The new BS EN 16430
...an introduction
Trench Heating / Trench Cooling
Natural Convection – Trench Heating
Forced Convection – Trench Heating
Trench Heating / Trench Cooling
The Problem...

The outputs shown are based on LPHW 82/71°C, EAT 18°C. Water Velocity 0.92m/s.

PERFORMANCE
Table 2:
L.T.H.W 80°C mean, 0.32kg/s water mass flow rate, ambient air at 20°C. To BS EN 442 (q)

Outputs

Outputs in watts at 75/65/20°C, in accordance with EN442

For 6 ºC water supply temperature, 26 ºC suction air temp. before entering the heat exchanger (may vary from the room air temp.), condensing operation, 50 % relative humidity.

TRENCH OUTPUTS

NOTE: Two columns of outputs are shown as some suppliers rely on the old BS3828 test results. The most up to date testing is BS EN442 which shows lower outputs due to a change in test procedure.
The Problem...

- no common standard for Trench Heating...
- Performance Data of different manufacturers not comparable
- no reliable design data for consultants
- no quality standards
Standards...

BS / DIN → national

BS EN / DIN EN → EU Member States

BS ISO / DIN ISO → International
Brings in....

- 75/65/20°C
- Reference Air Temp.
- Test Chamber

but...

.. Trench Heating not mentioned
German By-Standard in addition to EN 442

Brings in..
- nat conv. & fan ass. Trench Heating

But....

..... no Trench Cooling
The Solution...

The European Standard "Fan assisted radiators, convectors and trench convectors" consists of the following parts:

- Part 1: Technical specifications and requirements
- Part 2: Test method and rating for thermal output
- Part 3: Test method and rating for cooling capacity
BS EN 16430...

Foreword

This document (EN 16430-1:2014) has been prepared by Technical Committee CEN/TC 130 “Space heating appliances without integral heat sources”, the secretariat of which is held by UNI.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by June 2015 and conflicting national standards shall be withdrawn at the latest by June 2015.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] shall not be held responsible for identifying any or all such patent rights.

The European Standard "Fan assisted radiators, convectors and trench convectors" consists of the following parts:

- Part 1: Technical specifications and requirements
- Part 2: Test method and rating for thermal output
- Part 3: Test method and rating for cooling capacity

According to the CEN-CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.
8.2 Aim of the test programme

The aim of the test programme is to determine:

— the standard thermal outputs and/or standard cooling capacity for comparison of different products under manufacturer defined nominal conditions (e.g. primary air flow rate, acoustical power, fan speed);

— the thermal output and/or cooling capacity under variable operating conditions (e.g. water temperatures, fan speed, primary air flow rate, acoustical power etc.) to provide standardized technical data for the design of heating systems with or without a cooling function.

### CALCULATE OUTPUT

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flow temperature (t_w1 in °C)</td>
<td>75</td>
</tr>
<tr>
<td>Return temperature (t_w2 in °C)</td>
<td>65</td>
</tr>
<tr>
<td>Room air temperature (t_L in °C)</td>
<td>20</td>
</tr>
</tbody>
</table>

> Standard values can be changed by entering them directly or by using the slider.

<table>
<thead>
<tr>
<th>Speed setting [%]</th>
<th>100</th>
<th>80</th>
<th>60</th>
<th>40</th>
<th>20</th>
<th>Natural convection</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heat output [W]</td>
<td>1.476</td>
<td>1.374</td>
<td>1.224</td>
<td>1.044</td>
<td>818</td>
<td>164</td>
</tr>
<tr>
<td>Heating medium flow rate [l/h]</td>
<td>127</td>
<td>118</td>
<td>105</td>
<td>90</td>
<td>70</td>
<td>14</td>
</tr>
<tr>
<td>Water pressure drop [Pa]</td>
<td>786</td>
<td>692</td>
<td>563</td>
<td>424</td>
<td>275</td>
<td>16</td>
</tr>
<tr>
<td>Air volume [m³/h]</td>
<td>137</td>
<td>129</td>
<td>105</td>
<td>78</td>
<td>65</td>
<td>0</td>
</tr>
<tr>
<td>Sound pressure level [dB(A)]</td>
<td>30</td>
<td>28</td>
<td>23</td>
<td>&lt; 20</td>
<td>&lt; 20</td>
<td>0</td>
</tr>
<tr>
<td>Sound power level [dB(A)]</td>
<td>38</td>
<td>36</td>
<td>31</td>
<td>&lt; 28</td>
<td>&lt; 28</td>
<td>0</td>
</tr>
</tbody>
</table>
BS EN 16430...

5.3 Leak testing

Before leaving the manufacturer’s all heating appliances shall be tested for leaks to a test pressure equal to at least 1.3 times the quoted maximum operating pressure. The test pressure shall not be less than 520 kPa.
6 Electrical and mechanical safety for fan assisted radiators

The electrical components and the fan shall meet the requirements for electrical and mechanical safety.

Electrical components of the fan assisted radiators shall comply with EN 60335-2-80. The fan shall comply with EN ISO 12499 for mechanical safety.
7 Noise emission

The sound power shall be measured for the fixed rotation speed of the fan respectively for the highest, the lowest and the nominal speed in case of continuous or multi stage variable fan speeds.

In addition to the sound power level, the manufacturer may specify the sound pressure level with a room absorption of 8 dB (A). This corresponds to a distance of 2 m from the sample, a room volume of 100 m³ and a reverberation time of 0,5 s.
8.1 Test method and laboratory

8.1.1 Thermal outputs

The thermal outputs shall be determined with the method and test programme specified by EN 16430-2 in a laboratory, also taking into account the laboratory specific requirements and harmonization methods as specified by EN 442-2.

Key

a  cooling surface, temperature 16 °C ± 0.5 K
1  reference air temperature t,
4.2.2 Determination of the thermal output

4.2.2.1 General

The procedure of the test and the determination of the thermal output are performed in accordance with EN 442-2. EN 442-2, applies analogously with regard to the requirements for measuring instruments.

Here, a characteristic formula:

\[ \Phi = K_m \cdot \Delta T^n \]  

Where:

- \( \Phi \) is the thermal output
- \( K_m \) is the constant of the model
- \( \Delta T \) is the excess temperature
- \( n \) is the exponent

shall be determined on the basis of at least three measuring points, at a constant water flow rate and excess temperatures of

- \( \Delta T = (60 \pm 2.5) \text{ K}; \)
- \( \Delta T = (50 \pm 2.5) \text{ K}; \)
- \( \Delta T = (30 \pm 2.5) \text{ K}. \)
BS EN 16430...

Figure 11 — Displacement ventilation trench convector

Figure 12 — Ventilation trench convector

Figure 13 — Inductive ventilation trench convector
4 Testing of dry cooling capacity

4.1 Short description

The dry cooling capacity of the test sample has to be determined in its steady state with measurements of the cooling water flow and the temperature difference in the cooling water. The dry cooling capacity shall be quoted as a function of the temperature difference between the reference temperature and the average cooling water temperature.

4.3 Test methods

4.3.1 General

The test method shall be carried out according to EN 442-2.

Analogue to the excess temperatures given, the under temperatures shall be:

\[ \Delta T = (8\, K \pm 0.5)\, K \]
\[ \Delta T = (10\, K \pm 0.5)\, K \]
\[ \Delta T = (12\, K \pm 0.5)\, K \]

In deviation from EN 442-2, the reference air temperature shall be 28 °C ± 0.5 K during the measurement.
Total and Sensible Cooling Capacity ?!?!?
BS EN 16430...
Entering Air Temperature / Reference Air Temperature...

Non short-cut optimised air outlet

Short-cut optimised air outlet
EU-Konformitätserklärung

EU Declaration of Conformity
Déclaration de Conformité CE
Deklaracja zgodności CE
EU prohlášení o konformitě

Wir (Name des Anbieters, Anschrift):

KAMPANN GmbH
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48911 Lingen (Ems)

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declarons sous notre seule responsabilité, que le produit:
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deklarujeme s vší odpovědností, že produkt:

Type, Modell, Artikel-Nr.:
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to la/aux norme(s) ou autre(s) document(s) normalis(s) :
do którego odpowiada obecna deklaracja, jest zgodna z następującymi normami lub innymi dokumentami normalizacyjnymi:
ne které se táto deklarace vztahuje, souhlasí s následujícími normami/normami nebo s normativními dokumenty:

DIN EN 16430-1: 2-3
DIN EN 442-1-2
DIN EN 55014-1-2
DIN EN 61000-3-2; 3-3
DIN EN 61000-6-1; 6-2; 6-3
DIN EN ISO 12100
DIN EN ISO 13857

Gemäß den Bestimmungen der Richtlinien:

Following the provisions of Directive:
Conformément aux dispositions de Directive:
Zgodnie z postanowieniami Dyrektywy:
Odpovídá ustanovením směřovací:

EMV-Richtlinie
09/128/EG
Niederspannungsrichtlinie
09/55/EG

Lingen (Ems), den 07.09.2015
Ort und Datum der Ausstellung
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Místo a datum vystavení

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Thank you...