

# DISEASE CONTROL UNIT

DCU 8G+ 2016

**Retrofittable modular system**

0 - 250 kg/hour

Capacity > 4 m<sup>3</sup>

**1300 °C**

**ZANNI GROUP**

made  
in  
Germany



**Transportable disease control units**

**Incinerators for infected hazardous materials**

**Safety and reliability with newest technology**

**PATENTED  
TECHNOLOGY**

# DISEASE CONTROL UNITS

## DCU 8G+

### Incinerators for hazardous materials

Incineration is an important procedure for waste in case of disease control. Any kind of hazardous materials can be burnt in a sterile incineration process.

In case of an outbreak is primarily the safety and reliability of an incinerator the most important requirement. The plant concept must be based on durability because maintenance and maintenance under disease conditions are difficult for the operators at site.

Therefore we have developed this special disease control incineration unit.

**THERMAL DESTRUCTION** of hazardous materials combines high temperature, long residence time and high turbulence together with an efficient fuel management system to ensure that hazardous materials are efficiently destroyed.

Hazardous materials, when heated to a very high temperature undergoes predictable physical and chemical changes. The high temperature, that is over 1000°C prevents the formation of complex organic molecules and breaks down organics into gas. These primary molecules are stable at that temperature.

The oven of our system is capable of burning the waste at a temperature of 900 to 1300°C to deprive the breeding ground of any form of disease.

The rule for effective disease control is, the more toxic the material, the higher the burning temperature needs to be.

### Measures for the prevention and control of communicable diseases

The early recognition and detection of the first cases of the disease, discovery and elimination of sources of infection, and the prevention of a further spread of the disease are core pieces of disease control.

The most important measures:

1. determination and elimination of the source of the infection,
2. reporting of disease and of suspected disease as well as diagnosis as soon as possible,
3. isolation of diseased, suspicious persons, contact persons,
4. disinfection, sterilization and disinfection,
5. information and rules of conduct for persons affected and vulnerable,
6. measures on environmental hygiene (drinking water, food, waste disposal, etc.),
- 7. cremation of deceased to prevent a further spread of the disease,**
8. vaccinations against the pathogen.

You can find detailed codes of conduct and recommendations for example on the pages of the Robert Koch Institute (RKI) on the web page <http://www.rki.de/EN/> and on the pages of the World health Organisation (WHO) <http://www.who.int/ihr/en/> als International Health Regulations (IHR). Please note that we are not responsible for any contents linked or referred to from its pages. If any damage occurs by the use of information presented there, only the one who has linked to these pages and the one who provided the content, is/are liable.

### OUR TRANSPORTABLE / MOBILE SOLUTION FOR DISEASE CONTROL

The disease control unit (DCU) can be put anywhere into operation and has an excellent combustion capacity with a very big volume of the incineration chambers. The whole plant is mounted on container sized frames. The two basic modules are also a stand-alone unit including all necessary auxiliaries like compressor system, control cabinet, diesel pump and fan. The incinerator can be delivered with a power generator and an additional side door as option. The refractory lining is based among others on extremely heat-resistant ceramic fiber and a wear-resistant fire concrete. The exact composition and its structure, is a part of protected expertise for high-temperature furnaces up to 1600 °C.

In the case of an outbreak it is primarily the safety and reliability of an incinerator the most important requirement. Environmental protection requirements related to the exhaust filtering is only at a secondary importance.

The basic module consist of a 2 stage incineration module with a chimney and supply module. The rigid construction and the easy operability improve the transportable usage in crisis regions.

## The basic modules

The basic module consist of a 2 stage incineration module with a chimney and supply module.

### The incineration module

Standard execution

- 2 stage incineration module, main combustion chamber up to 950 °C, post combustion chamber up to 1300 °C
- Two stage top filling system
- Fix bed system
- Burner system with fuel pump



*Pictures:  
2 stage incineration module with front feeding system for batches and concrete gate valve on top with feeding hopper connection.*



*Exhaust outlet incinerator*



*Chimney and supply module*

### Charging of the combustion chamber

Manual feeding and slag extraction.

The feeding will be done manually through a two-stage filling (hopper) system from the top of the incinerator. This system consist of a state of the art double gate semi-automatic door that do not allow leakage from inside of the fire room to the outside or optionally through a front feeding system with pneumatic actuator (one or two cylinder) side door for the solid wastes.

The hopper system is consisting of two gates: upper gate is a flap system opened and closed pneumatically. The lower gate is a horizontally sliding gate that is also actuated pneumatically. This gate moves into a closed room. If the feeding is done, the waste falling on to the lower gate. If the upper flap closes the lower gate will be slid horizontally and the waste fall down to the fire room. The lower gate is clad with fire resistant special concrete like inside the main combustion chamber.

*Picture:  
Optionally a two-stage filling system can be installed. Take into consideration when ordering. Can not be retrofitted!  
On the left side double wall chimney extension pieces.*

The ash extraction is done via 3 side doors for de-ashing. The feeding is controlled by the operator!



### Incineration process and burner control

An automated burner serves for the heating of the combustion chamber subject to the temperature of the fire room. For heating the unit at start up the burner is in operation.

The feed opening should remain closed, as long as the necessary flue gas temperature is not reached. In the post combustion chamber the gas is heated up to a minimum of 1100 °C. With special modifications of the basic engineering the burning temperature can be increased up to 1300 °C. The incineration process produces a sterile ash quality.

If the incinerator is used as a stand alone unit, the stack module will be mounted to it and the flue gas will be released mixed with fresh air for cooling down the hot flue gas before discharging to the atmosphere from the stack.

## Insulation / lining

The main combustion chamber is lined with a special ceramic fiber, which is surrounded by a concrete sheath. It is specially blended and very wear- and impact-resistant.

The bottom of the post combustion chamber (gas combustion) is lined with a special ceramic fiber, which is surrounded by a concrete sheath.

The walls are insulated with a special ceramic fibre, which is heat-resistant up to 1300 °C. This fiber has a special coating as sealing surface that makes it insensitive to dust so that a wear protection is given.

Maintenance and repair work are easy to perform.

## Control system

The unit will be furnished with a simple control system that enables easy and safe controlling the system, acc. to the German Electrical Norms and VDI.

## Standards

Made in Germany. Design acc. to DIN/EN, control equipment acc. to VDE and documentation acc. to DIN EN 746

## SOLID WASTE INCINERATION

- No grate,  
absolutely sterile incineration and ash after complete combustion of waste. \*

*\* Depends on the operator at site*

## KEY FIGURES DCU 500/4 (basic modules)

Model: DCU 8G+

Type of Waste / Suitable for: Hazardous waste like infected waste, medical waste, chemical residues that are solid and paste-like up to 30% moisture content.

Forbidden materials: Ammunition and other explosives, lightning ammunition, Akkus and Batteries, mercury containing materials, PVC (only smaller amounts per feeding sequence allowed)

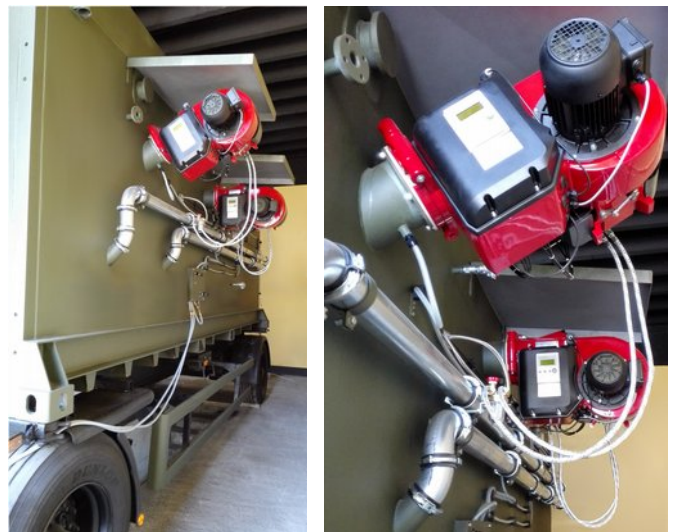
Stiring up of waste: Manual via the ash hole of the first chamber

Calorific value: 1 - 45 MJ/kg  
Density: 50 - 1.250 kg/m3

Waste Capacity: 0 - 250 kg/hr  
First chamber volume: ~ 4 m3

Burning temperature up to: 950/1300 °C  
Burner's Thermal Capacity: 2 x 700 kW  
Max. oil flow rate: 2 x 58.2 kg/h  
Calorific value of waste 12500 kJ/kg  
Average fuel consumption: ~ 0 – 45 l/h

Requirements: Fuel (Diesel)  
Power



### Notes:

The data indicated in the key figure table are reference values.

They are calculated for a calorific value of 12.500 kJ/kg of the waste and a moisture content less than 10%.

With the composition of the waste the data will change.

## The chimney and supply module

Standard execution with compressor, fan and two or three chimney modules (+ 5,6 m from ground).

First chimney module can be produced as an arch construction that can be directly mounted to the chimney connection. That is a great help for installation and operating at different sites.

A lot of options are available.

The basic modules are made for the **THERMAL DESTRUCTION** that combines high temperature, long residence time and high turbulence together with an adequate fuel management system to ensure that hazardous materials are efficiently destroyed.

After a successful disease control the incineration plant can be extended with two additional modules:

- a) an air cooling system (container size) and
- b) a filter system (container size) for dust filtering and chemical neutralization due to an adsorption system,

that combine the following advantages:

**CHEMICAL NEUTRALIZATION** has been done by use of a special additive that must be added to the waste. This is a very effective additive for SO<sub>2</sub>, HCl and HF, heavy metals, dioxins, etc.

**PHYSICAL FILTERING** will be applied by means of a special filter system. The particle removal creates a filter cake, which supports the removal efficiency. Depending on the differential pressure measured across the filter, the parts of the filter elements are cleaned by means of pressurized air impulses.

**ADSORPTION** is a part of the chemical neutralization, e.g. the binding of molecules or particles to a surface, will be done by means of feeding the flue gas through activated carbon. In this stage, the flue gas components with color or those that have taste or odor will be bound, so all these may-be-non-toxic-but disturbing gas components will be eliminated and a colorless, odorless flue gas will be emitted to the atmosphere.

## FEATURES

- Mobile/Transportable solution.
- Excellent combustion capacity with a very big volume of the incineration chambers.
- Easy commissioning and easy maintenance.
- Low energy consumption and low operation cost.
- High performance and rapid start up after first commissioning.
- State of the Art means highest technology standards.
- Made in Germany Quality.

## THE OPTIONAL modules

### Environmental friendly cooling module

The optional heat exchanger can be a modular part of the whole incineration system. It will cool the flue gas down to a temperature of averagely 230 °C. The advantage is that this facility do not require water consumption. In contrast to a spray cooling system this facility saves approx. 1-4 tons of water per hour.

Key figures:

- Air cooler.
- Pipes made of carbon and stainless steel.
- Cooling air fan and blow-off pipe for cooling air.
- No water consumption.
- External insulation.
- 20 ' container size frame.



## **Additive dosing system**

On top of the cooling system near to the discharge side there is the special opening to feed an additive (see plant configuration table). Via this opening an additive can be loaded, if needed.

The additive dosing system can be supplied in two types:  
Standard version for manual filling or optionally as an automated filling system.

The additive (NaHCO<sub>3</sub>) is needed if chemical substances like PVC, plastics, etc. shall be incinerated because that can cause emissions of dioxins and furans or heavy metals. The activated carbon added to the additive ensures that the flue gas will not have any color and odour.

## **High temperature resistant filter module**

This filter system can be a modular part of the whole incineration system.  
It can be connected to the outlet of the air-cooling module and filter the flue gas of the whole system.

Key figures:

- Filter with ceramic filter candles.
- Maximum temperature resistance 350 ° C.
- Dust discharge with a screw conveyor system.
- Induced draft fan.
- External insulation.
- 20 ' container size frame.

The filter system ensures cleaning of the flue gas from fly ash and all emissions, color and odor by means of the additive that is added from top of the cooling module above.

## **Continuous Exhaust Gas Monitoring (CEGM) System**

Envisaged analyses could be:

- HCL,
- CL<sub>2</sub>,
- NOX,
- SOX,
- CO,
- TOC.

The operation frequency can be either continuous operation or activation at a predefined frequency or upon demand.

The CEGM system will be installed in the Chimney and Supply module.

## **Diesel tank**

PE combined 1000 VS  
Volume 1000 l.

Including:

- 10m fuel hose,
- fuel lance,
- foot valve,
- optical level indicator,
- content indicator,
- vent hood.

**A detailed listing of standard and optional components can be found in the following table (page 7).**

**PLANT CONFIGURATION****DCU 8G+****INCINERATION MODULE**

Capacity	0 – 250 kg/hr
Max. Burning temperature (standard)	950 / 1300 °C
Min. Burning temperature	850 / 1100 °C
Diesel burner system	standard
NG burner system	option
Manual feeding (hopper system)	standard
Manual feeding (front filling system)	option
Manual slag extraction	standard
Stainless steel grate Provides better burnout of the solids. Delivery as easy to replace wear part.	option
Liquid waste lance spray system	option
Type of Waste / Suitable for	
Hazardous waste like infected waste, medical waste, chemical residues that are solid and paste-like up to 30% moisture content.	standard
Ammunition and other explosives, lightning ammunition, Akkus and Batteries, mercury containing materials, PVC (only smaller amounts per feeding sequence allowed)	forbidden

**COOLING MODULE**

Environmental friendly Air Cooling System	option
- Air cooler. - Pipes made of carbon and stainless steel. - Cooling air fan and blow-off pipe for cooling air. - No water consumption. - External insulation.	

**FLUE GAS CLEANING MODULE**

High temperature resistant flue gas cleaning system	option
- Filter with ceramic filter candles. - Maximum temperature resistance 350 ° C. - Dust discharge with a screw conveyor system. - Induced draft fan. - External insulation.	
Additive dosing system, manual	option
Additive dosing system, automatic	option

**CHIMNEY AND SUPPLY MODULE**

Compressor	standard
Fans	standard
Chimney with a standard height from ground +5,6 m	standard
Generator (3-Ph/400V)	option
Control box	standard
Continuous Exhaust Gas Monitoring System CEGM (Continuous Exhaust Gas Monitoring) System Envisaged analyses could be Chlorides (Hcl, Cl <sub>2</sub> ), NOx, SO <sub>2</sub> as Sox, Carbons as TOC, CO and TSP (total suspended particles) etc.	option
Diesel tank PE combined 1000 VS Volume 1000 l	option

## CONTACT



ZANNI + PARTNER Ltd.  
Rheinpromenade 9  
40789 Monheim  
Germany

Phone: +49 2173 2608272

Fax: +49 2173 2608275

email: [mail@zanni.de](mailto:mail@zanni.de)

web: <http://www.zanni.de>