



Solar Redefined

Same space, more energy

85% utilisation of land area compared to
40% for conventional flat plate collectors



Naked Energy.

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Certified products:
Virtu^{HOT}: 011-752980.B

Unrivalled performance in any environment

- > **85%** utilisation of land area compared to 40% for market-leading flat plate collectors (FPCs)
- > **1.5 x** greater energy generation per m² compared to market-leading FPCs
- > Thermal energy generation up to a temperature of **120°C**

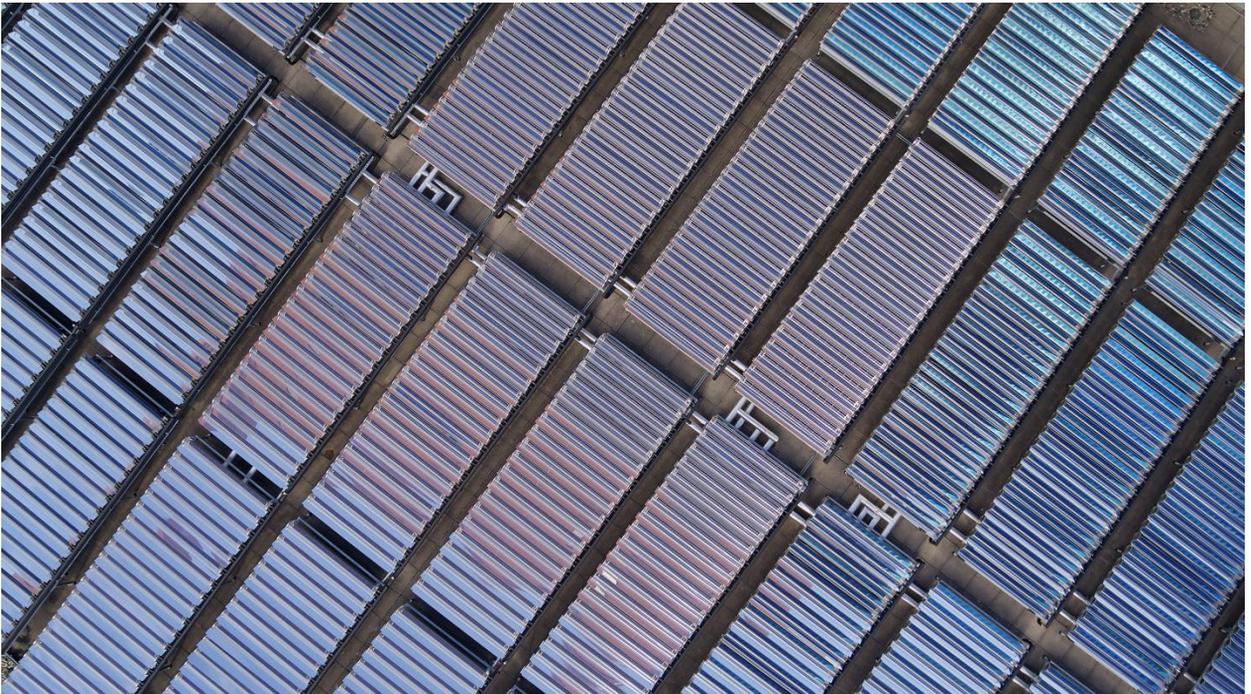
Versatile and easy to install

- > **Bespoke** ground mounting system designed for utility scale
- > Pre-assembled and quality assured prior to delivery
- > **Low profile** and aesthetic design

Designed for Utility Scale

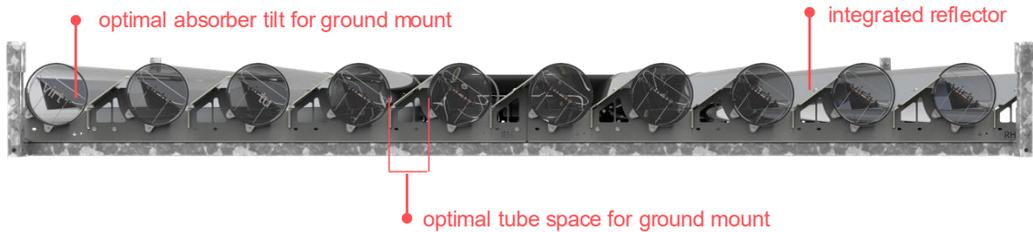
Ideal for

- > Solar district heat networks
- > 4th & 5th generation heat networks

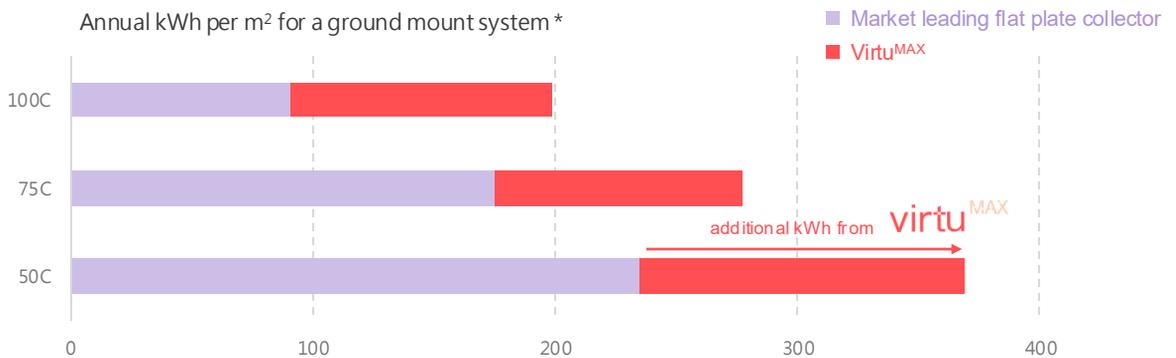


Ground Mount Performance

The unique array geometry of Virtu^{MAX} allows for a greater utilisation of available ground area.

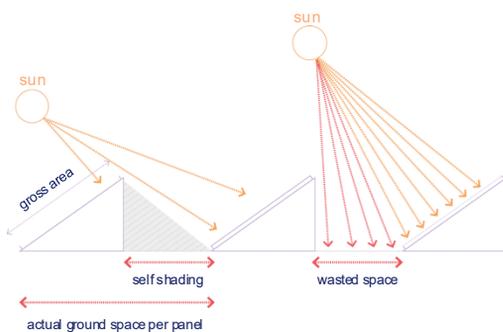


Annual kWh per m² for a ground mount system *



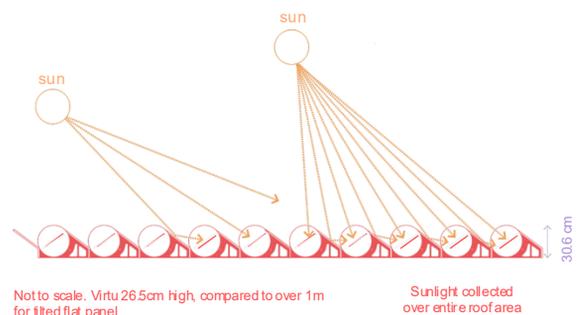
Standard panels waste space

- > Panels/collectors are tilted on large racks towards the sun
- > Spaced to avoid self shading in winter and provide service corridors for vehicles
- > Ground area required is larger than panel gross area



No wasted space with Virtu^{MAX}

- > Absorber plates are tilted to optimum angle within tubes
- > Integrated reflector captures sunlight between tubes
- > Same space, more energy



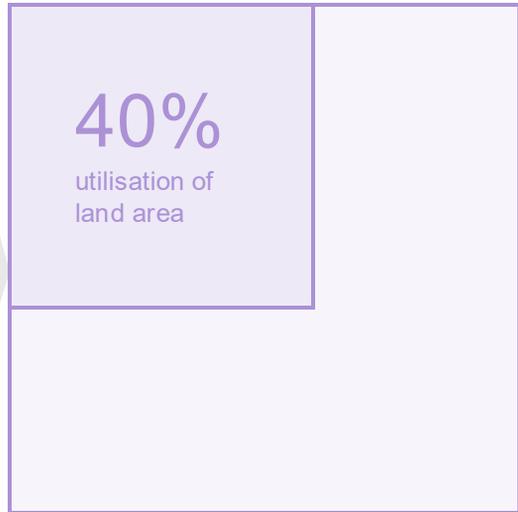
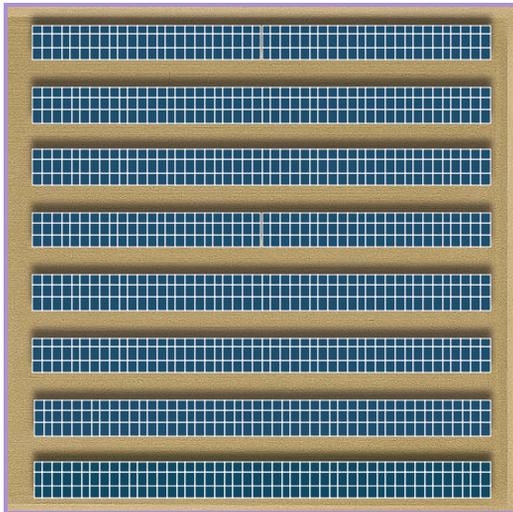
* Chart Note

- > All annual kWh values are calculated using industry-standard Spencat tool at Würzburg
- > Virtu^{MAX} kWh calculation takes parameters from the Virtu^{20T} Solar Keymark certificate. Calculation is made at 0° inclination. Service corridor allowance is considered in ground area calculation
- > Flat panel kWh calculation takes parameters from GreenOneTech GK HT 13.6 Solar Keymark certificate. Similar results are achieved by other best-in-class panels.

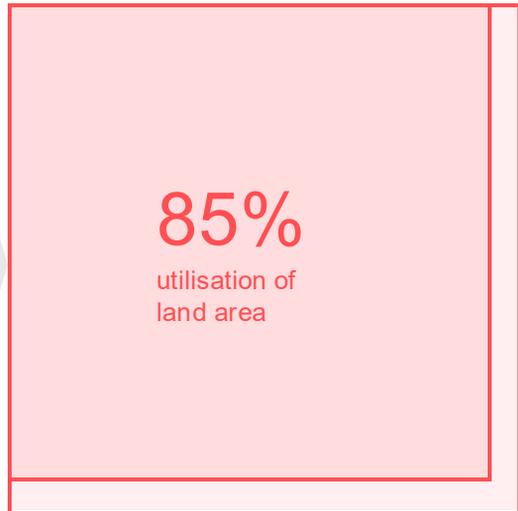
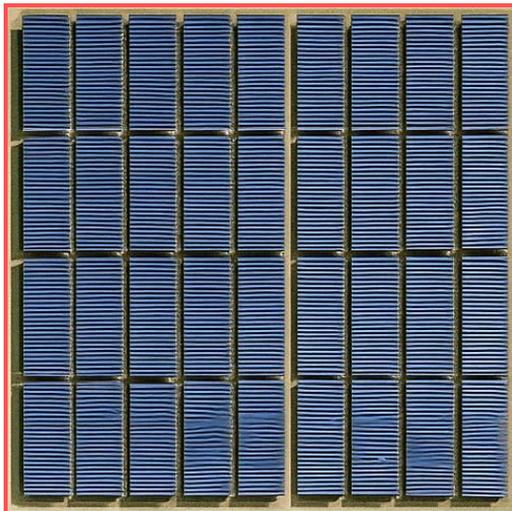
Virtu^{MAX} has more than twice the land utilisation factor than conventional solar modules

Removing the need for inter-row spacing, Virtu^{MAX} has greater packing density than traditional solar panels and enables higher yield per m² of available land area.

- Market leading flat plate collector (FPC)



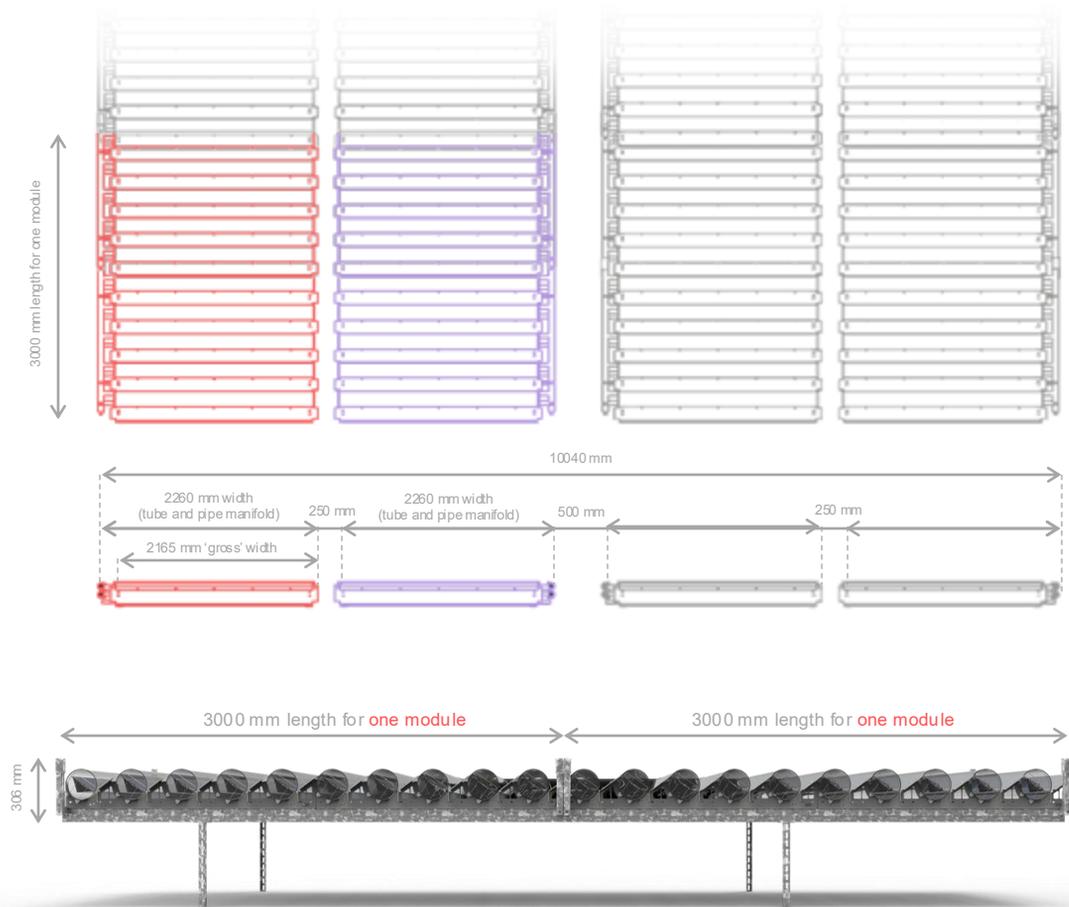
virtu^{MAX}



virtu^{MAX}

Includes integrated reflector. Key details:

- > Suitable for ground mount
- > Installed as a single module as a 10-tube & reflector set
- > Two manifold connections per module
- > Modules connect to form an array of any size
- > Individual collectors in a bank can be removed and replaced during routine maintenance
- > Can be configured with manifolds on **left** or **right** side





Model	Virtu^{MAX}
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ONE MODULE (SET OF 10 COLLECTORS)	
Gross width	2165 mm
Gross length	3000 mm
Gross height	306 mm
Absorber area	3.24 m ²
Aperture area	6.4 m ²
Gross area	6.5 m ²
Ground area occupied (incl. pipe manifold & service corridor)	7.5 m ²
Total wet weight	193 kg
Average ground loading	257 kg/m ³
Absorber tilt angle	35° south
Module title angle	0°

MATERIALS & MOUNTING	
Absorber plate	Aluminum/copper
Pipes and manifolds	Copper
Glass	Borosilicate 3.3
Collector frame	Aluminum
Mounting frame	Steel

HYDRONIC OPERATION AND CONNECTIONS	
Maximum operating pressure	6 bar
Fluid outlet temperature range	Up to 120 (°C)
Heat transfer fluid	Water-Glycol solution
Fluid volume (one module)	4 litre
Manifold diameter (external)	35 mm
Manifold connections	35 mm male flat face threaded

Annual performance in Solar Keymark standard locations

	ATHENS			DAVOS			STOCKHOLM			WURZBURG		
	25°C	50°C	75°C	25°C	50°C	75°C	25°C	50°C	75°C	25°C	50°C	75°C
Fluid temperature												
Ground mount (0° inclination) ¹ – Virtu ^{MAX}												
kWh per module	5670	4740	3810	4390	3550	2770	3140	2440	1830	3530	2770	2080
kWh per m ² absorber area	1750	1463	1176	1355	1096	855	969	753	565	1090	855	642
Annual efficiency of absorber area (%)	99%	83%	67%	82%	65%	52%	83%	65%	48%	88%	69%	52%
kWh per m ² gross area (incl. reflector)	857	717	575	675	547	426	484	375	281	544	426	320
Annual efficiency of gross area (%)	54%	45%	36%	50%	41%	32%	49%	38%	29%	50%	39%	29%

* Table note:
1. Calculated using industry-standard Scenocalc tool, taking input parameters from VirtuHOT Solar Keymark datasheet

Solar Keymark values



Area	6.5 m ²									
Zero-loss efficiency at 20° (south) incidence (η ₀)	0.643									
Zero-loss efficiency at 0° (vertical) incidence (η ₀)	0.376									
First-order coefficient (a1)	1.3 W/(m ² K)									
Second-order coefficient (a2)	0.006 W/(m ² K ²)									
IAM	10°	20°	30°	40°	50°	60°	70°	80°	90°	
Transversal	1.47	1.82	1.89	1.96	2.08	2.07	1.99	1.00	0.00	
Longitudinal	1.00	1.00	0.99	0.97	0.93	0.86	0.72	0.46	0.00	



Virtu^{MAX} absorber plates are tilted at 35° inside the tubes to maximise the capture of sunlight throughout the day.

The zero-loss efficiency (η₀) depicts the optimal efficiency at an incidence angle of 0° - this is ideal for flat panel collectors (FPCs), which during the certification are laid flat, however in reality, are not orientated in this manner.

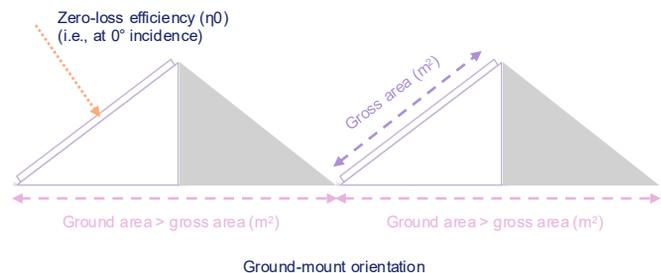
Due to the unique design of Virtu^{MAX}, the zero-loss efficiency (η₀) for Virtu^{MAX} should be taken at 20° when comparing with other FPC technology.

■ Market leading flat plate collector (FPC)

Furthermore, FPCs typically have a ground coverage of 40% in ground mounted systems. Therefore, as an example, a FPC with a zero-loss efficiency (η₀) of 0.78 with respect to gross area has an effective zero-loss efficiency (η₀) of 0.78 x 40% = 0.312 with respect to ground area.

By comparison, Virtu^{MAX} has a ground coverage of 85%, and so the effective zero-loss efficiency (η₀) is 0.643 x 85% = 0.547

Effective zero-loss efficiency (η₀)
(considering optimal irradiance angles and ground area utilisation)



Virtu ^{MAX}	FPC
0.547	0.312

virtu^{MAX}

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Virtu^{MAX} Specification Sheet



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