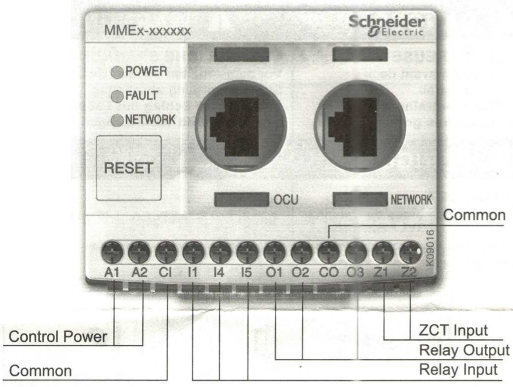
Configuring by buttons



ปุ่มกด Button	ลักษณะการทำงาน Function
∧ ∨	ปุ่มเลื่อนขึ้น-ลงเมนู หรือปรับตั้งค่า Navigating menu or adjusting a value
SET	선택, 저장 또는 하위 메뉴 열기 Selection, saving or enter sub-menu
ESC	ย้อนกลับไปยังเมนูเก่า Return to the previous menu
M MODE	모터 제어 채널 선택 Control channel selection
RESET	고장 수동 복귀 Fault reset
정회전 ON	모터 정방향 운전 Forward Run
STOP	모터 정지 Stop

* FAULT menu shows 3 fault records from the most recent one. Navigate fault information by ∧ ∨
120% LED is on during the most recent fault record display, 100%,110% and 120% LEDs are on during the oldest fault record display.Pressing ESC makes return to the menu tree.

สัญลักษณ์หลอดไฟแสดง| Fault Indication

Item	Display	Description
ไม่มีสัญญาณผิดพลาด No fault	noFLt	ไม่มีการบันทึก สัญญาณที่มีปัญหา no fault recorded
ค่ากระแสเกิน Over current	oc:3.6	มีกระแสเกินจากที่ตั้งค่าเอาไว้ที่ 3.6 A ที่เฟส R Overcurrent with 3.6A at R-phase
ไฟขาดหายบางเฟส Phase loss	PL-r	เกิดกระแสไฟหายจากเฟส R Phase loss at R-phase
เฟสลำดับเรียงกลับทาง Reversed phase	-rP-	กระแสไฟกลับทิศทางการหมุน หรือ ไม่ตรงเฟส Phase reversal
기동 중 구속(Stall) Stall at starting	Sc:35.0	Stall with 35.0A at S-phase immediately after dt expires
หยุดหมุนกระทันหัน Jam at running	JA: 15.8	Jam with 5.8A at T-phase
กระแสไม่สมดุลย์ Unbalance	Ub:4.2	ตรวจพบกระแสไม่สมดุลย์ Unbalance detected
กระแสต่ำเกินไป Under current	uc: 1.6	Under current with 1.6A at S-phase
กระแสรั่วลงดิน Earth leakage	Ec:0.06	Earth leakage with 0.06A detected
ถึงกำหนดระยะเวลารีเซ็ต Limit of auto-reset reached	rn:FuL	Number of auto-reset in 30minutes exceeds the limit
สายสัญญาณขาดหาย Network comm. loss	ntLoS	Network communication loss
버튼 불량 Stuck button	btn	Button stuck in OCU or EU
คำสั่ง Run ผิดพลาด Run command error	runEr	No current flowing after 1s from a run command
Run Checkback error	cbrun	Average load current for 0.5s is zero after a run command with no following a stop command
คำสั่งหยุดผิดพลาด Stop command error	StPEr	Current flowing after 1s from a stop command
Stop Checkback error	cbStP	Average load current is not zero for 0.5s after a stop command with no following a run command
External fault initiagted	EtFLt	Fault initiated by network communication

Modbus Cable

For the trunk cable, use a single, shielded, twisted pair cable and at least 3rd conductor. Keep the Modbus calbe away from the power cables(at least 30cm, 11.8inch).
Create crossovers of the Modbus cable and the power cables at right angles, if necessary.
Place at line terminator of 150Ω at each end of the bus to avoid malfunctions on the communication bus.

Customer Care Center
บริษัท เอ็นเนอร์ทริค จำกัด
25/401 ซอยรามคำแหง 124, แขวง/เขต สะพานสูง กรุงเทพฯ 10240
T: 0 2728 2902 F: 0 2728 1779 www.enertric.com e:et@enertric.com

■ 기술 사양 Specification

과전류 설정범위(A) Overcurrent Setting Range(A)	정한시: 0.5~ 6A (05 선택시), 5~ 100A(80선택시) 반한시/열축적반한시 : 0.5~ 6A(05선택시), 5~32A(80 선택시) Definite: 0.5~6A (05 selection), 5~100A(80 selection) Inverse/Thermal Inverse : 0.5~6A(05 selection), 5~32A(80 selection)
저전류 설정범위(A) Undercurrent Setting Range(A)	0.5 ~ oc (05 선택시), 5 ~ oc (80선택시) 0.5 ~ oc (05 selection), 5 ~ oc (80 selection)
과부하 특성곡선 Time-Current Characteristic	정한시(Def) / 반한시(Inv) / 열축적반한시(th) Definite(Def) / Inverse(Inv) / Thermal Inverse(th)
누설지락전류 설정범위(A) Earth leakage setting range	oFF 0.03-2.5A (Lo선택시) 또는 1.0-10A(Hi선택시)

동작시간 특성 Time	기동지연	Starting Delay(dt)	0~ 200s
	정한시 과전류 동작시간	Definite Overcurrent duration(ot)	0.2~ 120s
	반한시 과전류 특성곡선	Inverse Overcurrent curve (cLS)	1 ~ 30 Class
	누설지락전류 동작시간	Earth leakage duration	0.05 ~ 10s
	기동시 누설지락검출 지연시간 Starting delay of earth leakage detection		0 ~ 30s
	자동복귀시간	Automatic Reset time	0.5s~ 20min
	복귀형태	Reset Type	수동 (H-r) / 원방 (E-r) / 자동 (A-r) Manual (H-r) / Remote (E-r) / Auto (A-r)
제어전원 Control Power	정격전압	Rated Voltage	100~240VAC, 24VDC, 100~125VDC
	허용 입력 전압	Tolerance	정격의 85%~110% (of rated voltage)
	주파수	Frequency	50/60Hz
	소비전력	Power Consumption	7VA 이하 (Less than)
출력접점 Output relay	용량 구성	Capacity Composition	3A/250VAC Resistive. NO output: O1,O2,O3
표시기능 Display	7 Segment LED Bar-graph		계측전류, 고장정보, 설정값 표시 부하율 표시 (50 ~ 120%) Display measurement, fault information, settings Load ratio (50 ~ 120%)
통신방식 Network Communication			Modbus-RTU/ RS-485
취부방식 Installation			판넬 매입형 (Flush mounting)
절연저항 Insulation	회로와 외함	Between circuit and case	DC500V 10MΩ 이상
절연내압 Dielectric strength	회로와 외함	between circuit and case	2KV, 50/60Hz, 1 분(min)
	접점 상호간	between contacts	1KV, 50/60Hz, 1 분(min)
	회로간	between circuits	2KV, 50/60Hz, 1 분(min)
Electrostatic Discharge(ESD)	: IEC61000-4-2 / IEC60255-22-2		Level 3 : Air Discharge : ±8KV, Contact Discharge : ±6KV
Radiated Disturbance	: IEC61000-4-3 / IEC60255-22-3		Level 3 : 10V/m, 80 ~ 1000MHz
Conducted Disturbance	: IEC61000-4-6 / IEC60255-22-6		Level 3 : 10V,0.15~80MHz
EFT/Burst	: IEC61000-4-4 / IEC60255-22-4		Level 3 : ±2KV, 1 Min
Surge	: IEC61000-4-5 / IEC60255-22-5		Level 3 : 1.2 x 50μs, ±4KV(0° 90° 180°, 270°)
Emission	: CISPR11 / IEC60255-22-26		Class A (Conducted and Radiated)
사용환경 Environment	온도 Temperature	보관 Storage	-40°C ~ +85°C
		운전 Operation	-20°C ~ +60°C
	습도 Humidity		30~85% RH (결로가 없는 상태) (No-condensate)
치수 Dimension		본체 EU	70W x 56.3H x 108.1D
		디스플레이장치 OCU	108W x 74H x 38.6D
무게 Weight			MMED : 295g , MMEB : 330g
			MMEZ : 295g
			OCU : 180g 1M cable : 55g

■ 제어 채널 Control Channels

LOP가 있는 경우 (AUTO는 2Wire만 가능함) LOP exist (AUTO-2wire is supported)		입력 Input	기능 Function	선택된 제어 채널 Selected Channels			
				LOP	AUTO	MCC	COMM
		I1	RUN	OFF -> ON	ON	무시됨 ignored	
			STOP	기능 없음 n/a	OFF		
		I4	STOP	2 초 이하의 OFF OFF shorter than 2s	기능 없음 n/c	기능 없음 n/c	
			LOCAL 전환	ON	ON	ON	
			REMOTE 전환	2 초 이상의 OFF OFF longer than 2s	OFF	OFF	
LOP가 없는 경우 LOP is none	AUTO-3Wire	I1	RUN	기능 없음 n/c	OFF -> ON	무시됨 ignored	
		I4	STOP	기능 없음 n/c	OFF		
	AUTO-2Wire	I1	RUN	기능 없음 n/c	ON	무시됨 ignored	
			STOP	기능 없음 n/c	OFF		
		I4	기능 없음 n/c	기능 없음 n/c	무시됨 ignored		

시스템관련 설정항목 System Configuration

항목 Item	설명 Description	설정 범위 Range
Pd:000	설정 변경을 임의로 못하도록 제한하는 암호 Secure configuration	000 – 999 (0000이면 암호설정 안함) (blocked by 000)
Ph:3Ph	3상모터 또는 단상모터 3 phase or single phase	3ph, 1ph
r9:05	부하 전류설정 범위 선택 Base load current range	05, 80 (05-> oc:0.5 -6A, 80-> oc:5-100A)
EF:Lo	지락전류 설정범위 선택 Base earth leakage fault current range	Lo, Hi (Lo: 0.03 -2.5A, Hi : 1.0 – 10.0A)
ct:non	외부 CT 비율 설정 External CT ratio, select cuS for separate configuration of primary, secondary and multiple passes	Non, 2t, 3t, 4t, 5t, cuS (ctse:1, ctse:5, ct:10~3000, PaS:1~5)
LoP:yE	LOP 연결 여부 설정 LOP exist or not	yE, no
Aut:no	AUTO(PLC or DCS)연결 여부 설정 AUTO(PLC or DCS) exist or not	yE, no
nEt:no	통신으로 제어 가능하게 할것인지 선택 Enable control by communcation	yE, no
Ncc:yE	OCU로 제어가능하게 할것인지 선택 Enable control by OCU	yE, no
StP:no	OCU STOP버튼을 항상 유효하게 할것인지 선택 Enable global stop from OCU	yE, no
oP:doL	모터 기동 방식,DOL,YD,Inverter or By pass 지원 operation mode, select DOL,YD,Inverter or By pass	doL, y-d, Inv, b-P
Aut:2	AUTO가 2wire방식인지 3wire방식인지 선택 Select Auto-2wire for maintained contact or Auto-3wire for momentary contact	2, 3
out:SE	OL과 GR출력접점이 공통인지 분리인지 선택 Output type of OL and GR, select common or separate	SE, Co
Fr 9:60	계통 주파수 System fundamental frequency	50, 60
buP:yE	제어채널 변경시 모터 정지하게 할것인지 선택 Enable bump(stop) between control channel transfer	yE, no
LFd:no	저주파수 (5Hz~)검출 여부 선택 If yes, measurement starts from 5Hz	yE, no
nAc:no	통신으로 설정변경하게 할것인지 선택 Enable write access to network for configuration	yE, no

Configuration of Control and Protection

항목 Item	설명 Description	설정 범위 Range
rP:oFF	역상 검출 Reversed phase detection	On,oFF
tcc:dE	과부하 검출방식 선택 (안함,정한시,반한시,열축적반한시) Time-current characteristic (none, definite, inverse, thermal inverse)	no, dE, In, th
oc:5.0	과전류 설정값 Over current threshold	dE:0.5 – 6.0 or 5.0 – 100 In/th: 0.5 – 6.0 or 5.0 – 32
dt:5	모터 기동 지연시간 Starting delay	0 – 200s
ot:5	과전류 검출 시간 Over currentent duration	0.2 – 120s
cLS:5	반한시/열축적 반한시 동작곡선 TCC class for inverse or thermal inverse	1 – 30
uc:oFF	저전류 설정값 Under current threshold	oFF 0.5 – oc or 5.0 – oc
ut:5	저전류 검출 시간 Under current duration	0.5 – 120s

Configuration of Control and Protetion

Ec:2.5	누설지락전류 설정값 Earth leakage threshold	oFF, 0.03 – 2.5A or 1.0 – 10.0A
Et: 1	누설지락전류 검출 시간 Earth leakage duration	0.05 – 10s
Edt:0	기동시 누설지락검출 지연시간 Starting delay of earth leakage	0 – 30s
PL:on	결상 검출 Enable phase loss	on, oFF
PLt:2	결상 검출 시간 Phase loss duration	0.5 – 5s
Ub:50	불평형 설정값 Unbalance threshold	oFF, 10 – 50%
Ubt:5	불평형 검출 시간 Unbalance duration	1 – 10
Sc:4	기동 중 구속 설정값 Stall threshold (multiples of oc)	oc x Sc ≤ 45(05 선택시) oc x Sc ≤ 240(80선택시)
JA:4	운전 중 구속 설정값 Jam threshold (multiples of oc)	oc x JA ≤ 45(05 선택시) oc x JA ≤ 240(80선택시)
Jt:5	운전 중 구속 동작시간 Jam duration	0.2 – 10s
Yt:3.0	Y결선 운전시간 1st step time in YD starter	0.1 – 999s
tt: 1.0	Y-D절체 시간 Transition time in YD starter	0 – 3s
ALo:no	경보 출력 형태 Alarm output type	no,A,F,H,to,uc
AL:50	경보 설정값 Alarm threshold (% of oc)	50 – 100%
rt:H-r	고장 복귀 형태(수동,자동,원방복귀) Reset type (manual,remote,auto)	H-r,E-r,A-r
Ar:5	자동 복귀 시간 Auto reset timer	0.5 – 20n
rn:oFF	30분내 자동복귀 허용횟수 Limit of auto reset in 30 minutes	oFF,1-5
-trh-	설치부터의 누적 총 운전시간 (설정불가) Total running hour from installation	0 – 99999
--rh-	누적 운전시간 Running hour	0 – 99999
rh:OFF	누적 운전 시간 경보 출력 기준시간 Timeout alarm threshold	oFF,10-9990
Yr:09	연도 설정 Year, 2009 - 2099	09 – 99
Mon: 1	월 Month	1 – 12
dd: 1	일 Date	1 – 31
hh:0	시 Hour	1 – 23
Mn:0	분 Minute	0 – 59
SEc:0	초 Second	0 – 59
Ad: 1	슬레이브 주소 Modbus slave address	1 – 247
bP: 192	통신속도(bps) Baudrate(bps)	1.2, 2.4, 4.8, 9.6, 19.2, 38.4, auto
Pr:Eun	패리티, none,even,odd Parity, none,even, odd	non, even,odd
Lt:OFF	통신두절검출 기준시간 Communication loss time	1 - 999
Pcn:no	PCON 연결모드 선택 Open PCON port	yE, no
d9n:yE	제어 명령 진단 기능 활성화 Run/Stop command diagnosys	yE, no
FAULt	고장 정보 표시 Fault records	3 records
hLS:no	OCU 연결상태 점검 Enable disconnection detection of OCU	yE, no
rc:0	빈번한 기동 방지 시간 Rapid Cycle times	0 – 999
cLr:th	열용량 초기화 Clear thermal capacity	
tESt	출력접점 시험 Output test	
End	출력접점 시험 완료 End of output test	

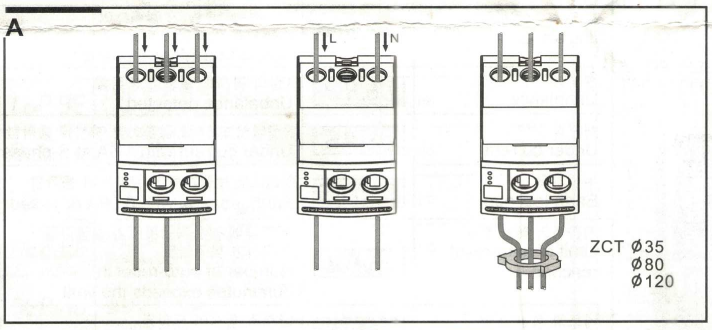
PC Set valu dov

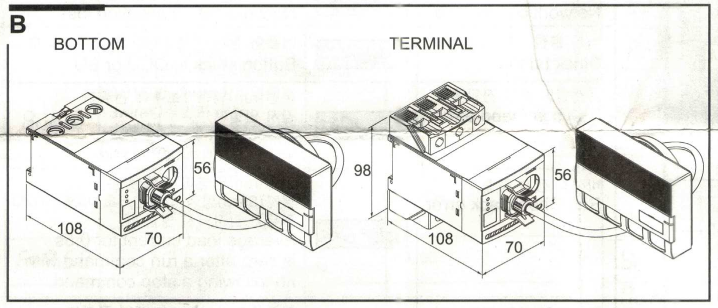
주의사항 및 설치방법

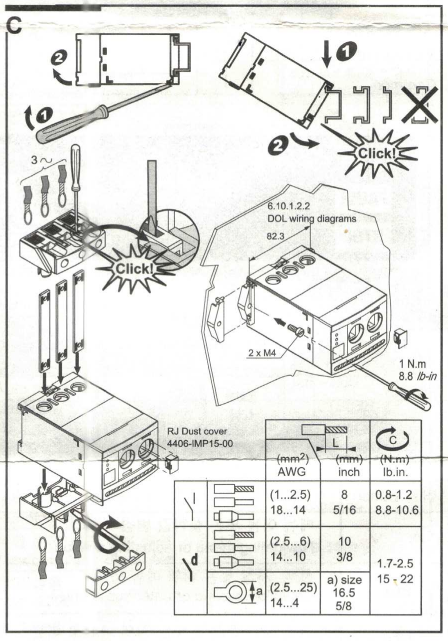
Warning and Installation

www.schneider-electric.co.kr

⚠ 위 험	⚠ DANGER	⚠ DANGER	⚠ WARNUNG
제품설치 및 보수전에 모든전원을 차단하여 주십시요. 감전으로 심각한 상해 또는 사망의 원인이 됩니다.	**HAZARDOUS VOLTAGE** Disconnect all power before servicing equipment. **Electric shock will result in death or serious injury.**	**TENSION DANGEREUSE** Coupez l'alimentation avant de travailler sur cet appareil. **Une électrocution entraînera la mort ou des blessures graves.**	**GEFAHRLICHE SPANNUNG** Vor dem Arbeiten an dem Gerät dessen Stromversorgung abschalten. **Elektrischer Schlag mit Lebensgefahr bzw. schweren Verletzungen.**
⚠ PELIGRO	**⚠ PERICOLO**	**⚠ PERIGO**	**⚠ 危险**
TENSIÓN PELIGROSA Desconecte toda alimentación antes de realizar el servicio. **Una descarga eléctrica podriá provocar la muerte o lesiones serias.**	**TENSION PERICOLOSA** Scollegare l'apparecchio dalla presa di corrente prima di qualsiasi intervento. **Una scarica elettrica potrebbe causare la morte o gravi lesioni.**	**TENSÃO PERIGOSA** Desligue a alimentação antes de trabalhar neste aparelho **Uma electrocussão ocasionará a morte ou ferimentos graves.**	**电压危险** 在此电力设备上进行工作时,请先切断电源 **触电可能导致死亡或者严重受伤**







결선도 예시 / Wiring Examples

* 제어전원은 절연된 전원을 사용하십시오.
* Isolated transformer is recommended for control voltage input.