

TELCOM ESS

TELCOM Energy Storage System



INDEX

| NO. | SPEC. DESCRIPTION |
|----------|--|
| 1 | CABINET 785mm X 2180mm X 640mm IP55、 IP65、 IP66 or IP67 * Outdoor Rack 19" ; IP 65 ; 37U GRP, standard sealing or EPDM sealing * |
| 2 | System Architecture Scheme & Single diagram |
| 3 | MPPT Charge Controller Charge range of 12Vdc, 24Vdc, 36Vdc, 48Vdc ,60**Vdc Input range : 12 / 24 / 36 / 48 / 60 Vdc ** output voltage: 12 / 24 / 36 / 48 / 60 Vdc ** |
| 4 | Monitoring PV Input, Output V, Output A, Today Amp Hour (Low/High record), Today Watt Hour(Low/High record) Real Time Charge Status, MPPT Temp., NET Mode, Battery SOC, Battery Status(including V、 A、 Amp Hour、 Temp.), Shunt Connect Status, Voltage senser Connect Status Local Server 20 years memory, 2 ModBus , 1 EtherNet, web page |
| 5 | Battery LCMO-2; 42V-58.8V ; 4.292kWh * |
| 6 | DC switch & DC MCCB & MCB |
| 7 | Surge Protective Devices 20kA I _{max} 40kA, with fire distinguishing arcing chamber 50KA * UL |
| 8 | gPV fuse protection 10KA, 30KA * |

* Optional **Specially made, to be advised

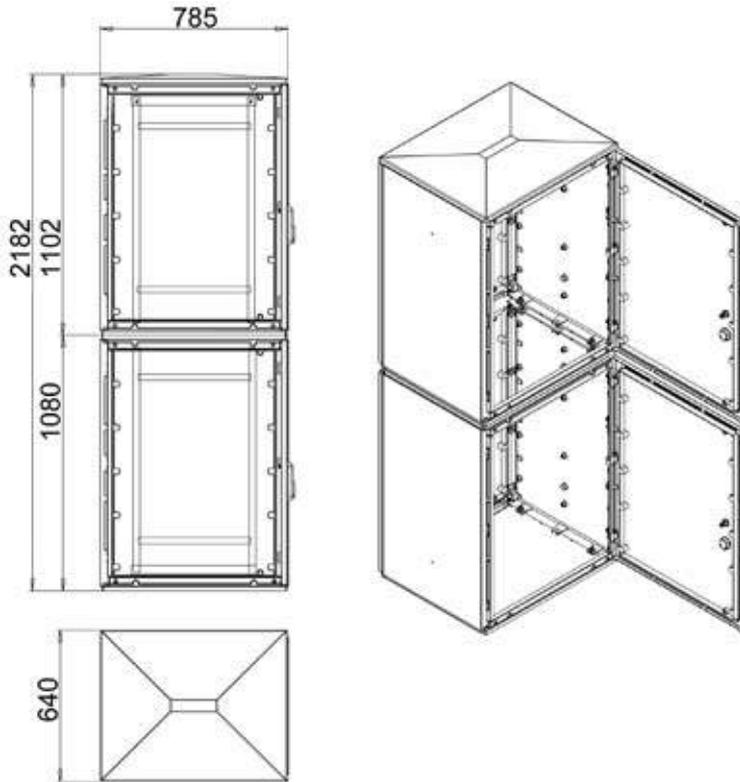
Cabinet Physical Properties

General Properties & Dimension



Cabinet Physical Properties

General Properties & Dimension



■ **Cabinet Size:**

785W x 2182H x 640D mm

■ **Protection level:**

IP65 according to IEC 529,
BS EN 60529:1992 Certified,
NEMA 4X and lower

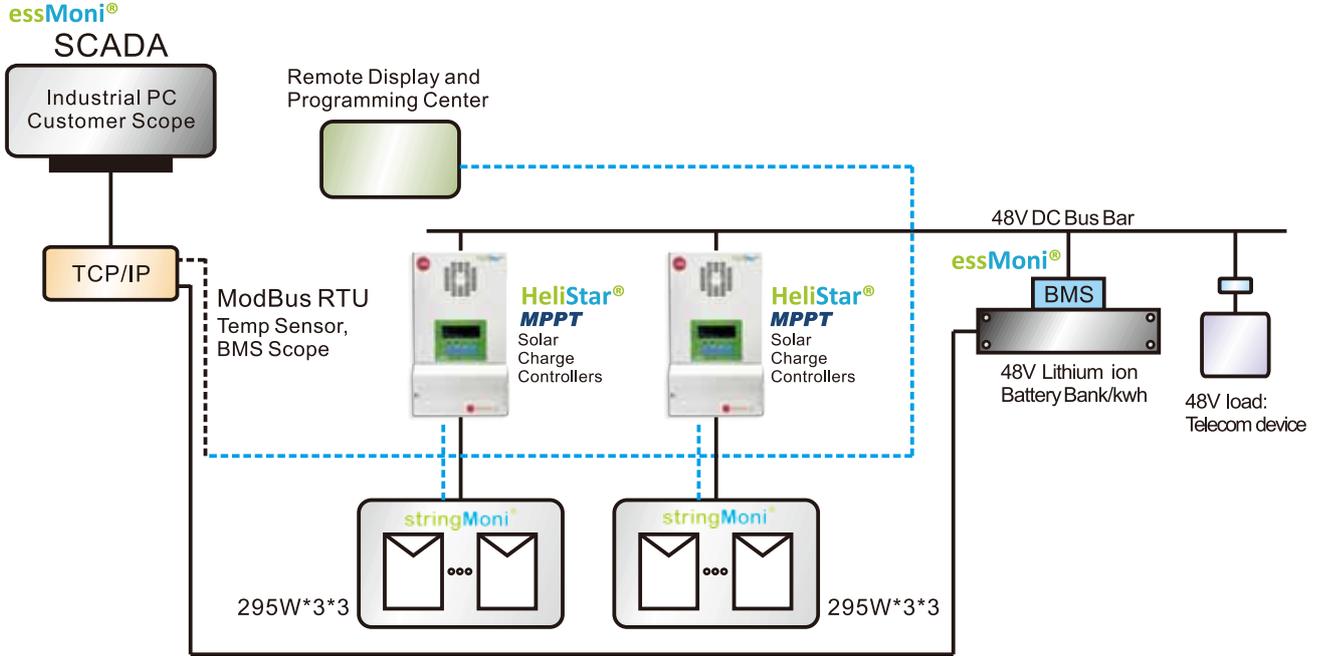
■ **IP-66/65-55 & Lower:**

BS EN 60529:1992 Certified,
NEMA 4X and lower

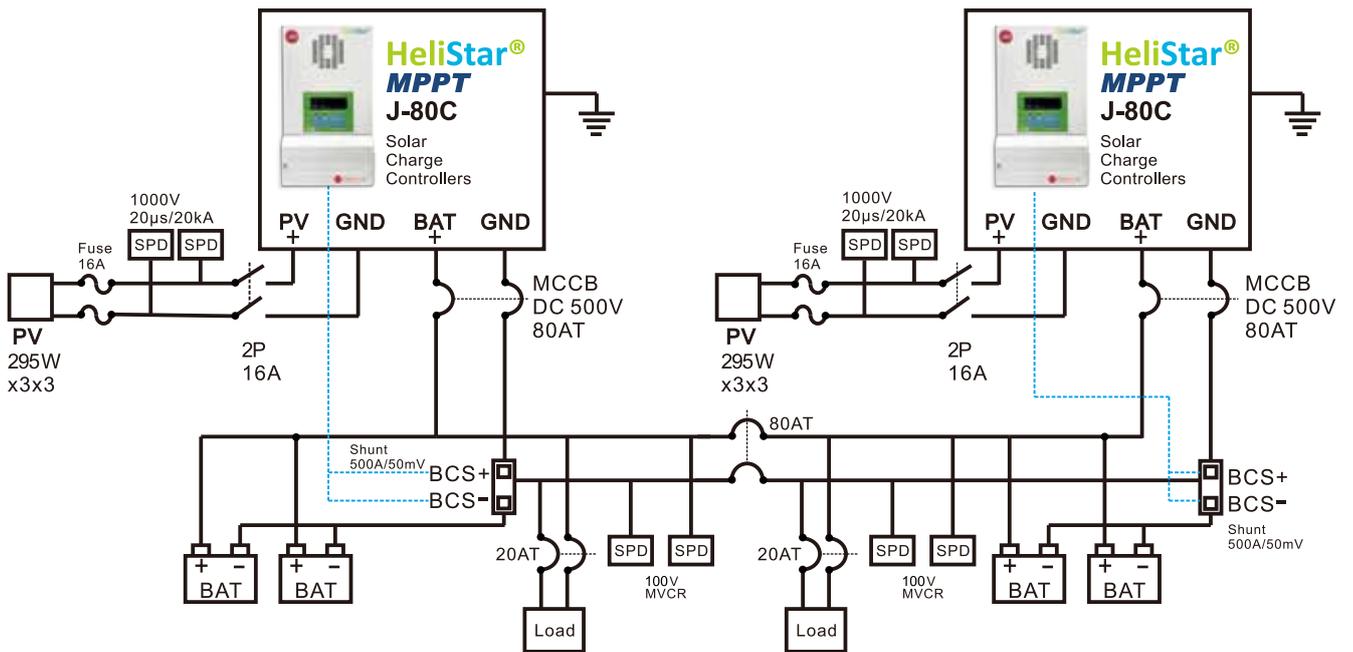
| Test | Norm | Unit | |
|-------------------------------------|---------------------------|-------------------|---|
| Young's modulus | DIN EN 527-4 | GPa | 12 |
| Tensile strength | DIN EN 527-4 | MPa | 62 |
| Flex strength | ISO 14125 | MPa | 150 |
| Flex modulus | ISO 14125 | GPa | 10 |
| Impact strength | ISO 179 | kJ/m ² | > 68 |
| Volume resistivity | IEC 60093 | Ohm/cm | 1.00E+15 |
| Surface resistivity | IEC 60093 | Ohm | 1.00E+13 |
| Tracking index | IEC 60112 | Stufe | CTI600 |
| Dielectric strength | IEC 60243.1 | kV/cm | 240 |
| Dielectric constant | IEC 60250 | | 4 |
| Dissipation factor | IEC 60250 | Tan Delta | 0.01 |
| Water absorption | ISO 62 | mg/4d | 45 |
| Surface resistance | IEC 60093 | Ohm | >10 ¹² |
| Dielectric resistance | IEC 60243) | kV/mm | > 18 |
| Stability by light | DIN EN ISO 877 | | 7 – 8 |
| Tropical and moisture resistance | IEC 60068-2-5 ed. 69 | | without any degradation Stability of shape |
| Stability of shape | ISO 75 (equiv. DIN 53462) | | > 200°C |
| Temperature resistance continuously | | °C | - 50 - + 150 Flame resistance |
| Flame resistance | UL 94 V0 | mm | 4 |

System Architecture

Scheme Diagram



Single Diagram



HeliStar[®] MPPT Solar Charge Controller

Specification

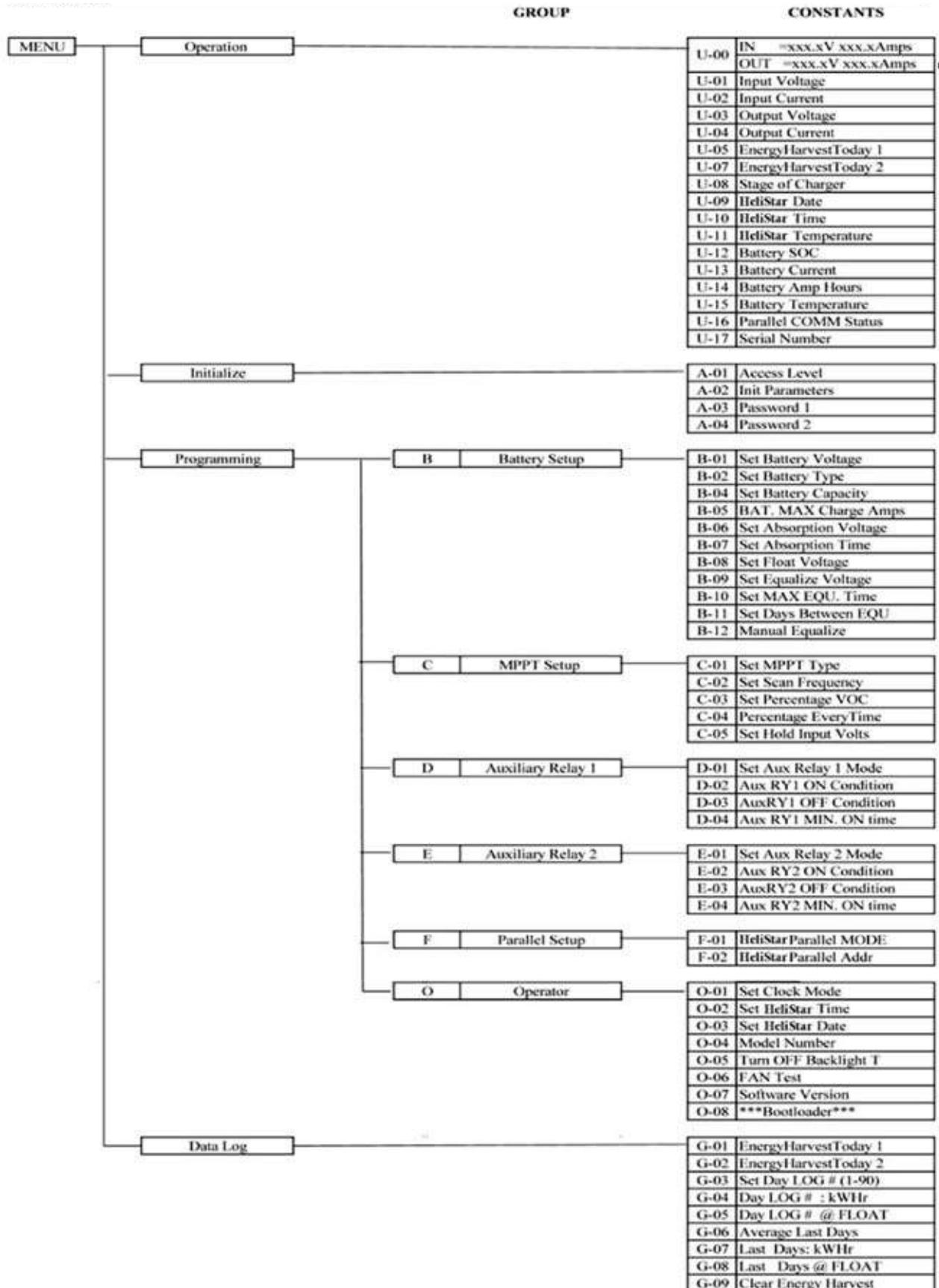


Solar Charge Controller
J-50C / J-80C / J-80CX / J160CX

| Model No. | J-50C MPPT | J-80C MPPT | J-80CX MPPT | J-160CX MPPT |
|--|--|--|--|--|
| Maximum output current (Continuous at up 50°C ambient temperature) | 50 Amps | 80 Amps | 80 Amps | 160 Amps |
| Battery Voltages | 12,24,36,48 VDC Normal | | | |
| Max PV Input Current | 40 Amps | 70 Amps | 70 Amps | 140 Amps |
| Input Voltage Range | 16~112VDC Operating | | 16~192VDC Operating | |
| | 140VDC Maximum Open Circuit Voltage | | 240VDC Maximum Open Circuit Voltage | |
| Max PV Array Power | 3250 Watts (Maximum when equalizing a 48V battery to 64V at 50 Amps) | 5200 Watts (Maximum when equalizing a 48V battery to 64V at 80 Amps) | 5200 Watts (Maximum when equalizing a 48V battery to 64V at 80 Amps) | 10400 Watts (Maximum when equalizing a 48V battery to 64V at 160 Amps) |
| Charge Regulation Modes | Bulk, Absorption, Float, Auto/ Manual Equalization | | | |
| Battery Temperature Compensation | 5.0 mV per °C, per 2 volt cell | | | |
| DC to DC Conversion Capability | 12V Battery: 16~112VDC | | 12V Battery: 16~192VDC | |
| | 24V Battery: 32~112VDC | | 24V Battery: 32~192VDC | |
| | 36V Battery: 48~112VDC | | 36V Battery: 48~192VDC | |
| | 48V Battery: 64~112VDC | | 48V Battery: 64~192VDC | |
| Display Status | Built-in 2-line, 20-character LCD with backlight LCD status screen displays input voltage and current, output voltage and current, charge-mode, Battery SOC | | | |
| Data Logging | Logs energy harvested for 90 days, LCD displays WH, KWH, AH | | | |
| Energy Monitor | LCD shows SOC, AH, WH, and present charge or discharge current. A 50mV/ 500Amp shunt is required to use | | | |
| Auxiliary Relays | Two independent relays with from A (SPST) contacts for control of external devices. Contact rating is 3 Amps, 50VDC | | | |
| Operation Temperature | Full Power Output to +50°C ambient | | | |
| Standby Power | < 2 Watts | | | < 4 Watts |
| Dimension | 267.6 x 196 x | 414.8 x 225 x | 414.8 x 225 x | 498 x 392.6 x |
| | 147 mm | 147 mm | 147 mm | 147 mm |
| Weight | 4.3 Kgs | 7.1 Kgs | 7.1 Kgs | 17 Kgs |

HeliStar[®] MPPT Control MENU

Contents Tree



essMoni[®] Monitoring

Monitoring System



Solar Panel Input String Monitoring



Detect INV DC IN DCV DCA
DC OUT DCV DCA

INV monitoring integrated with stringMoni[®]



Error Code

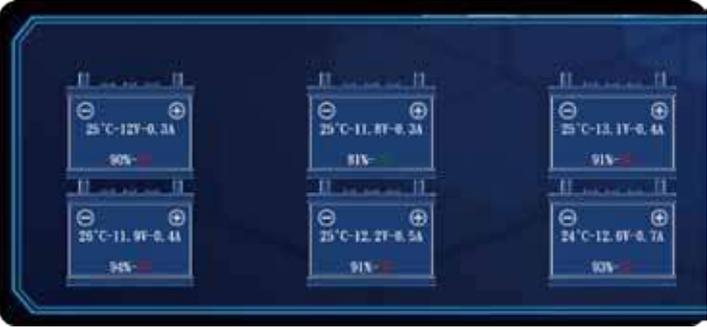


Charge Controller



It can detect DC IN DCA DCV
 Control battery charge and discharge

BMS integrated with essMoni[®]



ModBus access

- | | |
|---------------------------------|----------------------------------|
| 1.Input Voltage (PV Input) | 11.MPPT Temperature |
| 2.Input Current (PV Input) | 12.NET Mode |
| 3.Output Voltage | 13.Battery SOC |
| 4.Output Current | 14.BatteryVoltage |
| 5.Today Amp Hour (Low 16bits) | 15.Battery Current |
| 6.Today Amp Hour (High 16bits) | 16.Battery Amp Hour |
| 7.Today Watt Hour (Low 16bits) | 17.Battery Temperature |
| 8.Today Watt Hour (High 16bits) | 18.Shunt Connect Status |
| 9.Today FloatTime | 19.Voltage sensor Connect Status |
| 10.Real time Charge State | |

TCP/IP connection for different country, please specify

SNMP NAT VPN Firewall
 Wireless 4G network card



日煬科技有限公司
JD Auspice Co., Ltd.



stringMoni[®]

太陽能發電 智慧監測系統 雲端網頁管理

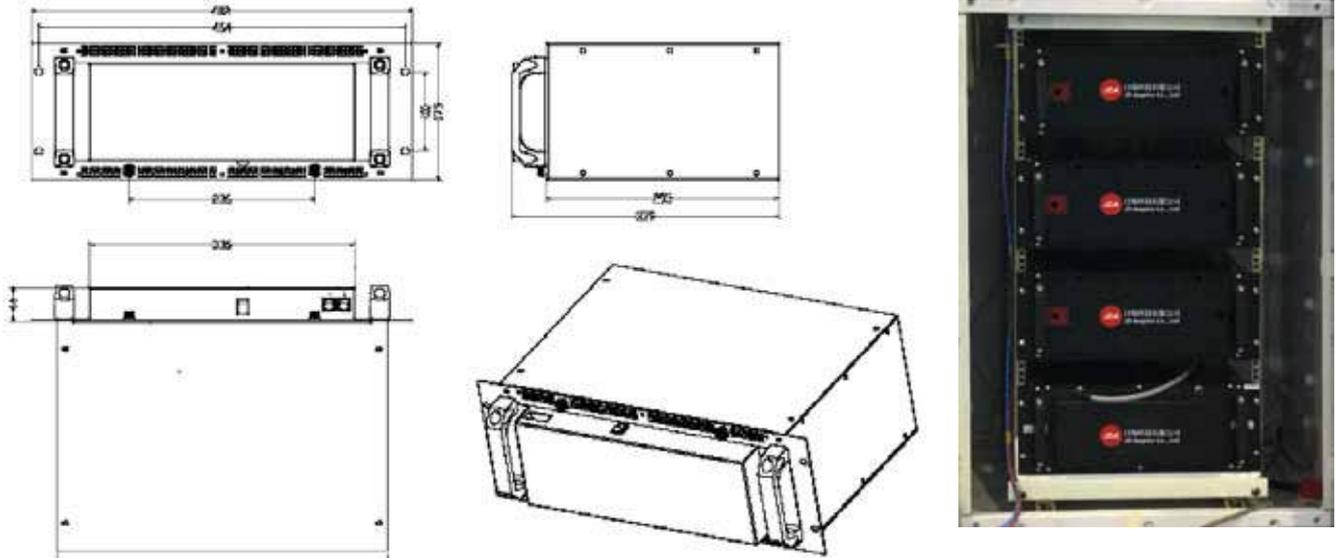
PV String Monitoring System & Web-server

太陽光發電SMART遠隔監視システム・ウェブサーバ



Battery Bank

Specification



Battery Specification

| Model | LCMO-2 |
|-----------------------------|------------------------------------|
| Energy [kWh] | 4.292 |
| Nominal Voltage [V] | 51.1 |
| Voltage Range [V] | 42~58.8 |
| Nominal Capacity [Ah] | 84 |
| Max Discharge Current [Amp] | 42 |
| Discharge End Voltage [V] | 42 |
| Max Charge Current [Amp] | 42 |
| Charge Voltage [V] Max | 58.8 |
| Cell Type | Pouch |
| Chemistry | LiCoxNiyMnzO |
| Dimensions (LWH) [mm/inch] | 482(L) × 175(W) × 339(H) mm (±3mm) |
| Weight [kg] | 36.3 |

Performance

| | |
|---------------------------------------|----------------------------------|
| Cycle(0.5C charge and 0.5C discharge) | >4000 cycle 85%DOD, Temp 25~35°C |
| End of Life | 80%SOC of 4000 cycle 85% DOD |
| Self-Discharge | TBD |
| Round Trip Efficiency | 98.50% |

Operation Environments

| | |
|-----------------------|----------|
| Operating Temperature | 0~50°C |
| Storage Temperature | -20~55°C |
| Humidity | RH45~85% |

Front Panel

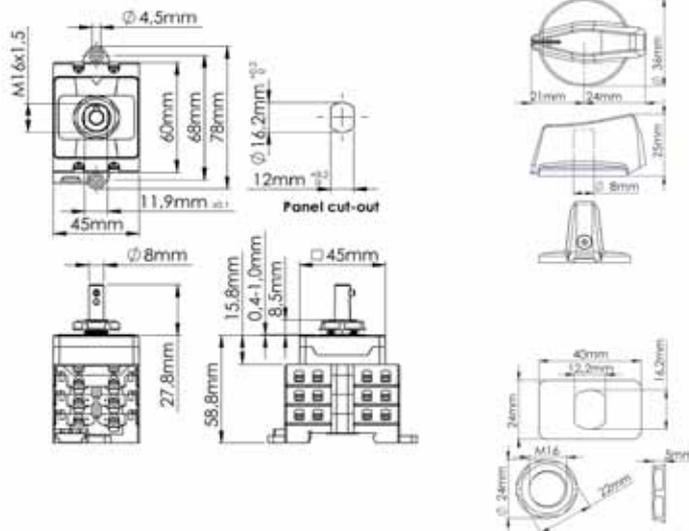
| | |
|---------------------------|------------------------|
| Status Indicators | NA |
| SOC/ALM/RUN | NA |
| Protocol | RS485 |
| Communication Ports | WP-04F2-44 防水頭 4PIN(F) |
| Communication in Parallel | Up to 14 trays |

DC SWITCH

Data Sheet

XBE+0210/2

Certified for IEC 60947 1&3
DC-PV1 and CCC (CQC)



The tolerances for the Santon datasheet are according to ISO 1101, ISO 8015, ISO 2768 1 class m, unless stated otherwise.

| Technical data | Symbol | Rated: | I | II | III | IV | Unit | |
|--|----------|--------|------|------|-------------|---|-----------------|----|
| Rated operational voltage | Ue | | 1100 | 1000 | 800 | 500 | V dc | |
| Rated operational current | Ie | | 10 | 16 | 25 | 50 | A dc | |
| Required fine wire cross-section (minimal)*: | | | 2,5 | 2,5 | 4 | 10 | mm ² | |
| *IEC60947-1, table 9 | | | | | | | | |
| Number of DC poles | | | | | | 2 | | |
| Utilization category DC | | | | | | DC-PV1 | | |
| Pollution degree | | | | | | 2 | | |
| IP rating terminals | | | | | | IP20 | | |
| Tightening torque terminal screws M4 (min. - max.) | | | | | 1,5 - 1,7 | | Nm | |
| Method of mounting | | | | | | | | |
| IP rating of the shaft in case of single hole mounting | | | | | | IP65 | | |
| Tightening torque panel mounting nut (min. - max.) | | | | | 2,0 - 2,5 | | Nm | |
| Panel thickness between | | | | | 1 - 4 | | mm | |
| Positions | | | | | | 12 (OFF) and 3 o'clock (ON) | | |
| Actuator | | | | | | Standard A knob with long screw to fix in shaft | | |
| Method of operation | | | | | | Independent manual operation | | |
| Actuator operation force (max.) | | | | | | 1,4 | Nm | |
| Tightening torque M3 screw in the actuator (min. - max.) | | | | | 0,50 - 0,70 | | Nm | |
| Rated impulse withstand voltage | Uimp | | | | | 8 | kV | |
| Insulation voltage | Ui | | | | | 1100 | V | |
| Rated thermal current uninterrupted duty | Iu | | | | | 50 | A | |
| Rated short-time withstand current (1s) | Icw | | | | | 700 | A | |
| Rated short-circuit making capacity | Icm | | | | | 1 | kA | |
| Rated conditional short-circuit current | Isc | | | | | 5 | kA | |
| Minimum required dimensions of enclosures L x W x D* (space envelope) | | | | | | | | |
| | | | 124 | x | 47 | x | 50 | mm |
| * see the drawing for the height of the switch. The number of layers N is: | | | | | | | | |
| | | | | | | 2 | | |
| Weight | | | | | | ca. 149 | g | |
| Allowed ambient temperature (min. - max.) | Tambient | | | | | -40 - 70 | °C | |
| Allowed storage temperature (min. - max.) | Tstorage | | | | | -40 - 85 | °C | |
| Relative humidity (max.), without condensation at 20°C | RH | | | | | 90 | % | |

| Terminals Scheme | | | | | | | | | | | | |
|------------------|------------|-------|--------|-----------|-------|-----------|---|---|---|---|--|---|
| Layer No. | Front Side | | Symbol | Rear Side | | Positions | | | | | | |
| | Left | Right | | Left | Right | | 1 | 2 | 3 | 4 | | |
| 9 | | | | | | | | | | | | |
| 8 | | | | | | | | | | | | |
| 7 | | | | | | | | | | | | |
| 6 | | | | | | | | | | | | |
| 5 | | | | | | | | | | | | |
| 4 | | | | | | | | | | | | |
| 3 | -1 | | | -1 | | I | | | | | | 0 |
| 2 | | +1 | | | +1 | I | | | | | | 0 |
| 1 | | | Empty | | | | | | | | | |

(I = Contact is closed, O = Contact is open)

Mounting instructions

In the application all ratings according to the datasheet have to be respected. After mounting, the wiring must be checked and the switch must operate smoothly. When building the switch in an enclosure, the space envelope must be respected according to the applicable standards.

Maintenance

The X type switches are designed for a very long life but it is advised to do some simple yearly maintenance.
- Check the installation for signs of overload or overheating. The terminals may not exceed the limit of 85°C under full load.
- By operating the switch a few times (5x) the contacts will clean themselves and the switch will have a longer life.

Connection

The terminals, can take copper wires up to 6 mm². The recommended Spade Tongue Terminals may have a maximum width of 9 mm (see table for recommendations)

*1 16mm² only with fine stranded wire (or two times 6mm²)

*2 Optional: A yellow finger safe sleeve for the Spade Tongue Terminal (Santon 52A1256.35) can be ordered under item number 52A1564.00

| Recommend Manufacturer | Type number | Wire size (AWG) | Wire size (mm ²) | Color |
|------------------------|---------------|-----------------|---|--------|
| JST | FVD2-YS4A | AWG 16 - AWG 14 | 1,0 - 2,5 mm ² | Blue |
| TE connectivity | C-165012 | AWG 16 - AWG 14 | 1,0 - 2,5 mm ² | Blue |
| Vogt | 3635c | AWG 16 - AWG 14 | 1,5 - 2,5 mm ² | Blue |
| TE connectivity | C-165015 | AWG 12 - AWG 10 | 3,0 - 6,0 mm ² | Yellow |
| Vogt | 3652c / 3653c | AWG 12 - AWG 10 | 3,0 - 6,0 mm ² | Yellow |
| Santon (JST) | 52A1256.35 | AWG 8 - AWG 10 | 10,5mm ² -16mm ² *1 | *2 |

屋頂型、小／中／大型 太陽能系統專用網頁伺服器
For the Rooftop, big to small PV plants Web Server solution
屋上型、小／中／大型、太陽光發電システム遠隔監視ウェブサーバ



内建免費OPC伺服軟體、整合SCADA驅動程式、提供所有SCADA系統整合廠商監測資料訊息平台。
The new freeware OPC server is available for driver-less integration to SCADA
最新無料OPC通信用サーバが内蔵され、全てのSCADAドライバ、システムに統合対応でき、監視データを簡単に入手。

A VIM-C 產品規格介紹

VIM-C Functions and features · VIM-C 機能と特徴

- ◎ 雲端管理
Cloud management
クラウド管理
- ◎ 可擴充100台VIM-C, 1KW~1.4MW
Each VIM-C can manage up to 100 VIM-C 1KW-1.4MW
VIM-C100台まで接続可能、1KW-1.4MW に対応
- ◎ 監測可透過有線或無線
Integrated Wired or Wireless Web-Service solution
有線或るは無線で監視可能
- ◎ 監測模組選擇彈性
Comprehensive monitoring Solution
監視ソリューションの多様な選択肢
- ◎ a. AC端+INVERTER+DC串列+自動控制設定模組+環境量測模組+防盜裝置
a.AC+ INVERTER + DC strings + VIM-O (I/O unit)+VIM-P+VIM-AT
a.交流+パワーコンディショナー+直流ストリング+自動制御入出力ユニット+環境計測ユニット+防犯装置
- ◎ b. AC端+INVERTER+環境量測模組
b.AC+INVERTER + environment variable unit
b.交流+パワーコンディショナー+環境計測ユニット
- ◎ 與30廠牌以上的inverter内建通訊協定
Compatibility to more than 30 different inverter
30種類以上のパワーコンディショナーの通信プロトコルに対応。
- ◎ 同Micro PC with Web server ,Web service功能
Micro PC with Web server and Web service capability
マイクロPCウェブサーバ、ウェブサービスとして兼用。
- ◎ 顯示DC端串列資料: 伏特、安培、千瓦、千瓦時
DC part managed information: V, A, kW, kWh
DC ストリング稼働状態を表示: 電圧、電流、電力、電力量の数値
- ◎ 顯示AC端串列資料: 伏特、安培、千瓦、千瓦時
AC part managed information: V, A, kW, kWh from energy meter
AC ストリング稼働状態を表示: 電圧、電流、電力、電力量の数値



VIM-C



屋頂型、小／中／大型 太陽能系統專用網頁伺服器
For the Rooftop, big to small PV plants Web Server solution
屋上型、小／中／大型、太陽光發電システム遠隔監視ウェブサーバ



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A

VIM-C 產品規格介紹

VIM-C Functions and features · VIM-C 機能と特徴

- ◎ 顯示環境測量值：日照，模組溫度，大氣溫度，風速
Environment variables: sun-irradiation, cell-temperature, air-temperature and wind speed
環境データ表示：日射度、セルの温度、大気温度、風速
- ◎ 可透過e-mail及SMS自動管理警示控制
Alarms control with automatic e-mailing and SMS management
異常通知のSMS(メール)送信を設定可能
- ◎ 變流器警示及錯誤功能
Inverters: Vac(Vdc with VIM-S), ac(Adc with VIM-S), kWac(kWdc with VIM-S) and alarm and error messages
パワーコンディショナー直交流電力交換時: Vac(Vdc with VIM-S), ac(Adc with VIM-S), kWac (kWdc with VIM-S)の異常エラーメッセージ表示と通知機能付き。
- ◎ 串列，系統組件(BOS)，效率比PR(KWH/KWP)三種效率的計算與控制
Efficiency calculation and control on three different levels: String, BOS and PR (kWh/kWp performance ratio)
ストリング、出力向上システム部品(BOS)、性能比(kWh/kWp)の効率計算及び管理機能付き
- ◎ CSV格式輸出
CSV All data exports on CSV format
CSV形式のデータに変換可能
- ◎ 使用8GB SD記憶卡(選購品)，可儲存20年資料
Data storage up to 20 years in a up to 8GB micro SD memory (option)
SDメモリーカード8GBを搭載可能、最大20年間の計測データを保存可能。(オプション品)
- ◎ 輸出入埠RS-485*2、USB2.0*2
Communication ports RS-485x2, USB 2.0 x 2
通信ポート：RS-485x2, USB 2.0 x 2
- ◎ 乙太網路*1 電源供應12~28Vdc
Ethernet port x1 , power supply 12 to 28Vdc
イーサネットポートx 1, 12 -28Vdcに対応
- ◎ 軌道安裝,保護等級(正面)：IP40
2-DIN modules, Protection degree (front): IP40
DINモジュール(2本)、表面部保護レベル：IP40



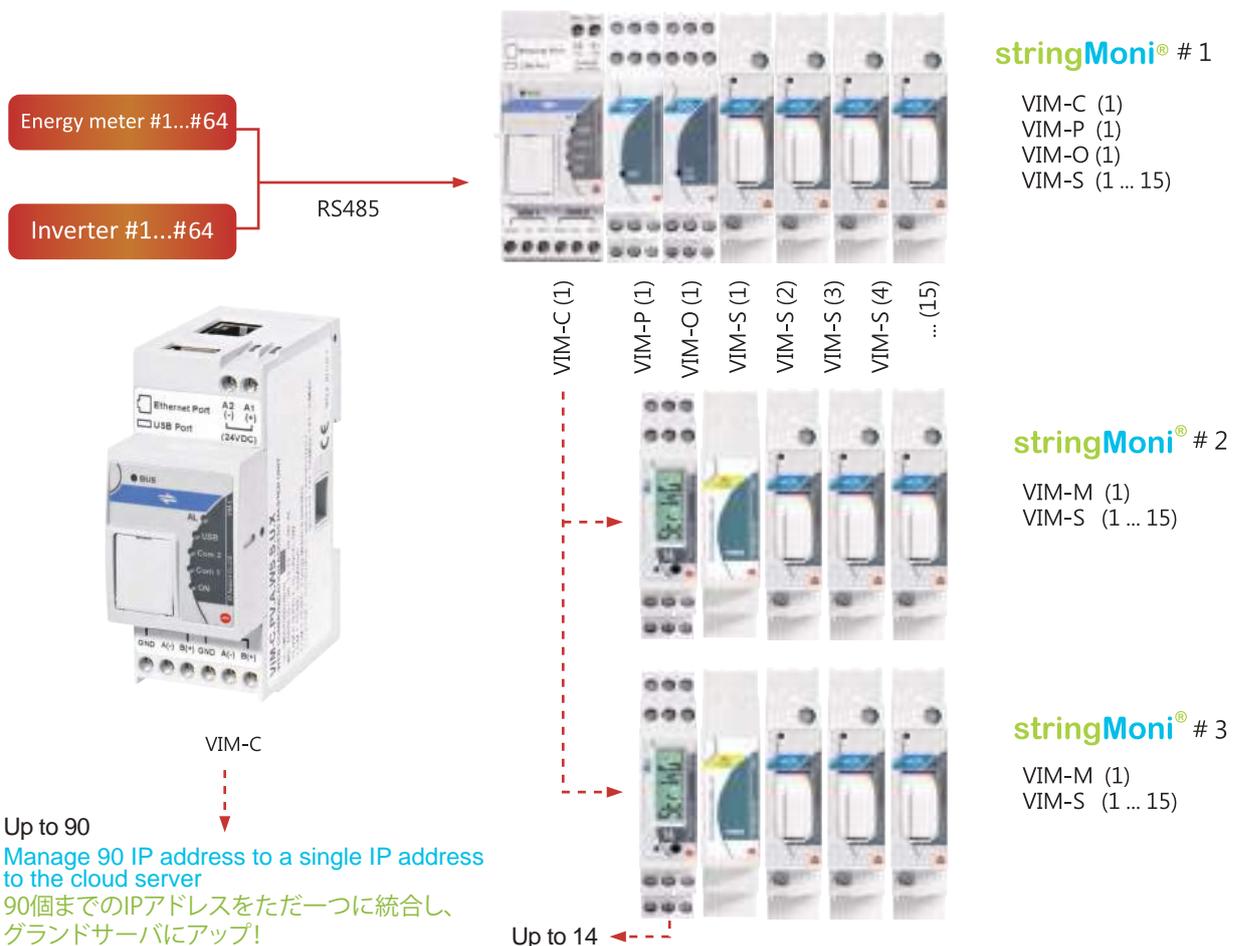
B 單一VIM-C可擴充每串監測stringMoni®監測模組數量

Each VIM-C can manage up to: VIM-C 1ユニットあたり搭載可能なソリューション:

- ☑ 變流器x64台
Inverter x 64 pcs
パワーコンディショナーx64台まで
- ☑ 電表x64台
Energy meter x 64 pcs
電力計x64台まで
- ☑ VIM-M資料傳輸主模組x14台
VIM-M Master module and Data logger x 14 pcs
VIM-Mマスターモジュール及&データ収集ユニットx14台まで
- ☑ VIM-S串列監測模組x15台
VIM-S String measuring unit x 15 pcs
VIM-Sストリング計測ユニットx15台まで
- ☑ VIM-P溫度日照風速量測模組x1台
VIM-P Environment variable unit x 1 pc
VIM-P溫度、日照、風速計測ユニットx 1台
- ☑ VIM-O自動控制設定模組x1台
VIM-O Inputs/Outputs unit x 1 pc
VIM-O自動制御入出力ユニットx 1台
- ☑ VIM-1隔離卡
VIM-1 Isolation enhancement unit x 1 pc
VIM-1アイソレーションユニットx 1台



擴充示意圖例 Exceeding map 擴充例

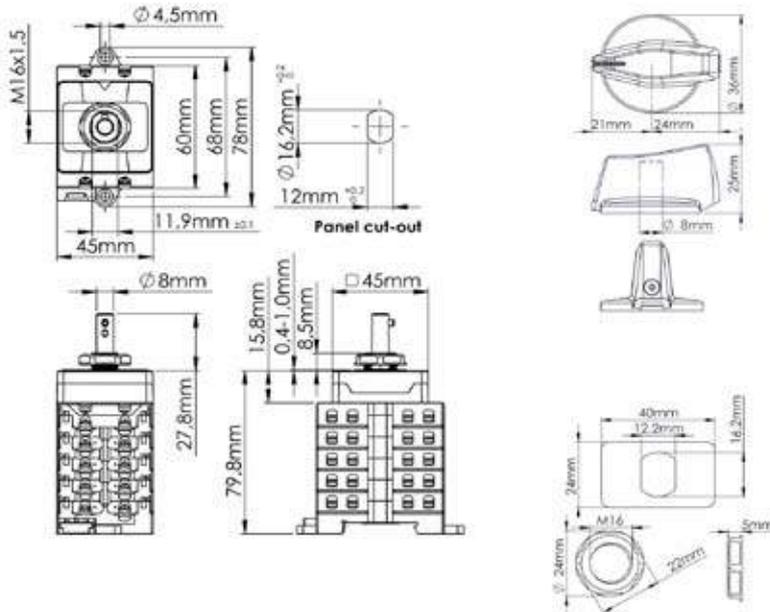


DC SWITCH

Data Sheet

XBE+0410/2

Certified for IEC 60947 1&3
DC-PV1 and CCC (CQC)



The tolerances for the Santon datasheet are according to ISO 1101, ISO 8015, ISO 2768 1 class m, unless stated otherwise.

| Technical data | Symbol | Ratings: | I | II | III | IV | Unit | |
|--|----------|----------|---|------|------|---------|-----------------|----|
| Rated operational voltage | Ue | | 1100 | 1000 | 800 | 500 | V dc | |
| Rated operational current | Ie | | 10 | 16 | 25 | 50 | A dc | |
| Required fine wire cross-section (minimal)*: | | | 2,5 | 2,5 | 4 | 10 | mm ² | |
| *IEC60947-1, table 9 | | | | | | | | |
| Number of DC poles | | | | | | 4 | | |
| Utilization category DC | | | | | | DC-PV1 | | |
| Pollution degree | | | | | | 2 | | |
| IP rating terminals | | | | | | IP20 | | |
| Tightening torque terminal screws M4 (min. - max.) | | | | | 1,5 | 1,7 | Nm | |
| Method of mounting | | | | | | | | |
| IP rating of the shaft in case of single hole mounting | | | | | | IP65 | | |
| Tightening torque panel mounting nut (min. - max.) | | | | | 2,0 | 2,5 | Nm | |
| Panel thickness between | | | | | 1 | 4 | mm | |
| Positions | | | 12 (OFF) and 3 o'clock (ON) | | | | | |
| Actuator | | | Standard A knob with long screw to fix in shaft | | | | | |
| Method of operation | | | Independent manual operation | | | | | |
| Actuator operation force (max.) | | | | | | 1,4 | Nm | |
| Tightening torque M3 screw in the actuator (min. - max.) | | | | | 0,50 | 0,70 | Nm | |
| Rated impulse withstand voltage | | | | | | | | |
| Rated impulse withstand voltage | Uimp | | | | | 8 | kV | |
| Insulation voltage | | | | | | | | |
| Insulation voltage | Ui | | | | | 1100 | V | |
| Rated thermal current uninterrupted duty | | | | | | | | |
| Rated thermal current uninterrupted duty | Iu | | | | | 50 | A | |
| Rated short-time withstand current (1s) | | | | | | | | |
| Rated short-time withstand current (1s) | Icw | | | | | 700 | A | |
| Rated short-circuit making capacity | | | | | | | | |
| Rated short-circuit making capacity | Icm | | | | | 1 | kA | |
| Rated conditional short-circuit current | | | | | | | | |
| Rated conditional short-circuit current | Isc | | | | | 5 | kA | |
| Minimum required dimensions of enclosures L x W x D* {space envelope} | | | | | | | | |
| | | | 124 | x | 47 | x | 71 | mm |
| * see the drawing for the height of the switch. The number of layers N is: | | | | | | | | |
| | | | | | | 4 | | |
| Weight | | | | | | | | |
| | | | | | | ca. 211 | g | |
| Allowed ambient temperature (min. - max.) | | | | | | | | |
| Allowed ambient temperature (min. - max.) | Tambient | | -40 | - | 70 | | °C | |
| Allowed storage temperature (min. - max.) | | | | | | | | |
| Allowed storage temperature (min. - max.) | Tstorage | | -40 | - | 85 | | °C | |
| Relative humidity (max.), without condensation at 20°C | | | | | | | | |
| | | | | | | 90 | % | |

| Terminals Scheme | | | | | | | | | |
|------------------|------------|-------|--------|-----------|-------|-----------|---|---|---|
| Layer No. | Front Side | | Symbol | Rear Side | | Positions | | | |
| | Left | Right | | Left | Right | 1 | 2 | 3 | 4 |
| 9 | | | | | | | | | |
| 8 | | | | | | | | | |
| 7 | | | | | | | | | |
| 6 | | | | | | | | | |
| 5 | +2 | | | +2 | | I | | | 0 |
| 4 | | -2 | | | -2 | | I | | 0 |
| 3 | -1 | | | | -1 | | I | | 0 |
| 2 | | +1 | | | | +1 | I | | 0 |
| 1 | | | Empty | | | | | | |

(I = Contact is closed, O = Contact is open)

Mounting instructions

In the application all ratings according to the datasheet have to be respected. After mounting, the wiring must be checked and the switch must operate smoothly. When building the switch in an enclosure, the space envelope must be respected according to the applicable standards.

Maintenance

The X type switches are designed for a very long life but it is advised to do some simple yearly maintenance.
- Check the installation for signs of overload or overheating. The terminals may not exceed the limit of 85°C under full load.
- By operating the switch a few times (5x) the contacts will clean themselves and the switch will have a longer life.

Connection

The terminals, can take copper wires up to 6 mm². The recommended Spade Tongue Terminals may have a maximum width of 9 mm (see table for recommendations)

| Recommend Manufacturer | Type number | Wire size (AWG) | Wire size (mm ²) | Color |
|------------------------|---------------|-----------------|---|--------|
| JST | FVD2-YS4A | AWG 16 – AWG 14 | 1,0 – 2,5 mm ² | Blue |
| TE connectivity | C-165012 | AWG 16 – AWG 14 | 1,0 – 2,5 mm ² | Blue |
| Vogt | 3635c | AWG 16 – AWG 14 | 1,5 – 2,5 mm ² | Blue |
| TE connectivity | C-165015 | AWG 12 - AWG 10 | 3,0 - 6,0 mm ² | Yellow |
| Vogt | 3652c / 3653c | AWG 12 - AWG 10 | 3,0 - 6,0 mm ² | Yellow |
| Santon (JST) | 52A1256.35 | AWG 8 - AWG 10 | 10,5mm ² -16mm ² *1 | *2 |

*1 16mm² only with fine stranded wire (or two times 6mm²)

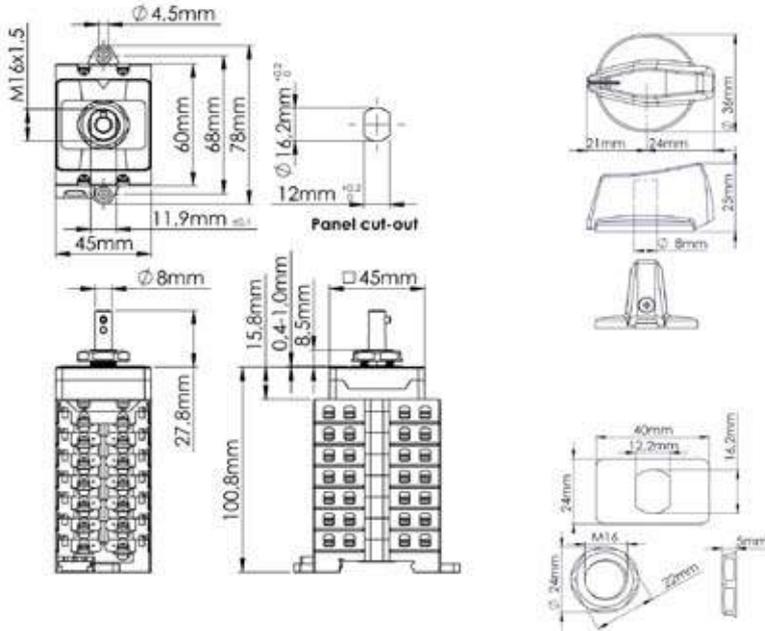
*2 Optional: A yellow finger safe sleeve for the Spade Tongue Terminal (Santon 52A1256.35) can be ordered under item number 52A1564.00

DC SWITCH

Data Sheet

XBE+0610/2

Certified for IEC 60947 1&3
DC-PV1 and CCC (CQC)



The tolerances for the Santon datasheet are according to ISO 1101, ISO 8015, ISO 2768 1 class m, unless stated otherwise.

| Technical data | Symbol | Ratings: | I | II | III | IV | Unit | |
|--|----------|----------|---|------|------|---------|-----------------|----|
| Rated operational voltage | Ue | | 1100 | 1000 | 800 | 500 | V dc | |
| Rated operational current | Ie | | 10 | 16 | 25 | 50 | A dc | |
| Required fine wire cross-section (minimal)*: | | | 2,5 | 2,5 | 4 | 10 | mm ² | |
| *IEC60947-1, table 9 | | | | | | | | |
| Number of DC poles | | | | | | 6 | | |
| Utilization category DC | | | | | | DC-PV1 | | |
| Pollution degree | | | | | | 2 | | |
| IP rating terminals | | | | | | IP20 | | |
| Tightening torque terminal screws M4 (min. - max.) | | | | | 1,5 | 1,7 | Nm | |
| Method of mounting | | | | | | | | |
| IP rating of the shaft in case of single hole mounting | | | | | | IP65 | | |
| Tightening torque panel mounting nut (min. - max.) | | | | | 2,0 | 2,5 | Nm | |
| Panel thickness between | | | | | 1 | 4 | mm | |
| Positions | | | 12 (OFF) and 3 o'clock (ON) | | | | | |
| Actuator | | | Standard A knob with long screw to fix in shaft | | | | | |
| Method of operation | | | | | | | | |
| Actuator operation force (max.) | | | | | | 1,4 | Nm | |
| Tightening torque M3 screw in the actuator (min. - max.) | | | | | 0,50 | 0,70 | Nm | |
| Rated impulse withstand voltage | | | | | | | | |
| Rated impulse withstand voltage | Uimp | | | | | 8 | kV | |
| Insulation voltage | | | | | | | | |
| Insulation voltage | Ui | | | | | 1100 | V | |
| Rated thermal current uninterrupted duty | | | | | | | | |
| Rated thermal current uninterrupted duty | Iu | | | | | 50 | A | |
| Rated short-time withstand current (1s) | | | | | | | | |
| Rated short-time withstand current (1s) | Icw | | | | | 700 | A | |
| Rated short-circuit making capacity | | | | | | | | |
| Rated short-circuit making capacity | Icm | | | | | 1 | kA | |
| Rated conditional short-circuit current | | | | | | | | |
| Rated conditional short-circuit current | Isc | | | | | 5 | kA | |
| Minimum required dimensions of enclosures L x W x D* (space envelope) | | | | | | | | |
| Minimum required dimensions of enclosures L x W x D* (space envelope) | | | 124 | x | 47 | x | 92 | mm |
| * see the drawing for the height of the switch. The number of layers N is: | | | | | | | | |
| Weight | | | | | | ca. 274 | g | |
| Allowed ambient temperature (min. - max.) | | | | | | | | |
| Allowed ambient temperature (min. - max.) | Tambient | | | | -40 | - | 70 | °C |
| Allowed storage temperature (min. - max.) | | | | | | | | |
| Allowed storage temperature (min. - max.) | Tstorage | | | | -40 | - | 85 | °C |
| Relative humidity (max.), without condensation at 20°C | | | | | | | | |
| Relative humidity (max.), without condensation at 20°C | RH | | | | | 90 | % | |

| Terminals Scheme | | | | | | | |
|------------------|-----------------|------------------|--------|----------------|-----------------|-------------|-----------------|
| Layer No. | Front Side Left | Front Side Right | Symbol | Rear Side Left | Rear Side Right | Positions 1 | Positions 2 3 4 |
| 9 | | | | | | | |
| 8 | | | | | | | |
| 7 | -3 | | | -3 | | I | 0 |
| 6 | | +3 | | | +3 | I | 0 |
| 5 | +2 | | | +2 | | I | 0 |
| 4 | | -2 | | | -2 | I | 0 |
| 3 | -1 | | | -1 | | I | 0 |
| 2 | | +1 | | | +1 | I | 0 |
| 1 | | | Empty | | | | |

(I = Contact is closed, O = Contact is open)

Mounting instructions

In the application all ratings according to the datasheet have to be respected. After mounting, the wiring must be checked and the switch must operate smoothly. When building the switch in an enclosure, the space envelope must be respected according to the applicable standards.

Maintenance

The X type switches are designed for a very long life but it is advised to do some simple yearly maintenance.

- Check the installation for signs of overload or overheating. The terminals may not exceed the limit of 85°C under full load.

- By operating the switch a few times (5x) the contacts will clean themselves and the switch will have a longer life.

Connection

The terminals, can take copper wires up to 6 mm².

The recommended Spade Tongue Terminals may have a maximum width of 9 mm (see table for recommendations)

*1 16mm² only with fine stranded wire (or two times 6mm²)

*2 Optional: A yellow finger safe sleeve for the Spade Tongue Terminal (Santon 52A1256.35) can be ordered under item number 52A1564.00

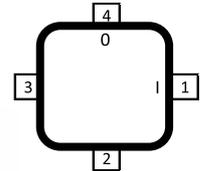
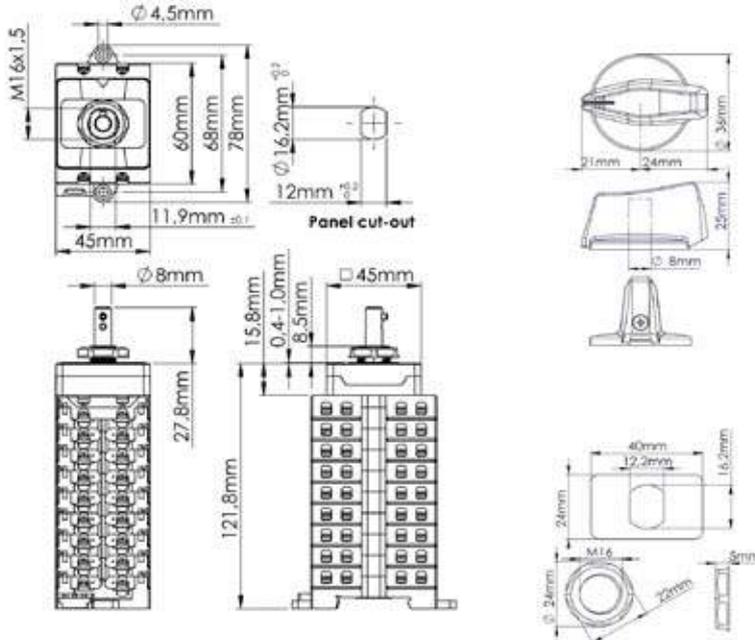
| Recommend Manufacturer | Type number | Wire size (AWG) | Wire size (mm ²) | Color |
|------------------------|---------------|-----------------|---|--------|
| JST | FVD2-YS4A | AWG 16 – AWG 14 | 1,0 – 2,5 mm ² | Blue |
| TE connectivity | C-165012 | AWG 16 – AWG 14 | 1,0 – 2,5 mm ² | Blue |
| Vogt | 3635c | AWG 16 – AWG 14 | 1,5 – 2,5 mm ² | Blue |
| TE connectivity | C-165015 | AWG 12 - AWG 10 | 3,0 - 6,0 mm ² | Yellow |
| Vogt | 3652c / 3653c | AWG 12 - AWG 10 | 3,0 - 6,0 mm ² | Yellow |
| Santon (JST) | 52A1256.35 | AWG 8 - AWG 10 | 10,5mm ² -16mm ² *1 | *2 |

DC SWITCH

Data Sheet

XBE+0810/2

Certified for IEC 60947 1&3
DC21B and CCC (CQC)



The tolerances for the Santon datasheet are according to ISO 1101, ISO 8015, ISO 2768 1 class m, unless stated otherwise.

| Technical data | Symbol | Rated | I | II | III | IV | Unit |
|--|----------|-------|---|------|-----|---------|-----------------|
| Rated operational voltage | Ue | | 1100 | 1000 | 800 | 500 | V dc |
| Rated operational current | Ie | | 10 | 16 | 25 | 50 | A dc |
| Required fine wire cross-section (minimal)*: | | | 2,5 | 2,5 | 4 | 10 | mm ² |
| *IEC60947-1, table 9 | | | | | | | |
| Number of DC poles | | | | | | 8 | |
| Utilization category DC | | | | | | DC-PV1 | |
| Pollution degree | | | | | | 2 | |
| IP rating terminals | | | | | | IP20 | |
| Tightening torque terminal screws M4 (min. - max.) | | | | 1,5 | - | 1,7 | Nm |
| Method of mounting | | | | | | | |
| IP rating of the shaft in case of single hole mounting | | | | | | IP65 | |
| Tightening torque panel mounting nut (min. - max.) | | | | 2,0 | - | 2,5 | Nm |
| Panel thickness between | | | | | 1 | - | 4 mm |
| Positions | | | 12 (OFF) and 3 o'clock (ON) | | | | |
| Actuator | | | Standard A knob with long screw to fix in shaft | | | | |
| Method of operation | | | Independent manual operation | | | | |
| Actuator operation force (max.) | | | | | | 1,4 | Nm |
| Tightening torque M3 screw in the actuator (min. - max.) | | | | 0,50 | - | 0,70 | Nm |
| Rated impulse withstand voltage | | | | | | | |
| | Uimp | | | | | 8 | kV |
| Insulation voltage | | | | | | | |
| | Ui | | | | | 1100 | V |
| Rated thermal current uninterrupted duty | | | | | | | |
| | Iu | | | | | 50 | A |
| Rated short-time withstand current (1s) | | | | | | | |
| | Icw | | | | | 700 | A |
| Rated short-circuit making capacity | | | | | | | |
| | Icm | | | | | 1 | kA |
| Rated conditional short-circuit current | | | | | | | |
| | Isc | | | | | 5 | kA |
| Minimum required dimensions of enclosures L x W x D* {space envelope} | | | | | | | |
| | | | 124 | x | 47 | x | 92 mm |
| * see the drawing for the height of the switch. The number of layers N is: | | | | | | | |
| | | | | | | 6 | |
| Weight | | | | | | | |
| | | | | | | ca. 274 | g |
| Allowed ambient temperature (min. - max.) | | | | | | | |
| | Tambient | | | -40 | - | 70 | °C |
| Allowed storage temperature (min. - max.) | | | | | | | |
| | Tstorage | | | -40 | - | 85 | °C |
| Relative humidity (max.), without condensation at 20°C | | | | | | | |
| | RH | | | | | 90 | % |

| Terminals Scheme | | | | | | | | | |
|------------------|------------|-------|--------|-----------|-------|-----------|---|---|---|
| Layer No. | Front Side | | Symbol | Rear Side | | Positions | | | |
| | Left | Right | | Left | Right | 1 | 2 | 3 | 4 |
| 9 | +4 | | | +4 | | I | | | 0 |
| 8 | | -4 | | | -4 | I | | | 0 |
| 7 | -3 | | | -3 | | I | | | 0 |
| 6 | | +3 | | | +3 | I | | | 0 |
| 5 | +2 | | | +2 | | I | | | 0 |
| 4 | | -2 | | | -2 | I | | | 0 |
| 3 | -1 | | | -1 | | I | | | 0 |
| 2 | | +1 | | | +1 | I | | | 0 |
| 1 | | | Empty | | | | | | |

(I = Contact is closed, O = Contact is open)

Mounting instructions

In the application all ratings according to the datasheet have to be respected. After mounting, the wiring must be checked and the switch must operate smoothly. When building the switch in an enclosure, the space envelope must be respected according to the applicable standards.

Maintenance

The X type switches are designed for a very long life but it is advised to do some simple yearly maintenance.
- Check the installation for signs of overload or overheating. The terminals may not exceed the limit of 85°C under full load.
- By operating the switch a few times (5x) the contacts will clean themselves and the switch will have a longer life.

Connection

The terminals, can take copper wires up to 6 mm². The recommended Spade Tongue Terminals may have a maximum width of 9 mm (see table for recommendations)

*1 16mm² only with fine stranded wire (or two times 6mm²)

*2 Optional: A yellow finger safe sleeve for the Spade Tongue Terminal (Santon 52A1256.35) can be ordered under item number 52A1564.00

| Recommend Manufacturer | Type number | Wire size (AWG) | Wire size (mm ²) | Color |
|------------------------|---------------|-----------------|---|--------|
| JST | FVD2-YS4A | AWG 16 – AWG 14 | 1,0 – 2,5 mm ² | Blue |
| TE connectivity | C-165012 | AWG 16 – AWG 14 | 1,0 – 2,5 mm ² | Blue |
| Vogt | 3635c | AWG 16 – AWG 14 | 1,5 – 2,5 mm ² | Blue |
| TE connectivity | C-165015 | AWG 12 - AWG 10 | 3,0 - 6,0 mm ² | Yellow |
| Vogt | 3652c / 3653c | AWG 12 - AWG 10 | 3,0 - 6,0 mm ² | Yellow |
| Santon (JST) | 52A1256.35 | AWG 8 - AWG 10 | 10,5mm ² -16mm ² *1 | *2 |

DC Molded Case Circuit Breaker (MCCB)

Specification



Main Technical Parameters

1) Electrical characteristics

- ▲ Rated insulation voltage U_i : 1000V
- ▲ Rated working voltage U_e : DC500V(2P); DC750V(3P); DC1000V(4P);
- ▲ Rated current of housing I_{nm} : 125A
- ▲ Rated limit short-circuit breaking current I_{cu} : 20kA
- ▲ Rated operating short-circuit breaking current I_{cs} : 20kA
- ▲ Rated operating current of auxiliary contact: 0.3A
- ▲ Conventional thermal current of auxiliary contact: 3A

2) Operating performance

- ▲ With Current: 5000times
- ▲ Without Current: 20000times

3) Mode of connection

- 2P: Wiring mode 2P;
- 3P: J0Wiring, NormalWiring;
- 4P: J0Wiring, J1 Wiring, J2Wiring ;

4) Connection capacity:

| Rated current A | 16、20 | 25 | 32 | 40、50 | 63 | 80 | 100 | 125 |
|--------------------------------|-------|----|----|-------|----|----|-----|-----|
| Wire cross-section area mm^2 | 2.5 | 4 | 6 | 10 | 16 | 25 | 35 | 50 |

Note: The products whose rated current is 100A or 125A need to use the connecting bars (see 3P product installation dimension), for standard wire terminal whose cross-sectional area is more than 35mm² is interference with the product terminal slot.

5. Normal Working Environment

- ▲ Altitude: ≤4000m (if the altitude is higher than 4000m, consider reducing the capacity, as shown in the Attached Sheet of Derating Factor).
- ▲ Operating ambient temperature: -35°C~+70°C (if the temperature is higher than 50°C, consider reducing the capacity, as shown in the Attached Sheet of Derating Factor; negotiate with the factory in case the temperature is lower than -35°C).
- ▲ The relative humidity at an ambient temperature of +40°C should not exceed 50%. A higher relative humidity is allowed at a lower temperature. For example, the relative humidity at 20°C can reach 90%. For frost due to temperature change, the corresponding measures should be taken.
- ▲ Pollution level: 3.
- ▲ The product can withstand the effects of wet air, salt mist and oil mist.
- ▲ The maximum gradient is 22.5°.
- ▲ The product can be disposed in places that are free from explosive media, media corrosive to metal, insulation damaging gas, and conductive dust.
- ▲ The product should be installed free from snow and rain.
- ▲ In case of stricter user conditions than the above description, negotiate with the manufacturer.

DC MCB

Specification



1P



2P



3P

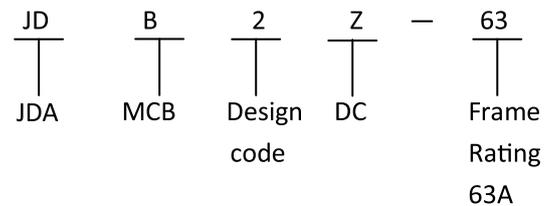


4P

1、Applicable scope and purpose

- Short-circuit protection
 - Over-load protection
 - Control
 - Isolation
 - DC system protection
- NDBZ-63 dedicated to the low voltage power distribution system of industrial, buildings, energy communications and infrastructure.

2、Model and implication



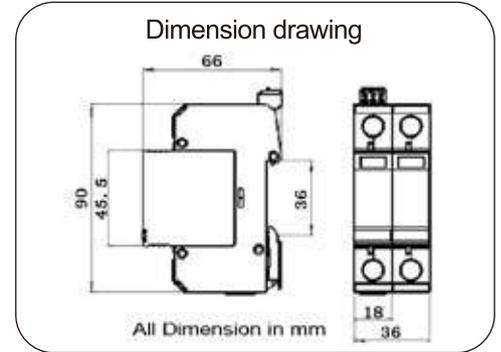
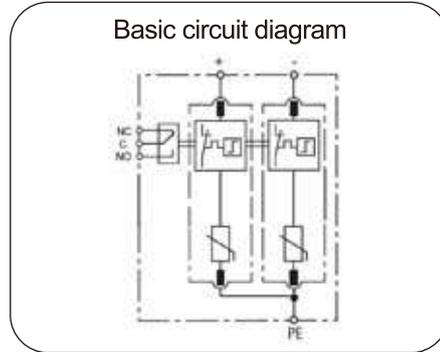
3、Main technical specification

- Electrical parameters
 - Rated voltage : 1P : DC125/220/250V , 2P : DC250/440/500 V, 3P : DC750V, 4P : DC1000V
 - Rated current : 1A, 2A,3A,4A, 5A ,6A, 7A,8A,10A, 12A, 13A,15A,16A, 20A,25A,30A,32A,40A,50A,60A,63A
 - Rated ultimate short-circuit breaking capacity : DC125 /220 /250V (1P) , DC250/440/500 V : 10kA DC750V/ DC1000V : 5 kA
 - Impulse withstand test voltages : 6kV
 - Mechanical & electrical life : 20000 times
- Isolation function
 - Practical breaking instructions
 - View window within the green identification said contact in the off position
- Tripping characteristic
 - B type curve*
 - Protection of short circuit current small load
 - rated current : 1A~63A
 - tripping characteristic : The instantaneous tripping range $6I_n (1 \pm 20\%)$
 - C type curve*
 - Protect normal load and distribution wire cable
 - rated current : 1A~63A
 - tripping characteristic : The instantaneous tripping range $12I_n (1 \pm 20\%)$

Surge Protective Devices

Specification

PV40/100-MVCR



Type 2 surge arrester designed for low voltage DC system against surges at the boundaries from lightning protection zone OB-2and higher.

- ⊙ In accordance with EN50539, IEC61643-11 and UL1449-4th
- ⊙ DC SPD for common mode protection
- ⊙ Pluggable module design, easy replacement
- ⊙ High discharge current 40kA 8/20
- ⊙ Reliable supervision due to disconnection device
- ⊙ Fault indication by red indication flag in window
- ⊙ With remote alarm terminal optional

Note: Subject to change without any notice.

| | | |
|---|--|--------|
| Part No. | PV40-100-MVCR | |
| In accordance with | EN50539;IEC61643-11:2011; UL1449-4th | |
| Category IEC/VDE | II/ C | |
| Protection Mode | Common mode | |
| Nominal voltage (Vdc) | Un | 48VDC |
| Max. continuous operating voltage (Vdc) | Ucpv | 100VDC |
| Nominal discharge current(8/20) | In | 20kA |
| Max. discharge current(8/20) | I _{max} | 40kA |
| Voltage protection rating | Up | <800V |
| Response time | ≤ 25ns | |
| Follow current | No | |
| Backup fuse(only required if not already provided in mains) | 125A gR/gPV | |
| Operating temperature range | - 40°C ~ + 80°C | |
| Cross-section of connection wire | Single-strand 35mm ² ; multi-strand 25mm ² | |
| Mounting | 35mm DIN-rail in accordance with EN 50022/DIN46277-3 | |
| Enclosure material | thermoplastic; extinguishing degree UL94 V-0 | |
| Degree of protection | IP20 | |
| Installation width | 2 modules, DIN 43880 | |
| Thermal disconnecter | Internal green – normal ; red - failure | |
| Remote alarm contact | YES | |
| Approvals, Certifications | CE | |
| Additional data for Remote Alarm Contacts | | |
| Remote alarm contact type | Isolated Form C | |
| Switching capability Un/In | AC: 250V/0.5A DC: 250V/0.1A; 125V/0.2A; 75V/0.5A | |
| Max. Size of connecting wire | Max. 1.5mm ² (or # 16AWG) | |

gPV fuse protection

Specification

FUSE & FUSE HOLDER

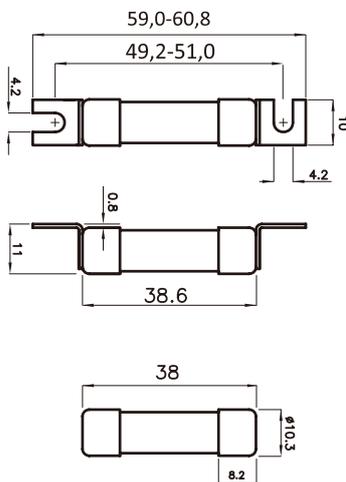
CH 10 gPV - Fuse - links



| General characteristics | | UL file: E347771 |
|-------------------------|---|------------------|
| Rated voltage | 1000V d.c. L/R=2ms | |
| Breaking capacity | 10kA d.c.30kA d.c. | |
| Standards | UL 2579, UL 248-1 | |
| Application | For protection of photovoltaic modules. | |

| CH 10x38 gPV | | | | | | | | | | | |
|--------------|-----------|--------------------------------------|---------------------------------------|--------------------------------------|--|---|---|--|------------|---------------------|--|
| Size | I_n [A] | Code No. "standard contacts" 10kA UL | Code No. "standard contacts" 30kA IEC | Code No. "type SU contacts" 30kA IEC | Pre-arcing Joule integral [A ² s] L/R=2ms | Operating Joule integral [A ² s] L/R=2ms | Power dissipation [0,7 x I_n] P _d [W] | Power dissipation [I _n] P _d [W] | Weight [g] | Packaging [pcs] | |
| 10 x 38 | 0,5 | | 002625134 | 002625131 | 0,016 | 0,068 | 0,2 | 0,52 | 10/12 | 10/500 SU:10/380 | |
| | 1 | | 002625138 | 002625129 | 1,5 | 3 | 0,42 | 1,0 | | | |
| | 2 | 002625101 | 002625065 | 002625115 | 1,7 | 2,3 | 0,47 | 1,12 | | | |
| | 3 | 002625100 | 002625067 | 002625113 | 2,8 | 5,4 | 0,65 | 1,6 | | | |
| | 3,5 | 002625135 | 002625068 | 002625127 | 2,5 | 7 | 0,57 | 1,4 | | | |
| | 4 | 002625102 | 002625069 | 002625116 | 3,9 | 11,7 | 0,52 | 1,25 | | | |
| | 5 | 002625111 | 002625070 | 002625124 | 8 | 21 | 0,63 | 1,49 | | | |
| | 6 | 002625103 | 002625071 | 002625117 | 10,6 | 34,6 | 0,73 | 1,75 | | | |
| | 7 | 002625110 | 002625072 | 002625114 | 16 | 60 | 0,74 | 1,74 | | | |
| | 8 | 002625104 | 002625073 | 002625118 | 17 | 65 | 0,8 | 1,9 | | | |
| | 10 | 002625105 | 002625075 | 002625119 | 8,3 | 33 | 0,97 | 2,4 | | | |
| | 12 | 002625106 | 002625077 | 002625120 | 22 | 73 | 0,8 | 1,9 | | | |
| | 13 | 002625137 | 002625078 | 002625128 | 21 | 70 | 1,0 | 2,3 | | | |
| | 14 | 002625136 | 002625079 | 002625126 | 28 | 92 | 1,3 | 3,0 | | | |
| | 15 | 002625112 | 002625080 | 002625125 | 49 | 145 | 1,0 | 2,2 | | | |
| | 16 | 002625107 | 002625081 | 002625121 | 48 | 147 | 1,1 | 2,6 | | | |
| | 20 | 002625108 | 002625085 | 002625122 | 86 | 245 | 1,3 | 3,2 | | | |
| | 25* | | 002625109 | 002625123 | 125 | 289 | 1,65 | 4,1 | | | |
| 25 | | 002625139 | 002625140 | 110 | 470 | 1,65 | 4,1 | | | | |

* 900V d.c.



Contacts

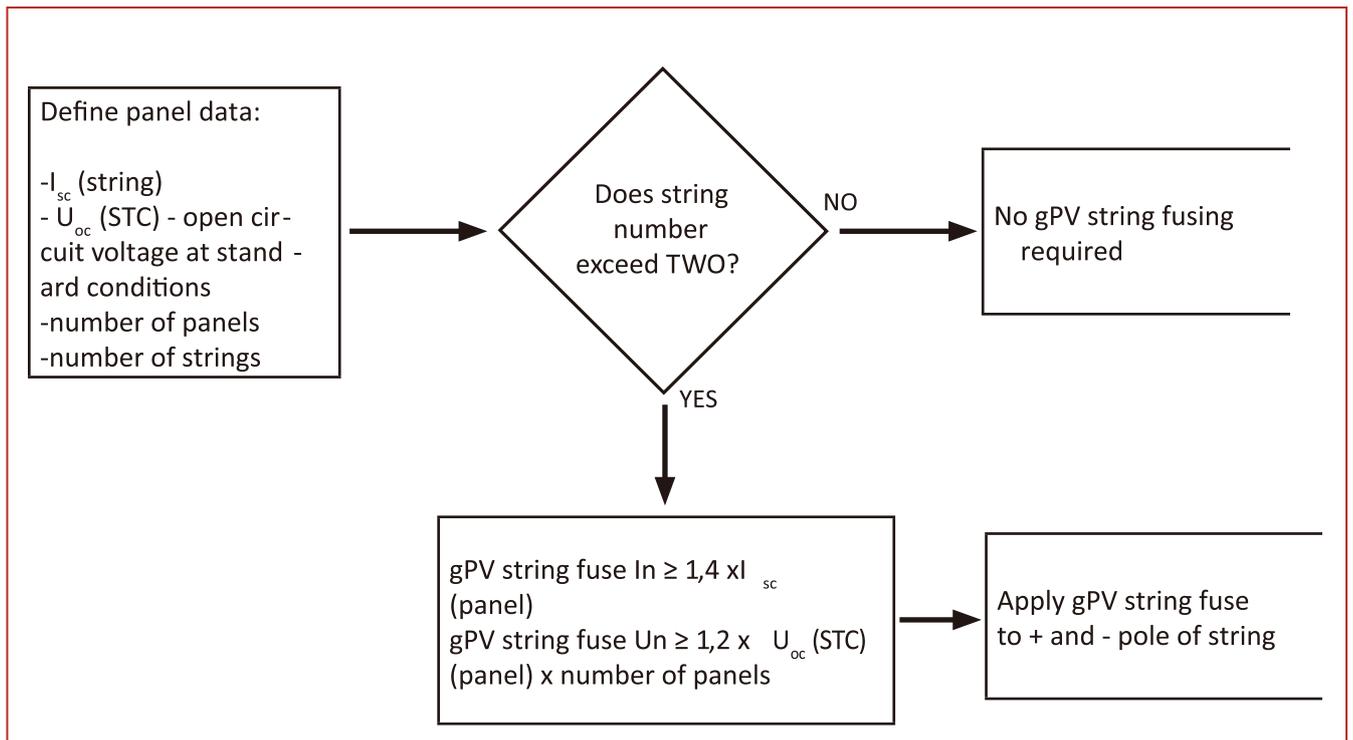


Contacts

gPV fuse protection

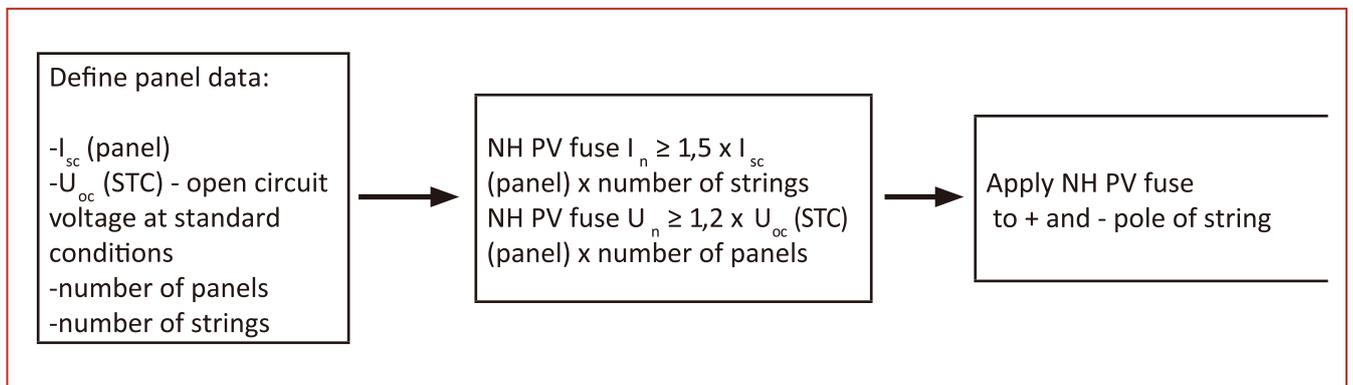
Specification

CH 10 gPV fuse selection



Derating factor 1,4 is defined for ambient temperature max. 45°C.
 Cable cross-section derating factor is not included!

NH gPV fuse selection



Derating factor 1,5 is defined for ambient temperature max. 45°C.
 Cable cross-section derating factor is not included!



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