



| Codes         |               |               |
|---------------|---------------|---------------|
| E11040-T40DSU | E11040-T50DSU | E11040-T80DSU |
| E11060-T40DSU | E11060-T50DSU | E11060-T80DSU |
| E11070-T40DSU | E11070-T50DSU | E11070-T80DSU |

**Fegen Solar Modules SM series** are All-in-One, Plug & Play, Outdoor, Scalable enclosures that incorporate all solar thermal and solar electric distribution gear for buildings in one device.

- No need of a conventional indoor boiler room
- No on-site labor cost
- Immediate start-up
- No responsibility conflicts
- Easy control and maintenance
- Scalable for infinite combinations

- **Tight single door dimensions**
- **40-80 gallons water storage**
- **Integrated heating element**
- **Simple DC pump design**
- **Solar back up system for redundancy**
- **Defrost system for reliability**
- **Solar pool gear option (P extension coded)**
- **Cost efficient mounted outdoors 1ph 4-7kWdC inverter**

## CABIN GENERAL CHARACTERISTICS

| Thermal Part                               |                                                                                                                 |
|--------------------------------------------|-----------------------------------------------------------------------------------------------------------------|
| Type                                       | RITTAL TS 8                                                                                                     |
| External dimensions W x H x D (front view) | 800 x 2000 x 800 mm / 31,50 x 78,74 x 31,50 inch                                                                |
| Mounting plate                             | Width: 699 mm, Height: 1896 mm                                                                                  |
| Weight/pack                                | 137 kg                                                                                                          |
| Material                                   | Sheet steel                                                                                                     |
| Cold / Hot Supply - Brass                  | 1 ¼ inch                                                                                                        |
| Color                                      | RAL 7035                                                                                                        |
| Protection category IP to IEC 60 529       | IP 55                                                                                                           |
| Doors                                      | 1                                                                                                               |
| Light                                      | Auto door power On/Off - 600 lumens                                                                             |
| Scalability                                | Unlimited                                                                                                       |
| Protection                                 | Over-temperature, Anti-freeze control                                                                           |
| Approvals                                  | Bureau Veritas, CSA, TÜV, DNV-GL, Lloyds Register of Shipping, Russian Maritime Register of Shipping, UL + C-UL |
| Certificates                               | EAC,IK-Code, Protection category                                                                                |
| Declarations                               | Declaration of conformity, Manufacturer's declaration                                                           |
| Certification                              | SRCC, Solar Keymark, CE                                                                                         |

## CABIN LIGHTING SYSTEM-TECHNICAL SPECIFICATIONS

| General Data                         |                                                                                                                  |
|--------------------------------------|------------------------------------------------------------------------------------------------------------------|
| Type                                 | RITTAL LED system light                                                                                          |
| Material                             | Light body: Extruded aluminium<br>Light cover: Polycarbonate (halogen-free)<br>Light ends: PC-ABS (halogen-free) |
| Color                                | Enclosure: RAL 7016                                                                                              |
| Protection category IP to IEC 60 529 | IP 20                                                                                                            |
| Dimensions                           | Width: 337 mm, Height: 55 mm, Depth: 23 mm                                                                       |
| Rated operating voltage              | 100 V - 240 V, 1~, 50 Hz/60 Hz                                                                                   |
| Operating temperature                | Operation (environment): -20°C...+55°C                                                                           |
| Power consumption                    | 7 W                                                                                                              |
| Luminous flux                        | 600 lm                                                                                                           |
| Light colour                         | 4000 K (neutral white)                                                                                           |
| Protection category                  | II (all-insulated)                                                                                               |
| Weight/pack                          | 0.35 kg                                                                                                          |
| Approvals                            | CCC, ENEC                                                                                                        |
| Certificates                         | EAC                                                                                                              |

| SOLAR TANK CHARACTERISTICS       |                   | T40 | T50                                                              | T60               |
|----------------------------------|-------------------|-----|------------------------------------------------------------------|-------------------|
| General Data                     |                   |     |                                                                  |                   |
| Type                             |                   |     | Sammler SV                                                       |                   |
| Solar tank capacity              | 160 lt / 40 gal   |     | 200 lt / 50 gal                                                  | 300 lt / 80 gal   |
| External dimensions W x H        | 580 x 1058 mm     |     | 580 x 1292 mm                                                    | 580 x 1735 mm     |
|                                  | 22,83 x 41,6 inch |     | 22,83 x 50,9 inch                                                | 22,83 x 68,3 inch |
| Weight                           | 67 kg / 235 lb    |     | 82 kg / 235 lb                                                   | 107 kg / 235 lb   |
| Number of boilers                |                   |     | 1                                                                |                   |
| Max pressure primary circuit     |                   |     | 3 bar                                                            |                   |
| Max pressure secondary circuit   |                   |     | 3 bar                                                            |                   |
| Electric Resistance              |                   |     | 1.50 – 4.00 KW (UL Ready) - not included                         |                   |
| Anti-corrosion protection        |                   |     | 2 x magnesium anodes                                             |                   |
| Certification                    |                   |     | SRCC, Solar Keymark, CE                                          |                   |
| DC CIRCULATION PUMP              |                   |     |                                                                  |                   |
| General Data                     |                   |     |                                                                  |                   |
| Type                             |                   |     | DC Solar Pump                                                    |                   |
| Power                            |                   |     | 10W (6-24 Vdc)                                                   |                   |
| Max Capacities                   |                   |     | 22 Lpm / 6 Gpm                                                   |                   |
| Max heads                        |                   |     | 3,2 m / 10,5 ft                                                  |                   |
| Suitable fluids                  |                   |     | Water / Glycol                                                   |                   |
| Maximum working temperature      |                   |     | 110 °C / 230 °F                                                  |                   |
| Max. working pressure            |                   |     | 10 bar                                                           |                   |
| Number of DC Pumps               |                   |     | 1                                                                |                   |
| Protection                       |                   |     | Over-temperature, overload, Over voltage, dry running protection |                   |
| Temperature Sensors              |                   |     |                                                                  |                   |
| Platinum RTD type                |                   |     | 1,000 ohm                                                        |                   |
| Collector sensor working range   |                   |     | -58 - 355 °F (-50 - 180 °C)                                      |                   |
| Tank sensor working range        |                   |     | 15 - 175 °F (-10 - 80 °C)                                        |                   |
| Length of collector black cable  |                   |     | 60 in (1.5 m)                                                    |                   |
| Length of tank sensor gray cable |                   |     | 95 in (2.5 m)                                                    |                   |
| Glycol (recommended type)        |                   |     |                                                                  |                   |
| Type                             |                   |     | DOWFROST HD                                                      |                   |
| Recommended temperature range    |                   |     | -46°C...163°C                                                    |                   |
| Freezing Point                   |                   |     | -33.5 °C                                                         |                   |
| Boiling Point @ 1 bar            |                   |     | 105.6 °C                                                         |                   |
| Freeze protection temperature    |                   |     | -51 °C                                                           |                   |
| Burst protection temperature     |                   |     | -73 °C                                                           |                   |
| Weight % Propylene Glycol        |                   |     | 94                                                               |                   |
| Weight % performance additives   |                   |     | 6                                                                |                   |
| Specific gravity (15 °C)         |                   |     | 1.053 - 1.062                                                    |                   |
| pH of Solution                   |                   |     | 9.5 - 10.5                                                       |                   |
| Reserve alkalinity               |                   |     | 15.0 ml                                                          |                   |

## TECHNICAL DATA AND TYPES

| Fimer type code                                                                    | UNO-DM-3.3-TL-PLUS-US-Q                             | UNO-DM-4.6-TL-PLUS-US-Q               | UNO-DM-5.0-TL-PLUS-US-Q               |
|------------------------------------------------------------------------------------|-----------------------------------------------------|---------------------------------------|---------------------------------------|
| General specifications                                                             |                                                     |                                       |                                       |
| Rated grid AC voltage (V <sub>acr</sub> )                                          | 208 V 240 V                                         | 208 V 240 V                           | 208 V 240 V                           |
| Nameplate Apparent Power (S <sub>max</sub> )                                       | 3300 VA 3300 VA                                     | 4600 VA 4600 VA                       | 5000 VA 5000 VA                       |
| Nameplate Output Active Power (P <sub>max</sub> @ cosφ=1)                          | 3300 W 3300 W                                       | 4600 W 4600 W                         | 5000 W 5000 W                         |
| P <sub>RATED</sub> : Output Active Power @V <sub>ACr</sub> and cosφ=±0,9           | 2700 W 3000 W                                       | 3780 W 4140 W                         | 4118 W 4500 W                         |
| Input side (DC)                                                                    |                                                     |                                       |                                       |
| Number of independent MPPT channels                                                | 2                                                   |                                       |                                       |
| Maximum usable power for each channel                                              | 2000 W                                              | 3000 W                                | 3500 W                                |
| Absolute maximum voltage (V <sub>max</sub> )                                       | 600 V                                               | 600 V                                 | 600 V                                 |
| Start-up voltage (V <sub>start</sub> )                                             | 200 V (Adj. 120-350)                                | 200 V (Adj. 120-350)                  | 200 V (Adj. 120-350)                  |
| Full power MPPT voltage range with parallel MPPT configuration at P <sub>acr</sub> | 160-530 V 170-530 V                                 | 140-530 V 150 - 530 V                 | 155-480 V 170-480 V                   |
| Operating MPPT voltage range                                                       | 0.7*V <sub>start</sub> - 580 V (≥ 90)               | 0.7*V <sub>start</sub> - 580 V (≥ 90) | 0.7*V <sub>start</sub> - 580 V (≥ 90) |
| Maximum usable current per channel                                                 | 10 A                                                | 16 A                                  | 19 (CH1) - 11.5 (CH2)                 |
| Maximum current (Idcmax)                                                           | 20 A                                                | 32 A                                  | 30,5 A                                |
| Maximum short circuit current per channel                                          | 25 A                                                |                                       |                                       |
| Number of wire landing terminals                                                   | 2 pairs, capable of connecting two parallel strings |                                       |                                       |
| Array wiring termination                                                           | Terminal block, pressure clamp, AWG20-8             |                                       |                                       |
| Output side                                                                        |                                                     |                                       |                                       |
| Grid connection type                                                               | 1Φ/2W Split-Φ/3W                                    | 1Φ/2W Split-Φ/3W                      | 1Φ/2W Split-Φ/3W                      |
| Adjustable voltage range (V <sub>min</sub> -V <sub>max</sub> )                     | 183-228 V 211-264 V                                 | 183-228 V 211-264 V                   | 183-228 V 211-264 V                   |
| Grid frequency                                                                     | 60 Hz                                               | 60 Hz                                 | 60 Hz                                 |
| Adjustable grid frequency range                                                    | 50-64 Hz                                            | 50-64 Hz                              | 50-64 Hz                              |
| Maximum current (Iac,max)                                                          | 14,5 A                                              | 20 A                                  | 22 A                                  |
| Power factor                                                                       | >0.995, adj. +/-0.8                                 | >0.995, adj. +/-0.8                   | >0.995, adj. +/-0.8                   |
| Total harmonic distortion at rated power                                           | <2%                                                 | <2%                                   | <2%                                   |
| Contributory fault current                                                         | 16 A                                                | 22 A                                  | 24 A                                  |
| Grid wiring termination type                                                       | Terminal block, pressure clamp, AWG20-6             |                                       |                                       |
| Input protections                                                                  |                                                     |                                       |                                       |
| Reverse polarity protection                                                        | Yes, from limited current source                    |                                       |                                       |
| Over-voltage protection type                                                       | Varistor                                            |                                       |                                       |
| PV array ground fault detection                                                    | Pre start-up RISO and dynamic GFDI                  |                                       |                                       |
| Output protections                                                                 |                                                     |                                       |                                       |
| Anti-islanding protection                                                          | Meets UL1741 / IEEE1547 requirements                |                                       |                                       |
| Over-voltage protection type                                                       | Varistor, 2 (L1 - L2 / L1 - G)                      |                                       |                                       |
| Maximum AC OCPD rating                                                             | 20 A                                                | 25 A                                  | 30 A                                  |
| Efficiency                                                                         |                                                     |                                       |                                       |
| Maximum efficiency                                                                 | 97%                                                 | 97%                                   | 97.4%                                 |
| CEC efficiency                                                                     | 96.5% 96.5%                                         | 96.5% 96.5%                           | 96.5% 97%                             |
| Operating performance                                                              |                                                     |                                       |                                       |
| Stand-by consumption                                                               | <8 W <sub>RMS</sub>                                 |                                       |                                       |
| Nighttime consumption                                                              | <0.6 W <sub>RMS</sub>                               |                                       |                                       |
| Auxiliary Output                                                                   |                                                     |                                       |                                       |
| Isolated Auxiliary Power Supply <sup>1)</sup>                                      | 24 Vdc, 0.4 A max                                   |                                       |                                       |

## TECHNICAL DATA AND TYPES

**Fimer Type code** **UNO-DM-3.3-TL-PLUS-US-Q** **UNO-DM-4.6-TL-PLUS-US-Q** **UNO-DM-5.0-TL-PLUS-US-Q**

### Embedded communication

|                                  |                                                                            |
|----------------------------------|----------------------------------------------------------------------------|
| Embedded communication interface | Wireless <sup>2)</sup>                                                     |
| Embedded communication protocol  | ModBus TCP (SunSpec)                                                       |
| Commissioning tool               | Web User Interface                                                         |
| Monitoring                       | Aurora Vision cloud (Plant Portfolio Manager, Plant Viewer, Energy Viewer) |

### Optional board UNO-DM-COM kit

|                                   |                                                                                             |
|-----------------------------------|---------------------------------------------------------------------------------------------|
| Optional communication interface  | RS485 (use with meter for dynamic feed-in control), Alarm/Load manager relay, Remote ON/OFF |
| Optional communication protocol   | ModBus RTU (SunSpec), Aurora Protocol                                                       |
| Advanced functionalities provided | Dynamic feed-in control, Load manager relay                                                 |

### Optional board UNO-DM-PLUS Ethernet COM kit

|                                  |                                                             |
|----------------------------------|-------------------------------------------------------------|
| Optional communication interface | Ethernet, RS485, Alarm/Load manager relay, Remote ON/OFF    |
| Optional communication protocol  | ModBus TCP (SunSpec), ModBus RTU (SunSpec), Aurora Protocol |

### Environmental

|                                             |                                                          |                                                          |
|---------------------------------------------|----------------------------------------------------------|----------------------------------------------------------|
| Ambient air operating temperature range     | -25...+60°C / -13...140°F<br>(derating above 50°C/122°F) | -25...+60°C / -13...140°F<br>(derating above 45°C/113°F) |
| Relative humidity                           | 0-100% RH condensing                                     |                                                          |
| Acoustic noise emission level               | < 50 db (A) @1m                                          |                                                          |
| Maximum operating altitude without derating | 6560ft (2000m)                                           |                                                          |

### Mechanical specifications

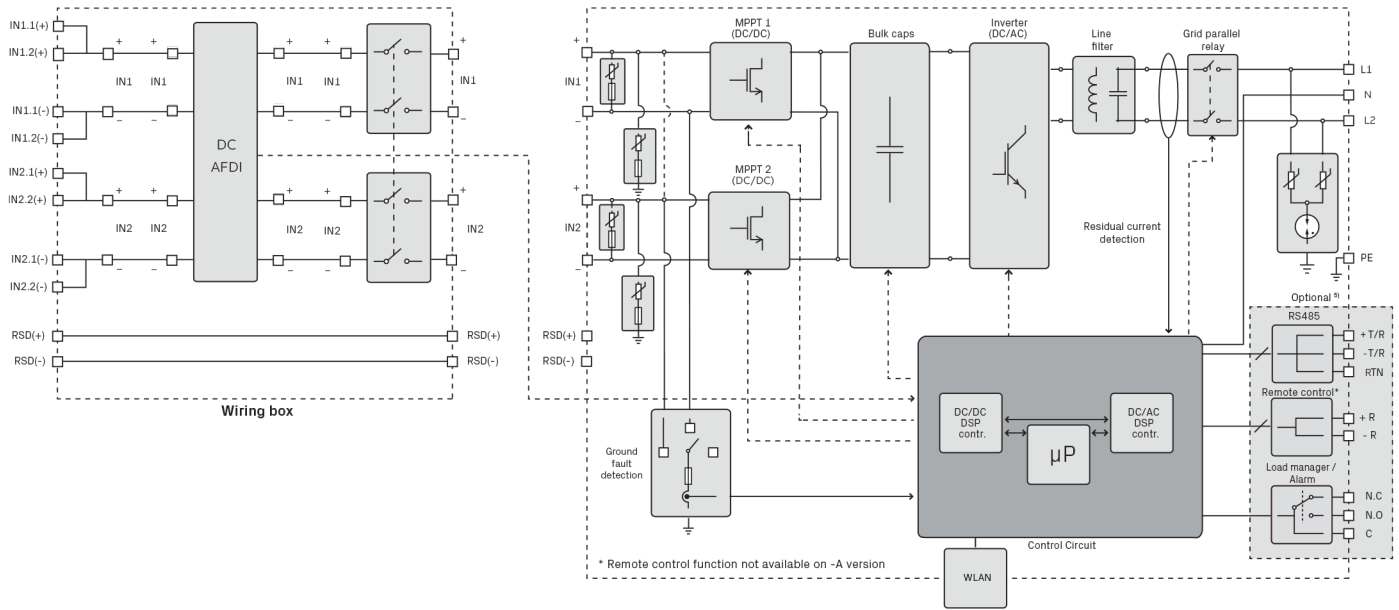
|                       |                                                                                                                                |  |
|-----------------------|--------------------------------------------------------------------------------------------------------------------------------|--|
| Enclosure rating      | Type 4X                                                                                                                        |  |
| Cooling               | Natural convection                                                                                                             |  |
| Dimension (H x W x D) | 34 x 16.4 x 8.7 in (863 x 418 x 222 mm) <sup>3)</sup>                                                                          |  |
| Weight                | 35.3 lb (16 kg) <sup>3)</sup>                                                                                                  |  |
| Shipping weight       | 46lb (20,7kg) <sup>3)</sup>                                                                                                    |  |
| Mounting system       | Wall bracket                                                                                                                   |  |
| Conduit connections   | Bottom: Markings for (2) Concentric KOs 1", 3/4" and (2) KOs 1/2"<br>Sides: Markings for Concentric KOs 1", 3/4" <sup>3)</sup> |  |
| DC switch rating      | 600 V, 23 A @ 600 V, 38 A @ 500 V and 45 A @ 350 V                                                                             |  |

### Safety

|                         |                                                                                                                                     |  |
|-------------------------|-------------------------------------------------------------------------------------------------------------------------------------|--|
| Isolation level         | Transformerless (floating array)                                                                                                    |  |
| Safety and EMC standard | UL1741, IEEE1547.1, CSA-C22.2 N. 107.1-01, UL1998 UL 1699B-2018, FCC Part 15 Class B                                                |  |
| Grid standard           | IEC/EN 62109-1, IEC/EN 62109-2, AS/NZS 4777.2, EN 61000-6-1, EN 61000-6-2, EN 61000-6-3, EN 61000-6-4, EN 61000-3-11, EN 61000-3-12 |  |
| Safety approval         | CTUVUS                                                                                                                              |  |

### Available models

|                                                          |                              |                              |                               |
|----------------------------------------------------------|------------------------------|------------------------------|-------------------------------|
| Model with DC switch, wiring box, AFD, RSD supply output | UNO-DM-3.3-TL-PLUS-USSB-RA-Q | UNO-DM-4.6-TL-PLUS-USSB-RA-Q | UNO-DM-5.0-TL-PLUS-US-SBRA-QU |
|----------------------------------------------------------|------------------------------|------------------------------|-------------------------------|



**UNO-DM-4.0/4.6/5.0-TL-PLUS-Q string inverter block diagram**

Models using other branded solar thermal or solar electric gear upon demand.