

INSTALLATION, SAFETY AND OPERATION GUIDE SUPPLEMENT FOR YINGLI SOLAR PHOTOVOLTAIC (PV) MODULES



This Guide SUPPLEMENT contains electrical and mechanical performance information, with which you should be familiar before using your Yingli Green Energy Holding Co. Ltd. (YGE) photovoltaic modules. Your YGE partner can provide additional sizing and system design information if necessary. This document is a supplement to the Installation, Safety and Operation Manuals and must not be used stand-alone. PLEASE READ THIS GUIDE SUPPLEMENT COMPLETELY BEFORE INSTALLING OR USING THE MODULES. RETAIN FOR LATER USE. APPLICABLE ONLY IN EU.

YL 185 P-23b YL 185 P-23b-1	YL 185 P-23b/2 YL 185 P-23b/2-1	YL 210 P-26b YL 210 P-26b-1	YL 235 P-29b YL 235 P-29b-1	YL 235 P-29b/2-1	YL 255 P-32b	YL 280 P-35b
YL 165 P-23b YL 165 P-23b-1	YL 165 P-23b/2 YL 165 P-23b/2-1	YL 190 P-26b YL 190 P-26b-1	YL 210 P-29b YL 210 P-29b-1	YL 210 P-29b/2-1	YL 235 P-32b	YL 260 P-35b
YL 170 P-23b YL 170 P-23b-1	YL 170 P-23b/2 YL 170 P-23b/2-1	YL 195 P-26b YL 195 P-26b-1	YL 215 P-29b YL 215 P-29b-1	YL 215 P-29b/2-1	YL 240 P-32b	YL 265 P-35b
YL 175 P-23b YL 175 P-23b-1	YL 175 P-23b/2 YL 175 P-23b/2-1	YL 200 P-26b YL 200 P-26b-1	YL 220 P-29b YL 220 P-29b-1	YL 220 P-29b/2-1	YL 245 P-32b	YL 270 P-35b
YL 180 P-23b YL 180 P-23b-1	YL 180 P-23b/2 YL 180 P-23b/2-1	YL 205 P-26b YL 205 P-26b-1	YL 225 P-29b YL 225 P-29b-1	YL 225 P-29b/2-1	YL 250 P-32b	YL 275 P-35b
YL 185 P-23b YL 185 P-23b-1	YL 185 P-23b/2 YL 185 P-23b/2-1	YL 210 P-26b YL 210 P-26b-1	YL 230 P-29b YL 230 P-29b-1	YL 230 P-29b/2-1	YL 255 P-32b	YL 280 P-35b
			YL 235 P-29b YL 235 P-29b-1	YL 235 P-29b/2-1		

Module Series		Module length x width x total thickness	Solar module gross weight per piece	Number of modules per box / Number of boxes per pallet	Box length x width x total thickness	Box gross weight	Storage temperature	Storage humidity
		mm	kg		mm	kg	°C	%
YL 185 P-23b	YL 185 P-23b-1	1,310 x 990 x 50	15.8	20/1	1,380 x 1,140 x 1,065	365	-20 - +40	40 - 60
YL 185 P-23b/2	YL 185 P-23b/2-1	1,335 x 990 x 50	16.1	20/1	1,380 x 1,140 x 1,065	365	-20 - +40	40 - 60
YL 210 P-26b	YL 210 P-26b-1	1,495 x 990 x 50	18.0	20/1	1,570 x 1,140 x 1,165	420	-20 - +40	40 - 60
YL 235 P-29b	YL 235 P-29b-1	1,650 x 990 x 50	19.8	20/1	1,700 x 1,140 x 1,165	450	-20 - +40	40 - 60
YL 235 P-29b/2-1		1,650 x 1,030 x 50	20.1	20/1	1,700 x 1,140 x 1,210	450	-20 - +40	40 - 60
YL 255 P-32b		1,810 x 990 x 50	22.5	21/1	1,835 x 1,130 x 1,131	512	-20 - +40	40 - 60
YL 280 P-35b		1,970 x 990 x 50	26.0	21/1	1,995 x 1,130 x 1,131	586	-20 - +40	40 - 60

General characteristics for all module types		
limiting reverse current, I _r	A	15
temperature coefficient alpha of Voc	1/K	-0.0037
temperature coefficient beta of I _{sc}	1/K	0.0006
cell type and material	c-Si, poly, 156 x 156 mm	
frame material		anodized aluminium
front cover type	tempered glass	

Module Series			Certificates					Electrical Performance														
			IEC 61215, Edition 2	IEC 61730, Class A	TÜV, Safety Class II	CE	ISO 9001	Maximum Power @ STC, P _{max STC}	Production Tolerances of P _{max}	Maximum Power Voltage, @ STC, V _{max STC}	Open-Circuit Voltage, @ STC, V _{oc STC}	Short-Circuit Current, @ STC, I _{sc STC}	Nominal operating photovoltaic cell temperature, @ NOCT conditions, NOCT	Maximum Power, @ NOCT, P _{max NOCT}	Maximum Power Voltage, @ NOCT, V _{max NOCT}	Open-Circuit Voltage, @ NOCT, V _{oc NOCT}	Short-Circuit Current, @ NOCT, I _{sc NOCT}	Reduction of Efficiency from 1,000 to 200 W/m ² , following EN 60904-1	Cable length, + and -, (optional length)	Cable manufacturer (installation details, see next page)	Front cover thickness	Maximum amount of modules to be connected in series (s) / parallel (p)
Module Type								W	%	V	V	A	°C	W	V	V	A	%	mm	—	mm	s/p
YL 185 P-23b YL 185 P-23b-1	YL 165 P-23b	YL 165 P-23b-1	Yes	Yes	Yes	Yes	Yes	165.0	+/- 3	23.0	29.0	7.90	46 +/- 2	119.5	20.7	26.5	6.40	5.0	900 (1,200)	CIXI / OC	3.6/3.2	27 / 2
	YL 170 P-23b	YL 170 P-23b-1	Yes	Yes	Yes	Yes	Yes	170.0	+/- 3	23.0	29.0	8.10	46 +/- 2	123.1	20.7	26.5	6.56	5.0	900 (1,200)	CIXI / OC	3.6/3.2	27 / 2
	YL 175 P-23b	YL 175 P-23b-1	Yes	Yes	Yes	Yes	Yes	175.0	+/- 3	23.0	29.0	8.20	46 +/- 2	126.8	20.7	26.5	6.64	5.0	900 (1,200)	CIXI / OC	3.6/3.2	27 / 2
	YL 180 P-23b	YL 180 P-23b-1	Yes	Yes	Yes	Yes	Yes	180.0	+/- 3	23.0	29.5	8.30	46 +/- 2	130.4	20.7	27.0	6.72	5.0	900 (1,200)	CIXI / OC	3.6/3.2	27 / 2
	YL 185 P-23b	YL 185 P-23b-1	Yes	Yes	Yes	Yes	Yes	185.0	+/- 3	23.5	29.5	8.45	46 +/- 2	134.0	21.1	27.0	6.85	5.0	900 (1,200)	CIXI / OC	3.6/3.2	27 / 2
YL 185 P-23b/2 YL 185 P-23b/2-1	YL 165 P-23b/2	YL 165 P-23b/2-1	Yes	Yes	Yes	Yes	Yes	165.0	+/- 3	23.0	29.0	7.90	46 +/- 2	119.5	20.7	26.5	6.40	5.0	1,200 (900)	CIXI / OC	3.6/3.2	27 / 2
	YL 170 P-23b/2	YL 170 P-23b/2-1	Yes	Yes	Yes	Yes	Yes	170.0	+/- 3	23.0	29.0	8.10	46 +/- 2	123.1	20.7	26.5	6.56	5.0	1,200 (900)	CIXI / OC	3.6/3.2	27 / 2
	YL 175 P-23b/2	YL 175 P-23b/2-1	Yes	Yes	Yes	Yes	Yes	175.0	+/- 3	23.0	29.0	8.20	46 +/- 2	126.8	20.7	26.5	6.64	5.0	1,200 (900)	CIXI / OC	3.6/3.2	27 / 2
	YL 180 P-23b/2	YL 180 P-23b/2-1	Yes	Yes	Yes	Yes	Yes	180.0	+/- 3	23.0	29.5	8.30	46 +/- 2	130.4	20.7	27.0	6.72	5.0	1,200 (900)	CIXI / OC	3.6/3.2	27 / 2
	YL 185 P-23b/2	YL 185 P-23b/2-1	Yes	Yes	Yes	Yes	Yes	185.0	+/- 3	23.5	29.5	8.45	46 +/- 2	134.0	21.1	27.0	6.85	5.0	1,200 (900)	CIXI / OC	3.6/3.2	27 / 2
YL 210 P-26b YL 210 P-26b-1	YL 190 P-26b	YL 190 P-26b-1	Yes	Yes	Yes	Yes	Yes	190.0	+/- 3	25.8	32.8	8.03	46 +/- 2	137.6	23.2	30.0	6.50	5.0	1,200 (900)	CIXI / OC	3.6/3.2	24 / 2
	YL 195 P-26b	YL 195 P-26b-1	Yes	Yes	Yes	Yes	Yes	195.0	+/- 3	26.0	33.0	8.15	46 +/- 2	141.3	23.4	30.2	6.60	5.0	1,200 (900)	CIXI / OC	3.6/3.2	24 / 2
	YL 200 P-26b	YL 200 P-26b-1	Yes	Yes	Yes	Yes	Yes	200.0	+/- 3	26.3	33.3	8.22	46 +/- 2	144.9	23.7	30.4	6.66	5.0	1,200 (900)	CIXI / OC	3.6/3.2	24 / 2
	YL 205 P-26b	YL 205 P-26b-1	Yes	Yes	Yes	Yes	Yes	205.0	+/- 3	26.5	33.5	8.33	46 +/- 2	148.5	23.8	30.6	6.75	5.0	1,200 (900)	CIXI / OC	3.6/3.2	23 / 2
	YL 210 P-26b	YL 210 P-26b-1	Yes	Yes	Yes	Yes	Yes	210.0	+/- 3	26.6	33.6	8.45	46 +/- 2	152.1	23.9	30.7	6.85	5.0	1,200 (900)	CIXI / OC	3.6/3.2	23 / 2
YL 235 P-29b YL 235 P-29b-1	YL 210 P-29b	YL 210 P-29b-1	Yes	Yes	Yes	Yes	Yes	210.0	+/- 3	28.5	36.0	7.95	46 +/- 2	152.1	25.6	32.9	6.44	5.0	1,200 (900)	CIXI / OC	3.6/3.2	22 / 2
	YL 215 P-29b	YL 215 P-29b-1	Yes	Yes	Yes	Yes	Yes	215.0	+/- 3	29.0	36.0	8.10	46 +/- 2	155.7	26.1	32.9	6.56	5.0	1,200 (900)	CIXI / OC	3.6/3.2	22 / 2
	YL 220 P-29b	YL 220 P-29b-1	Yes	Yes	Yes	Yes	Yes	220.0	+/- 3	29.0	36.5	8.15	46 +/- 2	159.4	26.1	33.4	6.60	5.0	1,200 (900)	CIXI / OC	3.6/3.2	22 / 2
	YL 225 P-29b	YL 225 P-29b-1	Yes	Yes	Yes	Yes	Yes	225.0	+/- 3	29.5	36.5	8.28	46 +/- 2	163.0	26.5	33.4	6.71	5.0	1,200 (900)	CIXI / OC	3.6/3.2	22 / 2
	YL 230 P-29b	YL 230 P-29b-1	Yes	Yes	Yes	Yes	Yes	230.0	+/- 3	29.5	37.0	8.40	46 +/- 2	166.6	26.5	33.8	6.80	5.0	1,200 (900)	CIXI / OC	3.6/3.2	21 / 2
YL 235 P-29b/2-1	YL 235 P-29b	YL 235 P-29b-1	Yes	Yes	Yes	Yes	Yes	235.0	+/- 3	29.5	37.0	8.54	46 +/- 2	170.2	26.5	33.8	6.92	5.0	1,200 (900)	CIXI / OC	3.6/3.2	21 / 2
	YL 210 P-29b/2-1		Yes	Yes	Yes	Yes	Yes	210.0	+/- 3	28.5	36.0	7.95	46 +/- 2	152.1	25.6	32.9	6.44	5.0	1,200	OC	3.2	22 / 2
	YL 215 P-29b/2-1		Yes	Yes	Yes	Yes	Yes	215.0	+/- 3	29.0	36.0	8.10	46 +/- 2	155.7	26.1	32.9	6.56	5.0	1,200	OC	3.2	22 / 2
	YL 220 P-29b/2-1		Yes	Yes	Yes	Yes	Yes	220.0	+/- 3	29.0	36.5	8.15	46 +/- 2	159.4	26.1	33.4	6.60	5.0	1,200	OC	3.2	22 / 2
	YL 225 P-29b/2-1		Yes	Yes	Yes	Yes	Yes	225.0	+/- 3	29.5	36.5	8.28	46 +/- 2	163.0	26.5	33.4	6.71	5.0	1,200	OC	3.2	22 / 2
YL 255 P-32b	YL 230 P-29b/2-1		Yes	Yes	Yes	Yes	Yes	230.0	+/- 3	29.5	37.0	8.40	46 +/- 2	166.6	26.5	33.8	6.80	5.0	1,200	OC	3.2	21 / 2
	YL 235 P-29b/2-1		Yes	Yes	Yes	Yes	Yes	235.0	+/- 3	29.5	37.0	8.54	46 +/- 2	170.2	26.5	33.8	6.92	5.0	1,200	OC	3.2	21 / 2
	YL 235 P-32b		Yes	Yes	Yes	Yes	Yes	235.0	+/- 3	32.0	40.5	8.00	46 +/- 2	170.2	28.8	37.0	6.48	5.0	1,200	CIXI	4.0	19 / 2
	YL 240 P-32b		Yes	Yes	Yes	Yes	Yes	240.0	+/- 3	32.2	40.5	8.15	46 +/- 2	173.9	29.0	37.0	6.60	5.0	1,200	CIXI	4.0	19 / 2
	YL 245 P-32b		Yes	Yes	Yes	Yes	Yes	245.0	+/- 3	32.2	40.8	8.22	46 +/- 2	177.5	29.0	37.3	6.66	5.0	1,200	CIXI	4.0	19 / 2
YL 280 P-35b	YL 250 P-32b		Yes	Yes	Yes	Yes	Yes	250.0	+/- 3	32.3	40.9	8.33	46 +/- 2	181.1	29.1	37.4	6.75	5.0	1,200	CIXI	4.0	19 / 2
	YL 255 P-32b		Yes	Yes	Yes	Yes	Yes	255.0	+/- 3	32.5	41.0	8.40	46 +/- 2	184.7	29.2	37.5	6.80	5.0	1,200	CIXI	4.0	19 / 2
	YL 260 P-35b		Yes	Yes	Yes	Yes	Yes	260.0	+/- 3	35.0	44.6	8.04	46 +/- 2	188.3	31.5	40.8	6.51	5.0	1,200	CIXI	4.0	18 / 2
	YL 265 P-35b		Yes	Yes	Yes	Yes	Yes	265.0	+/- 3	35.3	44.6	8.15	46 +/- 2	192.0	31.8	40.8	6.60	5.0	1,200	CIXI	4.0	18 / 2
	YL 270 P-35b		Yes	Yes	Yes	Yes	Yes	270.0	+/- 3	35.3	44.8	8.20	46 +/- 2	195.6	31.8	40.9	6.64	5.0	1,200	CIXI	4.0	17 / 2
YL 280 P-35b	YL 275 P-35b		Yes	Yes	Yes	Yes	Yes	275.0	+/- 3	35.5	45.0	8.30	46 +/- 2	199.2	31.9	41.1	6.72	5.0	1,200	CIXI	4.0	17 / 2
	YL 280 P-35b		Yes	Yes	Yes	Yes	Yes	280.0	+/- 3	35.5	45.0	8.35	46 +/- 2	202.8	31.9	41.1	6.76	5.0	1,200	CIXI	4.0	17 / 2

Mounting methods

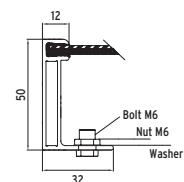
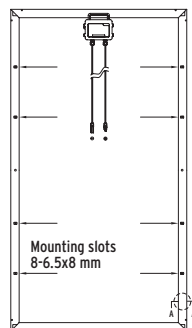
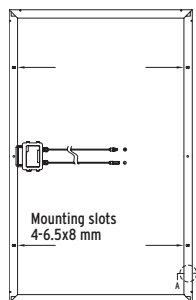
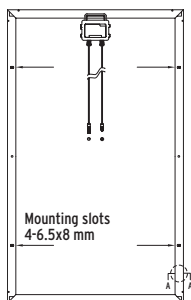
YL 185 P-23b YL 185 P-23b-1,
YL 185 P-23b/2 YL 185 P-23b/2-1,
YL 210 P-26b YL 210 P-26b-1,
YL 235 P-29b YL 235 P-29b-1

YL 235 P-29b/2-1

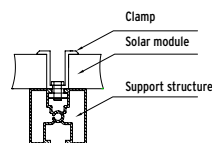
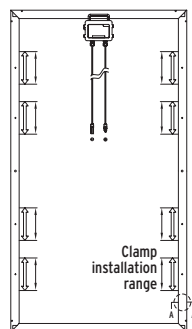
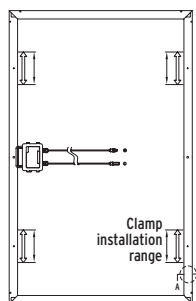
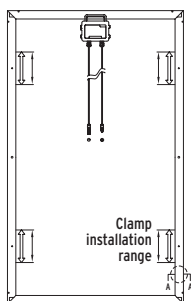
YL 255 P-32b, YL 280 P-35b

Cross Section

METHOD A: FRAME SCREW MOUNTING



METHOD B: CLAMP MOUNTING



ATTENTION

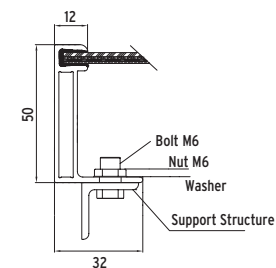
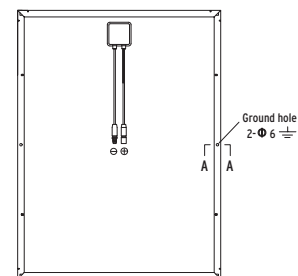
- The clamp installation range is 50 mm, centered from the screw mounting slot
- Clamp installation ranges are marked with these arrows on the next page



Grounding

CROSS SECTION DRAWING TO ILLUSTRATE GROUNDING

Cross Section



PRE-MOUNTED CABLES / PRE-MOUNTED CONNECTORS

	Pre-mounted cables ¹⁾		Pre-mounted connectors
Provider	Cixi Renhe Photovoltaic Electrical Appliance Co., Ltd.	QC Solar (suzhou) Corporation	MC
Type	PVI-F 4.0 mm ²	PVI-F 4.0 mm ²	MC4: PV-KBT4/6II-UR UV resistance and self-locking
Cross section	4.0 mm ²	4.0 mm ²	-/-
Max. current	16 A	16 A	30 A
Rated voltage	1,000 VDC	1,000 VDC	1,000 VDC
Temperature range	-40°C up to +90°C	-40°C up to +90°C	-40°C up to +90°C
Qualification	TÜV 2 Pfg 1169	TÜV 2 Pfg 1169	DIN V VDE V 0126-3
	¹⁾ When bending or looping cable minimum recommended bend radius must be greater than 5 x cable diameter		Polarity marked on the connectors

Rear and Side view and dimensions of modules series

<p>YL 185 P-23b / YL 185 P-23b-1 1,310 x 990</p>	<p>YL 185 P-23b/2 / YL 185 P-23b/2-1 1,335 x 990</p>	<p>YL 210 P-26b / YL 210 P-26b-1 1,495 x 990</p>	<p>YL 235 P-29b / YL 235 P-29b-1 1,650 x 990</p>
<p>YL 235 P-29b/2-1 1,650 x 1,030</p>	<p>YL 255 P-32b 1,810 x 990</p>	<p>YL 280 P-35b 1,970 x 990</p>	<p>Cross Section A-A</p>