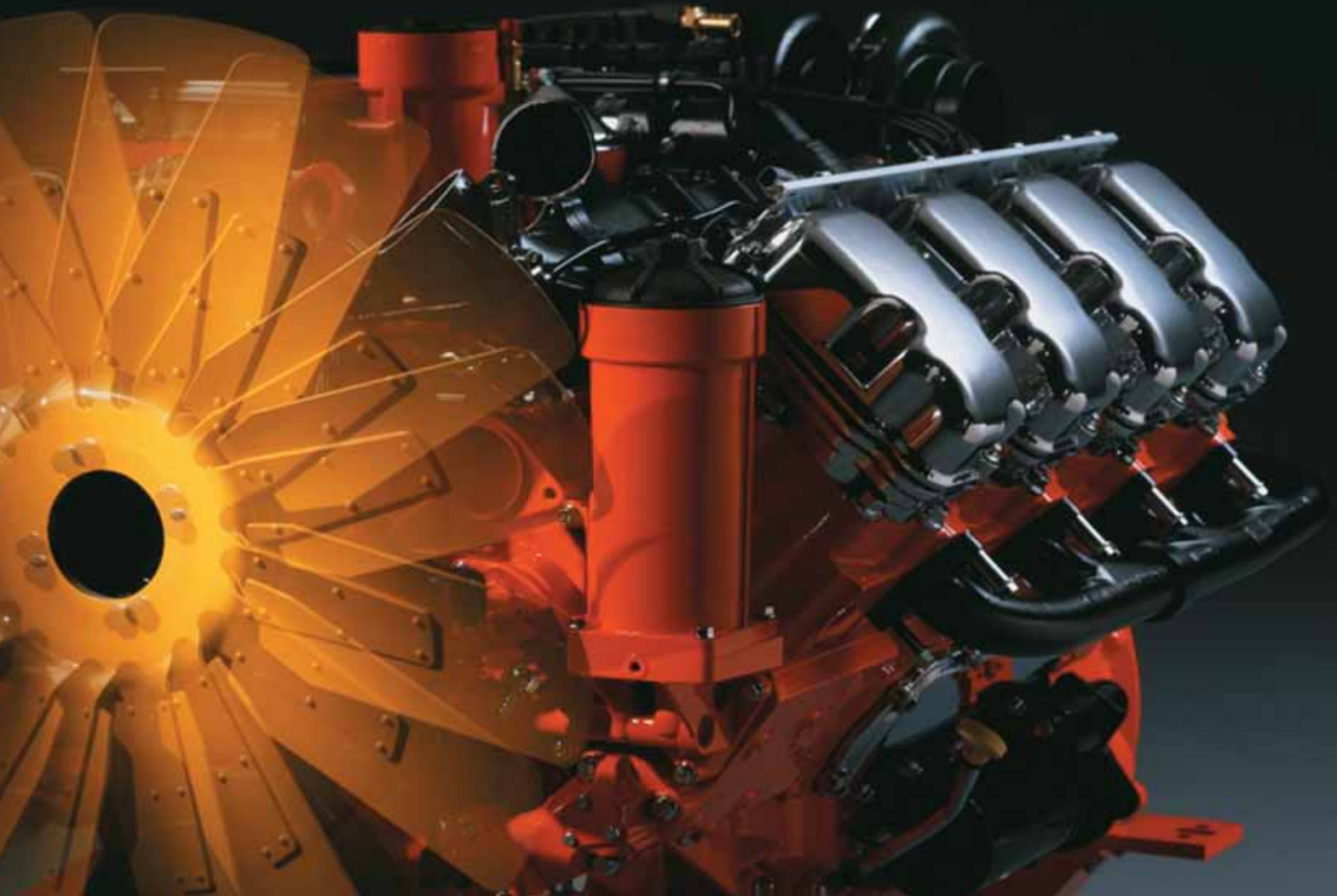


WÜRZ Energy –

We power the future.

Combined heat and power (CHP) units for vegetable oil, heating oil and natural gas



COGENERATION

PHOTOVOLTAICS

SOLAR THERMAL ENERGY

SERVICES



FRIEDHELM LOH GROUP

Heat and power – Technology for the future

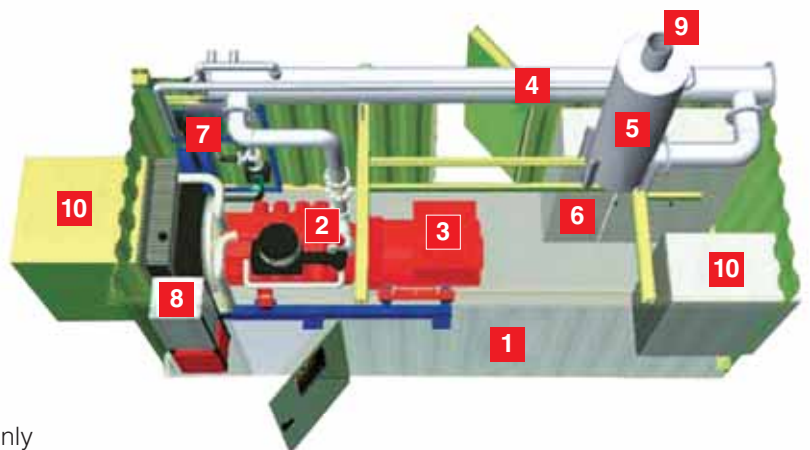
Würz CHP units work according to the principle of combined heat and power. They produce both current and heat at the same time – or cooling energy through conversion of the heat. Their base components are an engine and a power generator. The engine drives the power generator which produces power either for internal use or for distribution into the public grid. At the same time heat is dissipated by the running engine – within the cooling cycle of the engine (up to 90 °C) and in the exhaust fumes (up to 500 °C). This heat is put to use by heat exchangers and is utilised mostly for the heating or cooling of buildings.

As an experienced specialist in the development, project planning, manufacture and service of high-value CHP units we can deliver to you ready-to-connect solutions adapted to your power, heating and cooling needs. Our products range from small compact installations, through complete container solutions (also for mains-independent supply) up to linked, large installations with a modular design. We design, produce and deliver your system exactly as you need it. For example, with absorbers for cooling energy production (climate control) or additional modules for a reduction in reactive power, an increase in thermal power or for the stabilisation of the electrical power at extremely high external temperatures.

Take advantage of our experience and skills – in addition to our products we can provide support, where desired, in the form of site analysis, planning, project management, setting-up and commissioning in addition to round-the-clock service and maintenance of the CHP units.

Container configuration (example of a system powered by vegetable oil)

- 1 CHP container
- 2 Engine
- 3 Generator
- 4 Exhaust gas heat exchanger
- 5 Noise suppresser
- 6 Control and switching centre
- 7 Heating module (plate heat exchanger)
- 8 Fuel preparation module (FPM)
Tank heating and fuel preparation module is only needed if running with vegetable oil
- 9 Exhaust chimney
- 10 Air inlet and outlet connections





SOLAR THERMAL ENERGY

SERVICE

CHP units from WÜRZ

Efficient – reliable – profitable

Take action against

- Rising energy costs (electricity, oil, gas, etc.)
- Higher taxes (fuel, energy and possibly VAT)
- Increasing legal requirements: Energy conservation regulations, renewable energies legislation etc.

Take advantage of

- Greater security of supply (power and heat)
- A positive image through active environmental protection by the use of renewable energies
- The benefits of being your own “power generator”
- Subsidies from the state (loans, cogeneration bonus, renewable energy bonus, etc.)
- Income through the sale of power and heat

WÜRZ offers

- CHP units which can be operated using vegetable oil, heating oil, natural gas or bio-methane gas
- The design of a CHP unit according to your requirement profile
- Comprehensive advice on your CHP unit project
- Engineering services, such as planning and project management
- A CHP unit in container or compact versions
- CHP units in different output categories
- Connection to your supply grid
- Support for the installation around the clock and 365 days a year



Rittal in Herborn, Germany: 340 KW vegetable oil CHP unit with a Würz 36 m³ fuel tank.

Safety and service around the clock

A CHP unit is only useful when it is able to run – where possible all around the clock.

Würz creates the conditions for this. Our service team is connected to every CHP unit via a data link which transmits all the most important data regarding operation and the engine to our remote maintenance control centre. From there our service staff monitor, control and optimise your equipment.

The remote maintenance control centre is manned and accessible around the the clock. Our service engineers provide on-site support to keep the CHP unit running perfectly and, where necessary, carry out repairs.

Service services

Remote support service M1

Remote control comprises remote monitoring and remote diagnosis for your CHP unit 365 days a year and around the clock. Maintenance and repair advice is provided where needed by our service staff.

Maintenance service M2

In addition to remote control our staff also carry out the major servicing of the equipment (W3-W5)¹, including the exchange of worn and replacement parts.

Full repair service M3

In full repair, all forms of regular maintenance and repair work (W1-W5)² are carried out including the appropriate replacement parts. Additional parts are replaced after the given running time, such as the engine for instance.

Maintenance service M4

In addition to the full repair, maintenance service includes all replacement parts and repairs, even the replacement of the engine if necessary. Thus, maintenance service M5 ensures a high availability of the the plant.



¹ Major servicing of the equipment W3-W5: sophisticated maintenance work, such as setting valves on the engine

² Major servicing W1-W2: basic maintenance work, such as changing the engine oil

Vegetable oil CHP unit (renewable raw materials)

25 to 340 kW

| | WE-CG-025-V | WE-CG-050-V | WE-CG-100-V | WE-CG-150-V | WE-CG-200-V | WE-CG-250-V | WE-CG-333-V | WE-CG-340-V |
|---|--------------------------|---------------------------------------|--------------------------------|--------------------------------|--------------------------------|--------------------------------|--------------------------------|--------------------------------|
| Engine | Kubota | IVECO | Deutz | Scania | Scania | Scania | Scania | Scania |
| Cylinders | 4 in line | 4 in line | 6 in line | 6 in line | 6 in line | 6 in line | 8 in a 90° V | 8 in a 90° V |
| Capacity in ccm | 3,300 | 4,500 | 7,200 | 12,000 | 12,000 | 12,000 | 16,000 | 16,000 |
| Nominal speed (rev/min) | 1,500 | 1,500 | 1,500 | 1,500 | 1,500 | 1,500 | 1,500 | 1,500 |
| Continuous mechanical performance ICXN¹ | 27 kW | 54 kW | 105 kW | 157 kW | 210 kW | 261 kW | 345 kW | 353 kW |
| Generator | Asynchronised | Synchronised | Synchronised | Synchronised | Synchronised | Synchronised | Synchronised | Synchronised |
| Operation | Parallel to mains supply | Parallel to mains supply with back-up | Parallel to mains supply | Parallel to mains supply | Parallel to mains supply | Parallel to mains supply | Parallel to mains supply | Parallel to mains supply |
| Fuel² | Rapeseed oil | Rapeseed oil | Rapeseed oil | Rapeseed oil | Rapeseed oil | Rapeseed oil | Rapeseed oil | Rapeseed oil |
| Consumption per electrical kWh (approx.)³ | 293 g/kWh | 271 g/kWh | 237 g/kWh | 233 g/kWh | 229 g/kWh | 226 g/kWh | 223 g/kWh | 223 g/kWh |
| Thermal output | 76 kW | 141 kW | 247 kW | 364 kW | 477 kW | 589 kW | 774 kW | 790 kW |
| Electrical power (approx.) | 25 kW | 50 kW | 100 kW | 150 kW | 200 kW | 250 kW | 333 kW | 340 kW |
| Thermal power (approx.) | 44 kW | 78 kW | 105 kW | 144 kW | 208 kW | 257 kW | 336 kW | 344 kW |
| Electrical efficiency | 32.8 % | 35.4 % | 40.5 % | 41.2 % | 41.9 % | 42.5 % | 43.0 % | 43.0 % |
| Thermal efficiency | 57.7 % | 55.3 % | 42.5 % | 39.6 % | 43.6 % | 43.7 % | 43.4 % | 43.5 % |
| Overall efficiency | 90.5 % | 90.7 % | 83.0 % | 80.8 % | 85.5 % | 86.2 % | 86.4 % | 86.5 % |
| Voltage | 400 V | 400 V | 400 V | 400 V | 400 V | 400 V | 400 V | 400 V |
| Line current | 36 A | 72 A | 144 A | 217 A | 289 A | 361 A | 481 A | 491 A |
| Frequency | 50 Hz | 50 Hz | 50 Hz | 50 Hz | 50 Hz | 50 Hz | 50 Hz | 50 Hz |
| cos phi | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Sound level at 10 m | 60 dB (A) | 68 dB (A) | 62 dB (A) | 62 dB (A) | 62 dB (A) | 62 dB (A) | 62 dB (A) | 62 dB (A) |
| Max. inlet and return temperature | 85 °C/65 °C | 90 °C/65 °C | 90 °C/70 °C | 90 °C/70 °C | 90 °C/70 °C | 90 °C/70 °C | 90 °C/70 °C | 90 °C/70 °C |
| Dimensions (L x W x H) | 2.07 x 0.8 x 1.37 m | 2.46 x 0.99 x 1.79 m | 7.5 x 2.5 x 2.6 m ⁴ | 7.5 x 2.5 x 2.6 m ⁴ | 7.5 x 2.5 x 2.6 m ⁴ | 7.5 x 2.5 x 2.6 m ⁴ | 7.5 x 2.5 x 2.6 m ⁴ | 7.5 x 2.5 x 2.6 m ⁴ |
| Standard colour⁵ | RAL 6032 | RAL 6032 | RAL 6011 | RAL 6011 | RAL 6011 | RAL 6011 | RAL 6011 | RAL 6011 |
| Weight (approx.) | 1,300 kg | 2,000 kg | 8,000 kg | 8,500 kg | 8,500 kg | 8,500 kg | 9,500 kg | 9,500 kg |

Data based on a rated load at cos phi = 1 and normed conditions as per ISO 3046-1: 25 °C ambient temperature, 100 kPa air pressure, 100 m above sea level, 30 % relative humidity. The tolerance for the output levels and for the energy input is approx. 5 %. The technical data apply as given in each of the current data sheets prepared for each individual country. As part of our process of continuous development we retain the right to modify the technical data without advance notice.

¹ Continuous mechanical performance ICXN (to ISO 3046-1, rapeseed oil fuel, not overloaded at cos = 1).

² Rapeseed oil in line with the in-house fuel standards of WÜRZ Energy GmbH (minimum requirements DIN 51605). The use of additional fuels is possible on request.

³ Fuel consumption based on rapeseed oil with a fuel heating value Hu of 37,500 kJ/kg (10.417 kWh/kg).

⁴ Container dimensions plus roof mounting.

⁵ Further RAL colours available on request.

Additional soundproofing measure possible.

Heating-oil-powered CHP unit

25 to 400 kW

| | WE-CG-025-D | WE-CG-050-D | WE-CG-150-D | WE-CG-325-D | WE-CG-400-D |
|---|--------------------------|---------------------------------------|--------------------------------|--------------------------------|--------------------------------|
| Engine | Kubota | IVECO | Deutz | Scania | Scania |
| Cylinders | 4 in line | 4 in line | 6 in line | 6 in line | 8 in a 90° V |
| Capacity in ccm | 3,300 | 3,900 | 7,200 | 12,000 | 16,000 |
| Nominal speed (rev/min) | 1,500 | 1,500 | 1,500 | 1,500 | 1,500 |
| Continuous mechanical performance ICXN¹ | 27 kW | 54 kW | 160 kW | 340 kW | 415 kW |
| Generator | Asynchronised | Synchronised | Synchronised | Synchronised | Synchronised |
| Operation | Parallel to mains supply | Parallel to mains supply with back-up | Parallel to mains supply | Parallel to mains supply | Parallel to mains supply |
| Fuel² | Heating oil | Heating oil | Heating oil | Heating oil | Heating oil |
| Consumption per electrical kWh (approx.)³ | 0.316 l/kWh | 0.274 l/kWh | 0.249 l/kWh | 0.238 l/kWh | 0.236 l/kWh |
| Thermal output | 79 kW | 137 kW | 377 kW | 775 kW | 943 kW |
| Electrical power (approx.) | 25 kW | 50 kW | 152 kW | 327 kW | 400 kW |
| Thermal power (approx.) | 44 kW | 67 kW | 152 kW | 327 kW | 400 kW |
| Electrical efficiency | 31.6 % | 36.5 % | 40.3 % | 42.2 % | 42.4 % |
| Thermal efficiency | 55.7 % | 48.9 % | 40.3 % | 42.2 % | 42.4 % |
| Overall efficiency | 87.3 % | 85.4 % | 80.6 % | 84.4 % | 84.8 % |
| Voltage | 400 V | 400 V | 400 V | 400 V | 400 V |
| Line current | 36 A | 72 A | 219 A | 472 A | 577 A |
| Frequency | 50 Hz | 50 Hz | 50 Hz | 50 Hz | 50 Hz |
| cos phi | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Sound level at 10 m | 60 dB (A) | 70 dB (A) | 62 dB (A) | 62 dB (A) | 62 dB (A) |
| Max. inlet and return temperature | 85 °C/65 °C | 85 °C/70 °C | 90 °C/70 °C | 90 °C/70 °C | 90 °C/70 °C |
| Dimensions (L x W x H) | 2.07 x 0.8 x 1.37 m | 2.5 x 1.04 x 1.6 m | 7.5 x 2.5 x 2.6 m ⁴ | 7.5 x 2.5 x 2.6 m ⁴ | 7.5 x 2.5 x 2.6 m ⁴ |
| Standard external colour⁵ | RAL 6032 | RAL 6032 | RAL 6011 | RAL 6011 | RAL 6011 |
| Weight (approx.) | 1,300 kg | 2,000 kg | 8,000 kg | 8,500 kg | 9,500 kg |

Data based on a rated load at cos phi = 1 and normed conditions as per ISO 3046-1: 25 °C ambient temperature, 100 kPa air pressure, 100 m above sea level, 30 % relative humidity. The tolerance for the output levels and for the energy input is approx. 5 %. The technical data apply as given in each of the current data sheets prepared for each individual country. As part of our process of continuous development we retain the right to modify the technical data without advance notice.

¹ Continuous mechanical performance ICXN (to ISO 3046-1, heating oil fuel, not overloaded at cos = 1).

² Heating oil (minimum requirements DIN 51603-1). The use of additional fuels is possible on request.

³ Fuel consumption based on heating oil with a fuel heating value Hu of 42,600 kJ/kg (11.8 kWh/kg or 10 kWh/l).

⁴ Container dimensions plus roof mounting.

⁵ Further RAL colours available on request.

Additional soundproofing measure possible.

Natural gas and bio-methane powered CHP unit 20 to 100 kW

| | WE-CG-020-N | WE-CG-030-N | WE-CG-048-N | WE-CG-050-N | WE-CG-070-N | WE-CG-100-N |
|---|--------------------------|--------------------------|---------------------------------------|--------------------------|--------------------------|--------------------------|
| Engine | Ford | Ford | MAN | MAN | MAN | MAN |
| Cylinders | 4 in line | 6 V-type | 4 in line | 4 in line | 6 in line | 6 in line |
| Capacity in ccm | 2,300 | 4,000 | 4,580 | 4,600 | 6,900 | 6,900 |
| Nominal speed (rev/min) | 1,530 | 1,530 | 1,500 | 1,500 | 1,500 | 1,500 |
| Continuous mechanical performance ICXN¹ | 22 kW | 32 kW | 52 kW | 54 kW | 75 kW | 110 kW |
| Generator | Asynchronised | Asynchronised | Synchronised | Synchronised | Synchronised | Synchronised |
| Operation | Parallel to mains supply | Parallel to mains supply | Parallel to mains supply with back-up | Parallel to mains supply | Parallel to mains supply | Parallel to mains supply |
| Fuel² | Natural gas | Natural gas | Natural gas | Natural gas | Natural gas | Natural gas |
| Consumption per el. kWh (approx.) | 3.40 kWh/kWh | 3.53 kWh/kWh | 2.92 kWh/kWh | 2.96 kWh/kWh | 2.91 kWh/kWh | 2.71 kWh/kWh |
| Thermal output | 68 kW | 106 kW | 140 kW | 148 kW | 204 kW | 282 kW |
| Electrical power (approx.) | 20 kW | 30 kW | 48 kW | 50 kW | 70 kW | 104 kW |
| Thermal power (approx.) | 42 kW | 68 kW | 77 kW | 79 kW | 109 kW | 138 kW |
| Electrical efficiency | 29.4 % | 28.3 % | 34.3 % | 33.8 % | 34.3 % | 36.9 % |
| Thermal efficiency | 61.8 % | 64.2 % | 55.0 % | 53.4 % | 53.4 % | 48.9 % |
| Overall efficiency | 91.2 % | 92.5 % | 89.3 % | 87.2 % | 87.7 % | 85.8 % |
| Voltage | 400 V | 400 V | 400 V | 400 V | 400 V | 400 V |
| Line current | 28.9 A | 43.3 A | 69.3 A | 72.2 A | 101.0 A | 150.0 A |
| Frequency | 50 Hz | 50 Hz | 50 Hz | 50 Hz | 50 Hz | 50 Hz |
| cos phi | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Sound level at 1 m | 54 dB (A) | 53 dB (A) | 68 dB (A) | 66 dB (A) | 66 dB (A) | 72 dB (A) |
| Max. inlet and return temperature | 85 °C/65 °C | 85 °C/65 °C | 90 °C/75 °C | 90 °C/70 °C | 90 °C/70 °C | 90 °C/70 °C |
| Dimensions (L x W x H)³ | 1.5 x 0.81 x 1.27 m | 1.64 x 0.86 x 1.34 m | 2.48 x 1.00 x 1.74 m | 2.84 x 0.90 x 1.9 m | 2.84 x 0.90 x 1.9 m | 2.85 x 0.91 x 1.87 m |
| Standard colour⁴ | Pantone 5517C | Pantone 5517C | Pantone 5517C | RAL 7032 | RAL 7032 | RAL 7032 |
| Weight (approx.) | 870 kg | 1,160 kg | 1,700 kg | 2,300 kg | 2,600 kg | 2,700 kg |

Data based on a rated load at cos phi = 1 and normed conditions as per ISO 3046-1: 25 °C ambient temperature, 100 kPa air pressure, 100 m above sea level, 30 % relative humidity and a methane number greater than 80. The tolerance for the thermal output energy input specified is 8 % and 5 % respectively. The technical data apply as given in each of the current data sheets prepared for each individual country. As part of our process of continuous development we retain the right to modify the technical data without advance notice.

¹ Continuous mechanical performance ICXN (to ISO 3046-1, not overloaded at cos = 1).

² Natural gas acc. to provisions of the DVGW* Worksheet G 260, 2. Gas Family, Group L: natural gas with a heating value H_u of 10 kWh/Nm³ and a methane number larger than 80.

³ Dimensions = Compact module is the smallest design. Can be delivered to a heating cellar as a flat pack.

⁴ Further RAL colours available on request.

Additional soundproofing measure possible.

Natural gas and bio-methane powered CHP unit 150 to 400 kW

| | WE-CG-150-N | WE-CG-200-N | WE-CG-250-N | WE-CG-400-N |
|--|--------------------------|--------------------------|--------------------------|--------------------------|
| Engine | MAN | MAN | MAN | MAN |
| Cylinders | 6 in line | 6 in line | 12 V-type | 12 V-type |
| Capacity in ccm | 12,800 | 12,800 | 21,900 | 21,900 |
| Nominal speed (rev/min) | 1,500 | 1,500 | 1,500 | 1,500 |
| Continuous mechanical performance ICXN^{*1} | 150 kW | 210 kW | 250 kW | 420 kW |
| Generator | Synchronised | Synchronised | Synchronised | Synchronised |
| Operation | Parallel to mains supply | Parallel to mains supply | Parallel to mains supply | Parallel to mains supply |
| Fuel^{*2} | Natural gas | Natural gas | Natural gas | Natural gas |
| Consumption per el. kWh (approx.) | 2.76 kWh/kWh | 2.77 kWh/kWh | 2.79 kWh/kWh | 2.57 kWh/kWh |
| Thermal output | 392 kW | 553 kW | 669 kW | 1.037 kW |
| Electrical power (approx.) | 142 kW | 200 kW | 240 kW | 404 kW |
| Thermal power (approx.) | 207 kW | 293 kW | 365 kW | 460 kW |
| Electrical efficiency | 36.2 % | 36.2 % | 35.9 % | 39.0 % |
| Thermal efficiency | 52.8 % | 53.0 % | 54.6 % | 44.4 % |
| Overall efficiency | 89.0 % | 89.2 % | 90.5 % | 83.4 % |
| Voltage | 400 V | 400 V | 400 V | 400 V |
| Line current | 205.0 A | 289.0 A | 347.0 A | 583.0 A |
| Frequency | 50 Hz | 50 Hz | 50 Hz | 50 Hz |
| cos phi | 1.0 | 1.0 | 1.0 | 1.0 |
| Sound level at 1 m | 71 dB (A) | 80 dB (A) | 80 dB (A) | 80 dB (A) |
| Max. inlet and return temperature | 90 °C/70 °C | 90 °C/70 °C | 90 °C/70 °C | 90 °C/70 °C |
| Dimensions (L x W x H)^{*3} | 3.45 x 0.95 x 1.83 m | 3.63 x 1.74 x 2.55 m | 3.64 x 1.8 x 2.52 m | 3.66 x 1.74 x 2.60 m |
| Standard colour^{*4} | RAL 7032 | RAL 7032 | RAL 7032 | RAL 7032 |
| Weight (approx.) | 3,200 kg | 3,000 kg | 4,500 kg | 5,500 kg |

Data based on a rated load at cos phi = 1 and normed conditions as per ISO 3046-1: 25 °C ambient temperature, 100 kPa air pressure, 100 m above sea level, 30 % relative humidity and a methane number greater than 80. The tolerance for the thermal output energy input specified is 8 % and 5 % respectively. The technical data apply as given in each of the current data sheets prepared for each individual country. As part of our process of continuous development we retain the right to modify the technical data without advance notice.

^{*1} Continuous mechanical performance ICXN (to ISO 3046-1, not overloaded at cos = 1).

^{*2} Natural gas acc. to provisions of the DVGW* Worksheet G 260, 2. Gas Family, Group L: natural gas with a heating value H_u of 10 kWh/Nm³ and a methane number larger than 80.

^{*3} Dimensions = Compact module is the smallest design. Can be delivered to a heating cellar as a flat pack.

^{*4} Further RAL colours available on request.

Additional soundproofing measure possible.

References



90 kW vegetable oil powered CHP unit in a container with 25 m³ main tank and buffer tank.



120 kW vegetable oil powered CHP unit in a container with 2 x 24 m³ vegetable oil tank, heating oil tank with 24 m³ main tank and 24 m³ buffer tank



30 kW natural gas powered CHP unit with sound-insulating hood and 2 m³ buffer tank



340 kW CHP unit in a container with 220 kW absorption cooler, 50 m³ vegetable oil tank und two 60 m³ buffer tanks for heat and cooling energy



340 kW vegetable oil powered CHP unit in a container with 50 m³ vegetable oil tank and 50 m³ buffer tank



4 x 30 kW natural gas powered CHP unit with sound-absorbing hood and 2 x 5 m³ buffer tank



2 x 8 kW vegetable oil powered CHP unit with 10 kW absorption cooler, 750 litre fuel tank and 1,100 litre cold storage tank in a container



150 kW vegetable oil powered CHP unit in a container with 35 m³ main tank and 26 m³ buffer tank

Should you require additional information please contact us at: info@wuerz.com

WÜRZ Energy –

We power the future.

- Cogeneration
- Photovoltaics
- Solar thermal energy
- Services

All of the product and performance details are nominal values. All of the details are product descriptions without guarantees. Configuration agreements and guarantees require a special agreement covering the specific application usage. We do not give a guarantee when we provide free-of-charge technical or financial advice.

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