Solar Modules HSM

Hybrid Solar DC scalable outdoor enclosure with
2 integrated 1ph inverters for residential installations - US

Codes		
E2108I-T40DDU	E2108I-T50DDU	E2108I-T80DDU

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 triple door dimensions**
- **160 gallons water storage**
- **Integrated heating element**
- **Simple twin DC pump design**
- **Solar back up system for redundancy**
- **Defrost system for reliability**
- **Solar pool gear option (P extension coded)**
- **Robust protected-ventilated 1ph 8kWdC twin inverters**

CABIN GENERAL CHARACTERISTICS

	Thermal Part	Electrical Part
Type	RITTAL TS 8	
External dimensions W x H x D (front view)	1200 x 2000 x 800 mm 47,2 x 78,74 x 31,50 inch	800 x 2000 x 400 mm 31,5 x 78,74 x 15,75 inch
Material	Sheet steel	
Mounting plate W x H	1099 x 1896 mm / 43,3 x 74,65 inches	699 x 1896 mm / 27,5 x 74,65 inches
Weight/pack	203 kg	124 kg
Cold / Hot Supply - Brass	1 ¼ inch	
Color	RAL 7035	
Protection category IP to IEC 60 529	IP 55	
Doors	2	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 m³/h At 60 Hz: 250 m³/h	
Air throughput with outlet filter including standard filter mat (output 50/60 Hz)	203/230 m³/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

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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 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		2	
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	2
Protection	Over-temperature, overload, Over voltage, dry running protection
Temperature Sensors	
Platinum RTD type	1,000 ohm
Collector sensor working range	-58 - 355 ^{0}F (-50 - 180 ^{0}C)
Tank sensor working range	15 - 175 ^{0}F (-10 - 80 ^{0}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-6.0-TL-PLUS-US-Q	
General specifications		
Rated grid AC voltage (V_{acr})	208 V	240 V
Nameplate Apparent Power (S_{max})	6650 VA	6650 VA
Nameplate Output Active Power (P_{max} @ cosφ=1)	6000 W	6000 W
P_{RATED}: Output Active Power @V_{ACr} and cosφ=±0,9	6000 W	6000 W
Input side (DC)		
Number of independent MPPT channels	2	2
Maximum usable power for each channel	4000 W	4000 W
Absolute maximum voltage (V_{max})	600 V	600 V
Start-up voltage (V_{start})	200 V (Adj. 120-350 V)	200 V (Adj. 120-350 V)
Full power MPPT voltage range with parallel MPPT configuration at P_{acr}	200-480 V	200-480 V
Operating MPPT voltage range	0.7*V_{start} - 580 V (≥ 90)	0.7*V_{start} - 580 V (≥ 90)
Maximum usable current per channel	20 (CH1) - 11.5 (CH2)	20 (CH1) - 11.5 (CH2)
Maximum current (Idcmax)	31,5 A	
Maximum short circuit current per channel	24 A	24 A
Output side		
Grid connection type	1 Φ/2W	Split-Φ/3W
Adjustable voltage range (V_{min}-V_{max})	183-228 V	211-264 V
Grid frequency	60 Hz	60 Hz
Adjustable grid frequency range	50-64 Hz	50-64 Hz
Maximum current (Iac,max)	30 A	30 A
Power factor	>0.995, adj. +/-0.8	>0.995, adj. +/-0.8
Total harmonic distortion at rated power	<2%	<2%
Contributory fault current	40 Arms; 100 ms	40 Arms; 100 ms
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	40 A	40 A
Efficiency		
Maximum efficiency	97.4%	97.4%
CEC efficiency	96.5%	97%
Operating performance		
Stand-by consumption	<8 W_{RMS}	
Nighttime consumption	<0.6 W_{RMS}	
Auxiliary Output		
Isolated Auxiliary Power Supply [1)]	24 V, 0.4 A max	

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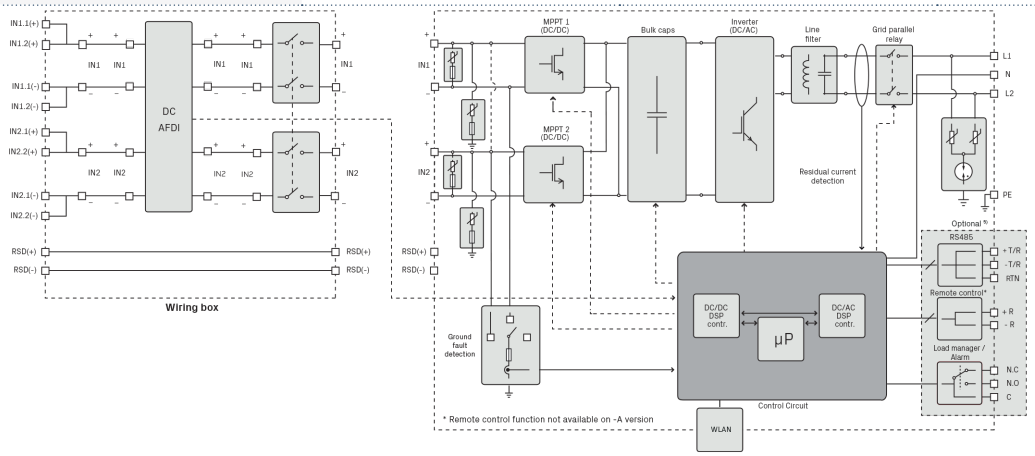
Fimer Type code	UNO-DM-6.0-TL-PLUS-US-Q
Embedded communication	
Embedded communication interface	Wireless [2]
Embedded communication protocol	ModBus TCP (SunSpec)
Commissioning tool	Web User Interface
Monitoring	Aurora Vision cloud (Plant Portfolio Manager, Plant Viewer, Energy Viewer)
Optional board 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
Optional board UNO-DM-PLUS Ethernet COM kit	
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
Environmental	
Ambient air operating temperature range	-25...+60°C /-13...140°F (derating above 45°C/113°F)
Relative humidity	5-100% RH condensing
Maximum operating altitude without derating	6560ft (2000m)
Mechanical specifications	
Enclosure rating	Type 4X
Cooling	Natural convection
Dimension (H x W x D)	28.7 x 21.7 x 8.7 in (729 x 553 x 222 mm) [3]
Weight	47.4 lb (21.5 kg) [3]
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" [3]
DC switch rating	32A - 600 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	UL 1741 SA, IEEE 1547, Rule 21, Rule 14 (HI)
Safety approval	CTUVUS
Available models	
Model with DC switch, wiring box, AFD, RSD supply output	UNO-DM-6.0-TL-PLUS-US-SB-RA-QU



UNO-DM-6.0-TL-PLUS-US-Q string inverter block diagram

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

