



DATASHEET

Issue 1

**NEW
PRODUCT**



- Multifunction Meters
- Transducers & Isolators
- Temperature Controllers
- Converters & Recorders
- Digital Panel Meters
- Current Transformers
- kWh Energy Meters
- Analogue Panel Meters
- Shunts
- Digital Bargraphs
- Digital Multimeters
- Protection Relays
- Synchroscope Series
- Rotary Switches
- Power Supplies
- Test & Measurement

DIN RAIL SINGLE CHANNEL DC ENERGY METER WITH SHUNT

DC21-1CSH-RS

SUBJECT TO CHANGE WITHOUT NOTICE

This datasheet superseded all previous versions – please keep for future reference

Product Features:

- Direct Connection Meter
- Measured Electrical Parameters
- Demand
- Pulse Outputs(Optional)
- Impulse LED
- Front Keys
- Remote Communication (Optional)
- LCD
- Compliance to Standards

DC21-1CSH-RS

Din Rail Single Channel DC Energy Meter with Shunt



Overview

DC21-1CSH-RS is a modern Single channel DC Energy meter with bidirectional energy measurement, designed for EV charging station, telecommunication base stations, solar photovoltaic, and other applications of DC Energy measurement. The meter is engineered using advanced micro controller technology and it is suitable for electrical parameter measurement and monitoring. It displays parameters on bright intuitive LCD and also has Pulse Outputs and Impulse LED for energy monitoring. It has inbuilt industry standard MODBUS RTU for remote monitoring. Meter housing is standard Din Rail Mount that allows ease of installation.

Product Features

Direct Connection Meter: The Meter can safely measure 2000A maximum current through external shunt resistor output 50-150mv.

Measured Electrical Parameters: The Meter is primarily for bidirectional Energy measurement but it also accurately measures important electrical parameters like Voltage, Current, Power, Energy, Amper hours. The measured parameters can be viewed on display and MODBUS for remote viewing.

Note: Voltage channel is isolated(4kVDC).

Demand: The Demand parameter for Power (Import/Export)and Current are calculated as per configurable demand integration time.

Pulse Outputs: The Meter has one opto-isolated Pulse Outputs (SO) that can be configured for (Import/Export) Energy parameter. The pulse width and rate of pulse out is onsite programmable.

Impulse LED: The meter has Impulse LED which flash at rate of 1000 IMP/kWh indicating the Energy consumption.

Front Keys: Two keys are provided for easy navigation and accessibility of different parameters and onsite programming of the meter.

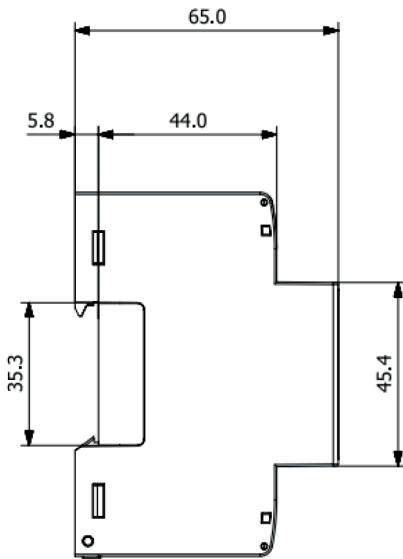
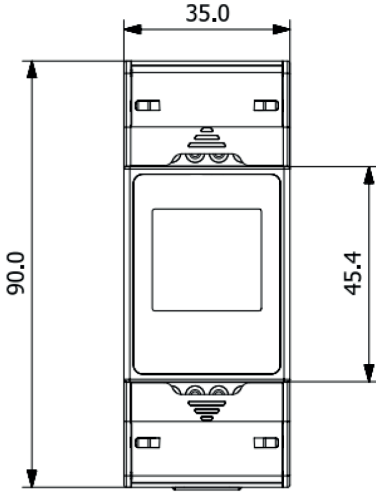
Remote Communication: The Meter provides RS485 communication based on MODBUS protocol for remote data acquisition of measurement data and configuration. MODBUS parameters baud rate, device address and parity- stop bits are programmable.

LCD: The LCD has bold seven segment digits with bright white backlit for display of measurement parameters. Special symbols, units and bar graph are provided for effective display and easy onsite configuration. Indications for communication status, pulse outputs are available on screen. Measurement screen can be set as automatic scrolling or manual scrolling.

Compliance to Standards: National / International Standards are complied

Accuracy Standard:	EN 50470-4:2023
	IEC 62053-41:2021
IP for water & dust:	IEC 60529
Plastic Flammability Standard:	UL 94
Electromagnetic Compatibility:	IEC 61326 - 1, Table 2

Dimensions Details



Technical Specifications:

Input :	
Measuring Voltage range	± 5-1000 VDC
Nominal Input Voltage range	100-1000 VDC
Operating Voltage range	± 5% to 110% of Nominal
Voltage Overload Withstand	2 x rated value for 1sec ,repeated 10 times at the 10 sec intervals
Power consumption in Voltage Circuit	< 2 W
Current Sensor	External Shunt
Shunt Setting Range	50 - 150(375) mV (Note 1)
Nominal Input Current range	5 to 2000A (via External Shunt)(Note 1)
Operating Current range	± 0.4% to 100% * Imax(Note 1) of Nominal
Auxiliary Supply:	
Aux Voltage	20-60V AC / DC (24V AC/DC nominal)
Aux Supply Frequency	45 to 65 Hz range
Burden	< 2VA approx. (at nominal value)
Accuracy:	
Voltage	± 0.5% of nominal value
Current	± 0.5% of Nominal value.
Power	± 1% of range max
Energy	± 1%
Energy (Import/Export)	Class 1 as per IEC 62053-41:2021 Class B as per EN 50470-4:2023
Pulse Output:	
SO	Passive Opto-isolated
Contact Ranges	5-27V DC, 27 mA DC (max)
Pulse Duration	60, 100 and 200 millisecond
Pulse Rate	1, 10, 100, 1000 pulse per kWh.
Impulse LED :	
Impulse Rate	1000 pulse per kWh

Note 1 :

IEC62053-41:2021 standard applicable to nominal input current range setting of 5A to 2000A and the shunt settings 50mV to 150mV

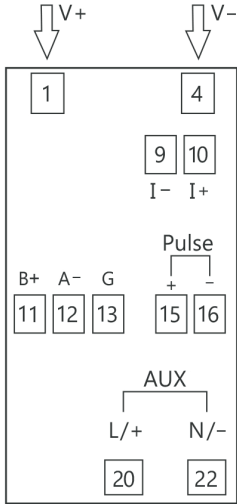
Current measurement parameters	5 to1000A	1001 to 2000A
Nominal Current (In)	5 to1000A	1001 to 2000A
Maximum Current Imax	<=2*In	2000A

EN50470-4:2023 standard applicable to nominal input current settings 5A to 400A and the shunt settings 50mV to 75mV.

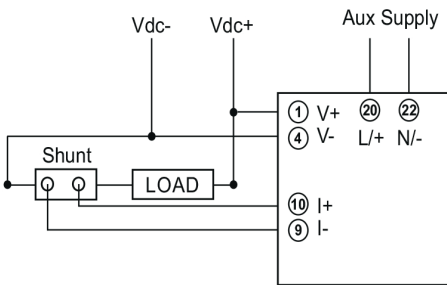
Current measurement parameters	5A	400A
Starting Current (0.04* <i>I_n</i>)	0.02A	1.6A
Minimum Current (0.5* <i>I_n</i>)	0.25A	20A
Transitional Current (<i>I_t</i>)	0.5A	40A
Nominal Current (<i>I_n</i>)	5A	400A
Maximum Current Imax (50* <i>I_n</i>)	25A	2000A

Connector Details:

Connection Diagram For DC2111 Mod:



Shunt Connection :



Communication Interface :	
Protocol	RS485 MODBUS
Baudrate	2.4 / 4.8 / 9.6 / 19.2 / 38.4 / 57.6 kbps
Data Width	8
Parity - Stop Bits	None -1 / None -2 / Even -1 / Odd -1
Response Time	< 200 millisecond
Display Ranges :	
Energy (Import / Export)	0 - 99999.99 kWh & Autoranging further
Ampere Hour	0 - 99999.99 Ah & Autoranging further
Voltage	±0 - 9999 V
Current	±0 - 9999 A
Power	±0 - 9999 VA
Installation :	
Installation	Indoor
Enclosure	IP51 (Front side) & IP20 (Terminal side) (IEC 60529: 2001)
Housing	2 Module DIN 43880
Dimensions	35mm x 90mm x 65mm
Weight	250gm
Mounting	35mm DIN Rail
Safety :	
Safety Standard	According to IEC61010
Installation Category	II
Protective Class	II
Pollution Degree	2
High Voltage Test	6200 V DC for 1 minute
Impulse Voltage Withstand	9.3 kV (1.2 microsecond waveform)
Housing Flame Resistance	Flammability Class V-0 acc. to UL 94, Self Extinguishing, Non Dripping, free of Halogen
Environmental Conditions :	
Mechanical Environment	M1
Electromagnetic Environment	E2
Operating Temperature	-25°C to +70°C
Storage/Transport Temperature	-40°C to +70°C
Relative Humidity	0... 95% (Non Condensing)
Altitude	<2000 m max
Wiring Guidelines:	
Aux / Voltage Input Wire Size	1 to 2.5 mm ² (use insulated pin types lugs)
Aux / Voltage Tightening Torque	0.4 Nm
RS485 / SO / Current Wire Size	0.5 to 2.5 mm ² (Solid/Stranded with pin type lug)
RS485 / SO / Current Tightening Torque	0.4 Nm

Measured Parameter :

Sr No	Parameters
1.	Total Energy
2.	Import Energy
3.	Export Energy
4.	Partial Total Energy
5.	Partial Import Energy
6.	Partial Export Energy
7.	Voltage
8.	Current
9.	Power
10.	Total Amper Hour
11.	Import Amper Hour
12.	Export Amper Hour
13.	Partial Total Amper Hour
14.	Partial Import Amper Hour
15.	Partial Export Amper Hour
16.	Import kW Demand
17.	Export kW Demand
18.	Max Import kW Demand
19.	Max Export kW Demand
20.	Max Import Current Demand
21.	Max Export Current Demand
22.	Import Current Demand
23.	Export Current Demand
24.	Max Current
25.	Min Current
26.	Max Voltage
27.	Min Voltage
28.	Max Power
29.	Min Power
30.	Run Hours
31.	On Hours
32.	Number of Interruptions

Note: Datasheet subject to change without notice.

Order Code :

Product Code	DC21	1C	SH	RS
DC Energy Meter				
Input Voltage Range: 5-1000VDC				
Current Range: 5-2000A(50-150mV)				
Meter Interface: RS485 with 1 SO Output				

Order Code Example:

DC21-1CSH-RS

DC 2111 Mod Single Channel DC Energy Meter, voltage range 5-1000V, lower aux 20-60V AC/DC with RS485 Modbus and SO output.

DC – Indicates the input as DC

1C – Indicates 1 channel

SH – Indicates Shunt Input

RS – Indicates the variants (RS485 Modbus)

Product Features:

- Rating 1A to 15000A
- Riveted and brazed construction
- In-line bus bar mounting
- Very low temperature coefficient
- High overload withstand
- Shock and vibration proof
- Long term stability
- DIN shunts of 1...25 A with base.
- IS shunts of 1...30 A with base.
- The isolation base is adapted to be assembled on a 35 mm DIN rail.

DC Shunts



Sifam Tinsley Shunts provide an accurate DC millivolt signal proportional to higher DC current to drive the New DC21 single channel DC energy meter. These are made from Manganin material and available from 1A up to 15'000A with an accuracy 0.5 & 1% (on request 0.2%). Standard voltage drop is 50, 60, 75 & 150mV. Our Shunts are manufactured in three different format version depending on the primary current and secondary rating.

Operating Principle

The current passing through the shunt produces a proportional voltage drop. A moving coil instrument connected to the shunt measures the voltage drop across the shunt terminals. Shunts are calibrated in such a way that they produce an accurately defined voltage drop (60mV, 150mV or other).

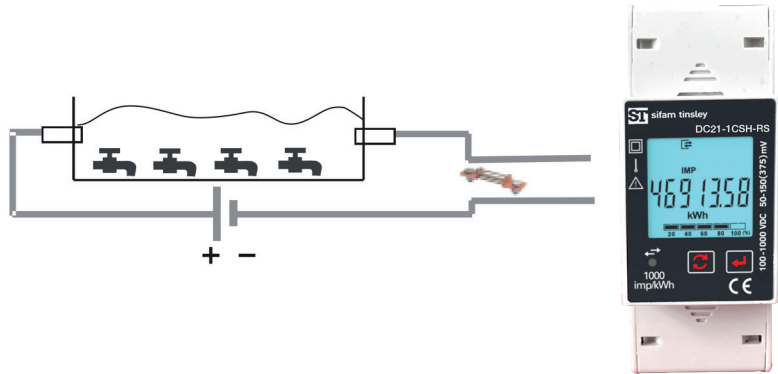
Rules and Standards

DIN 43 703	Shunts
IS 1248-8	Shunts
DIN EN 60 051	Direct acting indicating analogue electrical measuring instruments and their accessories
	Part 1: Definitions and general requirements common to all parts
8	Part 8: Special requirements for accessories
9	Part 9: Recommended test methods
DIN EN 60 715	Dimensions of low voltage switching devices: standardized DIN rails for mechanical fixation of electrical devices in switchgears

Technical Data:

Electromagnetic compatibility	Noise immunity	acc. to EN 61000-6-2
	Noise emissions	acc. to EN 61000-6-4
Accuracy class	0.5% & 1%	
5 Seconds withstand	10 times for 1 A to 500 A 5 times for 600 A to 2000 A 2 times for 2500 A to 15000 A	
Shunts dimensions	acc. to DIN 43 703 and IS 1248-8 standard	
Testing voltage of shunts with an isolating base	5 kV	
Resistance of a pair of wires connecting the shunt to the meter	35 mQ or 75 Q, wires are not delivered with the shunt	
Maximum Load	The load should not exceed 0.1% or the nominal current rating for specified accuracy	
Continuous Over Load	20% rated current	
Temperature Coefficient	0.002% percent	
Ambient Temperature	Calibration at 23°C	
Operating Temperature	- 10°C to 50°C	
Storage Temperature	- 20°C to 70°C	
Millivolt	50 mV, 60 mV, 75 mV, 100 mV, 150 mV	

Example of Application



General Data

Formate versions :

A,D Insulating base mounted shunts clamping to DIN mounting (up to 25 A/ 50, 60, 75,100 150 mV); without insulating base (30 ... 150 A)

B Lprofile end blocks

C Tprofile end blocks

Material resistance bars :- Manganin

End blocks :-

Format version A,D F high conductivity brass

ormat version B high conductivity brass/solid

Format version C copper solid copper



Features

1A
...
18 kA

Class
0.5

DIN
35 mm

Inputs

I

DC

Outputs

50 mV

60 mV

75 mV

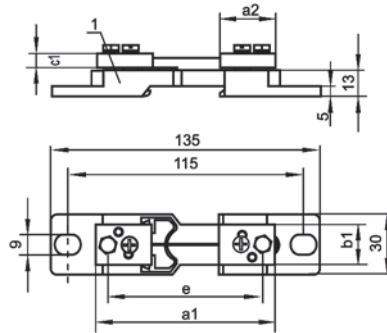
100 mV

150 mV

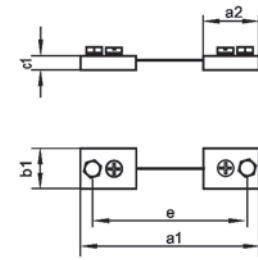
Process of fillings electroplating.

Kind of version

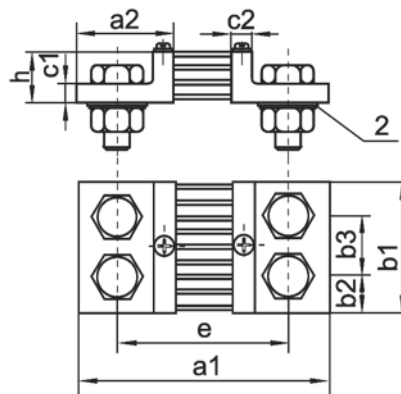
Version A (on an isolating base)



Version D



Version B



Version C

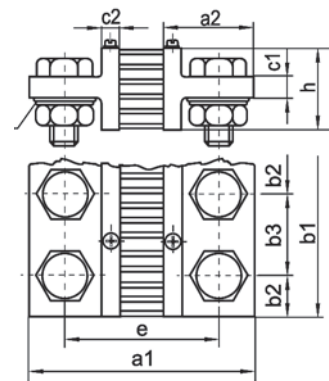


Fig.1. Fixing dimensions of shunts
1 - isolating base, 2 - round spring washer.

2 60 mV												Current terminals			
IN [A]	Version	a1	a2	b1	b2	b3	c1	c2	e	h	Weight [kg]	LZ	Bolt	P	N
1; 1.5; 2.5; 4; 6; 10; 15; 25	A	90	28	20	-	-	8	-	78	-	0.13	2 x 1	M5 x 12	5.5	-
40, 60, 100, 150	A, D	100	33	20	-	-	8	-	80	-	0.13	2 x 1	M8 x 16	8.5	-
250	B	145	55	30	15	-	10	10	105	30	0.60	2 x 1	M12 x 40	13	M12
400	B	145	55	40	20	-	10	10	105	30	0.85	2 x 1	M16 x 45	17	M16
600	B	145	55	40	20	-	10	10	105	30	0.85	2 x 1	M16 x 45	17	M16
1000	B	165	65	60	30	-	10	10	115	30	1.45	2 x 1	M20 x 50	21	M20
1500	B	165	65	90	21	48	10	10	115	30	2.00	2 x 2	M16 x 45	17	M16
2500	B	165	65	120	30	60	10	10	115	30	2.90	2 x 2	M20 x 50	21	M20
4000	C	165	65	120	30	60	15	10	115	60	4.30	2 x 2	M20 x 60	21	M20
6000	C	175	70	154	25	52	25	15	125	130	10.50	2 x 3	M20 x 75	21	M20
10000	C	185	75	206	25	52	30	20	135	170	21.00	2 x 4	M20 x 80	21	M20
15000	C	185	75	310	25	52	30	20	135	170	32.00	2 x 6	M20 x 80	21	M20



B2

3 150 mV												Current terminals			
IN [A]	Version	a1	a2	b1	b2	b3	c1	c2	e	h	Weight [kg]	LZ	Bolt	P	N
1; 1.5; 2.5; 4; 6; 10; 15; 25	A	90	28	20	-	-	8	-	78	-	0.14	2 x 1	M5 x 12	5.5	-
40, 60, 100, 150	D	225	33	25	-	-	8	-	205	-	0.23	2 x 1	M8 x 16	8.5	-
250	B	270	55	30	15	-	10	10	230	50	0.68	2 x 1	M12 x 40	13 M	12
400	B	270	55	40	20	-	10	10	230	50	1.05	2 x 1	M16 x 45	17 M	16
600	B	270	55	40	20	-	10	10	230	50	1.16	2 x 1	M16 x 45	17 M	16
1000	B	290	65	70	35	-	10	10	240	60	2.15	2 x 1	M20 x 50	21 M	20
1500	C	290	65	90	21	48	15	10	240	60	3.10	2 x 2	M16 x 60	17 M	16
2500	C	290	65	120	30	60	15	10	240	60	5.20	2 x 2	M20 x 60	21 M	20
4000	C	300	70	120	30	60	25	15	250	130	8.30	2 x 2	M20 x 75	21 M	20
6000	C	300	70	154	25	52	25	15	250	130	15.00	2 x 3	M20 x 75	21 M	20
10000	C	310	75	206	25	52	30	20	260	170	28.00	2 x 4	M20 x 80	21 M	20
15000	C	310	75	310	25	52	30	20	260	170	35.00	2 x 6	M20 x 80	21 M	20



B3

4 50 mV												Current terminals			
IN [A]	Version	a1	a2	b1	b2	b3	c1	c2	e	h	Masa [kg]	LZ	Bolt	P	N
1; 1.5; 2.5; 4; 6; 10; 15; 25	A	90	28	20	-	-	8	-	78	-	0.13	2 x 1	M5 x 12	5.5	-
40, 60, 100, 150	D	100	33	20	-	-	8	-	80	-	0.13	2 x 1	M8 x 16	8.5	-
250	B	138	55	30	15	-	10	10	98	30	0.60	2 x 1	M12 x 40	13	M12
400	B	138	55	40	20	-	10	10	98	30	0.85	2 x 1	M16 x 45	17	M16
600	B	138	55	40	20	-	10	10	98	30	0.85	2 x 1	M16 x 45	17	M16
1000	B	158	65	60	30	-	10	10	108	30	1.45	2 x 1	M20 x 50	21	M20
1500	B	158	65	90	21	48	10	10	108	30	2.00	2 x 2	M16 x 45	17	M16
2500	B	158	65	120	30	60	10	10	108	30	2.90	2 x 2	M20 x 50	21	M20
4000	C	158	65	120	30	60	15	10	108	60	4.30	2 x 2	M20 x 60	21	M20
6000	C	168	70	154	25	52	25	15	118	130	10.50	2 x 3	M20 x 75	21	M20
10000	C	178	75	206	25	52	30	20	128	170	21.00	2 x 4	M20 x 80	21	M20
15000	C	178	75	310	25	52	30	20	128	170	32.00	2 x 6	M20 x 80	21	M20



B4

IN [A]	Version	5 75 mV										Current terminals			
		a1	a2	b1	b2	b3	c1	c2	e	h	Weight [kg]	LZ	Bolt	P	N
1; 1.5; 2.5; 4; 6; 10; 15; 25	A	90	28	20	-	-	8	-	78	-	0.14	2 x 1	M5 x 12	5.5	-
40, 60, 100, 150	D	115	33	25	-	-	8	-	95	-	0.17	2 x 1	M8 x 16	8.5	-
250	B	160	55	30	15	-	10	10	120	30	0.63	2 x 1	M12 x 40	13	M12
400	B	160	55	40	20	-	10	10	120	30	0.92	2 x 1	M16 x 45	17	M16
600	B	160	55	40	20	-	10	10	120	30	1.00	2 x 1	M16 x 45	17	M16
1000	B	180	65	60	30	-	10	10	130	30	1.75	2 x 1	M20 x 50	21	M20
1500	B	180	65	120	30	60	10	10	130	30	2.30	2 x 2	M16 x 45	17	M16
2500	C	180	65	120	30	60	15	10	130	60	3.10	2 x 2	M20 x 60	21	M20
4000	C	190	70	120	30	60	25	15	140	130	5.20	2 x 2	M20 x 75	21	M20
6000	C	190	70	154	25	52	25	15	140	130	11.20	2 x 3	M20 x 75	21	M20
10000	C	200	75	206	25	52	30	20	150	170	22.00	2 x 4	M20 x 80	21	M20
15000	C	200	75	310	25	52	30	20	150	170	33.00	2 x 6	M20 x 80	21	M20



B5

IN [A]	Version	6 100 mV										Current terminals			
		a1	a2	b1	b2	b3	c1	c2	e	h	Weight [kg]	LZ	Bolt	P	N
1; 1.5; 2.5; 4; 6; 10; 15; 25	A	90	28	20	-	-	8	-	78	-	0.14	2 x 1	M5 x 12	5.5	-
40, 60, 100, 150	D	145	33	25	-	-	8	-	125	-	0.20	2 x 1	M8 x 16	8.5	-
250	B	190	55	30	15	-	10	10	150	30	0.65	2 x 1	M12 x 40	13	M12
400	B	190	55	40	20	-	10	10	150	30	1.00	2 x 1	M16 x 45	17	M16
600	B	190	55	40	20	-	10	10	150	30	1.11	2 x 1	M16 x 45	17	M16
1000	B	210	65	60	30	-	10	10	160	30	2.00	2 x 1	M20 x 50	21	M20
1500	B	210	65	120	30	60	10	10	160	30	2.50	2 x 2	M16 x 45	17	M16
2500	C	210	65	120	30	60	15	10	160	60	3.20	2 x 2	M20 x 60	21	M20
4000	C	220	70	120	30	60	25	15	170	130	5.80	2 x 2	M20 x 75	21	M20
6000	C	220	70	154	25	52	25	15	170	130	12.00	2 x 3	M20 x 75	21	M20
10000	C	230	75	206	25	52	30	20	180	170	23.00	2 x 4	M20 x 80	21	M20
15000	C	230	75	310	25	52	30	20	180	170	34.00	2 x 6	M20 x 80	210	M20



B6

IN - rated current

LZ - number of terminals

Bolt - hexagon bolt

P - washer

N - nut

Voltage terminals - two M5 x 8 cylinder-head bolts with a cruciform cavity + 5.5 washers + 5.1 spring washers

Ordering

Product Code	YN01-	XX	XX	X	X	S	000000
Primary Current	1A	01					
	2A	02					
	5A	03					
	10A	04					
	15A	05					
	20A	06					
	25A	07					
	30A	08					
	32A	09					
	40A	10					
	50A	11					
	60A	12					
	63A	13					
	70A	14					
	75A	15					
	80A	16					
	100A	17					
	125A	18					
	150A	19					
	160A	20					
	200A	21					
	250A	22					
	300A	23					
	400A	24					
	500A	25					
	600A	26					
	750A	27					
	800A	28					
	1000A	29					
	1200A	30					
	1250A	31					
	1500A	32					
	1600A	33					
	2000A	34					
	2500A	35					
	3000A	36					
	4000A	37					
	5000A	38					
	6000A	39					
	7500A	40					
	630A	41					
	192A	42					
	175A	43					
	1800A	44					
	3A	45					
	1400A	46					
	350A	47					
	120A	48					
	10000A	49					
Voltage Drop	50mV		50				
	60mV		60				
	75mV		75				
	100mV		10				
	150mV		15				
	0.50%			5			
	1%			1			
	Insulating base				B		
	without insulating base				W		

Contact



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