



Codes			
E1101I-T160DSE	E1101I-T200DSE	E1101I-T300DSE	E1101I-T500DSE
E1102I-T160DSE	E1102I-T200DSE	E1102I-T300DSE	E1102I-T500DSE
E1103I-T160DSE	E1103I-T200DSE	E1103I-T300DSE	E1103I-T500DSE

**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 double door dimensions**
- **160-500 liters 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)**
- **Robust protected-ventilated 1ph 1-3kWdC inverter**

### CABIN GENERAL CHARACTERISTICS

	Thermal Part	Electrical 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	400 x 2000 x 800 mm 15,75 x 78,74 x 31,5 inch
Mounting plate W x H	699 x 1896 mm / 27,5 x 74,65 inches	699 x 1896 mm / 27,5 x 74,65 inches
Weight/pack	203 kg	124 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	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

### CABIN LIGHTING SYSTEM-TECHNICAL SPECIFICATIONS

	General Data
Type	RITTAL LED system light
Material	Light body: Extruded aluminium Light cover: Polycarbonate (halogen-free) 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

## VENTILATION - TECHNICAL SPECIFICATIONS

	Fan	Thermostat
Type	RITTAL TopTherm	RITTAL internal thermostat
Color	RAL 7035	RAL 7035
Protection category IP to IEC 60 529	IP 54 with standard filter and additional fine filter mat: IP 55 with standard filter and hose-proof hood: IP 56	
Protection category NEMA	with standard filter: Type 12 with standard filter and additional fine filter mat: Type 12 with standard filter and hose-proof hood: Type 3, 3R, 4, 4X	
Air throughput (unimpeded air flow):	At 50 Hz: 230 m <sup>3</sup> /h At 60 Hz: 250 m <sup>3</sup> /h	
Air throughput with outlet filter including standard filter mat (output 50/60 Hz)	203/230 m <sup>3</sup> /h	
Rated operating voltage:	115 V, 1~, 50 Hz/60 Hz	24 V - 230 V, 1~24 V - 60 V (DC)
Dimensions	Width: 255 mm Height: 255 mm	Width: 71 mm Height: 71 mm Depth: 33.5 mm
Build depth	25 mm	
Installation depth	107 mm	
Temperature range:	Bearing: -30°C...+70°C Operation (environment): -30°C...+55°C	Setting range: +5°C...+60°C
Power consumption	At 50 Hz: 40 W, At 60 Hz: 42 W	
Rated current (max.)	At 50 Hz: 0.52 A, At 60 Hz: 0.48 A	
Miniature circuit breaker/ fuse	4 A	
Noise level	At 50 Hz: 54 dB(A), At 60 Hz: 56 dB(A)	
Diagonal fan	Diagonal, self-starting shaded pole motor	
Weight/pack	2.26 kg	0.1 kg
Approvals	Approval overview CSA UL + C-UL - FTFA UR + C-UR	UL + C-UL VDE
Certificates	EAC	EAC
Declarations	Declaration of conformity	Declaration of conformity

SOLAR TANK CHARACTERISTICS	T160	T200	T300	T500
<b>General Data</b>				
Type	Sammler SV			TESY EV
Solar tank capacity	160 lt / 40 gal	200 lt / 50 gal	300 lt / 80 gal	500 lt / 132 gal
External dimensions W x H	580 x 1058 mm 22,83 x 41,6 inch	580 x 1292 mm 22,83 x 50,9 inch	580 x 1735 mm 22,83 x 68,3 inch	580 x 1674 mm 22,83 x 66 inch
Weight	67 kg / 235 lb	82 kg / 235 lb	107 kg / 235 lb	145 kg / 320 lb
Number of boilers	1			
Max pressure primary circuit	3 bar			8 bar
Max pressure secondary circuit	3 bar			6 bar
Electric Resistance	1.50 – 4.00 KW (UL Ready) - not included			
Anti-corrosion protection	2 x magnesium anodes			
Certification	SRCC, Solar Keymark, CE			Solar Keymark, CE

### DC CIRCULATION PUMP

<b>General Data</b>	
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

<b>Temperature Sensors</b>	
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)

<b>Glycol (recommended type)</b>	
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-1.2-TL-PLUS-Q

UNO-DM-2.0-TL-PLUS-Q

UNO-DM-3.0-TL-PLUS-Q

### Input side

Absolute maximum DC input voltage ( $V_{max,abs}$ )	600 V	600 V	600 V
Start-up DC input voltage ( $V_{start}$ )	120 V (adj. 100...150 V)	150 V (adj. 100...250 V)	150 V (adj. 100...250 V)
Operating DC input voltage range ( $V_{dcr,min} \dots V_{dcr,max}$ )	0.7 x Vstart...580 V (min 90 V)		
Rated DC input voltage ( $V_{dcr}$ )	185 V	300 V	300 V
Rated DC input power ( $P_{dcr}$ )	1500 W	2500 W	3300 W
Number of independent MPPT	1	1	1
Maximum DC input power for each MPPT ( $P_{MPPTmax}$ )	1500 W	2500 W	3300 W
DC input voltage range with parallel configuration of MPPT at $P_{acr}$	100...530 V	210...530 V	320...530 V
DC power limitation with parallel configuration of MPPT	N/A		
DC power limitation for each MPPT with independent configuration of MPPT at $P_{acr}$ , max unbalance example	N/A		
Maximum DC input current ( $I_{dcr,max}$ ) / for each MPPT ( $I_{MPPTmax}$ )	10.0 A	10.0 A	10.0 A
Maximum input short circuit current for each MPPT	12.5 A	12.5 A	12.5 A
Number of DC input pairs for each MPPT	1	1	1
DC connection type <sup>1)</sup>	Quick Fit PV Connector		

### Input protection

Reverse polarity protection	Yes, from limited current source		
Input over voltage protection for each MPPT-varistor	Yes		
Photovoltaic array isolation control	According to local standard		
DC switch rating for each MPPT (version with DC switch)	25 A / 600 V		

### Output side

AC grid connection type	Single-phase		
Rated AC power ( $P_{acr}$ @ $\cos\phi=1$ )	1200 W	2000 W	3000 W
Maximum AC output power ( $P_{ac,max}$ @ $\cos\phi=1$ )	1200 W	2000 W	3000 W
Maximum apparent power ( $S_{max}$ )	1200 VA	2000 VA	3000 VA
Rated AC grid voltage ( $V_{acr}$ )	230 V		
AC voltage range <sup>2)</sup>	180...264 V		
Maximum AC output current ( $I_{ac,max}$ )	5.5 A	10.0 A	14.5 A
Contributory fault current	10.0 A	12.0 A	16.0 A
Rated output frequency ( $f_r$ ) <sup>3)</sup>	50/60 Hz		
Output frequency range ( $f_{min} \dots f_{max}$ ) <sup>3)</sup>	47...53/57...63 Hz		
Nominal power factor and adjustable range	> 0.995, adj. $\pm$ 0.1 - 1 (over/under excited)		
Total current harmonic distortion	< 3%		
AC connection type	Female connector from panel		

### Output protection

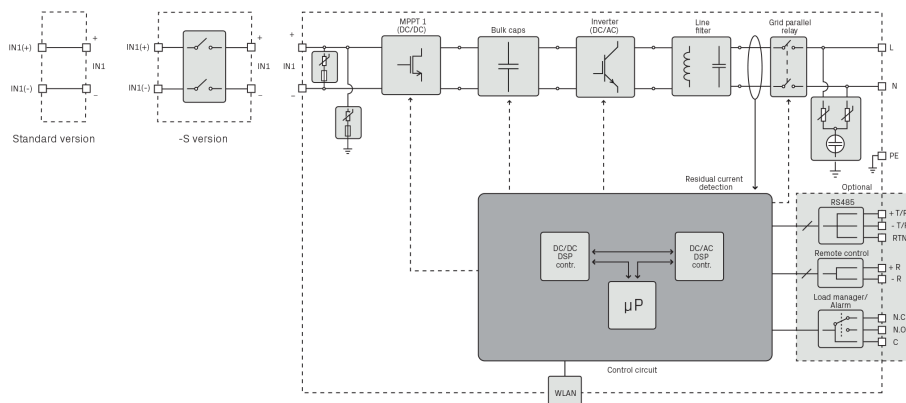
Anti-islanding protection	According to local standard		
Maximum external AC overcurrent protection	10.0 A	16.0 A	16.0 A
Output overvoltage protection - varistor	2 (L - N / L - PE)		

### Operating performance

Maximum efficiency ( $\eta_{max}$ )	94.8%	96.7%	96.7%
Weighted efficiency (EURO/CEC)	92.0%/-	95.0%/-	95.0%/-
Feed in power threshold	8 W		
Night consumption	<0.4 W		

## TECHNICAL DATA AND TYPES

Fimer Type code	UNO-DM-1.2-TL-PLUS-Q	UNO-DM-2.0-TL-PLUS-Q	UNO-DM-3.0-TL-PLUS-Q
<b>Embedded communication</b>			
Embedded communication interface 4)	Wireless		
Embedded communication protocol	ModBus TCP (SunSpec)		
Commissioning tool	Web User Interface, Aurora Manager Lite		
Monitoring	Plant Portfolio Manager, Plant Viewer, Plant Viewer for Mobile, Energy Viewer		
<b>Optional board UNO-DM-COM kit</b>			
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		
<b>Optional board UNO-DM-PLUS Ethernet COM kit</b>			
Optional communication interface	Ethernet, RS485 (use with meter for dynamic feed-in control), Alarm/Load manager relay, Remote ON/OFF		
Optional communication protocol	ModBus TCP (SunSpec), ModBus RTU (SunSpec), Aurora Protocol		
<b>Environmental</b>			
Ambient temperature range	-25...+60°C / -13...140°F with derating above 50°C/122°F	-25...+60°C / -13...140°F with derating above 50°C/122°F	-25...+60°C / -13...140°F with derating above 50°C/122°F
Relative humidity	0...100 % condensing		
Acoustic noise emission level	50 dBA @ 1 m		
Maximum operating altitude without derating	2000 m / 6560 ft		
<b>Physical</b>			
Environmental protection rating	IP 65		
Cooling	Natural		
Dimension (H x W x D)	553 x 418 x 175 mm / 21.8" x 16.5" x 6.9"		
Weight	15 kg / 33 lbs		
Mounting system	Wall bracket		
<b>Safety</b>			
Isolation level	transformerless		
Marking	CE , RCM		
Safety and EMC 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 61000-3-2, EN 61000-3-3		
Grid standard (check your sales channel for availability) 5)	CEI 0-21, DIN V VDE V 0126-1-1, VDE-AR-N 4105, G83/2, G59/3, G98-1, G99-1, RD 413, ITC-BT-40, AS/NZS 4777.2, IEC 61727, IEC 62116		
<b>Available products variants</b>			
Standard	UNO-DM-1.2-TL-PLUS-B-Q	UNO-DM-2.0-TL-PLUS-B-Q	UNO-DM-3.0-TL-PLUS-B-Q
With DC switch	UNO-DM-1.2-TL-PLUS-SB-Q	UNO-DM-2.0-TL-PLUS-SB-Q	UNO-DM-2.0-TL-PLUS-SB-Q



**UNO-DM-1.2/2.0/3.0-TL-PLUS-Q string inverter block diagram**

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