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Our Ref: 2242/K.Z

28 July 2016

Xiamen Hopergy Photovoltaic Technology Co. Ltd.
No.630, Tonghong Road
Tongan District, Xiamen 361100
China

PV Array Frame Engineering Certification

Installation of Hopergy Adjustable Tilt Leg Roof Mount Solar System with HOP-SLR02 Rails

Gamcorp (Melbourne) Pty Ltd, being Structural Engineers within the meaning of Australian and New Zealand Building Regulations, have carried out a structural design check of Hopergy Adjustable Tilt Leg Roof Mount Solar System installation within Australia and New Zealand. The design check has been based on the information in the schematic drawings of the system components and test report provided by Hopergy Australia (IMSOLAR).

We find the Installation of Hopergy Adjustable Tilt Leg Roof Mount Solar System for Australian and New Zealand use to be structurally sufficient based on the following conditions:

- Wind loads to AS/NZ1170.2:2011 Admt 3-2013
- Wind region A, B, C, D, W
- Wind terrain category 2 & 3
- Wind average recurrence interval of 500 years
- Maximum building height 20m
- The PV panel dimensions to be 1640mm x 992mm and 2000mm x 1000mm
- Maximum weight of the PV panel and array frame to be 15 kg/m²
- Rails to be HOP-SLR02
- The assessment of the rail is based on a deflection limit of 20mm specified by Hopergy Australia (IMSOLAR) as per the test report provided
- The roof interface to be Hopergy adjustable tilt leg as per drawing HOP-ARL01-15/30/60 and front leg as per drawing HOP-FB002-30
- The assessment is based on an assumption that the front leg and tilt leg meet the industrial standard requirements
- Each PV panel to be installed using 2 rails minimum in all circumstances
- Installation of PV array to be done in accordance with the PV installation manual
- The certification **excludes** assessment of roof structure and PV panels

Refer to attached summary table for interface spacing

NOTES:

- **The recommended spacing nominated in this certification is based on the capacity of the array frame, not the roof structure and PV panel. It is the responsibility of the installer to adopt the most critical spacing.**

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- **This is the up-to-date certification. All previous certifications for Hopergy products issued by Gamcorp Pty Ltd are no longer valid.**
- **If any of the above conditions cannot be met, the structural engineer must be notified immediately.**

Construction is to be carried out strictly in accordance with the manufacturers instructions. This work was designed in accordance with the provisions of Australian and New Zealand Building Regulations and in accordance with sound, widely accepted engineering principles.

Yours faithfully,
Gamcorp (Melbourne) Pty Ltd



Martin Gamble
Managing Director
MAICD



Mudi Ariyaratna
B.Eng(Civil)(Hons)Monash, M.Eng&Mgt, MIEAust,
CPEng, NPER, RBP EC-39699, RPEQ- 15899



gamcorp

Relationships built on trust

Gamcorp (Melbourne) Pty Ltd
Consulting Structural & Civil Engineers
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Structural Design Documentation

Solar Adjustable Tilt Legs System Spacing Table

According to AS 1170.2-2011 Amdt 3-2013

with HOP-SLR02 Rail

within Australia & New Zealand

Terrain Category 2 & 3

For: Xiamen Hopergy Photovoltaic
Technology Co. Ltd.



Job Number: 2242
Date: 27 July 2016

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ISO 9001:2008 Registered Firm
Certificate No: AU1222

Job No: 2242
Client: Xiamen Hopergy Photovoltaic Technology Co. Ltd.
Project: Solar Adjustable Tilt Legs System Spacing Table

Address: within Australia & New Zealand

Australian/New Zealand Standards

AS/NZS 1170. 2011 – Structural Design Actions

Part 0 – General Principles

Part 1 – Permanent imposed and other actions

Part 2 – Wind Actions

Part 3 – Snow and Ice Actions

AS/NZS 1252 – High Strength Structural Bolting

AS 4055 – Wind Loads for Housing

AS 4100 – Steel Structures

AS/NZS 4600 – Cold-Formed Steel Structures

Wind Terrain Category:

WTC 2 & 3

Designed: K.Z

Date: Jul-16

Client: **Xiamen Hopenrgy Photovoltaic Technology Co. Ltd.**
 Project: **Solar Adjustable Tilt Legs System Spacing Table**
 Address: **within Australia & New Zealand**
 Designed: **K.Z**

Job: **2242**
 Date: **Jul-16**
 Checked: **M.A**

PV Frame Spacing Table for Adjustable Tilt Leg System

Type of Rail: HOP-SLR02
 Type of Interface: Adjustable Tilt Leg
 Solar Panel Dimension: 1.64m x 0.99m
 Terrain category: **2**

Type of Interface: 10°-15° Adjustable Tilt Leg
 Roof Angle (Φ) – ≤10°

Wind Region	Building Height – H (m)															
	H≤5				5<H≤10				10<H≤15				15<H≤20			
	Corner	Edge	Intermediate	Internal	Corner	Edge	Intermediate	Internal	Corner	Edge	Intermediate	Internal	Corner	Edge	Intermediate	Internal
A	925	1416	1793	2018	760	1160	1573	1908	688	1047	1418	1855	649	987	1336	1825
B	568	862	1164	1792	468	709	956	1464	424	642	864	1320	400	606	815	1244
C	381	576	775	1182	315	475	638	970	285	430	577	877	269	406	545	827
D	235	354	474	719	194	292	392	592	176	265	355	536	166	250	335	506
W	714	1087	1473	1847	588	893	1206	1751	532	807	1089	1673	502	761	1027	1575

Type of Interface: 15°-30° Adjustable Tilt Leg
 Roof Angle (Φ) – ≤10°

Wind Region	Building Height – H (m)															
	H≤5				5<H≤10				10<H≤15				15<H≤20			
	Corner	Edge	Intermediate	Internal	Corner	Edge	Intermediate	Internal	Corner	Edge	Intermediate	Internal	Corner	Edge	Intermediate	Internal
A	505	765	1032	1584	416	630	848	1296	377	570	767	1169	356	538	723	1102
B	312	471	633	962	258	389	521	791	234	352	472	715	221	333	446	675
C	210	317	424	642	174	262	350	529	157	237	317	479	149	224	300	452
D	130	195	261	394	107	162	216	325	97	146	196	295	92	138	185	278
W	391	592	796	1214	323	488	655	997	292	441	592	900	276	417	559	849

Type of Interface: 30° Adjustable Tilt Leg
 Roof Angle (Φ) – ≤10°

Wind Region	Building Height – H (m)															
	H≤5				5<H≤10				10<H≤15				15<H≤20			
	Corner	Edge	Intermediate	Internal	Corner	Edge	Intermediate	Internal	Corner	Edge	Intermediate	Internal	Corner	Edge	Intermediate	Internal
A	411	622	838	1280	340	513	689	1050	308	464	623	948	290	438	588	894
B	255	384	515	781	210	317	425	643	191	287	385	582	180	271	363	549
C	172	258	346	523	142	214	286	431	129	194	259	390	122	183	244	369
D	106	160	213	321	88	132	176	266	80	120	160	241	75	113	151	227
W	319	482	647	984	263	397	533	809	239	360	482	731	226	340	456	690

PV Frame Spacing Table for Adjustable Tilt Leg System

Type of Rail HOP-SLR02
 Type of Interface Adjustable Tilt Leg
 Solar Panel Dimension 1.64m x 0.99m
Terrain category 2

Type of Interface 30°-60° Adjustable Tilt Leg
 Roof Angle (Φ) – ≤10°

Wind Region	Building Height – H (m)															
	H≤5				5<H≤10				10<H≤15				15<H≤20			
	Corner	Edge	Intermediate	Internal	Corner	Edge	Intermediate	Internal	Corner	Edge	Intermediate	Internal	Corner	Edge	Intermediate	Internal
A	322	486	653	994	266	401	538	817	241	363	487	738	228	343	460	697
B	200	301	403	609	165	248	332	502	150	225	301	455	141	213	284	429
C	135	203	271	409	111	167	224	337	101	152	203	306	95	143	192	289
D	83	125	167	252	69	104	138	208	63	94	125	189	59	89	118	178
W	250	377	505	766	207	311	417	631	187	282	377	571	177	266	356	539

Type of Interface 30°-60° Adjustable Tilt Leg
 Roof Angle (Φ) – 10°-20°

Wind Region	Building Height – H (m)															
	H≤5				5<H≤10				10<H≤15				15<H≤20			
	Corner	Edge	Intermediate	Internal	Corner	Edge	Intermediate	Internal	Corner	Edge	Intermediate	Internal	Corner	Edge	Intermediate	Internal
A	505	765	1032	1584	416	630	848	1296	377	570	767	1169	356	538	723	1102
B	312	471	633	962	258	389	521	791	234	352	472	715	221	333	446	675
C	210	317	424	642	174	262	350	529	157	237	317	479	149	224	300	452
D	130	195	261	394	107	162	216	325	97	146	196	295	92	138	185	278
W	391	592	796	1214	323	488	655	997	292	441	592	900	276	417	559	849

Type of Interface 30°-60° Adjustable Tilt Leg
 Roof Angle (Φ) – 20°-30°

Wind Region	Building Height – H (m)															
	H≤5				5<H≤10				10<H≤15				15<H≤20			
	Corner	Edge	Intermediate	Internal	Corner	Edge	Intermediate	Internal	Corner	Edge	Intermediate	Internal	Corner	Edge	Intermediate	Internal
A	925	1416	1793	2018	760	1160	1573	1908	688	1047	1418	1855	649	987	1336	1825
B	568	862	1164	1792	468	709	956	1464	424	642	864	1320	400	606	815	1244
C	381	576	775	1182	315	475	638	970	285	430	577	877	269	406	545	827
D	235	354	474	719	194	292	392	592	176	265	355	536	166	250	335	506
W	714	1087	1473	1847	588	893	1206	1751	532	807	1089	1673	502	761	1027	1575

General Notes			
Note 1	Screws minimum embedment length into timber 35 mm		
Note 2	Recommended screws		
	Metal Purlins/Battens	Fasteners to use	
	0.55 mm – 1.5 mm	M6-11 TPI RoofZips	
	1.9 mm	M6-11 TPI RoofZips OR 12g-14 TPI Tek screws	
	2.4 mm and Above	12g-24 TPI Tek screws	
	Wood purlins and Rafter	Fasteners to use	
	Pine and Hardwood (35mm embedment and above)	M6 (12g) with 10 TPI	
Note 3	Following components are satisfied to use according to AS1170.2011		
	Components	Part Number	Description
	HOP-SLR02 Rail	HOP-SLR02	HOP-SLR02 Rail
	Tilt Legs		Adjustable Tilt Legs Kit (front and back leg)
Note 4	For adjustable tilting leg,		
	Maximum back leg angle to horizontal	-	90°
	Minimum back leg angle to horizontal	-	30°
Note 5	Refer Figure 5.3 of AS/NZS 1170.2:2011 for definition of roof zones.		
Note 6	Terrain category 2 (TC2) refers to open terrain, including grassland, with well-scattered obstructions having heights generally from 1.5 m to 5 m, with no more than two obstruction per obstructions per hectare.		

Client: **Xiamen Hopergy Photovoltaic Technology Co. Ltd.**
 Project: **Solar Adjustable Tilt Legs System Spacing Table**
 Address: **within Australia & New Zealand**
 Designed: **K.Z**

Job: **2242**
 Date: **Jul-16**

Checked: **M.A**

PV Frame Spacing Table for Adjustable Tilt Leg System

Type of Rail: HOP-SLR02
 Type of Interface: Adjustable Tilt Leg
 Solar Panel Dimension: 1.64m x 0.99m
Terrain category: 3

Type of Interface: 10°-15° Adjustable Tilt Leg
 Roof Angle (Φ) – ≤10°

Wind Region	Building Height – H (m)															
	H≤5				5<H≤10				10<H≤15				15<H≤20			
	Corner	Edge	Intermediate	Internal	Corner	Edge	Intermediate	Internal	Corner	Edge	Intermediate	Internal	Corner	Edge	Intermediate	Internal
A	1311	1465	1589	1796	1311	1465	1589	1796	1157	1409	1527	1720	1033	1368	1481	1664
B	819	1248	1542	1738	819	1248	1542	1738	710	1079	1457	1666	635	963	1299	1613
C	549	832	1120	1552	549	832	1120	1552	476	721	969	1480	426	644	866	1319
D	338	510	684	1039	338	510	684	1039	293	442	593	899	263	396	530	804
W	1031	1349	1459	1639	1031	1349	1459	1639	892	1299	1404	1573	797	1214	1363	1525

Type of Interface: 15°-30° Adjustable Tilt Leg
 Roof Angle (Φ) – ≤10°

Wind Region	Building Height – H (m)															
	H≤5				5<H≤10				10<H≤15				15<H≤20			
	Corner	Edge	Intermediate	Internal	Corner	Edge	Intermediate	Internal	Corner	Edge	Intermediate	Internal	Corner	Edge	Intermediate	Internal
A	728	1107	1349	1509	728	1107	1349	1509	631	957	1292	1451	564	855	1152	1408
B	449	679	913	1393	449	679	913	1393	390	589	791	1204	349	527	707	1074
C	302	456	611	927	302	456	611	927	263	396	530	803	235	354	474	718
D	187	281	376	568	187	281	376	568	162	244	326	492	145	219	292	441
W	563	854	1150	1388	563	854	1150	1388	489	740	995	1336	437	661	889	1298

Type of Interface: 30° Adjustable Tilt Leg
 Roof Angle (Φ) – ≤10°

Wind Region	Building Height – H (m)															
	H≤5				5<H≤10				10<H≤15				15<H≤20			
	Corner	Edge	Intermediate	Internal	Corner	Edge	Intermediate	Internal	Corner	Edge	Intermediate	Internal	Corner	Edge	Intermediate	Internal
A	593	899	1212	1426	593	899	1212	1426	514	778	1048	1373	460	696	936	1333
B	366	553	743	1129	366	553	743	1129	318	480	644	977	285	429	576	873
C	247	372	498	754	247	372	498	754	214	323	432	653	192	289	387	584
D	153	229	307	463	153	229	307	463	133	199	266	402	119	179	239	359
W	459	695	934	1314	459	695	934	1314	399	602	809	1231	357	539	723	1099

PV Frame Spacing Table for Adjustable Tilt Leg System

Type of Rail HOP-SLR02
 Type of Interface Adjustable Tilt Leg
 Solar Panel Dimension 1.64m x 0.99m
Terrain category 3

Type of Interface 30°-60° Adjustable Tilt Leg
 Roof Angle (Φ) – ≤10°

Wind Region	Building Height – H (m)															
	H≤5				5<H≤10				10<H≤15				15<H≤20			
	Corner	Edge	Intermediate	Internal	Corner	Edge	Intermediate	Internal	Corner	Edge	Intermediate	Internal	Corner	Edge	Intermediate	Internal
A	464	701	943	1336	464	701	943	1336	402	608	817	1243	360	544	730	1109
B	287	433	580	880	287	433	580	880	249	376	503	762	223	336	450	681
C	194	291	390	589	194	291	390	589	168	253	338	511	151	227	303	457
D	120	180	240	362	120	180	240	362	104	156	209	315	93	140	187	282
W	360	543	729	1108	360	543	729	1108	312	471	632	958	280	421	565	856

Type of Interface 30°-60° Adjustable Tilt Leg
 Roof Angle (Φ) – 10°-20°

Wind Region	Building Height – H (m)															
	H≤5				5<H≤10				10<H≤15				15<H≤20			
	Corner	Edge	Intermediate	Internal	Corner	Edge	Intermediate	Internal	Corner	Edge	Intermediate	Internal	Corner	Edge	Intermediate	Internal
A	728	1107	1349	1509	728	1107	1349	1509	631	957	1292	1451	564	855	1152	1408
B	449	679	913	1393	449	679	913	1393	390	589	791	1204	349	527	707	1074
C	302	456	611	927	302	456	611	927	263	396	530	803	235	354	474	718
D	187	281	376	568	187	281	376	568	162	244	326	492	145	219	292	441
W	563	854	1150	1388	563	854	1150	1388	489	740	995	1336	437	661	889	1298

Type of Interface 30°-60° Adjustable Tilt Leg
 Roof Angle (Φ) – 20°-30°

Wind Region	Building Height – H (m)															
	H≤5				5<H≤10				10<H≤15				15<H≤20			
	Corner	Edge	Intermediate	Internal	Corner	Edge	Intermediate	Internal	Corner	Edge	Intermediate	Internal	Corner	Edge	Intermediate	Internal
A	1311	1465	1589	1796	1311	1465	1589	1796	1157	1409	1527	1720	1033	1368	1481	1664
B	819	1248	1542	1738	819	1248	1542	1738	710	1079	1457	1666	635	963	1299	1613
C	549	832	1120	1552	549	832	1120	1552	476	721	969	1480	426	644	866	1319
D	338	510	684	1039	338	510	684	1039	293	442	593	899	263	396	530	804
W	1031	1349	1459	1639	1031	1349	1459	1639	892	1299	1404	1573	797	1214	1363	1525

General Notes			
Note 1	Screws minimum embedment length into timber 35 mm		
Note 2	Recommended screws		
	Metal Purlins/Battens	Fasteners to use	
	0.55 mm – 1.5 mm	M6-11 TPI RoofZips	
	1.9 mm	M6-11 TPI RoofZips OR 12g-14 TPI Teks screws	
	2.4 mm and Above	12g-24 TPI Teks screws	
	Wood purlins and Rafter	Fasteners to use	
	Pine and Hardwood (35mm embedment and above)	M6 (12g) with 10 TPI	
Note 3	Following components are satisfied to use according to AS1170.2011		
	Components	Part Number	Description
	HOP-SLR02 Rail	HOP-SLR02	HOP-SLR02 Rail
	Tilt Legs		Adjustable Tilt Legs Kit (front and back leg)
Note 4	For adjustable tilting leg,		
	Maximum back leg angle to horizontal	-	90°
	Minimum back leg angle to horizontal	-	30°
Note 5	Refer Figure 5.3 of AS/NZS 1170.2:2011 for definition of roof zones.		
Note 6	Terrain category 3(TC3) refers to numerous closely spaced obstructions having heights generally from 3 m to 10 m. For example suburban housing or light industrial estates. Refer clause 4.2.1 of AS/NZS 1170.2-2011 Amdt 3-2013 for definition of Terrain category 3.		

Client: **Xiamen Hopenrgy Photovoltaic Technology Co. Ltd.**
 Project: **Solar Adjustable Tilt Legs System Spacing Table**
 Address: **within Australia & New Zealand**
 Designed: **K.Z**

Job: **2242**
 Date: **Jul-16**

Checked: **M.A**

PV Frame Spacing Table for Adjustable Tilt Leg System

Type of Rail: HOP-SLR02
 Type of Interface: Adjustable Tilt Leg
 Solar Panel Dimension: 2m x 1m
Terrain category: 2

Type of Interface: 10°-15° Adjustable Tilt Leg
 Roof Angle (Φ) – ≤10°

Wind Region	Building Height – H (m)															
	H≤5				5<H≤10				10<H≤15				15<H≤20			
	Corner	Edge	Intermediate	Internal	Corner	Edge	Intermediate	Internal	Corner	Edge	Intermediate	Internal	Corner	Edge	Intermediate	Internal
A	763	1172	1601	1936	627	959	1304	1828	566	865	1174	1776	534	815	1105	1716
B	467	711	962	1487	385	585	789	1213	349	528	712	1092	329	499	672	1029
C	313	474	639	977	259	391	525	801	234	354	475	723	221	334	448	682
D	193	291	390	593	159	240	322	488	144	218	291	441	136	206	275	416
W	588	898	1220	1768	484	737	997	1543	438	665	899	1388	413	628	848	1305

Type of Interface: 15°-30° Adjustable Tilt Leg
 Roof Angle (Φ) – ≤10°

Wind Region	Building Height – H (m)															
	H≤5				5<H≤10				10<H≤15				15<H≤20			
	Corner	Edge	Intermediate	Internal	Corner	Edge	Intermediate	Internal	Corner	Edge	Intermediate	Internal	Corner	Edge	Intermediate	Internal
A	415	631	852	1313	342	519	699	1072	310	469	632	967	293	443	596	911
B	256	388	521	794	212	320	429	652	192	289	388	589	181	273	366	556
C	173	260	349	529	143	215	288	435	129	195	261	394	122	184	246	372
D	107	160	215	324	88	133	177	267	80	120	161	242	76	114	152	229
W	321	487	656	1004	265	401	539	823	240	363	488	743	227	343	460	700

Type of Interface: 30° Adjustable Tilt Leg
 Roof Angle (Φ) – ≤10°

Wind Region	Building Height – H (m)															
	H≤5				5<H≤10				10<H≤15				15<H≤20			
	Corner	Edge	Intermediate	Internal	Corner	Edge	Intermediate	Internal	Corner	Edge	Intermediate	Internal	Corner	Edge	Intermediate	Internal
A	338	513	691	1058	279	422	568	867	253	382	513	782	239	361	484	738
B	209	316	424	644	173	261	349	530	157	236	316	479	148	223	299	452
C	141	212	284	430	117	175	235	355	106	159	213	321	100	150	201	303
D	87	131	175	264	72	108	145	218	65	98	131	198	62	93	124	187
W	262	396	533	812	216	327	439	667	196	296	397	603	185	279	375	569

PV Frame Spacing Table for Adjustable Tilt Leg System

Type of Rail HOP-SLR02
 Type of Interface Adjustable Tilt Leg
 Solar Panel Dimension 2m x 1m
Terrain category 2

Type of Interface 30°-60° Adjustable Tilt Leg
 Roof Angle (Φ) – ≤10°

Wind Region	Building Height – H (m)															
	H≤5				5<H≤10				10<H≤15				15<H≤20			
	Corner	Edge	Intermediate	Internal	Corner	Edge	Intermediate	Internal	Corner	Edge	Intermediate	Internal	Corner	Edge	Intermediate	Internal
A	265	400	538	820	218	330	443	673	198	299	401	608	187	282	378	574
B	164	247	331	502	135	204	273	413	123	185	247	374	116	175	234	353
C	111	166	223	336	91	137	184	277	83	125	167	251	78	118	157	237
D	68	103	137	207	57	85	114	171	51	77	103	155	48	73	97	146
W	205	310	416	632	170	256	343	520	154	232	310	470	145	219	293	443

Type of Interface 30°-60° Adjustable Tilt Leg
 Roof Angle (Φ) – 10°-20°

Wind Region	Building Height – H (m)															
	H≤5				5<H≤10				10<H≤15				15<H≤20			
	Corner	Edge	Intermediate	Internal	Corner	Edge	Intermediate	Internal	Corner	Edge	Intermediate	Internal	Corner	Edge	Intermediate	Internal
A	415	631	852	1313	342	519	699	1072	310	469	632	967	293	443	596	911
B	256	388	521	794	212	320	429	652	192	289	388	589	181	273	366	556
C	173	260	349	529	143	215	288	435	129	195	261	394	122	184	246	372
D	107	160	215	324	88	133	177	267	80	120	161	242	76	114	152	229
W	321	487	656	1004	265	401	539	823	240	363	488	743	227	343	460	700

Type of Interface 30°-60° Adjustable Tilt Leg
 Roof Angle (Φ) – 20°-30°

Wind Region	Building Height – H (m)															
	H≤5				5<H≤10				10<H≤15				15<H≤20			
	Corner	Edge	Intermediate	Internal	Corner	Edge	Intermediate	Internal	Corner	Edge	Intermediate	Internal	Corner	Edge	Intermediate	Internal
A	763	1172	1601	1936	627	959	1304	1828	566	865	1174	1776	534	815	1105	1716
B	467	711	962	1487	385	585	789	1213	349	528	712	1092	329	499	672	1029
C	313	474	639	977	259	391	525	801	234	354	475	723	221	334	448	682
D	193	291	390	593	159	240	322	488	144	218	291	441	136	206	275	416
W	588	898	1220	1768	484	737	997	1543	438	665	899	1388	413	628	848	1305

General Notes

Note 1Screws minimum embedment length into timber 35 mm

Note 2Recommended screws

Metal Purlins/Battens	Fasteners to use
0.55 mm – 1.5 mm	M6-11 TPI RoofZips
1.9 mm	M6-11 TPI RoofZips OR 12g-14 TPI Tek screws
2.4 mm and Above	12g-24 TPI Tek screws
Wood purlins and Rafter	Fasteners to use
Pine and Hardwood (35mm embedment and above)	M6 (12g) with 10 TPI

Note 3Following components are satisfied to use according to AS1170.2011

Components	Part Number	Description
HOP-SLR02 Rail	HOP-SLR02	HOP-SLR02 Rail
Tilt Legs		Adjustable Tilt Legs Kit (front and back leg)

Note 4For adjustable tilting leg,

Maximum back leg angle to horizontal-90°

Minimum back leg angle to horizontal-30°

Note 5Refer Figure 5.3 of AS/NZS 1170.2:2011 for definition of roof zones.

Note 6Terrain category 2 (TC2) refers to open terrain, including grassland, with well-scattered obstructions having heights generally from 1.5 m to 5 m, with no more than two obstruction per obstructions per hectare.

Client: **Xiamen Hopergy Photovoltaic Technology Co. Ltd.**
 Project: **Solar Adjustable Tilt Legs System Spacing Table**
 Address: **within Australia & New Zealand**
 Designed: **K.Z**

Job: **2242**
 Date: **Jul-16**

Checked: **M.A**

PV Frame Spacing Table for Adjustable Tilt Leg System

Type of Rail: HOP-SLR02
 Type of Interface: Adjustable Tilt Leg
 Solar Panel Dimension: 2m x 1m
Terrain category: 3

Type of Interface: 10°-15° Adjustable Tilt Leg
 Roof Angle (Φ) – ≤10°

Wind Region	Building Height – H (m)															
	H≤5				5<H≤10				10<H≤15				15<H≤20			
	Corner	Edge	Intermediate	Internal	Corner	Edge	Intermediate	Internal	Corner	Edge	Intermediate	Internal	Corner	Edge	Intermediate	Internal
A	1106	1400	1522	1727	1106	1400	1522	1727	955	1346	1461	1651	852	1306	1416	1596
B	675	1030	1398	1669	675	1030	1398	1669	584	890	1205	1598	522	794	1073	1545
C	452	685	925	1420	452	685	925	1420	392	593	799	1224	350	530	713	1090
D	278	419	563	857	278	419	563	857	241	364	488	741	216	325	436	662
W	850	1287	1395	1571	850	1287	1395	1571	735	1124	1341	1506	657	1002	1301	1459

Type of Interface: 15°-30° Adjustable Tilt Leg
 Roof Angle (Φ) – ≤10°

Wind Region	Building Height – H (m)															
	H≤5				5<H≤10				10<H≤15				15<H≤20			
	Corner	Edge	Intermediate	Internal	Corner	Edge	Intermediate	Internal	Corner	Edge	Intermediate	Internal	Corner	Edge	Intermediate	Internal
A	599	913	1237	1443	599	913	1237	1443	519	789	1067	1386	464	705	951	1345
B	369	559	753	1151	369	559	753	1151	320	485	651	994	287	433	582	886
C	248	375	503	764	248	375	503	764	216	325	436	661	193	291	390	591
D	153	231	309	467	153	231	309	467	133	200	268	405	119	179	240	362
W	463	704	950	1325	463	704	950	1325	402	609	821	1257	359	544	732	1120

Type of Interface: 30° Adjustable Tilt Leg
 Roof Angle (Φ) – ≤10°

Wind Region	Building Height – H (m)															
	H≤5				5<H≤10				10<H≤15				15<H≤20			
	Corner	Edge	Intermediate	Internal	Corner	Edge	Intermediate	Internal	Corner	Edge	Intermediate	Internal	Corner	Edge	Intermediate	Internal
A	488	741	1000	1363	488	741	1000	1363	423	641	864	1311	378	573	771	1180
B	301	455	612	932	301	455	612	932	261	395	530	806	234	353	474	719
C	203	306	410	621	203	306	410	621	176	265	355	538	158	237	318	481
D	125	188	252	380	125	188	252	380	109	164	219	330	97	147	196	295
W	378	572	770	1178	378	572	770	1178	328	495	666	1017	293	443	595	907

PV Frame Spacing Table for Adjustable Tilt Leg System

Type of Rail HOP-SLR02
 Type of Interface Adjustable Tilt Leg
 Solar Panel Dimension 2m x 1m
Terrain category 3

Type of Interface 30°-60° Adjustable Tilt Leg
 Roof Angle (Φ) – ≤10°

Wind Region	Building Height – H (m)															
	H≤5				5<H≤10				10<H≤15				15<H≤20			
	Corner	Edge	Intermediate	Internal	Corner	Edge	Intermediate	Internal	Corner	Edge	Intermediate	Internal	Corner	Edge	Intermediate	Internal
A	381	577	777	1190	381	577	777	1190	331	500	673	1027	296	447	601	915
B	236	356	477	725	236	356	477	725	205	309	414	627	183	276	370	561
C	159	239	320	485	159	239	320	485	138	208	278	420	124	186	249	376
D	98	148	197	298	98	148	197	298	85	128	172	258	77	115	154	231
W	295	447	600	914	295	447	600	914	256	387	520	790	230	346	465	705

Type of Interface 30°-60° Adjustable Tilt Leg
 Roof Angle (Φ) – 10°-20°

Wind Region	Building Height – H (m)															
	H≤5				5<H≤10				10<H≤15				15<H≤20			
	Corner	Edge	Intermediate	Internal	Corner	Edge	Intermediate	Internal	Corner	Edge	Intermediate	Internal	Corner	Edge	Intermediate	Internal
A	599	913	1237	1443	599	913	1237	1443	519	789	1067	1386	464	705	951	1345
B	369	559	753	1151	369	559	753	1151	320	485	651	994	287	433	582	886
C	248	375	503	764	248	375	503	764	216	325	436	661	193	291	390	591
D	153	231	309	467	153	231	309	467	133	200	268	405	119	179	240	362
W	463	704	950	1325	463	704	950	1325	402	609	821	1257	359	544	732	1120

Type of Interface 30°-60° Adjustable Tilt Leg
 Roof Angle (Φ) – 20°-30°

Wind Region	Building Height – H (m)															
	H≤5				5<H≤10				10<H≤15				15<H≤20			
	Corner	Edge	Intermediate	Internal	Corner	Edge	Intermediate	Internal	Corner	Edge	Intermediate	Internal	Corner	Edge	Intermediate	Internal
A	1106	1400	1522	1727	1106	1400	1522	1727	955	1346	1461	1651	852	1306	1416	1596
B	675	1030	1398	1669	675	1030	1398	1669	584	890	1205	1598	522	794	1073	1545
C	452	685	925	1420	452	685	925	1420	392	593	799	1224	350	530	713	1090
D	278	419	563	857	278	419	563	857	241	364	488	741	216	325	436	662
W	850	1287	1395	1571	850	1287	1395	1571	735	1124	1341	1506	657	1002	1301	1459

General Notes			
Note 1	Screws minimum embedment length into timber 35 mm		
Note 2	Recommended screws		
	Metal Purlins/Battens	Fasteners to use	
	0.55 mm – 1.5 mm	M6-11 TPI RoofZips	
	1.9 mm	M6-11 TPI RoofZips OR 12g-14 TPI Tek screws	
	2.4 mm and Above	12g-24 TPI Tek screws	
	Wood purlins and Rafter	Fasteners to use	
	Pine and Hardwood (35mm embedment and above)	M6 (12g) with 10 TPI	
Note 3	Following components are satisfied to use according to AS1170.2011		
	Components	Part Number	Description
	HOP-SLR02 Rail	HOP-SLR02	HOP-SLR02 Rail
	Tilt Legs		Adjustable Tilt Legs Kit (front and back leg)
Note 4	For adjustable tilting leg,		
	Maximum back leg angle to horizontal	-	90°
	Minimum back leg angle to horizontal	-	30°
Note 5	Refer Figure 5.3 of AS/NZS 1170.2:2011 for definition of roof zones.		
Note 6	Terrain category 3(TC3) refers to numerous closely spaced obstructions having heights generally from 3 m to 10 m. For example suburban housing or light industrial estates. Refer clause 4.2.1 of AS/NZS 1170.2-2011 Amdt 3-2013 for definition of Terrain category 3.		