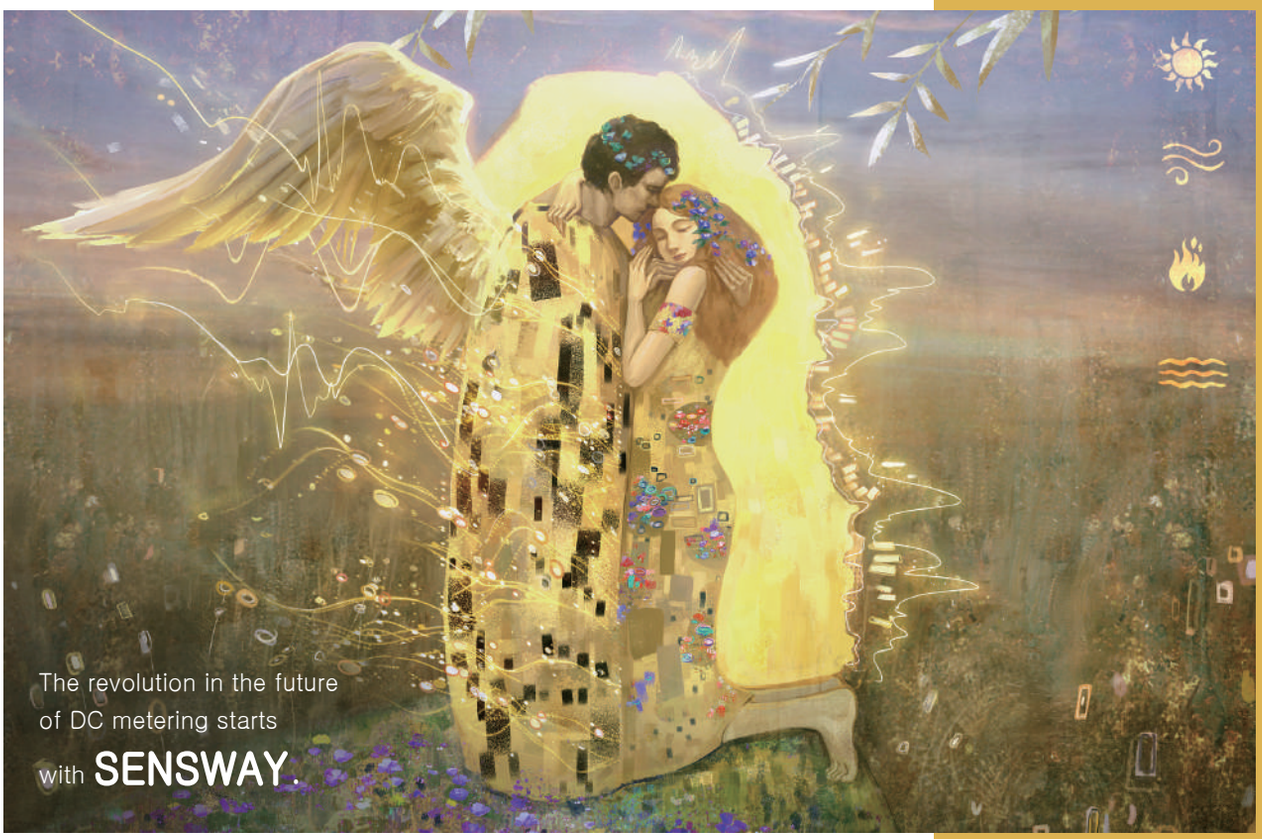


About Sensway®

J&D's Sensway® brand is a world-leading technology brand that manufactures and designs smart metering solutions with innovative voltage sensor and current sensor technologies for the electrical energy management industry.

Our smart metering and communication solution 'Sensway' enables you to implement a reliable and efficient smart grid system in the future market of decentralizedenergy grids.

Our Team

Our team consists of qualified design engineers, software and firmware engineers, application engineers, production technicians, and sales and support specialists to lead the smart metering market.

Customers and Partners

J&D's Sensway® brand of energy metering products is a world leader in smart metering, smart grid, smart home, or e-mobility.

They are used by individuals, businesses, and institutions in distributed grid

energy management, building automation, tenant sub-metering, end-use meter-ing, equipment performance monitoring, verification, evaluation, and diagnostic applications.

Customers and partners are pioneering the networked energy world of tomorrow through the Sensway® brand.

Contents

DC ENERGY METERING

WHY DC METERING?

Traditionally, the power grid has relied on alternating current (AC) distribution, which has limited the demand for direct current (DC) distribution. In recent years, however, the proliferation of DC circuits has made DC metering a hot topic. It offers benefits such as easy grid connection with distributed power systems, reduced losses, and miniaturization of power equipment. Renewable energy generation, electric vehicle chargers, energy storage systems (ESS), and residential direct current distribution systems are driving demand for direct current distribution facilities. With significant growth in microgrid and digital loads, DC loads are expected to account for up to 50% of the total electrical load. In the era of the DC power grid, reducing energy costs through increased efficiency is the most pressing concern of energy users and managers. Accurate measurement, analysis, and management of power consumption and efficiency are critical to energy efficiency, business improvement, and greenhouse gas reduction.

DC metering is essential for certain applications and enables the measurement, collection, and real-time data storage of DC power. This allows business owners to monitor power usage, both generated and incoming, reduce energy costs, and verify energy integrity. DC metering can be used in solar systems, electric vehicle charging stations, battery energy storage systems(BESS), cell towers, data centers, light rail, and many other industries. As DC circuits continue to grow, especially in renewable energy applications, the demand for DC metering is prominent in energy-related fields such as electric vehicle charging stations, solar panels, DC data centers, and DC microgrid. Monitoring these applications allows you to track energy production, conversion efficiency, and performance evaluation.

J&D Electronics offers the Sensway-DCS Series, an all-in-one DC metering solution that includes features such as watt-hour (Wh) monitoring and data logging. The DCS Series can comprehensively track the performance of a DC system across multiple parameters. For more information on J&D Electronics' DC metering solutions, please refer to the application product information provided.

WHAT INDUSTRIES DOES DC METERING APPLY TO?

DC fast electric vehicle charging stations
DC fast chargers supply high voltage (1000 VDC) and high current (up to 500 ADC) directly to electric vehicles, bypassing the on-board charger (OBC) and enabling efficient charging. DC electricity meters play an important role in accurately measuring the energy supplied to an EV. Accurate measurement of energy ensures accurate billing for DC charging services.

Renewable energy
Renewable energy sources, such as solar panels or wind turbines, generate DC electricity. Monitoring the performance of these systems, including energy storage systems, before converting to AC is critical to assessing efficiency and accurately identifying conversion losses.

DC Data Centers
Data centers striving to improve power usage efficiency have begun to adopt DC system architectures. DC energy meters play an important role in these data centers to monitor energy consumption, optimize equipment, reduce space and maintenance costs, and improve reliability and efficiency.

Industrial processes
Certain industrial processes, such as electroplating and aluminum smelting, rely heavily on DC power. Because these energy-intensive processes are sensitive to even small fluctuations in the DC power supply, it is important to accurately measure the DC supply.

DCS-I PRODUCT INTRODUCTION

The prevalence of direct current (DC) systems is increasing, and their adoption in commercial and industrial environments is becoming more widespread. This has led to a growing demand for precise metering of DC systems.
The J&D DC Energy Meter DCS-I addresses this need by utilizing an external DC current sensor that uses high-precision Hall effect technology. The meter also has a built-in DC voltage sensor to continuously monitor the primary voltage. By regularly sampling these parameters, it calculates the cumulative energy consumption over a specific period of time, providing an accurate energy meter reading in kilowatt-hours (kWh).

World's first DC meter and DC CTs

Designed to consume low amounts of power, reducing self-consumption energy and helping to lower your energy costs

Features

- A built-in DC voltage sensor measures the range of 0-1500VDC with high precision and satisfies the error class of 1%
- External type CT with greater flexibility in selecting and installing: You can select a split type or a solid core type.
- Connect DC Meter and CT easily with RJ45 connector.
- Wide range of selection : IDCS-U and IDCS-I series(Split core CT) for the range of 0-4000ADC
- Accurate power consumption measurements with our high-precision DC current sensor.
- Open-loop and closed-loop technology ensures precise measurements while saving energy costs.
- Reduce energy costs by low power consumption DC current sensors
- Efficiently measure power consumption with our advanced technology

Accuracy International Standard

- IEC 62053-41 : Electricity metering equipment – Particular requirements / Part 41: Static meters for DC energy (Accuracy : class 1)
- ANSI C12.32-2021 : American national standard for electricity meters for the measurement of DC energy (Accuracy : class 1)

Isolated Amplifier SPEC

Safety-related certifications:

- 10600-VPK reinforced isolation per DIN EN IEC 60747-17 (VDE 0884-17)
- 7500-VRMS isolation for 1 minute per UL1577
  AEC-Q100 qualified for automotive

Select security option

- CC EAL5+ AVA_VAN5 Common Criteria certified
- KCMVP Certification

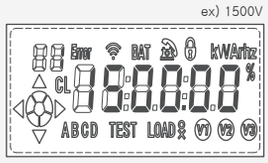
Specification

- Model: DCS-I
- Input Channel: 1ch
- Power Supply: DC 12-40V
- Power Consumption: 0.5W (typical)
  *small power consumption
- Voltage Input: DC 0-1500V
- Current Input: DC 0-4000A
- Constant: 100 pulse/kWh
- Communications: RS-485 (*Option CAN)
- Protocols: Modbus / DLMS
- LCD: 1.9 inch LCD
- Accuracy: 0.20% (full range)
- Storage Temperature: -40℃ ~ +70℃
- Operating Temperature: -25℃ ~ +55℃
- Relative Humidity: 5% to 95% Non-Condensing
- Elevation: 2500m less

DC meter LCD screen

VOLTAGE

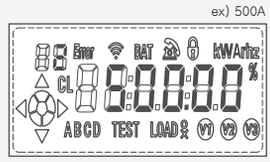
ex) 1500V



Unit : V Digit
: 4 digits in the integer part
: 2 digits after the decimal point

CURRENT

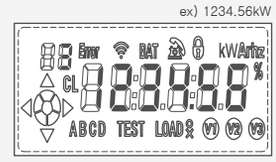
ex) 500A



Unit : A Digit
: 4 digits in the integer part
: 2 digits after the decimal point

POWER

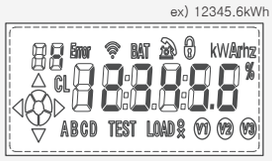
ex) 1234.56kW



Unit : kW Digit
: 4 digits in the integer part
: 2 digits after the decimal point

POWER CONSUMPTION

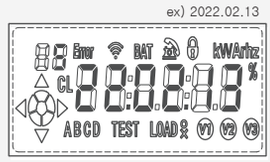
ex) 12345.6kWh



Unit : kWh Digit
: 5 digits in the integer part
: 1 digits after the decimal point

DATE

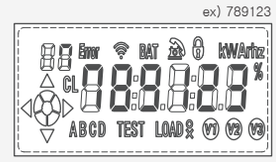
ex) 2022.02.13



00 year, 00 month, 00 day

METER NUMBER

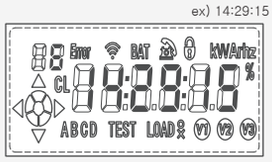
ex) 789123



Six-Digit

TIME

ex) 14:29:15



00 hours, 00 minutes, 00 seconds

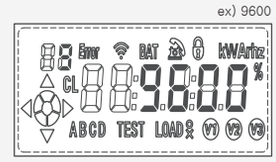
SOFTWARE IDENTIFIER

ex) 22.00.01

22: year
00: legal / non-legal
01: version

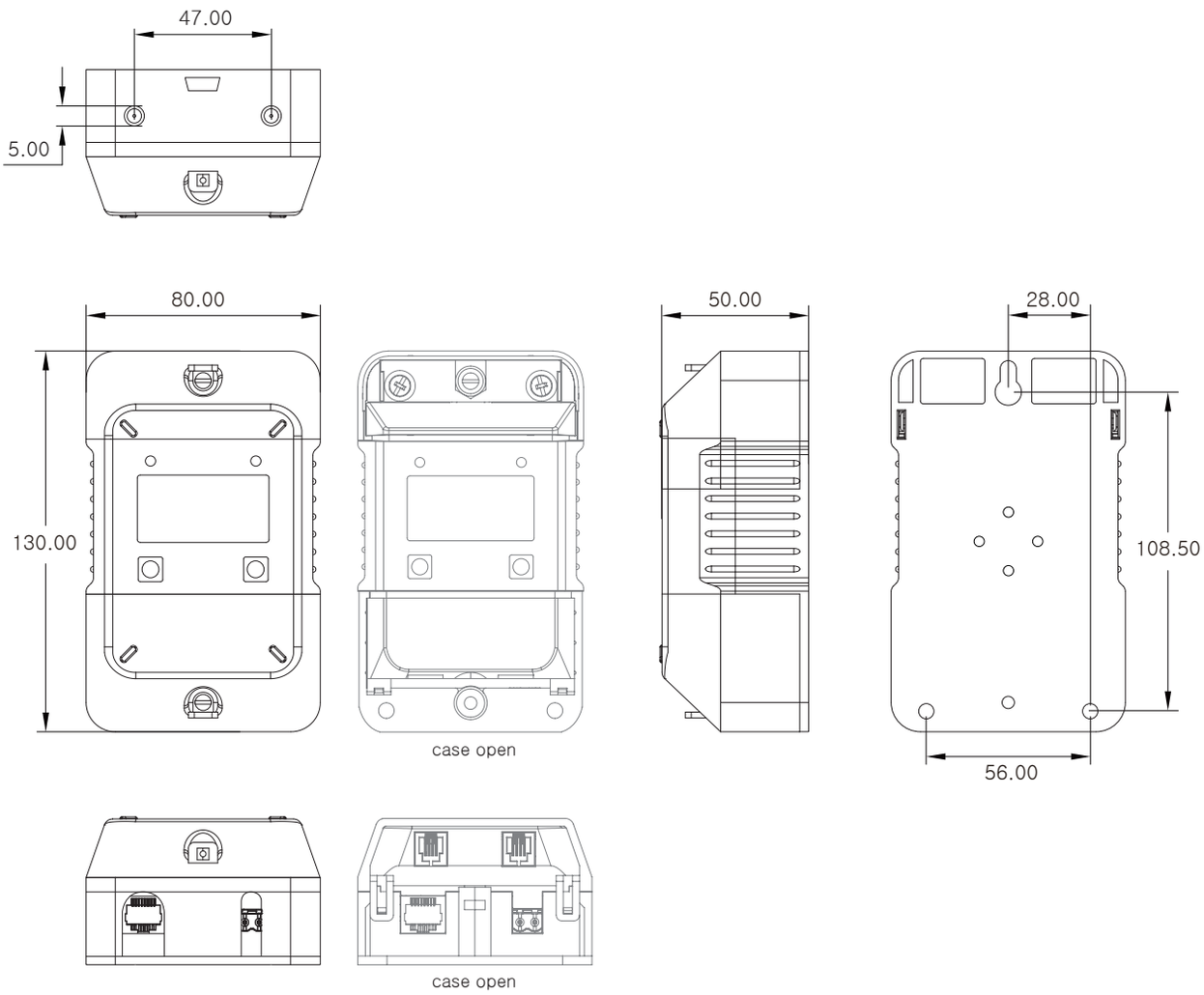
COMMUNICATION SPEED

ex) 9600



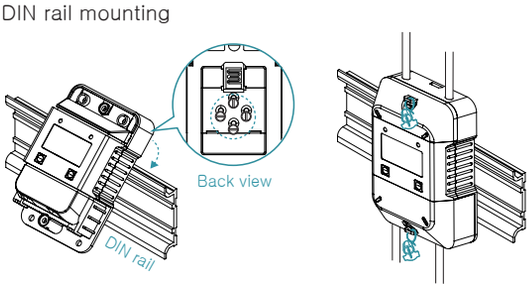
RS485 communication speed

Dimensions (mm)

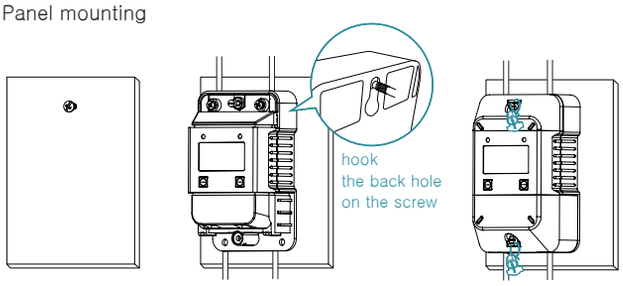


* OPTION

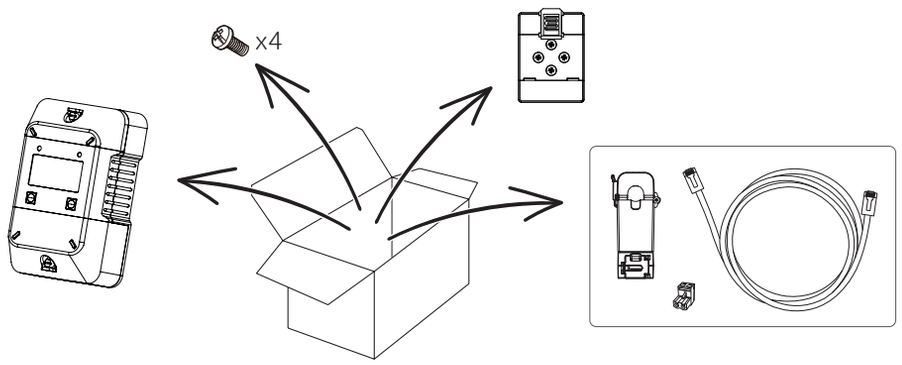
DIN rail mounting



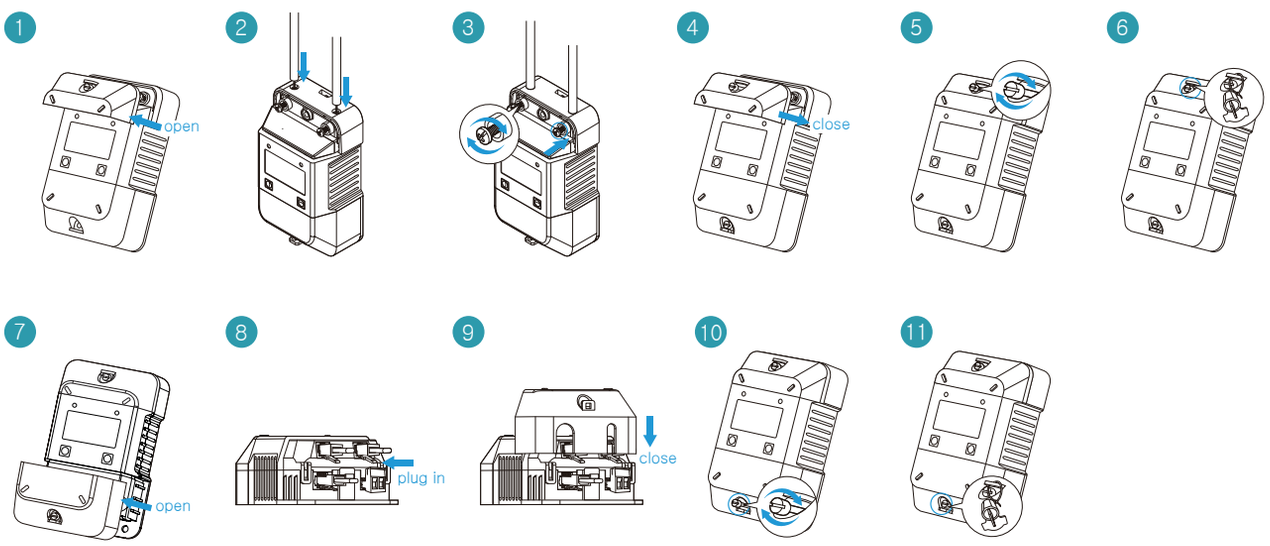
Panel mounting



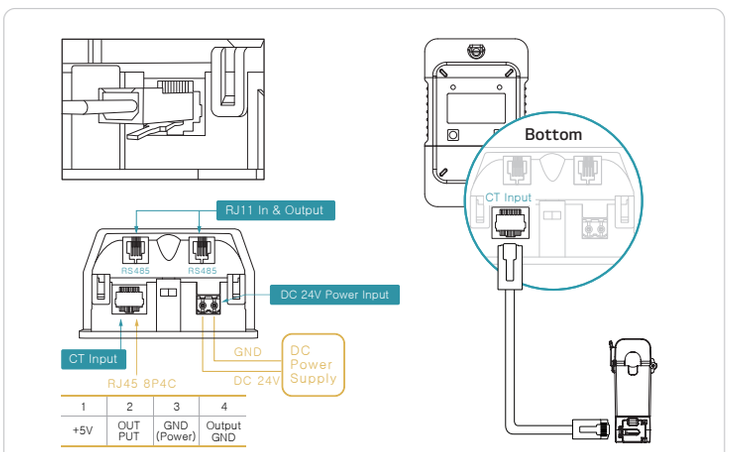
Accessory

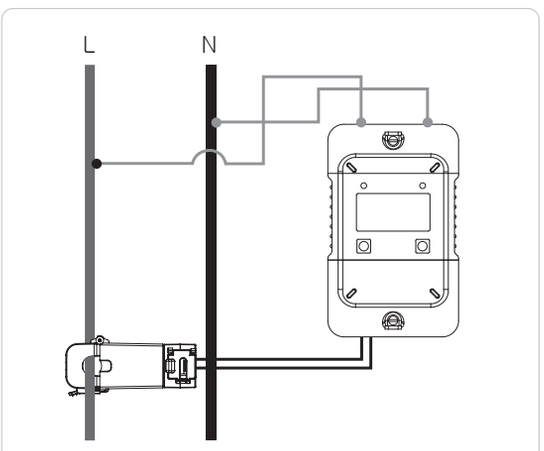


How to Use



How to Connect





BILLING ON THE DC-SIDE

DC CURRENT SENSORS

E344623

IDCS-PI

IDCS-C

IDCS-U

IDCS-G

IDCS-D

IDCS-H

The Sensway-IDCS/IACT series provides precise DC current measurement using an external DC current sensor.
The sensor uses open-loop and closed-loop technology and new digital isolation techniques to enable safe, accurate, and reliable measurements. The series is available in split-core and solid-core types, allowing for flexible installation on busbars or cables depending on the installation method of the main conductor.
Experience seamless and accurate DC current measurement with the Sensway-IDCS/IACT series.

Safety & Danger Notes

Safety

The J&D CTs are UL/EN 61010-1, CE, RoHS compliant and certified, are also conformed up to Pollution degree 2, 600Vac CAT III rated devices.
Please be sure that Failure to follow these instructions can result in serious injury and/or cause damage.
The transducer shall be used in electric/electronic equipment in accordance with the operating instructions of all related systems and component manufacturers with respect to applicable standards and safety requirements.

Follow applicable national codes and safe electrical work practices.
This equipment must be installed and serviced by qualified personnel only.
Qualified personnel means persons who possess the skills and knowledge related to the construction and operat on of this electrical equipment and installation, and who have received safety training to recognize and avoid associated hazards. In addition, the installation and maintenance shall be done with the main power supply disconnected except if there are no hazardous live parts in or in close proximity to the system and if the applicable national regulations are fully observed.

When operating the transducer, there may be dangerous active voltages (e.g. primary conductor) in certain parts of the module. The user must take all necessary measures to protect against electric shock. The transducer is a built-in device with conductive parts that are not accessible after installation. Therefore, a protective enclosure or additional insulating barrier is required. Safe and trouble-free operation of this converter can only be guaranteed if transportation, storage, and installation are carried out correctly, and operation and maintenance are carried out carefully.

Remark

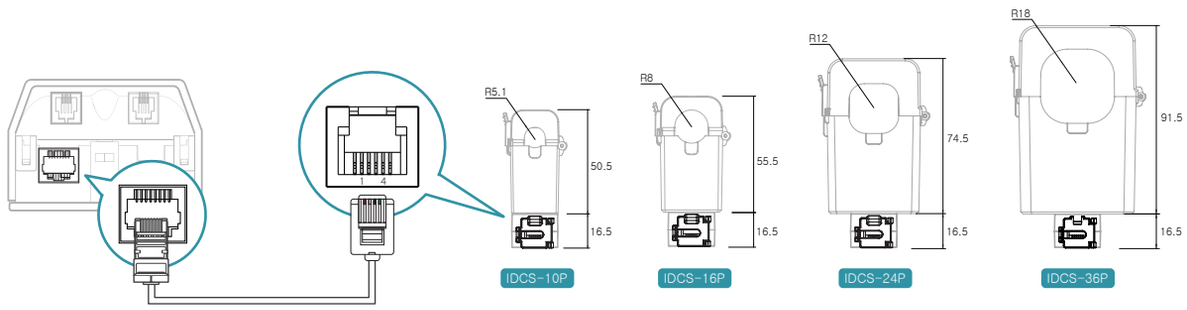
- V_o is positive when I_P flows in the direction of the arrow. (o : output, p : primary current) Temperature of the primary conductor should not exceed 75°C(167°F).
- Dynamic performances (di/dt and delay time) are the best with a single bar when the primary hole is completely filled.
- By hysteresis of core, offset drift occurs proportionally to the over-current higher than rating value.
- The output value fluctuates upon the various factors, so it is recommended to use the current range higher than 5% of the rated current.
- Do not use the product over the maximum current continuously.

Caution

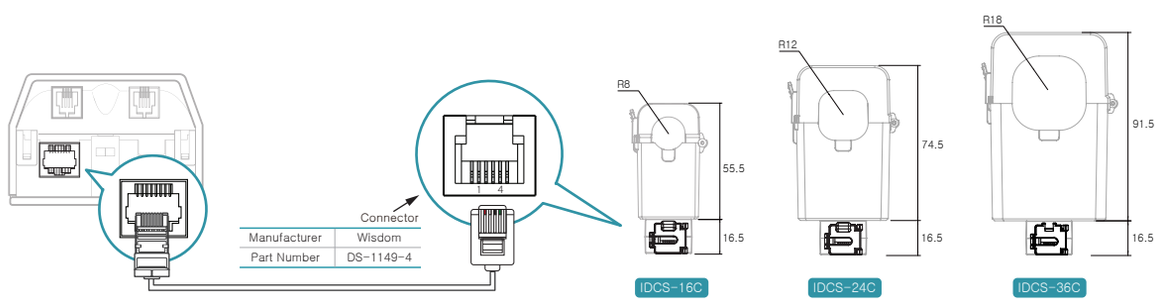
- For split-core CT, the contact area (air gap) must be kept clean (free of particles) for proper performance.

HOW TO USE & DIMENSIONS (mm)

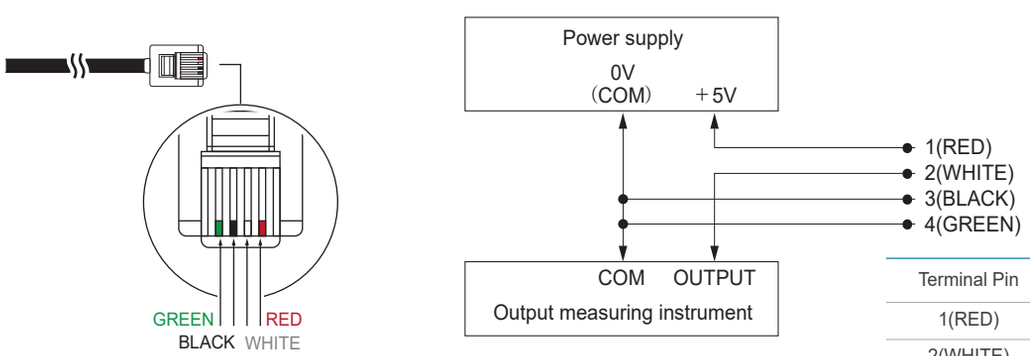
IDCS-PI



IACT-C



Connection Diagram



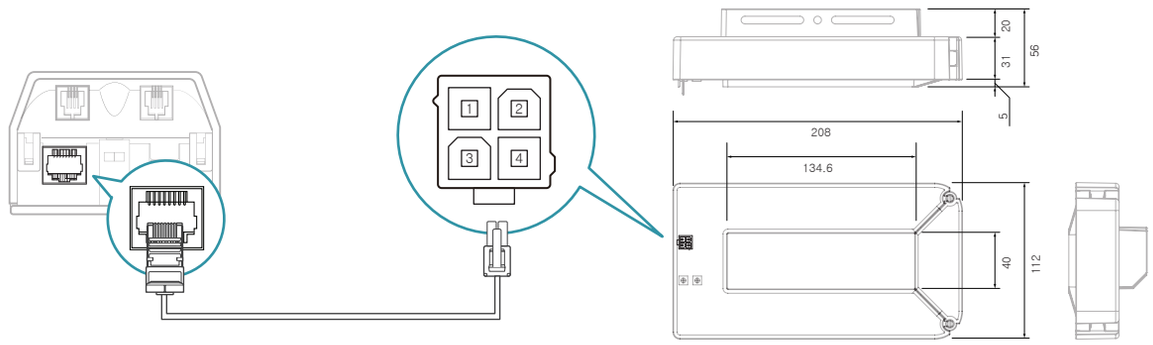
Connector :

Manufacturer	ASSMANN
Part Number	A-MO 6/4-F50

Terminal Pin	Function
1(RED)	+5 V
2(WHITE)	OUTPUT
3(BLACK)	GND(Power Supply)
4(GREEN)	OUTPUT GND

HOW TO USE & DIMENSIONS (mm)

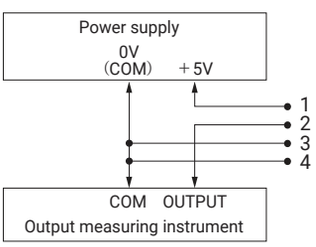
IDCS-U



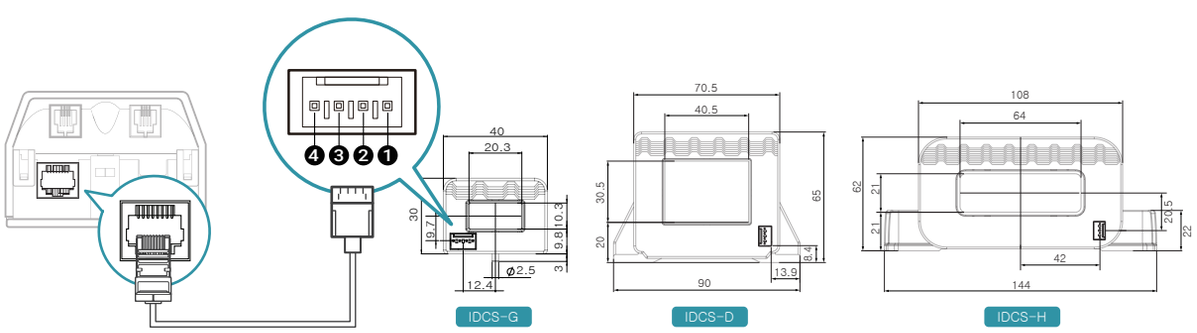
Connector

Manufacturer	Molex
Part Number	39-28-8040
Old Part Number	5566-04A-210

Terminal Pin	Function
❶	+5 V
❷	OUTPUT
❸	GND(Power Supply)
❹	OUTPUT GND



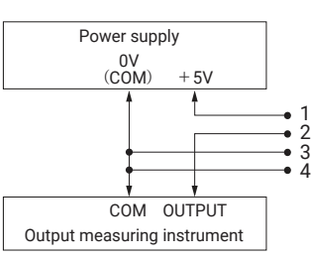
IDCS- G / D / H



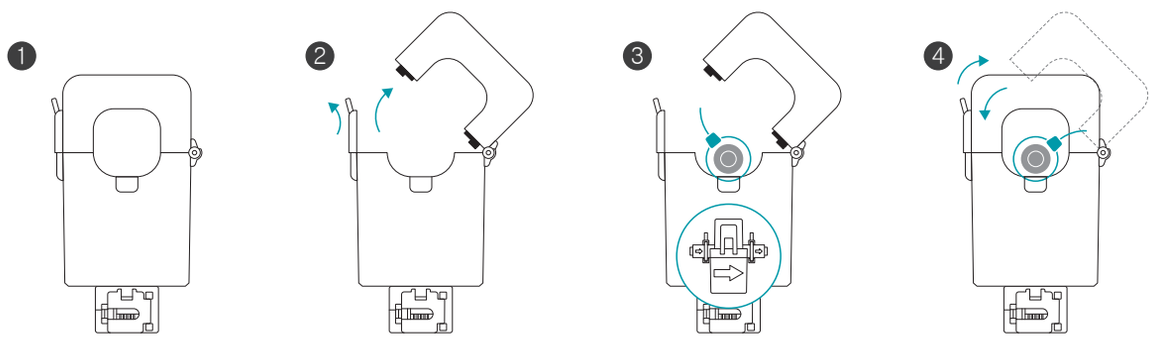
Connector

Manufacturer	Molex
Part Number	38-00-6294

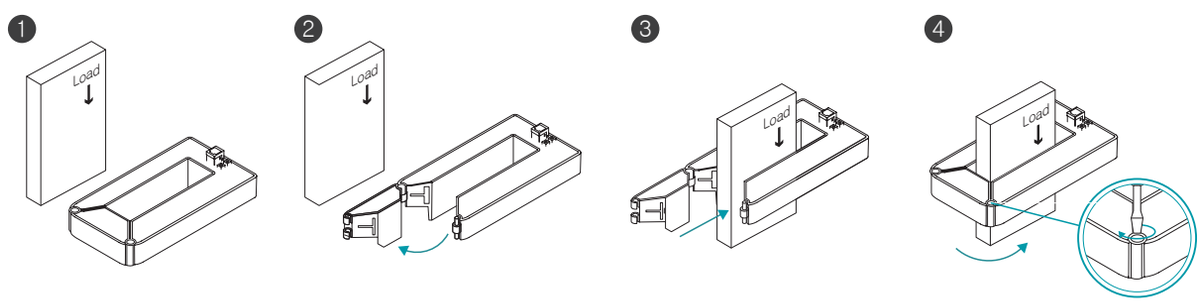
Terminal Pin	Function
❶	+5 V
❷	OUTPUT
❸	GND(Power Supply)
❹	OUTPUT GND



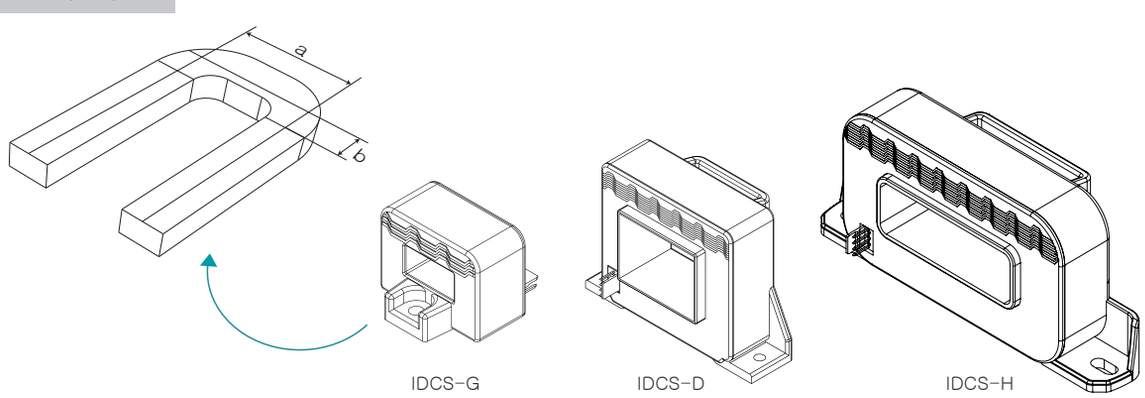
IDCS-PI / IACT-C



IDCS-U



IDCS-G / D / H



- Install the solid-core CT through the opening side of the primary conductor.
- CT should be installed inside the U-shaped busbar as close as possible (3mm).
- Tests are performed with minimum distances from the back section (a) et return section (b), which is the most disturbing case.

SAFETY: DC METERING

To ensure the safe operation of your product and the correct utilization of all its features, please read the following instructions carefully. Safety can only be guaranteed if the product is used for its intended purpose and within the defined limits of its technical specifications.

Technical specifications

For the latest technical information, please refer to www.sensway.org and access the relevant datasheets.

When connecting the elements of the product, ensure that only cables supplied by J&D are used.

The customer is responsible for providing the time source to set the time on the product.

Synchronization of time is necessary for the proper functioning of the product.

The Ethernet interface of the product should not be exposed to the public network; it should only be connected to a secure private network.

Regularly check the logbooking status of the product to ensure proper operation.

The product will stop functioning when the logbook is full.

According to EN50470-1: 2006, the meter must be installed in an IP51 (indoor) or IP54 (outdoor) enclosure.

Caution, risk of electric shock

Electrical equipment should only be installed, operated, serviced, and maintained by qualified individuals. No liability is accepted.

J&D assumes no responsibility for any consequences arising from the use of this material.

Qualified individuals are those who possess the necessary skills and knowledge related to the construction, installation, and operation of electrical equipment, and have received proper safety training. They should be capable of recognizing and avoiding potential hazards.

When installing or modifying the product, it is essential to de-energize the conductors to which the product is connected. Ignoring these warnings can result in serious injury or damage.

Ensure that the appropriate torque, as defined by the manufacturer, is applied to the product terminals.