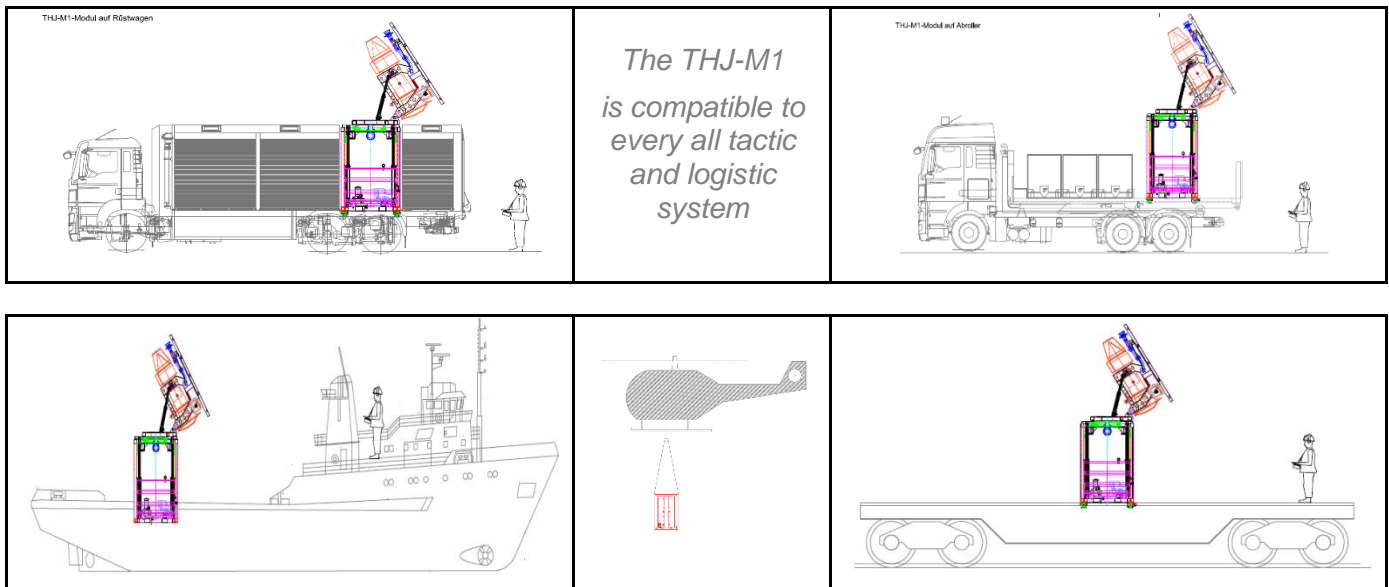


Technical Description

THJ-BOX



Operation from a safe distance, minimal manpower and equipment in the danger zone, mobile, safe and effective hazard control

All data and information provided in this specification will not be subject to the automatic change service. General changes in the sense of progress are reserved by DICOSY. Pictures and illustrations show optional equipment available at extra charge.

1. Introduction



The **THJ-BOX** combines jet engine technology and spray jet technology to make it the world's most powerful spray gun. As a modular, self-contained, **roof-top spray jet gun** stored in a **box**, it is **mounted on each chassis to save space**.

The system is equipped with a civilian turbofan engine, which is used worldwide in business jets. It is equipped with two commercially available spray jet monitors. It is designed as a compact closed unit (L x W x H = approx. 1,500 x 2,550 x 2,300 mm **all-in-one**) in container construction as a box. All energy systems (electricity, control technology, hydraulics, fuel tank, water management and jet engine) are integrated in the box and operate as an autonomous unit. The system is compact and modular. The maximum weight in refuelled condition (1,000 l tank) is 4,500 kg.



The jet engine carriage operates at a height of 4-5 m above the roof construction so that:

- The jet engine can suck in air without obstruction (no interfering contours in the intake area)
- No particles from the ground, sand or dirt are sucked in due to the large distance to the ground
- Fire-fighting on buildings above the 2-3 storey can also be carried out directly through a window (direct fire-fighting height with horizontal gun carriage position min. 4 m above ground level).

For this purpose, the jet engine carriage can be lifted from its dust-free and safe storage in the box (storage during travel) for emergency operation, by remote control electro-hydraulically from the box (safety box) above roof height. The working radius of the carriage above the container roof in the lifted state is 240° horizontally and +60° vertically upwards and -10° downwards. The water supply within the system is designed in such a way that it is possible to do so without any effort or impairment of the environment.

The box is connected to the carrier vehicle (truck, trailer, roll-off container, ship) by means of simple container sealing technology and can be detached again. Stacker pockets and crane eyes are provided. In addition, there is a possibility of securing the system with lashing straps on a platform.

2. Application

The THJ-Box covers the following tasks:

- Fire fighting
- Thinning and wash down of toxic clouds
- Cooling of 3D objects, penetration of complex structures
- Pressure aeration (tunnel, large-capacity storage...)

2.1 Technology

The THJ-Technology is a highly developed water / air stream procedure, which combines in a special construction water / foam technology and state-of-the-art control and regulation technology in a mobile outdoor aerosol generator.



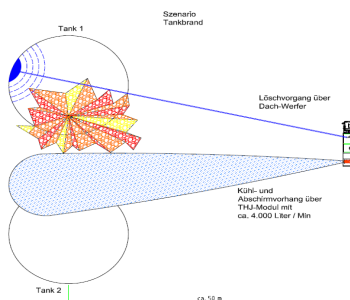
The THJ-Box disperses up to 3,000 l/min of water to a fine aerosol cloud with a medium droplet size of approx. 400 µm, which provides a controlled water release at a range of approx. 100 -120 m and at a height of 60 - 70 m. Jet engine, water monitors, water flow, water pressure and geometrical arrangement are coordinated in such a way that the aerosol generator produces an average minimum precipitate rate of 4 - 6 l/(m²xmin). The system has been tried and tested for 20 years and can be easily integrated into existing hazard prevention concepts and logistics systems.

2.2 Technical Data



| | |
|--------------------------|--|
| Model 1523 | L/B/H = ca. 1500 x 2.550 x 2.300 mm |
| Model 2520 | L/B/H = ca. 2.500 x 2.550 x 2.000 mm |
| Weight | approx. 3.500 kg (plus Diesel 1.000 l) |
| Pivoting range over roof | horizontal 300°, vertikalt-10° bis + 60° |
| Elektric system | On-board, autonomous |
| Hydraulic system | On-board, autonomous |
| Fuel supply | On-board, autonomous |
| On-board utilities | Air, oil, diesel |
| External utilities | Water/foam (1xA-Storz) |

2.3 Performance data



| | |
|-----------------------|--|
| Power | Approx. 3,000 HP |
| Air flow | Approx. 1,000 m ³ /s |
| Spray width | Approx. 100 – 120 m |
| Spray height | Approx. 60 – 70 m |
| Spray surface, fixed | Approx. 1,500 – 2,000 m ² |
| Spray surface, rotary | Approx. 15,000 – 20,000 m ² |
| Spray rate | Approx. 500 – 3,000 l/min |
| Precipitate rate | Approx. average 4-6 l/(m ² x min) |
| Foam concentration | Approx. foam 0 – 9 % |
| Fuel tank | Approx. 1,000 l diesel |

3 Construction

The basis is formed by a containerised steel construction with floor assembly, front and rear portal and liftable roof construction.

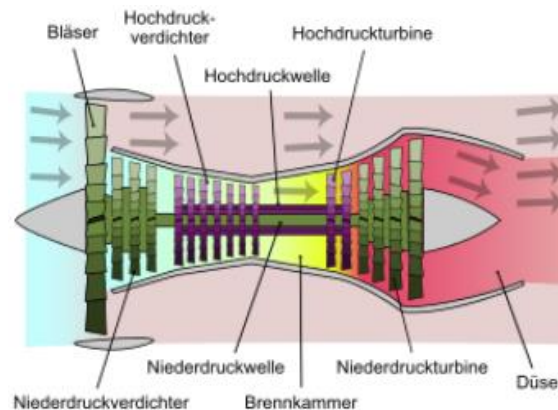
3.1 Water feeding

Easy water supply is guaranteed (no hose sump, only 1 hose size A). The size A hose is connected underneath the carriage slewing and lifting mechanism before being lifted out. This means that the carriage moves independently of the A-hose. The connected hose does not move when the carriage is swiveled.

3.2 Jet engine

The system is equipped with a civilian turbofan engine and is now used worldwide in business jets (Cessna, Mitsubishi). The first engines went into series production in 1973 and are still in use worldwide today.

The engines we use (turbofan engines) are installed in aircraft that have a **noise certificate** issued by the **EASA** (European Aviation Safety Agency) and **do not exceed the limits** required by the International Civil Aviation Organisation (**ICAO**) in ICAO Annex 16 Volume I Chapter 3.



To ensure that the jet engine operates safely and effectively for use by fire fighters near the ground, it is inspected and **accepted by a certified engine inspector** and modified in such a way that it can be used safely for civil applications on the ground. One consequence of this is that the complete system can be operated with diesel.

The speed of the engine is determined via a power controller by remote control

3.3 Fuel system

1,000 litre fuel tank. The average fuel consumption is approx. 500 - 550 litres of diesel/h at max. continuous power.

(On-board tank system available as an option)

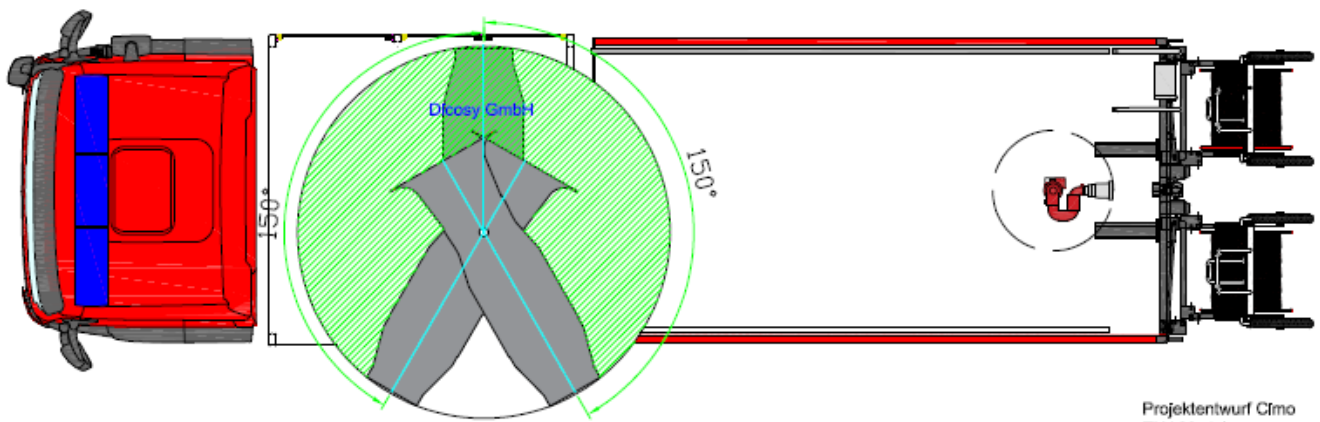
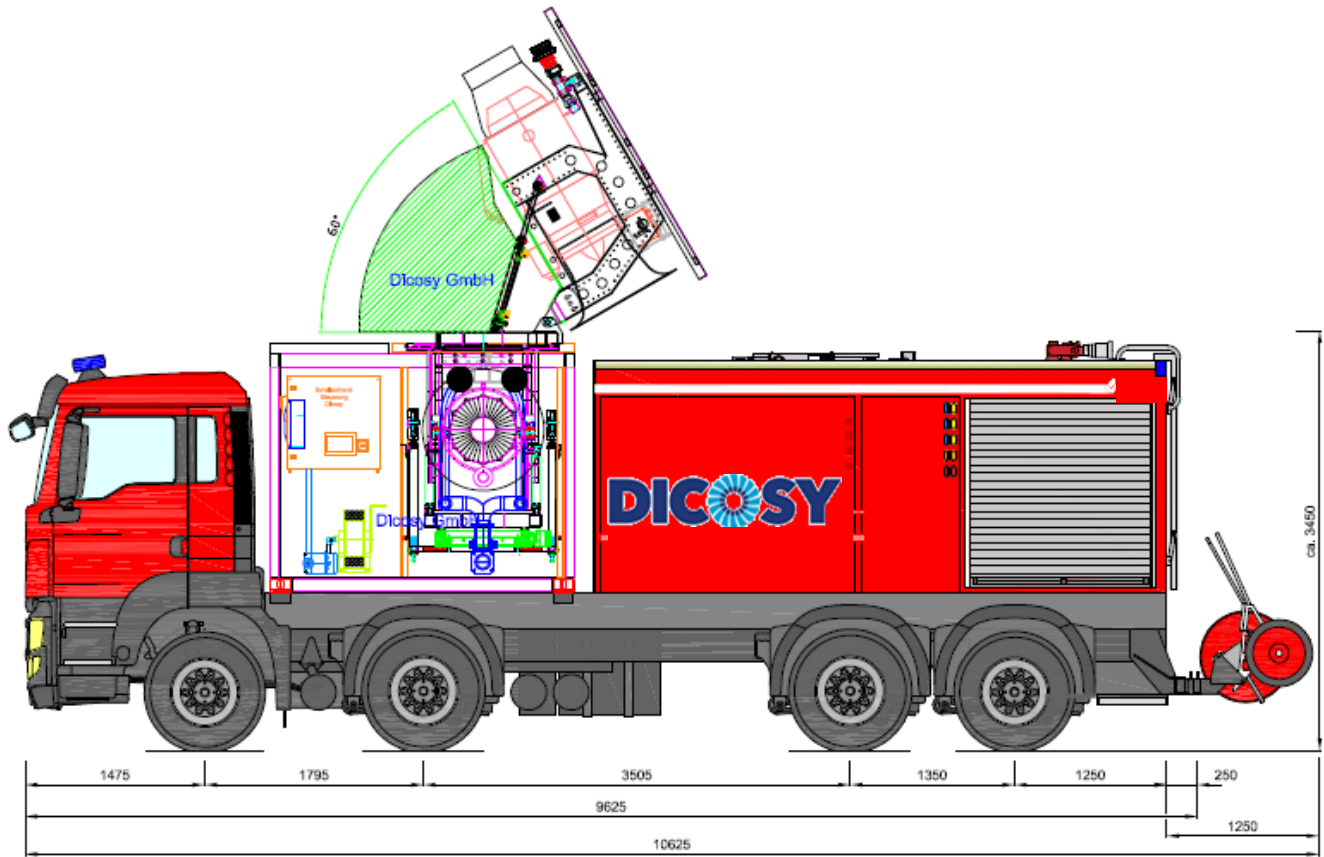
3.4 THJ carriage

The basic element is a vibration-optimised carriage construction, which combines the water and foam technology, jet engine technology and state-of-the-art control and regulation technology for a turbo hydro jet system. The system's swivel range is defined as follows:

- 300° horizontal range (from right to left)
- + 60° vertical level upwards
- - 10° vertical level downwards

The carriage is designed in such a way that the THJ technology can be used as an over-roof cannon in vehicles and can thus spray forward over the roof of the vehicle in the direction of travel. This makes it much easier to move and position the system for operation (**direct forward positioning to the object, no reversing, no banksman needed, only one operator required**)

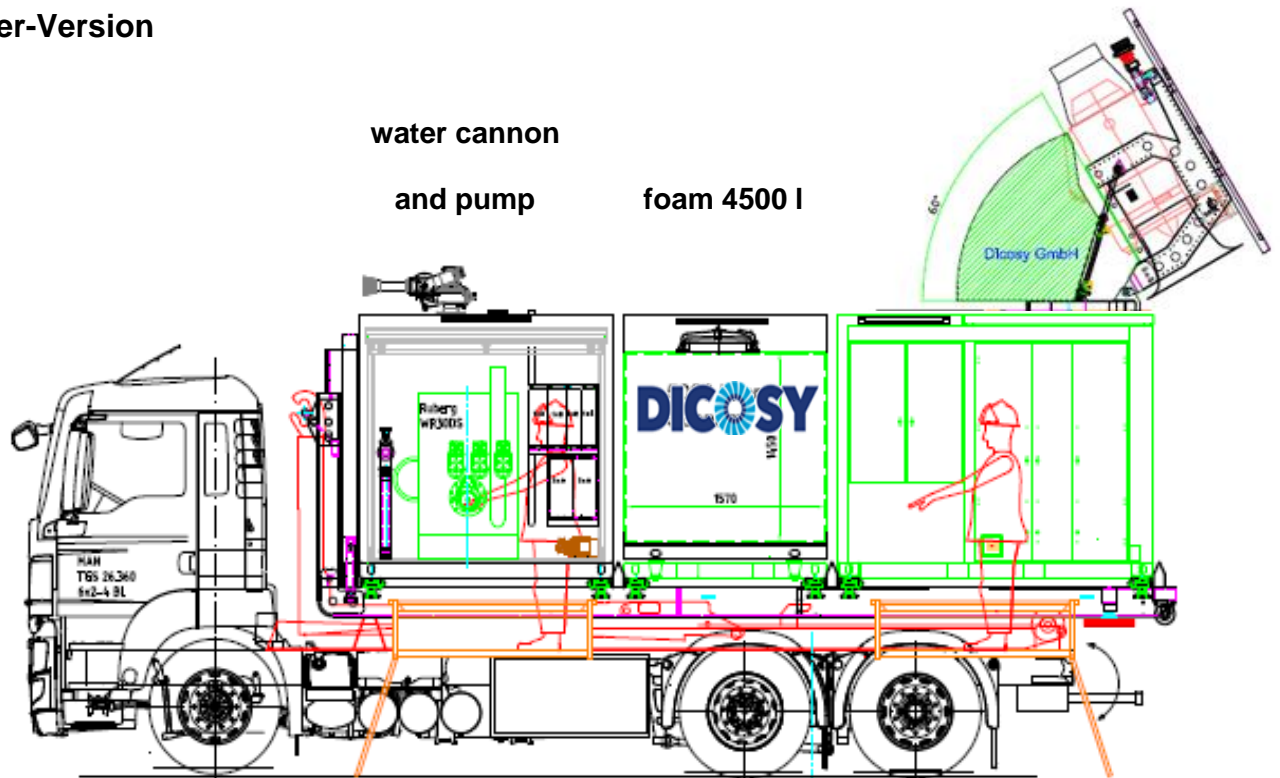
Truck-Version



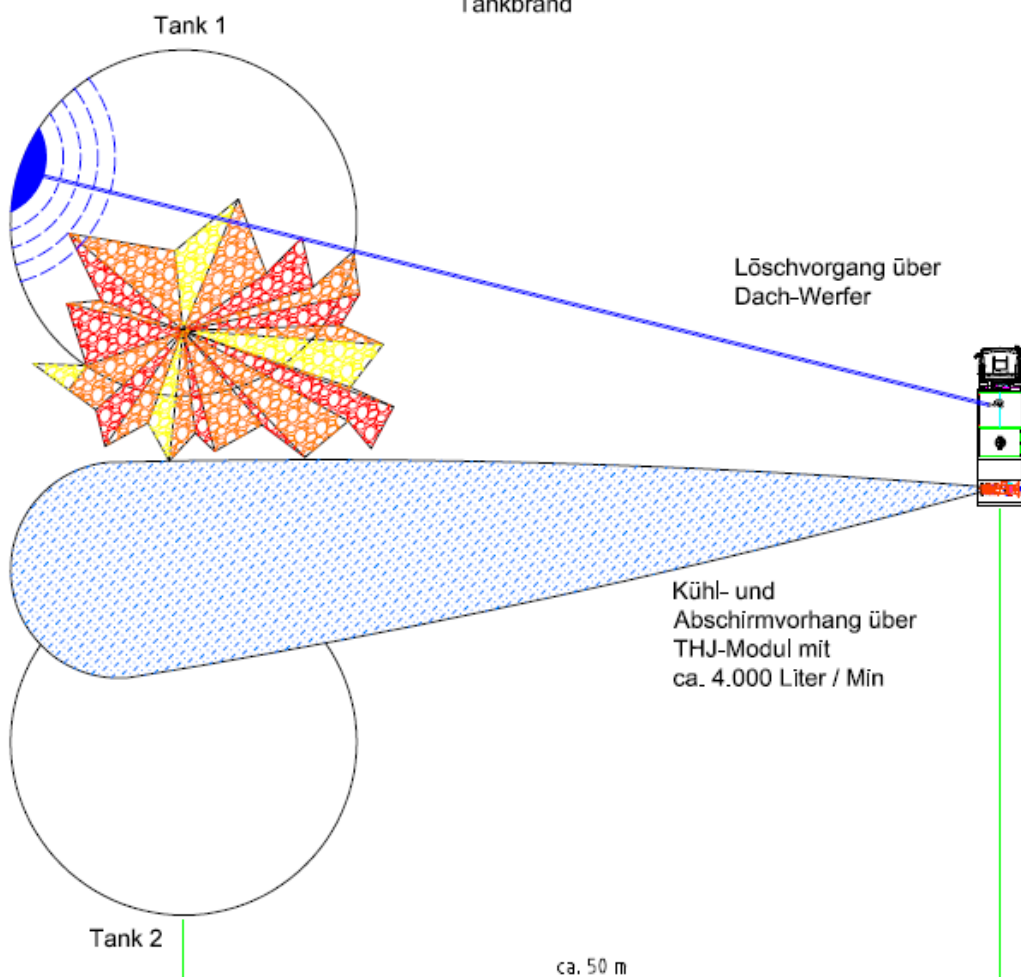
Rotationsbereich ca. 300°

Projektentwurf C/mo
THJ-Modul
Dicosy GmbH
17.4.18/HW

Container-Version



Szenario
Tankbrand



3.5 Suspension Special suspension concept for all-terrain operation.

3.6 Control system The control system controls and monitors all functions and safety elements of the turbo hydro jet system (jet motion control, water pressure, operating voltage, hydraulic and fuel pressure etc.) and directly performs the following tasks.

- Complete operation of the module via remote Control: extend/retract the carriage; movement of the carriage; start/stop of the jet engines (wire-linked operation possible in case of emergency)
- Error / and status display on the remote control
- Error indication and status display of all inputs and outputs of the control unit on the display in the control cabinet
- Remote maintenance with access to control and display
- Logging of system errors in the case of electrical, hydraulic system and on the jet engine as well as warnings and indication on the display in the control cabinet
- Monitoring of sensors

This means that Jet engine and all electrical and hydraulic systems (maintenance of charge, batteries, hydraulic motors, etc.) are controlled via PLC and monitored by means of a modem via remote diagnostics.

3.7 Remote Control Wire / Wireless High-End-Remote control-



- Operation / transport position
- Carriage turn / tilt
- Gas turbine start / stop
- Output controller for gas turbine
- Emergency stop
- Shut-off via "autopilot button" (automatic transport position)



4 Speech system JetCom helmet with headset (integrated communication), wireless communication system, Protective helmet up to 140 dB with eyepiece, microphone and dynamic loudspeaker for full-duplex communication, (communication with fire brigade radio).



| Technical data | |
|-----------------------|-----------------------|
| Operation temperature | -20°C - +55°C |
| Frequency | 1,880 MHz – 1,900 MHz |
| Channel selection | automatic 10 channel |
| Distance/ coverage | Approx. 300m |
| Operation time | Approx. 20 h |

5. Service & maintenance

- Based on standard spare parts
- No personnel and time-consuming maintenance
- Easy integration into local vehicle maintenance



- Emergency service in 48 h (7 days/week)
- Jet engines are maintained by our engine inspectors 1x/year
- Worldwide service and maintenance via modem and remote diagnostics / assistance (Vienna, Antwerp, Tennessee USA).

6 Certificates & Standards

The system follows the legal and normative principles mentioned below:

General

- Product Liability Act
- Product Safety Act
- EC Machinery Directive
- DIN EN 82079-1- Preparation of operating instructions - Structure, content and presentation
- VDI 4500 Sheet 4 - Technical Documentation, User Information
- EN ISO 12100 - Safety of machinery – General guiding principles - Risk assessment and risk reduction
- EN ISO 13849-1 - Safety of machinery - Safety-related parts of control systems - Part 1: General design principles

Jet engines

- Work and inspections on the jet engine are carried out by EASA (European Aviation Safety Agency) or LBA (Luftfahrtbundesamt) certified technical aviation personnel with many years of experience in the maintenance and overhaul of turbine engines in accordance with manufacturer's instructions.
 - The engines we use (turbofan engines) are installed in aircraft that have a **noise certificate** issued by the **EASA** (European Aviation Safety Agency) and **do not exceed the limits** required by the International Civil Aviation Organization (**ICAO**) in ICAO Annex 16 Volume I Chapter 3.
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