Maximum comfort, minimal energy consumption.


# Winterwarm JET

Sustainable heating for high industrial areas.

Winterwarm

# Characteristics Winterwarm JET:

- applicable in high areas with 5 to 15 m. height
- sustainable heating solution
- no extra recirculation fans needed
- up to 30% energy savings
- $CO_2$ reduction because of low energy consumption
- uniform temperature in the area > increased comfort
- conical nozzles with induction of air for more recirculation
- low sound level
- EC-fan (stepless control)

**Heating of high areas is a challenge? Not with the Winterwarm JET. This air heater is specially designed to transport warmth from underneath high ceilings downward toward the floor and to keep it there. The unit is equipped with an air discharge module with special nozzles that move 7 to 10 times more air than a unit without a discharge module would do. This way, the warm air is efficiently spread downward in four directions. The temperature difference between the ceiling and the floor remains minimal, helping you save energy while maintaining comfort.**

# Winterwarm JET: sustainable heating for industrial areas

## Sustainable and comfortable heating solution

The Winterwarm JET can be connected to each heat pump, boiler or district heating system and is provided with a coil which is especially designed to realise as high as possible heat output at low water temperatures.

The heaters are provided with economical EC fan motors of which the speed can be adjusted continuously (0-10V) for increased comfort. There are no destratification fans needed anymore which reduces the electricity consumption. After all, the goal is to realize a sustainable heating system.

The JET is available in two models in 3 capacities. The JET-S model is the standard heater which can be controlled by a simple 0-10 V signal. The JET-M is provided with a built in modbus router for control by a BMS of the Winterwarm Smart Controller.

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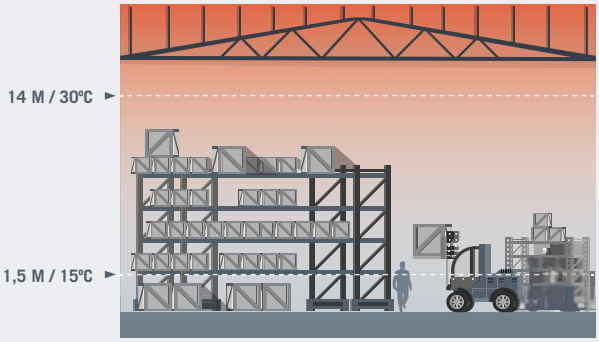
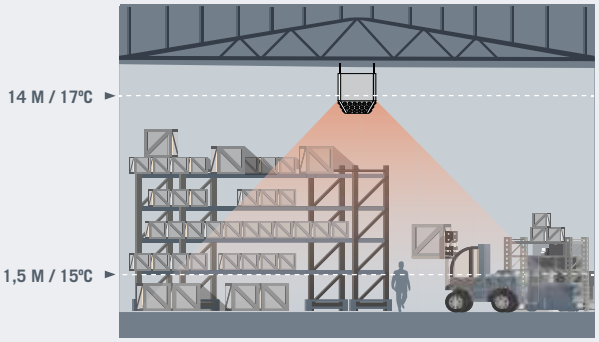
**www.winterwarm.com**
**or scan the QR-code.**

## Significant reduction in heat loss and energy consumption

The JET provides sufficient downward airflow in order to eliminate the need for additional ceiling fans. The temperature difference between the ceiling and the floor is reduced, thereby decreasing heat loss through the roof. In situations without destratification, the temperature typically increases by 1.3°C per meter of height. In a factory that is 12 meters high, this can lead to a temperature rise of up to 13°C! Measurements have proven that the JET can reduce this temperature increase to just 0.16°C per meter, thus limiting the heat loss through the roof.

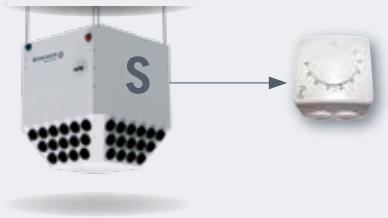


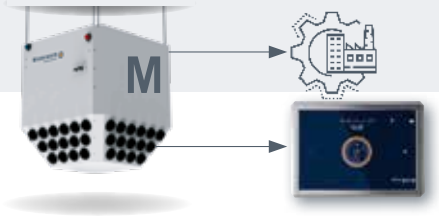

The adjustable nozzles have an inducing air discharge pattern with a large coverage of the area and an optimal warmth distribution. Compared to traditional air heaters combined with ceiling fans, there is less heat loss. The warm air present in the building is optimally reused, which also significantly reduces energy consumption. When compared to a heating system with radiators, the energy consumption in a factory heated with JETS can be up to 50% lower.

### Two models

The JET is available in two models, depending on the type of control system chosen for the unit.




The JET-S is the standard model that can be easily controlled with a 0-10V speed controller or another on/off signal. The air volume of the EC fan in the heater can be adjusted between 1 and 10 V, but it is recommended not to reduce the air volume by more than 40%, otherwise the warm air will not reach the floor.




The JET-M comes with an internal Modbus router and can be connected to any heat pump equipped with Modbus or a building management system that operates with a Modbus (RTU) protocol. Another option is to use the Winterwarm Smart Controller, which offers many additional functions and ensures efficient energy use.

*Source: ISSO 57 publication

## JET with heat pump

In combination with a heat pump, the Winterwarm JET is a fully electric heating solution. The heat pump's capacity must at least match the maximum capacity of the chosen JET model. The JET can be connected to any heat pump equipped with a Modbus protocol. No preference for a specific heat pump? Winterwarm offers its own HPX heat pump series, available in various capacities.

## Heating with low water temperatures

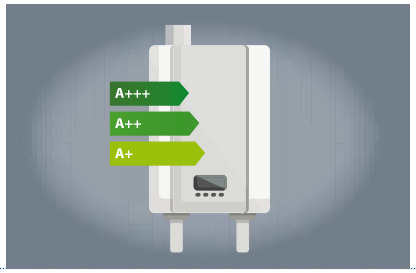
In areas with high ceilings it is especially important to work with relatively low water temperatures so that the vertical throw of the heater can reach the floor. It is a known fact that the lower the air temperature, the stronger the vertical airflow. At a water temperature of 35°-30°C, the temperature of the discharged air will be between 25°C and 35°C. This is optimal. In this situation the heated air can reach the floor from a greater height, allowing you to achieve maximum efficiency from the JET. The EC fan allows the air volume to be adjusted if the airflow is perceived as too strong.

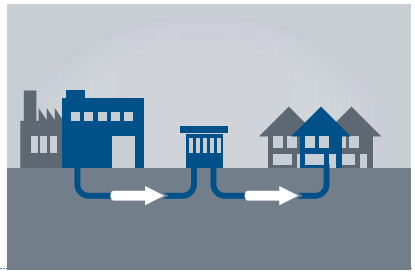
Due to the special construction of the coil, which ensures maximum heat output, the JET is particularly suitable for low-temperature heating. Application with higher water temperatures is also possible, but one must then take into account a lower throw.

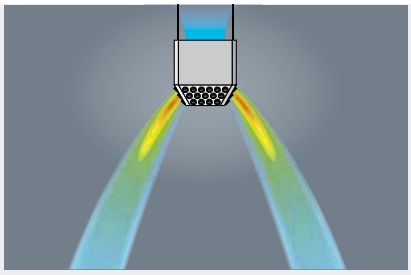
**Heating capacity of the JET at various water temperatures - Conversion table**

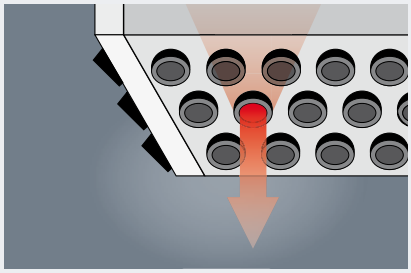
Choose the column with the present room temperature and the row with the applicable water temperature. Multiply the resulting factor by the standard capacity listed in the technical specifications (page 11). The result is the capacity of the JET at the chosen air and water temperatures.

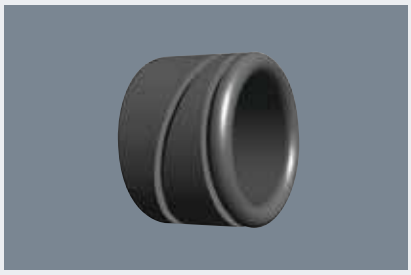
| | Air temperature | | | | | |
|---|---|---|---|---|---|---|
| **Water temperature** | **0°C** | **5°C** | **10°C** | **15°C** | **18°C** | **20°C** |
| 35-30°C | 1,9 | 1,6 | 1,3 | 1,0 | 0,8 | 0,7 |
| 40-30°C | 2,0 | 1,7 | 1,4 | 1,1 | 0,9 | 0,8 |
| 45-35°C | 2,4 | 2,0 | 1,7 | 1,4 | 1,2 | 1,1 |
| 70-50°C | 3,5 | 3,2 | 2,9 | 2,6 | 2,4 | 2,2 |
| 80-60°C | 4,2 | 3,9 | 3,5 | 3,2 | 3,0 | 2,9 |









## How do the Nozzles in the JET work?

The conical nozzles of the JET are designed to produce a low-pressure air jet stream, ensuring optimal air circulation. Initially, the air travels at a high speed, which induces additional airflow from the surrounding environment.

This strategic arrangement of multiple small nozzles next to each other offers two significant advantages:

1. Enhanced air movement: the combined effect of the nozzles creates a powerful airflow, generating 7 to 10 times more air movement than a single large nozzle or the standard air output of the unit. This ensures superior air circulation and effectiveness.
2. Increased comfort: the low-pressure design of the nozzles allows for precise air distribution, tailored to the specific needs of the user. The adjustable fan speed, depending on the height of the area, ensures a comfortable environment at floor level.

The JET disperses air in four directions, and each nozzle can be easily adjusted to either a straight position or angled up to 15 degrees. This flexibility, combined with the high number of nozzles, makes heating with the JET not only efficient but also exceptionally comfortable.

## Design Steps

**Step 1: Calculate the heat loss of the building in kW as usual.**

**Step 2: Select the type of JET based on the height of the area to be heated:**

JET 220: 5-8 meters
JET 330: 7-10 meters
JET 340: 10-16 meters

**Step 3: Determine the number of JET units**

The heat loss divided by the capacity per JET determines the required number of JET units. If the area is very small, one unit may be sufficient.

**Step 4: Make a plan for the placement of the JET units in the building.**

Ensure that all units are evenly distributed across the surface or ceiling of the building, considering machinery, racks, moving cranes, etc. Units should be placed as high as possible to draw return air from the highest point (=warmest) of the building. Take the parameter "L" into account to maintain sufficient distance from the walls (see diagram on page 8).

**Step 5: Check the coverage of the discharge air.**

Use the table below to determine if the discharge air from the selected number of JET units covers the entire space. If not, add an additional JET to achieve a uniform temperature in the room.
Note: The discharge height of the JET (distance from the floor to the bottom of the heater) determines the covered area, not the height of the area.

Coverage table of discharge air from one JET (height = discharge height)
The table is based on a total discharge angle of 45° so that the maximum area is covered with warm air: 30° from the discharge module plus 15° from the nozzles.

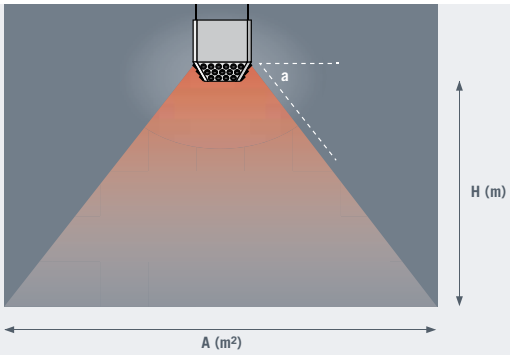
**Approximate covered area in m²**

At a total discharge angle of 45° (discharge module + nozzles).

| Height (H) in m | Length (L) in m | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **5** | **6** | **7** | **8** | **9** | **10** | **11** | **12** | **13** | **0** | **15** | **16** |
| **5** | 100 | 125 | 150 | 160 | | | | | | | | |
| **6** | | 150 | 175 | 190 | 220 | | | | | | | |
| **7** | | | 200 | 220 | 250 | 280 | | | | | | |
| **8** | | | | 250 | 290 | 320 | | | | | | |
| **9** | | | | | 325 | 360 | 410 | | | | | |
| **10** | | | | | | 400 | 450 | 480 | 560 | | | |
| **11** | | | | | | | 490 | 530 | 620 | 670 | | |
| **12** | | | | | | | | 575 | 675 | 730 | 730 | |
| **13** | | | | | | | | | | 790 | 840 | 890 |
| **14** | | | | | | | | | | | 900 | 950 |
| **15** | | | | | | | | | | | | 1020 |

JET 220= 19KW JET 330= 29KW JET 340= 38KW

| | JET220 | JET330 | JET340 |
|---|---|---|---|
| a | 15-45° | 15-45° | 15-45° |
| H (m) | 7-10 | 9-14 | 10-16 |
| Diameter (*) min. – max. | 5-25 | 10-30 | 10-35 |
| A (m2) (*) min. – max. | 20-500 | 80-700 | 80-1000 |




*(*) Depending on a at maximum height*

*Maximum throw can only be reached at a water temperature of 35°C.*

**Step 6: Make your choice for a JET-S model or a JET-M model depending on the available control.**

## Controls

**Stepless speed controller 0-10 V (GA3955)**

To control the EC fan motor. Reduction of air volume up to 40%, depending on the desired comfort level. Attention: do not set the speed controller too low otherwise the generated heat will remain in the upper part of the building forming a heat blanket under the ceiling. Then the advantages of the JET will be lost.

**Smart Controller (IW8050)**

For an installation with a Winterwarm HPX heat pump a Smart Controller is required. This innovative control system is especially developed for Winterwarm heating equipment and optimizes the operation of an HPX-heat pump in combination with the JET. The Smart Controller assures an energy saving operation of the heater.

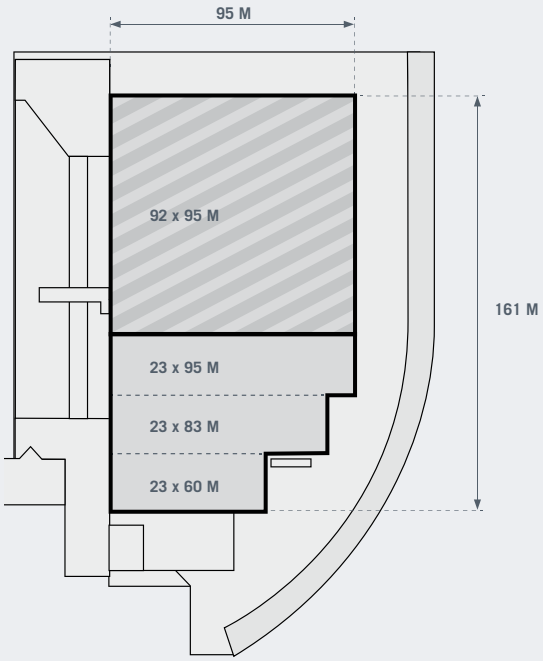
Characteristics:
- Simple installation with Modbus connection
- Self-optimizing for cost efficient heating
- Clock function
- Multiple JETS on one Smart Controller
- Possibility to set and read out per unit
- Contact for external heat source (f.i. heat pump or boiler)
- Smart Grid Ready

## Example of a JET -installation calculation

**1. General data**

- Name of the project: Bulk – Denmark
  Heating advice for the part of the building called “Bulk Modul 1”
- Purpose of the building: warehouse/logistics
- Measurements: 95 x 92 x 14 ( b x d x h)
- Set room temperature

**2. Image and plan**




**3. Determine the heat loss. For this building it has been calculated at 261 kW.**

**4. The area in the building is 14m. high > at this height the JET 340 is the right choice.**

According to the table on page 7 at 14m. height the covered surface is 900m2. To cover the whole area of 95x92m. = 8740 m2, 9x JET 340 heaters are required. The capacity of a JET 340 is 37,9 kW at the available water temperatures of 45°/35°.

**5. Air recirculation**

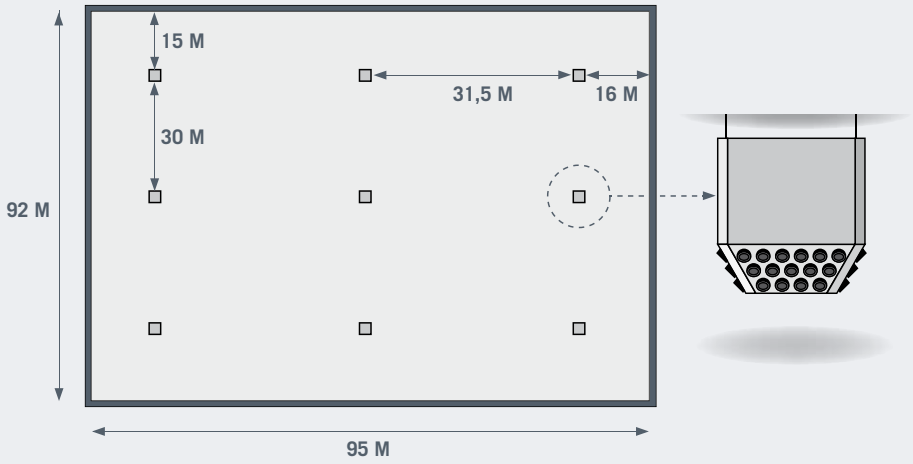
The volume of the BULK building is 95x92x14 = 122,360 m³. The air output of one JET 340 is 8,000 m³/h. The nozzles will move approximately 5 times the air volume compared to the output of one JET. This means one JET 340 moves 8,000x5 = 40,000 m³ of air. For the BULK building, 9x JET 340 units will recirculate about 360,000 m³/h of air. This results in a recirculation rate of 360,000/122,360 = 2.93, which is ideal for such a large space according to common standards. By recirculating this volume of air, a uniform room temperature of 18°C can be maintained, with a low temperature gradient. A small temperature difference between the top and bottom of the area reduces heat loss through the roof, leading to lower energy loss and, consequently, lower energy costs.

**6. Layout of the JET units**

The BULK building is nearly square. Each JET has a coverage area of 900 m². The best solution is to distribute the units evenly across the entire surface of 95x92 meters, keeping in mind that the distance between the JETs can be twice as large as the distance to the wall. See the example layout below.

**7. Final Step**

Choose between a JET-S model or a JET-M model, depending on the desired control method. In this situation, the JET 340 M was chosen, as a building management system was available.



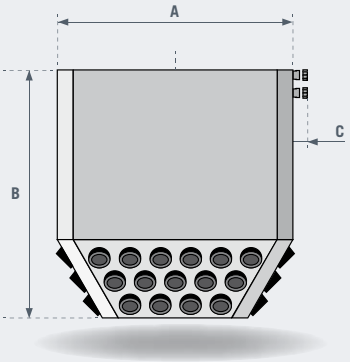

## Technical data Wintewarm JET series

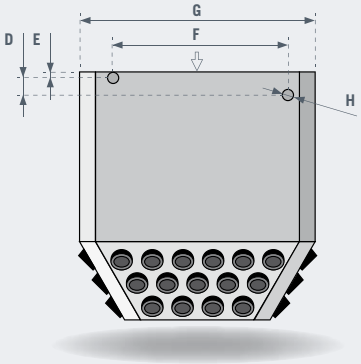
| Type | Unit | JET 220S | JET 220M | JET 330S | JET 330M | JET 340S | JET 340M |
|---|---|---|---|---|---|---|---|
| **Article no.** | | **GJ220BWWS** | **GJ220BWWM** | **GJ330BWWS** | **GJ330BWWM** | **GJ340BWWS** | **GJ340BWWM** |
| Heat output at 35°C/30°C* | kW | 14 | 14 | 20 | 20 | 25,5 | 25,5 |
| Air output | m³/h | 4200 | 4200 | 5500 | 5500 | 8000 | 8000 |
| Throw vertical (warm) | m | 12 | 12 | 14 | 14 | 16 | 16 |
| Voltage (50Hz) | V | 230 | 230 | 230 | 230 | 400+N | 400+N |
| Electrical power | W | 840 | 840 | 840 | 840 | 1100 | 1100 |
| Electrical current | A | 4.2 | 4.2 | 4.2 | 4.2 | 1.8 | 1.8 |
| Sound level (@10 m height) (min. 4V - max. 10V) | dB(A) | 47-63 | 47-63 | 47-63 | 47-63 | 47-63 | 47-63 |
| Weight (incl. water) | kg | 58 | 58 | 93 | 93 | 93 | 93 |
| Water volume | ltr | 3.9 | 3.9 | 6.6 | 6.6 | 6.6 | 6.6 |
| Water connection (male thread) | G” | 1 | 1 | 1 | 1 | 1 | 1 |
| Watersided pressure loss | kPa | 11 | 11 | 30 | 30 | 30 | 30 |
| Minimum suspension height (distance floor to JET) | m | 7 | 7 | 10 | 10 | 12 | 12 |
| Power isolation switch in heater | | no | no | no | no | yes | yes |

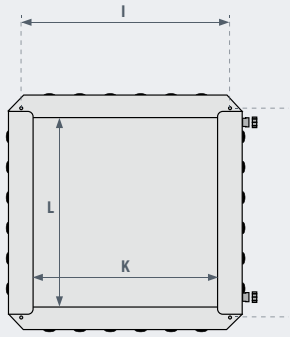
**) at room temperature of 15°C  Attention: the JET is not suitable for cooling.*

The JET is designed only to heat and is not suitable for cooling. If cooling is desired please check the possibilities with the WWH-LT range.

## Measurements




| Type | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **JET 220** | 695 | 820 | 35 | 65 | 20 | 495 | 695 | 1” | 615 | 615 | 535 | 550 |
| **JET 330** | 865 | 920 | 30 | 65 | 20 | 645 | 865 | 1” | 770 | 770 | 690 | 700 |
| **JET 340** | 865 | 920 | 30 | 65 | 20 | 645 | 865 | 1” | 770 | 770 | 690 | 700 |

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## That's why the Winterwarm JET!


### Innovative
Low pressure nozzles/
Induction of air

### Sustainable
Low water temperature system /Low energy consumption/high performance

### High quality
Reliable product with heavy duty EC-fan inside

### Efficient heating
Specially designed for high buildings creating maximum comfort

### Low investment cost
Value for money/
low installation costs/
low running cost

### Energy saving
Limiting energy loss at the max

### Dutch product
Engineered and manufactured in the Netherlands

**Winterwarm Heating Solutions BV**
Olden Goorweg 1 P.O.Box 36 NL-7100 AA Winterswijk The Netherlands
T +31 (0)543 54 63 00 info@winterwarm.nl www.winterwarm.nl

**Winterwarm UK Ltd.**
Unit H3, Taylor Business Park, Warrington Road, Risley, Warrington, Cheshire WA3 6BL
Tel. +44 (0)192 57 65 799 www.winterwarm.co.uk enquiries@winterwarmuk.com

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Winterwarm