

! DANGER / 危險

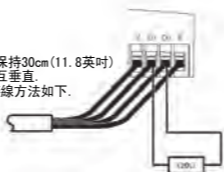
HAZARD OF ELECTRIC SHOCK, EXPLOSION OR ARC FLASH
Disconnect all power before servicing equipment.
Failure to follow these instructions will result in death or serious injury.

電擊、爆炸或電弧危險
在檢修設備之前，請斷開所有電源。
若違背這些說明，則可能會導致嚴重的人身傷害甚至死亡。

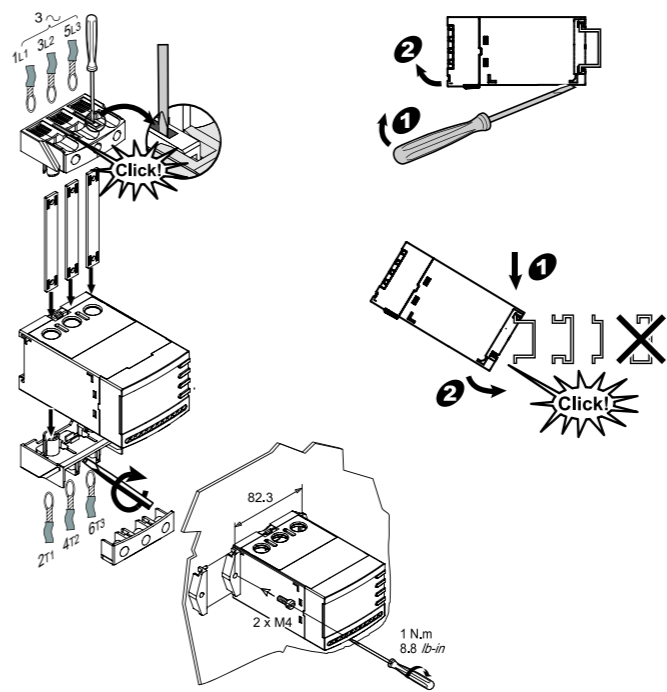
Schneider Electric 施耐德電機授權經銷商
普得企業股份有限公司
總公司：台北市內湖區行愛路68號6樓
電話：(02)8791-8588 傳真：(02)8791-9588
中辦處：(04)2296-9388 高辦處：(07)227-2133
E-mail: toyotech@ms37.hinet.net
網址: www.toyotech.com.tw

- Authorized technical engineers only for installation, maintenance or repair. 所有電器的安裝和維護必須由獲得認證的電氣技工操作完成。
- Adjust the settings according to the electric characteristics of a motor, an inappropriate setting may cause permanent damage on the motor. 以電機特性來設定好跳閘時間和額定電流，若誤設定會造成電機燒損壞。
- External filter should be installed to reduce harmonics in an environment where the AC power contains excessive harmonic than IEC standard. No installation in the site may result in accuracy problem, abnormal operation and mal-function. 在含有高週波含有IEC規定以上的現場上，需配備掛不濾波器未配備濾波會因為產品，受到干擾而產生誤動作。
- With a device using SCRs to control electricity such as an inverter set 'Lfd YE' or contact customer service center for more information. 關於逆變器或SCR控制負荷，就在Hidden menu設定 "Lfd YE" 或請向本公司詢問
- Check periodically whether our product works properly by pressing and holding the test button. 為了保證正常動作，請定時確認產品動作狀態。
- 18 months warranty from the date of shipment. 我公司對於物流中心出庫後18個月內出現問題產品進行免費維修。

- For the trunk cable use a single, shielded, twisted pair cable and at least 3rd conductor. Keep the Modbus cable away from the power cables (at least 30 cm - 11.8in). Create crossovers of the Modbus cable and the power cables at right angles, if necessary. Place at line terminator at 120Ω each end of the bus to avoid malfunctions on the communication bus. Line terminator cabling is as follows. 為了保護接口，請使用屏蔽雙絞線 (Shielded Twisted Conductors). Modbus電纜與電力線至少要保持30cm(11.8英寸)必要時，使Modbus電纜與電力線相互垂直。電路終端器 (Line Terminator) 的接線方法如下。
- Avoid ZCT secondary grounding ZCT secondary shielding recommended. Keep the PDM Display unit communication cable away from the main power and control power line cable. 請勿從ZCT二次上接接地。推薦在於ZCT 2次上用屏蔽電纜。PDM設備通信電纜也應該與主電源和控制電源線之間隔離。



□ Installation / 安裝方法

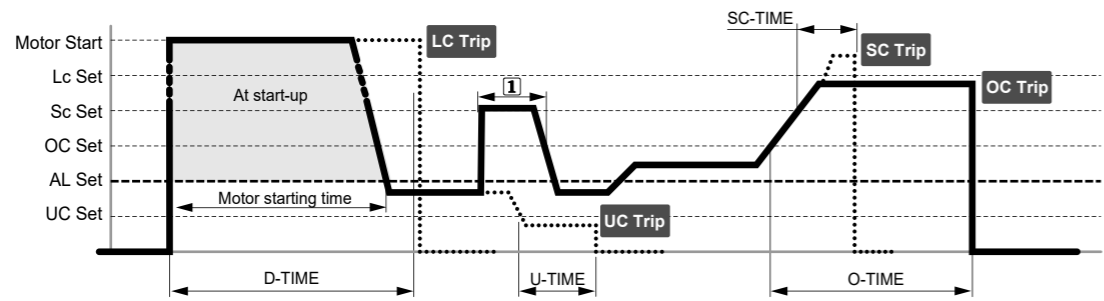


9 mm (0.35 in) minimum	< 45 °C (< 113°F)
9...40 mm (0.35...1.57 in) minimum	45...80 °C (113...140°F)
40 mm (1.57 in) minimum	> 80 °C (> 140°F)

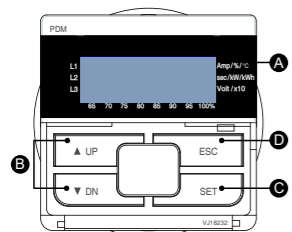
	(mm ²) AWG	(mm) inch	(N.m) lb.in.
I	(1...2.0)	8	0.8-1.2
	18...14	5/16	8.8-10.6
Y	(2.5...6)	10	1.7-2.5
	14...1	3/8	15 - 22
a	(2.5...25)	8	15 - 22
	14...4	15/32	

Notice.
Blade terminal width: less than 2.3mm.
Cable: less than 2.0 SQMM.

1 The trip is deactivated until the over-current run time is longer than O-time. 雖然感知過電流，如果比設定 O-Time 時間短 則不動作



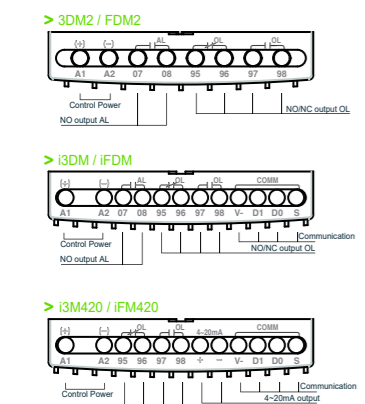
□ Description / 外觀



□ Setting / 設置

- UP / DN**: Press UP or DN to find a menu item. Refer to the User's guide for detailed menu description. 按UP或DN按鍵來查找要設置的菜單。菜單請參考設置順序及顯示說明。
- SET**: In the menu mode, pressing SET makes blinking. A parameter and allows modifying paramete. 按一次SET按鍵，向繼電器發送開始設置信號。此時，要設置的數字或文字開始閃爍。這表明可以進行設置。
- UP / DN**: Press "UP" or "DN" key to set the parameter while blinking. 按UP或DN按鍵來查看要設置的數字或文字。
- SET**: Press "SET" again then blinking is stopped and it will be stored the parameter in the non-volatile memory while blinking. 顯示要設置的文字或數字後，按SET按鍵保存到繼電器上。閃爍的文字或數字不再閃爍，表示已保存設置。
- ESC**: To return normal display mode, either press "ESC" or wait for 50secs of the time elapsed from set menu 按ESC按鍵返回電流顯示模式。完成設置後，即使不按ESC按鍵，經過50秒後，也會自動返回電流顯示模式。

□ Description of terminal / 端子配置圖



*3●●2 沒有通信接點
Models with "2" at the end do NOT include communication terminal.

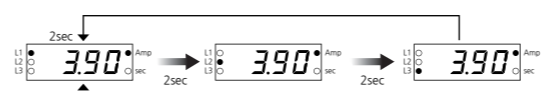
□ Trip Cause Indication/ 動作原因指示

None Fault 無動作歷史	noFlt	Fault History Initial State 沒有動作歷史的初始狀態 (無跳閘狀態)
(oc) Over Current 過電流	oc: 35	Tripped by over-current, the maximum phase was L1 and 3.5A detected 被過電流跳閘，最大相位為L1並檢查出了3.5A
(PL) Phase Loss 欠相	PL: -r	Tripped by current phase-loss on L1 phase L1相電流損失引起的跳閘
(RP) Reverse Phase 逆相	--rP-	Tripped because the current phases of a 3-phase motor are phase reversal during start state 因啟動中檢查到電流反相而跳閘
(Sc) stall at starting 啟動中鎖死	Sc:450	Tripped by 45A current on L1 phase that detects a locked or stalled rotor during start state 啟動狀態下在L1相位上檢測到45A的鎖死電流而跳閘
(JA) stall at running 運行中鎖死	Jr:350	Tripped by 35A current on L2 phase that detects a locked rotor during run state 運行狀態下在L2相位上檢測到35A的鎖死電流而跳閘
(Ub) Unbalance 不平衡	Ub: 55	Tripped by current phase imbalance on L3 phase. 因L3相電流不平衡而跳閘
(uc) Under Current 低電流	uc: 15	Tripped by 1.5A under-current during run state 在運行狀態下在L3相位檢測到1.5A的低電流而跳閘
PDM Loss PDM通信中斷	PdLoS	Tripped when PDM communication status is lost 因PDM通信狀態中斷而跳閘
Network Loss 網路通信中斷	ntLoS	Tripped when Modbus network communication status is lost 因Modbus網路通信狀態中斷而跳閘
activation limit 啟動限制	rrFuL	Auto Reset is not possible because the number of times of activation limit is exceeded within 30 minutes 因超過已設置的30分鐘內啟動限制次數而無法再啟動
Test Complete 測試完成	-End-	Tripped by self-test completion 測試完成而跳閘

□ Diagnosis / 顯示診斷

EEPROM error EEPROM錯誤	EPH50	Operated by diagnosing EEPROM memory error If the fault persists after the power cycle, replace the product. 診斷EEPROM儲存器錯誤後動作 若重放操作電源後仍發生同樣問題則需要交換產品
Major Internal Fault 內部系統故障	iF●● / F●●2 i3●● / 3●●2	Operated by diagnosing system faults internally If the fault persists after power cycle, replace the product. 診斷內部系統故障而動作 若重放操作電源後仍發生同樣問題則需要交換產品
(Only Enhanced Version) 電源保護電路破損	--LR-	Tripped by detecting the breakdown of the power protection circuit. In this case, please replace the product 因檢查到電源保護電路破損而跳閘 需要交換產品

□ Automatically-scrolling display / 電流自動循環指示功能

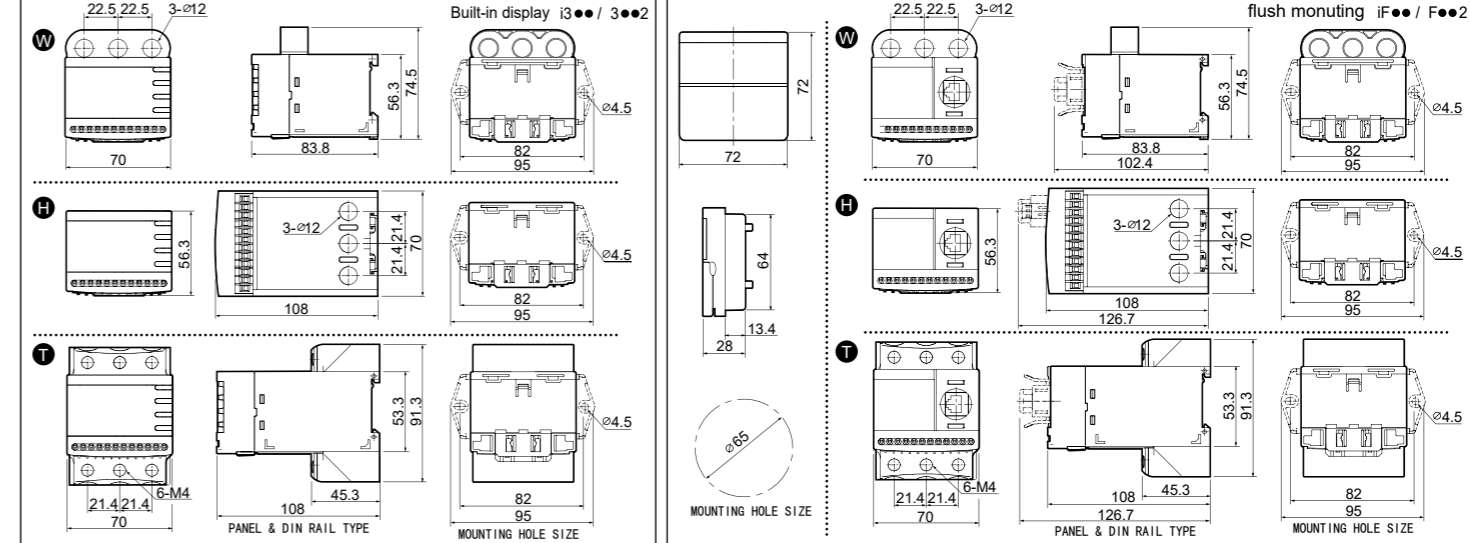


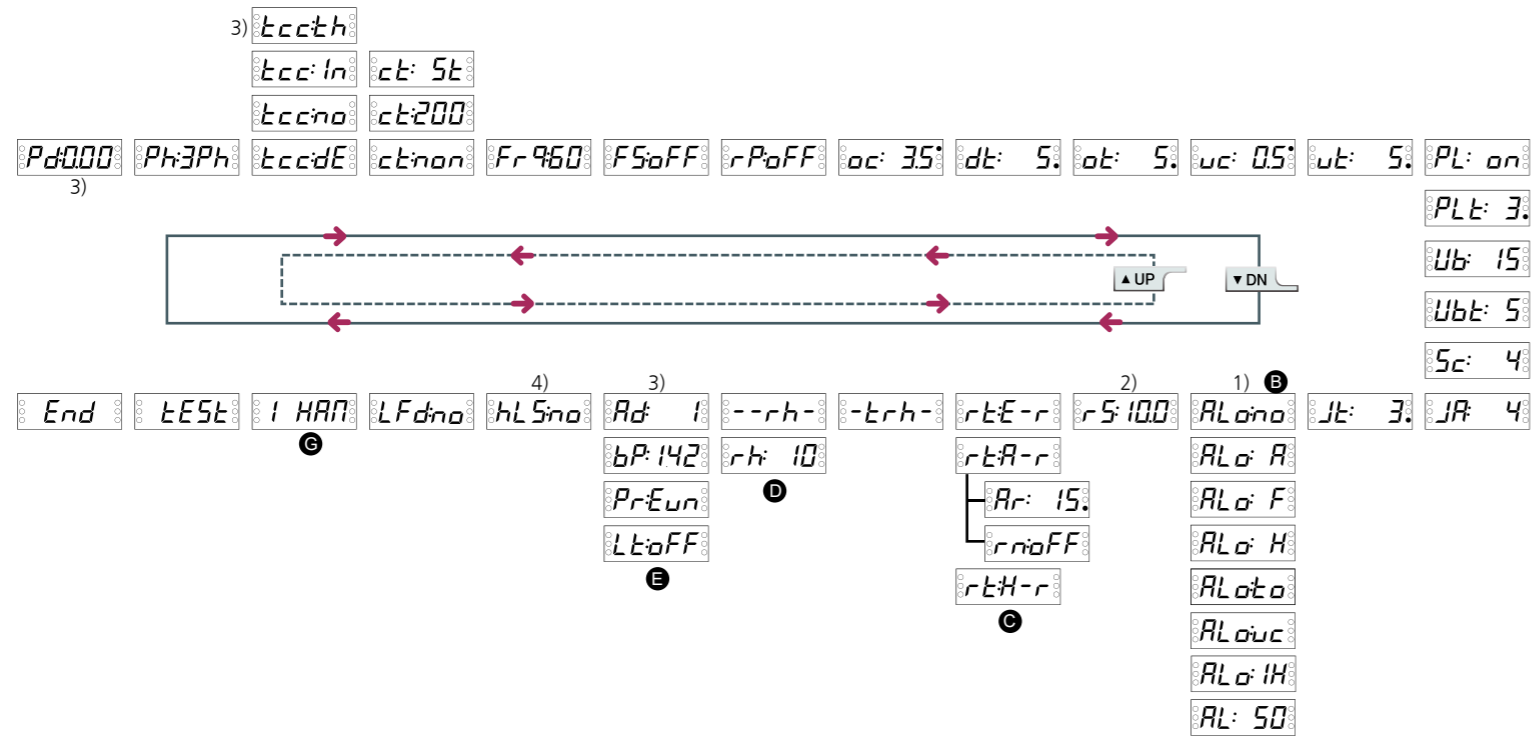
Once the SET button is pressed during a product operation, the auto-scrolling is de-activated so that the display does NOT change. Another SET press will turn the current on display to the next phase one. (e.g. if you press the SET button with L1 current displayed, the display will show L2 current.) To re-activate the auto-scrolling, press the ESC button. In manually-scrolling display, you can access each setting in a circular manner as pressing UP or DN. 動作中按一次set鍵，就顯示手動循環，代替自動循環。在手動循環模式下每次按set鍵，按如上順序循環，所以必要時可鎖定一個相的電流或接地電流，進行集中管理，若按一次ESC鍵，就回到自動循環模式，在手動循環指示模式下按UP/DN鍵，就轉換為各個設定模式。

□ Fault History / 查看故障履歷

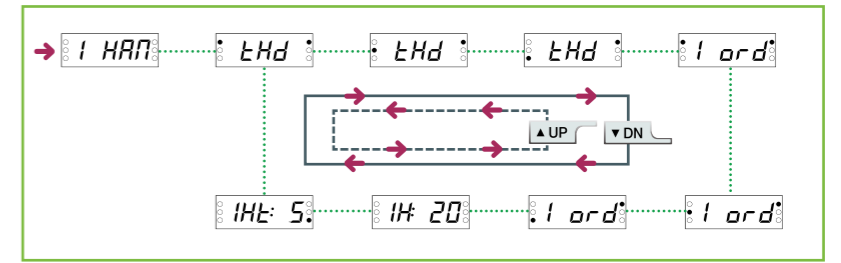
Fault history check : Pressing the ESC button more than 5sec, it displays the latest fault cause and the fault current or fault phase. Continuing to press DN button, you can see the current of L1(R),L2(S),L3(T),(GR) in turn. press the DN button again to check the previous fault continually. In the latest fault display, the 100% LED of bargraph lights on and two LEDs of 95%,100% lights on for the second fault display, three LEDs of 90%,95%,100% lights on for the oldest fault display. When you press the ESC button in this mode, it returns to the normal current display mode. The oldest fault record is over written when the number of fault to record exceeds three. 在顯示電流循環的情況下，長按ESC按鍵5秒以上，就顯示最近故障原因及其電流或電相，這時再按DN按鍵，每按DN按鍵就以R相，S相，T相(接地電流)的順序顯示，如果要確認過去故障履歷，再按DN按鍵，就顯示故障訊息。對於顯示故障信息，顯示最近動作內容時，就亮起Bargraph的100%，若顯示其之前的故障內容，就亮起95%和100%兩個LED燈，再顯示以前的故障內容時，就亮起90%，95%和100%三個LED燈。在查看故障履歷之中，按ESC按鍵，就轉換為電流循環，這時UP或DN按鍵，若顯示故障電流，就在左邊L1, L2, L3 LED燈中亮起相關的LED燈。如果顯示其他故障信息時，就顯示故障項目信息，故障履歷最多保存三個，若超過三個，最久的故障內容就自動刪除。

□ Dimensions / 外形尺寸





Harmonics Menu / 高週波菜單

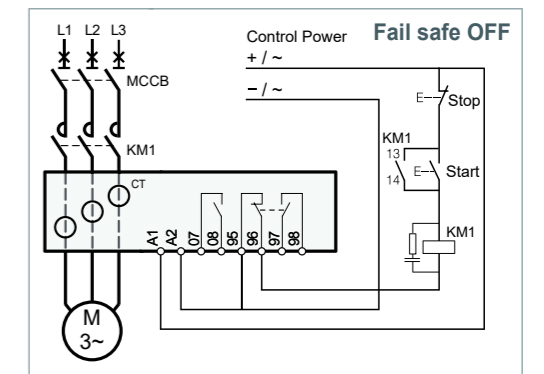


- 1) Applicable for 3DM2 / FDM2 / i3DM / iFDM 產品才有
- 2) Applicable for i3M420 / iFM420 產品才有
- 3) Applicable for i3DM / iFDM / i3M420 / iFM420 產品才有
- 4) Applicable for FDM2 / iFDM / iFM420 產品才有

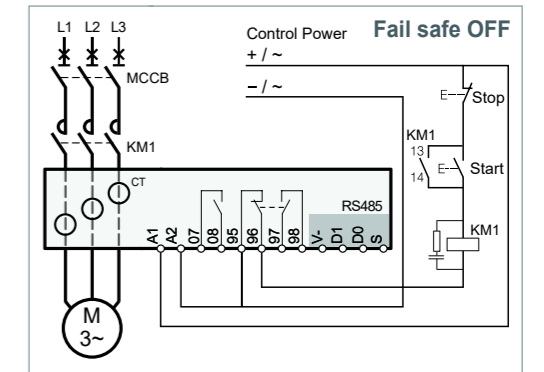
MODE	Description	Range	Default	MODE	Description	Range	Default
3) Pd000	Password 設定密碼	000 -999 (000 for no password setting)	000	rE-r	Reset type(manual,Electric,auto) 故障復歸形式(手動,自動,遠端復歸)	H-r (Manual reset only) E-r (Electric, Manual, Comm reset) A-r (Auto, Electric, Manual, Comm reset)	E-r
Ph3Ph	Select 3 phase or single phase 選擇單相、3相	3ph, 1ph	3ph	Ar: 15	Auto reset timer 自動復歸時間	0.5 - 20n	5
tcc dE	Time-current characteristic 超負荷檢測方式	no, dE, In, th (none, definite, inverse, thermal inverse)	dE	rnoFF	Restart limitation 控制重啟	oFF, 1 - 5	oFF
ct non	設定外部CT比率 External CT ratio,select cuS for separate configuration of primary, secondary and multiple passes	Non, 2t, 5t ct:10~3000	non	-trh-	Total running hour 總運作時間	0 - 99999	trh
Fr 960	System fundamental frequency 基本頻率	50,60	60	--rh-	Running hour 顯示運作時間	0 - 99999	rh
FS oFF	Set/Reset Fail safe mode 選擇Fail Safe功能	On, oFF	oFF	rthoFF	Timeout alarm threshold of running hour 累積運作時間的警報輸出基準時間	0 - 9990	oFF
rPoFF	逆相 Reversed phase detection	On, oFF	oFF	Ad: 1	通信 Communication (Modbus slave address)	1 - 247	1
oc 5	Over current threshold 設定過電流	dE: 0.5 - 80 In/th: 0.5 - 32	5	bP: 192	Baud rate(bps) 通信速度	1.2, 2.4, 4.8, 9.6, 19.2, 38.4, auto	192
dt: 5	Starting delay time 設定啟動延遲時間	0 - 200	5	Pr:Eun	Communication Parity pr:no1 -> stop bit = 2 pr:non, pr:Eun, pr:odd -> stop bit = 1	non, no1, Eun(even), odd	Eun
ot: 5	Over current duration 設定過電流運作時間	0.2 - 30	5	LtoFF	Communication Loss operating time 通信中斷檢測基準時間	1 - 999	oFF
uc oFF	Under current threshold 設定低電流值	oFF, 0.5 - (oc -1)	oFF	hLSno	Enable disconnection detection of sPDM 檢測sPDM連接狀態	yE, no	no
ut: 5	Under current duration 設定低電流時運作時間	0.5 - 30	5	LFdno	低頻運轉設置 Select Enable Low Frequency Detection	yE, no	no
PL: on	欠相 Phase loss	On, oFF	on	I HAN	Harmonics Menu 1st~ 8th : 5% 諧波菜單 9th~ 16th : 10%		
PLt: 2	Phase loss duration 欠相動作時間	0.5 - 5	2	tHd	L1 Phase - Current Total Harmonic Distortion L1相電流總諧波失真率 (不可設定)		
Ub: 50	Unbalance threshold 設定電流失衡	oFF, 10 - 50	50	tHd	L2 Phase - Current Total Harmonic Distortion L2相電流總諧波失真率 (不可設定)		
Ubt: 5	Unbalance duration 不平衡動作時間	1 - 10	5	tHd	L3 Phase - Current Total Harmonic Distortion L3相電流總諧波失真率 (不可設定)		
Sc: 4	Stall threshold (multiples of oc) 啟動之中堵轉設定	2~8times of oc setting if Sc x OC doesn't exceed 250A	4	I ord	L1 Phase - Fundamental Frequency Current L1相基本週波電流 (不可設定)		
JA: 4	Jam threshold (multiples of oc) 運轉之中堵轉設定	1.5~8times of oc setting if JA x OC doesn't exceed 250A	4	I ord	L2 Phase - Fundamental Frequency Current L2相基本週波電流 (不可設定)		
Jt: 5	Jam fault duration 運轉之中設定堵轉時間	0.2 - 10	5	I ord	L3 Phase - Fundamental Frequency Current L3相基本週波電流 (不可設定)		
ALo no	Alert output type 警報輸出方式	no, A, F, H, to, uc, IH Connected PDM no, A, F, H, to, uc, tE, hU, Pt, 42, IH	no	I H 20	Alarm Level for maximum Current THD of Three phases 在於3相電流THD之中最大的THD來設定報警層次	20 - 1000	20
1) AL: 50	Alert threshold (% of oc) 設定警報率	50 - 100 (ALo F or H Selected)	50	I Ht: 5	Alarm duration for maximum Current THD of Three phases 3相電流THD中最大THD的報警操作時間設置, 不適用於啟動時間	1 - 30	5
2) rS: 100	4-20 Output range threshold 4-20設定輸出範圍	0.5 - 80	10	tEst	Output test 輸出按點測試	Press RESET to reset it from a trip after the test is complete. 結束後按RESET按鈕就復歸, 運轉中不能轉換為Test模式	
				End	End of output test 完成輸出按點測試		

Wiring / 接線圖

3DM2 / FDM2



i3DM / iFDM



i3M420 / iFM420

