



[Calpak VTN Vacuum Tube Collector]

The European choice
when **supreme efficiency** is asked!

Calpak
powered by the sun

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Highly efficient evacuated tube collector with parabolic reflector for maximum energy yield even under diffused radiation conditions!

Calpak, having a 35 year experience in the design and production of high quality and robust collectors, offers a high efficient evacuated tube collector for exceptional performance.

Our VTN collector is specially designed to combine:

- Very long service life
- Durability
- High performance in environments that weather conditions are not favourable for such applications, when for example solar radiation is not in abundance or the ambient temperature is very low.

Combined with the vacuum insulation:

- Our Copper U-Pipe which is the only in the market $\varnothing 9.5$ mm, and a Manifold Copper Pipe $\varnothing 18$ mm, provides increased thermal capacity of the collector in order to extract the maximum amount of solar radiation with marginal losses.
- The aluminium fin used to collect the heat to the tube is also the thickest available in the market, 0.8 mm.
- The specially designed parabolic reflector, made in house, achieves, very high exploitation of the diffused radiation as well managing in this way, high energy yield even in cases that cloudy weather is more than usual.
- Along with the Glass Vacuum tubes we insulate the header with Water-Blown Environmental Friendly PU without CFC. In this way our collectors have much better insulation properties.

The VTN collectors are also available with 6, 8 or 10 tubes.



Technical specifications				
		12 VTN	14 VTN	16 VTN
Collector:				
Dimensions:	length	1600 mm	1600 mm	1600 mm
	width	1330 mm	1550 mm	1770 mm
	height	100 mm	100 mm	100 mm
Weight:		35 kg	41 kg	45,5 kg
Aperture area:		1.96 m ²	2.26 m ²	2.61 m ²
Number of vacuum tubes:		12	14	16
Glass cover tube external diameter		47		
Glass cover tube length		1500 mm		
Tested at pressure		1.3 Mpa		
Vacuum tubes material		Borosilicate glass 3.3		
Vacuum		$p < 0,005$ Pa		
Absorber:				
Inner copper U-pipes		$\varnothing 9,52$ mm, thickness 0,65 mm		
Inner Aluminum fin		Thickness 0,8 mm		
Surface treatment		Selective sputtered		
Absorption coefficient		$a > 0,92$		
Emission coefficient		$e < 0,08$		
Absorbing surface glass tube diameter		33 mm		
Heat transfer medium		Glycol brine		
Insulation and casing:				
Thermal insulation thickness of header		30 mm		
Header insulation		Expanded polyurethane (40-45 kg/m ³) and fiberglass		
Frame		Black anodized aluminum		
Diameter of connections		$\varnothing 18$ or $\varnothing 22$ mm		
Reflector		High-reflection aluminum (CPC-Type)		
Limitations and efficiency:				
Maximum temperature of operation		220°C		
Maximum operating pressure		10 bar		
Efficiency (ENEA)		$\eta_0 = 0,665$		
Thermal loss factor (ITW)		$a_1 = 0,7$		

