

Ingecon[®]uWind

TRANSFORMERLESS

2.5TL / 3TL / 3.3TL / 3.68TL / 3.8TL / 4.6TL / 5TL / 6TL



Inverter for small wind energy plants up to 6 kW

The **Ingecon[®]uWind** transformerless family of grid-connected inverters are designed to adapt the energy produced by wind turbines and deliver it to the electricity grid, being fully compliant with the regulations in force. This **Ingecon[®]uWind** transformerless inverter range can be adapted to suit a wide range of mini-wind turbine systems, operating between 2,500 W to 6,000 W.

Given the extensive variety of wind turbines on the market, grid-connected inverters must be able to adapt to the specific characteristic curves of each particular wind turbine, in order to permit maximum energy extraction and grid delivery at all times.

In addition to achieving constant maximum energy extraction, the new **Ingecon[®]uWind** transformerless guarantees the safety of the mini-wind system. Like the PV inverters, the **Ingecon[®]uWind** transformerless inverter range incorporates the communication and monitoring interfaces required for local or remote system surveillance.

The inverters are easy to install and are compliant with the regulations in force in the principal countries around the world.

Ingecon[®]Wind Interface

In order to deliver the energy produced by a mini-wind turbine to the grid, a grid-connected inverter is required. The alternating current (AC) voltage generated by a wind turbine presents variations in voltage and frequency which are determined by the wind turbine speed of rotation. The **Ingecon[®]Wind Interface** (IWI) converts this AC voltage to direct current (DC) whilst protecting the **Ingecon[®]uWind** transformerless from any abrupt voltage variations by discharging any excess energy produced into a discharge resistor, thereby protecting the system. The unit formed by the **Ingecon[®]uWind** transformerless and the IWI adapt the wind energy produced to the public grid connection requirements. The possibility of parameterising each particular wind turbine curve and measuring the wind turbine speed of rotation guarantees maximum energy extraction at each operating point, within a wide range of speeds of rotation.

Protections

The **Ingecon[®]uWind** transformerless inverters are equipped with the following electrical protections against:

- Reverse polarity.
- Input and output overvoltage.
- Output short-circuits and overloads.
- Insulation failures.
- Anti-islanding with automatic disconnection.
- Optional DC breaker.

Optional accessories

- Inter-inverter communication via RS-485, fibre optics, wireless or Ethernet.
- Modem for GSM/GPRS remote communication.
- **Ingecon[®]Sun Manager** software for parameter display and data recording.
- **IngeRAS[™]** for Internet data display.
- Analogue input card for the measurement of meteorological variables.
- Potential free relay for alarm signalling.

Ingecon[®]μWind

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Technical data

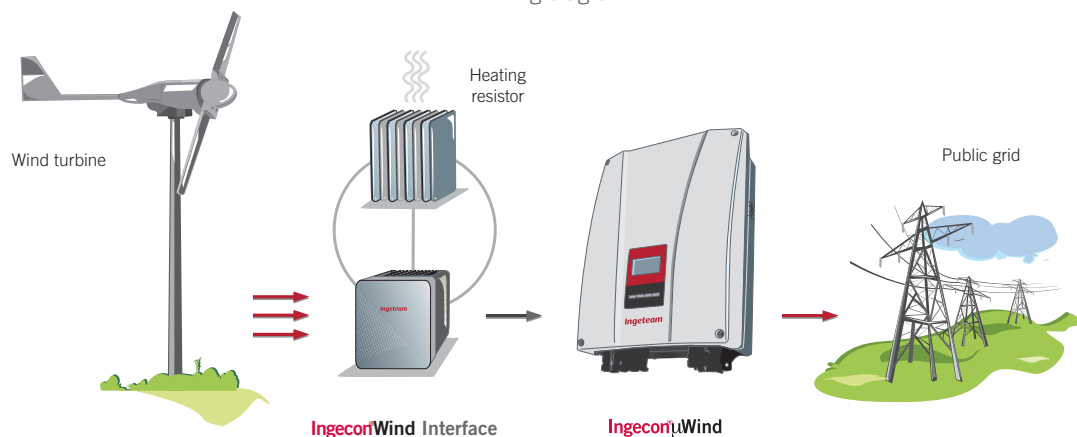
Model	Ingecon ^μ Wind 2.5TL	Ingecon ^μ Wind 3TL	Ingecon ^μ Wind 3.3TL	Ingecon ^μ Wind 3.68TL	Ingecon ^μ Wind 3.8TL	Ingecon ^μ Wind 4.6TL	Ingecon ^μ Wind 5TL	Ingecon ^μ Wind 6TL
Input (DC)								
Generator's voltage range for nominal power	160 - 450 V	195 - 450 V	155 - 450 V	175 - 450 V	140 - 450 V	145 - 450 V	160 - 450 V	190 - 450 V
Maximum voltage DC ⁽¹⁾	550 V	550 V	550 V	550 V	550 V	550 V	550 V	550 V
Maximum current DC	16 A	16 A	22 A	22 A	33 A	33 A	33 A	33 A
Output (AC)								
Rated power AC HT ⁽²⁾	2.5 kW	2.8 kW	3.3 kW	3.68 kW	3.6 kW	4.6 kW	5 kW	5.4 kW
Rated power AC HP ⁽³⁾	2.7 kW	3 kW	3.7 kW	3.68 kW	3.9 kW	5 kW	5.5 kW	6 kW
Maximum current AC	13 A	13.5 A	17 A	17 A	18.8 A	24.2 A	25.5 A	26.2 A
Rated voltage AC	230 V	230 V	230 V	230 V	230 V	230 V	230 V	230 V
Frequency AC	50 Hz	50 Hz	50 Hz	50 Hz	50 Hz	50 Hz	50 Hz	50 Hz
Phi Cosine ⁽⁴⁾	1	1	1	1	1	1	1	1
THD ⁽⁴⁾	3%	3%	3%	3%	3%	3%	3%	3%
Efficiency								
Maximum efficiency	96.6%	96.6%	96.8%	96.8%	97.0%	97.0%	97.0%	97.0%
Euroefficiency	95.0%	95.1%	95.2%	95.2%	95.6%	96.0%	96.1%	96.1%
General Information								
Stand-by consumption	<10 W	<10 W	<10 W	<10 W	<10 W	<10 W	<10 W	<10 W
Ambient temperature	-20°C to +70°C	-20°C to +70°C	-20°C to +70°C	-20°C to +70°C	-20°C to +70°C	-20°C to +70°C	-20°C to +70°C	-20°C to +70°C
Relative humidity	0 - 95%	0 - 95%	0 - 95%	0 - 95%	0 - 95%	0 - 95%	0 - 95%	0 - 95%
Protection class	IP65	IP65	IP65	IP65	IP65	IP65	IP65	IP65
Compliance with standards	EN 50178, VDE0126-1-1, G83/1, CEI 11-20, CEI 11-20 V1, CEI 0-16, RD 661/2007, RTC alle rete BT di Enel Distribuzione, CE Mark							

HT mode (high temperature) - Rated outputs at 45°C

HP mode (high power) - Rated outputs at 40°C

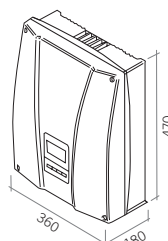
Notes: ⁽¹⁾ Must not be exceeded under any circumstances. Consider the voltage increase of the 'Voc' at low temperatures. ⁽²⁾ Up to 45°C ambient temperature, P_{max}= 110% P_{nom} for non permanent transients ⁽³⁾ Up to 40°C ambient temperature, P_{max} = P_{nom} ⁽⁴⁾ For P_{out} > 25% of the rated power.

Wiring diagram



Size and weight (mm)

Ingecon ^μ Wind 2.5TL / 3TL	18.3 kg.
Ingecon ^μ Wind 3.3TL / 3.68TL	19.7 kg.
Ingecon ^μ Wind 3.8TL / 4.6TL / 5TL / 6TL	23.3 kg.



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