

## Electricity Meters and AMR System



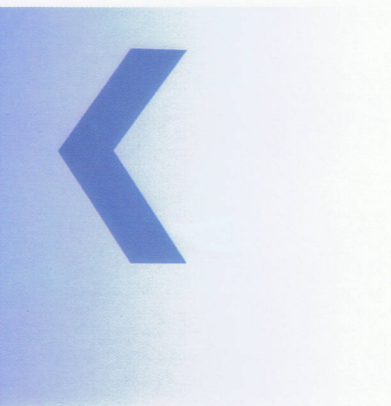
For Civil and Industrial Use



**ฮอลี่ กรุ๊ป**  
HOLLEY GROUP



# COMPANY PROFILE



Holley Group subsidiary companies Holley Group Electric (Thailand) Co., Ltd, Holley Electronic meter Co., Ltd, are professional meter manufactory in Thailand, which has been established on year 2000, as the headquarter in Southeast Asia, Holley Group has its own head office in Bangkok Thailand, and factory area is around 8400sqm in AMATA Industrial Zone, located in Chonburi, Thailand.

Holley Group adopts the essential technology on meter manufacturing of Holley Group China, which has history more than 36 years in R&D, designing, manufacturing and service for meter, and make use of the experiences for factory-running in Thailand more than 6 years. At present, the products of energy meter have been sold to Electricity of Thailand and other Southeast Asia countries.

Beside, Holley has bases in Hangzhou, Chongqing, Kunming, Guangzhou, Beijing, Shenyang and Hainan of China, and manufacturing plants and research institutions in U.S.A. and Canada, India, Argentina, Nigeria, Philippines etc. The comprehensive economic indicator of electricity meters, Holley's core business, has been leading meter manufacturers in China, which enables the company to be the biggest electricity meter manufacturer worldwide.



# WE ARE HOLLEY GROUP

## CERTIFICATE

TIS9001-2552 MASCI (ISO 9001:2008)

MASCI and AFAQ

**ใบรับรอง**  
เลขที่: 01/01/2552

**ผู้รับใบรับรอง**  
ชื่อบริษัท: บริษัท ออลซี อิเล็กทรอนิกส์ จำกัด  
ที่ตั้ง: เลขที่ 255 หมู่ 6 ตำบลบางพลีใหญ่ อำเภอบางพลี จังหวัดสมุทรปราการ 10540

**ประเภทของผลิตภัณฑ์**  
ชื่อผลิตภัณฑ์: เครื่องวัดไฟฟ้าแบบอิเล็กทรอนิกส์

**ผู้ตรวจประเมิน**  
ชื่อ: นายสมชาย ใจดี  
ตำแหน่ง: ผู้จัดการฝ่ายตรวจสอบ

**ผลการประเมิน**  
ผลการประเมิน: ผ่านเกณฑ์การประเมิน

**วันที่หมดอายุ**  
วันที่: 31/12/2552

**ใบรับรอง**  
เลขที่: 01/01/2552

**ผู้รับใบรับรอง**  
ชื่อบริษัท: บริษัท ออลซี อิเล็กทรอนิกส์ จำกัด  
ที่ตั้ง: เลขที่ 255 หมู่ 6 ตำบลบางพลีใหญ่ อำเภอบางพลี จังหวัดสมุทรปราการ 10540

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**วันที่หมดอายุ**  
วันที่: 31/12/2552

**KEMA**

**CERTIFICATE**  
TYPE TEST OF ENERGY METERS

**Manufacturer**  
Contact person  
Address  
Postal code, Place  
Country

**Production site**  
Address  
Postal code, Place  
Country

**Instrument**  
Electronics single-phase two-wire energy meter

**Mark - Type**  
Register  
Accuracy Class  
Measurement range

**Use**  
Protection Class

The energy meter meets the requirements of:  
IEC 62053-21 (2003)  
IEC 62053-21 (2003)  
Based on a non-recurrent examination.

The results are recorded in our test report with reference 7214209-TCI 0084-11.

**KEMA Nederland B.V. - Calibration & Testing**  
Address: Jan van Goyenkade 1  
4132 PH Vianen, The Netherlands  
T +31 (0)36 536 5118 F +31 (0)36 536 5117

**CERTIFICATE**  
ELECTROMAGNETIC COMPATIBILITY

**Applicant**  
Contact person  
Address  
Postal code, Place  
Country

**Manufacturer**  
Address  
Postal code, Place  
Country

**Electrical equipment**  
Transformer operated static three-phase four-wire energy meter

**Type**  
Class  
Measurement range

**Environment**  
Residential, commercial and light industrial

IEC 62053-21 (2003)  
IEC 62053-21 (2003)  
IEC 62053-21 (2003)

The undersigned declares that the described products meet the essential requirements of the EMC Directive 89/368/EEC.

**KEMA Quality B.V.**  
Contact person  
Address  
Postal code, Place  
Country

**Certification Manager EMC**

**Certificate no. 2000338-QUACAL 06-4013E**

**ISO9001**  
QUALITY MANAGEMENT SYSTEM

**Certificate of Approval**  
This is to certify that

**Holley Electronic Meter Co., Ltd.**  
Address of head office: 255 Soi Ratchadaphisek 6, Ratchadaphisek-Road, Bangkok 10600, Thailand

**Address of premises:** 700/793 Plo 6, Rongkham Industrial Estate, Chonburi 20000, Thailand

has been assessed and found to be conforming to the requirements of TIS 9001-2552 (ISO 9001:2008)

for the scope:  
1. Manufacture of electronic alternating current watt-hour meter by assembling  
2. Manufacture of alternating current watt-hour meter by assembling

**Dr. S. S. Kulkarni**  
President

**ISO9001**  
QUALITY MANAGEMENT SYSTEM

**ใบรับรองระบบบริหารคุณภาพ**  
This is to certify that

**บริษัท ออลซี อิเล็กทรอนิกส์ จำกัด**  
สำนักงานใหญ่: 255 หมู่ 6 ตำบลบางพลีใหญ่ อำเภอบางพลี จังหวัดสมุทรปราการ 10540

**สาขาสถาปัตยกรรม:** 700/793 หมู่ 6 อุตสาหกรรมโรงกัม จังหวัดชลบุรี 20000

ได้รับการประเมินและพบว่าตรงตามข้อกำหนดของ TIS 9001-2552 (ISO 9001:2008)

สำหรับขอบข่าย:  
1. การผลิตเครื่องวัดไฟฟ้าแบบอิเล็กทรอนิกส์โดยการประกอบ  
2. การผลิตเครื่องวัดไฟฟ้าแบบอิเล็กทรอนิกส์โดยการประกอบ

**Dr. S. S. Kulkarni**  
President

## SCOPE OF BUSINESS

Manufacture of Watt-Hour meter and electrical equipment

## MAIN PRODUCT

- Single phase watt-hour meter
- Three phase watt-hour meter
- Single phase and multi-phase electronic meter
- Automatic meter reading system

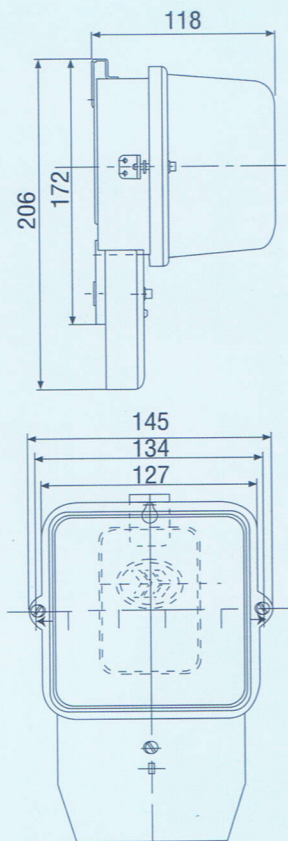
## MAJOR CUSTOMER

- Provincial Electricity Authority (Thailand)
- Metropolitan Electricity Authority (Thailand)
- National Electricity Cooperatives (Philippines)
- Electricite Du Laos (Laos)



# Product HLD01 Series

Outline Dimension (mm)



## DESCRIPTION

The HLD01 single-phase watt-hour meter is adopted the latest technology in the range of ferrous type induction meter. The meter has been designed in a modular structure allowing for fewer components with the benefits of reduced cost and increased reliability. Servicing costs have been kept to a minimum due to the structure design, and the wide measuring range ensures accurate measurement at both low and high loads.

The HLD01 meter enables electricity supplier authorities to install the meter with total confidence, realizing these expected high peak loads, while at the same time recording low consumption accurately.

A long and trouble-free service life is guaranteed by a state of art design concept, specialized finishing of components, and high stability of the brake magnets.

The HLD01 meter, awarded the KEMA certification, has been designed and manufactured in compliance with IEC521.



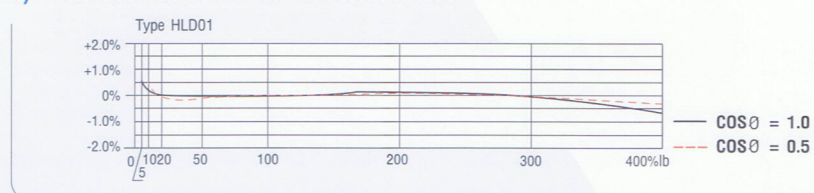
# Single-phase Watt-hour Meter

## SPECIFICATIONS

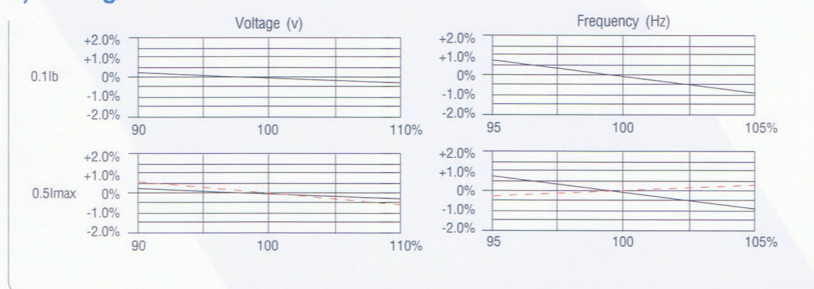
Type	HLD01
Type of Connection	Direct
Standard Reference Voltage	220 V
Optional Reference Voltage	110, 120, 230, 240, 250 V
Rated Frequency	50 or 60 Hz
Rated (Max.) Current	5(15), 10(30), 15(45), 20(60), 30(100)A
Voltage Circuit Consumption at Nominal Charge	< 1VA
Current Circuit Consumption at Nominal Charge	< 1 W < 5 VA
Starting Current	< 0.5% Ib
Lower bearing	Magnetic
Accuracy class	2.0
Case	Metal
Terminal Cover	Extended
Register	Cyclometer
Weight	2.0 Kg.

## TYPICAL PERFORMANCE CHARACTERISTICS

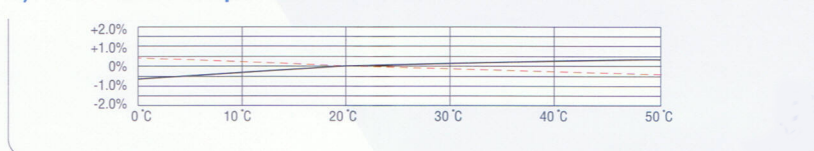
### A) Load curves of whole current meters



### B) Average values of additional errors



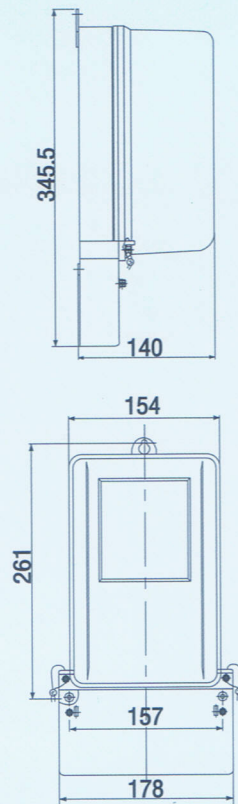
### C) Error due to temperature variation





# Product D58 Series

Outline Dimension (mm)



## DESCRIPTION

D58 series three-phase watt-hour meter, including DT58/DS58 three-phase four/three-wire watt-hour metres and DX58/DX59 three-phase four/three-wire var-hour meters, are induction type three-phase long-service life meters, designed with advanced techniques.

Equitable structure, magnetic circuit design and strict technical control guarantee D58 meters stable metering, reliable function and low service costs. Through strict selection and post-treatment of the materials of electromagnetic element and the magnetic compensation, D58 are entitled with good load characteristic and excellent starting performance. And the low mechanical load of register, the homogeneity of magnetic bearing and steady friction of moving element ensure stability of accuracy during the service life.

The D58 series have been designed and manufactured in comply with IEC521 or BS5685.



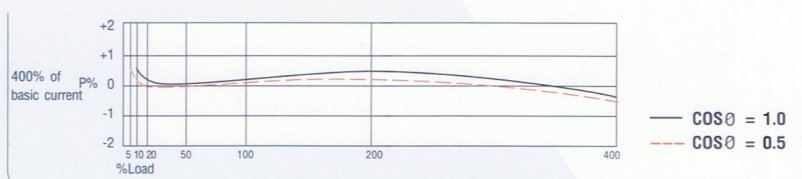
# Three-phase Watt-hour Meter

## SPECIFICATIONS

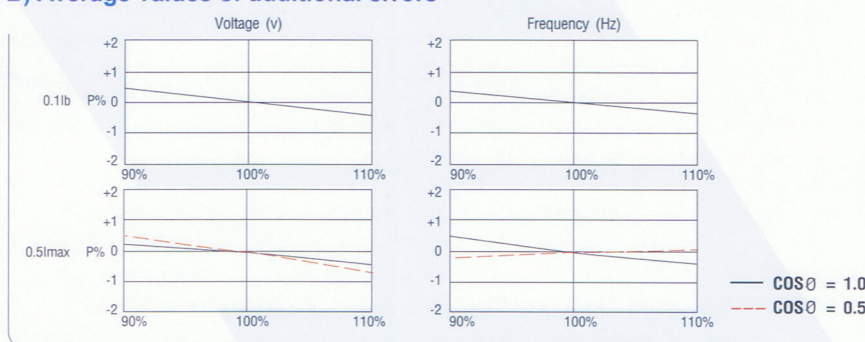
Type	DT58
Type of Connection	Direct or CT
Standard Reference Voltage	220 / 380 V
Optional Reference Voltage	57.7/100, 230/400, 240/415 V
Rated Frequency	50 or 60 Hz
Rated (Max.) Current	5(15), 10(30), 15(45), 20(60), 30(100)A
Voltage Circuit Consumption at Nominal Charge	< 1 VA
Current Circuit Consumption at Nominal Charge	< 1 W < 6 VA
Starting Current	< 0.5% Ib
Lower bearing	Magnetic
Accuracy class	2.0
Case	Bakelite or Metal
Terminal Cover	Extended or Shot
Register	Cyclometer
Weight	4.3 Kg.

## TYPICAL PERFORMANCE CHARACTERISTICS

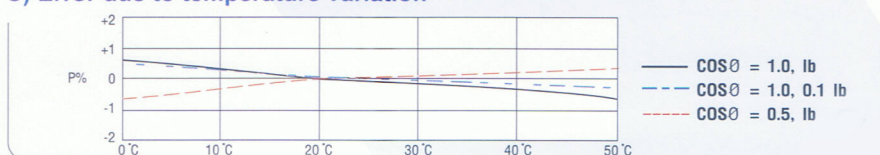
### A) Load curves of whole current meters



### B) Average values of additional errors



### C) Error due to temperature variation

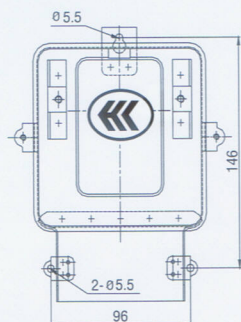




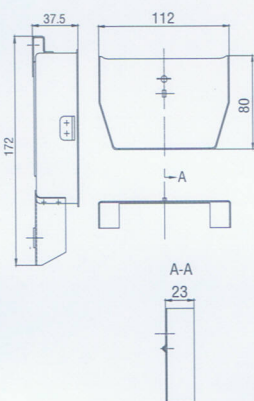
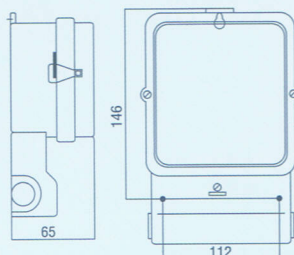
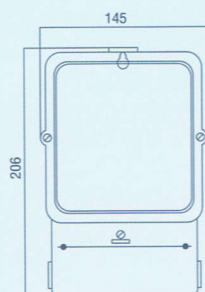
# Product DDS28 Series

Outline Dimension (mm)

**Type 1**



**Type 2**



## DESCRIPTION

DDS28 or HLM01 single-phase static watt-hour meter designed for active energy measurement for direct connection and measurement through instrument transformers in single-phase low voltage mains with frequency of 50 or 60Hz. They comply with the IEC 62053-21 standard for Class 2 or 1 and are manufactured in compliance with the ISO 9000 standard. The type test has past the KEMA (Holland) Type Test according to IEC 62053-21. This meters produced with the first-class equipment of the world and state-of-the-art workmanship. Adopts the electronic components of high quality supplied by the international reputed manufactures. It is a meter with high accuracy and reliability, low power loss and wide load range.

## BASIC FUNCTIONS

- Energy display by register
- Bi-directional active energy measurement
- Operation indicated by pulse LED
- SO output with optical isolated output transistor corresponding to DIN 43864

## OPTION FUNCTIONS

- Reverse indicator: An LED indicator will be on when the current is reversed
- Anti-tamper in condition that load is connected between the line and the earth
- Entirely closed register
- HF magnet immune register
- Reversal preventing register
- Transformer connection



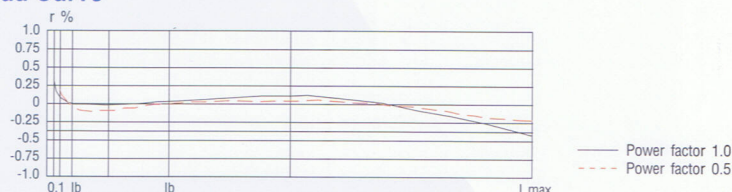
# Single-Phase Two-Wire Static Watt-Hour Meter

## SPECIFICATIONS

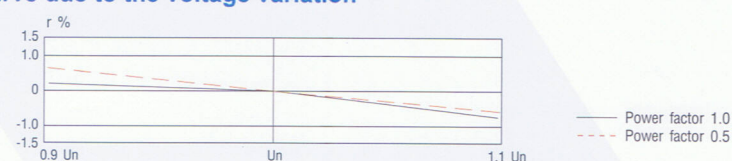
Type	DDS28 or HLM 01
Standard	IEC 62053-21 / KEMA
Type of Connection	Direct or CT/PT
Standard Reference Voltage	220V
Operational Reference Voltage	110/120/220/230/240 V
Rate Frequency	50 or 60Hz
Rate (Max.) Current	5(15)A / 10(60)A / 15(45) A / 30(100)A
Meter Constant	3200 / 1600 / 800
Power Loss	Current Circuit
	< 0.3 W
	Voltage Circuit
	< 0.7 W or < 6.0 VA
Accuracy Class	1.0
Starting Current	0.4% I <sub>b</sub>
Thermal Current	1.2 I <sub>max</sub>
Operation Temperature	-40 °C to 70 °C
Impulse Voltage	6000V
Short-circuit overcurrent	30 I <sub>max</sub>

## TYPICAL PERFORMANCE CHARACTERISTICS

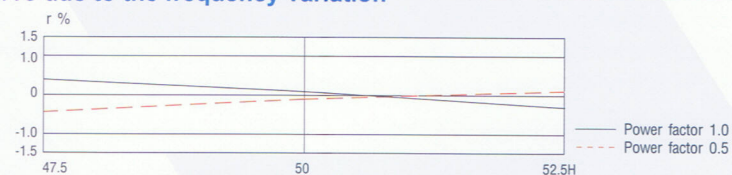
### A) Load Curve



### B) Curve due to the voltage variation



### C) Curve due to the frequency variation



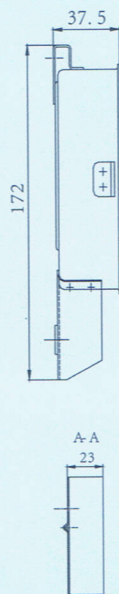
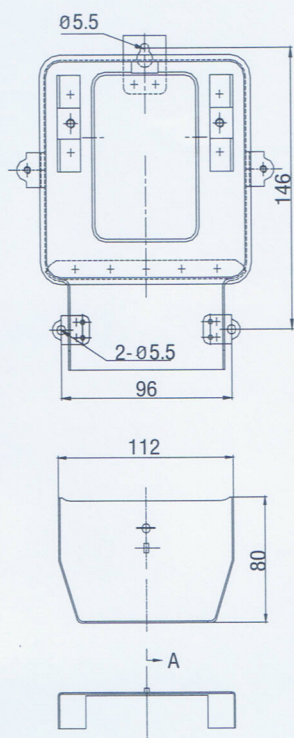
### D) Curve due to the temperature variation





# Product DDS28A Series

Outline Dimension (mm)



## DESCRIPTION

The DDS28A single-phase two-wire static watt-hour meter is developed and designed specially for PEA and MEA in Thailand. It is suitable to measure active energy, reactive energy, r.m.s (root mean square) voltage, r.m.s current and current demand (kW, kVA, kvar [optional]) in alternating current circuit. It can be used yet to record maximum demands of kW, kvar and kVA in a month. All of these maximum demands in kW, kvar, kVA and accumulative total active energy (kWh) and total reactive energy (kvarh) consumed are stored in a memory for 12 months.

The meter is constructed and designed in such a way as avoid introducing any danger in normal use and under normal working conditions, so as to ensure especially personal safety against electric shock, effects of excessive temperature, spread of fire and penetration of solid objects, dust and water.

The measuring range of the watt-hour meter is suitable to small and middle customer who consumed generally less than 11 kW of power. Its percent error of metering energy is all not more than  $\pm 1\%$  for these customers.

All of billing data for 12 months is read out from the meter at one time through communication with hand-held unit (common meter reading instrument). The information of consumption, for example, maximum demand, average power factor of load is also understood. The supply voltage, current in circuit, accumulative active energy and reactive energy [optional] also can be observed on LCD of the meter. So it is a very excellent static single-phase watt-hour meter, and is of great value to a distribution power department.



# Single-Phase Two-Wire Static Watt-Hour Meter

## NORMAL OPERATING CONDITIONS AND LIMITED CONDITIONS

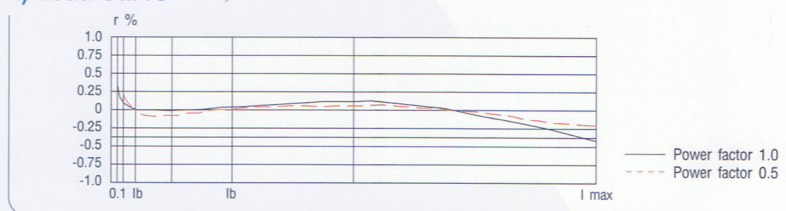
Normal operating temperature	-40 °c to 70 °c
Relative humidity	below 90%
Altitude	below 3000m
Limited temperature	above -45 °c and below 80 °c
Limited relative humidity	below 100%

## SPECIFICATIONS

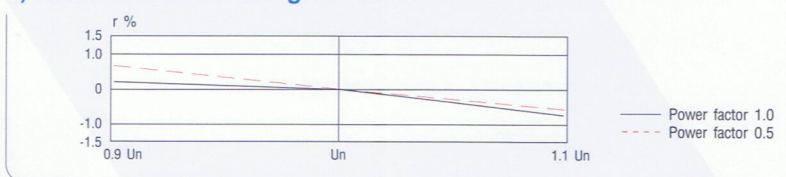
Type	DDS28A
Reference Voltage	220V
Operation Reference Voltage	110, 120, 220, 230, 240V
Maximum Current	100A
Reference Frequency	50/60Hz
Accuracy	Active (IEC62053-21): class 1 Reactive (IEC62053-23): class 2
Communication protocol	IEC62056-21
Constant	1600 imp/kWh and 1600 imp/kvarh
Reference temperature	23 °c (can be customized designation)

## TYPICAL PERFORMANCE CHARACTERISTICS

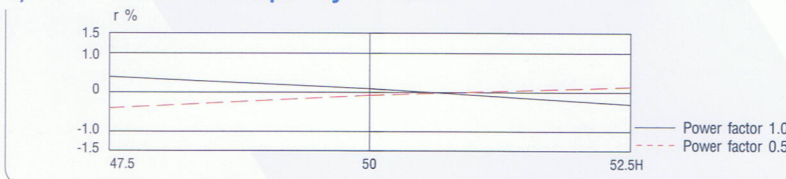
### A) Load Curve



### B) Curve due to the voltage variation



### C) Curve due to the frequency variation



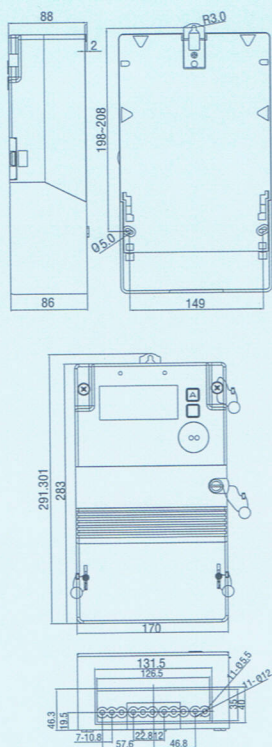
### D) Curve due to the temperature variation





# Product DTSD546 Series

Outline Dimension (mm)



## DESCRIPTION

DTSD546/DSSD536 series Three-phase Static Multi-function Energy Meter, designed to satisfy industrial demand, adopts LSI, digital sampling technology and SMT process. It features stable capability, high precision and easy operation.

The product conforms to all technical requirements specified in IEC62053-22 <Alternating current static watt-hour meters for active energy (classes 0.2S and 0.5S)>, IEC62053-23 <Alternative current static var-hour meters for reactive energy (class 2 and 3)> and IEC62056-21<Data exchange for meter reading, tariff and load control-Direct local data exchange>.

The meter has the functions of measuring active / reactive energy and demand in all directions, RS232 port communication, manual and infrared waking up during power break, load record and so on.

## FUNCTIONS

1. Active and reactive energy measurement
2. Energy consumption record of every month
3. Max demand record
4. Multi-tariff energy measurement
5. Demand load curve record
6. IEC62056-21 infrared communication
7. Single RS232 port communication
8. Remote output
9. Data scroll display or key display



# Multi-Function Meter

## SPECIFICATIONS

Type	DTSD546
Three-phase four-wire	DTSD546
Three-phase three-wire	DSSD536
Reference voltage	3x220/380V, 3x63.5/110V (four-wire) 3x110V (three-wire)
Basic (maximum) current	3x1, 0A, 3x5, 0A 3x1, 5(6)A, 3x3(6)A 3x5(20)A, 3x10(40)A, 3x15(60)A 3x20(80)A, 3x30(100)A

## BASIC PARAMETERS

Applicable standard	IEC62053-22 IEC62053-23 IEC62056-21
Accuracy class	Active: Class 0.5S Reactive: Class 2
Reference frequency	50Hz
Potential	With anti-potential logic design
Starting current	Active: 0.001 I <sub>n</sub> (transformer connected) Reactive: 0.003 I <sub>n</sub>
Service life	10 years
Outline dimension	278mm 174mm 77mm
Installation size	241x150 mm
Net Weight	2.5 kg

## ELECTRIC PARAMETERS

Normal working voltage	0.9U <sub>n</sub> ~1.1U <sub>n</sub>
Limit working voltage	0.75U <sub>n</sub> ~1.15U <sub>n</sub>
Voltage circuit power consumption	< 2W or. 5VA
Current circuit power consumption	≤ 1VA
Voltage of battery for data storing	3.6V <sub>DC</sub>



# AMR SYSTEM

## Integrated Management Automation System Automatic Meter Reading

Integrated Management Automation System (IMAS) is an efficient, economical and reliable All-In-One solution for automatic meter reading (AMR) and management.

### Integrate electricity power level of

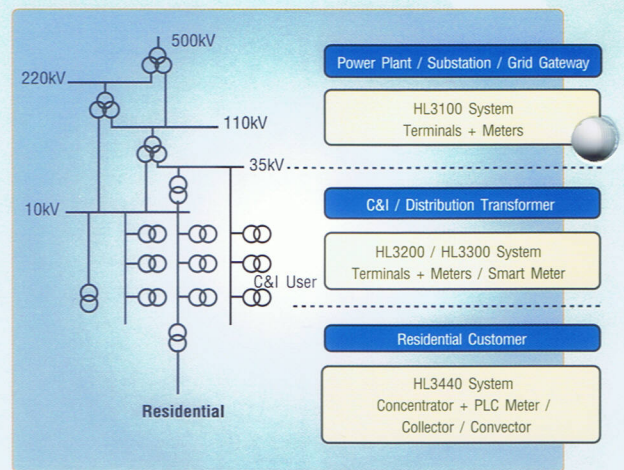
- High voltage (HV) metering (110kV+) for substations
- Middle voltage (MV) metering (10kV~35kV) for C&I (Large-Scale) Consumers /Distribution Transformers (DT)
- Low voltage (LV) metering (110V/220V/380V) for residential

### Integrate business applications of

- Data management
- Report & graph analysis
- Event alarm
- Line loss analysis

### Integrate database interface with

- Management Information System (MIS)
- Customer Information/Service System (CIS)
- Billing System
- SCADA
- Graphic Information System (GIS)



## SYSTEM FUNCTIONS

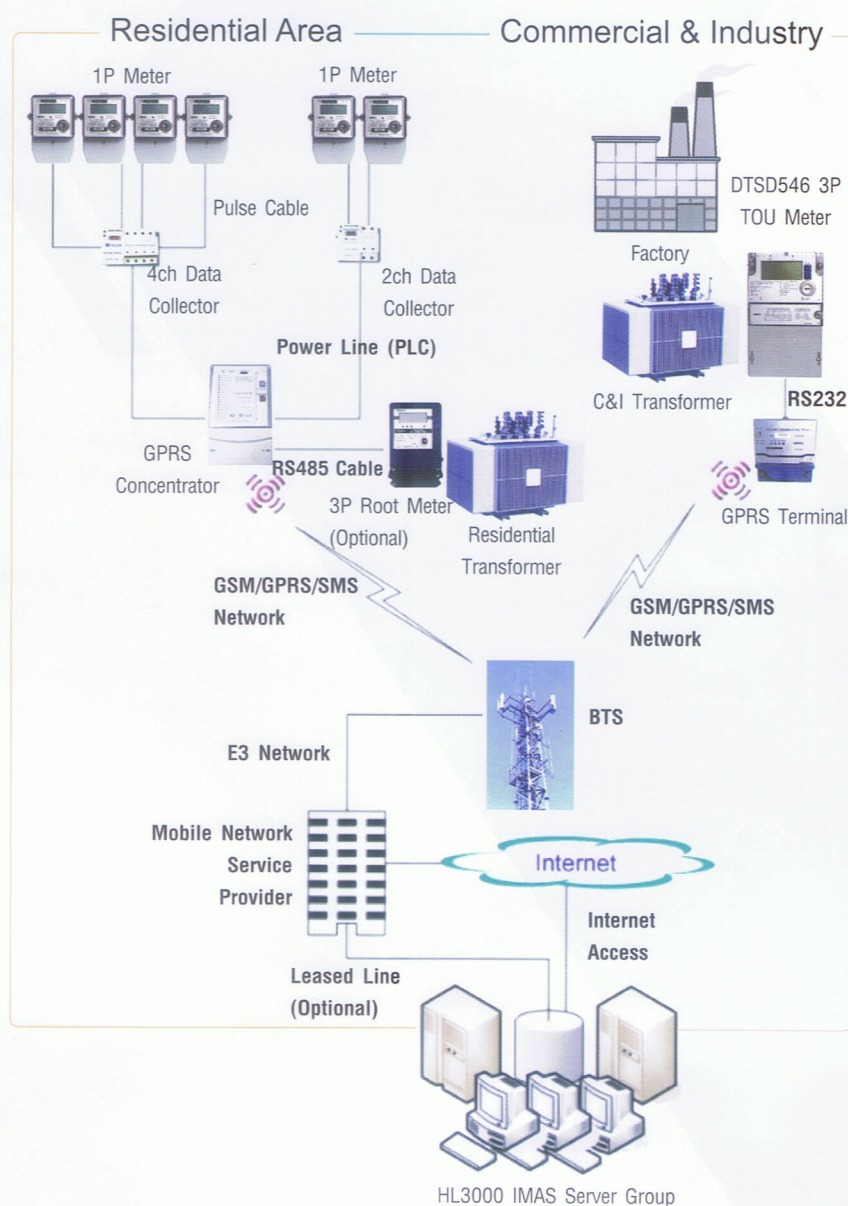
- **Data Acquisition:** KWH / KW / KVAR / Voltage / Ampere / Demand / PF / Phase Angle / Frequency, etc.
- **Automatic calculation & statistics:** Statistics of raw data, line loss data, etc.
- **Working Condition Monitor & Analysis:** Power quality supervision, line loss analysis, power load analysis, meter status, etc.
- **Event Log & Alarm:** Support more than 60 kinds of abnormalities record and send SMS to duty person. (need local mobile network support) Eg.: Voltage loss, open phase, reversed phase, abnormal CT status, network failure, hardware failure, electricity tampering, etc.
- **Load Control:** Automatic/manual switch on/off. Can be controlled by demand/energy threshold. Report Forms, Graph & Curves:
- **WEB Service:** Users can access to HL3000-WEB from anywhere has internet connection
- **Save Data as Other Format:** Support save data as MS Excel/PDF/TXT(CSV)/XML format from HL3000-WEB or HL3000 server
- **Real-time time synchronizing.**



## SYSTEM FEATURES

- **Database Sharing** with other Electrical Applications(MIS/EMS/SCADA/SAP®)
- **Live Updates and Remote Meter Settings via mobile network**
- **Smart Communication** Can be self-adapted with any GSM/GPRS network
- **Consideration of stability and reliability**
  - 1) Distributed network system structure
  - 2) Redundant a s dual machines dual networks clusters, dual server hot backup, double machines mutual backup, disc array mode, etc.
- **Universal hardware platform** Users can select hardware equipments like of the brand they are familiar with.
- **High security of system and data processing at 5 levels. SSL at**
- **website is optional**

## HOW IMAS SYSTEM WORKS







**โฮลลี่ กรุ๊ป**  
HOLLEY GROUP

Address : No. 295 Soi Ratchadaphisek 6, Ratchadaphisek-Thapra Rd., Bukkalo, Khet Thonbuli, Bangkok 10600, -Thailand

Tel : (66) 2-867-6971-6 Fax : (66) 2-867-6980

E-mail : frank.shou@holley.cn Website : www.holley.cn