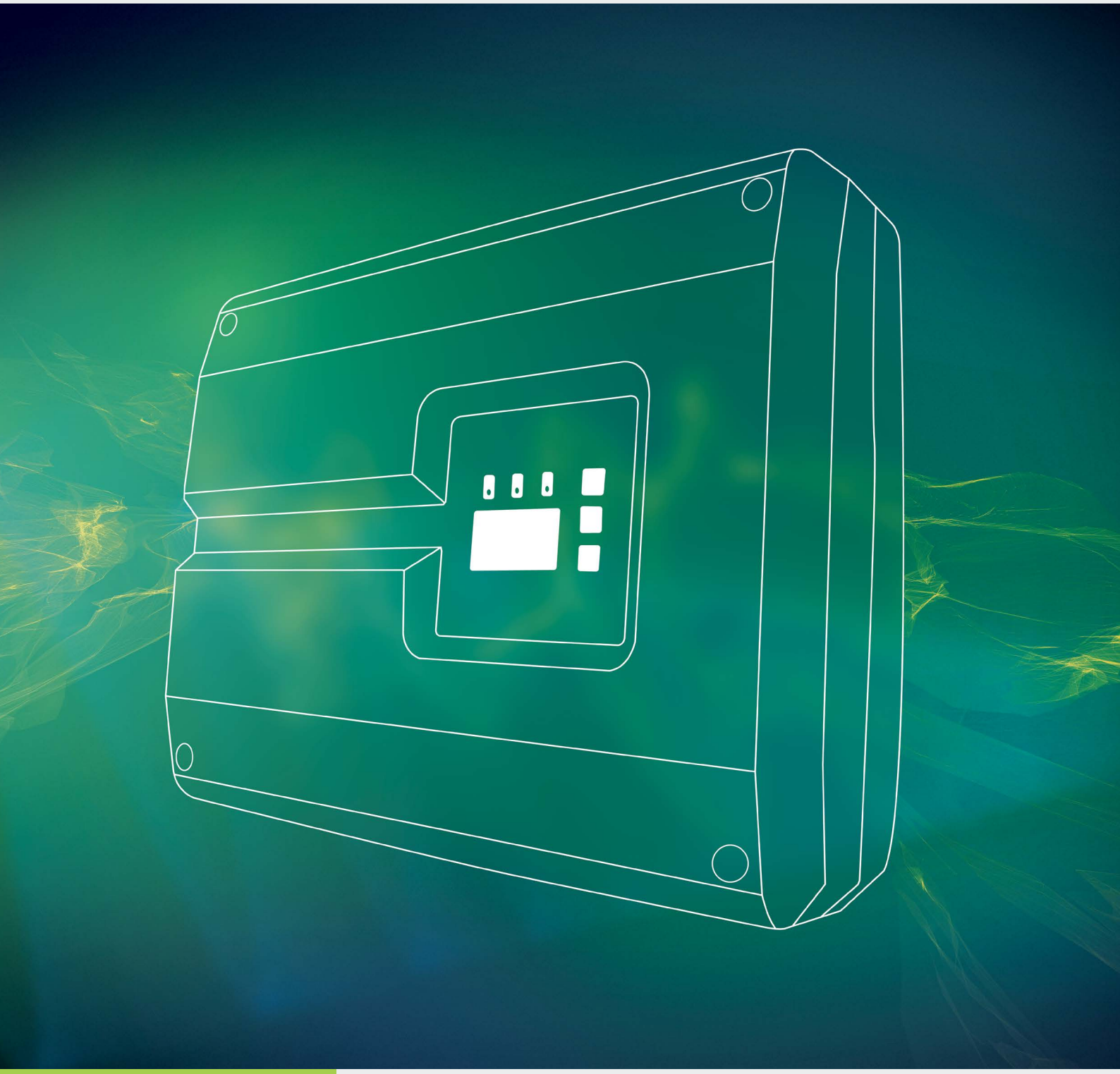
SOLAR ELECTRIC

KOSTAL



Smart connections.

Operating manual

PIKO inverter
3.0 - 20

10.1 Technical data

Subject to technical changes. Errors excepted. You can find current information at www.kostal-solar-electric.com.

PIKO inverter	Unit	3.0	4.2	4.6	5.5	7.0	8.5	10	12	15	17	20
Input side												
Inverter type		PIKO	PIKO	PIKO	PIKO	PIKO	PIKO	PIKO	PIKO	PIKO	PIKO	PIKO
Max. PV power (cos φ = 1)	kWp	4.3	4.6	5.1	6.1	7.7	9.4	10.8	12.9	16.9	19.2	22.6
Rated input voltage ($V_{DC,r}$)	V	400	680	680	680	680	680	680	680	680	680	680
Max. input voltage (V_{DCmax})	V	900	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
Max. input voltage (V_{DCmin})	V	160	160	160	160	160	160	160	160	160	160	160
Start input voltage ($V_{DCstart}$)	V	180	180	180	180	180	180	180	180	180	180	180
Max. MPP voltage (V_{MPPmax})	V	730	800	800	800	800	800	800	800	800	800	800
Min. MPP voltage in single-tracker mode (V_{MPPmin})	V	270	400	435	530	660	–	527	626	–	–	–
Min. MPP voltage in two-tracker or parallel mode (V_{MPPmin})[4]	V	–	–	265	265	330	400	sym: 290/290 asym: 390/250	sym: 345/345 asym: 490/250	390	440	515
Min. MPP voltage in three-tracker mode (V_{MPPmin})[4]	V	–	–	–	–	–	–	–	–	sym.: 260/260/260 asym.: 325/325/250	sym.: 290/290/290 asym.: 375/375/250	sym.: 345/345/345 asym.: 450/450/250
Max. input current (I_{DCmax})[4]	A	12.5	11	11	11	11	11	sym.: 18/18 asym: 20/10	sym.: 18/18 asym: 20/10	sym.: 20/20/20 asym.: 20/20/10	sym.: 20/20/20 asym.: 20/20/10	sym.: 20/20/20 asym.: 20/20/10
Max. input current with parallel connection[6]	A	–	–	22	22	22	22	36 (DC1+DC2)	36 (DC1+DC2)	40 (DC1+DC2) 20 (DC 3)	40 (DC1+DC2) 20 (DC 3)	40 (DC1+DC2) 20 (DC 3)
Max. feedback current	A	–	–	–	–	–	–	–	–	–	–	–
Number of DC inputs		1	1	2	2	2	2	2	2	3	3	3
Number of independent MPP trackers		1	1	2	2	2	2	2	2	3	3	3
Max. PV short-circuit current (I_{SC_PV})	A	18	13.8	13.8	13.8	13.8	13.8	25	25	25	25	25

PIKO inverter	Unit	3.0	4.2	4.6	5.5	7.0	8.5	10	12	15	17	20
Output side												
Rated output, cos φ = 1 ($P_{AC,r}$)	kW	3	4.2	4.6	5.5	7	8.5	10	12	15	17	20
Max. output apparent power, cos $\varphi_{,adj}$	kVA	3	4.2	4.6	5.5	7	8.5	10	12	15	17	20
Rated output current	A	13	6.1	6.7	8	10.2	12.3	14.6	17.4	21.7	24.6	29
Max. output current (I_{ACmax})	A	13.7	6.1	6.7	8	10.2	12.5	16.2	19.3	24.2	27.4	32.2
Switch-on current (I_{Inrush})	A	13.7	6.1	6.7	8	10.2	12.5	16.2	19.3	24.2	27.4	32.2
Short-circuit current (peak/RMS)	A	26.4/16.9	9.5/6.7	12.5/8.8	12.5/8.8	15.8/11.2	17.7/12.5	25/16.6	27.4/16.7	42/28.5	41.3/29.0	51/36.5
Number of feed-in phases		1	3	3	3	3	3	3	3	3	3	3
Grid connection		1N~, 230V	3N~, 400V	3N~, 400V	3N~, 400V	3N~, 400V	3N~, 400V	3N~, 400V	3N~, 400V	3N~, 400V	3N~, 400V	3N~, 400V
Rated frequency (fr)	Hz	50	50	50	50	50	50	50	50	50	50	50
Setting range of the power factor cos $\varphi_{AC,r}$		0.9...1...0.9	0.8...1...0.8	0.8...1...0.8	0.8...1...0.8	0.8...1...0.8	0.8...1...0.8	0.8...1...0.8	0.8...1...0.8	0.8...1...0.8	0.8...1...0.8	0.8...1...0.8
Device properties												
Stand-by consumption	W	1.7	1.8	1.8	1.8	1.8	1.8	1.8	1.8	2.15	2.15	2.15
Efficiency												
Max. efficiency	%	96.2	97.5	97.7	97.7	97.6	97.6	97.7	97.7	98.0	98.0	98.0
European efficiency	%	95.5	96.1	96.3	96.3	96.5	96.5	97.1	97.1	97.2	97.3	97.3
System data												
Topology: Without galvanic separation - transformerless		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Protection type according to IEC 60529, housing/fan		IP 65/IP 55	IP 65/IP 55	IP 65/IP 55	IP 65/IP 55	IP 65/IP 55	IP 65/IP 55	IP 65/IP 55	IP 65/IP 55	IP 65/IP 55	IP 65/IP 55	IP 65/IP 55
Protective class according to IEC 62109-1		I	I	I	I	I	I	I	I	I	I	I
Overvoltage category according to IEC 60664-1 input side (PV generator)[1]		II	II	II	II	II	II	II	II	II	II	II
Overvoltage category according to IEC 60664-1 output side (grid connection)[2]		III	III	III	III	III	III	III	III	III	III	III
Degree of contamination[3]		4	4	4	4	4	4	4	4	4	4	4
Environmental category (outdoor installation)		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Environmental category (indoor installation)		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
UV resistance		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

PIKO inverter	Unit	3.0	4.2	4.6	5.5	7.0	8.5	10	12	15	17	20
Minimum cable cross-section of AC connection line	mm^2	2.5	1.5	1.5	1.5	2.5	2.5	4	4	6	6	6
Maximum cable cross-section of AC connection line	mm^2	6	6	6	6	6	6	6	6	16	16	16
Minimum cable cross-section of DC connection line	mm^2	4	4	4	4	4	4	4	4	4	4	4
Maximum cable cross-section of DC connection line	mm^2	6	6	6	6	6	6	6	6	6	6	10
Max. fusing on output side according to IEC 60898-1		B16, C16	B16, C16	B16, C16	B16, C16	B16, C16	B16, C16	B25, C25	B25, C25	B32, C32	B32, C32	B40, C40
Compatibility with external residual current protection devices		RCD type B, RCM type B										
Tightening torque of PE connection, outer	Nm	3	3	3	3	3	3	3	3	3	3	3
Tightening torque of cover screws	Nm	5	5	5	5	5	5	5	5	5	5	5
Reverse polarity protection, DC-side, with short-circuit diodes		---	---	---	---	---	---	---	---	---	---	---
Internal operator protection according to EN 62109-2		RCMU / RCCB type B										
Automatic disconnection device integrated[5]		✓										
Height	mm (inch)	385 (15.16)	385 (15.16)	385 (15.16)	385 (15.16)	385 (15.16)	385 (15.16)	445 (17.52)	445 (17.52)	540 (21.26)	540 (21.26)	540 (21.26)
Width	mm (inch)	500 (19.69)	500 (19.69)	500 (19.69)	500 (19.69)	500 (19.69)	500 (19.69)	580 (22.83)	580 (22.83)	700 (27.56)	700 (27.56)	700 (27.56)
Depth	mm (inch)	222 (8.74)	236 (9.29)	236 (9.29)	236 (9.29)	236 (9.29)	236 (9.29)	248 (9.76)	248 (9.76)	265 (10.43)	265 (10.43)	265 (10.43)
Weight	kg (lb)	22 (48.50)	24 (52.91)	25.5 (56.22)	25.5 (56.22)	26.5 (58.42)	26.5 (58.42)	37.5 (82.67)	37.5 (82.67)	48.5 (106.92)	48.5 (106.92)	48.5 (106.92)
Cooling principle - convection		✓	✓	–	–	–	–	–	–	–	–	–
Cooling principle - regulated fans		–	–	✓	✓	✓	✓	✓	✓	✓	✓	✓
Max. air throughput	m^3/h	–	–	84	84	84	84	2x48	2x48	2x84	2x84	2x84
Max. noise emission	dBA	<33	43	52	52	52	52	43	44	56	56	56
Ambient temperature	°C (°F)	-20 ... 60 (-4 ... 140)										
Max. operating altitude above sea level	m (ft)	2000 (6562)	2000 (6562)	2000 (6562)	2000 (6562)	2000 (6562)	2000 (6562)	2000 (6562)	2000 (6562)	2000 (6562)	2000 (6562)	2000 (6562)
Relative humidity (condensing)	%	4 … 100	4 … 100	4 … 100	4 … 100	4 … 100	4 … 100	4 … 100	4 … 100	4 … 100	4 … 100	4 … 100
Connection technology on input side		MC 4	MC 4	MC 4	MC 4	MC 4	MC 4	SUNCLIX	SUNCLIX	SUNCLIX	SUNCLIX	SUNCLIX
Connection technology on output side - spring-loaded terminal strip		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

PIKO inverter	Unit	3.0	4.2	4.6	5.5	7.0	8.5	10	12	15	17	20
Interfaces												
Ethernet RJ45		2	2	2	2	2	2	2	2	2	2	2
RS485		1	1	1	1	1	1	1	1	1	1	1
S0-Bus		1	1	1	1	1	1	1	1	1	1	1
Analog inputs		4	4	4	4	4	4	4	4	4	4	4
PIKO BA Sensor interface		–	1	1	1	1	1	1	1	1	1	1
PIKO BA Sensor												
Primary rated current (peak/RMS)	A	–	50/35	50/35	50/35	50/35	50/35	50/35	50/35	50/35	50/35	50/35
Secondary rated current	A	–	1	1	1	1	1	1	1	1	1	1
Ext. current sensor transmission ratio		–	50:1	50:1	50:1	50:1	50:1	50:1	50:1	50:1	50:1	50:1
Accuracy class		–	1	1	1	1	1	1	1	1	1	1
Connected power	KW	–	27	27	27	27	27	34.5	34.5	34.5	34.5	34.5
Dimensions (H x W x D)	mm (inch)	–	90 x 105 x 54 (3.5 x 4.1 x 2.1)	90 x 105 x 54 (3.5 x 4.1 x 2.1)	90 x 105 x 54 (3.5 x 4.1 x 2.1)	90 x 105 x 54 (3.5 x 4.1 x 2.1)	90 x 105 x 54 (3.5 x 4.1 x 2.1)	90 x 105 x 54 (3.5 x 4.1 x 2.1)	90 x 105 x 54 (3.5 x 4.1 x 2.1)	90 x 105 x 54 (3.5 x 4.1 x 2.1)	90 x 105 x 54 (3.5 x 4.1 x 2.1)	90 x 105 x 54 (3.5 x 4.1 x 2.1)
Max. line diameter	mm (inch)	–	13.5 (0.5)	13.5 (0.5)	13.5 (0.5)	13.5 (0.5)	13.5 (0.5)	13.5 (0.5)	13.5 (0.5)	13.5 (0.5)	13.5 (0.5)	13.5 (0.5)
Installation on top-hat rail according to EN 60715		–	TH35	TH35	TH35	TH35	TH35	TH35	TH35	TH35	TH35	TH35

[1] Overvoltage category II (DC input) The device is suitable for connection to PV strings. Long feed cables out of doors or a lightning protection system in the vicinity of the PV system may make lightning protection or surge protection equipment necessary.

[2] Overvoltage category III (AC output): The device is suitable for permanent connection in the grid distribution behind the meter and the line protection fuse. When the connection line travels outdoors over long distances, overvoltage protection devices may be necessary.

[3] Contamination degree 4: Contamination results in continuous conductivity, e.g. due to conductive dust, rain or snow; indoors or outdoors.

[4] In the case of symmetrical DC feed-in, strings of the same length are connected to the inverter. In the case of unsymmetrical DC feed-in, strings of varying lengths are connected to the inverter.

[5] Disconnection device to VDE V 0126-1-1, for Austria: The inverter is equipped "With automatic disconnection device in accordance with ÖVE/ÖNORM E 8001-4-712".

[6] It is essential to ensure that with parallel connection the maximum current load of the DC plugs is not exceeded (max. 30 A). This could result in damage to the device. If the DC string input current is higher than the maximum plug load (see manufacturer's information), both DC inputs should be used.