



Central Inverters for Utility-Scale PV Plants

Compiled by Joe Schwartz





SolarPro's 2016 utility-scale central inverter specification dataset provides PV plant designers with a high-level comparison of the electrical and mechanical specifications for inverter models that are well suited for centralized, large solar applications. The products included in the following table have an ac output capacity of 250 kW at 50°C or greater, and their makers currently offer and support them in the US market (with a few exceptions).

While many US solar developers now consider decentralized designs that utilize high-capacity 3-phase string inverters for projects up to 10 MW or even larger, central inverter platforms are still currently the standard for most utility-scale projects over 10 MW in the US. As a result, we continue to see the rapid advancement of central inverters and platforms that integrate them into blocks that can process 2 MW or more of PV power.

The aggregated specifications presented here cover 58 central inverter models from 10 manufacturers. Most of the included solutions are listed to the UL 1741 standard. In addition, 19 currently available models from six manufacturers (ABB, Ingeteam, Power Electronics, SMA America, Sungrow and TMEIC) are listed for deployment in 1,500 Vdc systems, which is becoming the new standard for many utility-scale PV plants. ⊕

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Manufacturers

ABB / 877.261.1374 / abb.com/solarinverters

Eaton / 855.386.7657 / eaton.com/solar

Ingeteam / 855.821.7190 / ingeteam.com

KACO new energy / 210.446.4238 / kaco-newenergy.com

Power Electronics / 602.354.4890 / power-electronics.com

Schneider Electric / 888.778.2733 / sesolar.com

SMA America / 916.625.0870 / sma-america.com

Sungrow USA / 510.656.1259 / en.sungrowpower.com

TMEIC / 540.283.2000 / tmeic.com

Yaskawa–Solectria Solar / 978.683.9700 / solectria.com

Central Inverters for Utility-Scale PV Plants

Manufacturer	Model	Rated continuous power at 50°C (kW)	Input data (dc)	
			Maximum Voc (Vdc)	MPPT range (Vdc)
ABB	Ultra-1500-HD-TL-OUTD-US	1,560	1,000	645–850
ABB	PVS980-58-1818kVA-I	1,818	1,500	850–1,500
ABB	PVS980-58-1909kVA-I	1,909	1,500	893–1,500
ABB	PVS980-58-2000kVA-I	2,000	1,500	935–1,500
Eaton	Power Xpert Solar 1670 kW	1,660	1,000	550–1,000
Eaton	Power Xpert Solar 2000 kW	2,000	1,000	550–1,000
Eaton	Power Xpert Solar 2000+ kW	2,000	1,000	605–1,000
Eaton	Power Xpert Solar 2200 kW	2,200	1,000	605–1,000
Eaton	Power Xpert Solar 2750 kW ²	2,750	1,500	825–1,300
Ingeteam	PowerMax 1170TL U B450	975	1,500	660–1,300
Ingeteam	PowerMax 1400TL U B540	1,169	1,500	786–1,300
Ingeteam	PowerMax 1500TL U B578	1,251	1,500	840–1,300
Ingeteam	PowerMax 1560TL U B600	1,299	1,500	870–1,300
Ingeteam	PowerMax 1600TL U B615	1,332	1,500	889–1,300
Ingeteam	PowerMax 1640TL U B630	1,364	1,500	915–1,300
Ingeteam	PowerMax 610TL U B220	560.9	1,050	480–820
Ingeteam	PowerMax 830TL U B300	764.9	1,050	440–820
Ingeteam	PowerMax 1000TL U B360	917.8	1,050	524–820
Ingeteam	PowerMax 1110TL U B400	1,019.8	1,050	580–820
Ingeteam	PowerMax 1165TL U B420	1,070.8	1,050	610–820
KACO new energy	blueplanet 750 TL3 OD	750	1,100	550–830
KACO new energy	blueplanet 875 TL3 OD	875	1,100	550–830
KACO new energy	blueplanet 1000 TL3 OD	1,000	1,100	550–830
KACO new energy	blueplanet 2200 TL3 OD	2,000	1,000	550–830
Power Electronics	HEC-US V1500 FS1275CU15 ⁵	1,150	1,500	976–1,250
Power Electronics	HEC-US V1500 FS1700CU15 ⁵	1,530	1,500	976–1,250
Power Electronics	HEC-US V1500 FS2125CU15 ⁵	1,910	1,500	976–1,250
Power Electronics	HEC-US V1500 FS2550CU15 ⁵	2,250	1,500	976–1,250
Power Electronics	HEC-US V1500 FS3000CU15 ⁵	3,000	1,500	976–1,250

Footnote Key

¹ Per MPP tracker

² Preliminary specifications

³ Estimated

⁴ -40°F low-temperature option

⁵ 690 Vac version; specs vary for 645, 600 and 565 Vac versions

⁶ 440 Vac version; specs vary for 420 Vac and 400 Vac versions

⁷ -31°F low-temperature option

⁸ Passive cooling up to 50% load at 50°C

DNR = did not report

Output data (ac)		Performance					Mechanical
Maximum dc input current (Adc) ¹	Nominal output voltage (Vac)	Nominal output current (Aac)	Peak efficiency (%)	CEC-weighted efficiency (%)	Nighttime standby loss (W)	Operating temp. range (°F)	Dimensions H x W x D (in.)
2,800	690	1,300	98.4	98	180	-4-140	108 x 191 x 45
DNR	600	1,750	98.8	98.5	225	-4-140	93.1 x 125.1 x 59.9
DNR	630	1,750	98.8	98.5	225	-4-140	93.1 x 125.1 x 59.9
DNR	660	1,750	98.8	98.5	225	-4-140	93.1 x 125.1 x 59.9
3,100	356	2,707	98.6	98 ⁶	100	-4-122 ⁴	92.3 x 130.8 x 61.1
3,700	384	3,000	98.7 ³	98.5 ³	335	-4-122 ⁴	92.3 x 130.8 x 61.1
3,700	423	3,000	98.7 ³	98.5 ³	335 ³	-4-122 ⁴	92.3 x 130.8 x 61.1
3,700	423	3,000	98.7 ³	98.5 ³	335 ³	-4-122 ⁴	92.3 x 130.8 x 61.1
3,700	580	3,000	98.7 ³	98.5 ³	335 ³	-4-122 ⁴	92.3 x 130.8 x 61.1
2,000	450	1,500	98.9	98.5	60	-4-131	89 x 111 x 35
2,000	540	1,500	98.9	98.5	60	-4-131	89 x 111 x 35
2,000	578	1,500	98.9	98.5	60	-4-131	89 x 111 x 35
2,000	600	1,500	98.9	98.5	60	-4-131	89 x 111 x 35
2,000	615	1,500	98.9	98.5	60	-4-131	89 x 111 x 35
2,000	630	1,500	98.9	98.5	60	-4-131	89 x 111 x 35
2,000	220	1,600	98.9	98.5	60	-4-149	89 x 111 x 35
2,000	300	1,600	98.9	98.5	60	-4-149	89 x 111 x 35
2,000	360	1,600	98.9	98.5	60	-4-149	89 x 111 x 35
2,000	400	1,600	98.9	98.5	60	-4-149	89 x 111 x 35
2,000	420	1,600	98.9	98.5	60	-4-149	89 x 111 x 35
1,433	370	1,560	98.5	DNR	150	-4-122	83.5 x 122.4 x 39.4
1,671	370	1,560	98.5	DNR	150	-4-122	83.5 x 122.4 x 39.4
1,910	370	1,560	98.5	DNR	150	-4-122	83.5 x 122.4 x 39.4
3,818	270	3,468	98.8	DNR	150	-4-122	84.6 x 133.9 x 55.1
1,600	690	1,285	98.5	98	150	-31-140	86.5 x 119.6 x 37.2
2,140	690	1,710	98.7	98.5	200	-31-140	86.5 x 147.6 x 37.2
2,675	690	2,140	98.7	98.5	250	-31-140	86.5 x 175.7 x 37.2
3,210	690	2,570	98.7	98.5	300	-31-140	86.5 x 231.8 x 37.2
3,745	690	3,000	98.7	98.5	350	-31-140	86.5 x 231.9 x 37.2

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Manufacturer	Model	Mechanical			Listing	Warranty	
		Enclosure	Cooling method	Weight (lbs.)	UL 1741 compliant	Standard (yr.)	Extended (yr.)
ABB	Ultra-1500-HD-TL-OUTD-US	NEMA 3R	liquid	8,818	yes	5	10, 15, 20
ABB	PVS980-58-1818kVA-I	NEMA 4X	hybrid	8,488	yes	5	10, 15, 20
ABB	PVS980-58-1909kVA-I	NEMA 4X	hybrid	8,488	yes	5	10, 15, 20
ABB	PVS980-58-2000kVA-I	NEMA 4X	hybrid	8,488	yes	5	10, 15, 20
Eaton	Power Xpert Solar 1670 kW	NEMA 3R	liquid/air	12,700	yes	5	10, 15, 20
Eaton	Power Xpert Solar 2000 kW	NEMA 3R	liquid/air	12,700	pending	5	10, 15, 20
Eaton	Power Xpert Solar 2000+ kW	NEMA 3R	liquid/air	12,700	pending	5	10, 15, 20
Eaton	Power Xpert Solar 2200 kW	NEMA 3R	liquid/air	12,700	pending	5	10, 15, 20
Eaton	Power Xpert Solar 2750 kW ²	NEMA 3R	liquid/air	12,700	pending	5	10, 15, 20
Ingeteam	PowerMax 1170TL U B450	NEMA 3R	air	3,770	yes	5	10, 15, 20, 25
Ingeteam	PowerMax 1400TL U B540	NEMA 3R	air	3,770	yes	5	10, 15, 20, 25
Ingeteam	PowerMax 1500TL U B578	NEMA 3R	air	3,770	yes	5	10, 15, 20, 25
Ingeteam	PowerMax 1560TL U B600	NEMA 3R	air	3,770	yes	5	10, 15, 20, 25
Ingeteam	PowerMax 1600TL U B615	NEMA 3R	air	3,770	yes	5	10, 15, 20, 25
Ingeteam	PowerMax 1640TL U B630	NEMA 3R	air	3,770	yes	5	10, 15, 20, 25
Ingeteam	PowerMax 610TL U B220	NEMA 3R	air	3,440	yes	5	10, 15, 20, 25
Ingeteam	PowerMax 830TL U B300	NEMA 3R	air	3,440	yes	5	10, 15, 20, 25
Ingeteam	PowerMax 1000TL U B360	NEMA 3R	air	3,440	yes	5	10, 15, 20, 25
Ingeteam	PowerMax 1110TL U B400	NEMA 3R	air	3,440	yes	5	10, 15, 20, 25
Ingeteam	PowerMax 1165TL U B420	NEMA 3R	air	3,440	yes	5	10, 15, 20, 25
KACO new energy	blueplanet 750 TL3 OD	NEMA 3R	air	3,923	no	5	10, 15, 20
KACO new energy	blueplanet 875 TL3 OD	NEMA 3R	air	3,923	no	5	10, 15, 20
KACO new energy	blueplanet 1000 TL3 OD	NEMA 3R	air	3,923	no	5	10, 15, 20
KACO new energy	blueplanet 2200 TL3 OD	NEMA 3R	air	11,023	no	5	10, 15, 20
Power Electronics	HEC-US V1500 FS1275CU15 ⁵	NEMA 3R	air	5,809	yes	5	10, 15, 20
Power Electronics	HEC-US V1500 FS1700CU15 ⁵	NEMA 3R	air	7,253	yes	5	10, 15, 20
Power Electronics	HEC-US V1500 FS2125CU15 ⁵	NEMA 3R	air	8,697	yes	5	10, 15, 20
Power Electronics	HEC-US V1500 FS2550CU15 ⁵	NEMA 3R	air	10,141	yes	5	10, 15, 20
Power Electronics	HEC-US V1500 FS3000CU15 ⁵	NEMA 3R	air	11,585	yes	5	10, 15, 20

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Central Inverters for Utility-Scale PV Plants

Manufacturer	Model	Rated continuous power at 50°C (kW)	Input data (dc)	
			Maximum Voc (Vdc)	MPPT range (Vdc)
Power Electronics	HEC-US PLUS FS1112CU ⁶	1,000	1,000	642–820
Power Electronics	HEC-US PLUS FS1331CU ⁶	1,190	1,000	642–820
Power Electronics	HEC-US PLUS FS1550CU ⁶	1,390	1,000	642–820
Power Electronics	HEC-US PLUS FS1770CU ⁶	1,590	1,000	642–820
Power Electronics	HEC-US PLUS FS1991CU ⁶	1,790	1,000	642–820
Power Electronics	HEC-US PLUS FS2200CU ⁶	1,980	1,000	642–820
Schneider Electric	XC 540-NA	540	1,000	440–800
Schneider Electric	XC 630-NA	630	1,000	510–800
Schneider Electric	XC 680-NA	680	1,000	550–800
Schneider Electric	XC 733-NA	733	1,000	591–800
SMA America	Sunny Central 1850-US	1,666	1,000	570–950
SMA America	Sunny Central 2200-US	2,000	1,000	570–950
SMA America	Sunny Central 2500-EV-US	2,250	1,500	850–1,425
Sungrow USA	SG750MX	825	1,000	500–820
Sungrow USA	SG800MX	880	1,000	545–820
Sungrow USA	SG1000MX	1,000	1,000	550–950
Sungrow USA	SG1250HV	1,250	1,500	800–1,300
Sungrow USA	SG1500HV	1,500	1,500	900–1,300
TMEIC	Solar Ware 250	250	1,000	450–850
TMEIC	Solar Ware 500	500	1,000	450–950
TMEIC	Solar Ware 630	630	1,000	550–950
TMEIC	Solar Ware Samurai 833 kW	833	1,000	605–950
TMEIC	Solar Ware Samurai 1667 kW	1,667	1,000	605–950
TMEIC	Solar Ware Samurai 1833 kW	1,833	1,000	605–950
TMEIC	Solar Ware Samurai 2500 kW	2,500	1,500	800–1,300
TMEIC	Solar Ware Samurai 2700 kW	2,700	1,500	800–1,300
Yaskawa–Solectria Solar	SGI 500XT	500	600	300–500
Yaskawa–Solectria Solar	SGI 500XTM	500	1,000	545–820
Yaskawa–Solectria Solar	SGI 750XTM	750	1,000	545–820

Footnote Key

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² Preliminary specifications

³ Estimated

⁴ -40°F low-temperature option

⁵ 690 Vac version; specs vary for 645, 600 and 565 Vac versions

⁶ 440 Vac version; specs vary for 420 Vac and 400 Vac versions

⁷ -31°F low-temperature option

⁸ Passive cooling up to 50% load at 50°C

DNR = did not report

Maximum dc input current (A _{dc}) ¹	Output data (ac)		Performance				Mechanical
	Nominal output voltage (Vac)	Nominal output current (A _{ac})	Peak efficiency (%)	CEC-weighted efficiency (%)	Nighttime standby loss (W)	Operating temp. range (°F)	Dimensions H x W x D (in.)
1,750	440	1,600	98.6	98	200	-22-122	94.5 x 153.5 x 40.1
2,100	440	1,920	98.6	98	240	-22-122	94.5 x 153.5 x 40.1
2,450	440	2,240	98.6	98	280	-22-122	94.5 x 192.9 x 40.1
2,800	440	2,560	98.6	98	320	-22-122	94.5 x 192.9 x 40.1
3,150	440	2,880	98.6	98	360	-22-122	94.5 x 232.3 x 40.1
3,500	440	3,200	98.6	98	400	-22-122	94.5 x 232.3 x 40.1
1,280	300	1,040	98.4	97	210	-4-122 ⁷	89.5 x 126.5 x 33.6
1,280	350	1,040	98.5	97.5	210	-4-122 ⁷	89.5 x 126.5 x 33.6
1,280	380	1,040	98.7	97.5	210	-4-122 ⁷	89.5 x 126.5 x 33.6
1,280	407	1,040	98.8	97.5	210	-4-122 ⁷	89.5 x 126.5 x 33.6
3,960	385	2,498	98.6	98	300	-13-140	91.3 x 109.4 x 62.5
3,960	385	3,300	98.6	98	300	-13-140	91.3 x 109.4 x 62.5
2,700	550	2,624	98.6	98	370	-13-140	91.3 x 109.4 x 62.5
1,600	315	1,512	98.7	98.5	100	-13-140	85.2 x 102.3 x 39.4
1,600	342	1,512	98.7	98.5	100	-13-140	85.2 x 102.3 x 39.4
2,000	385	1,500	98.8	98.5	20	-22-140	85 x 102 x 42.3
1,754	550	1,443	99	DNR	20	-22-149	75.4 x 71.1 x 32.9
1,754	600	1,443	99	DNR	20	-22-149	75.4 x 71.1 x 32.9
611	300	481	98.2	98	75	-4-122	74.8 x 47.2 x 35.4
1,333	300	962	98.5	98	75	-4-122	81.7 x 74.8 x 27.6
1,402	380	957	98.6	98	75	-4-122	81.7 x 74.8 x 27.6
DNR	418	1,265	99	98.5	DNR	-4-131	92 x 118 x 46
2,826	418	2,533	99	98.5	DNR	-4-131	92 x 197 x 46
DNR	418	2,762	99	98.5	DNR	-4-131	92 x 197 x 46
DNR	550	2,624	98.8	98.5	DNR	-4-131	92 x 197 x 46
DNR	550	2,624	98.8	98.5	DNR	-4-131	92 x 197 x 46
1,750	208	1,387	98.1	98	41	-40-122	82 x 109 x 41
965	380	760	98.3	98	89	-40-122	82 x 109 x 41
1,445	380	1,140	98.3	98	123	-40-122	82 x 109 x 41

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Manufacturer	Model	Mechanical			Listing	Warranty	
		Enclosure	Cooling method	Weight (lbs.)	UL 1741 compliant	Standard (yr.)	Extended (yr.)
Power Electronics	HEC-US PLUS FS1112CU ⁶	NEMA 3R	air	7,804	yes	5	10, 15, 20
Power Electronics	HEC-US PLUS FS1331CU ⁶	NEMA 3R	air	8,487	yes	5	10, 15, 20
Power Electronics	HEC-US PLUS FS1550CU ⁶	NEMA 3R	air	10,119	yes	5	10, 15, 20
Power Electronics	HEC-US PLUS FS1770CU ⁶	NEMA 3R	air	10,802	yes	5	10, 15, 20
Power Electronics	HEC-US PLUS FS1991CU ⁶	NEMA 3R	air	12,434	yes	5	10, 15, 20
Power Electronics	HEC-US PLUS FS2200CU ⁶	NEMA 3R	air	13,117	yes	5	10, 15, 20
Schneider Electric	XC 540-NA	NEMA 3R	air	4,938	yes	5	10, 15, 20
Schneider Electric	XC 630-NA	NEMA 3R	air	4,938	yes	5	10, 15, 20
Schneider Electric	XC 680-NA	NEMA 3R	air	4,938	yes	5	10, 15, 20
Schneider Electric	XC 733-NA	NEMA 3R	air	4,938	yes	5	10, 15, 20
SMA America	Sunny Central 1850-US	NEMA 3R	air	8,819	yes	5	10, 15, 20
SMA America	Sunny Central 2200-US	NEMA 3R	air	8,819	yes	5	10, 15, 20
SMA America	Sunny Central 2500-EV-US	NEMA 3R	air	8,819	yes	5	10, 15, 20
Sungrow USA	SG750MX	NEMA 3R	air	5,952	yes	5	10, 15, 20
Sungrow USA	SG800MX	NEMA 3R	air	5,952	yes	5	10, 15, 20
Sungrow USA	SG1000MX	NEMA 3R	air	4,519	yes	5	10, 15, 20
Sungrow USA	SG1250HV	NEMA 3R	air	3,638	yes	5	10, 15, 20
Sungrow USA	SG1500HV	NEMA 3R	air	3,638	yes	5	10, 15, 20
TMEIC	Solar Ware 250	indoor	air	2,205	yes	5	10, 15, 20
TMEIC	Solar Ware 500	indoor	air	2,866	yes	5	10, 15, 20
TMEIC	Solar Ware 630	indoor	air	2,866	yes	5	10, 15, 20
TMEIC	Solar Ware Samurai 833 kW	NEMA 3R	air ⁸	7,940	yes	5	10, 15, 20
TMEIC	Solar Ware Samurai 1667 kW	NEMA 3R	air ⁸	11,500	yes	5	10, 15, 20
TMEIC	Solar Ware Samurai 1833 kW	NEMA 3R	air ⁸	11,500	yes	5	10, 15, 20
TMEIC	Solar Ware Samurai 2500 kW	NEMA 3R	air ⁸	13,228	yes	5	10, 15, 20
TMEIC	Solar Ware Samurai 2700 kW	NEMA 3R	air ⁸	13,228	yes	5	10, 15, 20
Yaskawa–Solectria Solar	SGI 500XT	NEMA 3R	air	3,410	yes	5	10, 15, 20
Yaskawa–Solectria Solar	SGI 500XTM	NEMA 3R	air	3,080	yes	5	10, 15, 20
Yaskawa–Solectria Solar	SGI 750XTM	NEMA 3R	air	3,570	yes	5	10, 15, 20