



Codes			
E1306I-T160DSE	E1306I-T200DSE	E1306I-T300DSE	E1306I-T500DSE
E1308I-T160DSE	E1308I-T200DSE	E1308I-T300DSE	E1308I-T500DSE
E1309I-T160DSE	E1309I-T200DSE	E1309I-T300DSE	E1309I-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 3ph 6-9kWdc 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 ³ /h At 60 Hz: 250 m ³ /h	
Air throughput with outlet filter including standard filter mat (output 50/60 Hz)	203/230 m ³ /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
General Data				
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

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	TRIO-5.8-TL-OUTD	TRIO-7.5-TL-OUTD	TRIO-8.5-TL-OUTD
Input side			
Absolute maximum DC input voltage ($V_{max,abs}$)		1000 V	
Start-up DC input voltage (V_{start})		350 V (adj. 200...500 V)	
Operating DC input voltage range ($V_{dcr,min} \dots V_{dcr,max}$)		0.7 x $V_{start} \dots 0.950$ V (min 200 V)	
Rated DC input voltage (V_{dcr})		620 V	
Rated DC input power (P_{dcr})	5950 W	7650 W	8700 W
Number of independent MPPT	1	2	2
Maximum DC input power for each MPPT ($P_{MPPT,max}$)	6050 W Linear derating from max to null [800 V ≤ V_{MPPT} ≤ 950 V]	4800 W	4800 W
DC input voltage range with parallel configuration of MPPT at P_{acr}	-	320...800 V	320...800 V
DC power limitation with parallel configuration of MPPT	Linear derating from max to null [800 V ≤ V_{MPPT} ≤ 950 V]		
DC power limitation for each MPPT with independent configuration of MPPT at P_{acr} max unbalance example	-	4800 W [320 V ≤ V_{MPPT} ≤ 800 V] the other channel: P_{dcr} = 4800 W [215 V ≤ V_{MPPT} ≤ 800 V]	4800 W [320 V ≤ V_{MPPT} ≤ 800 V] the other channel: P_{dcr} = 4800 W [290 V ≤ V_{MPPT} ≤ 800 V]
Maximum DC input current ($I_{dcr,max}$) / for each MPPT ($I_{MPPT,max}$)	18.9 A	30.0 A / 15.0 A	30.0 A / 15.0 A
Maximum input short circuit current for each MPPT	24 A	20 A	20 A
Number of DC input pairs for each MPPT		2 (-S version)	
DC connection type ¹⁾	PV quick fit connector 1) on -S version / Screw terminal block on standard version		
Input protection			
Reverse polarity protection		Yes, from limited current source	
Input over voltage protection for each MPPT-varistor		Yes, 4	
Photovoltaic array isolation control		According to local standard	
DC switch rating for each MPPT (version with DC switch)		16 A / 1000 V, 25 A / 800 V	
Output side			
AC grid connection type		Three-phase 3W+PE or 4W+PE	
Rated AC power (P_{acr} @ $\cos\phi=1$)	5800 W	7500 W	8500 W
Maximum apparent power (S_{max})	5800 VA	7500 VA	8500 VA
Rated AC grid voltage (V_{acr})		400 V	
AC voltage range ²⁾		320...480 V ²⁾	
Maximum AC output current ($I_{acr,max}$)	10.0 A	12.5 A	14.5 A
Contributory fault current	12.0 A	14.5 A	16.5 A
Rated output frequency (f_r) ³⁾		50/60 Hz	
Output frequency range ($f_{min} \dots f_{max}$) ³⁾		47...53 Hz / 57...63 Hz ³⁾	
Nominal power factor and adjustable range	> 0.995, adj. ± 0.9 with P_{acr} = 5.22 kW, ± 0.8 with max 5.8 kVA	> 0.995, adj. ± 0.9 with P_{acr} = 6.75 kW, ± 0.8 with max 7.5 kVA	> 0.995, adj. ± 0.9 with P_{acr} = 7.65 kW, ± 0.8 with max 8.5 kVA
Total current harmonic distortion		< 2%	
AC connection type		Screw terminal block, cable gland M32	
Output protection			
Anti-islanding protection		According to local standard	
Maximum external AC overcurrent protection	16.0 A	16.0 A	20.0 A
Output overvoltage protection - varistor		4 plus gas arrester	
Operating performance			
Maximum efficiency (η_{max})		98.0%	
Weighted efficiency (EURO/CEC)	97.4% / -	97.5% / -	97.5% / -
Feed in power threshold	32 W	36 W	36 W
Night consumption		< 3 W	

User interface

Fimer Type code

TRIO-5.8-TL-OUTD

TRIO-7.5-TL-OUTD

TRIO-8.5-TL-OUTD

Communication

Wired local monitoring

Ethernet card with webserver (opt.), PVI-USB-RS232_485 (opt.)

Remote monitoring

Ethernet card (opt.), VSN300 Wifi Logger Card (opt.), VSN700 Data Logger (opt.)

Wireless local monitoring

VSN300 Wifi Logger Card (opt.)

User interface

Graphic display

Environmental

Ambient temperature range

-25...+60°C / -13...140°F with derating above 50°C/122°F

Relative humidity

0...100 % condensing

Sound pressure level, typical

50 dBA @ 1 m

Maximum operating altitude without derating

2000 m / 6560 ft

Physical

Environmental protection rating

IP 65

Cooling

Natural

Dimension (H x W x D)

641mm x 429 mm x 220 mm / 25.2" x 16.9" x 8.7"
(855 mm x 429 mm x 237 mm / 33.7" x 16.9" x 9.3" with open front cover)

Weight

25.0 kg / 55.1 lbs

28.0 kg / 61.7 lbs

28.0 kg / 61.7 lbs

Mounting system

Wall bracket

Safety

Isolation level

transformerless

Marking

CE (50 Hz only), RCM

Safety and EMC standard

EN 62109-1, EN 62109-2, AS/NZS3100, EN 61000-6-2, EN 61000-6-3, EN 61000-3-2, EN 61000-3-3

Grid standard

(check your sales channel for availability) 5)

CEI 0-21, CEI 0-16, DIN V VDE V 0126-1-1, VDE-AR-N 4105, G83/2, G59/3, RD 1699, RD 413, NRS-097-2-1, AS 4777, IEC 61727, IEC 62116, VFR 2014

Available products variants

Standard

TRIO-5.8-TL-OUTD-400

TRIO-7.5-TL-OUTD-400

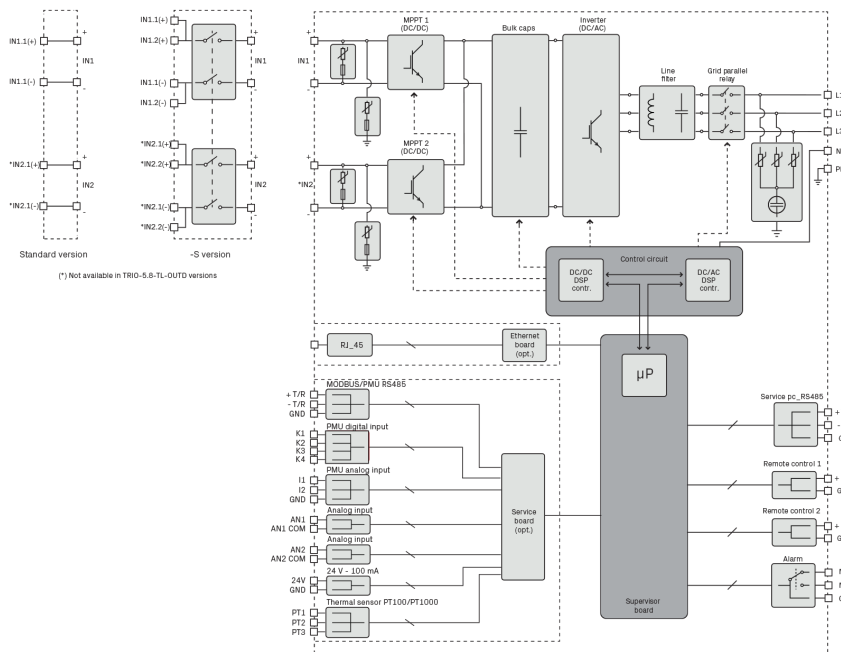
TRIO-8.5-TL-OUTD-400

With DC switch

TRIO-5.8-TL-OUTD-S-400

TRIO-7.5-TL-OUTD-S-400

TRIO-8.5-TL-OUTD-S-400



TRIO-5.8/7.5/8.5-TL-OUTD string inverter board block diagram

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