



Codes		
E2104I-T40DSU	E2104I-T50DSU	E2104I-T80DSU
E2106I-T40DSU	E2106I-T50DSU	E2106I-T80DSU
E2107I-T40DSU	E2107I-T50DSU	E2107I-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 double 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)**
- **Robust protected-ventilated 1ph 7kWdC twin inverters**

### 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 - FTTA UR + C-UR	UL + C-UL VDE
Certificates	EAC	EAC
Declarations	Declaration of conformity	Declaration of conformity

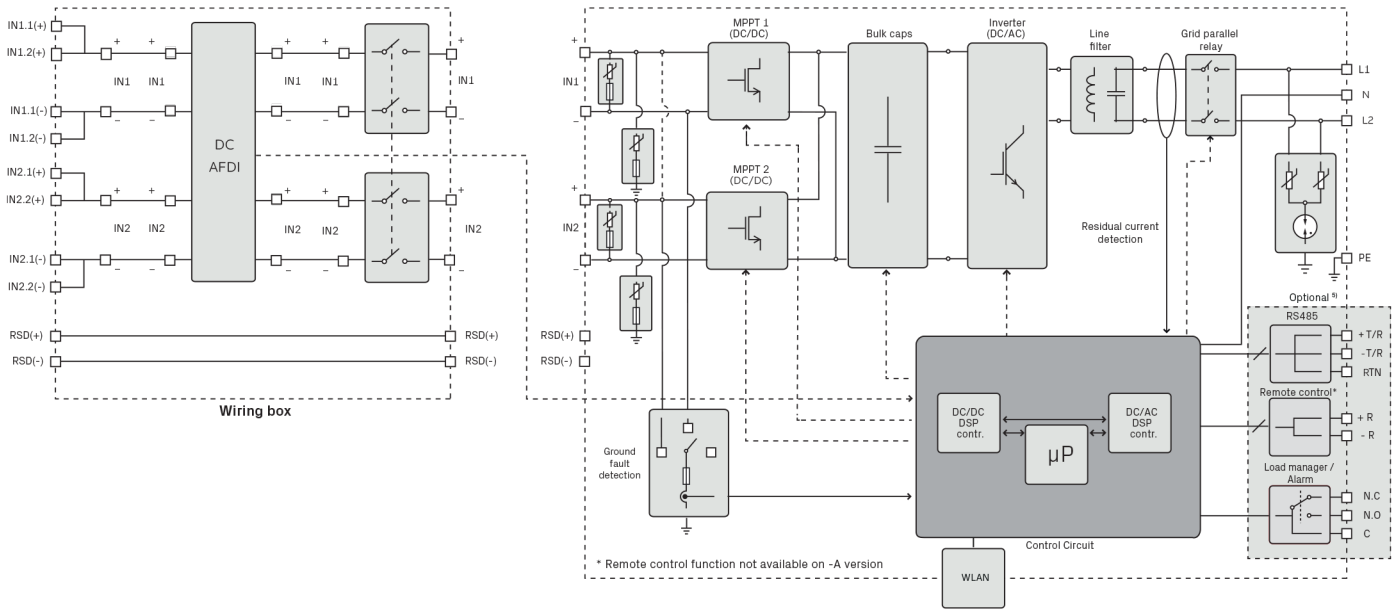
SOLAR TANK CHARACTERISTICS	T40	T50	T60
<b>General Data</b>			
Type		Sammler SV	
Solar tank capacity	160 lt / 40 gal	200 lt / 50 gal	300 lt / 80 gal
External dimensions W x H	580 x 1058 mm 22,83 x 41,6 inch	580 x 1292 mm 22,83 x 50,9 inch	580 x 1735 mm 22,83 x 68,3 inch
Weight	67 kg / 235 lb	82 kg / 235 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	
<b>DC CIRCULATION PUMP</b>			
<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-3.3-TL-PLUS-US-Q	UNO-DM-4.6-TL-PLUS-US-Q	UNO-DM-5.0-TL-PLUS-US-Q
<b>General specifications</b>			
Rated grid AC voltage ( $V_{acr}$ )	208 V 240 V	208 V 240 V	208 V 240 V
Nameplate Apparent Power ( $S_{max}$ )	3300 VA 3300 VA	4600 VA 4600 VA	5000 VA 5000 VA
Nameplate Output Active Power ( $P_{max}$ @ $\cos\phi=1$ )	3300 W 3300 W	4600 W 4600 W	5000 W 5000 W
$P_{RATED}$ : Output Active Power @ $V_{acr}$ and $\cos\phi=\pm 0,9$	2700 W 3000 W	3780 W 4140 W	4118 W 4500 W
<b>Input side (DC)</b>			
Number of independent MPPT channels	2		
Maximum usable power for each channel	2000 W	3000 W	3500 W
Absolute maximum voltage ( $V_{max}$ )	600 V	600 V	600 V
Start-up voltage ( $V_{start}$ )	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 $P_{acr}$	160-530 V 170-530 V	140-530 V 150 - 530 V	155-480 V 170-480 V
Operating MPPT voltage range	$0.7*V_{start} - 580 V (\geq 90)$	$0.7*V_{start} - 580 V (\geq 90)$	$0.7*V_{start} - 580 V (\geq 90)$
Maximum usable current per channel	10 A	16 A	19 (CH1) - 11.5 (CH2)
Maximum current ( $I_{dmax}$ )	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		
<b>Output side</b>			
Grid connection type	1 $\Phi$ /2W Split- $\Phi$ /3W	1 $\Phi$ /2W Split- $\Phi$ /3W	1 $\Phi$ /2W Split- $\Phi$ /3W
Adjustable voltage range ( $V_{min} - V_{max}$ )	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 ( $I_{ac,max}$ )	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		
<b>Input protections</b>			
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		
<b>Output protections</b>			
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
<b>Efficiency</b>			
Maximum efficiency	97%	97%	97.4%
CEC efficiency	96.5% 96.5%	96.5% 96.5%	96.5% 97%
<b>Operating performance</b>			
Stand-by consumption	<8 W <sub>RMS</sub>		
Nighttime consumption	<0.6 W <sub>RMS</sub>		
<b>Auxiliary Output</b>			
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
<b>Embedded communication</b>			
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)		
<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		
Advanced functionalities provided	Dynamic feed-in control, Load manager relay		
<b>Optional board UNO-DM-PLUS Ethernet COM kit</b>			
Optional communication interface	Ethernet, RS485, Alarm/Load manager relay, Remote ON/OFF		
Optional communication protocol	ModBus TCP (SunSpec), ModBus RTU (SunSpec), Aurora Protocol		
<b>Environmental</b>			
Ambient air operating temperature range	-25...+60°C /-13...140°F (derating above 50°C/122°F)	-25...+60°C /-13...140°F (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)		
<b>Mechanical specifications</b>			
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" 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		
<b>Safety</b>			
Isolation level	Transformerless (floating array)		
Safety and EMC standard	UL1741, IEEEE1547.1, 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		
<b>Available models</b>			
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.