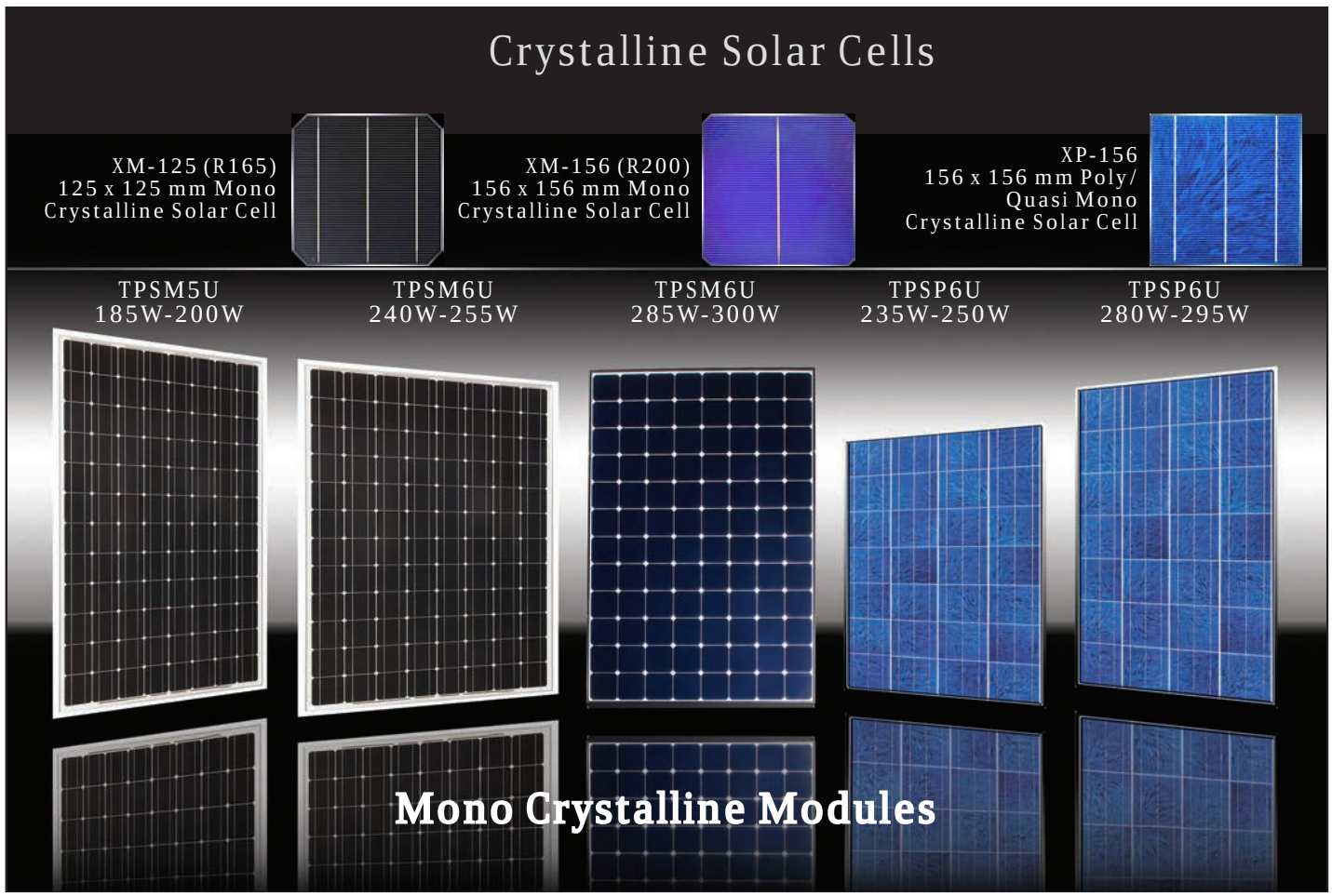
PHOTOVOLTAIC

SOLAR PANEL



Introduction

Topray Solar from “Deutsche Power” provides a complete product portfolio (mono & poly) with various power outputs.

Its modules are covered by special PV (PHOTOVOLTAIC) module insurances from Zurich Insurance and other international insurance company to guarantee the benefit of PV investors and PV module users.

All Deutshe Power (Topray)modules are plus power tolerance only to ensure the high reliability of power output.

Deutsche Power (Topray) proprietary PV glass design improves module’s oblique irradiance performance and enhances module yield in low-light and medium-angle-light condition.

All Deutshe Power (Topray) modules can withstand high level of wind loads (2400 Pa) and snow loads (5400 Pa) certified by TÜV Rheinland.

Key features:

- Plus power tolerance (0-3%) to ensure the high reliability of power output.
- Modules certified by TÜV to withstand high level of wind loads (2400 Pa) and snow loads (5400 Pa)*.
- Anti-reflective, hydrophobic layer of module surface (proprietary 800°C online coating technology) improves light absorption and reduces surface dust.
- Easy installation and minimal maintenance with compatibility to industry standard inverters and mounting systems.
- Junction box and bypass diodes guarantee the modules free of overheating and “hot spot effect” Large LCD Display.
- Modules’ excellent performance under low light environments (mornings, evenings, and cloudy days) create better kWh/kW ratio and produce average 2-3% more electricity in the field.

DP Electronics e.K (Deutsche Power Co., Limited)

SOLAR PANEL

TECHNICAL SPECIFICATION

Cell Type	Number of cells	Dimensions (A-B-C)	Weights	Front Glass	Frame	Junction Box	Connector	Output Cables
185W/190W/195W/200W Mono Crystalline Photovoltaic Module								
Mono crystalline 125×125 mm (5 inches)	72 (6×12)	1581×809×35 mm	13kg	3.2 mm Low iron tempered glass	Anodized aluminum	IP 65, with bypass diodes	MC4 compatible	TÜV, length 900mm, 4.0mm²
230W/235W/240W/245W/250W Poly Crystalline Photovoltaic Module								
Poly crystalline 156×156 mm (6 inches)	60 (6×10)	1640×992×40 mm	18.6kg	3.2 mm Low iron tempered glass	Anodized aluminum	IP 65, with bypass diodes	MC4 compatible	TÜV, length 900mm, 4.0mm²
285W/290W/295W/300W Mono Crystalline Photovoltaic Module								
Poly crystalline 156×156 mm (6 inches)	72 (6×12)	1956×992×50 mm	23kg	3.2 mm Low iron tempered glass	Anodized aluminum	IP 65, with bypass diodes	MC4 compatible	TÜV, length 900mm, 4.0mm²

Module P/N

Maximum Power at STC (Pmax)														
100W	120W	185W	190W	195W	200W	230W	235W	240W	245W	250W	285W	290W	295W	300W
Short Circuit Current (Isc)														
6.45	7.58	5.77A	5.71A	5.65A	5.61A	8.69A	8.62A	8.52A	8.39A	8.80A	285W	290W	295W	300W
Open Circuit Voltage (Voc)														
22.30	21.60	45.40V	45.20V	44.90V	44.60V	36.60V	36.80V	36.90V	37.10V	37.20V	8.57A	8.61A	8.68A	8.71A
Maximum Power Current (Impp)														
5.81A	6.82A	5.41A	5.36A	5.28A	5.20A	7.80A	7.92A	8.06A	8.14A	8.6A	44.60V	44.70V	45.00V	45.20V
Maximum Power Voltage (Vmpp)														
17.2V	17.6V	37.00V	36.40V	36.00V	35.60V	29.50V	29.70V	29.80V	30.10V	30.30V	8.05A	8.15A	8.24A	8.30A
Encapsulated Cell Efficiency														
18.90%	18.62%	18.10%	17.60%	17.20%	16.70%	15.75%	16.09%	16.44%	16.78%	17.12%	16.35%	16.64%	16.93%	17.21%
Module Efficiency														
16.08%	15.80%	15.60%	15.20%	14.90%	14.50%	14.14%	14.44%	14.75%	15.06%	15.37%	14.66%	14.92%	15.17%	15.43%
Power Tolerance														
0/+3%	0/+3%	0/+3%	0/+3%	0/+3%	0/+3%	0/+3%	0/+3%	0/+3%	0/+3%	0/+3%	0/+3%	0/+3%	0/+3%	0/+3%

DP Electronics e.K (Deutsche Power Co., Limited)

PHOTOVOLTAIC

OFF-GRID/ON-GRID SM SERIES SOLAR INVERTER WITH MPPT CHARGER

DP Electronics e.K (Deutsche Power Co., Limited)

PHOTOVOLTAIC INVERTER (OFF-GRID)

High Efficiency Integrated solar power system

SM Series Inverter With MPPT Solar Charger

Integrated solar power system

Integrated solar power system, combined with all the basic elements for a total solar solution: controller, inverter, AC bypass, solar and DC d terminal, with protecting breakers, friendly user interface and LCD display. No installation work and one button to start up.

Auto- Switch

Auto- Switch function could smoothly transfer the load to another back up source, even if whichever of the AC input or inverter drops. Two back up sources are allowable and supply the load interruptedly.

High Efficiency

High Efficiency In view of system capacity and the total ownership cost, DC bus voltage is designed (12V/24V/48V/96V/110V) to reduce power lost and work with the optimized efficiency.

Inrush withstand

Inrush withstand Based on low-frequency transformer design, the inverter could withstand high inrush load current, which could greatly improve the system reliability, especially for pump or motor load (washing machine, microwave oven ex.)

Pure Sine-wave

Pure Sine-wave output has greatly improved the load compatibility. All the fans, pumps, icebox, TV, lamp and so on could be supported.

Key features:

- Pure sine wave inverter
- Selectable input voltage range for home appliances and personal computers
- Selectable charging current based on applications
- Configurable AC/Solar input priority via LCD setting
- Compatible to mains voltage or generator power Auto restart while AC is recovering
- Overload and short circuit protection
- Smart battery charger design for optimized battery performance
- Cold start function
- Built-in advanced DSP-Controlled MPPT solar charge controller

DP Electronics e.K (Deutsche Power Co., Limited)

PHOTOVOLTAIC INVERTER (OFF-GRID)

TECHNICAL SPECIFICATION

DP Electronics e.K (Deutsche Power Co., Limited)

Model	SM-1K		SM-2K		SM-3K		SM-4K	SM-5K
Rated Power	1000VA/800W		2000VA/1600W		3000VA/2400W		4000VA/3200W	5000VA/400W
INPUT								
Voltage	230 VAC							
Selectable Voltage Range	170-280VAC (For Personal Computer) 90-280VAC (For Home Apliances)							
Frequencyrange	50HZ / 60 HZ Auto Sensing							
OUTPUT								
AC Voltage (Batt. Mode)	230 VAC + 5%							
Surge Power	2000VA		4000VA		6000VA		8000VA	10000VA
Efficiency Peek	90%		93%					
Transfer Time	10ms For Personal Computer 20 ms For Home Apliances							
Wave Form	Pure Sine Wave							
BATTERY & AC CHARGER								
Battery Voltage	24VDC	48VDC	24VDC	48VDC	24VDC	48VDC	48VDC	
Floting Charge Voltage	27VDC	54VDC	27VDC	54VDC	27VDC	54VDC	54VDC	
Overcharge Protection	31VDC	62VDC	31VDC	62VDC	31VDC	62VDC	60VDC	
MAX Charge Current	10Aor 20A	10Aor 15A	10Aor 30A	10Aor 15A	10Aor 30A	10Aor 15A	20A or 30A	
SOLAR CHARGER								
Max PV Array Power	600W	900W	600W	900W	600W	900W	3000W	
MPPT Range @	30V~	60V~	30V~	60V~	30V~	60V~	60V~ 115V	
Oprating Voltage	66V	88V	66V	88V	66V	88V		
Max PV Array -								
Open Circuit Voltage	75V	102V	75V	102V	75V	102V	145V	
Nominal Battry Voltage	24V	48V	24V	48V	24V	48V	48V	
Max Current Charging	24A	18A	25A	18A	25A	18A	60A	
Max Efficiency	98%							
Standby Power Consumption	02%							
PHYSICAL								
Dimension D x W x H (mm)	128x272x355						120x295x468	
Net Weight (kgs)	7.4		7.6		8.0		10.0	
OPERATING ENVOIRMENT								
Humidity	5% to 95% Relative Humidity(Non-Condensing)							
Oprating Temperature	0 C - 55 C							
Stroge Temperature	-15 C - 60 C							

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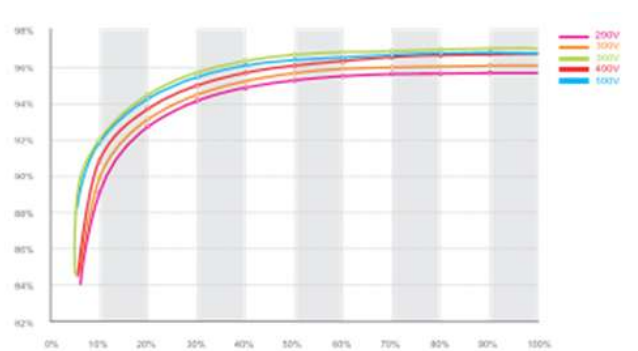
PHOTOVOLTAIC INVERTER (ON-GRID)

DP Electronics e.K (Deutsche Power Co., Limited)

On-Grid Solar Inverter With Transformless GT Topology



Leading-Edge Technology

Maximum efciency of 97.8% and wide input voltage range

Internal DC switch

Transformerless GT topology

Compact design

MTL - String

Bluetooth technology

Sound control

Easy installation

PHOTOVOLTAIC INVERTER (ON-GRID)

DP Electronics e.K (Deutsche Power Co., Limited)

	1500TL	2000TL	3000TL	4400TL	5000TL
Input Data					
Max. DC power	1800W	2300W	3200W	4600W	5000W
Max. DC voltage	450V	500V	500V	580V	580V
Full load Mpp-Voltage range	175V - 430V	195V -450V	250V -450V	250V -500V	250V - 500
PV voltage range MPPT	120V - 450V	120V -450V	120V -450V	120V - 500V	120V -500V
Max. number of parallel strings	1	2	2	3	3
Number of MPP trackers	1	1	1	1	1
Max. input current	10A	12A	15A	20A	20A
Output (AC)					
Nominal AC output power	1600W	2000W	2850W	4200W	4600W
Max. AC power	1650W	2000W	3000W	4400W	4600W
Max. output current	8A	11A	13A	21A	22.3A
AC voltage range	200V ac - 250V ac	200V ac - 250V ac	200V ac - 250V ac	200V ac - 250V ac	200V ac - 250V ac
AC grid frequency range	40.1Hz - 50.9Hz	40.1Hz - 50.9Hz	40.1Hz - 50.9Hz	40.1Hz - 50.9Hz	40.1Hz - 50.9Hz
Phase shift	1	1	1	1	1
THDI	<3%	<3%	<3%	<3%	<3%
AC connection	Single phase	Single phase	Single phase	Single phase	Single phase
Efficiency					
DC reverse polarity protection	yes	yes	yes	yes	yes
AC short-circuit protection	yes	yes	yes	yes	yes
Ground fault monitoring	yes	yes	yes	yes	yes
Grid monitoring	yes	yes	yes	yes	yes
Integrated all-pole sensitive leakage current monitoring unit	yes	yes	yes	yes	yes
Protection Devices					
Max.ef ciency	97%	97%	97%	97.8%	97.8%
Euro-eta	96%	96%	96.5%	97.4%	97.4%
MPPT ef ciency	99.5%	99.5%	99.5%	99.5%	99.5%
General Data					
Dimensions (W / H / D) in mm	362/329/132	362/329/132	362/329/132	406/406/192	406/406/192
W eight	11.5KG	11.7KG	12.2KG	21KG	21KG
Operating temperature range	-25 °C ... +60 °C	-25 °C ... +60 °C	-25 °C ... +60 °C	-25 °C ... +60 °C	-25 °C ... +60 °C
Noise emission (typical)	=25 dB(A)	=25 dB(A)	=25 dB(A)	=25 dB(A)	=25 dB(A)
Consumption: operating (standby)/ night	< 5W / < 0.5 W	< 5W / < 0.5 W	< 5W / < 0.5 W	< 5W / < 0.5 W	< 5W / < 0.5 W
Topology	transformerless	transformerless	transformerless	transformerless	transformerless
Cooling concept Installation: Indoors /	No fan	No fan	No fan	No fan	No fan
Outdoors (IP65)	yes / yes	yes / yes	yes / yes	yes / yes	yes / yes
Altitude	Up to 2000m without power derating	Up to 2000m without power derating	Up to 2000m without power derating	Up to 2000m without power derating	Up to 2000m without power derating
Humidity	0 ~ 95%, no condensation	0 ~ 95%, no condensation	0 ~ 95%, no condensation	0 ~ 95%, no condensation	0 ~ 95%, no condensation
Features					
DC connection:(MC3/MC4/H4)	opt /opt / yes	opt /opt / yes	opt /opt / yes	opt /opt / yes	opt /opt / yes
AC connection: Terminals	yes	yes	yes	yes	yes
LCD display	yes	yes	yes	yes	yes
Interfaces: Bluetooth/RS485/RS232	opt / yes / yes	opt / yes / yes	opt / yes / yes	opt / yes / yes	opt / yes / yes
Warranty: 5 years / 10 years	yes / opt	yes / opt	yes / opt	yes / opt	yes / opt

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PHOTOVOLTAIC CHARGE CONTROLER (MPPT)

DP Electronics e.K (Deutsche Power Co., Limited)

PHOTOVOLTAIC

MPPT SOLAR CHARGE CONTROLER

PHOTOVOLTAIC CHARGE CONTROLER (MPPT)

PV Network Mppt Solar Charge Controler

PV charge controler is an advance Maximum Power Point Tracking (MPPT controller for off-grid photovoltaic (PV) Systems. The controller features a smart tracking algorithm that maximizes the energy harvest from the PV by rapidly finding the solar array peak power piont in all the weather condition. The controller provides higher efficiency up to 97% with lower power loss.

PV charge controler is speacially designed to work with all established PV modules and is optimized for film grid-tied modules.

Features

- MPPT technology
- Peak conversion efficiency of 97%
- High Tracking Efficiency of 99%
- Several seconds tracking speed
- 4 stage charge with PWM output
- Nature convection cooling
- Full power output in ambient temperature up to 45 C
- Temperature compensation
- Sealed, gel and Flooded battery option
- Widely used, automatically recognize day/night
- Diversified load control
- RJ45 interface & optional meter
- 2 years warranty
- CE certificate

Electronic Protections

- PV array short circuit
- Over discharging
- Over charging
- Load overload
- Load short circuit
- PV over current
- PV reverse polarity
- Overheating protection

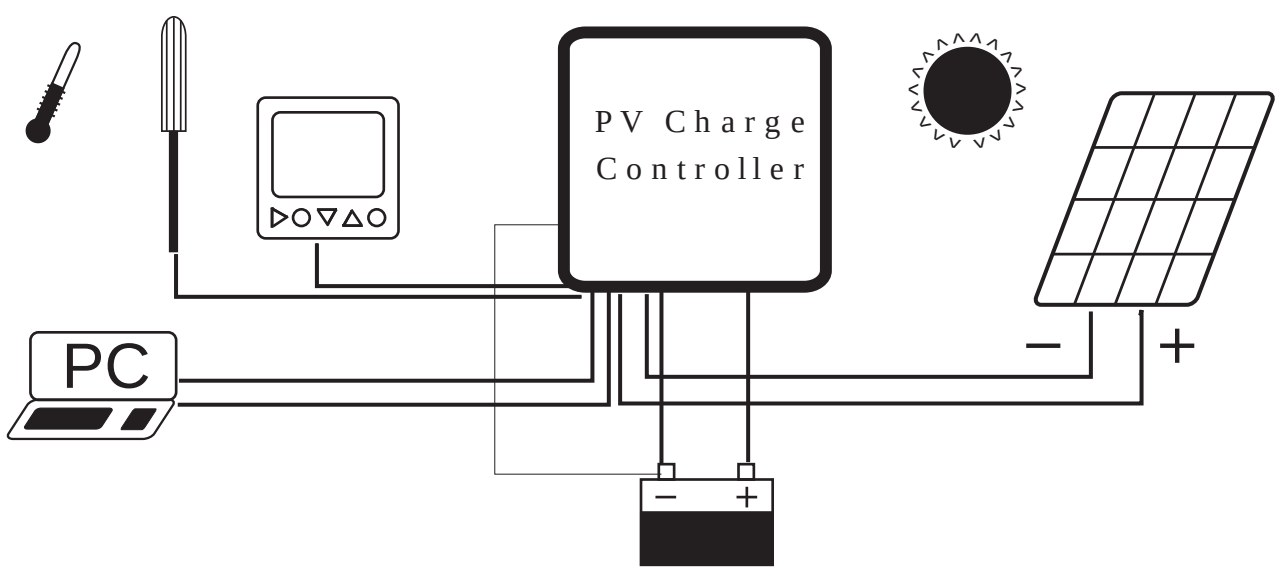
DP Electronics e.K (Deutsche Power Co., Limited)

PHOTOVOLTAIC CHARGE CONTROLER (MPPT)

DP Electronics e.K (Deutsche Power Co., Limited)

TECHNICAL SPECIFICATION

MODEL	PV-1206RN(P) PV-1216RN(P) PV-1215RN(P)	PV-2210RN(P) PV-2215RN(P)	PV-3215RN(P)	PV-4215RN(P)
Rated System Voltage	12V / 24V auto work			
Rated Battry Current	10A	20A	20A	20A
Maximum Battry Current	32V			
Max. PV open circuit voltage	60VDC PV-1206RN(P) 100-VDC PV-1210RN(P) 150-VDC PV-1215RN(P)	--- 100-VDC PV-1210RN(P) 150-VDC PV-2215RN(P)	150-VDC	150-VDC
Max. PV input power	12V 130W 24V 260W	12V 260W 24V 520W	12V 390W 24V 780W	12V 585W 24V 1170W
Self-consumption	<10mA(24V)			
Grounding	Negative			
Communication	TTL232 / 8pin RJ45			
Temp. Compensation	-30mV/C/12V (25C)			
Working temperature	-35C - + 55C			
Humidity	10% ~ 90% NC			



PHOTOVOLTAIC CHARGE CONTROLER (MPPT)

PV Network Mppt Solar Charge Controler

Tracer is an advance Maximum Power Point Tracking (MPPT controller for off-grid photovoltaic (PV) Systems up to 3KW. The controller features a smart tracking algorithm that maximizes the energy harvest from the PV by rapidly finding the solar array peak power piont in all the weather condition. The controller provides higher efficiency up to 98% with lower power loss.

Include up to 450 days data logging by connecting to Ethernet.

Features

- 12/24/36/48V auto work
- Advance MPPT technology
- Several seconds tracking speed
- High Tracking Efficiency of 99%
- Multiphase synchronous rectification technology
- Peak conversion efficiency of 98%
- DSP&ARM processors architecture ensures high speed and performance
- Three kinds of communication ports: RS232, CAN BUS and Ethernet
- Three stages charging optimizes battery performance Software update by users

Electronic Protections

- PV array short circuit
- Over discharging
- Over charging
- PV over current
- PV reverse polarity
- Overheating protection

DP Electronics e.K (Deutsche Power Co., Limited)

PHOTOVOLTAIC CHARGE CONTROLER (MPPT)

DP Electronics e.K (Deutsche Power Co., Limited)

TECHNICAL SPECIFICATION

MODEL	ET2415	ET3415	ET4415	ET6415
Rated System Voltage	12 / 24 / 36 /48V auto work			
Rated Battry Current	20A	30A	45A	60A
Maximum PV Open Current voltage	150V			
Voltage range	9~64V			
Max. PV input power	12V 260W 24V 520W 36V 780W 48V 1040W	12V 390W 24V 780W 36V 1170W 48V 1560W	12V 520W 24V 1040W 36V 1560W 48V 2080W	12V 780W 24V 1560W 36V 2340W 48V 3120W
Self-consumption	1.4~2.2W			
Grounding	Negative			
Overall dimension	213x203x105mm	238x203x105mm	293x203x105mm	293x203x121mm
Mounting dimension	105x193mm	105x193mm	200x193mm	200x193mm
Terminal	35mm^2			
Net weight	2.6kg	4.1kg	4.4kg	5.0kg
Working temperature	-20C to + 55C			
Humidity	10% ~ 90% NC			
Enclosure	IP20