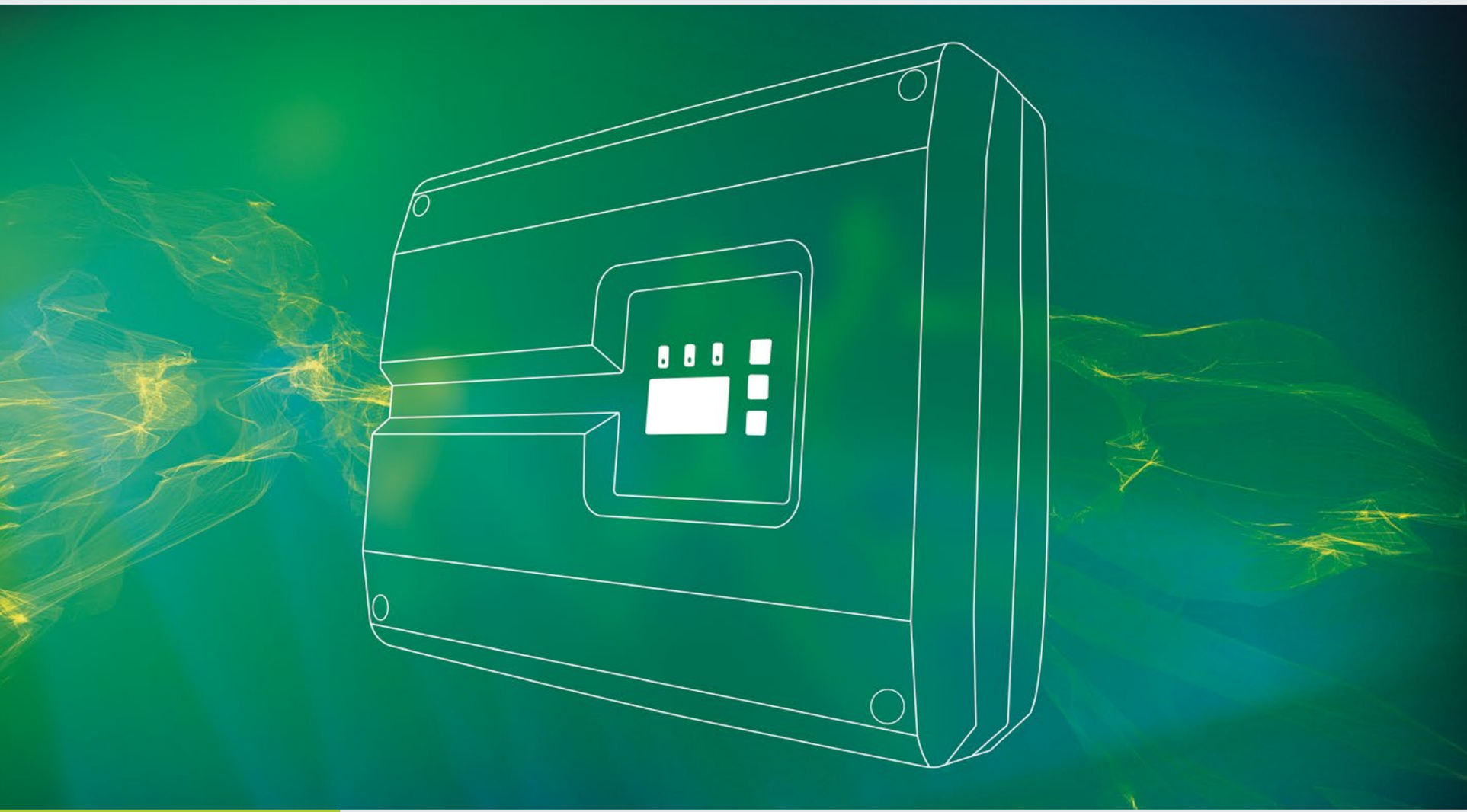
SOLAR ELECTRIC

KOSTAL



Smart connections.

Short Manual

PIKO Inverter 3.0 - 20

EU Declaration of conformity

The company

KOSTAL Solar Electric GmbH
Hanferstraße 6
79108 Freiburg i. Br.
Germany

hereby declares that the inverter **PIKO 3.0** **starting from FW 5.0** to which this declaration refers, conforms to the following guidelines and standards.

European Standards including relevant amendments

EN 61000-3-2:2006 / A1:2009 / A2:2009 (Harmonic currents)

EN 61000-3-3:2013 (Flicker)

EN 61000-6-2:2005 / AC:2005
(Interference resistance for industrial environments)

EN 61000-6-3:2007 / A1:2011
(Interference emission for domestic environments)

EN 62109-1: 2010 (safety of power converters Part 1)

EN 62109-2: 2011 (safety of power converters Part 2)

Directive 2011/65/EU (RoHS) on the restriction of the use of certain hazardous substances

Directive 2004/108/EC Electromagnetic compatibility

Directive 2006/95/EC Electrical Apparatus Low Voltage Directive

Application of the CE marking in accordance with Appendix III, Section B:2013

KOSTAL Solar Electric GmbH – 2015-01-01

Werner Palm (Managing Director) Armin von Preetzmann (Development Manager)

This declaration applies to all identical copies of this product.

This declaration loses its validity if the device is modified or incorrectly connected.

This declaration certifies compliance with the mentioned regulations but does not ensure the properties.

The safety instructions in the product documentation provided must be observed!

EU Declaration of conformity

The company

KOSTAL Solar Electric GmbH
Hanferstraße 6
79108 Freiburg i. Br.
Germany

hereby declares that the inverter **PIKO 4.2, 4.6, 5.5, 7.0, 8.5**
starting from FW 5.0 to which this declaration refers, conforms to the following guidelines and standards.

European Standards including relevant amendments

EN 61000-3-2:2006 / A1:2009 / A2:2009 (Harmonic currents)

EN 61000-3-3:2013 (Flicker)

EN 61000-6-2:2005 / AC:2005
(Interference resistance for industrial environments)

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Application of the CE marking in accordance with Appendix III, Section B:2013

KOSTAL Solar Electric GmbH – 2015-06-30

Werner Palm (Managing Director)

Armin von Preetzmann (Development Manager)

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EU Declaration of conformity

The company

KOSTAL Solar Electric GmbH
Hanferstraße 6
79108 Freiburg i. Br.
Germany

hereby declares that the inverter **PIKO 10, 12 starting from FW 5.0** to which this declaration refers, conforms to the following guidelines and standards.

European Standards including relevant amendments

EN 61000-3-2:2006 / A1:2009 / A2:2009 (Harmonic currents)

EN 61000-3-3:2013 (Flicker)

EN 61000-3-11:2005 (Flicker)

EN 61000-3-12:2011 (Harmonic currents)

EN 61000-6-2:2005 / AC:2005
(Interference resistance for industrial environments)

EN 61000-6-3:2007 / A1:2011
(Interference emission for domestic environments)

EN 62109-1: 2010 (safety of power converters Part 1)

EN 62109-2: 2011 (safety of power converters Part 2)

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KOSTAL Solar Electric GmbH – 2015-01-01

Werner Palm (Managing Director)

Armin von Preetzmann (Development Manager)

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EU Declaration of conformity

The company

KOSTAL Solar Electric GmbH
Hanferstraße 6
79108 Freiburg i. Br.
Germany

hereby declares that the inverter **PIKO 15, 17, 20 starting from FW 5.0** to which this declaration refers, conforms to the following guidelines and standards.

European Standards including relevant amendments

EN 61000-3-2:2006 / A1:2009 / A2:2009 (Harmonic currents)

EN 61000-3-11:2005 (Flicker)

EN 61000-3-12:2011 (Harmonic currents)

EN 61000-6-2:2005 / AC:2005
(Interference resistance for industrial environments)

EN 61000-6-3:2007 / A1:2011
(Interference emission for domestic environments)

EN 62109-1: 2010 (safety of power converters Part 1)

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KOSTAL Solar Electric GmbH – 2015-01-01

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This declaration applies to all identical copies of this product.

This declaration loses its validity if the device is modified or incorrectly connected.

This declaration certifies compliance with the mentioned regulations but does not ensure the properties.

The safety instructions in the product documentation provided must be observed!

Proper use

The PIKO Inverter converts DC current into AC current.

The current can be used for the following:

- for consumption
- for feeds into the public mains grid

The unit may only be used in grid-connected photovoltaic systems within the permissible power range and under the permissible environmental conditions. The device is not intended for mobile use.

Inappropriate use can be hazardous and lead to injury or even death of the user or third parties. Material damage to the device and other equipment can also occur. The inverter may therefore only be used for its intended purpose.

Additional User Information

For additional information, please read the complete operation manual on the CD.

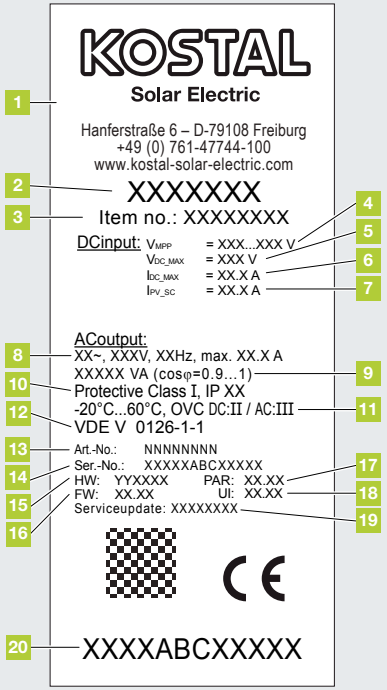
Exclusion of liability

Any use that differs from or goes beyond the stated intended purpose is considered inappropriate. The manufacturer accepts no liability for any damage resulting from this. Modifications to the inverter are prohibited. The inverter may only be used if safe to operate and in technically perfect condition. Any instance of misuse will cause the termination of the warranty, guarantee and general liability of the manufacturer.

Only a qualified electrician may open the device. The inverter must be installed by an electrician who is responsible for observing the applicable standards and regulations. Work that could affect the electrical power system of the respective utility company at the site of the solar energy feed-in may only be carried out by qualified electricians expressly authorised (licensed) by the utility company.

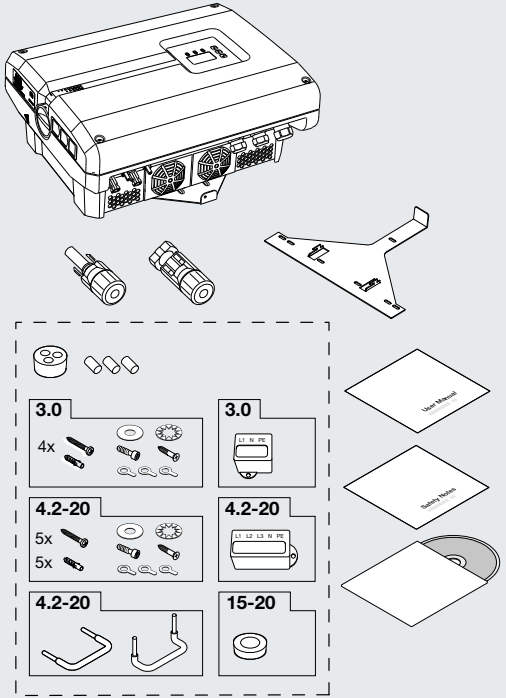
This includes changes to the factory preset parameters. The installer must always observe the regulations of the utility company. The utility company‘s specifications must always be observed when setting the parameters.

Type plate



1. Name and address of manufacturer
2. Device type
3. Item number
4. MPP control range
5. Maximum DC input voltage
6. Maximum DC input current
7. Maximum DC short circuit current
8. Number of feed-in phases, Output voltage (nominal), Output frequency, Maximum AC output current
9. Maximum AC power
10. Protective class to IEC 62103, Protection type and ambient
11. Temperature range, overvoltage category
12. Requirements conforming to those of the built-in grid monitoring
13. Internal item number
14. Serial number
15. Version of hardware
16. Version of firmware
17. Version of parameter set
18. Version of user interface
19. Date of the last update
20. Removable guarantee label

Scope of delivery



Selecting the installation side

NOTE
Observe the following instructions, or else warranty claims will be restricted.

Protect from rain and water.

Protect from direct sunlight.

Protect from falling parts.

Protect from dust, contamination and ammonia.

Select non-flammable installation location.

Select stable installation location.
No plasterboard or wooden walls.

Maintain safe distance from flammable materials or areas at risk of explosion.

Select vertical installation location.
Use the included wall bracket.

Required cooling space is 200 mm vertical and 100 mm horizontal.

Ambient temperature must be between -20 °C and +60 °C.
Air humidity must be between 4 % and 100 % (condensing).

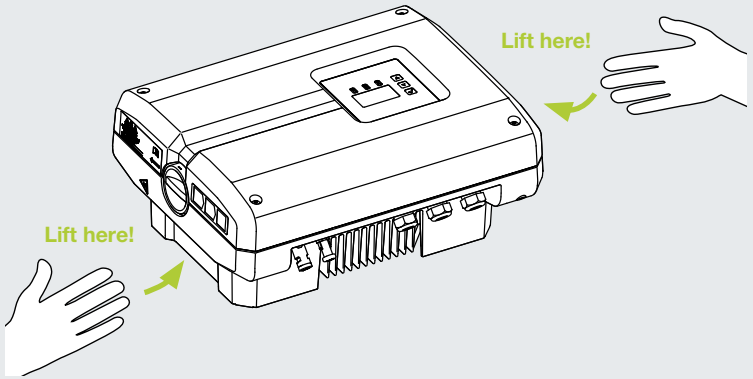
Prevent access by children.

Ensure easy access and visible display.

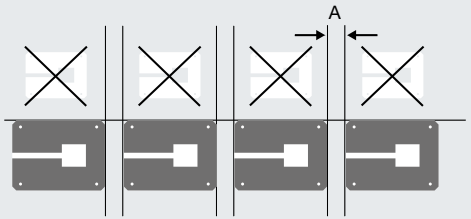
Ensure that people are not disturbed by operating noise.

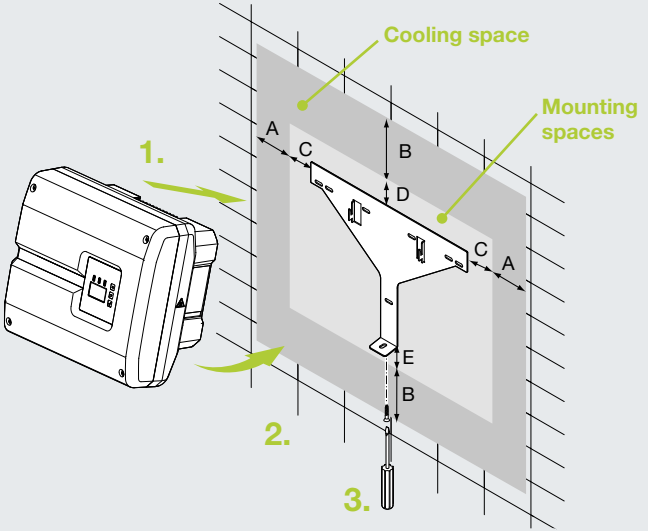
Installation

To lift the inverter



To install several inverters





Inverter Type — **Measures in mm (inch)**

	A	B	C	D	E
PIKO 3.0, 4.2 - 8.5	100 (3.9)	200 (7.9)	60 (2.4)	70 (2.8)	2 (0.1)
PIKO 10 - 12	100 (3.9)	200 (7.9)	66 (2.6)	35 (1.4)	2 (0.1)
PIKO 15 - 20	100 (3.9)	200 (7.9)	76 (2.99)	46 (1.8)	2 (0.1)

Connecting AC and DC side

LEBENSGEFAHR DURCH STROMSCHLAG!
Wechselrichter spannungsfrei schalten.

RISK OF DEATH DUE TO ELECTRICAL SHOCK!
De-energise the inverter.

DANGER DE MORT PAR ÉLECTROCUTION !
Mettre l'onduleur hors tension.

¡PELIGRO DE MUERTE DEBIDO A ELECTROCUCIÓN!
Desconectar el inversor de la tensión.

PERIGO DE MORTE DEVIDO A CHOQUE ELÉTRICO!
Desligar a tensão de corrente do inversor.

PERICOLO DI MORTE PER SCOSSA ELETTRICA!
Eliminare la tensione dall'inverter.

LIVSFARE PGA. ELEKTRISK STØD!
Vekselstrømsomformeren skal kobles fra spændingen.

LEVENSGEVAAR DOOR ELEKTRISCHE SCHOK!
Schakel de omvormer spanningsvrij.

OHROŽENÍ ŽIVOTA ELEKTRICKÝM PROUDEM!
Odpojte střídač od napětí.

PERICOL DE ELECTROCUTARE!
Scoateți ondulorul de sub tensiune.

SMRTNA NEVARNOST ZARADI ELEKTRIČNEGA UDARA!
Razsmernik odklopite iz električne napetosti.

NEBEZPEČENSTVO OHROZENIA ŽIVOTA ZÁSAHOM ELEKTRICKÉHO PRÚDU!
Menič prepnite do beznapäťovej prevádzky.

ELEKTRIK ÇARPMASI NEDENIYLE HAYATI TEHLIKE!
İnvertörü gerilimsiz hale getirin.

ΚΙΝΔΥΝΟΣ ΘΑΝΑΤΟΥ ΑΠΟ ΗΛΕΚΤΡΟΠΛΗΞΙΑ!
Αποσυνδέστε τον αντιστροφέα από το ρεύμα.

ОПАСНОСТ ЗА ЖИВОТА ПОРАДИ ТОКОВ УДАР.
Изключвайте инвертора от напрежението.

LIVSFARA PÅ GRUND AV ELEKTRISK STÖT!
Koppla växelriktaren spänningsfri.

ZAGROŻENIE ŻYCIA PRZEZ PORAŻENIE PRĄDEM!
Odłączyć falownik od zasilania.

ELEKTRILÖÖGI OHT!
Lahutage vaheldi vooluvõrgust.

PAVOJUS GYVYBEI DĖL ELEKTROS SROVĖS SMŪGIO!
Inverteriui nutraukite įtampos tiekimą.

ELEKTRISKĀS STRĀVAS TRIECIENA BRIESMAS!
Atslēgt invertoru no strāvas.

OPASNOST PO ŽIVOT OD STRUJNOG UDARA!
Isključiti izmjenjivač.

OPASNOST PO ŽIVOT ZBOG STRUJNOG UDARA!
Isključiti izmjenjivač.

OPASNOST PO ŽIVOT USLIJED STRUJNOG UDARA!
Izmjenjivač isključite sa naponskog napajanja.

OPASNOST PO ŽIVOT USLED STRUJNOG UDARA!
Izmenjivač isključite sa naponskog napajanja.

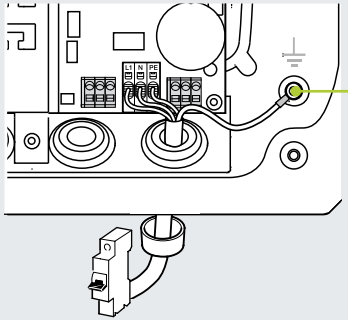
De-energising inverter:

1. Switch off DC side at Inverter
2. Switch off
   - AC side
   - S0/AL-Out
3. Safeguard
4. Disconnect DC side
5. Wait 5 minutes

Connecting AC and DC side

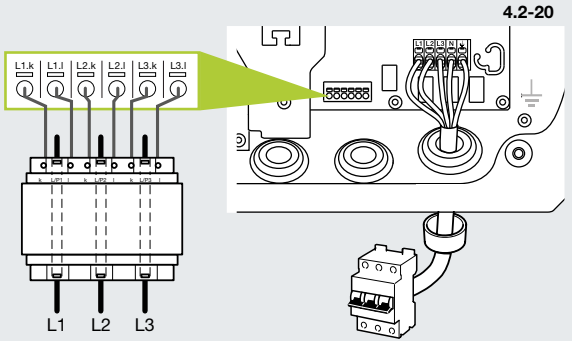
Connecting AC side and current sensor

3.0

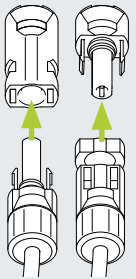


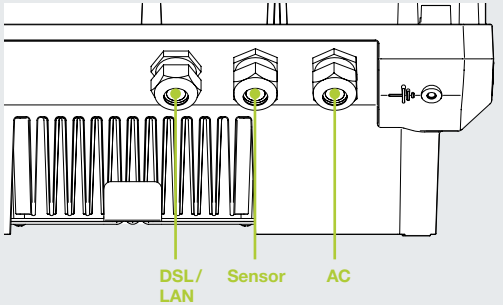
Second ground connection inside or outside is mandatory for PIKO 3.0

4.2-20



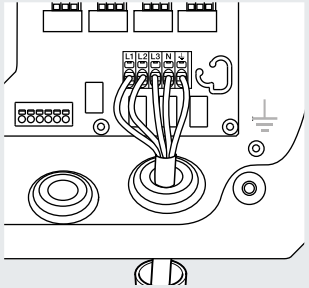
Connecting DC side

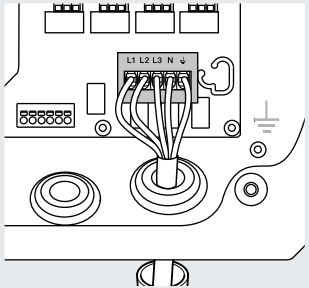




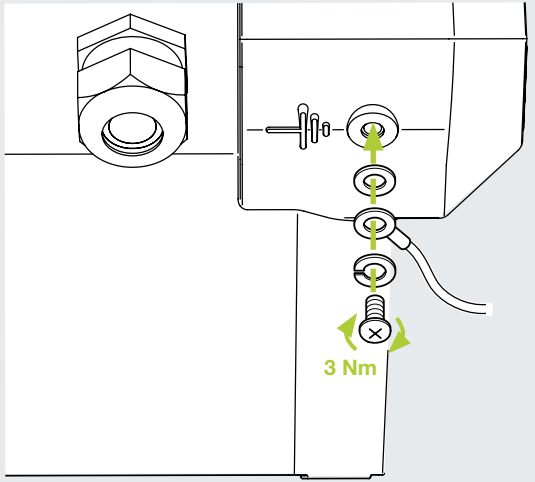
Country-specific installation

Connecting main cable with sealing cap



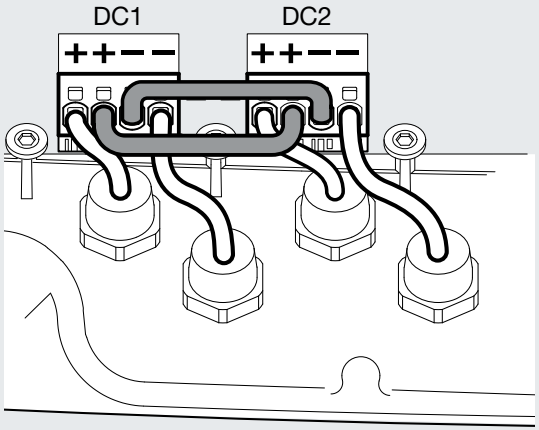


Second ground connection



NOTE
For PIKO 3.0 the second ground connection inside or outside is mandatory.

Option: Connecting DC1 & DC2 in parallel

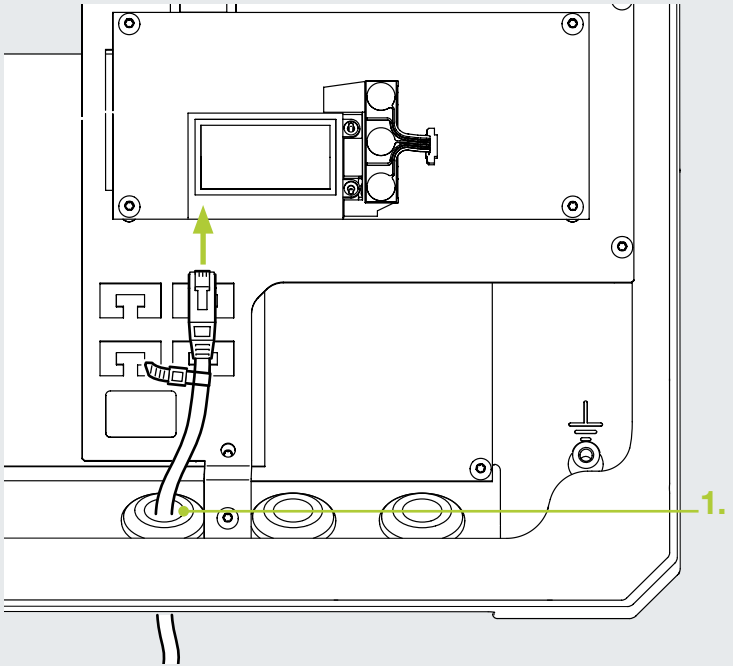


NOTE
For PIKO 3.0 and 4.2 the parallel connection is not possible.

NOTE
When using the parallel connection this feature must be activated under the menue Settings >> Hardware settings >> String connection >> Parallel connection.

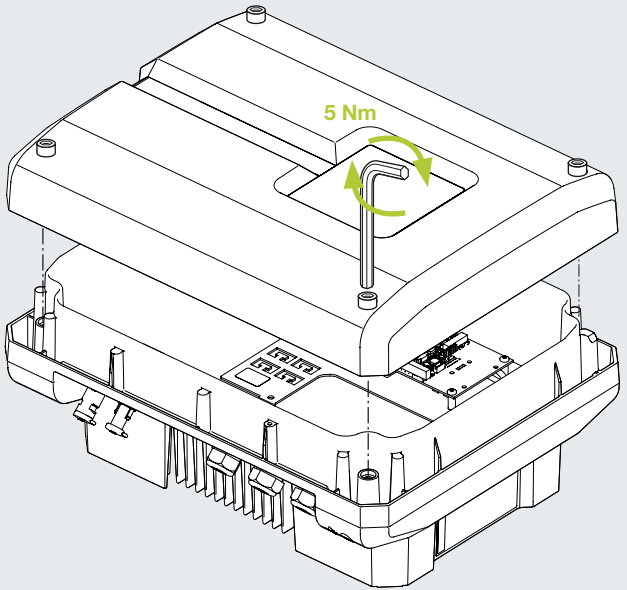
Data transfer communication board II

DSL or LAN

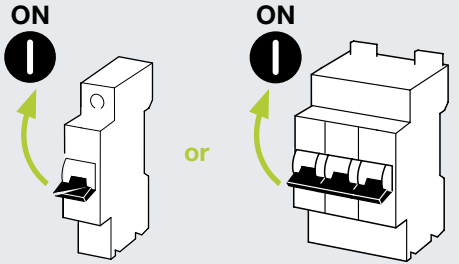


Commissioning the inverter

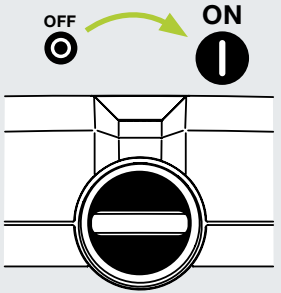
1.



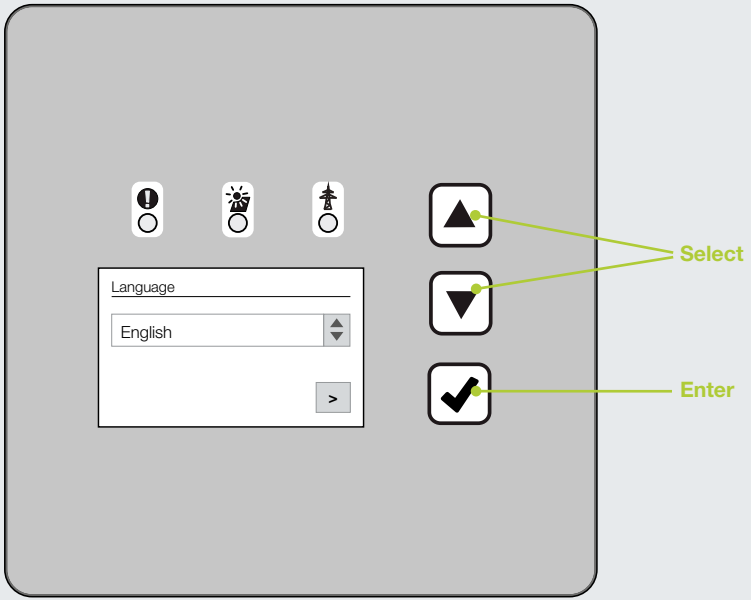
2.

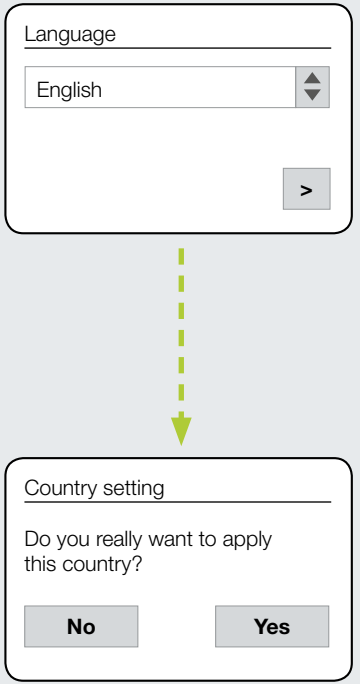


3.



Installation Assistent*





1. Select language
2. Enter
3. Enter Date / time
4. Enter
5. Select string connection
6. Enter
7. Select modus of the current sensor
8. Enter
9. Select country
10. Enter
11. Confirm Country settings with YES
12. Enter

*Deviations due to software versions (UI level) is possible.

Menu overview*

DC menu

AC menu

Settings menu

Self consumption menu

* Depending on the inverter type and software version of the communication board, the menu may differ.

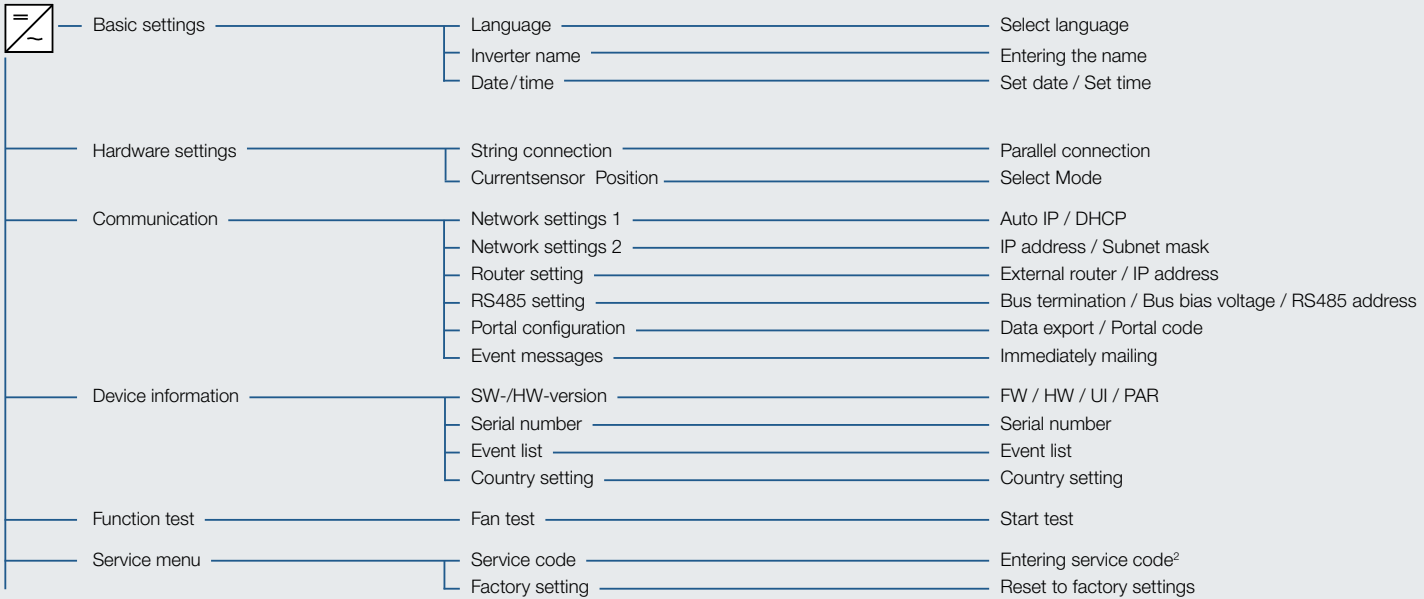
DC menu

- DC input 1 (V, I, P)
- DC input 2 (V, I, P)
- DC input 3 (V, I, P)

AC menu

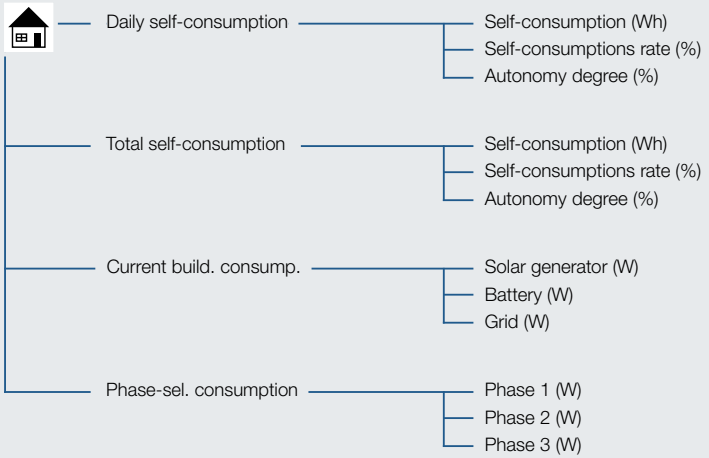
- Phase 1 (V, I, P)
- Phase 2 (V, I, P)
- Phase 3 (V, I, P)
- Yield
  - Power (W)
  - Daily yield (kWh)
  - Total yield (kWh)
- Grid parameters
  - Limitation on (%)
  - Grid frequency (Hz)
  - cos phi
- Daily yield (diagram)
- Monthly yield (diagram)
- Annual yield (diagram)
- Total yield (diagram)

Settings menu[1]



[1] Variations due to software versions (UI level) are possible.
[2] After entering the code, additional menu items appear to configure the inverter.
The code can be obtained by electricians from our customer service.

Own consumption menu



Technical data PIKO 3.0-8.5*

*This manual is subject to technical changes and printing errors. You can find current information on our website www.kostal-solar-electric.com.

PIKO Inverter Inverter	Unit	3.0	4.2	4.6	5.5	7.0	8.5
Input side (DC)							
Inverter type		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
MPP range with rated DC power (sym)	V	270-730	400-800	265-800	265-800	330-800	400-800
MPP range with rated DC power (unsym)	V	–	400-800	265-800	265-800	330-800	400-800
Max. input voltage (V_{DCmax})	V	900	1000	1000	1000	1000	1000
Min. input voltage (V_{DCmin})	V	160	160	160	160	160	160
Rated input current	A	12	6.33	7.35	8.3	10.56	12.9
Max. input current (I_{DCmax})	A	12.5	11	11	11	11	11
Max. input current with parallel connection[1]	A	–	–	22	22	22	22
Number of DC inputs		1	1	2	2	2	2
Number of independent MPP trackers		1	1	2	2	2	2
Output side (AC)							
Rated output, cos φ = 1 ($P_{AC,r}$)	kW	3	4.2	4.6	5.5	7.0	8.5
Max. output apparent power, cos $\varphi_{,adj}$	kVA	3	4.2	4.6	5.5	7.0	8.5
Rated output current	A	13	6.1	6.7	8.0	10.2	12.3
Max. output current (I_{ACmax})	A	13.7	6.1	6.7	8.0	10.2	12.5
Short circuit current / peak	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

PIKO Inverter Inverter	Unit	3.0	4.2	4.6	5.5	7.0	8.5
Output side (AC)							
Number of feed-in phases		1	3				
Grid connection		1N~, AC, 230 V	3N~, AC, 400 V				
Rated frequency (f_r)	Hz	50	50				
Efficiencies							
Max. efficiency	%	96.2	97.5	97.7	97.7	97.6	97.6
Max. European efficiency rate	%	95.5	96.1	96.3	96.3	96.5	96.5
System data							
Topology: without galvanic separation - transformerless		✓					
Internal protection according to IEC 60529 housing / fan		IP 65 / IP 55					
Protective class according to IEC 62103		I					
Overvoltage category according to IEC 60664-1 Input side (PV generator)		II					
Overvoltage category according to IEC 60664-1 Output side (grid connection)		III					
Pollution Degree		4					
Enviromental category (outdoor installation)		✓					
Enviromental category (interior installation)		✓					
UV resistance		✓					

PIKO Inverter Inverter	Unit	3.0	4.2	4.6	5.5	7.0	8.5
System data							
Minimum cable cross-section of AC connecting line	mm^2	2.5	1.5	1.5	1.5	2.5	2.5
Minimum cable cross-section of DC connecting line	mm^2	4					
Max. fusing on output side		B16, C16	B16, C16	B16, C16	B16, C16	B16, C16	B16, C16
Tightening torque of PE connection, outer	Nm	3					
Tightening torque of lid screws	Nm	5					
Operator protection according to EN 62109-2		RCCB type B					
Electronic disconnection device integrated		✓					
Height	mm (in)	385 (15.2)	385 (15.2)	385 (15.2)	385 (15.2)	385 (15.2)	385 (15.2)
Width	mm (in)	500 (19.7)	500 (19.7)	500 (19.7)	500 (19.7)	500 (19.7)	500 (19.7)
Depth	mm (in)	222 (8.7)	236 (9.29)	236 (9.29)	236 (9.29)	236 (9.29)	236 (9.29)
Weight	kg (lb)	22 (48.5)	24 (52.91)	25,5 (56.22)	25,5 (56.22)	26,5 (58,42)	26,5 (58,42)
Max. air throughput	m^3/h	–	–	84	84	84	84
Max. noise emission	dBA	< 33	43	52	52	52	52
Ambient temperature	°C (F°)	-20...60 (-4...140)					
Max. installation altitude	m above sea level	2000					
Relative humidity (condensing)	%	4…100					
Connection technology at input side – MC 4		✓					
Connection technology at output side – spring-loaded terminal strip		✓					

PIKO Inverter Inverter	Unit	3.0	4.2	4.6	5.5	7.0	8.5
Various							
Warranty	Years	5					
Warranty extension optional	Years	10/20					
Ext. current sensor (MBS ASRD 14)							
Rated current primary (Peak/RMS)	A	–	50/35				
Precision method		–	1				
Connected power PIKO	kW		27				
Dimensions (H x W x D)	mm (in)	–	90 x 105 x 54 (3.5 x 4.1 x 2.1)				
Max. cable diameter	mm (in)	–	13.5 (0.5)				
Mounting on top hat rail to DIN EN 60715		–	✓				

[1] It is important that the maximum current load of the DC connector will not be exceeded in a parallel circuit (max. 30 A). This could lead to damage of the device. If the DC string input current is higher than the maximum current load of the plug (see manufacturer's instructions), both DC inputs must be used.

Technical data PIKO 10-20*

*This manual is subject to technical changes and printing errors. You can find current information on our website www.kostal-solar-electric.com.

PIKO Inverter Inverter	Unit	10	12	15	17	20
Input side (DC)						
Inverter type		PIKO	PIKO	PIKO	PIKO	PIKO
Max. PV power (cos φ = 1)	kWp	10.8	12.9	16.9	19.2	22.6
MPP range with rated DC power (sym)	V	290-800	345-800	260-800	290-800	345-800
MPP range with rated DC power (unsym)	V	String 1: 390-800 (max. 20A) String 2: 250-800 (max.10A)	String 1: 490-800 (max. 20A) String 2: 250-800 (max.10A)	String 1&2: 325-800 (max.20A) String 3: 250-800 (max.10A)	String 1&2: 375-800 (max. 20A) String 3: 250-800 (max.10A)	String 1&2: 450-800 (max.20A) String 3: 250-800 (max.10A)
Max. input voltage (V_{DCmax})	V	1000				
Min. input voltage (V_{DCmin})	V	160				
Rated input current	A	15.1	18.1	22.74	25.77	30.32
Max. input current (I_{DCmax})	A	sym: 18/18, unsym: 20/10	sym: 18/18, unsym: 20/10	sym.: 20/20/20 unsym.: 20/20/10	sym.: 20/20/20 unsym.: 20/20/10	sym.: 20/20/20 unsym.: 20/20/10
Max. input current with parallel connection[1]	A	36 (DC1+DC2)	36 (DC1+DC2)	40 (DC1+DC2) / 20 (DC3)	40 (DC1+DC2) / 20 (DC3)	40 (DC1+DC2) / 20 (DC3)
Number of DC inputs		2	2	3	3	3
Number of independent MPP trackers		2	2	3	3	3
Output side (AC)						
Rated output, cos φ = 1 ($P_{AC,r}$)	kW	10	12	15	17	20
Max. output apparent power, cos $\varphi_{,adj}$	kVA	10	12	15	17	20

PIKO Inverter Inverter	Unit	10	12	15	17	20
Output side (AC)						
Rated output current	A	14.6	17.4	21.7	24.6	29
Max. output current (I_{ACmax})	A	16.2	19.3	24.2	27.4	32.2
Short circuit current / peak	A	25/16.6	27.4/16.7	42/28.5	41.3/29	51/36.5
Number of feed-in phases		3				
Grid connection		3N~, AC, 400V				
Rated frequency (f_r)	Hz	50				
Efficiencies						
Max. efficiency	%	97.7	97.7	98.0	98.0	98.0
Max. European efficiency rate	%	97.1	97.1	97.2	97.3	97.3
System data						
Topology: without galvanic separation - transformerless		✓				
Internal protection according to IEC 60529 housing / fan		IP 65 / IP 55				
Protective class according to IEC 62103		I				
Overvoltage category according to IEC 60664-1 Input side (PV generator)		II				
Overvoltage category according to IEC 60664-1 Output side (grid connection)		III				
Pollution Degree		4				

PIKO Inverter Inverter	Unit	10	12	15	17	20
System data						
Enviromental category (outdoor installation)				✓		
Enviromental category (interior installation)				✓		
UV resistance				✓		
Minimum cable cross-section of AC connecting line	mm^2	4	4	6	6	6
Minimum cable cross-section of DC connecting line	mm^2			4		
Max. fusing on output side		B25, C25	B25, C25	B32, C32	B32, C32	B40, C40
Tightening torque of PE connection, outer	Nm			3		
Tightening torque of lid screws	Nm			5		
Operator protection according to EN 62109-2				RCCB type B		
Electronic disconnection device integrated				✓		
Height	mm (in)	445 (17.5)	445 (17.5)	540 (21.26)	540 (21.26)	540 (21.26)
Width	mm (in)	580 (22.8)	580 (22.8)	700 (27.56)	700 (27.56)	700 (27.56)
Depth	mm (in)	248 (9.8)	248 (9.8)	265 (10.43)	265 (10.43)	265 (10.43)
Weight	kg (lb)	37.5 (82.7)	37.5 (82.7)	48.5 (106.92)	48.5 (106.92)	48.5 (106.92)
Max. air throughput	m^3/h	2x48	2x48	2x84	2x84	2x84
Max. noise emission	dBA	43	44	56	56	56
Ambient temperature	°C (F°)			-20...60 (-4...140)		
Max. installation altitude	m above sea level			2000		
Relative humidity (condensing)	%			4…100		

PIKO Inverter Inverter	Unit	10	12	15	17	20
System data						
Connection technology at input side – MC 4				✓		
Connection technology at output side – spring-loaded terminal strip				✓		
Various						
Warranty	Years			5		
Warranty extension optional	Years			10/20		
Ext. current sensor (MBS ASRD 14)						
Rated current primary (Peak/RMS)	A			50/35		
Precision method				1		
Connected power PIKO	kW			34.5		
Dimensions (H x W x D)	mm (in)			90 x 105 x 54 (3.5 x 4.1 x 2.1)		
Max. cable diameter	mm (in)			13.5 (0.5)		
Mounting on top hat rail to DIN EN 60715				✓		

[1] It is important that the maximum current load of the DC connector will not be exceeded in a parallel circuit (max. 30 A). This could lead to damage of the device. If the DC string input current is higher than the maximum current load of the plug (see manufacturer's instructions), both DC inputs must be used.

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KOSTAL

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[1] Language: German, English
[2] Language: Spanish, English
[3] Language: Turkish, English

Smart connections.

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