# **SKALA** ARCHITECTS PANELS



APPLICATIONS AND TECHNICAL SPECIFICATIONS



ENGLISH

### THE AVANCIS ARCHITECTS PANEL SKALA

The AVANCIS SKALA solar panel is the architectural PV module series designed as a premium component for the building industry to meet the needs in energy efficiency, design and quality of solar façades – for public, commercial as well as residential buildings.

The 'solar active' building material SKALA is scalable in shape and colour. This enables architects, façade planners and investors to create the real integration of solar energy generating units into their construction projects. Whichever design combination you choose, SKALA always stands for the highest aesthetics, as well as durability and efficiency.

#### Design and Aesthetics

Aesthetics is the key in the building envelope. With the innovative CIGS thin film technology, SKALA provides a consistent surface in a uniform colour without any framing. The unique back-rail system enables a shaped mounting of the system without any visible clamping of the front glass. So, SKALA solar panels provide a smooth and elegant glass surface.

The SKALA solar panel can be applied in a portrait or landscape mode\* which provides for the maximum freedom of design and different sizes and shapes are being introduced.

#### Quality and Efficiency

AVANCIS products are designed and manufactured in Germany and engineered to resist harsh climate and weather conditions. The glass/glass SKALA solar panels are designed to resist global weather conditions and diverse wind load stresses in the building envelope.

The special characteristic of CIGS thin-film technology provides the highest energy output with a broad spectral sensitivity. This also helps to generate electricity beyond the optimal solar radiation conditions – with shallow angles of sunlight, cloudy skies, shadowing effects and hot temperatures.

#### Sustainability

SKALA solar panels are no ordinary façade cladding material. These are multifunctional building materials generating clean solar energy as a functional add-on. We can unhesitatingly say that the materials used fulfil not only the requirements of sustainable construction, but also achieves excellent environmental performance and improves the energy performance of the building.

As for all AVANCIS products, sustainability starts with production: With fully vertically integrated production and the spearheading CIGS thin-film technology, the use of material and energy is reduced. Thanks to the use of environmentally friendly material without any toxic components, the products can be easily recycled.



## SKALA MOUNTING: MAXIMUM FREEDOM OF DESIGN

SKALA architectural solar modules can be applied in landscape and portrait format for maximum freedom of architectural design, according to regional and local restrictions.

SKALA panels are mounted with the special AVANCIS clamp on the mounting structure. This special clamp is part of the certification of the SKALA panel and guarantees a secure mounting of the panel on the support structure. This clamping method also provides a smooth glass surface with a defined distance between the panels. For more information please ask for detailed specifications.

The support structure can be freely chosen with standard solar mounting profiles or any profile that has been approved by the AVANCIS technical department. It is even possible to use the panels as a part of ventilated façades, which are shown on the following page.



# VENTILATED FAÇADE SYSTEMS WITH SKALA

SKALA panels are designed for use in innovative and functional ventilated façade systems and provide energy efficient, durable characteristics. Please always provide adequate rear ventilation under a SKALA module for cooling and dissipation of condensation or moisture.



### SHAPED PANELS FOR INDIVIDUAL BUILDING ENVELOPES:

### SCALING OF FORMATS

SKALA architects panels have a standard format of 1,587 mm x 664 mm as the ideal format of the relation between length and breadth. AVANCIS SKALA solar panels also allow customised panels, so that standard sized SKALA panels can be combined with reshaped panels to exclusive and design tailor-made façades. Thus, builders, architects and façade designers have the greatest possible freedom for their design planning and arrangement of the building envelope.



### ... AND OF COLOURS

Due to the cell structure of the semiconductor, SKALA solar panels are distinguished by a uniform black panel surface with a fine pinstripe look. By using coloured front glasses of our cooperation partner KROMATIX<sup>™</sup>, the surface can be varied with different colours.



## SPECIFICATIONS FOR STANDARD SIZE IN BLACK

#### MECHANICAL SPECIFICATIONS

PowerMax <sup>®</sup> SKALA	Value
External dimensions	1,587 x 664 mm²
Thickness	38 mm
Weight	17 kg
Cell type	CIGS
Frame	none
Front cover	3.2 mm tempered glass
Junction box protection class	IP65
Dimensions of the junction boxes	70 x 64 x 13 mm³
Cable lengths ( $\ominus$ plug l $\oplus$ socket)	180   310 mm
Cable cross section	2.5 mm²
Connector type	LC4





Safety Class II

- Design qualification and type approval, IEC 61646
- Safety qualification, IEC 61730
- Ammonia corrosion, IEC 62716
- Salt mist corrosion, IEC 61701



#### ELECTRICAL SPECIFICATIONS

Data measured under standard test conditions (STC)\*:

PowerMax <sup>®</sup> SKALA	135
Nominal power P <sub>nom</sub>	135 W
Tolerance of nominal power $\triangle P_{nom}$	-0/+4%
Module efficiency η	12.8 %
Aperture efficiency η	14.2 %
Open-circuit voltage V <sub>oc</sub>	59.2 V
Short-circuit current I <sub>sc</sub>	3.35 A
Voltage at mpp V <sub>mpp</sub>	44.9 V
Current at mpp I <sub>mpp</sub>	3.01 A
Limiting reverse current I <sub>R</sub>	5.0 A
Max. system voltage V <sub>sys</sub> (IEC)	1000 V
Max. system voltage V <sub>sys</sub> (UL)	600 V

 $^{*}$  Insolation intensity 1000 W/m² in the plane of the module, module temperature 25 °C and a spectral distribution of the sunlight according to the atmospheric mass (AM) 1.5.

Data measured at nominal operating cell temperature (NOCT)\*\* and AM 1.5:

PowerMax <sup>®</sup> SKALA	135
NOCT	40 °C
Nominal power P <sub>nom</sub>	101 W
Open-circuit voltage V <sub>oc</sub>	56.2 V
Short-circuit current I <sub>sc</sub>	2.68 A
Voltage at mpp $V_{_{mpp}}$	42.3 V

\*\* Module operating temperature at 800 W/m<sup>2</sup> insolation intensity in the plane of the module, air temperature 20 °C, wind speed 1 m/s and open-circuit condition.

Temperature coefficients:

PowerMax <sup>®</sup> SKALA	Value
Temperature coefficient P <sub>nom</sub>	-0.39 %/°C
Temperature coefficient V <sub>oc</sub>	-170 mV/°C
Temperature coefficient I <sub>sc</sub>	0 mA/°C

Data measured at low light intensity:

The relative reduction in the module efficiency at a light intensity of 200 W/m<sup>2</sup> relative to 1000 W/m<sup>2</sup> at 25 °C module temperature and spectrum AM 1.5 is 6 %. At 500 W/m<sup>2</sup> the relative improvement in module efficiency is +1 %.

The measurement accuracy of  $\mathsf{P}_{\mathsf{nom}}$  is ±3.5 %. As a result of ongoing research and product improvements, the specifications in this product data sheet are subject to changes without prior publication. This data sheet is not allowed to be used for deriving any rights, and AVANCIS does not accept any liability with regard to and resulting from the use of information contained herein. Installation equipment is not supplied with the product.

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