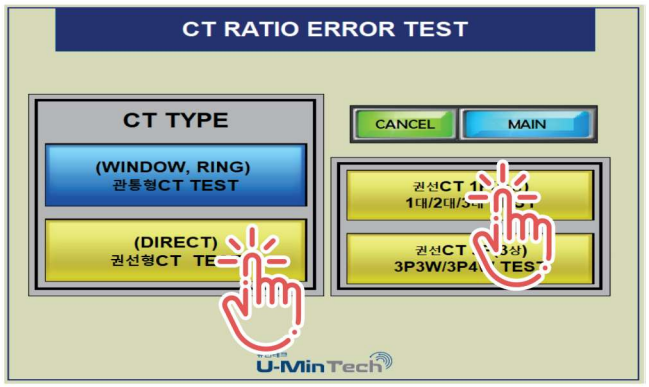
04 CT TEST LIST /

4-2 권선형 CT TEST

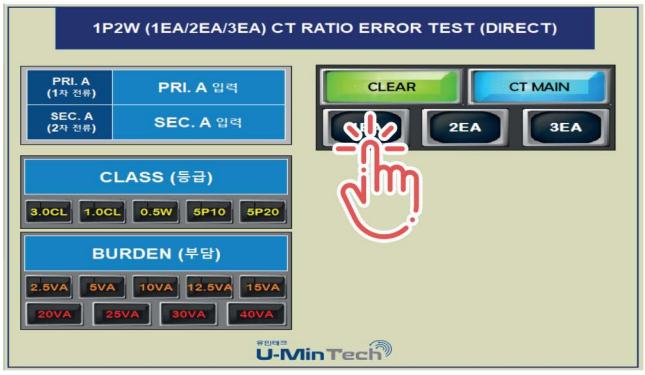
4-2-a 단상 TEST(1 PHASE) 1EA, 2EA, 3EA

권선형 1P2W CT RATIO 테스트입니다. 최대 3대까지 동시에 순차적으로 검사가 가능합니다.

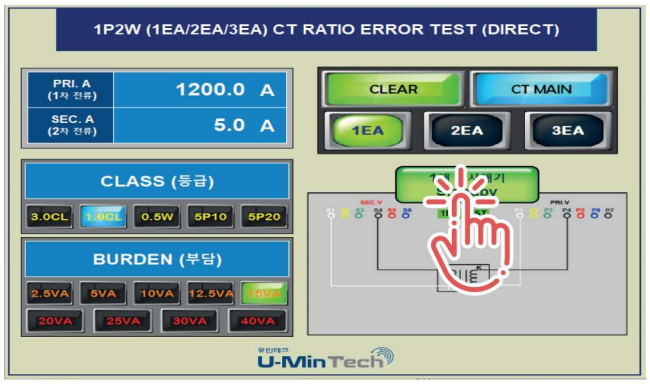
4-2-a(1) 1P2W 1EA TEST



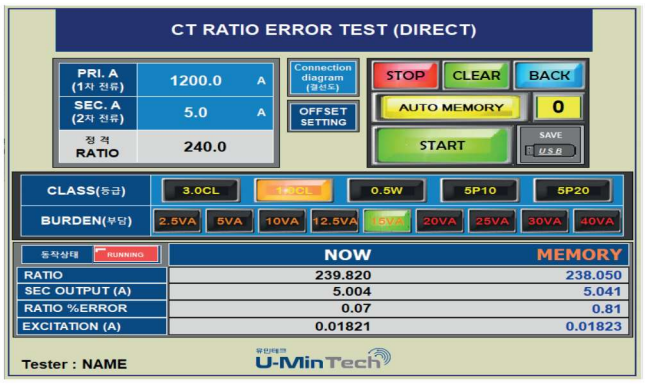
1. 1P2W 1EA TEST



2. 사양 입력(터치)후 1EA터치

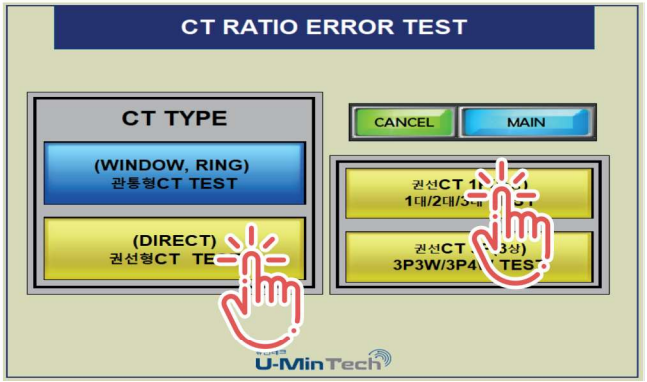


3. 사양 입력 및 결선 후 "Standby"터치

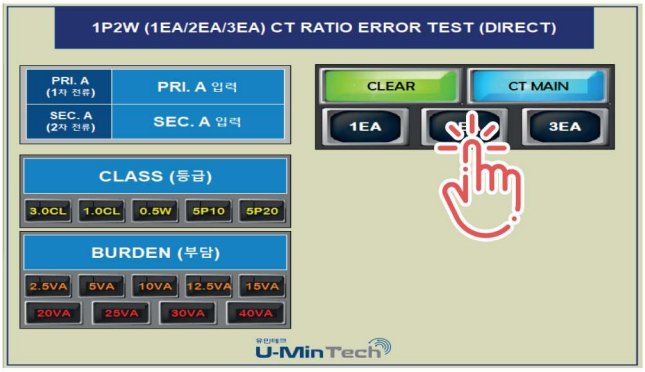


4. 1P2W 1EA 시험 Data Display

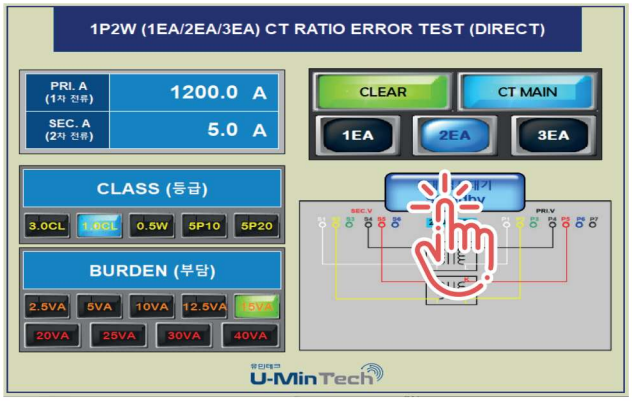
4-2-a(2) 1P2W 2EA TEST



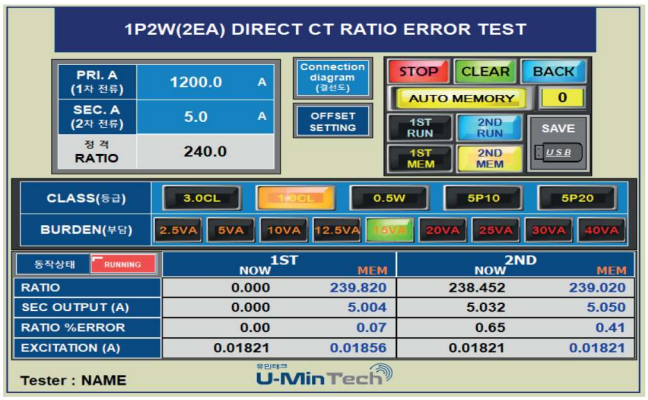
1. 1P2W 2EA TEST



2. 사양 입력(터치)후 2EA터치

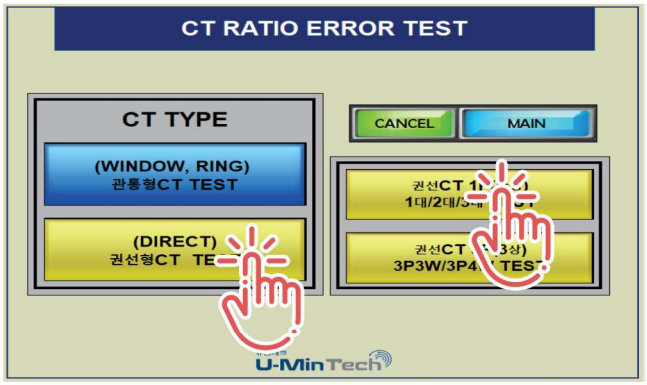


3. 사양 입력 및 결선 후 "Standby" 터치

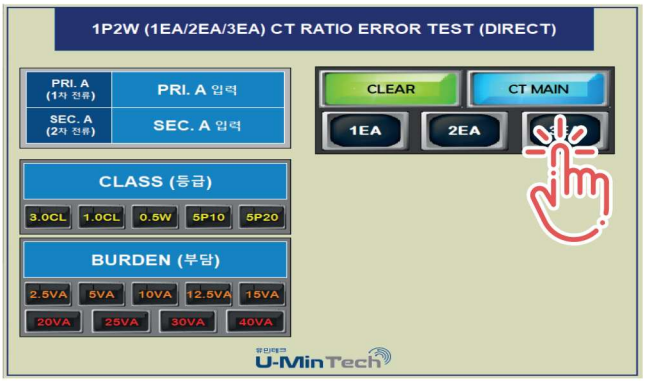


4. 1P2W 2EA 시험 Data Display

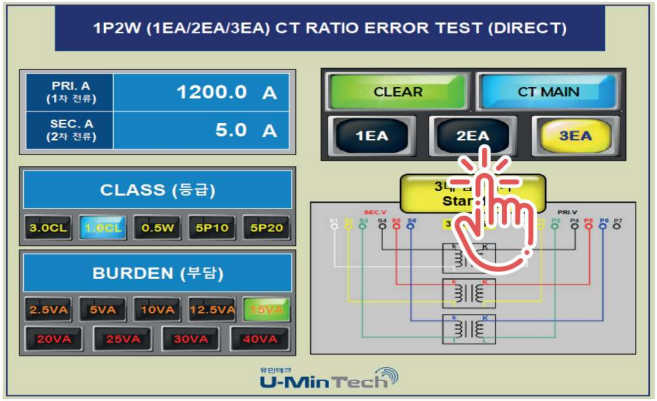
4-2-a(3) 1P2W 3EA TEST



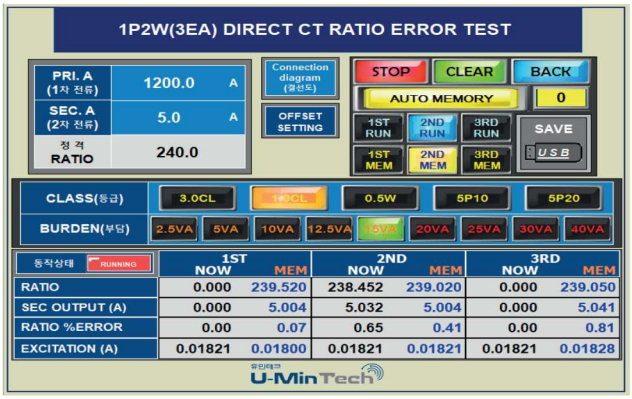
1. 1P2W 3EA TEST



2. 사양 입력(터치)후 3EA터치



3. 사양 입력 및 결선 후 "Standby" 터치

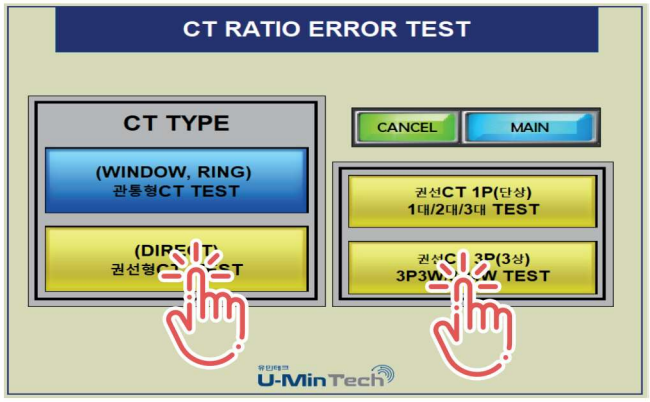


4. 1P2W 3EA 시험 Data Display

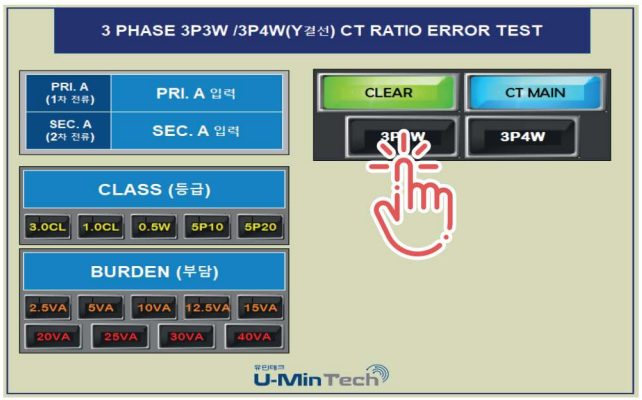
4-2-b 3상(3 PHASE) TEST

권선형 3상 CT(3P3W, 3P4W) Ratio&Error 테스트입니다.
각 상별로 순차적으로 검사합니다.

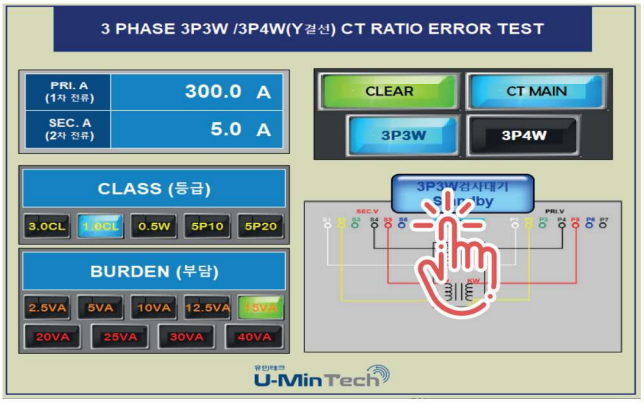
4-2-b(1) 3P3W TEST



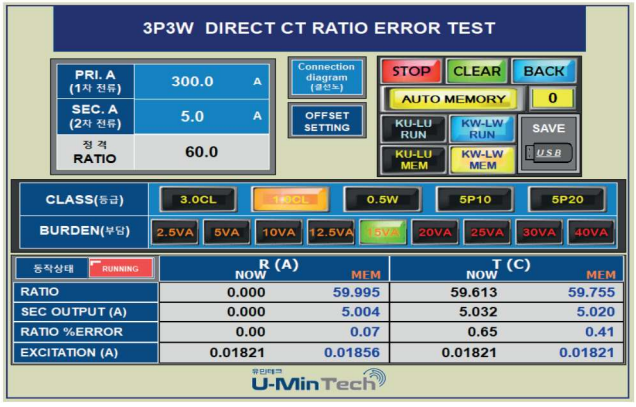
1. 3P3W TEST



2. 사양 입력(터치)후 3P3W터치

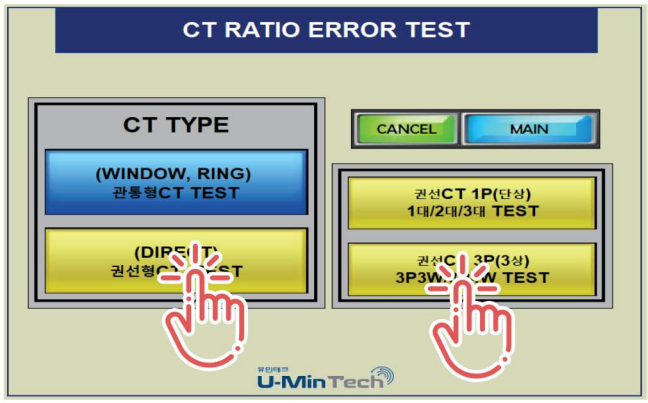


3. 사양 입력 및 결선 후"Standby"터치

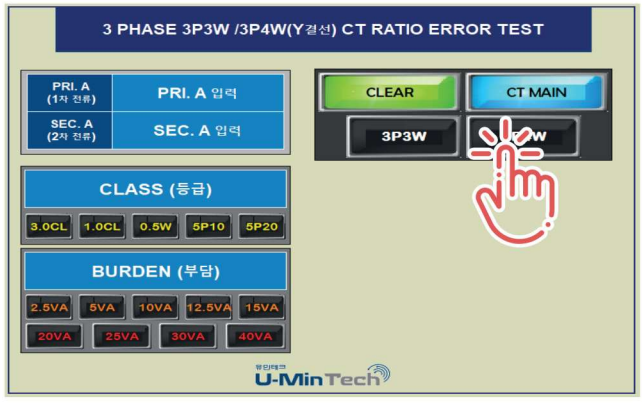


4. 3P4W 시험 Data Display

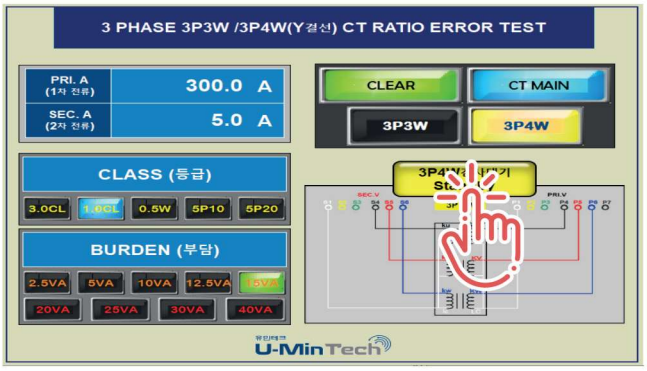
4-2-b(2) 3P4W TEST



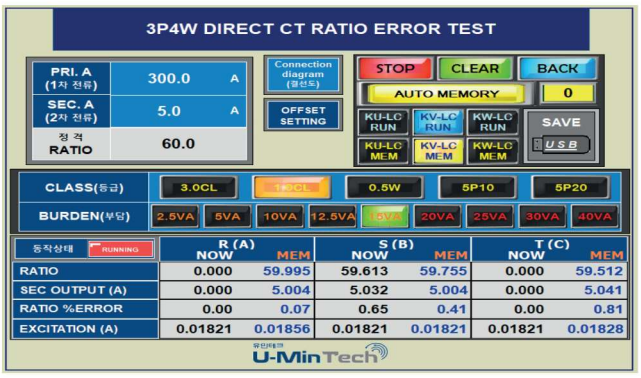
1. 3P4W TEST



2. 사양 입력(터치)후 3P4W터치



3. 사양 입력 및 결선 후 "Standby"터치

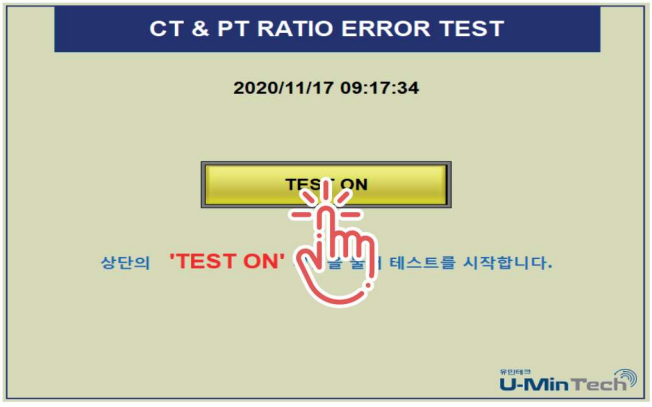


4. 3P4W 시험 Data Display

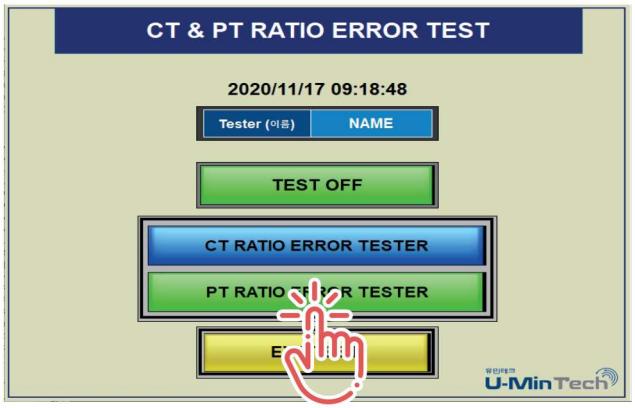
05 PT RATIO TEST QUICK GUIDE /

5-1 사양이 명확한 경우

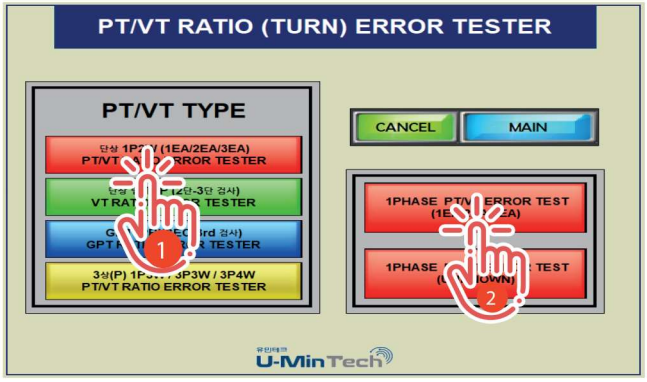
1. 전원을 220V 단자에 연결한 후 전원스위치를 켭니다.
2. 모든 PT 테스트는 QUICK GUIDE 예시와 같은 방식으로 동작합니다.
3. 예상 치와 크게 상이한 값이 나올 경우 back 버튼을 터치하여 결선 시 화면에 표기된 단자와 PT간 바르게 결선 되었는지 재확인합니다.
4. 모든 TEST는 동시에 동작하지 않고 순차적으로 동작합니다.



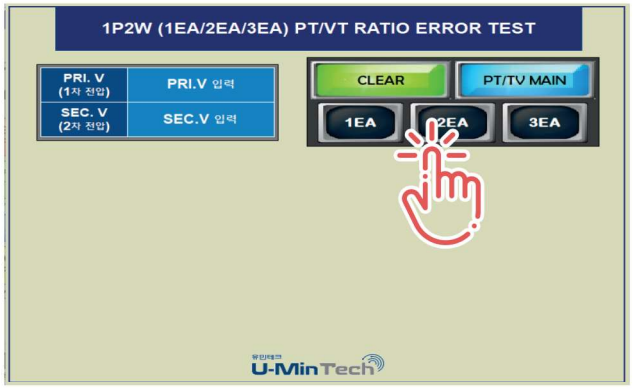
1. POWER ON버튼을 터치



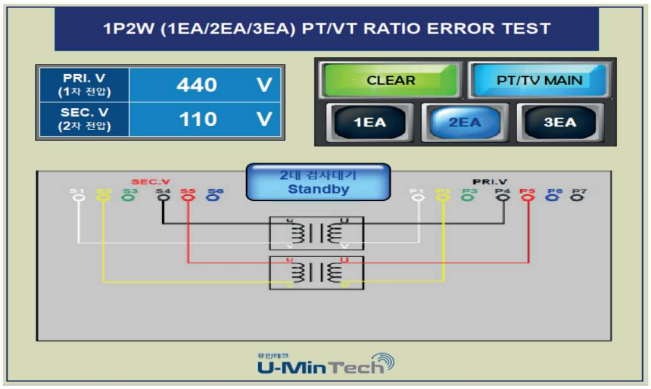
2. 원하는 테스트 타입의 버튼을 터치



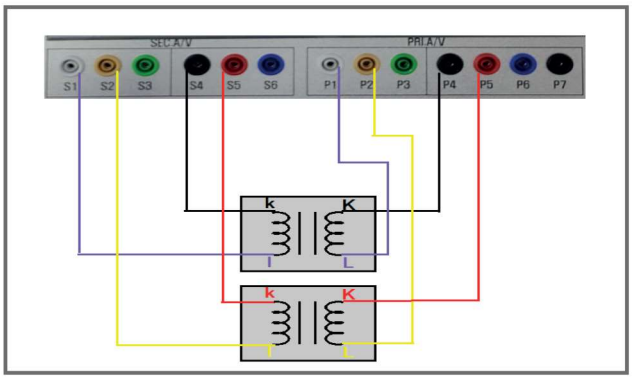
3. 1P2W 검사 터치하여 다음페이지 이동



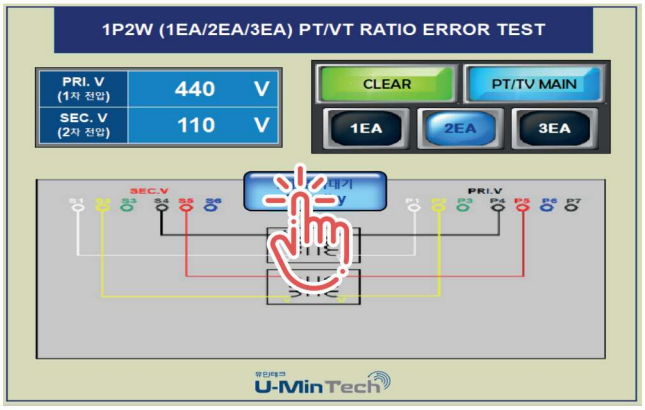
4. 원하는 검사 대수 터치 -2EA



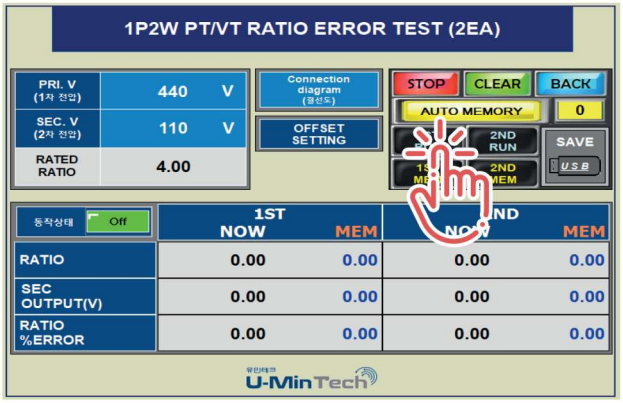
5. 파라메터 (PRI.V/SEC.V) 입력 및 결선



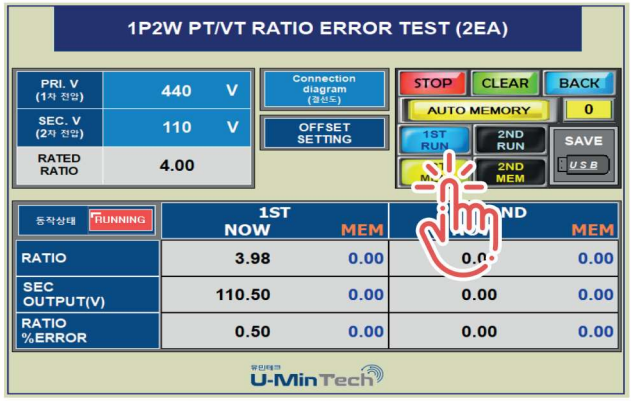
6. 피시험기 제품 결선시 화면



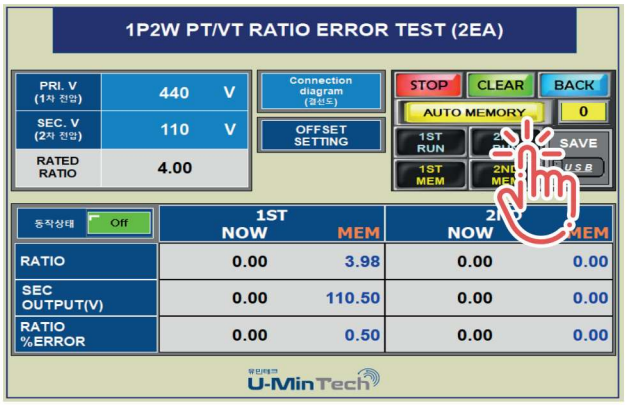
7. 결선 후 STANDBY 터치하여
다음페이지 이동



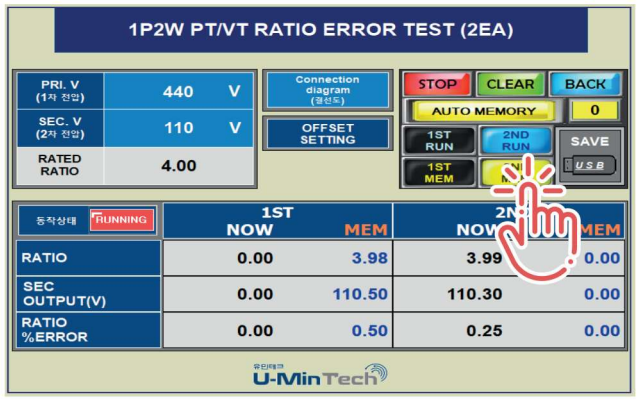
8. PRI.V/SEC.V 사양 확인, BURDEN 및
TYPE SET 설정후 1ST RUN버튼 터치



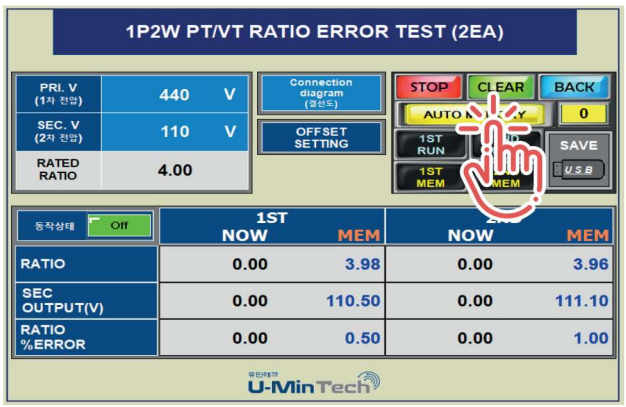
9. 1st Mem(Memory)버튼을 터치하여
결과값 DATA를 임시저장



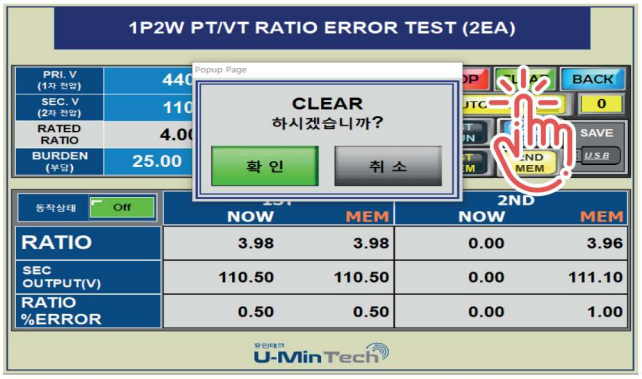
10. PRI.V/SEC.V 사양 확인 후
2ND RUN버튼 터치



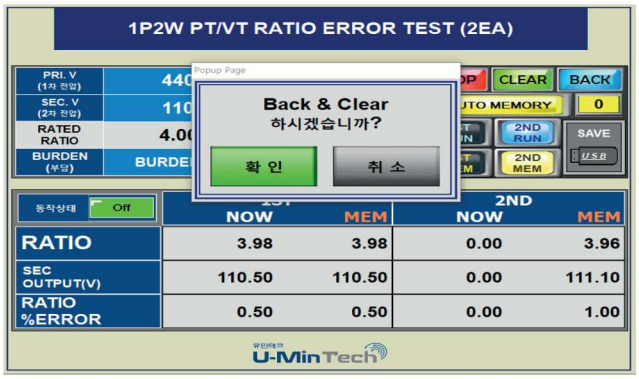
11. 2nd MEM(Memory)버튼을 터치하여
결과값 DATA를 임시저장



12. AUTO MEMORY 버튼 터치 시
8번~11번 동작



13. CLEAR 버튼 터치 시 RESET

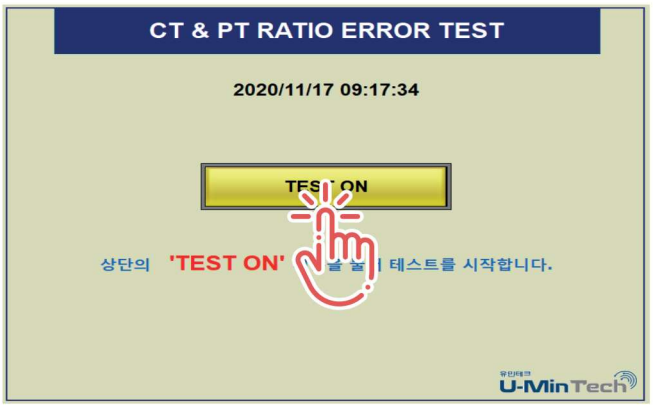


14. 테스트를 마치고 이전화면 돌아가기

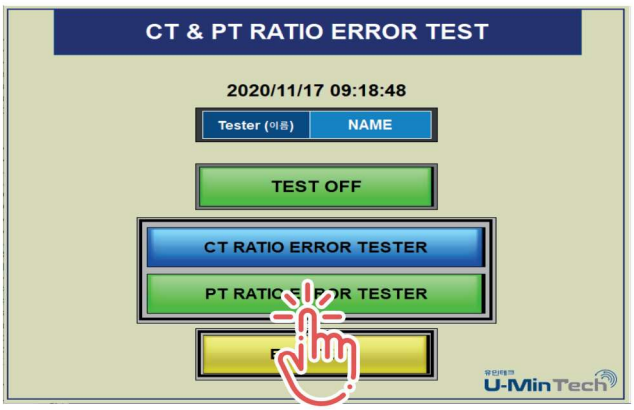
05 PT RATIO TEST QUICK GUIDE /

5-2 사양이 불명확한 경우

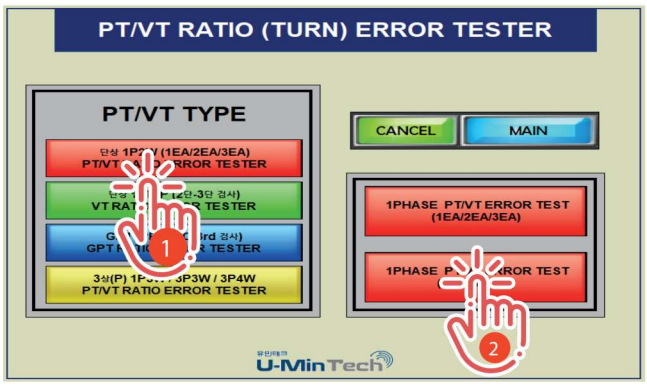
1. 전원을 220V 단자에 연결한 후 전원스위치를 켭니다.
2. 모든 PT 테스트는 QUICK GUIDE 예시와 같은 방식으로 동작합니다.
3. 예상 치와 크게 상이한 값이 나올 경우 back 버튼을 터치하여 결선 시 화면에 표기된 단자와 PT간 바르게 결선 되었는지 재확인합니다.
4. 모든 TEST는 동시에 동작하지 않고 순차적으로 동작합니다.



1. POWER ON버튼을 터치



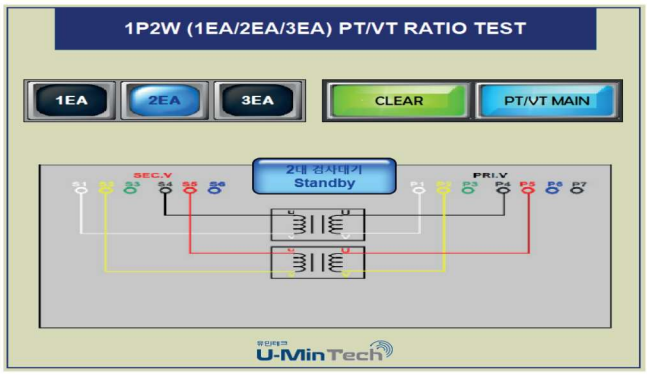
2. 원하는 테스트 타입의 버튼을 터치



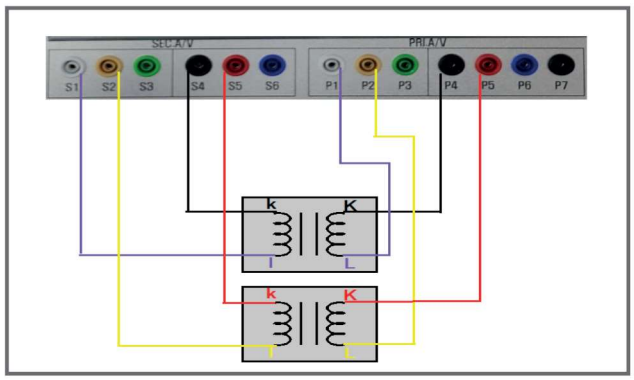
3. 1P2W 검사 터치하여 다음페이지 이동



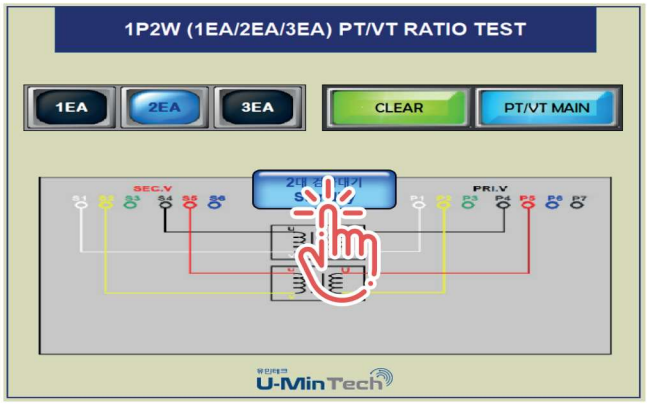
4. 원하는 검사 대수 터치 - 2EA



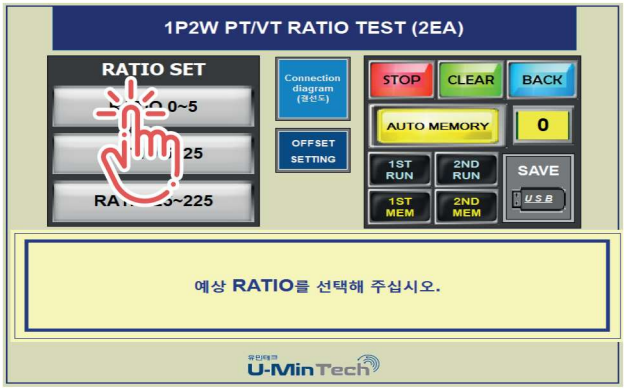
5. 결선도를 확인하며 결선



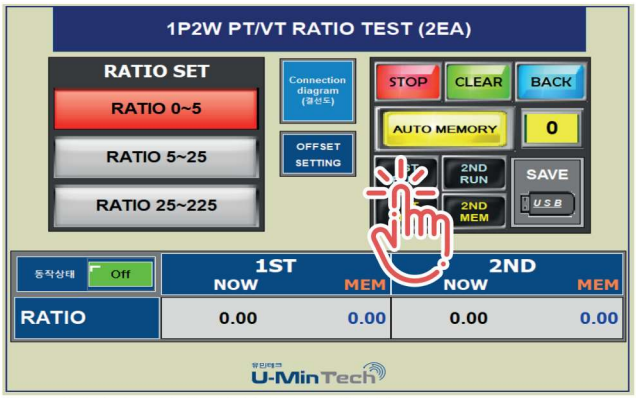
6. 피시험기 제품 결선시 화면



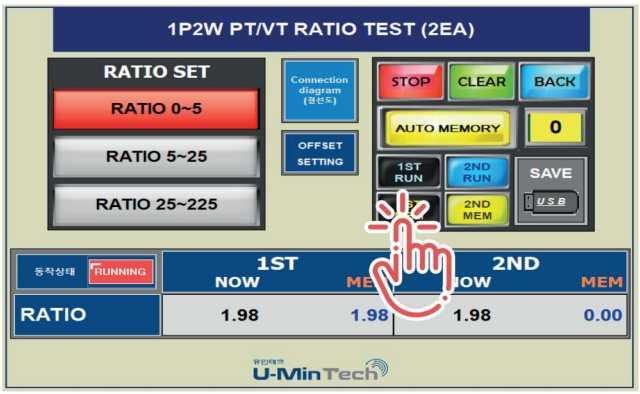
7. 결선 후 STANDBY 터치하여 다음페이지



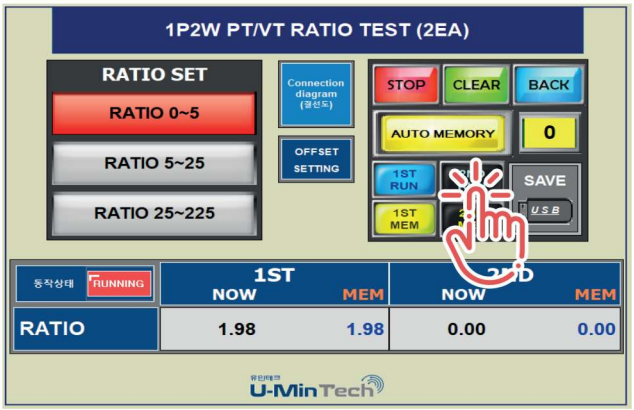
8. 예상 RATIO를 터치합니다.



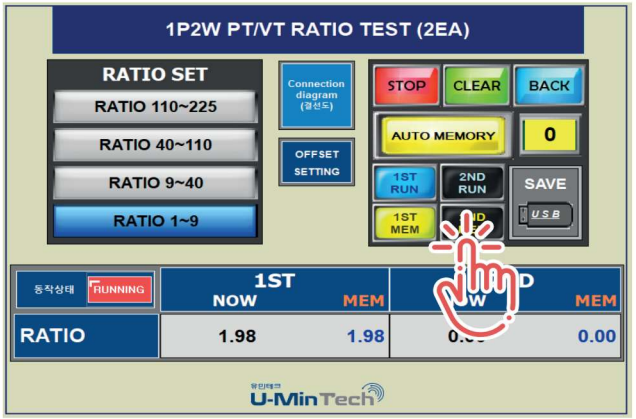
9. 1ST RUN버튼 터치



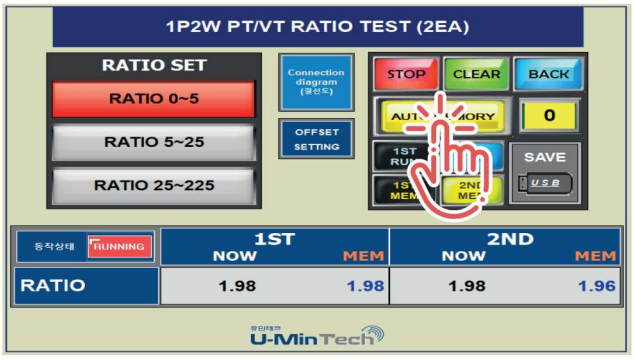
10. 1ST MEM(Memory)버튼을 터치하여 결과값 DATA를 임시저장한다



11. 2ND RUN버튼 터치



12. 2ND MEM(Memory)버튼을 터치하여 결과값 DATA를 임시저장한다



13. AUTO MEMORY 버튼 터치 시 9번~12번 동작



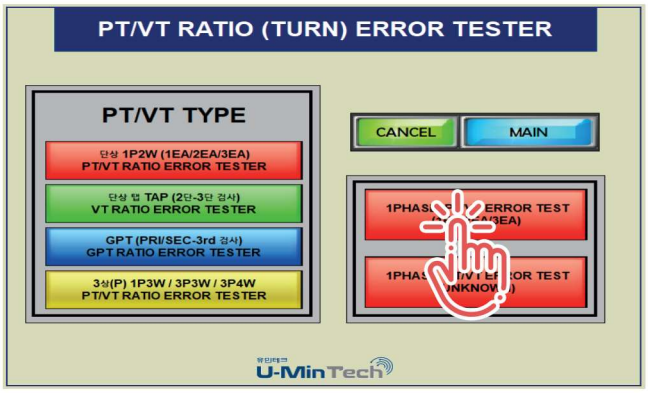
14. CLEAR 버튼 터치 시 RESET

06 PT TEST LIST /

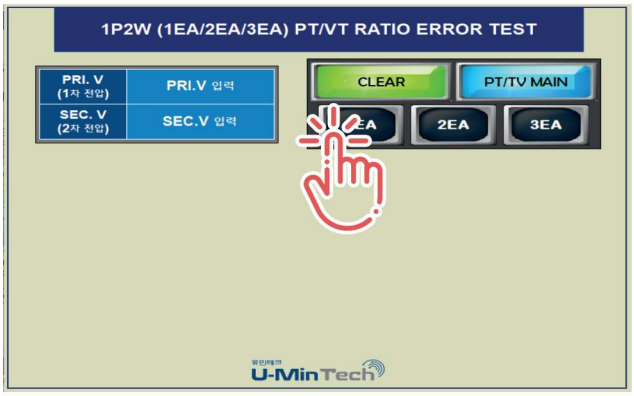
6-1 PT TEST 사양이 명확한 경우

일반 타입의 1P2W PT RATIO 테스트입니다.
최대 3대까지 동시에 검사가 가능합니다.

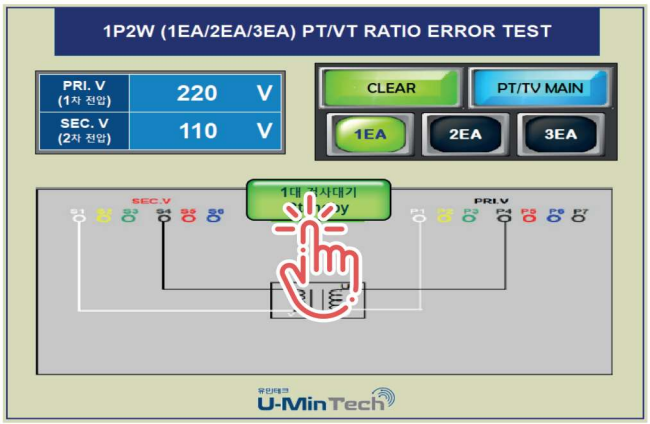
6-1-a(1) 1P2W 1EA TEST



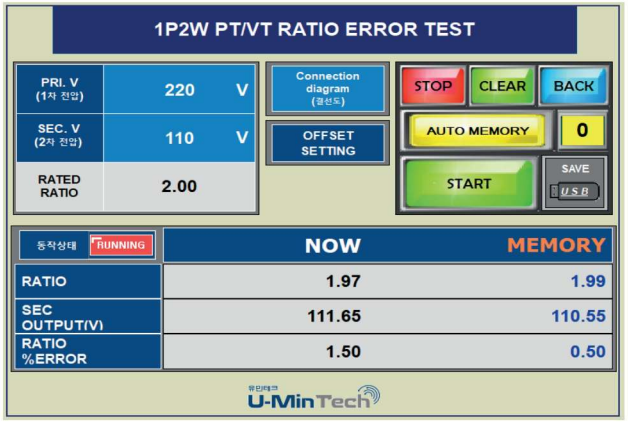
1. 1PHASE TEST (1EA)



2. 1PHASE TEST (1EA)

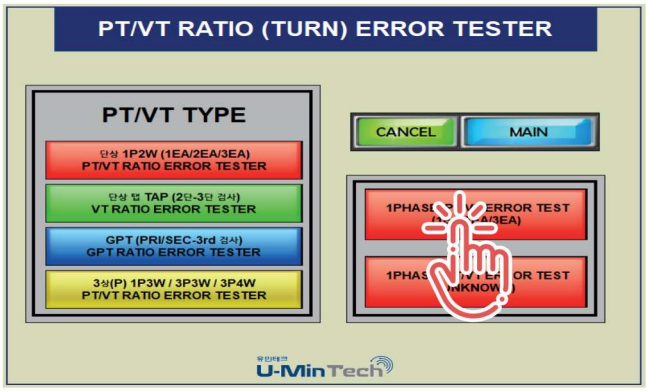


3. 1PHASE TEST (1EA)

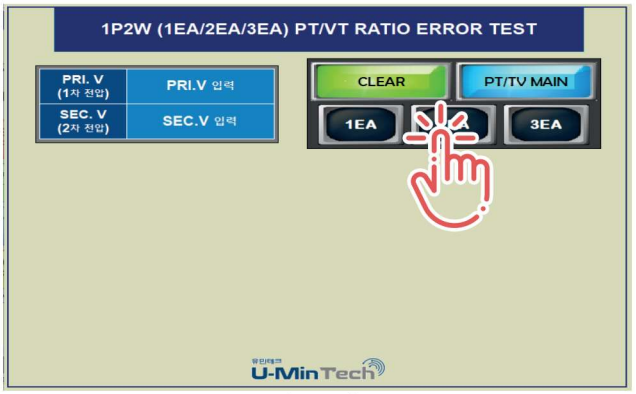


4. 1PHASE TEST (1EA)

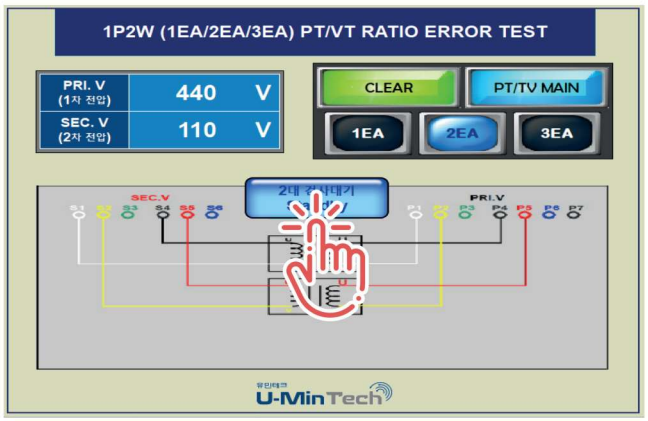
6-1-a(2) 1P2W 2EA TEST



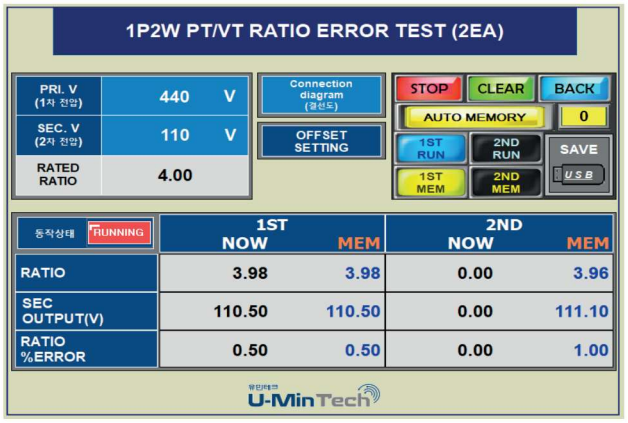
1. 1PHASE TEST (2EA)



2. 1PHASE TEST (2EA)



3. 1PHASE TEST (2EA)

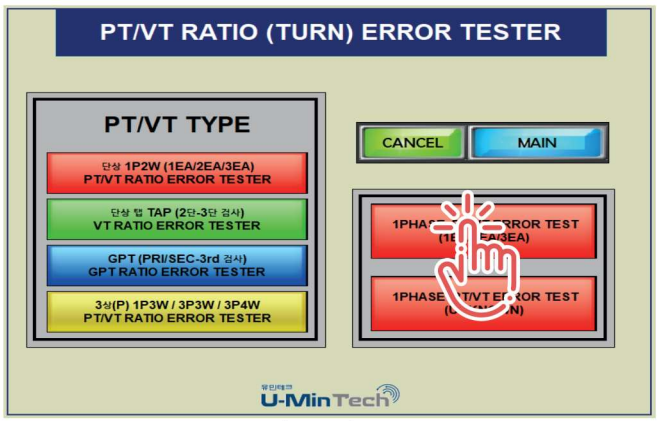


4. 1PHASE TEST (2EA)

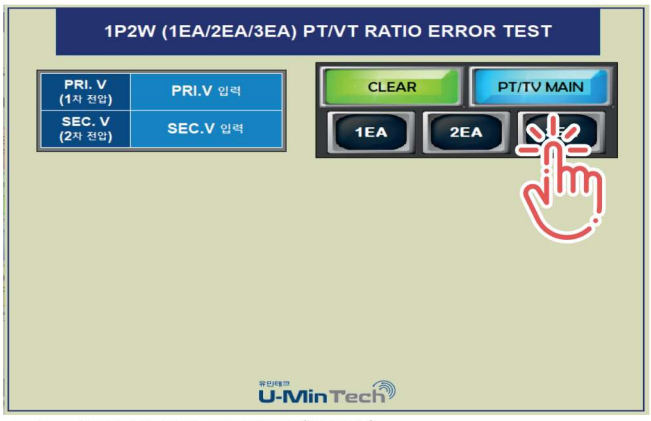
*** AUTO MEMORY**

AUTO MEMORY 버튼을 터치하면 연결된 피시험 대상의 테스트 및 기억동작을 순차적으로 모두 동작합니다.

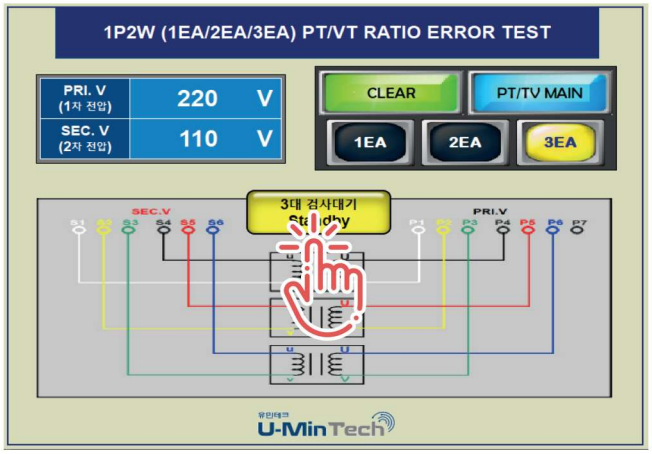
6-1-a(3) 1P2W 3EA TEST



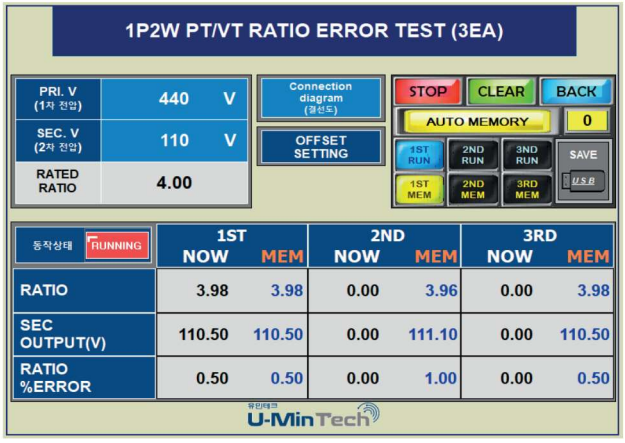
1. 1PHASE TEST (3EA)



2. 1PHASE TEST (3EA)



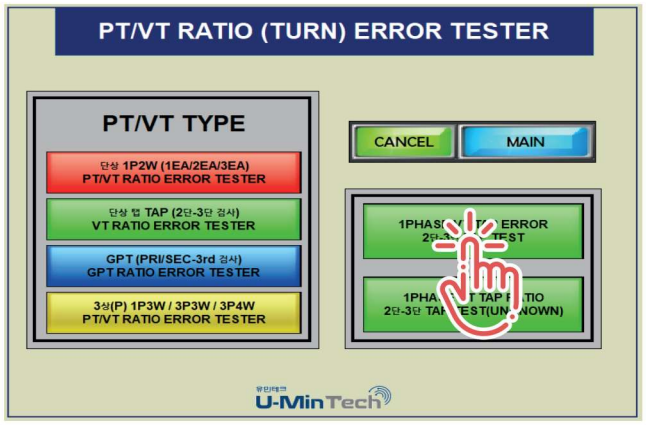
3. 1PHASE TEST (3EA)



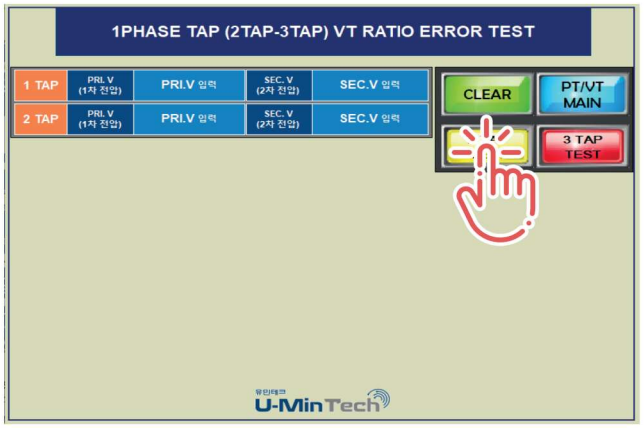
4. 1PHASE TEST (3EA)

6-1-b(1) 2TAP VT TEST

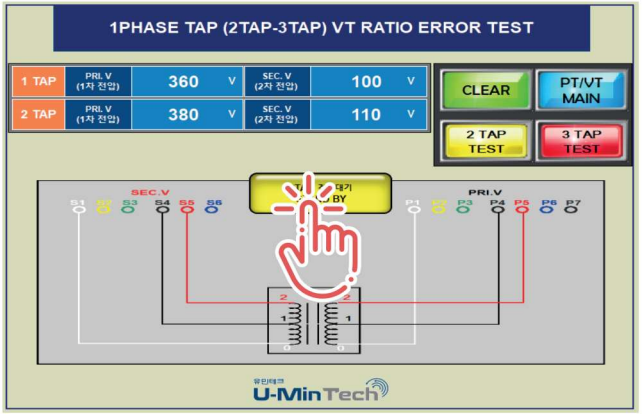
TAP Changer가 설치된 변압기 타입으로 2차측의 각 TAP과 1차 측의 상간 전압을 아래와 같이 측정 가능합니다.



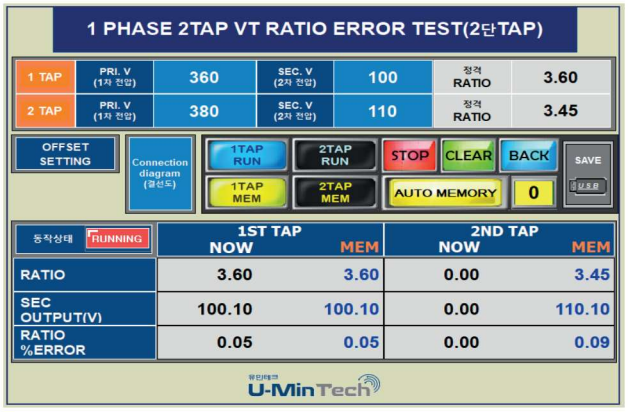
1. 1P TAP TEST (2 TAP)



2. 1P TAP TEST (2 TAP)



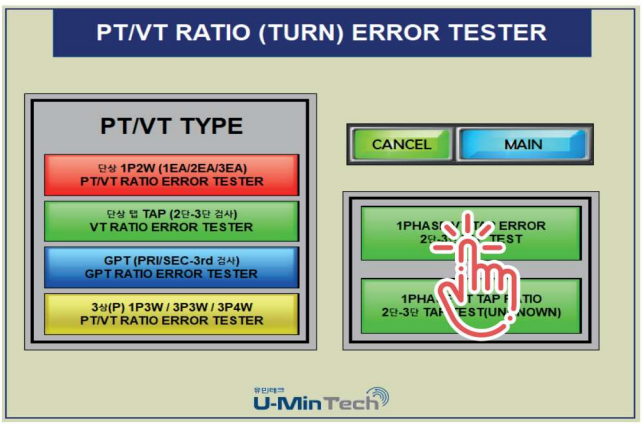
3. 1P TAP TEST (2 TAP)



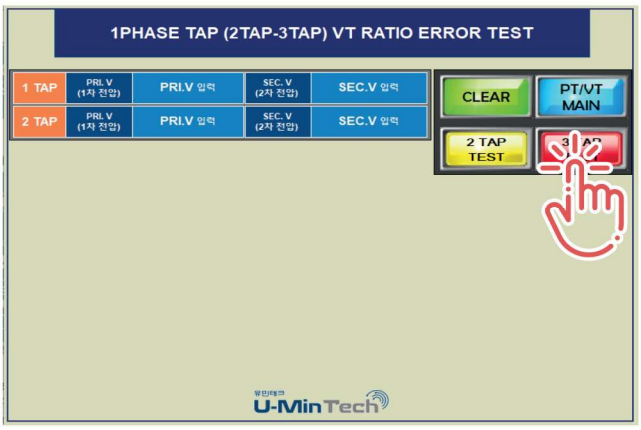
4. 1P TAP TEST (2 TAP)

6-1-b(2) 3TAP VT TEST

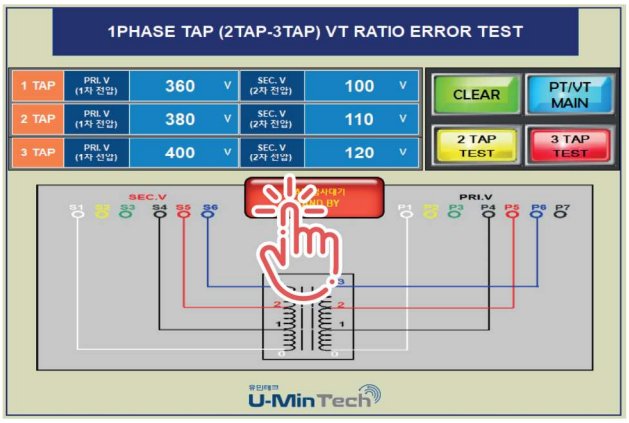
최대 3개의 탭까지 한번에 검사 가능합니다



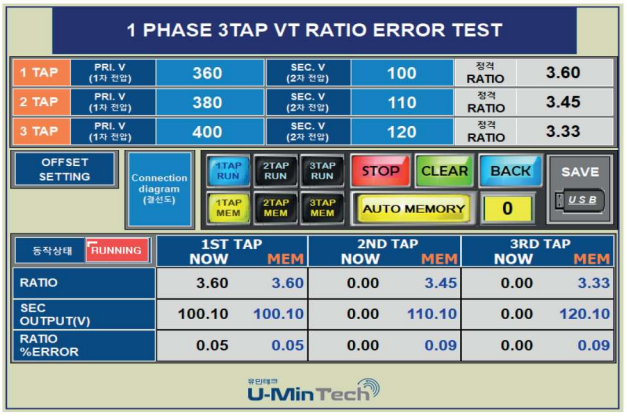
1. 1P TAP TEST (3TAP)



2. 1P TAP TEST (3 TAP)



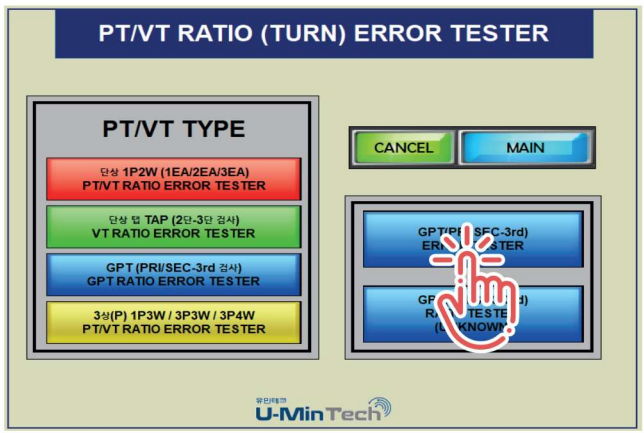
3. 1P TAP TEST (3 TAP)



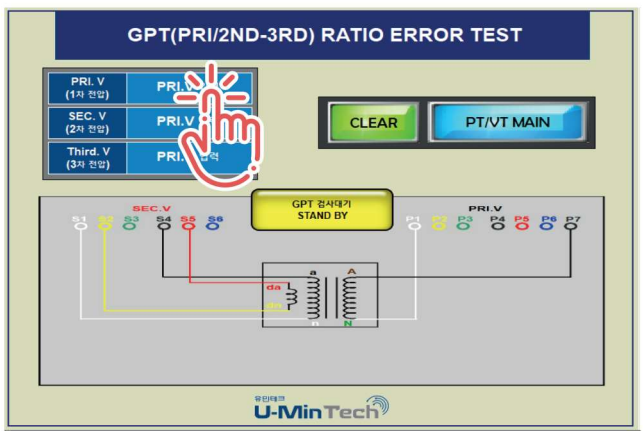
4. 1P TAP TEST (3 TAP)

6-1-c GPT(Ground Potential Transformer)

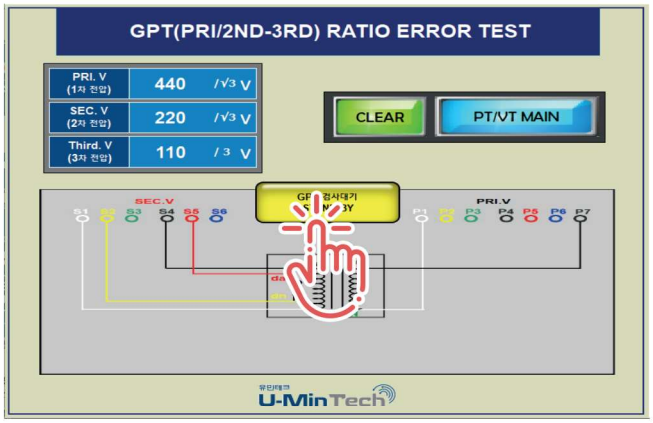
접지형 계기용 변압기로 아래로 같은 방식으로 측정 가능합니다.



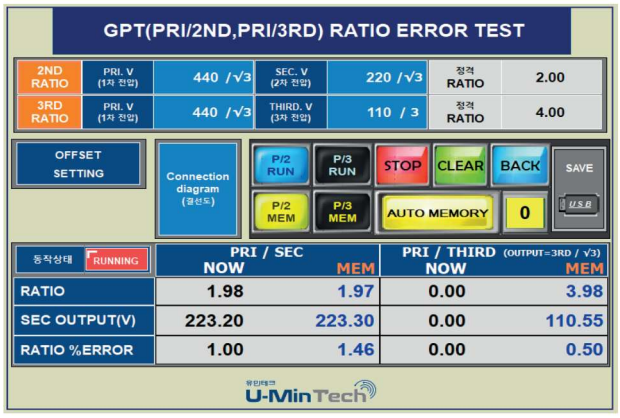
1. GPT TEST



2. GPT TEST



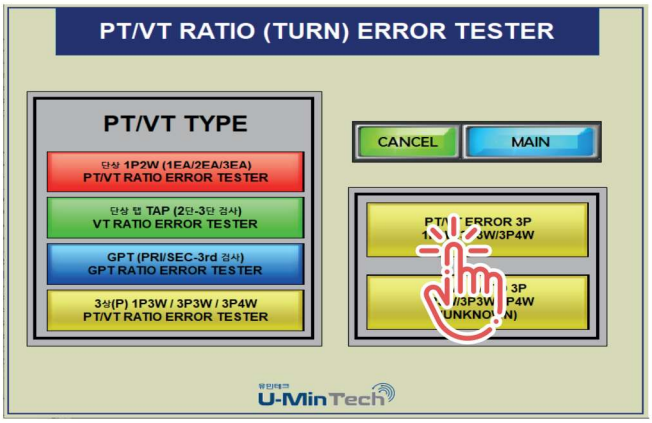
3. GPT TEST



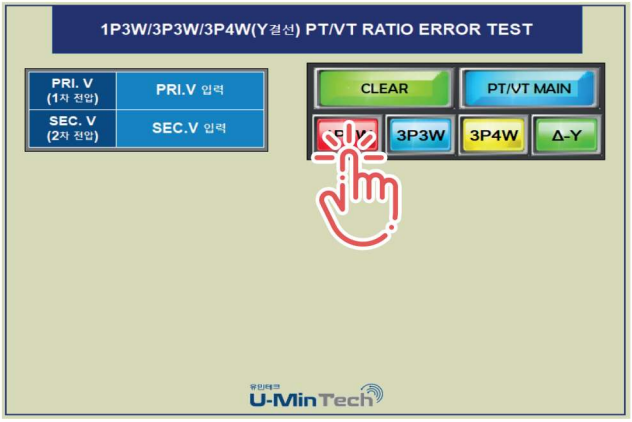
4. GPT TEST

6-1-d(1) 1P3W TEST

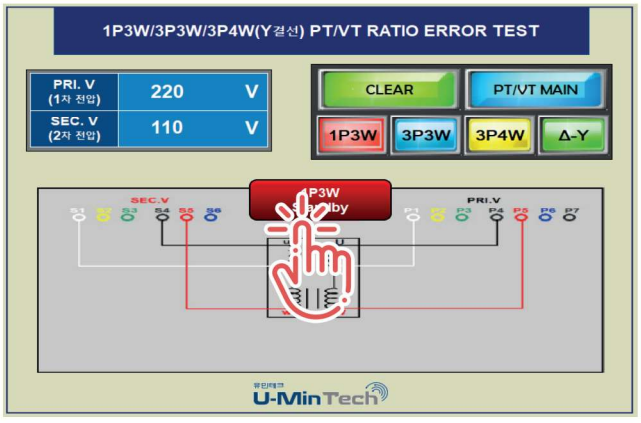
일반적인 3상 PT TEST로 1P3W, 3P3W, 3P4W PT의 측정 시 아래와 같이 테스트를 진행합니다



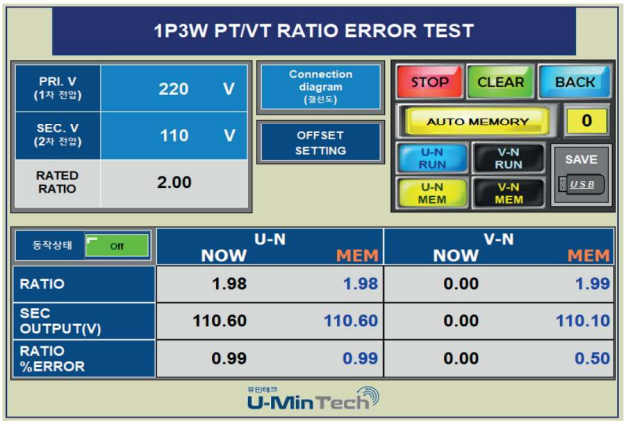
1. 3 PHASE TEST (1P3W)



2. 3 PHASE TEST (1P3W)

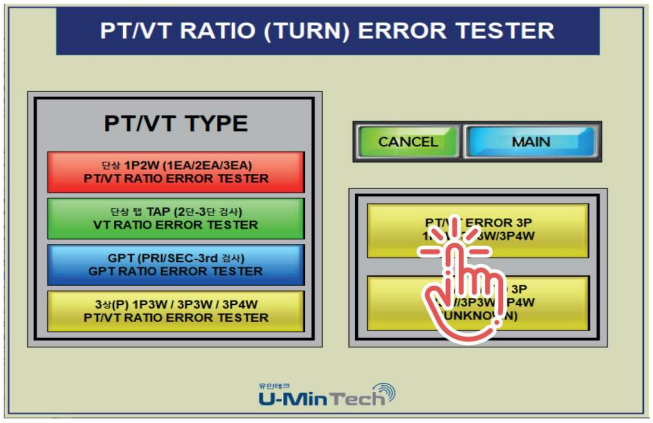


3. 3 PHASE TEST (1P3W)

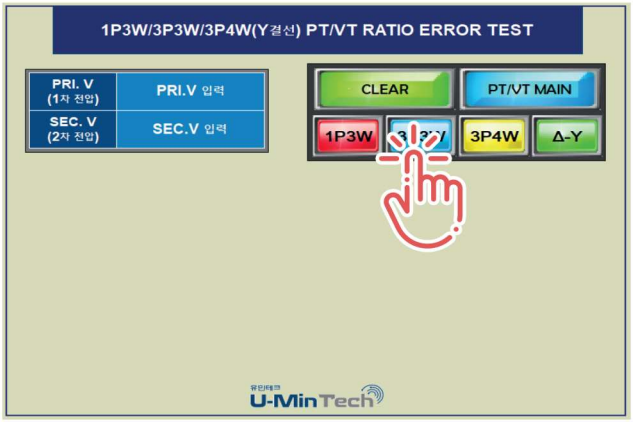


4. 3 PHASE TEST (1P3W)

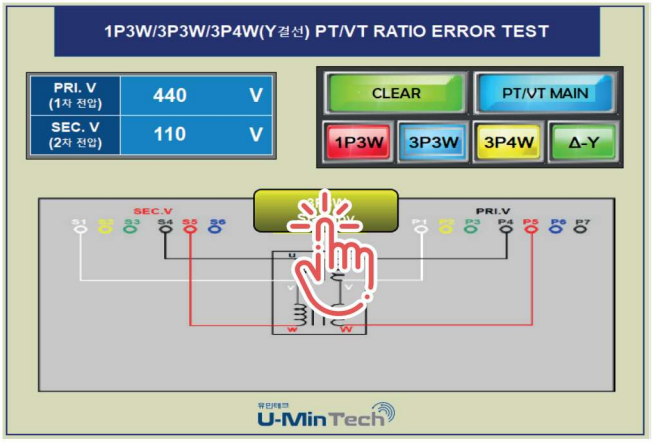
6-1-d(2) 3P3W TEST



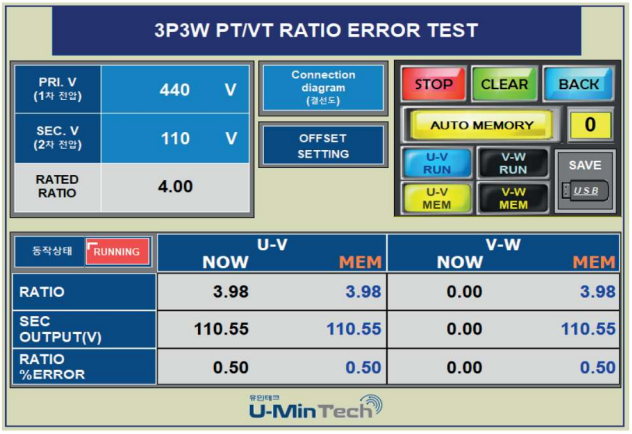
1. 3 PHASE TEST (3P3W)



2. 3 PHASE TEST (3P3W)

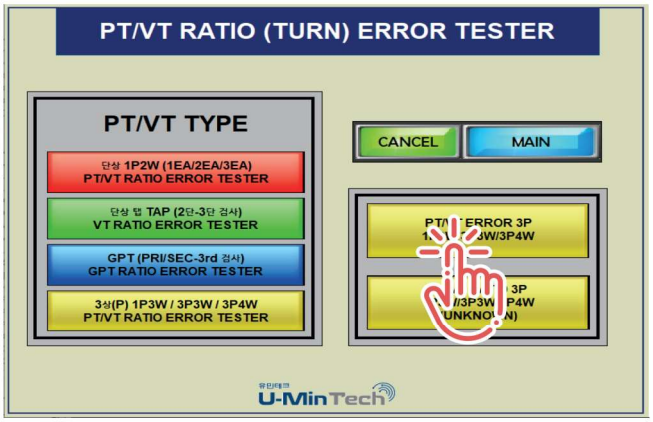


3. 3 PHASE TEST (3P3W)

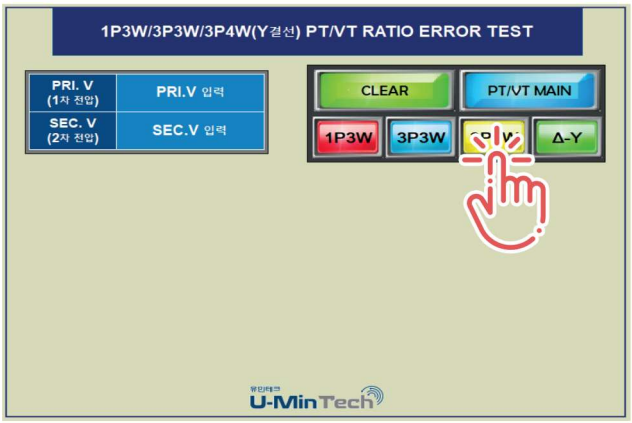


4. 3 PHASE TEST (3P3W)

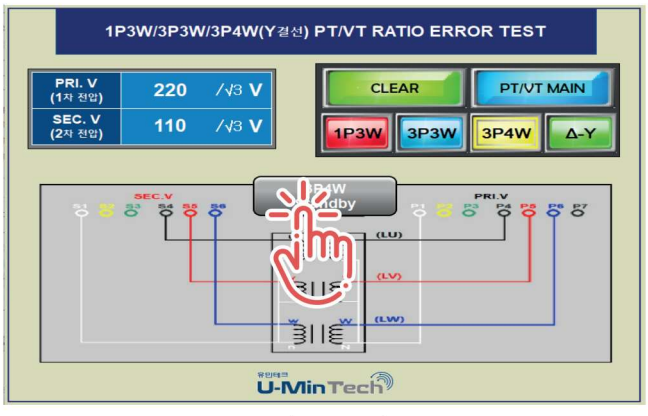
6-1-d(3) 3P4W TEST



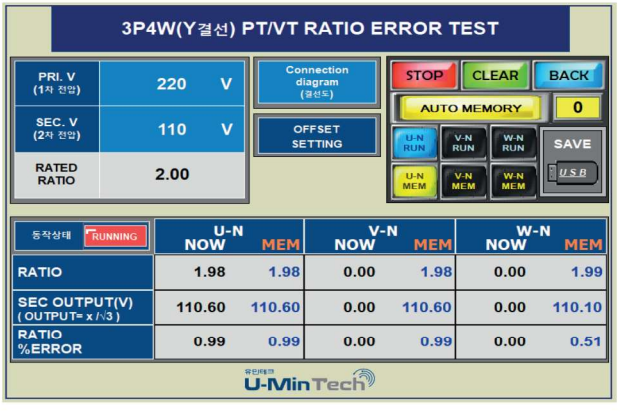
1. 3 PHASE TEST (3P4W)



2. 3 PHASE TEST (3P4W)

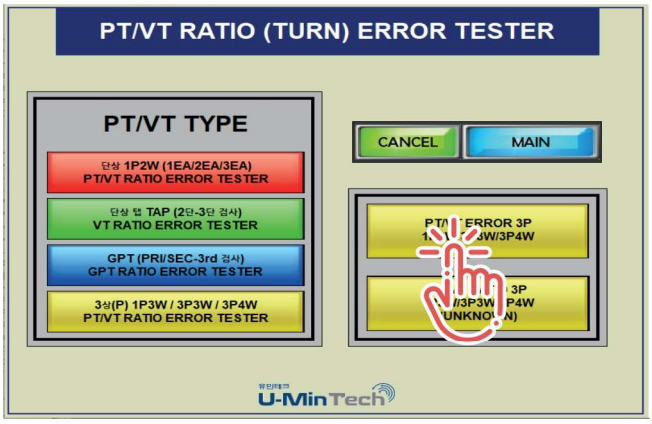


3. 3 PHASE TEST (3P4W)

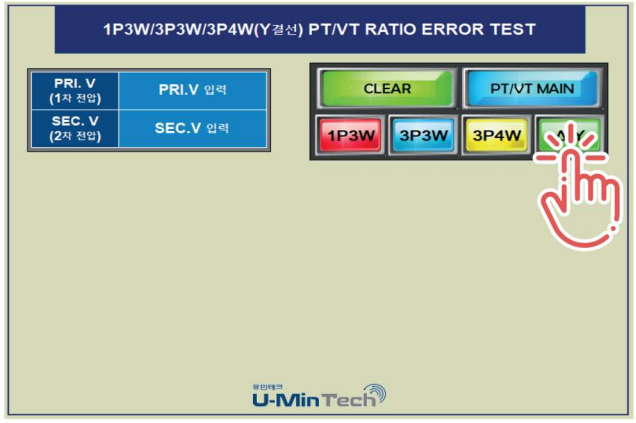


4. 3 PHASE TEST (3P4W)

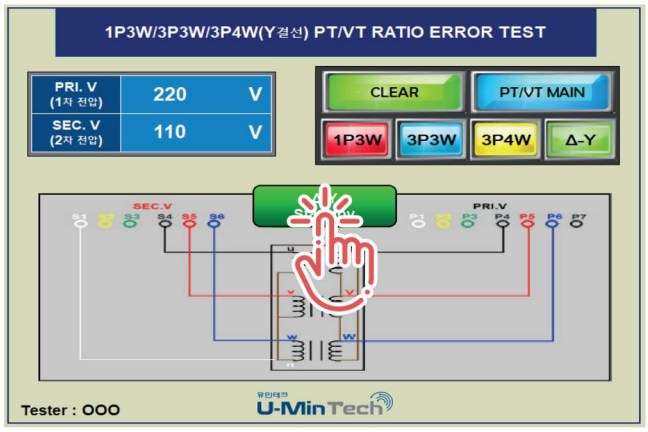
6-1-d(4) △-Y TEST



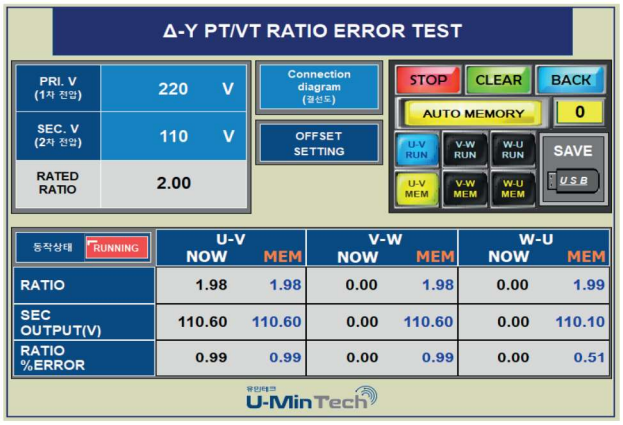
1. △-Y TEST



2. △-Y TEST



3. △-Y TEST



4. △-Y TEST

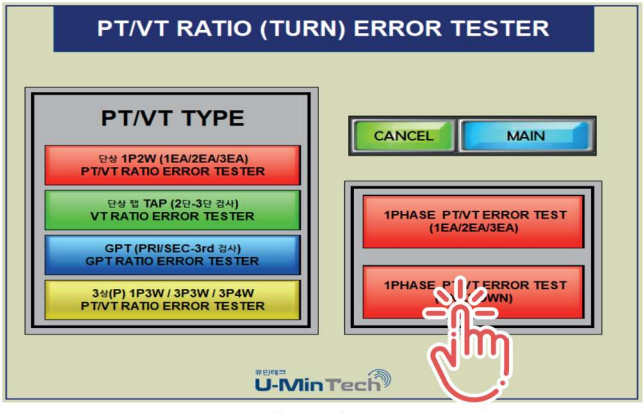
06 PT TEST LIST /

6-2 PT TEST 사양이 불명확한 경우

6-2-a(1) 1상 TEST 사양이 불명확한 경우의 TEST 입니다

주의 !예상 RATIO 터치 시 안전을 위해 상단의 고 배율의 RATIO부터 적용하여 작동합니다.

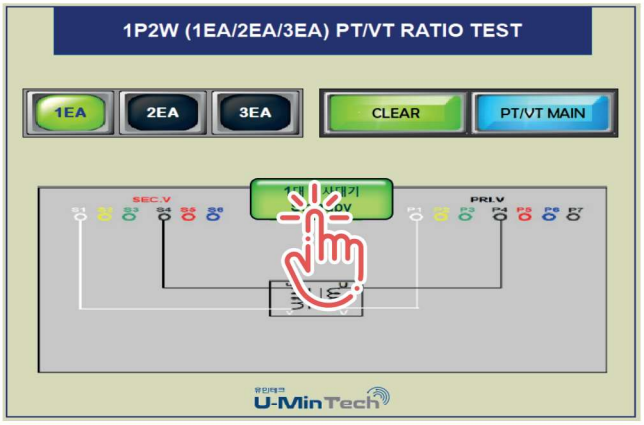
작동 후의 결과 값에 맞춰 해당 RANGE의 RATIO를 터치하여 정밀도를 상향합니다.



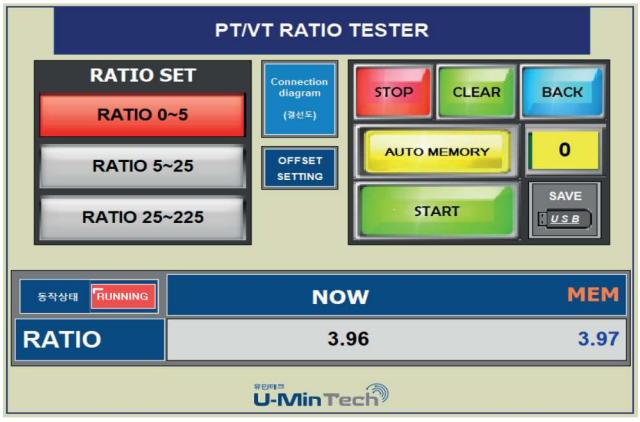
1. 1PHASE TEST (1EA)



2. 1PHASE TEST (1EA)

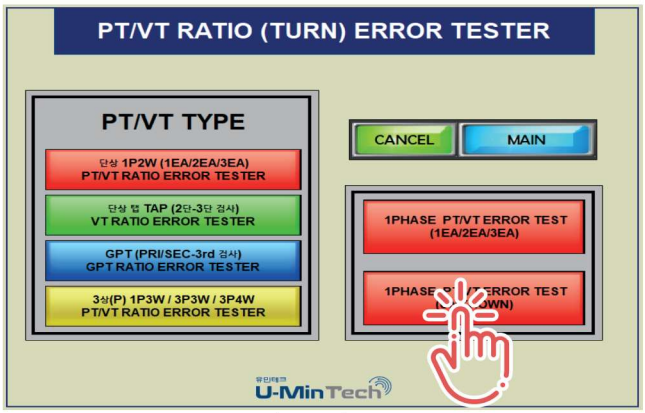


3. 1PHASE TEST (1EA)



4. 1PHASE TEST (1EA)

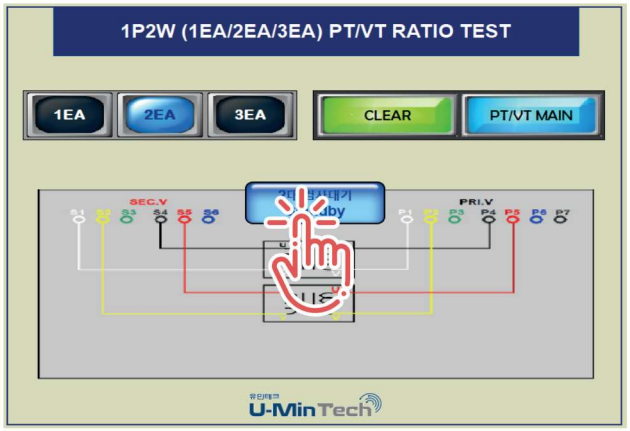
6-2-a(2) 1P2W - 2EA



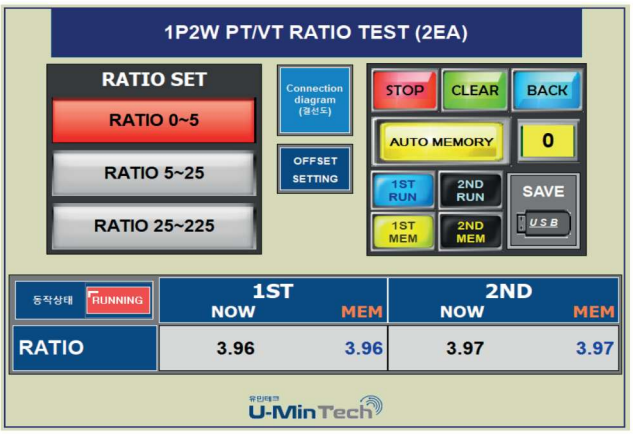
1. 1PHASE TEST (2EA)



2. 1PHASE TEST (2EA)

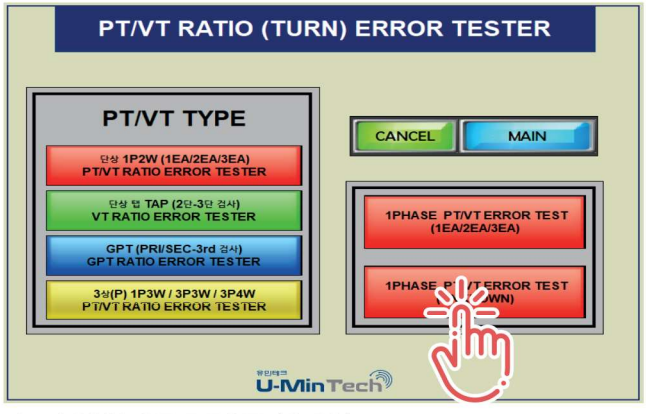


3. 1PHASE TEST (2EA)



4. 1PHASE TEST (2EA)

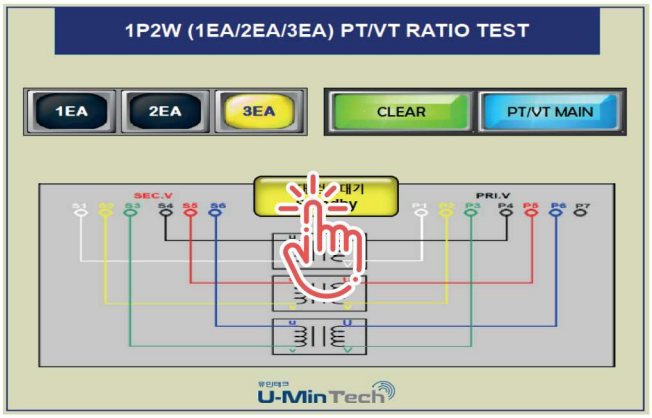
6-2-a(3) 1P2W - 3EA



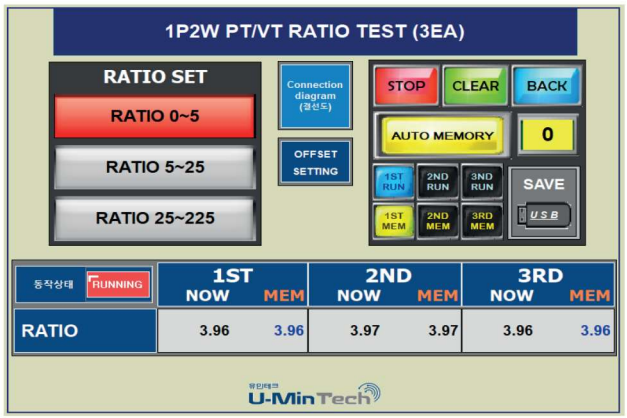
1. 1PHASE TEST (3EA)



2. 1PHASE TEST (3EA)



3. 1PHASE TEST (3EA)



4. 1PHASE TEST (3EA)

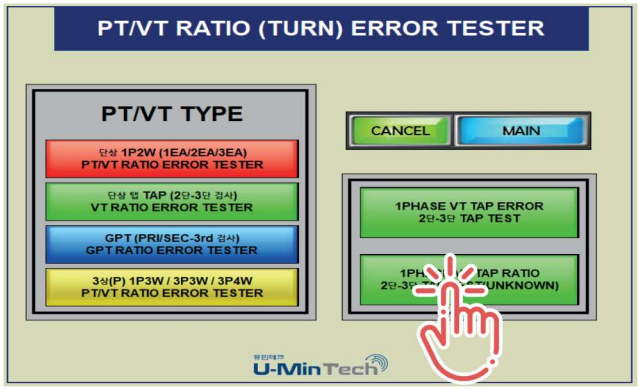
6-2-b TAP PT

TAP Changer가 설치된 변압기 타입으로 2차 측의 각 TAP과 1차 측의 상간전압을 아래와 같이 측정 가능합니다

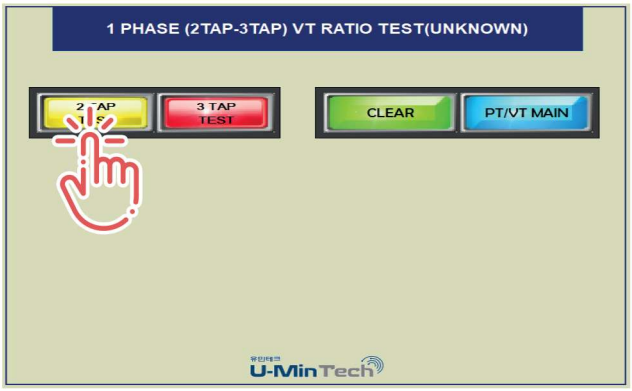
주의 !예상 RATIO 터치 시 안전을 위해 상단의 고 배율의 RATIO부터 적용하여 작동합니다.

작동 후의 결과 값에 따라 해당 RANGE의 RATIO를 터치하여 정밀도를 상향합니다.

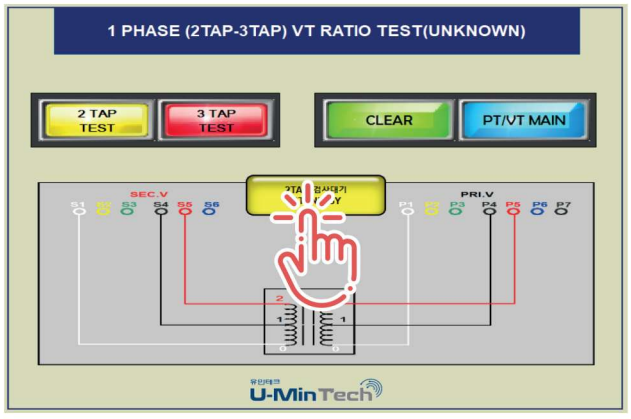
6-2-b(1) 2TAP PT



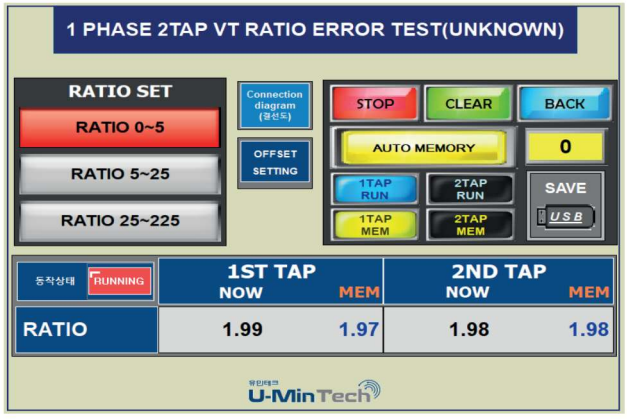
1. 1P TAP TEST (2 TAP)



2. 1P TAP TEST (2 TAP)

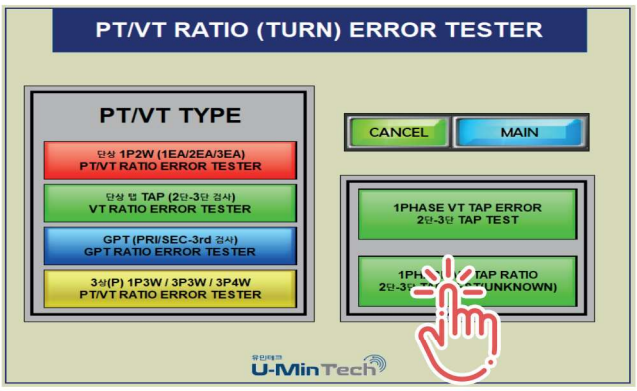


3. 1P TAP TEST (2 TAP)

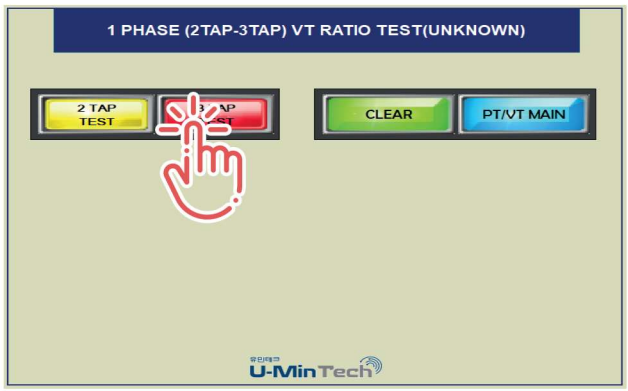


4.1P TAP TEST (2 TAP)

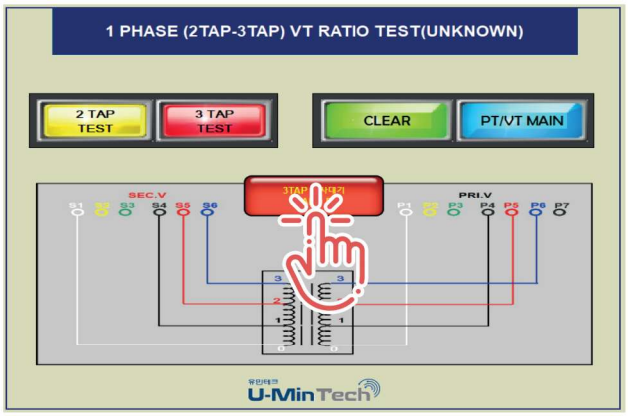
6-2-b(2) 3TAP PT



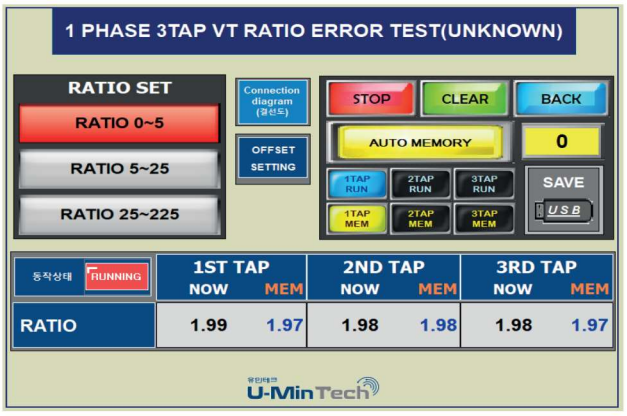
1. 1P TAP TEST (3 TAP)



2. 1P TAP TEST (3 TAP)



3. 1P TAP TEST (3 TAP)



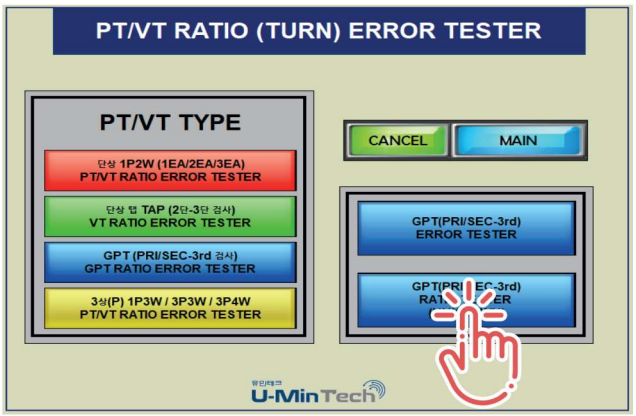
4.1P TAP TEST (3 TAP)

6-2-C GPT(Ground Potenial Transformer)

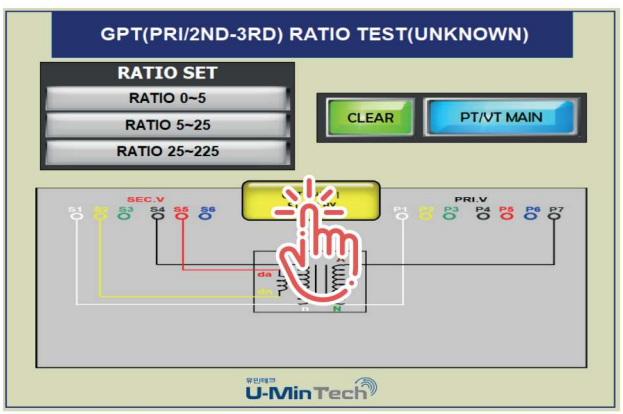
접지형 계기형 변압기로 아래와 같은 방식으로 측정 가능합니다

주의 !예상 RATIO 터치 시 안전을 위해 상단의 고 배율의 RATIO부터 적용하여 작동합니다.

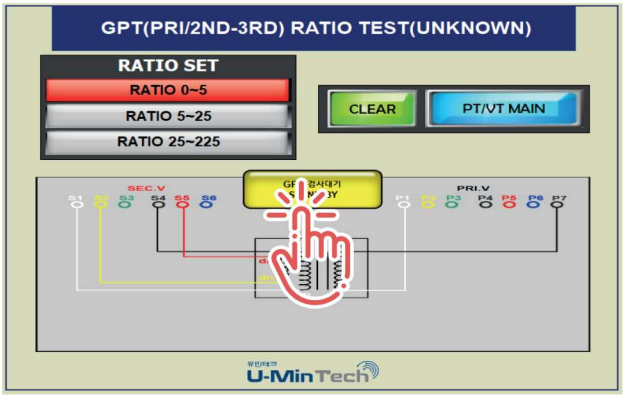
작동 후의 결과 값에 맞춰 해당 RANGE의 RATIO를 터치하여 정밀도를 상향합니다.



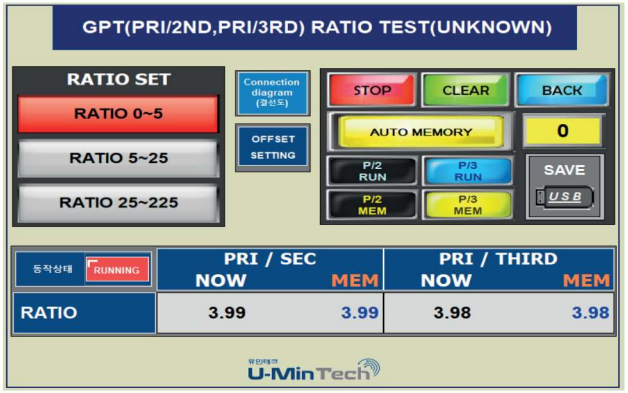
1. GPT TEST



2. GPT TEST



3. GPT TEST



4. GPT TEST

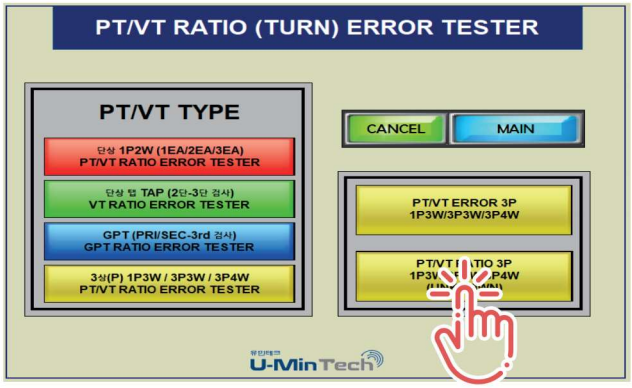
6-2-d 3상 (3PHASE) TEST

일반적인 3상 PT TEST로 1P3W, 3P3W, 3P4W PT의 측정 시 아래와 같이 테스트를 진행합니다

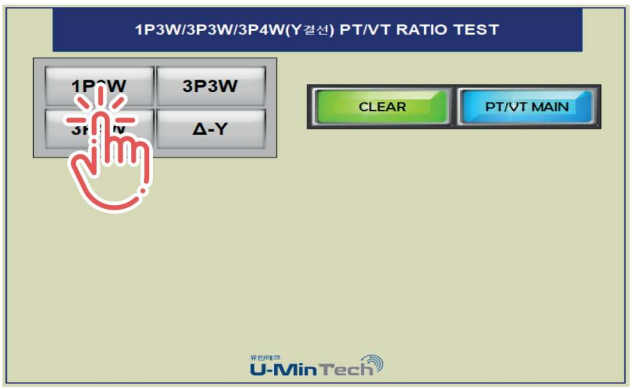
주의 !예상 RATIO 터치 시 안전을 위해 상단의 고 배율의 RATIO부터 적용하여 작동합니다.

작동 후의 결과 값에 맞춰 해당 RANGE의 RATIO를 터치하여 정밀도를 상향합니다.

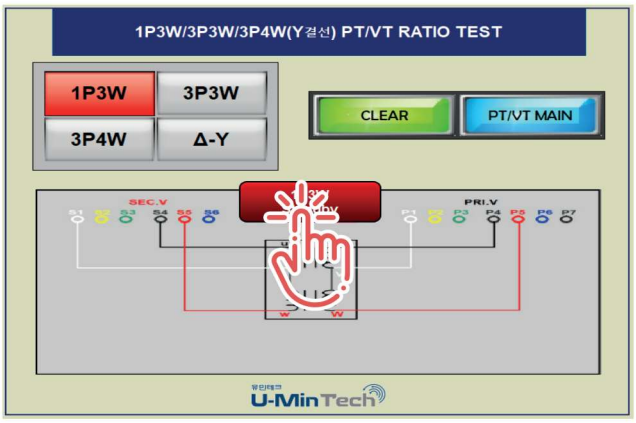
6-2-d(1) 3상 TEST



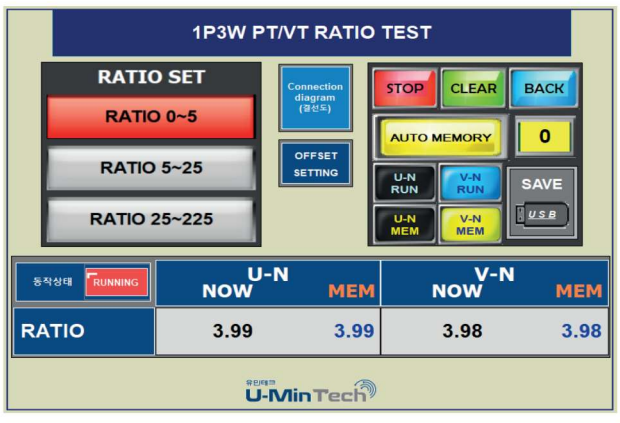
1. 3 PHASE TEST (1P3W)



2. 3 PHASE TEST (1P3W)

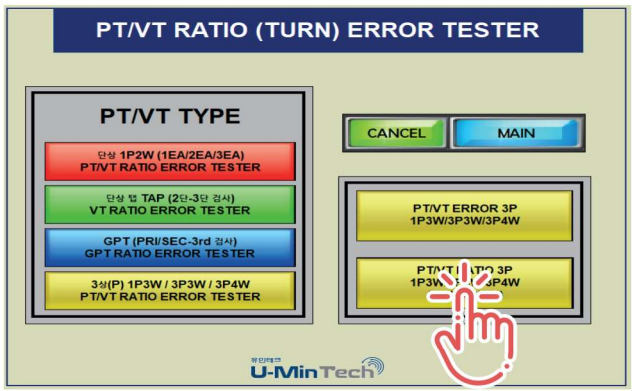


3. 3 PHASE TEST (1P3W)



4. 3 PHASE TEST (1P3W)

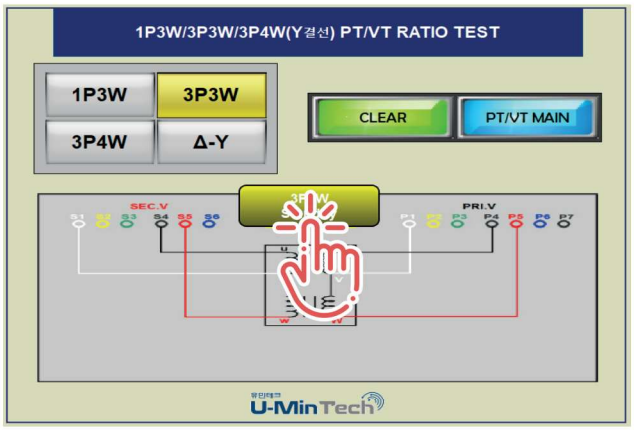
6-2-d(2) 3P3W



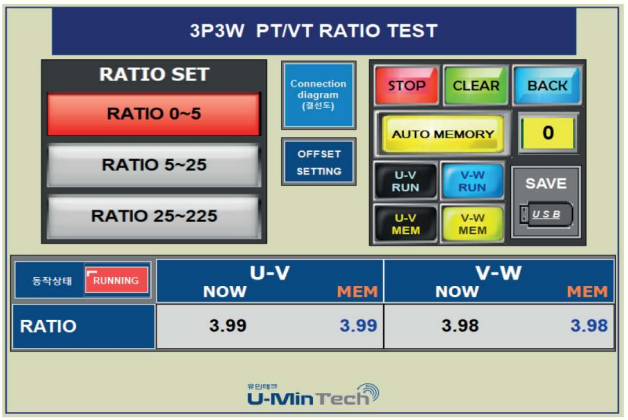
1. 3 PHASE TEST (3P3W)



2. 3 PHASE TEST (3P3W)

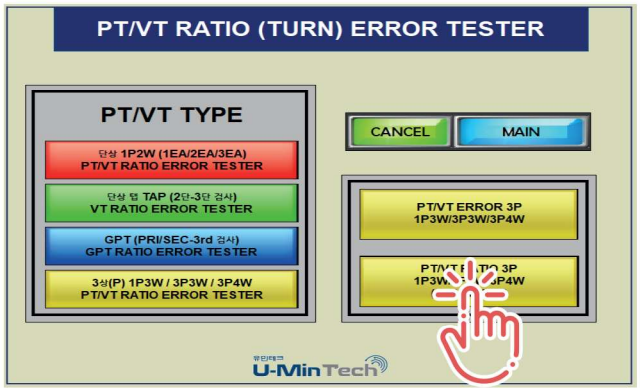


3. 3 PHASE TEST (3P3W)

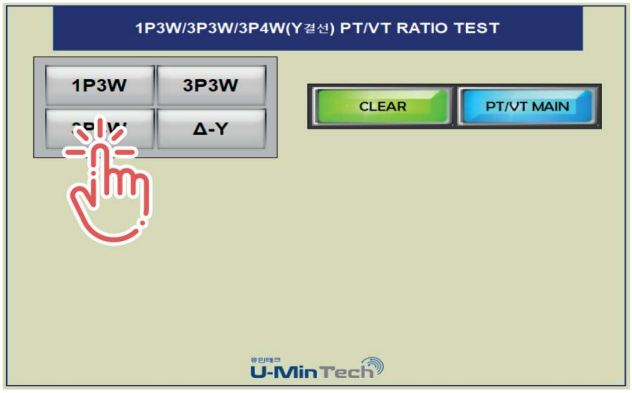


4. 3 PHASE TEST (3P3W)

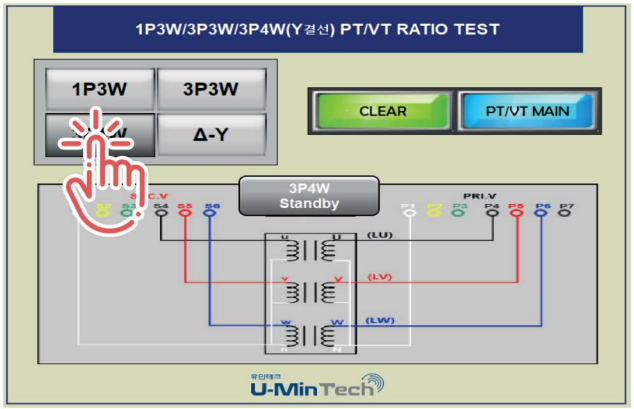
6-2-d(3) 3P4W



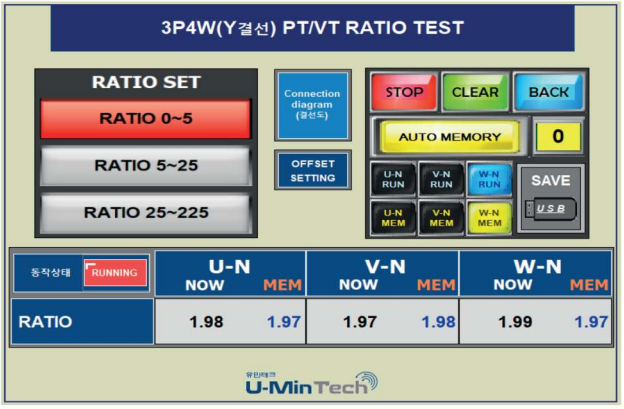
1. 3 PHASE TEST (3P4W)



2. 3 PHASE TEST (3P4W)

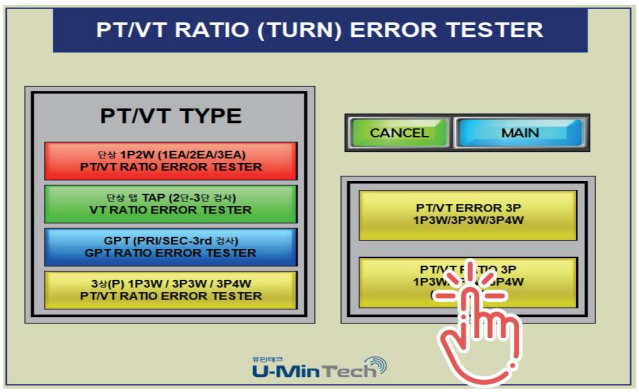


3. 3 PHASE TEST (3P4W)

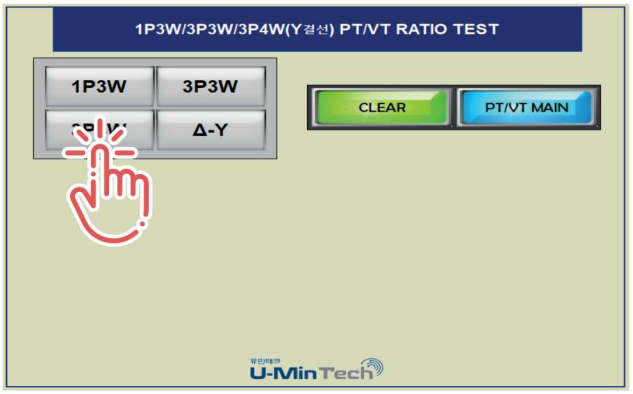


4. 3 PHASE TEST (3P4W)

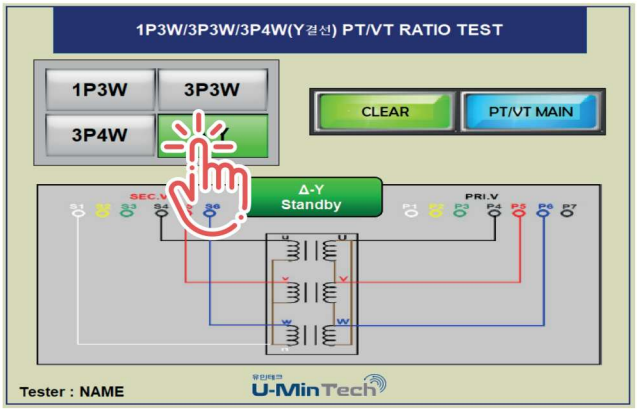
6-2-d(4) △-Y TEST



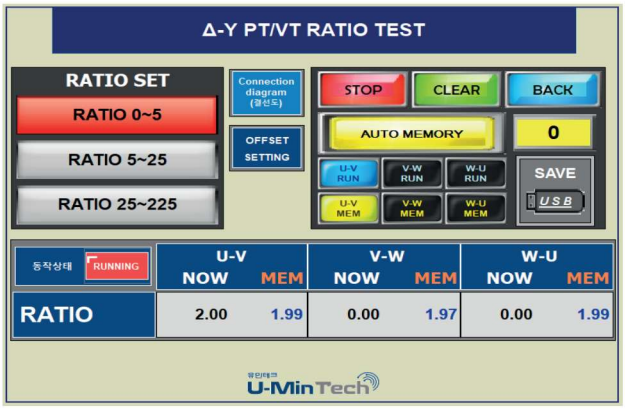
1. △-Y TEST



2. △-Y TEST



3. △-Y TEST

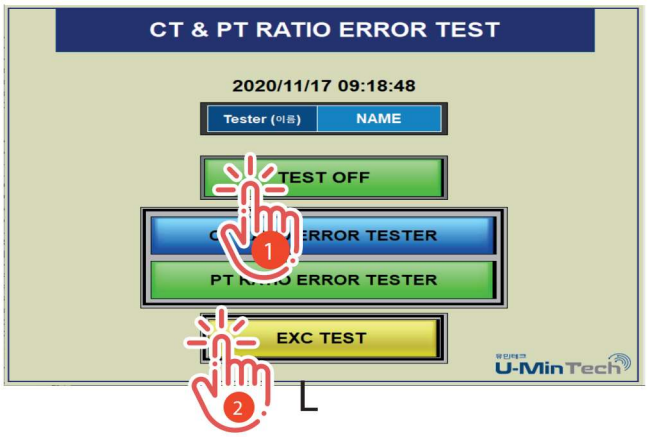


4. △-Y TEST

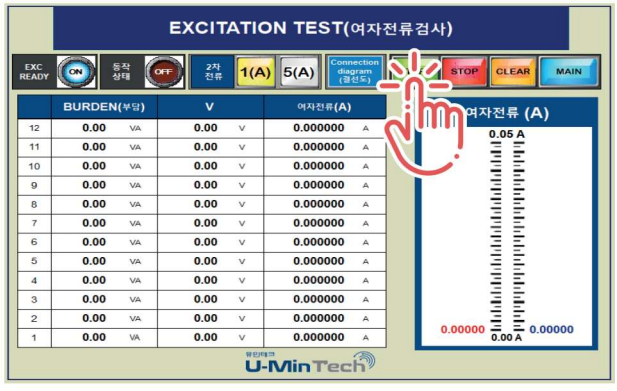
07 EXCITATION(여자전류) TEST

EXCITATION(여자전류) TEST를 통하여 CT 2차 전류(1A, 5A)에 따른 전압, 부담(BURDEN) 및 여자전류를 확인할 수 있습니다.

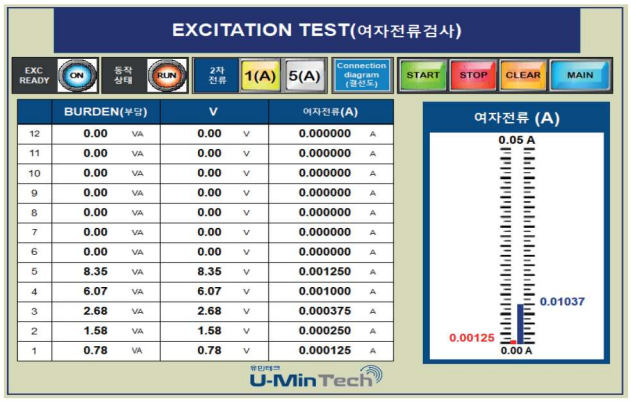
07-1 2차 전류 1A



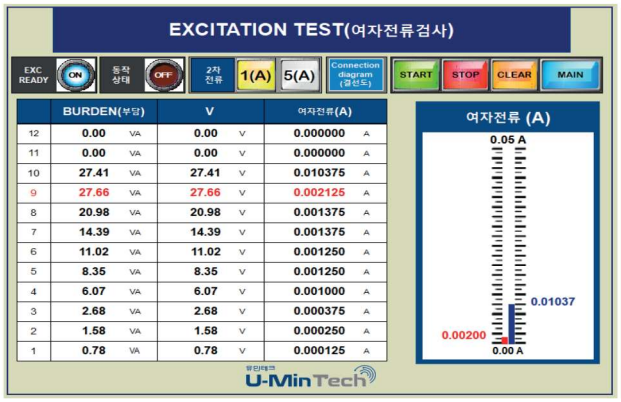
1. TEST ON 버튼을 누른 후
EXC TEST버튼을 터치



2. EXC READY램프(ON상태)와 2차전류 확인후 CT장비를 TESTER에 결선하고 START버튼 터치
* 2차전류선택은 5A를 기본설정

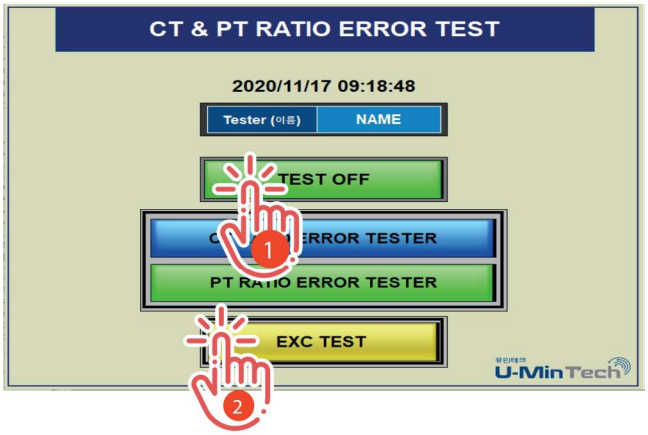


3. TEST를 하는 중 현재 여자전류 값을 확인 가능

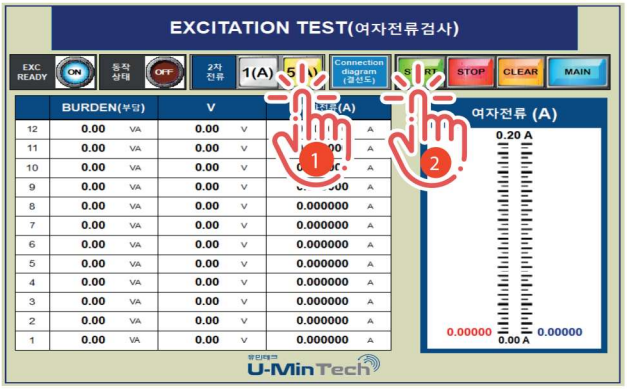


4. TEST가 마무리되면 TESTER는 자동으로 멈추고 결과를 화면 출력
적정값은 빨간색으로 표기

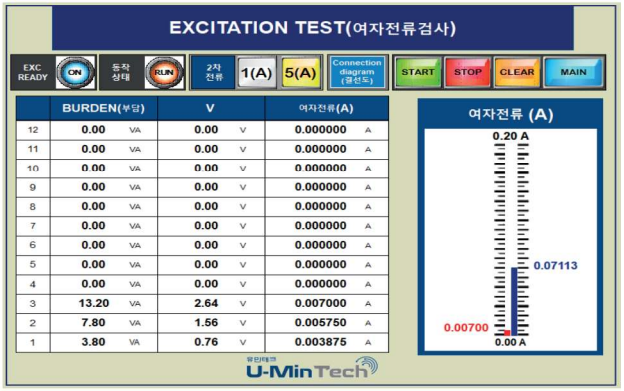
07-2 2차 전류 5A



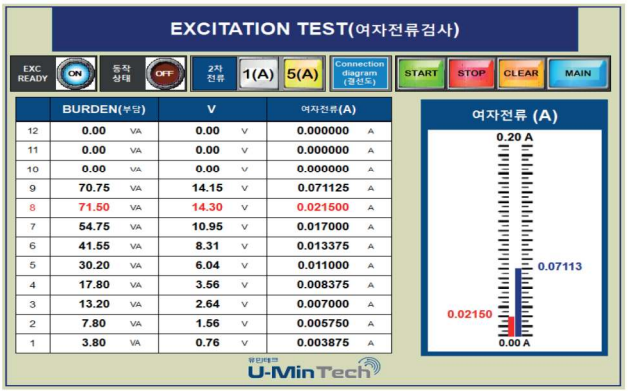
1. TEST ON 버튼을 누른 후
EXC TEST버튼을 터치



2. EXC READY램프(ON상태)와 2차전류 확인 후 5A터치 후 START버튼 터치



3. TEST 를 하는 중 현재 여자전류 값을 확인 가능

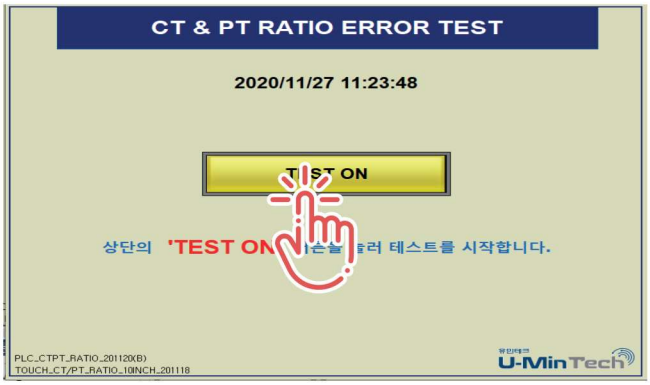


4. TEST가 마무리되면 TESTER는 자동으로 멈추고 결과를 화면 출력
적정값은 빨간색으로 표기

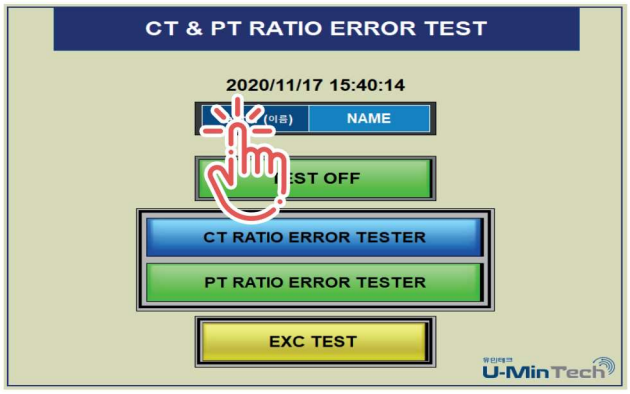
08 부가기능/

8-1 TESTER(검사자) 등록(English Only)

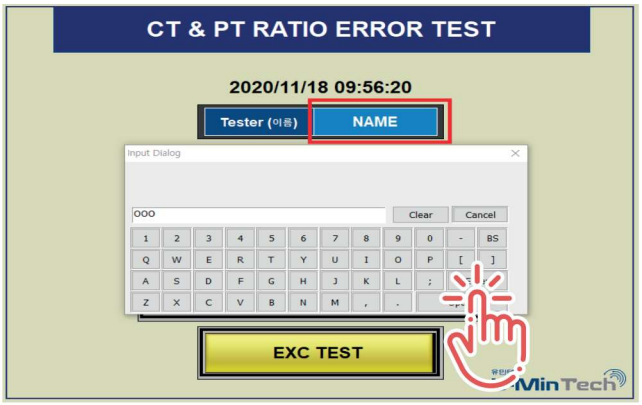
CT/PT RATIO TESTER(검사자)를 입력하여 CSV파일로 저장 시 확인 할 수 있습니다.



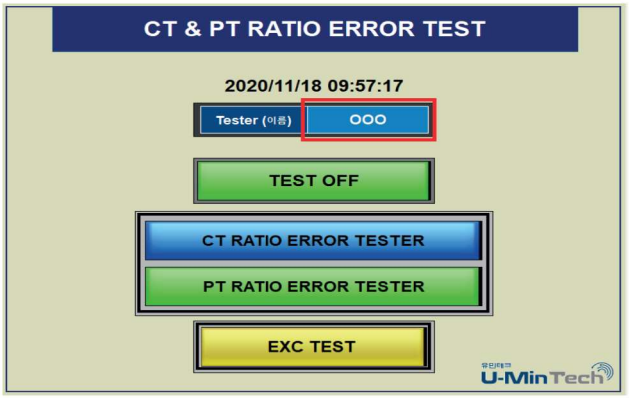
1. TEST ON 터치



2. NAME 버튼 터치



3. 검사자의 입력 후 ENTER 터치



4. TESTER(이름) 변경된 것을 확인
데이터 저장후 CSV파일확인

8-2 데이터 저장방법

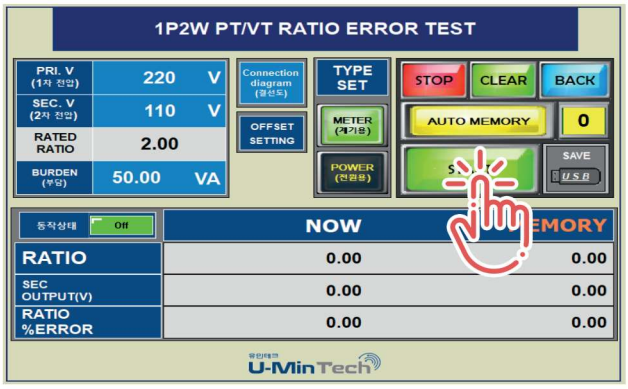
PT RATIO TESTER는 메모리 된 값을 USB 메모리 카드를 이용하여 저장할 수 있습니다. 데이터는 CSV파일로 저장 됩니다.
아래와 같은 방법으로 DATE를 저장 할 수 있습니다.

예시 1) 1P2W 1EA TEST DATA 저장

STEP 1 먼저 가지고 있는 USB CARD(USB 2.0 이상)을 본체 상단 USB 커넥터에 연결합니다

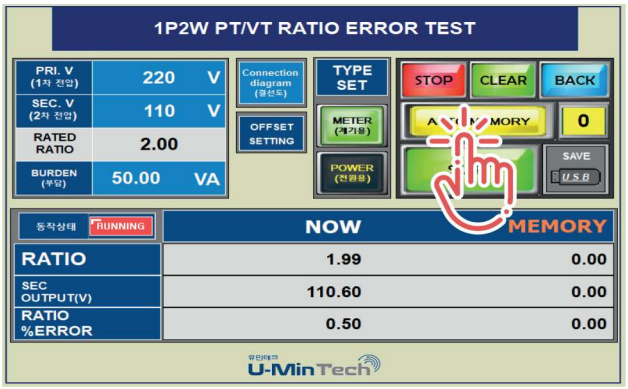
STEP 2

PT TEST를 위한 모든 준비과정을 진행하여 TEST PAGE를 활성화시킵니다.



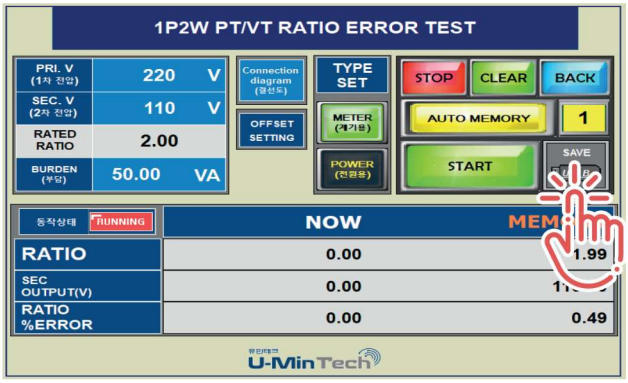
STEP 3

동작 실행후 MEMORY 버튼을 터치하면 MEMORY된 값이 검사기기 내의 메모리에 저장됩니다.



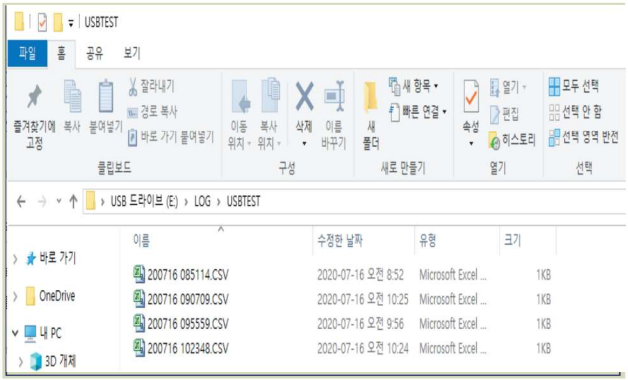
STEP 4

원하는 만큼 검사를 반복 한 후 USB 버튼을 터치 하여 저장합니다.



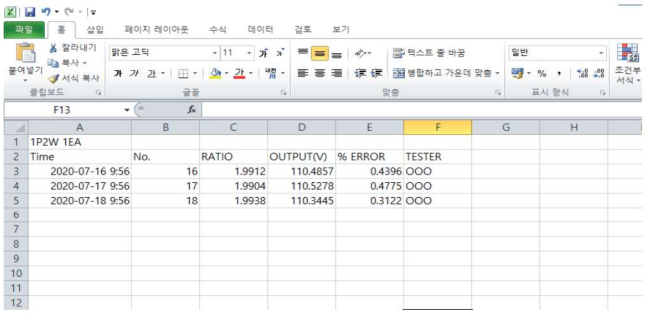
STEP 5

이 후 저장된 값을 확인하기 위해 USB 메모리카드를 PC와 연결합니다. 화면과 같이 CSV형식으로 저장되기 때문에 EXECL 등의 프로그램으로 확인 할 수 있습니다.(모든 파일은 USB내 LOG폴더의 하위영역에 저장됩니다.)
형식 : USB₩LOG₩하위폴더₩데이터.CSV



STEP 6

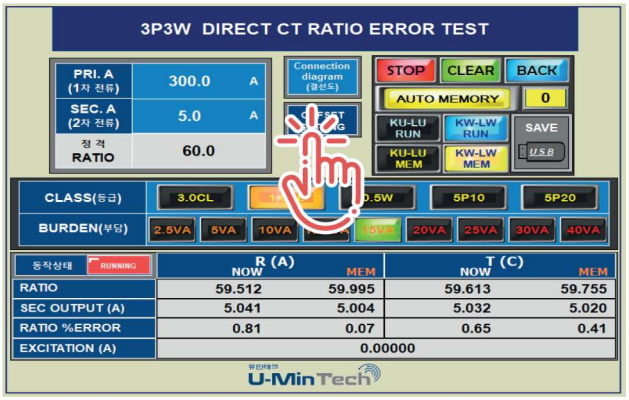
파일을 열어버면 화면과 같은 값 및 TESTER(검사자)를 확인 할 수 있습니다.



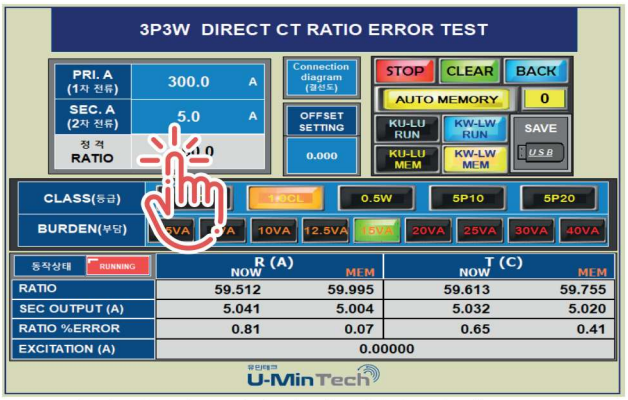
	A	B	C	D	E	F
1	1P2W 1EA					
2	Time	No.	RATIO	OUTPUT(V)	% ERROR	TESTER
3	2020-07-16 9:56	16	1.9912	110.4857	0.4396	OOO
4	2020-07-17 9:56	17	1.9904	110.5278	0.4775	OOO
5	2020-07-18 9:56	18	1.9938	110.3445	0.3122	OOO

8-3 CT TEST용 OFF-SET 사용방법

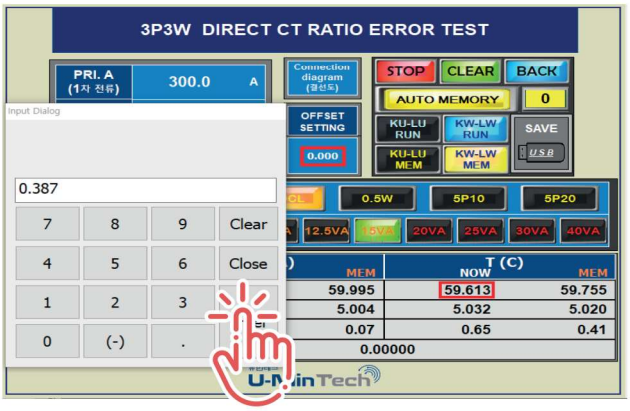
CT의 정도를 맞추기 위한 별도의 OFF-SET 기능을 TEST 화면 내에 제공합니다. off-set은 Ratio의 정도를 맞추는 것으로 표준 CT 또는 그에 준하는 CT를 보유한 경우 해당 CT에 Ratio의 정도를 맞추어 CT를 검사하는 사용합니다.
사용 방법은 아래와 같습니다.



1. off-set 버튼을 터치



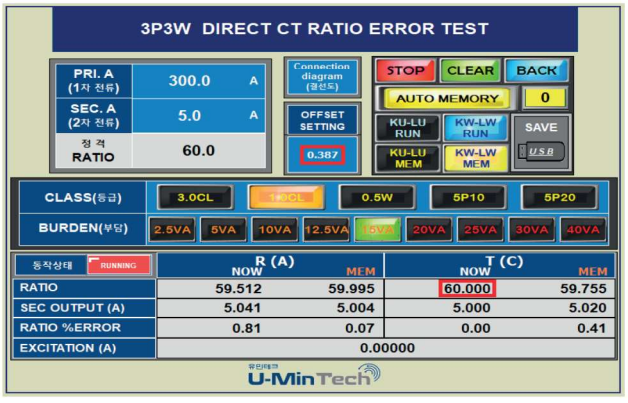
2. 나타난 흰 부분의 숫자를 하여 숫자패드를 불러옵니다.



3. 숫자 패드가 나타나면 값을 입력 후 Enter를 터치.

*정격 Ratio - 현재 값 = 입력 값

예) 60 – 59.613 = 0.387 -> -0.387 입력



4. off-set 값을 입력 후 다시 작동하여 변화된 값을 확인.

09

9-1 측정 범위 및 정확도

1, PT RATIO 범위 :
- 1 ~ 225 (110V/110V ~ 24750V/110V, 220V/220V ~ 49500V / 220V)
  측정 오차 : ±0.5% of Ratio

2. CT RATIO 범위 :
- 권선형(Direct) : 1~ 600
- 관통형(Window) : 1~4000 * T (T= 측정전용 TEST LEAD의 턴 수, 최대 2회)
  측정 오차 : ±0.5% of Ratio

* 5VA 이하의 CT test 주의 사항 - 5VA 이하의 CT test 시 기준이 되는 CT를 활용하여 OFF-SET 값을 설정 후 타 CT를 측정합니다.

9-1 SPECIFICATION

입력전원	AC 220V ±10% 50/60Hz
본체 출력전압	AC 0.8V ~ 48V
전류 OVER 차단	여자전류 0.5A 자동(AUTO)차단 및 2A 차단기
내부 전원 TRANS 온도 차단	온도 70℃ 이상 전원 차단 센서 부착
통신형태 / 통신속도	RS-232C / 9600
터치 스크린 사양	CIMON X-PANEL / DC 24V / 통신RS232C
체 적	W450㎜ × H370㎜ × D150~180mm
중 량	15kg
운전조건	온도-20 ~ 50°C 습도 ≤85%

10 고장 및 A/S 안내

1. 올바른 사양 입력 및 결선 상태를 모두 확인하여 테스트하였음에도 불구하고 전압이 출력되지 않는 경우
- 연결시킨 PT 또는 CT 내의 충격에 의한 파손 및 내부결손을 의심할 수 있습니다. 다른 장비를 연결하여 Test 시에도 출력이 나타나지 않는 경우 아래와 같이 조치합니다.
- Test Lead의 단선 여부를 확인합니다. Test Lead의 단선인 경우 A/S를 요청하여 Test Lead 추가 구매를 요청하시면 됩니다.
- Test lead의 단선이 아닌 경우 노후화로 인한 테스트 단자의 접촉불량 또는 내부 결선이 의심되므로 A/S를 요청하시기 바랍니다.

2. USB 저장 시 “Fail to create a log output Folder”라는 문구가 나타나면서 테스트 값이 CSV 파일로 저장되지 않는 경우
- USB 메모리 스틱이 바르게 연결되지 않거나, 해당 장비 내의 결선을 의심할 수 있습니다. USB 스틱을 교체 후 결합하여 저장하여도 위와 같은 문구가 반복 된다면 A/S를 요청합니다.

3. 전원 인가 후 초기화면이 나오지 않거나 화면은 켜졌지만 초기화면이 제대로 켜지지 않는 경우
- 전원이 켜졌지만 터치 화면이 들어오지 않으면 터치로 향한 전원부의 결손을 의심 할 수 있습니다. 화면은 켜졌지만 TEST ON 등의 버튼이 나타나지 않는 경우 내부 통신선의 결선을 의심할 수 있습니다. A/S 요청을 하시기 바랍니다.

4. 취급 부주의로 인한 심한 외관손상, 터치 판넬의 파손, 각종 포트의 훼손시 수리비용이 유상으로 청구 될 수 있습니다.

*무상 수리기간(구입후 1년)이 지난 이 후의 모든 A/S는 자사의 정책에 따라 수리비가 유상으로 청구 될 수 있습니다.







유민테크는 PLC, HMI SCADA SYSTEM 활용,응용하여 각종 검사시험장비, 전기전력제어 장비, 기계설비 자동제어장비등의 소프트웨어 및 하드웨어를 개발, 제조하는 업체입니다.

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