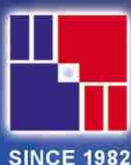


ISO 9001 認證通過  
Certified

# 電子產品綜合目錄

## Electronic Products General Catalog



SINCE 1982

# 敏尚企業有限公司

## MINSUN TECHNOLOGY CO., LTD.

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**敏尚企業有限公司** 成立於1982年，初創時期以自動化設備設計、製造為主。於1989年成立電子事業部從事電力儀錶及電子控制器材的研發製造。目前分為電力儀錶事業部及自動化表面處理設備事業部兩大類，產品外銷世界三十幾個國家。

敏尚企業有限公司在1999年通過ISO9001國際品保認證，秉持「有良好的品質才有美好的明天」「良好的品質是最好的業務員」的經營理念，追求世界級一流品質的目標向前邁進。

為了擴大產能，於2000年在台南擴建2000多坪新廠，投資總額約新台幣壹億多元，並積極在中國大陸、海外設立業務及服務據點。

未來將以多年經驗為基礎，再以更專業的規劃設計及更精確的品質要求，以研發更多符合市場潮流和客戶需要的產品，期以達到行銷國際化而努力。

### **Minsun Technology Co., Ltd.**

was established in 1982. During its initial period of development, the company focused on the design and manufacture of automatic plating machines. In 1989, we set up the Electronic Business Department, which focused on the production and invention of Electronic Meters and Electronic Control Devices. Our company is currently divided into two departments: the Electronic Business Department and the Automatic Surface-finishing Equipment Business Department. Our sales have extended to over 30 countries worldwide.

Minsun Technology Co., Ltd. was approved by ISO9001, the international quarantine of quality in 1999. We have upheld the principles of "Superior quality is the best sales policy," and "Superior quality will create a better future" as our ideal of business management. We are optimistically moving forward, to reach for our goal of world-class quality. To meet the demands of this prosperous market, we set up a new, 6600 square meter's factory in Tainan City in 2000 and invested about 3.5 million US dollars to create an expanding array and competitive advantage.

In the near future, our years-long experience will continue to expand. Based on our professional tactics and targeted search for superior quality, we intend to invent and develop new products that will more readily meet market trends and customers' desires. We will concentrate on targeted products and promote the company in the international market.

## 多功能數位電力錶

### Multi-Function Digital Power Meter



#### 簡介

MSDP-800 為敏尚多功能電錶中最具代表的產品之一，同時顯示十二組數據，即使在昏暗的環境中依然容易閱讀，並具備記錄、列表、警報、需量控制等功能，而且價格合宜。

#### 功能

- **顯示功能**
  - 12視窗同時顯示電力數據，可顯示三相電壓、三相電流、功率因數、頻率、虛功率、瓦時、乏時、視在功率等。
  - 功率單位、倍率 Kilo/Mega 指示燈。
  - 顯示電壓、電流至 21 次總諧波及總諧波失真率的功能。
- **記錄功能**
  - 歷史資料記錄及查詢功能，記錄期間長達兩個月。
- **需量功能**
  - 可顯示現在需量、預估需量、可用需量及最大需量記錄，並可使用輸出接點作四段式需量控制。
- **接點輸出**
  - 四段 Relay 輸出可設定為各項數據上下限警報輸出或需量控制器等用途。
- **列印功能**
  - 連接列表機即可定時列印電力數據、時間及 Relay 狀態功能。
- **通訊功能**
  - 使用 RS-485 與 RS-232 / Modbus 通訊協定傳送電力數據，可於遠端設定 PT / CT 比值及清除瓦 / 乏時累積值。

#### Synopsis

MSDP-800 is the one of most representatives' multi functional meter of Minsun's products. It shows 12 items of data at the same time, even still easy to read in the dim environment, Offer recording, print interface, alarm function, simply demand control, and the price is suitable.

#### Specifications

- **Display function**
  - 12 windows show the electric data at the same time, It's shows three-phase voltage, three-phase current, power factor, frequency, reactive power, watt-hour, reactive energy, apparent power, etc.
  - Unit rate about Power, Kilo / Mega indicator lamps.
  - Offer the total harmonic and THD of the voltage and current.
- **Recording function**
  - The historical data record and inquire about the function, record period up to two months.
- **Demand function**
  - Can show present demand, estimate demand, usable demand and maximum demand etc. most, and can use output contact to make a basic demand controller.
- **Output contact**
  - Four sections of Relay are outputted and can be set up for every data alarm exporting or demand controller, etc. Use.
- **Print interface**
  - Print some of electric data, time and Relay state function regularly when connected printer.
- **Communication function**
  - Use RS-485 and RS-232 convey electric data by Modbus communication protocol, Can set up PT / CT ratio and clear accumulating value of KWH/KVARH when being remote terminal.



## 顯示範圍及解析度

顯示功能	範圍	精確度 (F.S值, 50 / 60 HZ)
電壓	0~9999 V/KV	±0.2%
電流	0~9999 A	±0.2%
功率	0~9999 MW	±0.2%
視在功率	0~9999 MVA	±0.2%
虛功率	0~9999 MVAR	±0.2%
總瓦時	0~999999 MWH	±0.4%
總乏時	0~999999 MVARH	±0.4%
功率因數	0~1 (LEAD/LAG)	±0.4% (PF 1-0.5)
頻率	0~99.9 HZ	±0.2%
需量	0~9999 MW	±0.4%

## Display range and resolution

DISPLAY FUNCTION	RANGE	ACCURACY (FS, 50 / 60 HZ)
Voltage	0~9999 V/KV	±0.2%
Current	0~9999 A	±0.2%
Power	0~9999 MW	±0.2%
Apparent power	0~9999 MVA	±0.2%
Reactive power	0~9999 MVAR	±0.2%
Kilowatt-hour meter	0~999999 MWH	±0.4%
Kvar-hour meter	0~999999 MVARH	±0.4%
Power factor	0~1 (LEAD/LAG)	±0.4% (PF 1-0.5)
Frequency	0~99.9 HZ	±0.2%
Demand	0~9999 MW	±0.4%

## 規格

項目	規格
工作電源	90V~260V AC (頻率範圍 45~65 HZ)
消耗電力	17VA
操作環境	溫度 0~50°C, 濕度 0~90%
輸入電壓	0~510V AC
輸入電流	0~5A AC
繼電器接點容量	5A / 250VAC
停電記憶	10年
尺寸	278 (W) x 180 (H) x 104 (D) mm
開孔尺寸	272 x 175 mm

## Specification

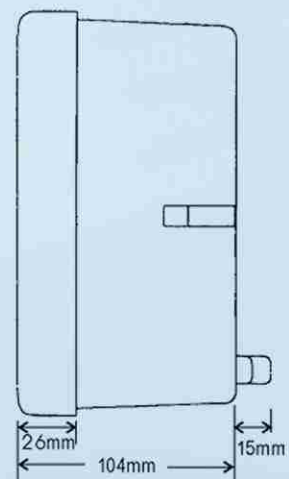
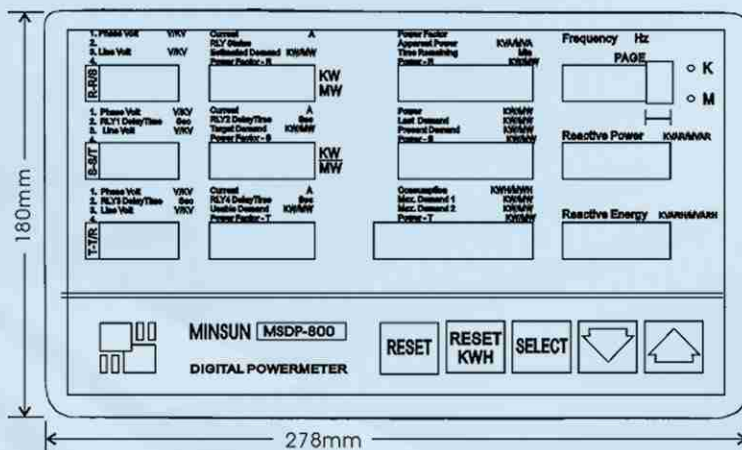
Item	Specification
Power Supply	90V~260V AC (Frequency range 45~65 HZ)
Power consumption	17 VA (max.)
Operating environment	Temperature 0~50°C, Humidity 0~90%
Input voltage	0~510V AC
Input current	0~5A AC
Relay contact capacity	5A / 250 VAC
Power failure memory	10 Years
Size	278 (W) x 180 (H) x 104 (D) mm
Panel cutout	272 x 175 mm

## 機種及外觀尺寸

機種	規格
MSDP-800-3	適用於三相三線式電力系統
MSDP-800-4	適用於三相四線式、單相電力系統

## Models and exterior dimensions

Models	Specification
MSDP-800-3	Three-phase three-wire power system
MSDP-800-4	Three-phase four-wire, single-phase power system



## 多功能電力數據分析儀錶

### Electric Power Meter



#### 簡介

MSDP-300 為多功能電力儀錶中尺寸緊緻，操作簡單、閱讀容易、功能完整、價格經濟的產品之一。

#### 特點

- 4.1" x 2.4" LCD大畫面，同時顯示三組數據。
- 具備項目、單位、模式、頁數等註標顯示，方便閱讀。
- 可切換模式以顯示各電力數據，包括一般模式、諧波模式、基波模式。
- 適用各種高壓、低壓、單相、三相交流電力系統。
- 使用 RS-485 / Modbus 通訊協定傳送各電力數據。

#### 功能

- 一般電力數據
  - 顯示電壓、電流、功率、功因等項目，可分別顯示各相及三相總合數據，依顯示範圍自動調整小數位數以及單位加上 K (kilo)、M (mega) 等符號。
- 電力需量
  - 提供現在需量及最大需量顯示。
- 逆功率
  - 提供功率、乏、瓦時、乏時的逆功率 (電流反向) 顯示。
- 諧波
  - 提供電壓、電流、功率至 21 次的總諧波及總諧波失真率。
- 其他
  - 頻率，內部溫度，工作狀態等訊息顯示。

#### Synopsis

MSDP-300 is a compact size product of MINSUN's multi-functional electric instrument, For operate simply, read easy, function intact, lower in price.

#### Features

- 4.1"x 2.4" large LCD for display, shows three items of data at the same time.
- Showing such instructions as the item, unit, mode, number of pages, etc., it is convenient to read.
- Can switch over the mode and show all electric data, including V, A, Watt, PF, Var, WH, VARH, Demand, Max. Demand, etc. up to 14 pages. include harmonic & THD.
- To fit various kinds of power system. Such as high-voltage, low-voltage, single-phase, three-phases.
- Use RS-485 / Modbus communication protocol to convey all electric data.

#### Specifications

- General electric data
  - To show voltage, current, power, PF, etc., can show separately every phase and three phases summary data, in accordance with showing the range is adjusted unit (kilo, Mega) and decimal-places automatically.
- The Demand of electricity
  - Offer the demand and the maximum demand record to show.
- Reverse power
  - Offer the reverse power, reverse reactive power, reverse consumption, reverse reactive energy ( The electric current is reverse ) show.
- Harmonic
  - Offer the total harmonic and THD to 21th of the voltage, current, power.
- Other
  - Frequency, inside temperature, the working state, etc. show

### 顯示範圍及解析度

顯示功能	範圍	精確度 (F.S值, 50 / 60 HZ)
電壓	0~9999 V/KV	±0.2%
電流	0~9999 A	±0.2%
功率	0~9999 MW	±0.2%
視在功率	0~9999 MVA	±0.2%
虛功率	0~9999 MVAR	±0.2%
總瓦時	0~999999 MWH	±0.4%
總乏時	0~999999 MVARH	±0.4%
功率因數	0~1 (LEAD/LAG)	±0.4% (PF 1-0.5)
頻率	0~99.9 HZ	±0.2%
需量	0~9999 MW	±0.4%

### Display range and resolution

DISPLAY FUNCTION	RANGE	ACCURACY (F.S, 50 / 60 HZ)
Voltage	0~9999 V/KV	±0.2%
Current	0~9999 A	±0.2%
Power	0~9999 MW	±0.2%
Apparent power	0~9999 MVA	±0.2%
Reactive power	0~9999 MVAR	±0.2%
Kilowatt-hour meter	0~999999 MWH	±0.4%
Kvar-hour meter	0~999999 MVARH	±0.4%
Power factor	0~1 (LEAD/LAG)	±0.4% (PF 1-0.5)
Frequency	0~99.9 HZ	±0.2%
Demand	0~9999 MW	±0.4%

### 規格

項目	規格
工作電源	85V~250V AC ±15% (頻率範圍 45~65 HZ)
消耗電力	10VA (max.)
操作環境	溫度 0~50°C, 濕度 0~90%
輸入電壓	0~510V AC
輸入電流	0~5A AC
停電記憶	10年
尺寸	144 (W) x 144 (H) x 109.4 (D) mm
開孔尺寸	138 x 138 mm

### Specification

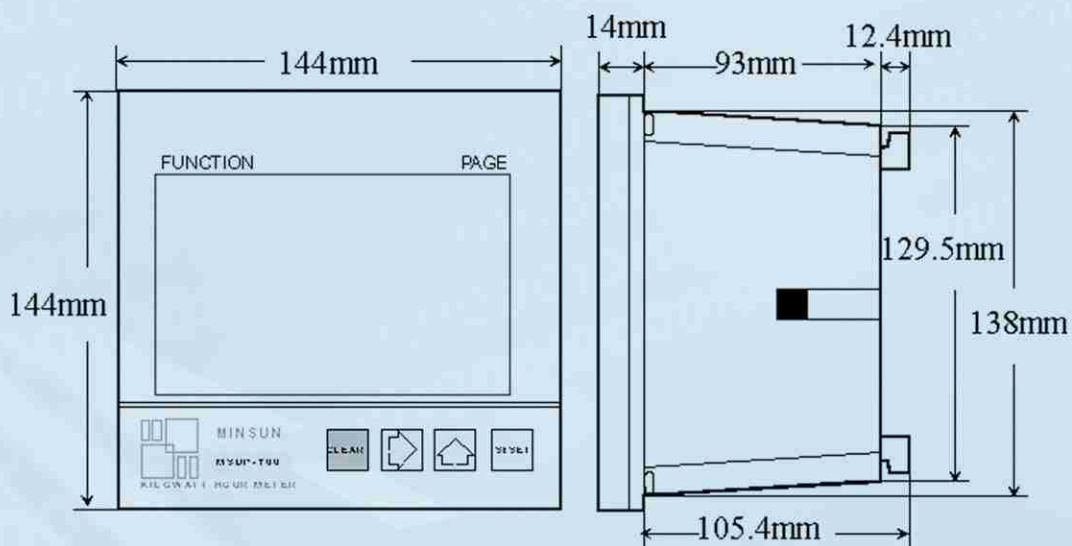
Item	Specification
Power Supply	85V~250V AC ±15% (Frequency range 45~65 HZ)
Power consumption	10 VA (max.)
Operating environment	Temperature 0~50°C, Humidity 0~90%
Input voltage	0~510V AC
Input current	0~5A AC
Power failure memory	10 Years
Size	144 (W) x 144 (H) x 109.4 (D) mm
Panel cutout	138 x 138 mm

### 機種及外觀尺寸

機種	規格
MSDP-300-3	適用於三相三線式電力系統
MSDP-300-4	適用於三相四線式、單相電力系統

### Models and exterior dimensions

Models	Specification
MSDP-300-3	Three-phase three-wire power system
MSDP-300-4	Three-phase four-wire, single-phase power system





## 多功能三相數位電力錶

### Multi-Function Power Meter



#### 機種功能

- 集合式綜合電力錶
  - 同時顯示三相電壓 (V)、三相電流 (A)、實功率 (KW)、虛功率 (KVAR)、頻率 (HZ)、功率因數 (PF) ...等多項數據。
- 可程式設定
  - 各項數據可做上下限警報設定及四組可程式控制輸入點。Relay ON/OFF可設定延遲時間、時間範圍 0-999 秒，並可顯示時間現在值。
- CT、PT 比值可任意設定
  - 可靈活應用於高、低壓盤及大電力的場合，只需在面板上即可修改 PT、CT 比值，活用性高。
- 實功率 (KW) 可做四段式設定
  - 可用於契約容量的管理，減少能源消耗降低電力成本。
- 功率因數超前顯示
  - 可監視功率因數的超前指示，使進相電容器及電力消耗減少到最少降低電力成本。
- RS-232 或 RS-485 通信介面
  - 可連接電腦做工廠之集中電力監控及數據收集。
- 需量管理及需量控制
  - 附有現在需量錶及最大需量錶，並可做四段式需量控制。

#### Features

- Clustered synthesized power meter simultaneous display of a multitude of data:
  - Three-Phase Voltage (V), Three-Phase Current (A), Actual Wattage (KW), Consumption (KWH), Reactive Power (KVAR), Frequency (HZ), Power Factor (PF), Reactive Energy (KVARH).
- Programmable replay
  - All the data permissible for Upper / Lower Limit Alarm Setting, as well as four sets of programmable controlled outputs. Relay ON / OFF permissible for the setting of delay time, ranging from 0 to 999 seconds, may also display exact present-time readings.
- CT、PT ratios adjustable at user's discretion
  - CT、PT ratios adjustable directly on the panel in applications involving HV、LV panels and considerable power consumption.
- Actual wattage (KW) may be set on four settings :
  - Ideal for management of contractual capacities, which helps to reduce energy consumption and is reflected in the savings of power supply costs.
- Power factor leading display
  - Serves to monitor Power Factor Leading Displays, helps to minimize Phase-led Capacitors and power consumption, thereby reducing power rate costs.
- RS-232 or RS-485 communication interfacing
  - May run on-line with computer to serve as Master Power Monitor system at a plant or to collect data.
- Power Demand Management and Power Demand Control
  - Complete with meter indicating present Maximum Demand, and with permissibility for four steps Demand Control。



### 功能及範圍

單位	範圍	精度
交流電壓	0~99.9 KV	±0.2%
交流電流	0~6000 A	±0.2%
瓦特	0~9999 MW	±1.0%
瓦時計	0~99999 MWH	±1.0%
功率因數	0.00~1.00	±2.0%
頻率	40.0~70.0 HZ	±0.1%
視功率	0~9999 MVA	±0.4%
虛功率	0~9999 MVAR	±0.4%
乏時計	0~9999 MVARH	±1.0%
需量計	0~9999 MW	±1.0%
最大需量	0~9999 MW	±1.0%
N 相電流	0~6000 A	±0.5%

### Function & Range

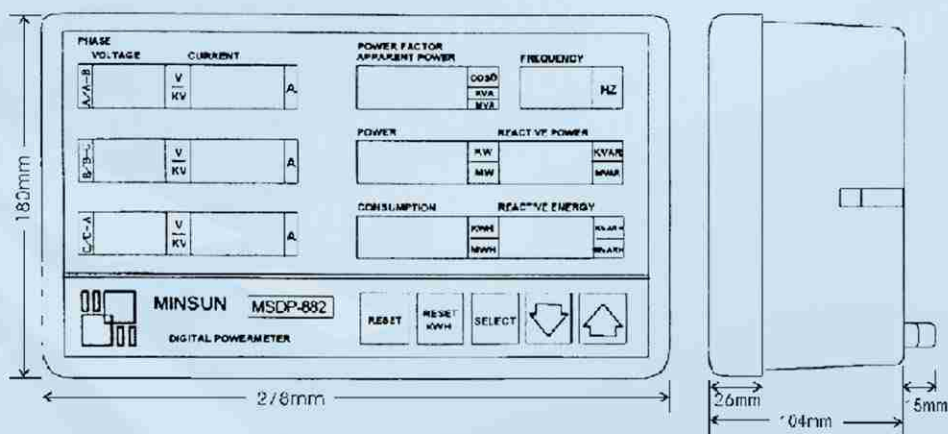
UNIT	RANGE	ACCURACY
AC Voltage	0~99.9 KV	±0.2%
AC Current	0~6000 A	±0.2%
Wattmeter	0~9999 MW	±1.0%
Kilowatt-hour meter	0~99999 MWH	±1.0%
Power factor	0.00~1.00	±2.0%
Frequency meter	40.0~70.0 HZ	±0.1%
Apparent power	0~9999 MVA	±0.4%
Reactive power	0~9999 MVAR	±0.4%
KVAR Hour meter	0~9999 MVARH	±1.0%
Demand meter	0~9999 MW	±1.0%
Max. Demand meter	0~9999 MW	±1.0%
Ground leakage	0~6000 A	±0.5%

### 機種功能表

機種	MSDP-880-					MSDP-882-						
	1	2	3	4	5	1	2	3	4	5	6	
測量 / 顯示項目												
三相電壓	•	•	•	•	•	•	•	•	•	•	•	•
三相電流	•	•	•	•	•	•	•	•	•	•	•	•
功率因數	•	•	•	•	•	•	•	•	•	•	•	•
瓦特	•	•	•	•	•	•	•	•	•	•	•	•
瓦時計	•	•	•	•	•	•	•	•	•	•	•	•
頻率	•	•	•	•	•	•	•	•	•	•	•	•
視功率						•	•	•	•	•	•	•
虛功率						•	•	•	•	•	•	•
乏時計						•	•	•	•	•	•	•
通訊介面	•	•	•	•	•	•	•	•	•	•	•	•
類比輸出	•	•	•	•	•	•	•	•	•	•	•	•
可程式接點	•	•	•	•	•	•	•	•	•	•	•	•
開關延遲	•	•	•	•	•	•	•	•	•	•	•	•
瓦小時接點輸出		•					•					
超前 / 落後顯示			•					•				
N 相電流				•					•			
需量計					•					•	•	
最大需量紀錄					•					•	•	
需量控制器												•

### Functions of each type

TYPE	MSDP-880-					MSDP-882-						
	1	2	3	4	5	1	2	3	4	5	6	
Display Items												
3 Phase Voltage	•	•	•	•	•	•	•	•	•	•	•	•
3 Phase Current	•	•	•	•	•	•	•	•	•	•	•	•
Power Factor	•	•	•	•	•	•	•	•	•	•	•	•
Watt/Active Power	•	•	•	•	•	•	•	•	•	•	•	•
Kilowatt Hour Meter	•	•	•	•	•	•	•	•	•	•	•	•
Frequency Meter	•	•	•	•	•	•	•	•	•	•	•	•
KVA/ Apparent Power						•	•	•	•	•	•	•
KVAR/ Reactive Power						•	•	•	•	•	•	•
KVAR Hour Meter						•	•	•	•	•	•	•
RS-232C Interface	•	•	•	•	•	•	•	•	•	•	•	•
Analog Output	•	•	•	•	•	•	•	•	•	•	•	•
Programmable Setter	•	•	•	•	•	•	•	•	•	•	•	•
Switching Time Delay	•	•	•	•	•	•	•	•	•	•	•	•
KWH Pulse Output		•					•					
Lead/ Lag Display			•					•				
Ground Leakage				•					•			
Demand Meter					•					•	•	
Maximum Demand					•					•	•	
Demand Controller												•



# MSDP-802

## 多功能數位電力錶

### Multi-function Digital Power Meter



#### 簡介

MSDP-802 為敏尚的中階多功能電力錶，可同時最多顯示六組數據，使用LED顯示器，即使在昏暗的環境中依然容易閱讀，並具備接點輸出入、網路通訊介面等功能，而且價格合宜。

#### 功能

- 顯示功能
  - 可同時顯示六到四組不等的電力數據（依頁數而定），包括三相電壓、三相電流、功率因數、頻率、虛功率、瓦時、乏時、視在功率、現在需量、最大需量、剩餘時間等數據。
  - 具有頁數顯示。
  - 功率單位倍率 (K) Kilo / (M) Mega 指示燈。
  - 數位輸出入接點指示燈。
- 顯示位數
  - 電壓、電流、乏、功因、頻率、瓦特可顯示達四位半的讀數。
  - 瓦時、乏時可顯示達十一位數。
- 接點輸出入
  - 兩組Relay輸出可設定為各項數據警報輸出或簡易需量控制器等用途。
  - 四組數位訊號輸入，可於面板上顯示及經由通訊讀取狀態。
- 通訊功能
  - 具備RS-485 / Modbus-RTU及Modbus-TCP雙通信介面。

#### 顯示範圍及解析度

顯示功能	範圍	精確度 (FS值, 50 / 60 HZ)
電壓	0~19999 V/KV	±0.2%
電流	0~19999 A	±0.2%
功率	0~19999 MW	±0.2%
視在功率	0~19999 MVA	±0.2%
虛功率	0~19999 MVAR	±0.2%
總瓦時	0~999999999.9 MWH	±0.4%
總乏時	0~999999999.9 MVARH	±0.4%
功率因數	LAG 0~1~LEAD 0	±0.4% (PF 1-0.5)
頻率	0~99.9 HZ	±0.2%
需量	0~19999 MW	±0.4%

#### 規格

項目	規格
工作電源	110V, 220V AC ±15% (頻率範圍 45~65 HZ)
消耗電力	30VA (max.)
操作環境	溫度 0~50°C + 濕度 0~90%
輸入電壓	0~510V AC
輸入電流	0~5A AC
輸出接點	兩組α接點，容量為 250V / 5A
輸入接點	四組α接點輸入
停電記憶	10年
尺寸	144 (W) x 144 (H) x 109.4 (D) mm
開孔尺寸	138 x 138 mm

#### 機種

機種	MSDP-802-3 三相三線式				MSDP-802-4 三相四線式			
	1	2	3	4	1	2	3	4
功能	•	•	•	•	•	•	•	•
RS-485	•	•	•	•	•	•	•	•
Modbus TCP	•	•	•	•	•	•	•	•
DI, DO	•	•	•	•	•	•	•	•

#### Synopsis

MSDP-802 as a MINSUN mid-range multi-function power meter, still can simultaneously display up to six items of data, the use of LED displays, even in dimly lit environments is still easy to read, and have input and output contact interface, networking interfaces and other functions, and price appropriate.

#### Function

- Display Function :
  - Can display six to four items electric data (depending on the pages), including the three-phase voltage, current, power factor, frequency, reactive power, consumption, reactive energy, apparent power, demand, maximum demand, the remaining time data etc.
  - With the number of pages displayed.
  - Unit of Power rate (K) Kilo / (M) Mega indicator.
  - Digital input/output contacts indicator.
- Display digits
  - Voltage, current, reactive power, power factor, frequency, power can display up to four and a half digits of reading.
  - Consumption (KWH), reactive energy (KVARH) can display up to 11 digits.
- Input / Output contacts
  - Two set of relay can be set to alarm output, or simply demand controller uses.
  - Four digital input can be displayed on the panel and read by the communication.
- Communication
  - With RS-485 / Modbus-RTU and Modbus-TCP dual communications interface.

#### Display Range and Accuracy

DISPLAY FUNCTION	RANGE	ACCURACY (FS, 50 / 60 HZ)
Voltage	0~19999 V/KV	±0.2%
Current	0~19999 A	±0.2%
Power	0~19999 MW	±0.2%
Apparent power	0~19999 MVA	±0.2%
Reactive power	0~19999 MVAR	±0.2%
Kilowatt-hour meter	0~999999999.9 MWH	±0.4%
Kvar-hour meter	0~999999999.9 MVARH	±0.4%
Power factor	LAG 0~1~LEAD 0	±0.4% (PF 1-0.5)
Frequency	0~99.9 HZ	±0.2%
Demand	0~19999 MW	±0.4%

#### Specification

Item	Specification
Power Supply	110V, 220V AC ±15% (Frequency range 45~65 HZ)
Power consumption	30 VA (max.)
Operating environment	Temperature 0~50°C + Humidity 0~90%
Input voltage	0~510V AC
Input current	0~5A AC
Output contacts	Two normal open (250V / 5A) contacts
Input contacts	Four sets of normal open contacts input
Power failure memory	10 Years
Size	144 (W) x 144 (H) x 109.4 (D) mm
Panel cutout	138 x 138 mm

#### Functions of each type

Model	MSDP-802-3 Three-phase three-wire				MSDP-802-4 Three-phase four-wire			
	1	2	3	4	1	2	3	4
Function	•	•	•	•	•	•	•	•
RS-485	•	•	•	•	•	•	•	•
Modbus TCP	•	•	•	•	•	•	•	•
DI, DO	•	•	•	•	•	•	•	•



## 多功能三相電壓電流錶

### Three-Phase Voltage and Ampere Meter



#### 簡介

MSDP-883 領導盤面型電錶進入"集合數位式"的新紀元，詞符合新一代使用者的需求。具高度的運用彈性，清晰易讀的特點，多功能卻易操作，並能提高整個系統的附加價值，充分表現出"數位化是未來趨勢"的優點！

#### 特點

- 同時顯示三相電壓、三相電流
  - 以大型LED集中顯示數據，無傳統VS(電壓開關)、AS(電流開關)切換困擾，同時顯示方便觀察。可由面板單鍵切換△或Y電壓顯示。
- 各項保護功能
  - 欠相保護、過電流保護、過電壓保護、低電壓保護。有兩組輸出、可選擇以a接點或b接點輸出，並可設定動作的延遲時間。
- 安裝簡易
  - CT、PT比值，保護功能等直接由面板設定。並且設定經一程序才能更改(避免被非技術人員更改)。
- 節省工時
  - 配線簡單、工時短，且無傳統需加VS(電壓開關)、AS(電流開關)。
- 一機適用
  - 電流範圍0-6000A、電壓範圍0-510V/KV高低壓、三相三線、三相四線式一機適用，減少庫存，管理方便。

#### 規格

項目	說明
工作電源	110V, 220V, 380V, 440V AC $\pm 10\%$ (15VA Max.) 頻率範圍 50-60HZ
輸入電流	0-5A (CT 輸入), 顯示範圍 0-6000A
輸入電壓	0-510V (PT 輸入), 顯示範圍 0-999V/KV
輸入接點	2 點輸出, 容量 AC220V/DC30V 5A, 機械壽命 2000 萬次
操作環境	溫度 -10~60°C, 溼度 0~90%
尺寸	外型144x144mm, 盤孔138x138mm, 深108.5mm(含端子座) DIN 43 700
精確度	電力錶 $\pm 0.2\%$ F.S., 電流錶 $\pm 0.2\%$ F.S.

#### 機種功能表

系統	MSDP-883	MSDP-883-1	MSDP-883-2	MSDP-883-M
三相電壓	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
三相電流	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
H/L設定警報輸出	<input type="checkbox"/>			<input type="checkbox"/>
三相電流最大值紀錄			<input type="checkbox"/>	
通訊介面				<input type="checkbox"/>

#### Synopsis

MSDP-883 is the leading electric meter, which is entering into a new era of digitalization and which will meet the requirements of a new generation of users. Having a high degree of application flexibility, including features of clearness and easy reading, the easy multifunctional operation and the added value of upgrading the performance of the entire system, it fully shows the advantages of digitalization as a future trend.

#### Features

- Simultaneously display 3-phase voltage and 3-phase current
  - Collectively display data via a large LED without the selection of the traditional VS (voltage switch), AS(current switch), and  $\Delta$  or Y voltage via the front panel and single-key select.
- Various protective functions
  - They include Phase-lack protection, over-current protection, over-voltage protection and under-voltage protection. There are two relay outputs, a contact a or b output, and an on/off relay delay, which can be set from 0-999 seconds.
- Simple and easy installation
  - CT / PT value, protective functions, etc. are set directly from the front panel ; after setup, they cannot be changed except via a certain procedure so as to avoid non-technical personnel from changing them erroneously.
- To save working time
  - With its simple wiring, short work time , there is no need for the addition of the traditional VS ( voltage switch ), AS ( current switch ).
- Applicable to any system
  - Current range : 0-6,000A; voltage range: 0- 510 V/KV; three-phase three-wire , three-phase four-wire systems are suitable. It may also help to decrease stock and facilitate management.

#### Specifications

ITEM	DESCRIPTION
Power Source	110V, 220V, 380V, 440V AC $\pm 10\%$ (15VA Max.) frequency range:50-60HZ
Input Current	0-5A (CT input), display range: 0-6000A
Input Voltage	0-510V (PT input), display range: 0-999V/KV
Output Contact	2-contact output, capacity: AC220V/DC30V 5A, mechanical life: 20 million times
Tolerance	Temperature: -10~ 60°C , humidity: 0~ 90%
Dimension	Exterior:144x144mm, Panel cut out:138x138mm, depth:108.5mm (including terminal)DIN 43,700
Accuracy	Volt meter: $\pm 0.2\%$ F.S. , Ampere meter: $\pm 0.2\%$ F.S.

#### Models Menu

SYSTEM	MSDP-883	MSDP-883-1	MSDP-883-2	MSDP-883-M
Three-phase voltage	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Three-phase current	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
H / L set the alarm output	<input type="checkbox"/>			<input type="checkbox"/>
Three-phase current maximum records			<input type="checkbox"/>	
Communication Interface				<input type="checkbox"/>

# MSDP-700 / 702

## 多功能數位瓦時錶

### Kilowatt Hour Meter



#### 特點

- 6位數大型數位顯示，清晰、易讀。
- 可直接由面板設定PT、CT比值，各種高低壓盤皆適用。
- MSDP-702 附4位數KW / MW 顯示功能。
- 可設定小數位數。
- 設定保護週密，可避免非相關人員修改或設定。
- 同步輸出瓦小時脈波，可直接連接中央監控系統。
- 適用於工廠高、低壓設備，及商場、套房等。

#### Features

- Large 6-digit digital display, clear and easy to read.
- Directly from the panel to set PT, CT ratio, are applicable to a variety of high and low voltage panel.
- MSDP-702 attached to 4-digit KW / MW display.
- Can set number of decimal places.
- Set up to protect well, one can prevent non-related personnel changes or settings.
- Synchronous Output Watt - Hour Pulse, can be directly connected to a central monitoring system.
- Apply to high and low voltage equipment, and plant, shopping malls, suites and so on.

#### 規格

項目	MSDP-700	MSDP-700M	MSDP-702	MSDP-700-30A	MSDP-700-30AM
輸入電壓	0~510V(單相或三相)				
輸入電流	0~5A(單相或三相)		0~30A(單相或三相)		
精確度	±0.5%F.S.				
Pulse輸出	NPN接點(Pulse rate可由面板設定小數位數而變更)				
通訊功能	—	RS-485/MODBUS	—	—	RS-485/MODBUS
保護方式	由背後端子短路之後方可設定				
停電記憶	停電時內部數據可保存兩個月以上				
面板顯示	6位數大型數字KWH / MWH顯示 (MSDP-702附4位數KW / MW顯示)				
工作環境	溫度0~50°C, 濕度0~90%				
工作電源	110V, 220V, 380V, 440V AC ±15% 頻率45~65HZ; 耗電量10VA(max)		220V, 380V AC ±15% 頻率45~65HZ; 耗電量10VA(max)		
外型尺寸	高144x寬144x深105mm (MSDP-700-30A/M 接線長度約10公分) 開孔尺寸:138x138mm				

#### Specifications

ITEM	MSDP-700	MSDP-700M	MSDP-702	MSDP-700-30A	MSDP-700-30AM
Input Voltage	0~510V(Single-phase or three-phase)				
Input Current	0~5A(Single-phase or three-phase)		0~30A(Single-phase or three-phase)		
Accuracy	±0.5%F.S.				
Pulse Output	NPN junction (Pulse rate set by the panel and change the number of decimal places)				
Communication	—	RS-485/MODBUS	—	—	RS-485/MODBUS
Protection Mode	By short the protect terminal				
Power failure memory	Power failure data can be stored more than two months				
Panel Display	6-digit large-scale digital KWH / MWH display (MSDP-702 attached to 4-digit KW / MW display)				
Work environment	Temperature 0 ~ 50 °C, Humidity 0 ~ 90%				
Power Supply	110V, 220V, 380V, 440V AC ±15% Frequency 45 ~ 65HZ; consumption 10VA (max)		220V, 380V AC ±15% Frequency 45 ~ 65HZ; consumption 10VA (max)		
Size	High-144 x Wide 144 x Depth 105 mm (MSDP-700-30A / M cable length of about 10 cm) Panel cutout: 138x138mm				



## 可攜式電力數據分析儀錶

### Portable Power Meter



#### 簡介

MSDP-360 將多功能電力分析儀錶與數位記錄器結合，裝設於可攜帶的鋁箱之中，並搭配開口 CT，可容易在現場觀測並記錄電力數據。

#### 特點

- 4.1" x 2.4" LCD 大畫面，同時顯示三組數據。
- 內建 MSREC-260 SD 卡數位記錄器，即使未連線電腦也可方便的讀取記憶數據。
- 使用 80A 開口夾式 CT，不用停電也能進行安裝作業。
- 顯示項目、單位、模式、頁數等指示，方便閱讀。
- 可切換模式及顯示各電力數據，包括 V、A、Watt、PF、Var、KWH、KVARH、Demand、Max.Demand 等最多至 14 頁畫面，包含諧波、總諧波失真率。
- 適用各種高壓、低壓、單相、三相交流電力系統。
- 附有 RS-485 / Modbus 通訊協定可傳送各電力數據。

#### 功能

- 一般電力數據
  - 電流、功率、功因等項目，可分別顯示各相及三相總合數據，依顯示範圍自動調整小數位數及單位加上 K(Kilo)、M(mega) 等符號。
- 電力需量
  - 提供現在需量及最大需量顯示。
- 逆功率
  - 提供功率、乏、瓦時、乏時的逆功率(電流反向)顯示。
- 諧波
  - 提供電壓、電流、功率的總諧波及總諧波失真率。
- 記憶容量
  - 最大可達約一千五百萬筆記錄。
- 資料格式
  - 相容於 EXCEL 的文字檔表格，並有欄位項目名稱方便判讀。
  - 每筆記錄包含記錄的時間。
- 時間間隔
  - 記錄的時間間隔為可設定，最快為 10 秒記錄一筆資料。

#### 顯示範圍及解析度

顯示功能	範圍	精確度 (FS值, 60 HZ)
電壓	0~9999 V/KV	±0.2%
電流	0~9999 A	±0.2%
功率	0~9999 MW	±0.2%
視在功率	0~9999 MVA	±0.2%
虛功率	0~9999 MVAR	±0.2%
總瓦時	0~999999 MWH	±0.4%
總乏時	0~999999 MVARH	±0.4%
功率因數	LAG 0~1~LEAD 0	±0.4% (PF 1-5)
頻率	0~99.9 HZ	±0.2%
需量	0~9999 MW	±0.4%

#### 規格

項目	說明
工作電源	100V~240VAC ±15% (45~65HZ) · 30VA (max.)
操作環境	溫度 0~50°C，濕度 0~90%
輸入電壓	0~510V AC
輸入電流	0~80A AC
儲存裝置	SD 數位記憶卡，最大容量 2GB
儲存時間間隔	10~86400 秒 (一日)，設定單位為秒
尺寸	200 (W) x 260 (L) x 205 (H) mm

#### Synopsis

MSDP-360 to the multi-function power meter and digital recorders combines, installed in a portable aluminum boxes, and with clamp CT, can be easily observed in the electricity panel and record the power data.

#### Features

- 4.1" x 2.4" large LCD for display, shows three items of data at the same time.
- Built-in MSREC-260 SD Card Digital Recorder, even if not connected computers can also be convenient to read memory data.
- Use of 80A clamp CT, can be installed without switch off power.
- Showing such instructions as the item, unit, mode, number of pages, etc., it is convenient to read.
- Can switch over the mode and show all electric data, including V, A, Watt, PF, Var, KWH, KVARH, Demand, Max. Demand, etc. Up to 14 pages, include harmonic and THD.
- To fit various kinds of power system. Such as high-voltage, low-voltage, single-phase, three-phases.
- Use RS-485 / Modbus communication protocol to convey all electric data.

#### Specifications

- General electric data
  - To show voltage, current, power, PF, etc., can show separately every phase and three phases summary data, in accordance with showing the range is adjusted unit ( kilo, Mega) and Decimal figure automatically.
- The Demand of electricity
  - Offer the demand and the maximum demand record to show.
- Reverse power
  - Offer the reverse power, reverse reactive power, reverse consumption, reverse reactive energy (The electric current is reverse) Show.
- Harmonic
  - Offer the total harmonic and THD of the voltage, current, power.
- Memory capacity
  - Up to about 15 million document records.
- Data format
  - Text file, compatible with EXCEL, and the name of a field item to easy interpretation. Each data contains the record time.
- Time interval
  - Record time interval can be set to 10 seconds minimum.

#### Display Range and Accuracy

DISPLAY FUNCTION	RANGE	ACCURACY (FS, 60 HZ)
Voltage	0~9999 V/KV	±0.2%
Current	0~9999 A	±0.2%
Power	0~9999 MW	±0.2%
Apparent power	0~9999 MVA	±0.2%
Reactive power	0~9999 MVAR	±0.2%
Kilowatt-hour meter	0~999999 MWH	±0.4%
Kvar-hour meter	0~999999 MVARH	±0.4%
Power factor	LAG 0~1~LEAD 0	±0.4% (PF 1-5)
Frequency	0~99.9 HZ	±0.2%
Demand	0~9999 MW	±0.4%

#### Specifications

ITEM	DESCRIPTION
Power Supply	100V~240 VAC ±15% (45~65HZ) · 30VA (max.)
Operating environment	Temperature 0~50°C / Humidity 0~90%
Input voltage	0~510V AC
Input current	0~80A AC
Memory equipmentSD	The SD (Secure Digital) Memory Card · maximum capacity 2GB
Time interval	10 to 86400 seconds (one day), the unit is second
Size	200 (W) x 260 (L) x 205 (H) mm



## 數位記錄器

### Power Recorder



#### 簡介

MSREC-260 為經由通訊界面連接敏尚全系列產品，讀取各裝置的數據而記錄於SD記憶卡的設備。  
達成不必使用監控系統即可以自動記錄電力資訊的功能。

#### 特點

- 使用RS-485 / Modbus 通訊協定連接各電錶。
- 使用SD卡記錄數據，抄錶時替換SD卡即可將數據攜回處理。
- 體積小，軌道式安裝，亦可做為暫時的電力記錄之用。

#### 功能

- **記憶容量**
  - 使用2GB的SD卡，最大可達約一千五百萬筆記錄。
  - 若每分鐘記錄一筆資料，則可記錄長達十年以上的資料。
- **資料格式**
  - 文字檔的表格，相容於EXCEL，並有欄位項目名稱方便判讀。
  - 每筆記錄包含記錄的時間。
- **時間間隔**
  - 記錄的時間間隔為可設定，最快為10秒記錄一筆資料。
- **其他**
  - 若記憶卡滿了，會自動刪除最舊的資料，以記錄新資料。

#### 規格

工作電源	100V~240V AC (7VA MAX.) 50HZ / 60HZ
通訊界面	RS-485 / Modbus-RTU
可連接設備	敏尚所有具 Modbus-RTU 的裝置
最大連接數量	10 部電錶
儲存裝置	SD 數位記憶卡，最大容量 2GB
儲存時間間隔	10~86400秒 (一日)，設定單位為秒
尺寸	80 (L) x 52 (W) x 120 (H) mm

#### Synopsis

MSREC-260 through the communication interface to connect full series of products of MINSUN, reads the data from each meters and recorded in the SD memory card .  
Reached the function that without use SCADA system still can automatically record the information from the power system.

#### Features

- Using the RS-485 / Modbus protocol to connect the meter.
- Use the SD card record data, when meter reading only to replace the SD card that you can bring back the data and then processing.
- Small size, rail mounting, can also be used as a temporary record of the electricity system.

#### Specifications

- **Memory capacity**
  - Using the 2GB SD card, up to about 15 million document records.
  - If a data record per minute, can record over 10 years of data.
- **Data format**
  - Text file of the table, compatible with EXCEL, and the name of a field item to easy interpretation.
  - Each record contains the record time.
- **Time interval**
  - Record time interval can be set to 10 seconds minimum.
- **Others**
  - If the memory card is full, it will automatically delete the oldest data, to record the new information.

#### Specifications

Power Supply	100V~240V AC (7VA MAX.) 50HZ / 60HZ
Communication interface	RS-485 / Modbus-RTU
Equipment can be connected	MINSUN all devices with a Modbus-RTU interface
Maximum number of connections	10 meters
Memory equipment	The SD (Secure Digital) Memory Card , maximum capacity 2GB
Time interval	10 to 86400 seconds (one day), the unit is second
Size	80 (L) x 52 (W) x 120 (H) mm



## 電力需量控制器

### Electric Demand Control



#### 簡介

MSDM-900為敏尚新出品的全功能電力需量控制器，適用於單 / 雙迴路電力系統，最多可控制十二組負載，具備串列通訊功能及列表機介面以及類比訊號輸出功能。

#### 特點

- 負載段數1~12段可設定。
- 一、二、三段式時間電價及休假日可設定。
- 單/雙迴路電力系統適用。
- 各需量時段以列表機列印需量值及負載狀態等資訊。
- 同時顯示目前需量、預測需量、可用需量、實功率、最高需量記錄等實用數據。
- 實功率同時以類比訊號輸出，可連接數字看板或記錄器等裝置。
- 避免超約的負載管理機制。
- 使用RS-485 / Modbus 通訊協定送出資料。

#### 功能

項目	說明
顯示功能	目前需量、預測需量、可用需量、目標需量、實功率、兩組最高需量記錄、剩餘時間、契約模式、控制模式、現在時間、上次需量、負載狀態。
瓦時計輸入端子	兩組瓦時脈波輸入(相加)，可設定脈波速率1~1000K Pulse/KWH
類比輸出端子	實功率以 DC4~20mA 輸出，並且可設定最大值對應點 (Span addition.)
通訊輸出端子	使用RS-485 / Modbus送出目前需量、實功率、負載狀態等資料。
列表機介面	每需量時距結束時列印時間、需量、負載狀態等資料。
控制方式	可選擇順序模式(優先權模式)或循環模式(平均使用率)；可設定滯滯區間以調整控制頻繁程度。
尖 / 離峰時段設定	可個別設定各時間電價的目標需量、可設定二十組休假日、尖峰 / 半尖峰 / 離峰時間可設定。
同步方式	設定系統時間與電力公司電表時間相同而達成同步。
繼電器接點容量	5A / 250 VAC
工作電源	90V~260VAC (頻率範圍45~65HZ)
消耗電力	17VA
操作環境	溫度0~50°C，濕度0~90%
停電記憶	2個月
尺寸	278 (W) x 180 (H) x 104 (D) mm
開孔尺寸	272 x 175 mm

#### Synopsis

MSDM-900 is the full function demand controller of new product from MINSUN, it is suitable for single / twin of power system, can control 12 sections of load at most, possess serial communication function and printer interface and analog signal output function.

#### Features

- 1 ~ 12 sections load can be set up.
- 1, 2, 3 sections of "time of use rate" can be setup.
- Suitable for single / twin of power system.
- Print demand data and load status, etc. when each demand period end.
- Can show present demand, forecast demand, usable demand, power, maximum demand record etc. practical data.
- Provide analog output of power can be connected to PLC, display, recorders and other devices.
- Avoid exceeding the contract demand of load management is invited.
- Use RS-485 / Modbus communication protocol to send data.

#### Function

ITEM	SPECIFICATION
Show the function	Present demand, forecast demand, usable demand, power, two group of maximum demand record, remain time, TOU mode, control mode, time, last demand, load state.
Watt-hour input terminals	There are two groups of terminals for pulses input of two watt-hour meters connected (Summation), Can set up the pulse rate 1~1000K Pulse / KWH.
Analog output	DC 4~20mA corresponding with power, and can set up the maximum point (Span addition.)
Communication output	Use RS-485/Modbus sends present demand, power, load state, etc.
Printer interface	Print demand data and load status, etc. in every demand period end.
Control Mode	Can choose the order mode (Priority mode) Or circulation mode (Average rate of utilization); Can set up the hysteresis band by adjusting and controlling the frequent of load or unload.
Valley / peak time zone set up	Can set up the target demand of each time of use rate, can set up 20 groups of holiday, peak / half a peak / Valley time zone can be set up individually.
Synchronous method	In order to set up system time and period to reach simultaneously with KWH meter of electric power company for synchronous.
Relay contact capacity	5A / 250 VAC
Power Supply	90V~260VAC (Frequency range 45~65HZ)
Power consumption	17VA
Operating environment	Temperature 0~50°C, Humidity 0~90%
Power failure memory	2 Months
Size	278 (W) x 180 (H) x 104 (D) mm
Panel cutout	272 x 175 mm



## 多功能智慧型功因調整器

### Intelligent Power Factor Regulator



#### 特點

- 內附六種表計及警報輸出
  - 功能最強，配線最少。
- 免C/K值設定
  - 完全由電腦偵測（省去技術人員至現場調整，節省人員成本。
- 相序錯誤自動顯示功能
  - 方便除錯，節省工時。
- 電容放電保護功能
  - 有效保護電磁開關及電容器壽命，延長整體盤之壽命，節省長期維修成本。
- 諧波保護功能
  - 不受諧波影響，穩定性高。
- 顯示項目
  - 功率因數 (PF)、電壓 (V)、電流 (A)、無效功率 (KVAR)、頻率 (HZ)、溫度 (C) 等六項數據；並可個別設定上下限警報及延遲時間，以接點輸出。

#### 規格

項目	MSPFR-806	MSPFR-806M	MSPFR-812	MSPFR-812M
工作電源	110V, 220V, 380V, 440VAC ± 15% (15VA MAX.) 50HZ / 60HZ			
相序	單相, 三相三線式, 三相四線式			
輸入電源	5A (CT比值可設定)			
工作點數	最多 6點		最多 12點	
輸出接點容量	AC220V/DC30V5A 機械壽命2000萬次			
接點循環方式	依平均使用率先投入者先切離，延長接點壽命；且未接之多餘接點不加入運轉。			
延遲時間	10~600秒，最小設定單位為一秒			
低載不動作界線	以全載 (KW) 的百分比為不動作區域 (1%~20%可設定)			
自動/手動功能	面板單鍵切換, 方便偵錯			
通訊功能	-	RS-485/MODBUS	-	RS-485/MODBUS
操作環境	溫度 -10°C~60°C, 溼度 0~90%			
盤孔尺寸	138x138mm; 深108.5mm (含端子座) DIN43 700			

#### 顯示及警報

項目	顯示範圍	上限警報	下限警報	警報延遲
功率因數	落後 0.00-1.00, 超前 0.00	•	•	•
電壓	0~510V	•	•	•
電流	0~4000A	•	•	•
無效功率	0~9999KVAR	•	•	•
頻率	40~70HZ	•	•	•
溫度	0~70°C	•	•	•

#### Features

- Includes 6 kinds of meters and alarm outputs
  - It has displays for power factor (Lead/ Lag), KVAR value, Voltage, Current, frequency, temperature with increasing functions and using less wire.
- No need for C / K value setup
  - Complete computer-controlled inspection (Saves the expense of having a technician perform the adjustment)
- Automatically displays phase-order errors
  - Easily make corrections and save working time.
- Capacitors release electricity for protection
  - Effectively protect the magnetic switch and capacitor, prolong the life of the entire set and save repair costs in the long term.
- Prevent from abnormal voltage
  - No effect from abnormal voltage and stability remains high.
- Display items
  - Power factor (PF)、voltage (V)、current (A)、KVAR (KVAR)、frequency (HZ)、temperature (C); six kinds of values can be individually set upper and lower limit alarm and delay time to output by connection points.

#### Specifications

ITEM	MSPFR-806	MSPFR-806M	MSPFR-812	MSPFR-812M
Working Power	110V, 220V, 380V, 440VAC ± 15% (15VA MAX.) 50HZ / 60HZ			
Phase Order	Single phase, 3-phase 3-wire and 3- phase 4-wire			
Input Current	5A (CT ratio can be set directly on the panel)			
Contact Point	Max. 6 points		Max. 6 points	
Output Contact Capacity	AC220V/DC30V5A, mechanical life: 20,000,00 times			
Average Contact Service Recycling Mode	The principle is that an earlier model should be cut off sooner, so that the contacts may be used more evenly, thus achieving a prolonged contact service life( The connection-free redundant with not joint the operating system )			
Delay Time	10~600 seconds. The minimum unit is set as 1 second			
Power-out memory	All the stored data can be saved for no less than 60 days in the event of a power failure.			
Mode of Operation	Automatic/ Manual should be switched on the panel to facilitate error detection.			
Communication	-	RS-485/MODBUS	-	RS-485/MODBUS
Tolerance	Temperature: -10°C~60°C, humidity: 0~90%			
Cutout size	138x138mm; depth:108.5mm (including terminal set ) DIN43 700			

#### Display & Alarm

ITEM	DISPLAY RANGE	UPPER-LIMIT ALARM	LOWER-LIMIT ALARM	ALARM DELAY
Power Factor	Lag: 0.00~1.00, Lead: .00~-1.00	•	•	•
Voltage	0~510V	•	•	•
Current	0~4000A	•	•	•
KVAR	0~9999KVAR	•	•	•
Frequency Meter	40~70HZ	•	•	•
Temperature	0~70°C	•	•	•



## 自動功因調整器

### Power Factor Regulator



#### 簡介

APFR-6 功因調整器除了可滿足控制功率因數之外，尚有免設定的優點。

與 MSPFR 系列同樣具有完整的錯誤碼提示功能，使得安裝時的除錯更加容易。

#### 特點

- 免 C / K 值設定，完全自動偵測。
- 相序錯誤自動顯示功能，方便除錯，節省工時。
- 電容放電保護功能，確保電容放電完成後才可再投入，有效保護電磁及電容器壽命。
- 含功率因數 (PF) 顯示，及投入段數顯示。
- 可選擇手動 / 自動操作功能。
- 電容性、電感性負載顯示。
- 停電時會自動切離，復電後依序投入。
- 電容器依平均循環使用率功能，可延長接點壽命。
- 外型尺寸：高144 x 寬144 x 深105 mm
- 開孔尺寸：138 x 138 mm

#### 規格

工作電源	110V, 220V, 380V, 440V ±15% (15VA MAX.) 50HZ / 60HZ
相序	單相、三相三線式、三相四線式
輸入電流	5A (CT 比值可設定)
工作點數	最多6點
輸出接點容量	AC220V / DC30V 5A 機械壽命2000萬次
延遲時間	10~600秒，最小設定單位為一秒
低載不動作界限	以全載入 (KW) 的百分比為不動作區域 (1% ~ 20%可設定)

#### Synopsis

APFR-6 in addition to meet the control power factor, it still has the advantages of setting free.

Have complete error code of suggestion function as MSPFR series, except that further easy trouble shooting when installing.

#### Features

- Avoid C/K value to set up, totally detects and examines automatically.
- The function for phase sequence mistake display, convenient to obviate the fault, saves working man-hour.
- The electric capacity discharges and protects function. Protect the electromagnetic switch and life-span of it is just more absorbed after the electric capacity discharges and finishes to guarantee, capacitors effectively.
- Include the power factor (PF), and capacitors inserted section display.
- Can choose manually / automatically for function operate.
- Capacitive or inductive indicate.
- The action principle of the capacitor adopts the circulation function of average rate of utilization, can lengthen the contact and life-span of capacitor.
- Can cut capacitors connect automatically when power failure, Insert capacitors in order after power normally.
- Size: High 144 x Wide 144 x Deep 105 mm.
- Panel cutout: 138 x 138 mm.

#### Specification

Working power	110V, 220V, 380V, 440V ±15% (15VA MAX.) 50HZ / 60HZ
System fit.	Single-phase, three-phase three-Line system, three-phase four-Line system
Input current	5A (CT ratio can be set up)
Output segment	6 segment most more
Output contact	AC220V / DC30V 5A mechanical life-span 20 million times
Delay times	10~600 seconds, it is one second to set up the unit minimully
Light-loading-none-act-limit	Enter with the Percentage of full load (KW) for being unable to act (1% ~ 20% can be set)

## 電力轉換器

### Multi-Functional Electric Transducer



#### 簡介

MSDP-200 為功能完整的集合式電力轉換器，將各項電力數據傳送至遠端的控制器或電腦主機。適用於監控系統的電力資訊擷取。

#### 特點

- 遠端設定 PT / CT 比值及清除累積值
- 適用各種高壓、低壓、單相、三相交流電力系統。
- 使用 RS-485 / Modbus 通訊協定傳送各電力數據。

#### 功能

- 一般電力數據
  - 可量測三相電壓、電流、功率、功因等項目，並依顯示範圍自動調整小數位數以及單位加上 K (kilo)、M (mega) 等符號。
- 電力需量
  - 提供現在需量及最大需量數據。
- 逆功率
  - 提供功率、乏、瓦時、乏時的逆功率 (電流反向) 數據。
- 諧波
  - 提供電壓、電流、功率至 21 次的總諧波及總諧波失真率數據。
- 脈波輸出
  - 提供瓦時的脈波輸出，可連接 PLC、計數器等裝置以統計耗電量。
- 類比輸出
  - 提供實功率的類比輸出，可連接 PLC、字幕機、記錄器等裝置。
- 其他
  - 頻率，內部溫度，工作狀態等訊息資訊。

#### Synopsis

The MSDP-200 is an integrated electric converter that has intact function, it can transmission all electric data to the controller or host computer that is carried far. Suitable for the electric data retrieval of the electro power monitoring system.

#### Features

- Can set up PT / CT ratio and clear the accumulating value by remote device.
- To fit various kinds of power system. Such as high -voltage, low -voltage, single-phase, three phases.
- Use RS-485 / Modbus communication protocol to convey all electric data.

#### Specifications

- General electric data
  - Current, power, power factor, etc. To have every phase and three phases summing up data.
- Demand of electricity
  - Offer the present demand and maximum demand record data.
- Reverse power
  - Provider reverse power detected, reverse power consumption ( -KWH ), reverse reactive power consumption ( -KVARH ) data.
- Harmonic
  - Offer the total harmonic and THD of the voltage, current, power.
- Analog output
  - Provide analog output of power can be connected to PLC, display, recorders and other devices
- Other
  - Frequency, inside temperature, the working state, etc. detect.



### 量測範圍及解析度

量測功能	範圍	精確度 (FS值, 50 / 60 HZ)
電壓	0~9999 V/KV	±0.2%
電流	0~9999 A	±0.2%
功率	0~9999 MW	±0.2%
視在功率	0~9999 MVA	±0.2%
虛功率	0~9999 MVAR	±0.2%
總瓦時	0~999999 MWH	±0.4%
總乏時	0~999999 MVARH	±0.4%
功率因數	0~1 (LEAD/LAG)	±0.4% (PF 1-0.5)
頻率	0~99.9 HZ	±0.2%
需量	0~9999 MW	±0.4%

### Measurement range and resolution

FUNCTION	RANGE	ACCURACY (FS, 50 / 60 HZ)
AC Voltage	0~9999 V/KV	±0.2%
AC Current	0~9999 A	±0.2%
Wattmeter	0~9999 MW	±0.2%
Apparent power	0~9999 MVA	±0.2%
Reactive power	0~9999 MVAR	±0.2%
Kilowatt-hour meter	0~999999 MWH	±0.4%
Kvar-hour meter	0~999999 MVARH	±0.4%
Power factor	0~1 (LEAD/LAG)	±0.4% (PF 1-0.5)
Frequency	0~99.9 HZ	±0.2%
Demand meter	0~9999 MW	±0.4%

### 規格

項目	規格
工作電源	85V~250V AC ±15% (頻率範圍 45~65 HZ)
消耗電力	10VA (max.)
操作環境	溫度 0~50°C, 濕度 0~90%
輸入電壓	0~510V AC
輸入電流	0~5A AC
脈波輸出	可設定脈波速 1~1000K Pulse / KWH
類比輸出	DC4~20mA, 可設定最大對應點。
停電記憶	10年
尺寸	135 (W) x 150 (H) x 70 (L) mm

### Specification

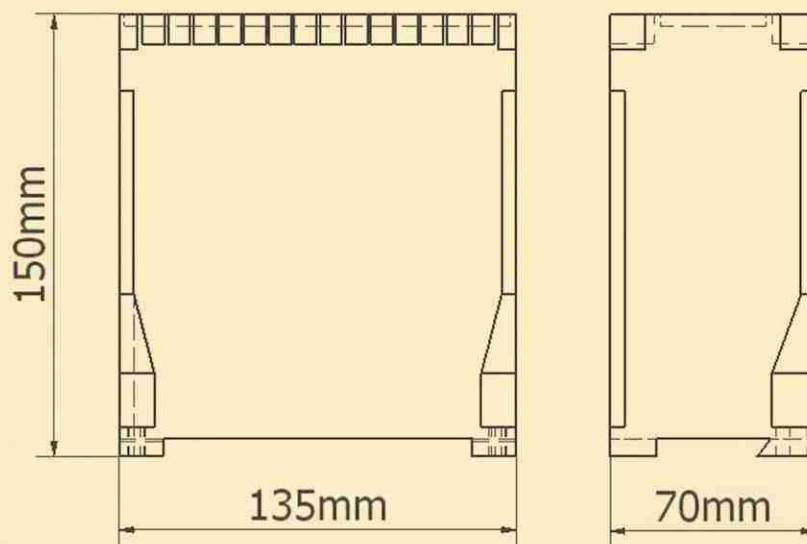
Item	Specification
Power Supply	85V~250V AC ±15% (Frequency range 45~65HZ)
Power consumption	10VA (max.)
Operating environment	Temperature 0~50°C · Humidity 0~90%
Input voltage	0~510V AC
Input current	0~5A AC
Pulse output	Pulse wave velocity can be set 1~1000K Pulse / KWH
Analog Output	DC4~20mA, Corresponding points can be set to the maximum.
Power failure memory	10 Years
Size	135 (W) x 150 (H) x 70 (L) mm

### 規格尺寸

機種	規格
MSDP-200-3	適用於三相三線式電力系統
MSDP-200-4	適用於三相四線式、單相電力系統

### Size

Models	Specification
MSDP-200-3	Three-phase three-wire power system
MSDP-200-4	Three-phase four-wire, single-phase power system



## 多類型訊號轉換器

### Signal Transducer



#### 特點

- 線性度高，穩定性良好。
- 高精準度  $\pm 0.1\%$ 。
- 輸入、輸出範圍可按客戶系統需求設計。
- 輸入、輸出隔離效果良好，不易干擾。
- 含輸入訊號 LED 百分比顯示器易於偵錯。
- 異常時 LED 顯示器會閃爍警告方便除錯。
- 插座式標準設計，體積小，安裝方便。  
(W50 x H78 x D100 mm)
- 電源 AC110V / 220V  $\pm 10\%$  50 / 60HZ ;  
消耗電力 4 VA 以下。

#### Features

- High linearity and high stability.
- High accuracy to 0.1%.
- Collect statistics on range of input and output according to customer's system demand.
- Good effects of safeguarding input and output to protect and not easy to interrupt.
- Percentage of the input signal LED display with easy-to-debug.
- When the signal is abnormal, LED monitor will light, warning the users to correct error easily.
- Standard socket-type design, small size and expedient installation ( W50 x H78 x D100 mm ).
- Power : AC110V/ 220V  $\pm 10\%$  50/ 60HZ ;  
Electricity Consumption: Less than 4VA.

#### 各類型訊號轉換器

類別	功能描述	輸入 / 輸出範圍
MST-DC 直流訊號轉換器	直流電壓/電流輸入轉換為直流電壓/電流輸出	輸入: 0~600V DC / 0~1A DC 輸出: 0~10V DC / 0~20mA DC
MST-AC 交流訊號轉換器	交流電壓/電流輸入轉換為直流電壓/電流輸出	輸入: 0~440V AC / 0~10A AC 輸出: 0~10V DC / 0~20mA DC
MST-A, MST-B 警報設定轉換器	以面板的指撥開關設定兩組警報點百分率，當輸入訊號高於設定點時警報輸出，低於設定點則警報復歸。	輸入: 0~600V DC / 0~1A DC 輸出: 1a1b contact
MST-RT 反向轉換器	直流電壓/電流輸入轉換為直流電壓/電流輸出，但輸出入訊號成反比。	輸入: 0~600V DC / 0~1A DC 輸出: 10~0V DC / 20~0mA DC
MST-T、J、K 熱電偶溫度轉換器	適用K、T、J-TYPE的熱電偶	輸入: 0~1200°C 輸出: 0~10V DC / 0~20mA DC
MST-RD RTD溫度轉換器	適用PT100的白金溫度探針	輸入: -50~400°C 輸出: 0~10V DC / 0~20mA DC
MST-FD 頻率轉換器	直流頻率電壓輸入轉換為直流電壓 / 電流輸出。	輸入: 0~2KHz 50Vp-p Max. 輸出: 0~10V DC / 0~20mA DC
MST-W 瓦特轉換器	三相三線或三相四線式電壓 / 電流訊號輸入轉換為直流電壓/電流輸出。	輸入: 3P3W/3P4W, 110/220 VAC 輸出: 0~10V DC / 0~20mA DC
MST-RS 電阻訊號轉換器	電阻訊號轉換為直流電壓 / 電流輸出。	輸入: 0~2M $\Omega$ 輸出: 0~10V DC / 0~20mA DC
MST-MF 雙輸入轉換器	兩組直流電壓 / 電流輸入，相加或相減後轉換為直流電壓 / 電流輸出。	輸入: 0~600V DC / 0~1A DC 輸出: 0~10V DC / 0~20mA DC

#### Type of transducer

Models	Function	Input / Output Range
MST-DC DC Signal Transducer	DC voltage or current input converted to DC voltage or current output.	Input: 0~600V DC / 0~1A DC Output: 0~10V DC / 0~20mA DC
MST-AC AC Signal Transducer	AC voltage or current input converted to DC voltage or current output.	Input: 0~440V AC / 0~10A AC Output: 0~10V DC / 0~20mA DC
MST-A MST-B Alarm Transducer	Use two sets panel DIP switch to set the alarm percentage points, when the input signal above the set point, alarm output, below the set point, alarm reset.	Input: 0~600V DC / 0~1A DC Output: 1a1b contact
MST-RT Reverse Transducer	DC voltage or current input converted to DC voltage or current output, but the output is inversely proportional to the input signal.	Input: 0~600V DC / 0~1A DC Output: 10~0V DC / 20~0mA DC
MST-T、J、K Thermocouple Transducer	Fit to the thermocouple of K、T、J-TYPE, converted to DC voltage or current output.	Input: 0~1200°C Output: 0~10V DC / 0~20mA DC
MST-RD RTD Signal Transducer	Apply PT100 platinum temperature probe, converted to DC voltage or current output.	Input: -50~400°C Output: 0~10V DC / 0~20mA DC
MST-FD Frequency Transducer	DC Frequency voltage signal input converted to DC voltage or current output.	Input: 0~2KHz 50Vp-p Max. Output: 0~10V DC / 0~20mA DC
MST-W Watt Transducer	AC 3P3W or 3P4W voltage and current input converted to DC voltage or current output.	Input: 3P3W/3P4W, 110/220 VAC Output: 0~10V DC / 0~20mA DC
MST-RS Resistance signal transducer	Resistance signal converted to DC voltage or current output.	Input: 0~2M $\Omega$ Output: 0~10V DC / 0~20mA DC
MST-MF Math function transducer	Two DC voltage / current input, plus operator or minus operator after the conversion to the DC voltage / current output.	Input: 0~600V DC / 0~1A DC Output: 0~10V DC / 0~20mA DC



# 電力監控系統

## Power SCADA System



### 簡介

本公司所推出的監控系統，是架構在 PC Base 的系統軟體，配合本公司生產的多功能數位電力錶及結合可程式控制器 (PLC)，達成電力集中監控的功能。

### 系統軟體功能

#### ● 監控系統

- 本軟體具備有多工作業之能力，可同時監視多組數位電力錶，執行操作、警報、紀錄及列印表等功能。
- 本軟體具有彩色中文顯示能力，能顯示各式電力數據、曲線圖、警報等畫面。
- 監視的電力數據以數位電力錶為單位，在不同畫面顯示、監視及警報，操作人員可任意改變、切換其畫面。
- 為了方便操作員監視，能迅速掌握狀況，所有類比監測數據如電壓、電流、頻率、KW、PF、KWH 等數據均可以燈號、狀態文字或圖形符號等方式顯示。

#### ● 警報功能

- 所有類比數據可設定上限警報，下限警報，並可設定其警報狀態。
- 警報狀況以燈號或文字訊號顯示於畫面上，並可接受操作人員的個別確認操作。各種警報狀況能以不同欄位表示，在操作員確認前需閃爍，確認後即維持該警報狀態的顏色不再閃爍。

#### ● 列印功能

- 報表資料可列印數據，資料檔案的儲存會自動換檔，以確保資料的完整性。紀錄之資料檔可循環覆蓋使用，以節省磁碟儲存空間。
- 除了文字報表外，系統能列印歷史資料及曲線圖，曲線圖可容納多條曲線，以清楚表達資料方便閱讀。

### Synopsis

Our Power Management System is a PC-based system software framework and works in conjunction with our brand products: Multi-function digital Power Meter and Programmable Controller ( PLC ) in order to functions for manage power.

### Function of Software of System

#### ● Monitor System

- This software contains multilateral capabilities and simultaneously monitors several digital power meters. It also performs the following functions: Alarm, Record, Manipulation, and Print.
- This software is able to display in color, and it also displays window of any type of power data, diagram of curves and alarm.
- The power data in the monitor takes sources information from a Digital Power Meter and then displays the monitor and alarm in different windows. The operator can change and switch windows by user.
- Displays all the analog monitor data, such as Voltage, Current, Frequency, KW, Power Factor, KWH by a light sign, status words or figures and symbols in order to facilitate operation of the monitor and to help the operator to complete his work promptly.

#### ● Alarm Function

- All the Analog Data are able to setup high-limit alarm and low-limit alarm and alarm situations.
- The alarm situation is displayed on the window by a light sign or status words and can be managed and confirmed by the individual operator. Each type of alarm situation can be displayed in a distinct column. It will be lit before confirmation of the operator, and after confirmation by the operator, it will remain unlit in the color of alarm situation.

#### ● Print Function

- You can print out the data report and save all the data in different files automatically in order to ensure the completeness of the data. The records of these data files can be updated with new data in order to save hard disc space.
- Besides written reports, the system can also print out historical data and multicurve diagrams. It will display clear data and aid the reader in the study thereof.

# 需量控制系統

## Demand Control System



### 簡介

台電公司之營業規則對於申請需量電錶的用戶，皆在電錶中設有微電腦來測量最高用電量並記錄之。若最高用電量超過申請之契約容量，則可向用電戶加收超過契約容量用電罰款。

電力需量監控之優點就在於如何協調各負載設備的用電時段，以增進變電設備之效率，減少變電設備之設置容量、降低契約容量、減少流動電費及超約罰款之支出，減少能源的消耗及增加用電安全，且全天候由電腦監視守護，省電省錢又安全。

### 特點

- 顯示每 15 分鐘最大需量值及負荷率。
- 顯示日最大需量、月最大需量、年最大需量紀錄及時間。
- 顯示日、月累積 KWH 值，總累積 KWH 值。
- 尖峰、半尖峰、離峰時間設定尖峰、半尖峰、離峰最大需量值設定。
- 顯示各項電力數據及負載曲線。
- PT、CT 比率值設定。
- 負載控制迴路輸出 8 或 16 點控制方式。
- 回路自動控制方式：
  - (1) 優先順序控制
  - (2) 循環順序控制

### Synopsis

Power company has certain regulations for any applicant who needs power demand electric meter. The inside electric meter sets up using a microcomputer to gauge the maximum demand and to record it. If the maximum consumption of electricity is over the Contracted Demand, the user will be fined an extra bill for breaking the Contracted Demand.

The advantages of the Electric Demand Control system are that it regulates and adjusts the time of electric consumption of each piece of equipment, increasing efficiency and reducing the capacity of converting equipment, that it decreases contracted capacity, that it reduces the current bills and fines of breaking the contract. It also can cut down the power source consumption and raise consumption safety. Full-time control and computer-controlled protection are other advantages that save costs and electricity and maintain safety.

### Features

- Display the workload maximum and ratio every 15 minutes.
- Display the maximum by day、month、and year and reveal its time.
- Display the accumulative KWH value and its total value.
- Set up the time and maximum demand value of peak、half-peak、low-peak period.
- Display all electric data and the loading curve thereof.
- Set up the PT、CT ratio value.
- Output 8 or 16 points of loading control electric circuit.
- Methods of automatic electric circuit control：
  - (1) Prior-order control
  - (2) Circle-order control



## AC 電焊機專用防電擊待機節能裝置

### AC Welding Anti-Shock Device



#### 簡介

勞工安全衛生設施規則規定「僱主對勞工於良導體機器設備內之狹小空間或在高度兩公尺以上之鋼架上作業時，所使用之交流電焊機應具備自動電擊防止裝置」。

三機一體：自動防電擊 + 漏電防止 + 待機節能。

#### 特點

- 空載安全電壓小於24V，內含漏電跳脫功能，將各種環境的觸電危險降至最低，確保操作人員的安全。
- 啟動時間小於0.06s，對於電焊作業的效率沒有影響。
- 起啟動靈敏度小於500 歐母，當人體於接觸輸出線路時(包括潮濕場合)不會起動，達到安全保護作用。
- 待機延時小於1s，當輸出空載電壓達80V時，可在1s內降至小於24V以下，防止人身觸電危險。

#### 規格

入力電源	220V AC
出電電壓	AC 19V
延遲時間	約一秒
控制方式	入電式
漏電檢知	50mA 防止電焊機漏電
狀態LED	紅(待機)、黃(動作中)、綠(漏電)

#### 效果比較

項目	裝設本裝置	未裝設本裝置
電焊機空載時輸出電壓	19VAC 可避免電擊	80VAC
待機功因 (PF)	1	0.18
待機電流	0.1A 可節省電費	10A 以上
漏電斷路功能	有	無

#### Synopsis

This installment conforms to government stipulation " When employer to laborer in good conductor machinery equipment work, the use AC electric welding machine have to installed Anti-electric shock device "

"Three function integrated: Automatic anti-shock + electric leakage prevent + standby energy saving.

#### Features

- Safety no-load voltage is less than 24V, content electric leakage trip function, Will all-environment get an electric shock danger to decline to lowest, ensure the safety of the operator.
- Start-up time of less than 0.06s, don't influence the efficiency of electric welding work .
- Start-up sensitivity of less than 500 Ohm, when the human body contact with the output lines ( including wet places ) will not start too, Reach the function of the safety protection.
- Standby delay is less than 1 second, when the output voltage up to 80V at no load can be reduced to 24V during 1 second, to prevent an electric shock hazard to the person.

#### Specifications

Power input	220V AC
Output voltage	AC 19V
Delay time	About one second
Control mode	Into electric method
Leakage detector	50mA to prevent leakage of electric welding machine
Status LED	Red (Standby), Yellow (In action), Green (Leakage)

#### Comparison

Item	To installation the device	Not to install the device
No-load output voltage of electric welding machine	19VAC can avoid electric shocks	80VAC
Standby power factor (PF)	1	0.18
Standby current	0.1A, can saving electricity	More than 10A
Leakage break - circuit function	Have	Without



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