



# EASERGY P5

## PROTECTION RELAY

슈나이더 일렉트릭 박문환매니저

Life Is On | **Schneider**  
Electric

## **+ SAFER & SECURE**

*Enhancing operators' safety and being better protected against cyber-attacks*

## **+ RELIABLE & SUSTAINABLE**

*Extending products usability and maintainability in a longer term*

# Easergy P5

**An innovative range helping end user to lower total cost of ownership**

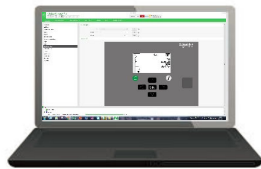
## **+ FLEXIBLE & EASY**

*An unequalled experience throughout the entire lifecycle*

Life Is On

**Schneider**  
Electric

# Easergy Series



Easergy Pro setting software (P1/P3/P5)



**Entry range**  
*Secondary*  
Easergy P1(V11)



**Middle Range**  
*Secondary*  
Easergy P3



**Middle Range premium**  
*Secondary and primary*  
Easergy P5

Product/Application Complexity

Life Is On



# Connected Device, 실시간 제어 및 소프트웨어 구동, 분석 및 서비스

## EcoStruxure™ Power Innovation At Every Level



# Easergy P5- Advantages



Life Is On

**Schneider**  
Electric

## One Platform can cover all MV applications

Easergy P5x20



Easergy P5x30



Universal Protection – P5U20  
Voltage Protection – P5V20

Feeder Protection – P5F30  
Motor Protection – P5M30  
Generator Protection – P5G30  
Transformer Protection – P5T32  
Line differential – P5L30

Life Is On

**Schneider**  
Electric

## 안정성과 지속가능성을 위한 도약

100년 이상의 보호계전기 경험

향상된 안정성 및 교체성능

- 인출형으로 10분 이내로 교체 구현
- 백업메모리로 셋팅 값 보호
- 내부 발열 감시

높은 수준의 EMC 강도

차단기 상태 감시(온도, 습도)

Green Premium 인증

낮은 소모전력



Life Is On

Schneider  
Electric

# 빠른 교체를 위한 인출형 디자인 & 백업 메모리

## Your benefits

- The back-up memory acts as a redundant memory, that enables to restart in a few minutes recovering automatically all device settings.
- Unique solution to reduce maintenance time and ease operations, keeping higher level of safety for operators.
- The withdrawable design with back-up memory brings to MTTR (Mean Time to Repair) to less than 10 minutes, the quickest MTTR of the market.

## Our solution

Draw-out design with optional extension module with redundant back-up memory :

- Redundant data storage in back-up memory:
  - Device settings
  - Disturbance records
  - Motor-startup records
  - Sequence of events recorders
  - Power system maintenance data log
  - Maintenance data of circuit-breaker, switches, motor and transformer
- IP20 protected internal fix part
- Switchgear CTs remain closed to avoid any unwanted voltage raise
- Securely closed handle with 4 screws and seal
- Withdrawable communication boards for more evolutivity



Withdrawable part with core memory

MTTR  
< 10 minutes



Extension module with back-up memory



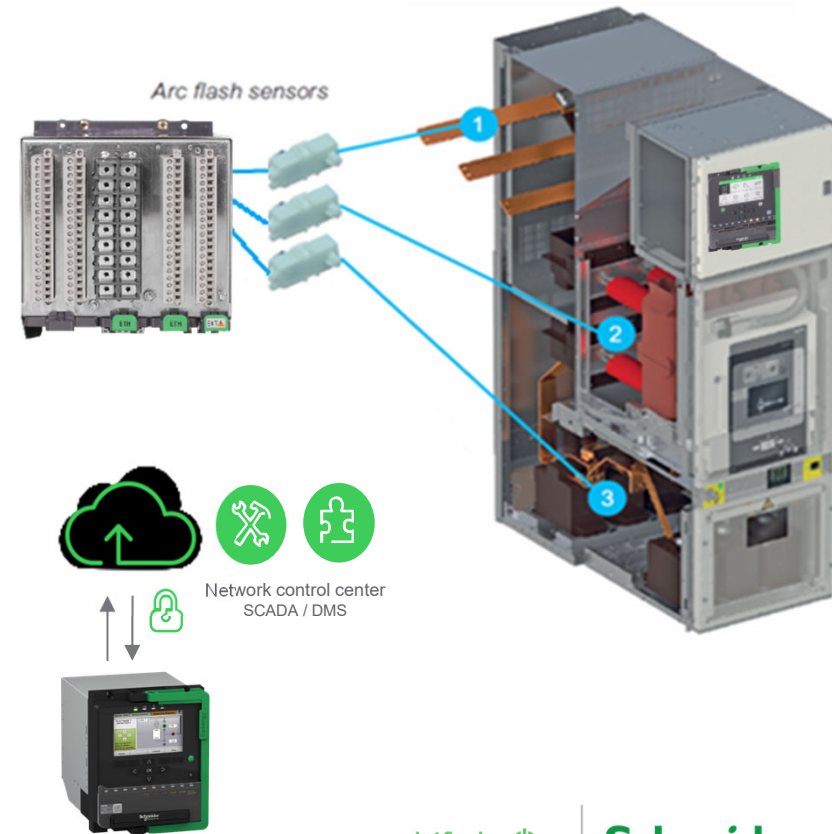
Life Is On

Schneider  
Electric

# 인명과 설비를 위한 안전장치

최대 6개 센서로 아크 보호(optional)  
IP 52~54 인출형  
CT 개방 방지 인출형 디자인  
Web server와 Mobile App을 통한 근접 제어  
Cybersecurity with Achilles certification(optional)

\* Available in next phases

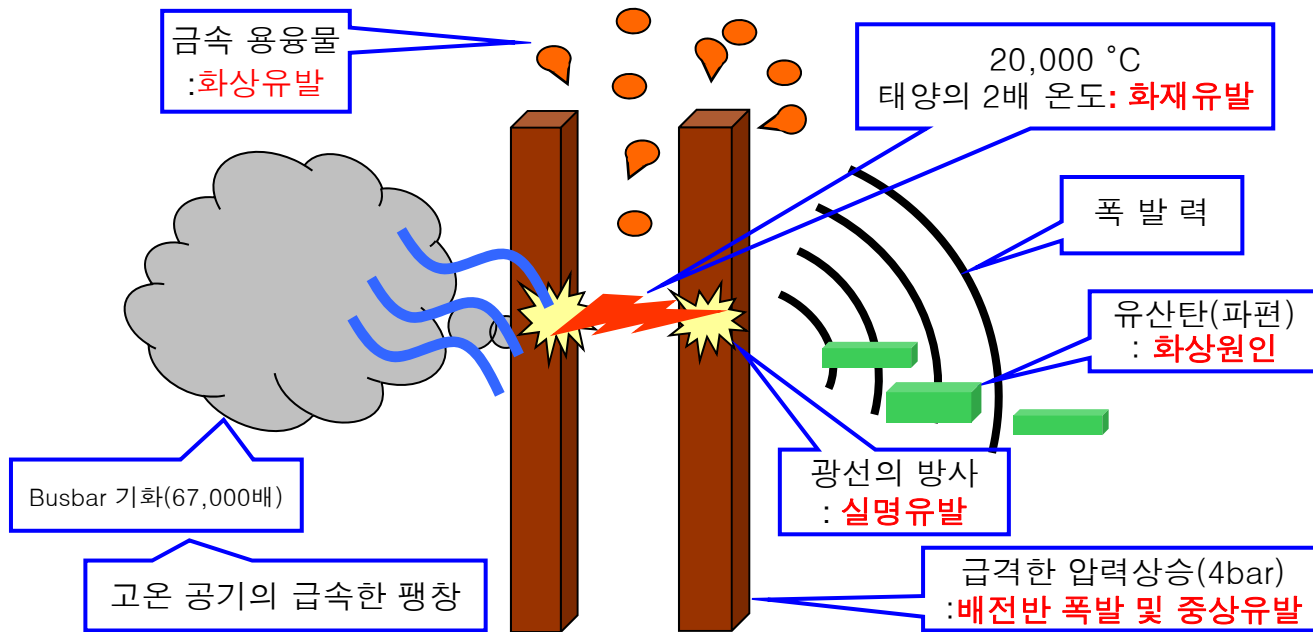


Life Is On

Schneider  
Electric

# 아크(Arc)란?

- 아크 사고는 이온화된 공기(플라즈마)를 통해 1선지락 또는 상간 단락이 발생한 상황.
- 인체와 설비에 치명적인 열, 복사 광선, 금속 파편이 방출되는 현상.
- 순간적인 고온 발생 → SWGR 내부 동(copper)의 기화 → 방사열과 압력파를 발생 → 배전반 폭발



Confidential Property of Schneider Electric

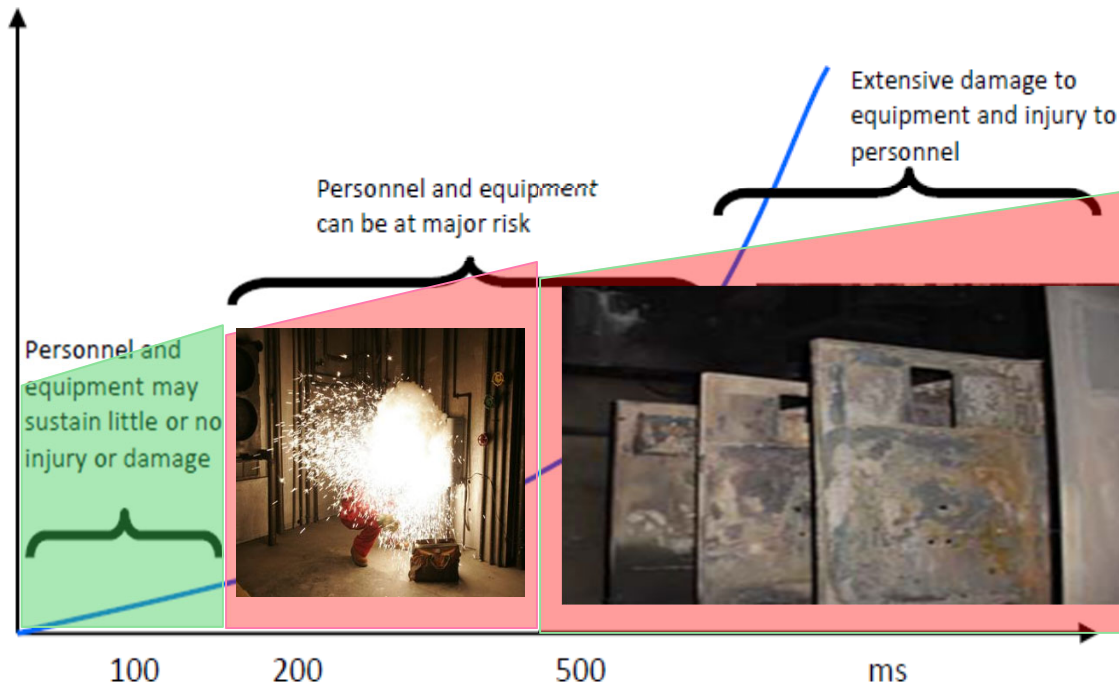


Life Is On

Schneider Electric

# 아크시간(arcing time) vs 피해범위

아크사고의 결과는 사고에너지(**Incident Energy=I<sup>2</sup>t**)가 좌우.  
 에너지의 크기를 결정하는 네 가지 요인은 : 거리, 전압, 전류, 시간(아크 지속시간).



**Facts on conventional relay protection**

- Protection algorithm, 15 ... 30 ms
- Mechanical output contact, 5 ms
- Time setting, 30 ... 350 ms
- CB operating time, 50 ... 80 ms

**Fault clearing time**

Feeders  
 15+5+30+50 = **100 ms** (+AR)

Incomers  
 15+5+350+50 = **420 ms**

---

**With Arc protection**  
 7+50 = **< 60 ms**

# Easergy Pro- setting software

## Intuitive visual

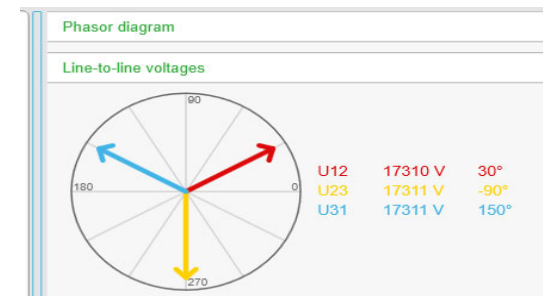
The screenshot displays the Easergy Pro software interface. At the top, there is a toolbar with various icons for editing and simulation. Below the toolbar, a control panel shows settings for 'FEEDER #1', including 'Sublocation', 'Remote/Local', 'Auto reclosing', and 'Virtual Input' options. The main area shows a circuit diagram with three circuit breakers labeled DL3, DL1, and DL2. To the right of the diagram is a table of measurements:

Measurement	Value	Unit
IL1	0.0000	A
IL3	0.0000	A
Io	0.0000	A
P	0.1000	kW
U12	17310	V
U23	17311	V
U31	17311	V
Uo	0.0000	V

## 장점

### Simple and Easy

- On/Offline 접속
- Virtual simulation test 기능
- LCD graphic diagram(MiMIC) 구성
- 프로그램 가능한 로직다이아그램
- Phasor Diagram으로 명확한 계측
- 차단기의 직접제어 On/OFF버튼



Life Is On

**Schneider**  
Electric

# Easergy Pro- setting software

## Virtual simulation test

Manual File

Cycles:

Runtime:

Remaining:

Start Stop

Scalings

Imax  A

MEASUREMENTS

VL1  V

VL2  V

VL3  V

Uo  V

IL1  A

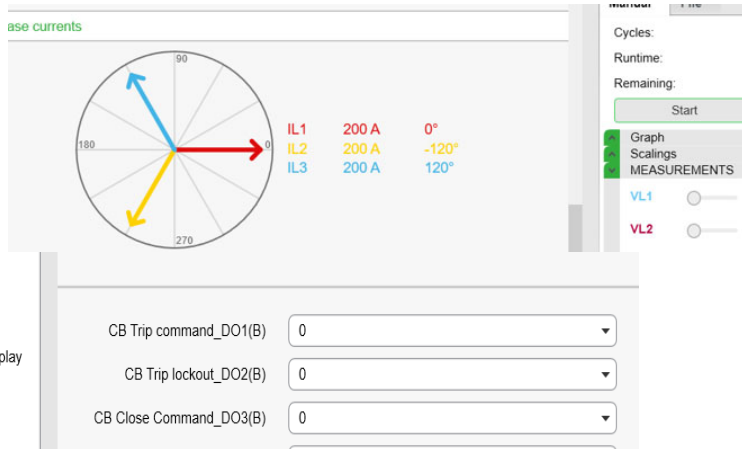
IL2  A

IL3  A

Relays

Virtual outputs

Local panel display



## 장점

### Simple and Easy

- 셋팅 툴 내 Virtual simulation test 기능으로 간단한 셋팅 테스트 가능.
- Comtrade file을 열어 사고 재현 가능
- Commissioning 단계에 신속성 구현

Life Is On

Schneider  
Electric

# Easergy P5 WebHMI

더 쉬운 조작을 위해 새롭게 장착된 웹페이지

EASERGY P3 Feeder Protection

Auto-refresh  ON  OFF

GENERAL MEASUREMENTS INPUTS/OUTPUTS PROTECTION MATRIX LOGS COMMUNICATION

DEVICE INFO  
LED NAMES  
DISTURBANCE RECORDER  
TIMERS  
OBJECTS  
RELEASE LATCHES  
NAMES for LOGIC OUTPUTS  
**LOCAL PANEL DISPLAY**  
LOCAL PANEL CONF  
SCALING  
SYSTEM CLOCK  
CLOCK SYNC  
CARD INFO  
DIAGNOSIS

Panel Properties

LCD Type LCD2x-P  
H-Pixel Count 128  
V-Pixel Count 64

Local panel

Bay

0A  
0.000A  
0kW  
0kvar

Home, Info, OK, Up, Down, Left, Right navigation buttons

## 장점

설치 파일 없이도 셋팅 툴과 연결가능

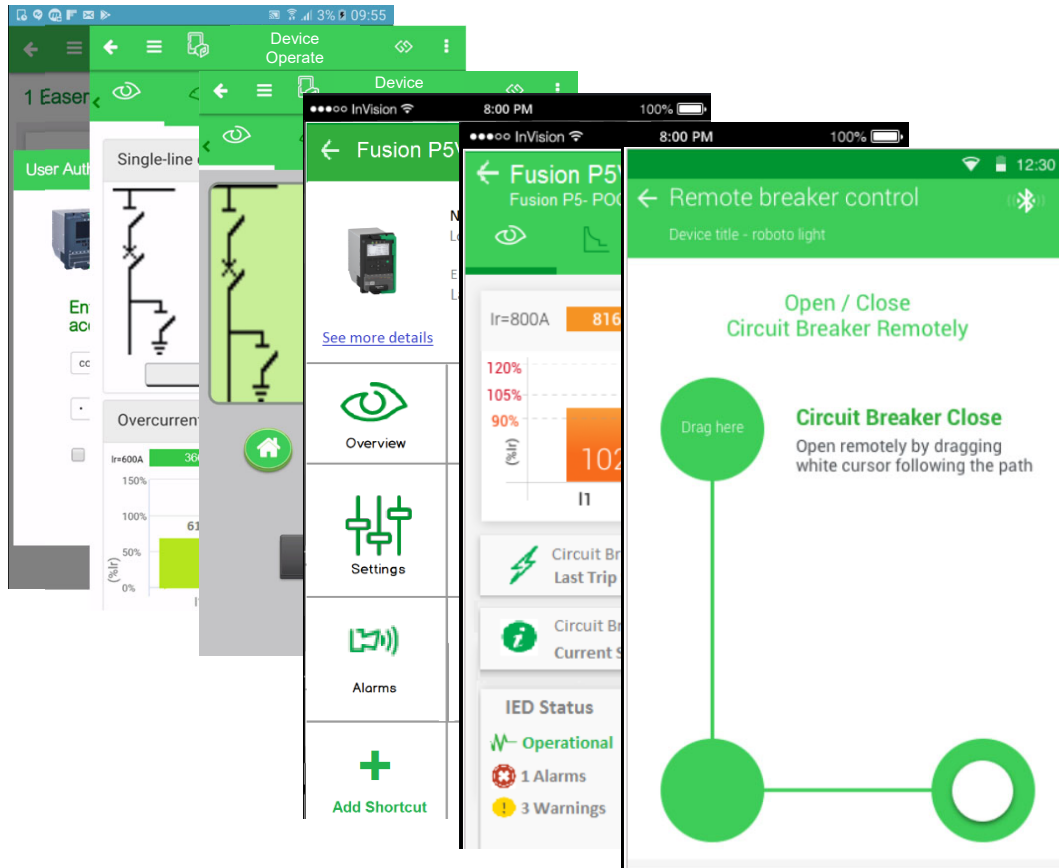
- Easergy 제품과의 높은 연결성 구현
- 웹서버를 통한 셋팅 변경
- 웹서버를 통한 차단기 제어
- 웹서버를 통한 알람 및 로그 접속
- 웹서버를 통한 계측 및 파형기록 접속

Life Is On

Schneider  
Electric

# EcoStruxure Power Device Operate application

Smart app으로 모니터링



## 장점

빠른 조작을 위한 직관적 인터페이스

- 셋팅 변경
- 알람 및 로그 접속
- 웹서버를 통한 계측 및 파형기록 접속
- 차단기 제어-투입/차단
- 지원문서 접속
- 다음의 제품들에 접속가능



Life Is On

Schneider  
Electric

## Easy and intuitive display

### Easy Commissioning and Operation



### 장점

직관적이고 쉬운 HMI 네비게이션

- 단선도
- 계측
- 보호
- 제어
- 유저 로그인
- 일반 셋팅
- 로그기록 접속
- 제품 정보/ 테스트

Life Is On

**Schneider**  
Electric

# Easergy P5, General(1)

Wiring (system & communication) in the rear panel

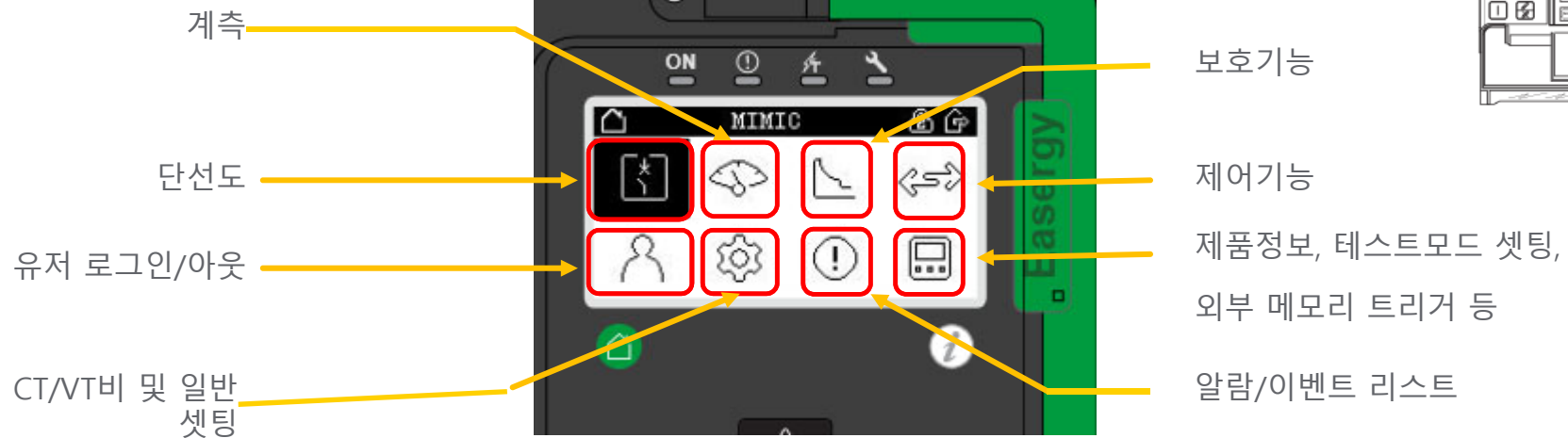


## • 전면패널

- 큰 화면으로 접근성 용이
  - 직관적 아이콘으로 선택 및 제어 가능
  - 컬러 디스플레이(P530)
- 
- 전면 통신부를 CAP으로 보호로 IP52구현
  - 전용 키트 사용으로 IP54 구현

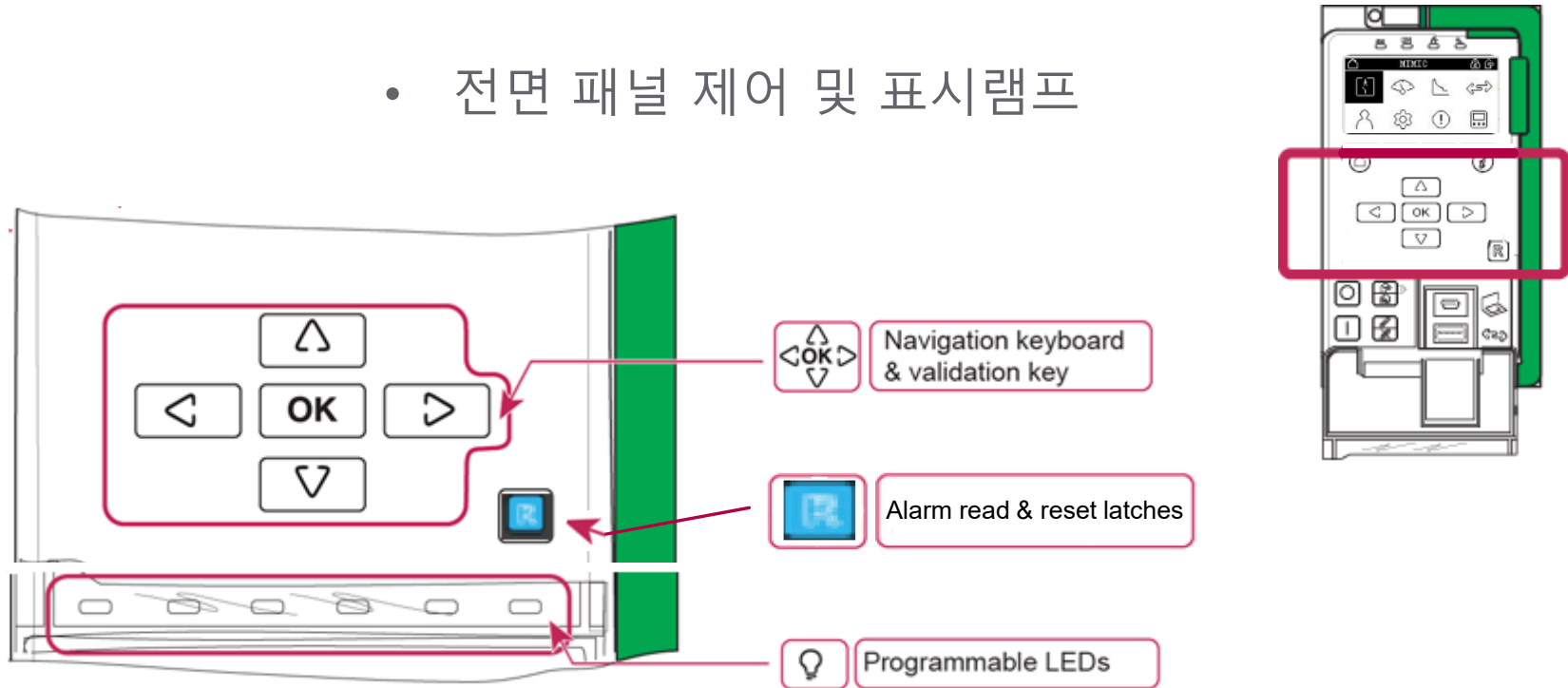
# Easergy P5, Front Panel-detail

## 아이콘으로 LCD구성



# Easergy P5, Front Panel-detail

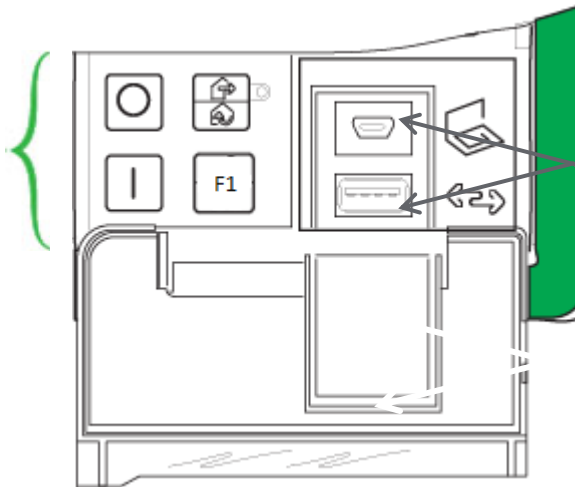
- 전면 패널 제어 및 표시램프



## Easergy P5, Front Panel-detail

- 전면패널: 보호캡 내부 구성

차단기 조작  
Local / Remote  
Function button

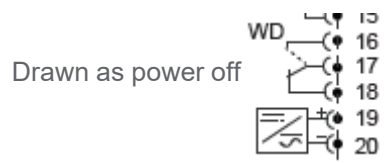


IED 통신포트  
USB 저장용 포트

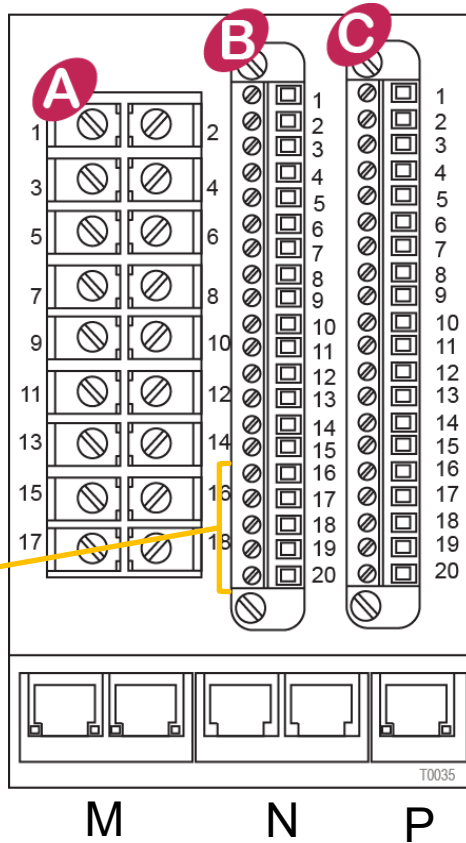
# Easergy P520, Rear panel detail

- 후면 패널(P520)

A) CT or VT 입력



CT: Current Transformer  
 VT: Voltage Transformer  
 I/O: Input / Output



B) Digital I/O, Power supply & watchdog  
 C) Digital I/O 추가

통신 모듈

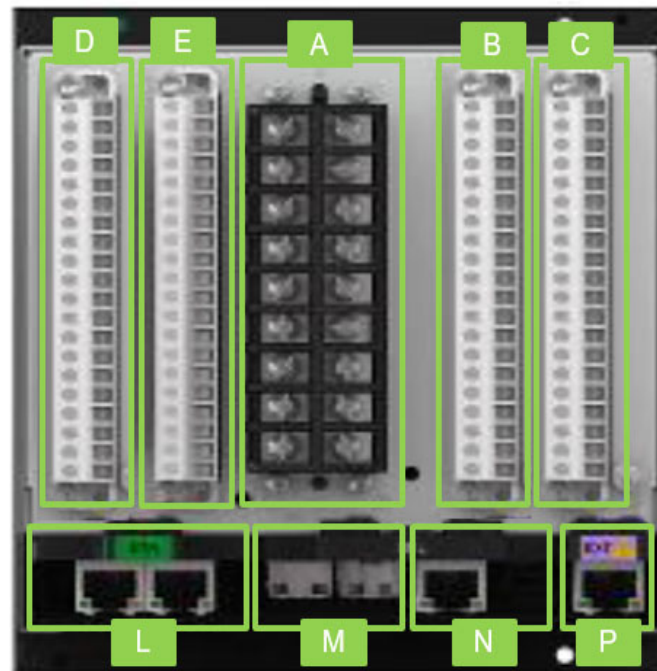
# Easergy P530, Rear panel detail

- 후면 패널(P530)

A) CT and VT 입력



CT: Current Transformer  
 VT: Voltage Transformer  
 I/O: Input / Output

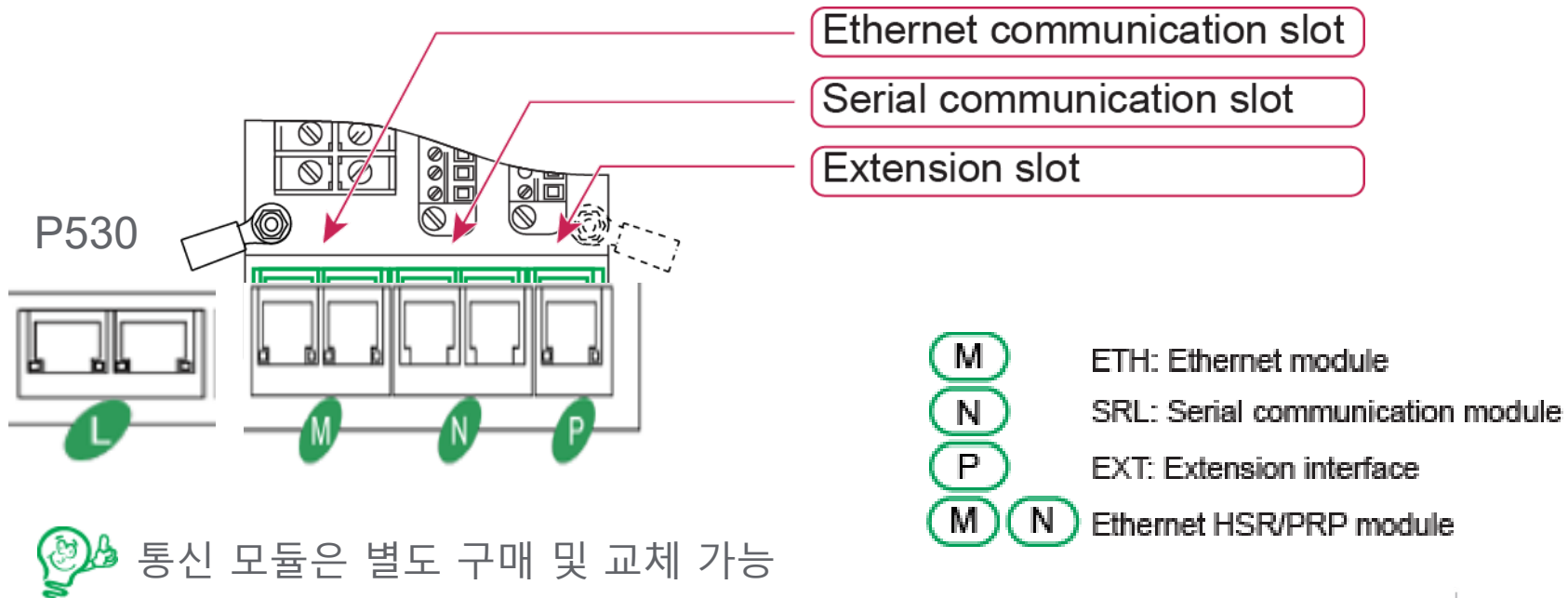


B) Digital I/O, Power supply & watchdog  
 C) additional digital I/O  
 D) additional digital I/O / ARC  
 E) additional digital I/O / ARC

통신 모듈

## Easergy P5, Rear panel detail

### ● Slots M, N, L & P – Communication



## Easergy P5, Withdraw-out

- 인출형으로 쉬운 설치 및 교체



# Easergy P5, Withdraw-out

- 구조적 안전성

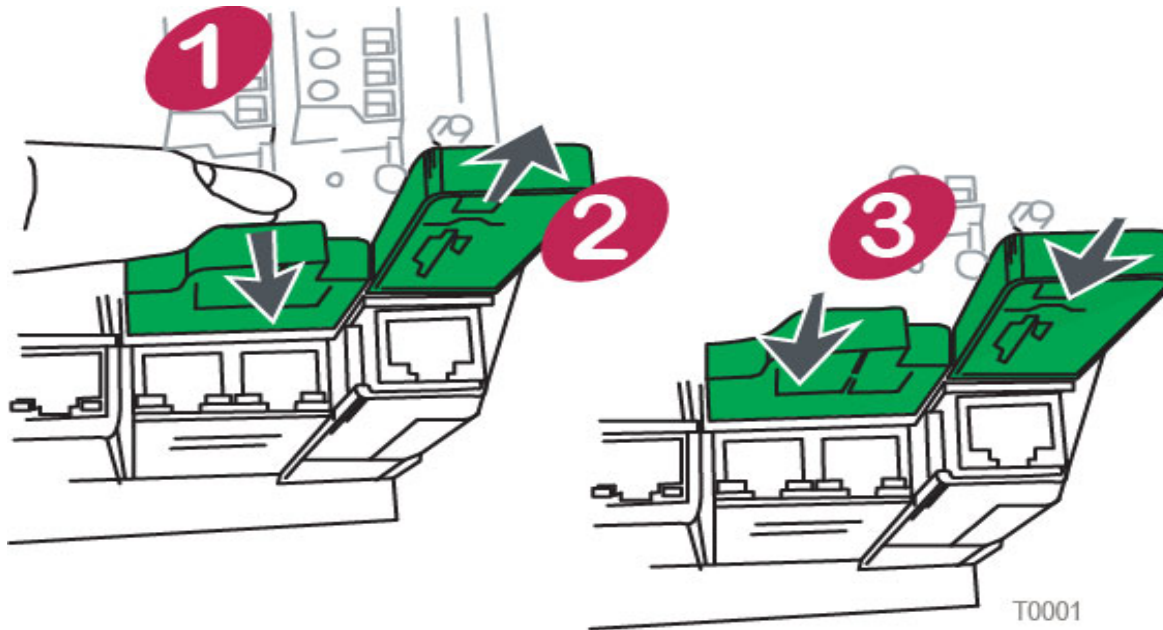


## 인출형 구조:

- CT wiring terminal & Internal CT (Interposing CTs) 부분은 계전기 프레임에 고정됨으로써, 영구히 short circuited됨.

## Easergy P5, Modular

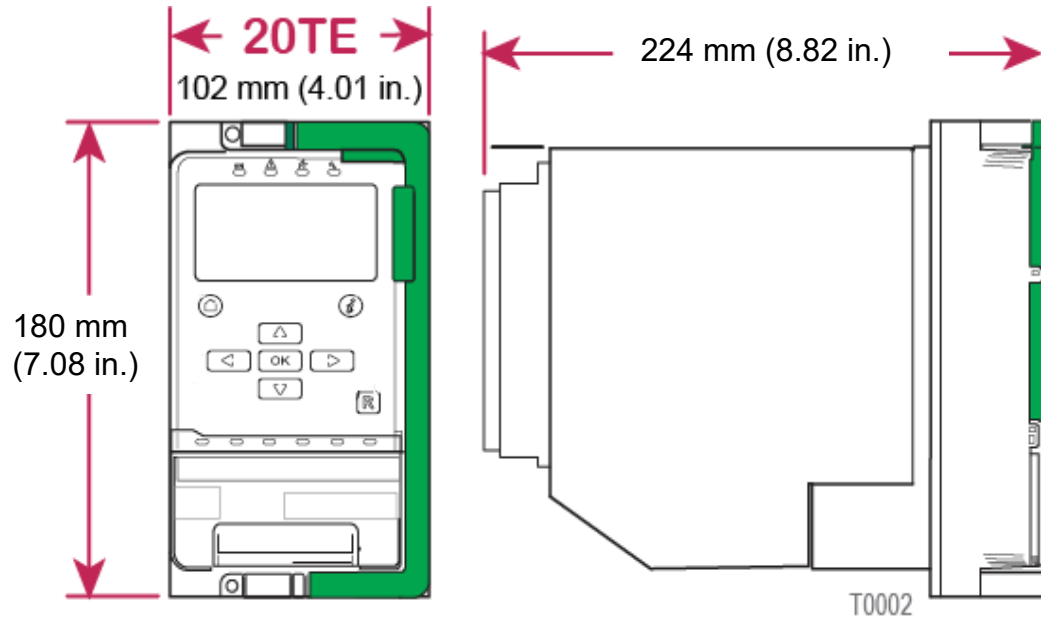
- 통신 및 외장형 모듈- 추가 및 교환이 용이



용이한 통신  
네트워크 구성  
변경!

## Easergy P5, Dimension

- Size/dimension(P520)



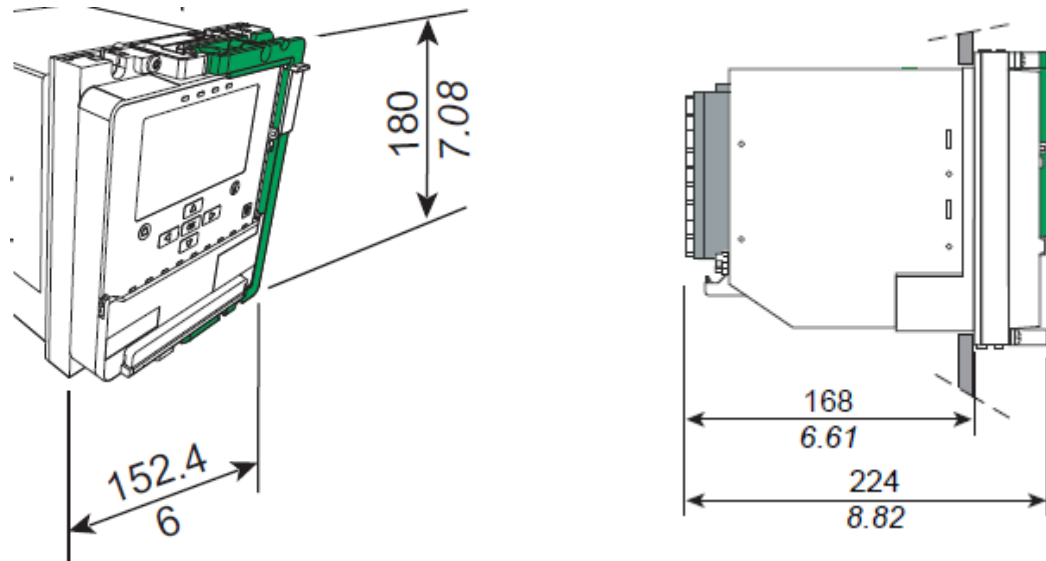
1 TE = 5.08 mm or 0.2 in.



표준 Rack 사이즈에 완벽하게 호환: 20TE 폭

## Easergy P5, Dimension

- Size/dimension(P530)



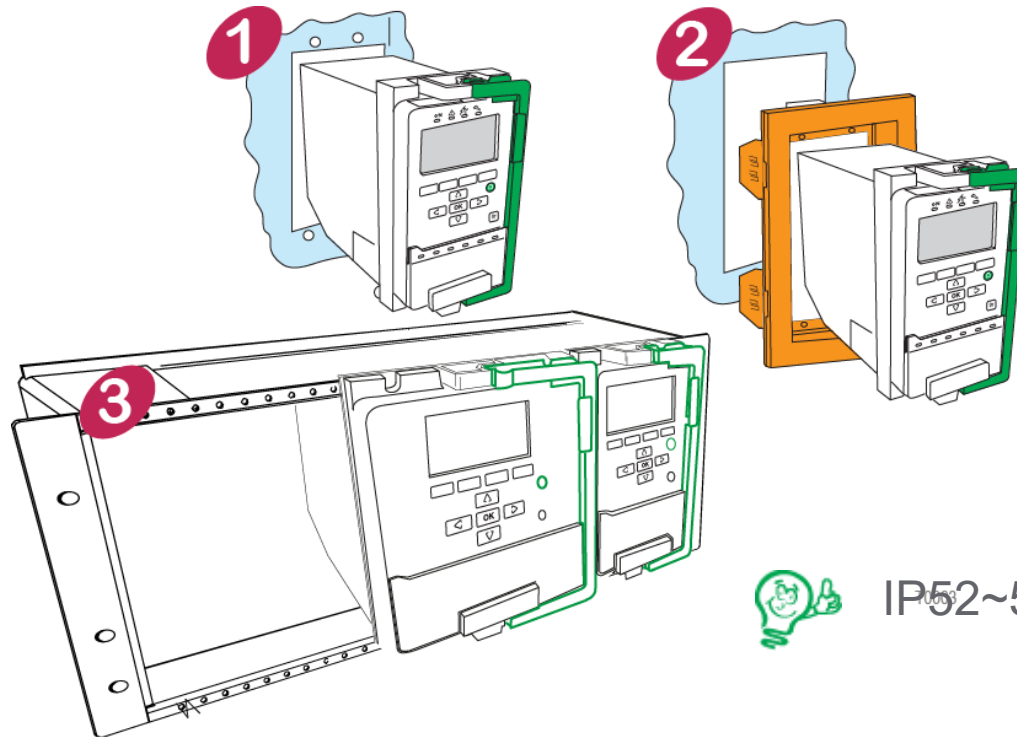
1 TE = 5.08 mm or 0.2 in.



표준 Rack 사이즈에 완벽하게 호환: 30TE 폭

# Easergy P5, Installation

- 설치방법 (1/2)



다양한 방식으로 설치:

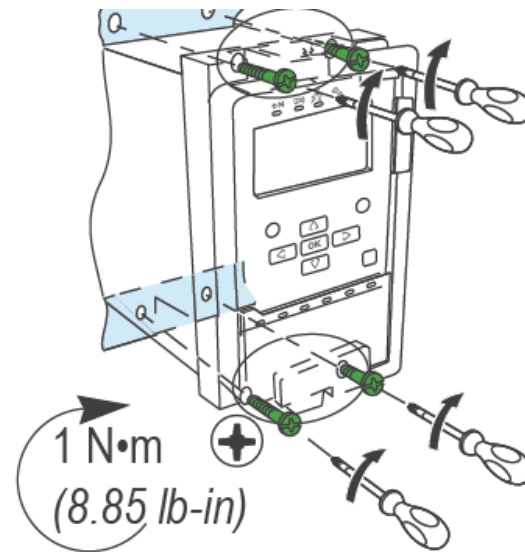
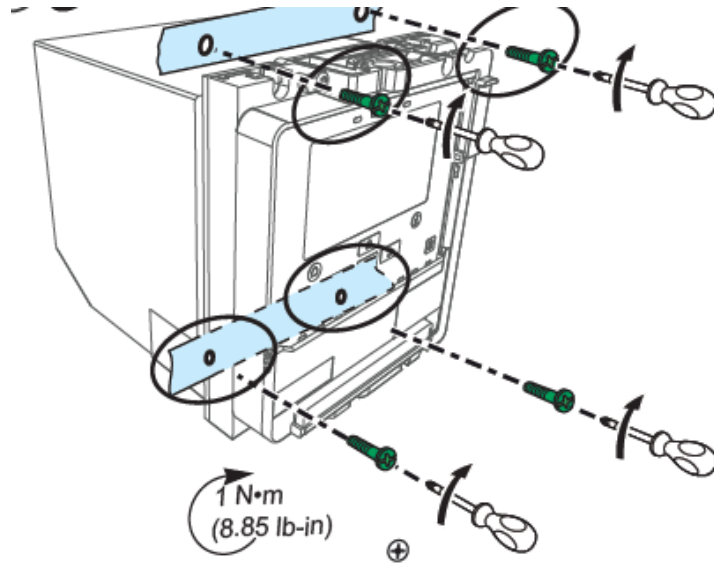
- 1) Flush mounting
- 2) IP54 with mounting kit.  
REL51032 for 20TE &  
REL51052 for 30TE
- 3) Standard Rack



IP52~54

# Easergy P5, Installation

- 설치방법 (2/2)



4개의 고정 Screw  
bolt 만으로 설치가능

**EcoStruxure™**  
Innovation At Every Level

Life Is On | **Schneider**  
Electric

