



Technical datasheet | Direct Flow

Innovative – Powerful – Long-living



Product description:

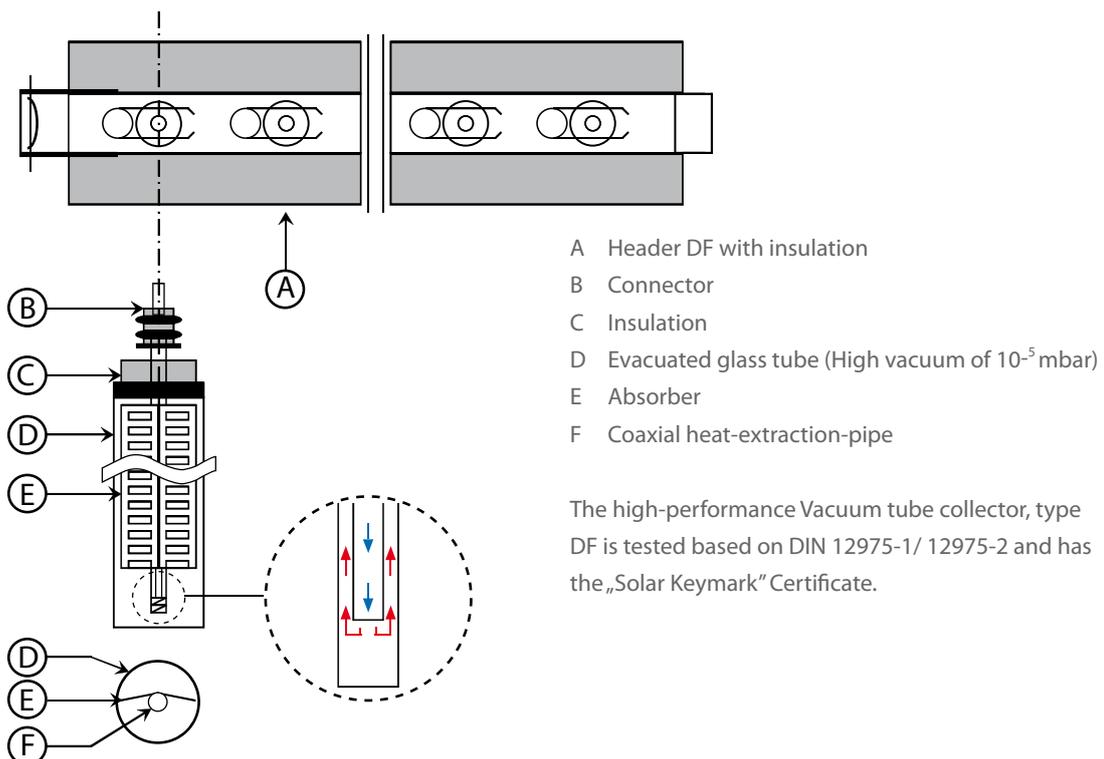
DF (Direct Flow) collector systems

Based on their hydraulic properties, DF collectors are able to be integrated on any building (pitched roof, facade or even free standing). The s-power collectors are used for solar drinking water, pool heating, furnace support and process heat. The s-power DF tubes carry a coaxial heat-extraction-pipe (pipe within a pipe). The to be heated heat-carrier-fluid runs from the header through the inner pipe towards the lower part of the vacuum tube and then through the outer pipe (outer heat pipe) back towards the header. On its way back to the header, the heat is transferred from the outer pipe, which is connected to the absorber, onto the heat-carrier-fluid. All vacuum tubes are axial adjustable towards the sun and can be individually exchanged. The innovative plug-in connection system of the tubes allows them to be fast and securely assembled inside the header. Their modular concept allows the collectors to be fast and easy installed onto the building.

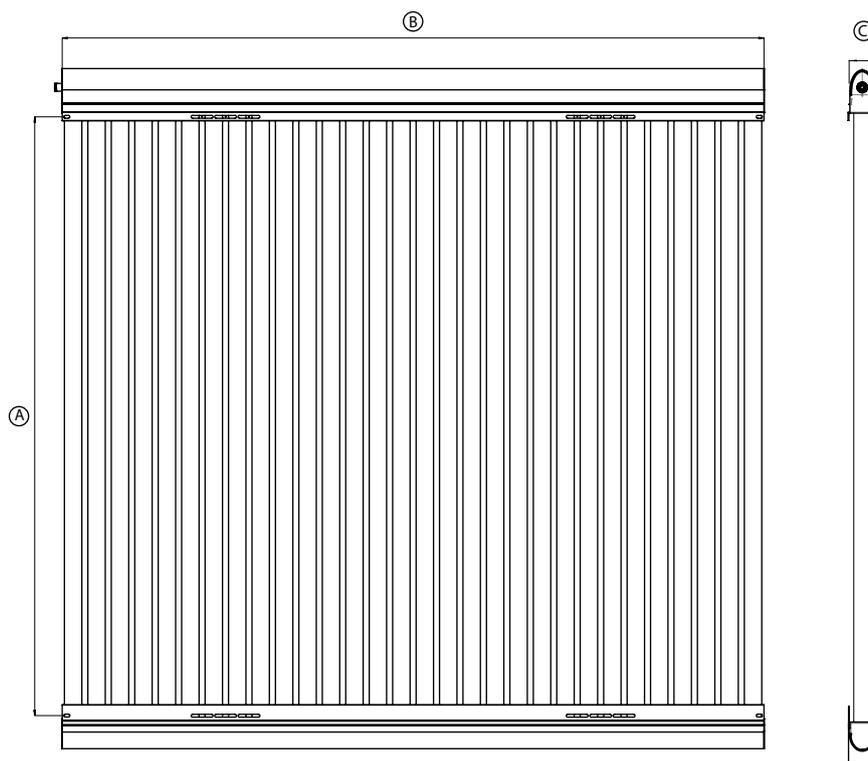
The s-power DF (Direct Flow) collectors are „real“ all seasons systems with exceptional yearly solar earnings ($\text{kW}/\text{m}^2/\text{a}$). They therefore set new standards in the area of diffuse irradiation. The one-of-a-kind anti-reflex-coating (nano-coating) applied onto the inner and outer side of the glass tube allows for an extraordinary high light transmission ($\sim 97\%$), a very low light reflection ($\sim 3\%$) and therefore outperforms all standards so far. The high performance-copper-absorber, which is coated with Titan-Nitrid-Oxide (TINOX), absorbs the sunlight highly effective. ($\sim 96\%$). The absorber is welded onto the heat-carrier-pipe using ultrasound-welding. The patented, innovative glass-metal connection grants for highest quality measures (10 years warranty by the manufacturer). The glass-metal connection seals the glass tube to preserve the high-performance-absorber-unit enduringly under a vacuum of 10^{-5} mbar (100% Insulation).



Technical details



Technical facts



Technical data

Collector type	DF10-1000	DF20-2000	DF30-3000
Performance Power Plus * ¹	1079 Wpeak	2158 Wpeak	3238 Wpeak
Aperture area Power Plus	1,464 m ²	2,928 m ²	4,392 m ²
η_0 Power Plus * ¹	0,75	0,75	0,75
Performance Power * ²	785 Wpeak	1570 Wpeak	2355 Wpeak
Aperture area Power	1,017 m ²	2,034 m ²	3,051 m ²
η_0 Power * ²	0,80	0,80	0,80
Number of vacuum tubes	10 Stk.	20 Stk.	30 Stk.
Length (A)	2190 mm	2190 mm	2190 mm
Width (B)	750 mm	1500 mm	2250 mm
Height (C)	88 mm	88 mm	88 mm
Gross area	1,62 m ²	3,25 m ²	4,87 m ²
Weight	24,57 kg	49,13 kg	73,70 kg
Vacuum in the tube (100% insulated)	10 ⁻⁵ mbar	10 ⁻⁵ mbar	10 ⁻⁵ mbar
Fluid volume	1,36 l	2,72 l	4,08 l
Collector flow rate	0,68-0,83 l/min.	1,37-1,66 l/min.	2,05-2,48 l/min.
Pressure loss with flow rate	22 mbar	75 mbar	195 mbar
Max. operating pressure	10 bar	10 bar	10 bar
Max. collector stagnation temperature	192° C	192° C	192° C
Collector connection	18 mm Ø	18 mm Ø	18 mm Ø
Collector installation (tube)	min. 0° max. 90°	min. 0° max. 90°	min. 0° max. 90°
Heat carrier fluid	S-SOL-VT ⁵⁰	S-SOL-VT ⁵⁰	S-SOL-VT ⁵⁰

*¹ Peak performance as per Keymark, with a solar irradiation of 985 W/m² and a radiation angle of 15° in relation to the aperture area absorber fin of vacuum tube is coated on both sides.

*² Peak performance as per Keymark, with a solar irradiation of 985 W/m² and a radiation angle of 15° in relation to the aperture area absorber fin of vacuum tubes is coated on one side.

Product advantages:

- ▶ Vacuum tube collector „Made in Germany“
- ▶ featuring the NARVA High-Performance-Vacuum tubes „Made in Germany“ labeled with the OTTI-Innovation award of 2008.
- ▶ High performance due to the anti-reflex coating on the basis of nano-particles and high selective absorber surface.
- ▶ Hail and impact resistance certified by TÜV - Rheinland Group based on DIN EN 12975-2.
- ▶ Patented glass-metal-connection (by highly experienced glass manufacturer) protects the vacuum permanently.
- ▶ 10 years warranty for vacuum by the manufacturer.
- ▶ Tube connection via plug-in principle of Direct Flow.
- ▶ Tubes are able to be rotated and individually angled.
- ▶ Consistent tube distance when mounting more than one module together.
- ▶ Low weight
- ▶ Low fluid volume
- ▶ Shortest energy amortization
- ▶ Amortization of purchase cost within 6-8 years possible.
- ▶ Simple installation due to s-power mounting-and connection systems.

Errors and omissions excepted. Date 05.12

Certificates

The s-power high-performance vacuum tube collectors comply with guidelines of a variety of certification-and testing institutions:



Solar Keymark certification DIN EN 12975-1 and 12975-2.



TÜV Rheinland collector testing DIN EN 12975-1 and 12975-2.



CE-label according to EC-guidelines.



SRCC-label (Solar Rating and Certification Corporation) for the USA according to SRCC guidelines.



CSA-label (Canadian Standards Association) for the USA, Canada and countries worldwide according to CSA guidelines.



OTTI Innovations award 2008 for the Narva high-performance-vacuum tube.



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