

# ELITE SERIES

## N-TYPE

BiN-13-415 to BiN-13-445

Framed Glass Transparent Backsheet Bifacial module

# WAAREE®

One with the Sun



Highest reliability & enhanced crack tolerance MBB module



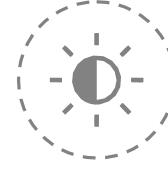
Sustain heavy snow & wind loads (5400 Pa & 2400 Pa)



Best in class thermal coefficients



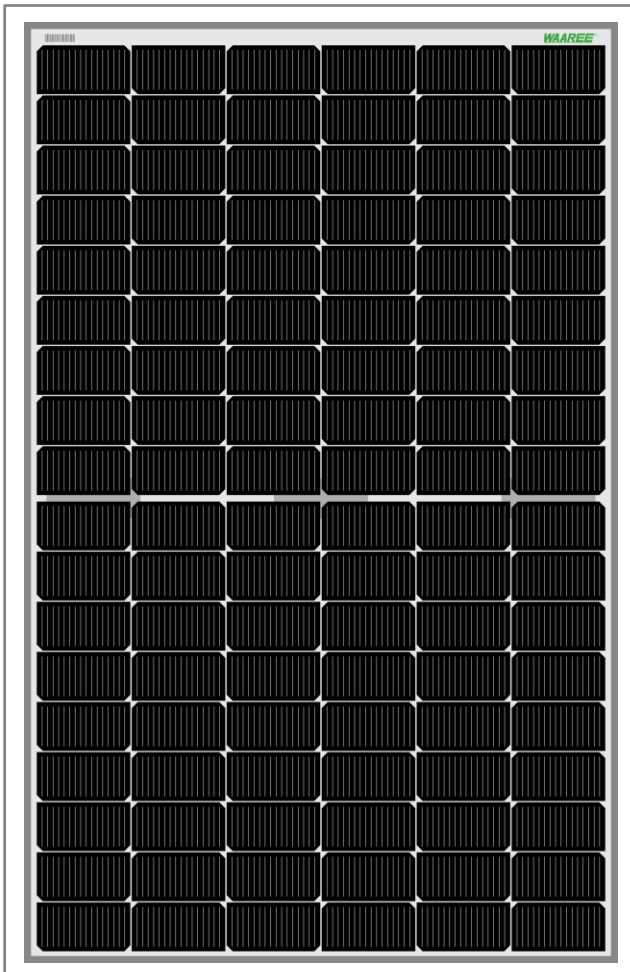
Highest commercial gains, lower LCOE



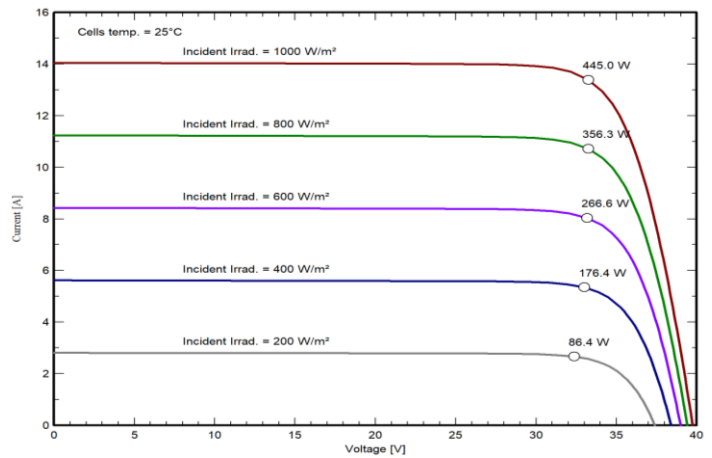
Better weak light performance



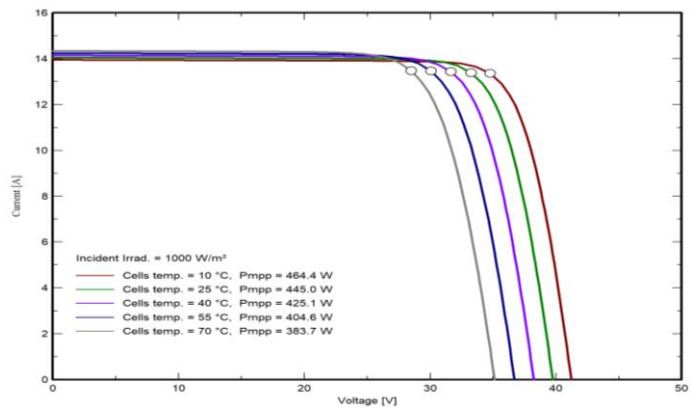
Excellent PID resistance



## I-V VARIATION WITH IRRADIANCE



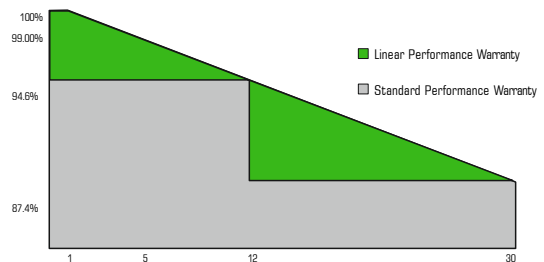
## I-V VARIATION WITH TEMPERATURE



The Graphs are for reference purpose only. Please consult Waaree technical team for further clarifications.



IEC 61215, IEC 61730  
UL 61730-1, UL 61730-2



ISO 9001:2015 | ISO 14001:2015 | ISO 45001:2018  
Independent assessment of factories by BLACK & VEATCH

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## ELECTRICAL CHARACTERISTICS

Models	Pmax (W)		Vmp (V)		Imp (A)		Isc (A)		Voc (V)		Module Eff. (%)
	STC	NOCT	STC	NOCT	STC	NOCT	STC	NOCT	STC	NOCT	
BiN-13-415	415	313.30	32.32	30.12	12.84	10.37	13.62	10.99	38.77	36.83	21.25
BiN-13-420	420	317.10	32.51	30.30	12.92	10.44	13.69	11.05	38.93	36.99	21.51
BiN-13-425	425	320.90	32.69	30.47	13.00	10.50	13.76	11.10	39.10	37.14	21.76
BiN-13-430	430	324.70	32.87	30.64	13.08	10.57	13.83	11.16	39.26	37.30	22.02
BiN-13-435	435	328.40	33.05	30.81	13.16	10.63	13.90	11.22	39.42	37.45	22.28
BiN-13-440	440	332.20	33.23	30.97	13.24	10.70	13.97	11.27	39.58	37.60	22.53
BiN-13-445	445	336.00	33.41	31.14	13.32	10.76	14.04	11.33	39.74	37.76	22.79

\*Standard Test Conditions (STC) - 1000 W/m<sup>2</sup> irradiance, Air Mass 1.5 and 25°C cell temperature. Nominal Operating Cell Temperature (NOCT) - 800 W/m<sup>2</sup> irradiance, Air Mass 1.5, Ambient temperature 20°C and Wind speed 1 m/s. Average power reduction of 4.5% at 200 W/m<sup>2</sup> as per IEC 60904-1. Measuring Uncertainty ± 3%.

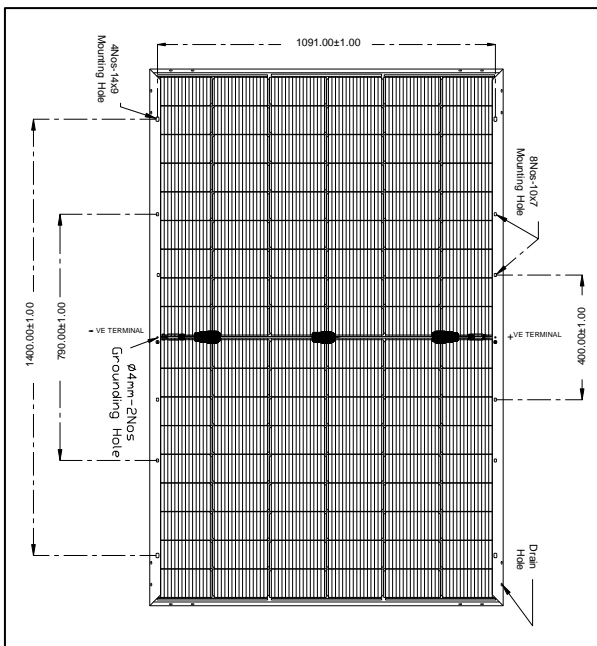
System Voltage	1500 V	Series Fuse Rating	30 A
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## BI-FACIAL OUTPUT - BACKSIDE POWER GAIN\*

		BiN-13-415	BiN-13-420	BiN-13-425	BiN-13-430	BiN-13-435	BiN-13-440	BiN-13-445
15%	Power Output (W)	477.25	483	489	495	500	506	512
	Module Efficiency (%)	24.44	24.74	25.02	25.32	25.62	25.91	26.21
20%	Power Output (W)	498	504	510	516	522	528	534
	Module Efficiency (%)	25.50	25.81	26.11	26.42	26.74	27.04	27.35
25%	Power Output (W)	518.75	525	531	538	544	550	556
	Module Efficiency (%)	26.56	26.89	27.20	27.53	27.85	28.16	28.49
30%	Power Output (W)	539.5	546	553	559	566	572	579
	Module Efficiency (%)	27.63	27.96	28.29	28.63	28.96	29.29	29.63

\*The bifacial gains are dependant on the power plant design and location

## DESIGN SPECIFICATIONS



## THERMAL CHARACTERISTICS

Temperature coefficient of Current (Isc), α (%/°C)	0.046
Temperature coefficient of Voltage (Voc), β (%/°C)	-0.26
Temperature coefficient of Power (Pm), γ (%/°C)	-0.30
NOCT (°C)	43 ± 2
Operating temperature range (°C)	-40 to 85
Bifaciality Factor (%)	80 ± 10

## MECHANICAL CHARACTERISTICS

Length x Width x Thickness (L x W x T)	1722 mm (L) x 1134 mm (W) x 33 mm (T)
Weight	21.0 kgs
Solar Cells per Module (Units) / Arrangement	108 cells / (9x6     9x6)
Solar Cell Type & Size	M10/M10R N-type TOPCon Bifacial
Front Glass (Material / Thickness)	3.2 mm Low Iron HTAR Tempered glass
Backsheet	Transparent / Patterned Backsheet
Encapsulate	PID Free & UV Resistant
Junction Box (Protection degree / Material)	IP68 / Weatherproof PPO
Cable & Connector (Protection degree / Type)	IP68 rated / MC4 compatible
Cable cross - section & Length	4 mm <sup>2</sup> & 500mm
Frame	Anodized Aluminium Alloy

Waaree Energies Ltd. is amongst the top Solar Energy Companies and has the country's largest Solar PV Module manufacturing capacity of 12 GW. In addition, it is committed to provide top notch EPC services, project development, rooftop solutions, solar water pumps and also in an Independent Power Producer. Waaree has its presence in over 350+ locations nationally and 68 countries globally.

**12 Years Product Warranty • 30 Years Power Output Warranty**

- The electrical data given here is for reference purpose only.
- Please confirm your exact requirements with the sales representative while placing your order.
- Refer installation Manual instructions & Waaree warranty statement for terms & conditions.
- Waaree Reserves the right to change the specifications without prior notice.

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