Manual DRUM-HEATER DH27

Release: 11.07.2015

A Table of contents

B Function

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The DRUM HEATER DH27 consists of a high-performance heating element and was specially developed for the SMART HEATER from the world market leader for special panels ZOPPAS.

ZOPPAS has experience in development and manufacture of electric heating elements, as well as systems that can be equipped also with thermal monitoring and control equipment more than 40 years in the field of electrical heating technology.

The departments in the Zoppas industries group have a very high level of expertise with continuous innovation in products round tubular heating elements, cartridges and band heaters, heating foils, thick-film technology, heating cable, mineral insulated heating cables, convection heaters made of aluminum, devices and electronic control systems.

The DH27 is compatible for use with all SMART HEATER ´ n from the series SH-V (starting with version 1.1) as well as for all SH-S/M and Sunloader.

The DRUM HEATER is manufactured in Germany and can only buy to selected distributors.

KRENTZEL GmbH

C Safety

These warnings apply to all persons who work on the DRUM HEATER.

CAUTION !

- The non-observance of the following instructions may cause severe injury or installation and maintenance of smart heaters result in fatal accidents may be carried out only by qualified personnel.

  Working on the DRUM HEATER or its input and output cables never if the smart heater to the mains is connected. Before carrying out any work on the inside to ensure the DRUM HEATER that no dangerous voltages. (Main-switch = off , etc.)

  Unlock unintentionally secure voltage !!!

Perform any work on the control cables, if voltage is present at the smart-heater or external control circuits. Externally-powered control circuits can lead to dangerous voltages even in the smart-heater if the voltage supply of the smart heater is switched off. (wait 10 min)

The DH27 may exclusively operated at a SH-S, M, V or Sunloader.

Live parts inside the housing are protected against direct contact if all protective covers of plastic and metal are attached.

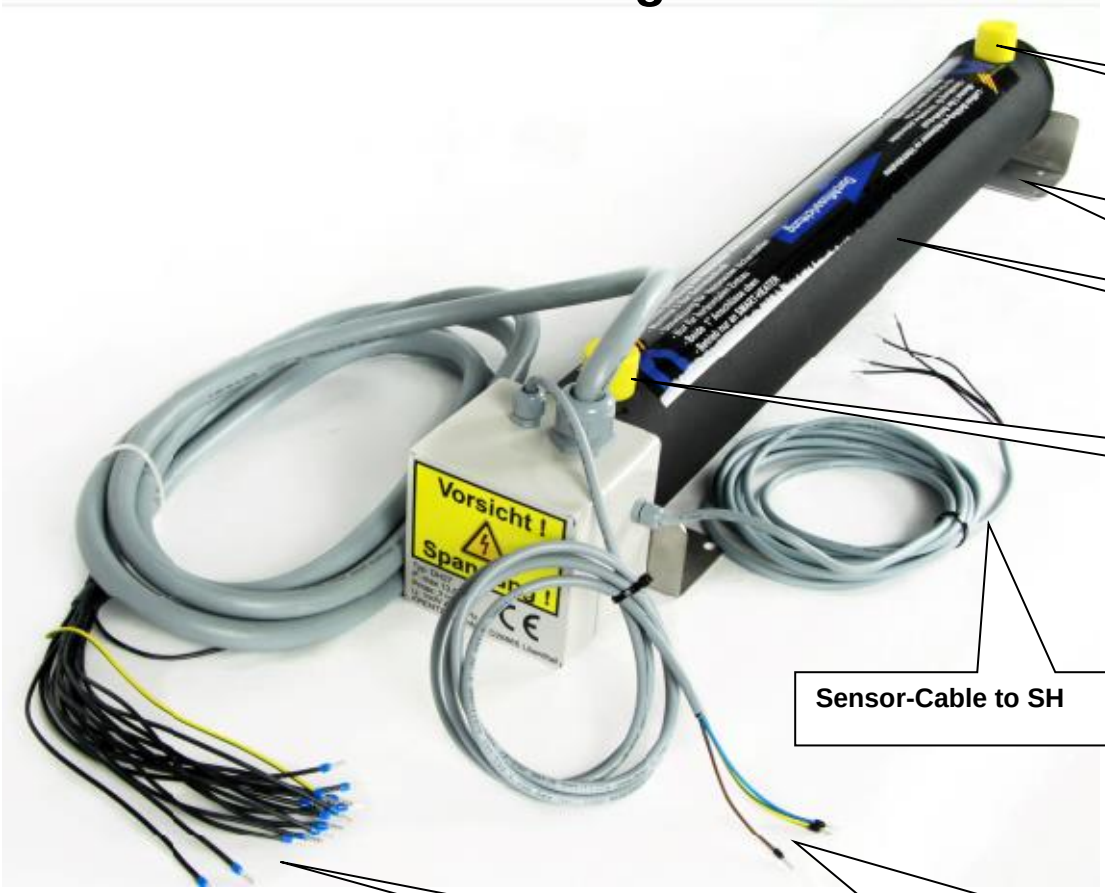
Special attention is required, when handling sharp metal covers.

Never open the enclosures. There is danger to life and the possibility of system damage.

Connection of DH27 may be performed only by qualified personnel (electrician or master)

Warning: In the DRUM HEATER modus, no switching in series with multiple DH´s the hydraulic flow allowed in to prevent overheating of the DH.

D Housing Views



Warning: The fitting of the junction box is protected by special paint & decals.
The guarantee and warranty will be void, if damage

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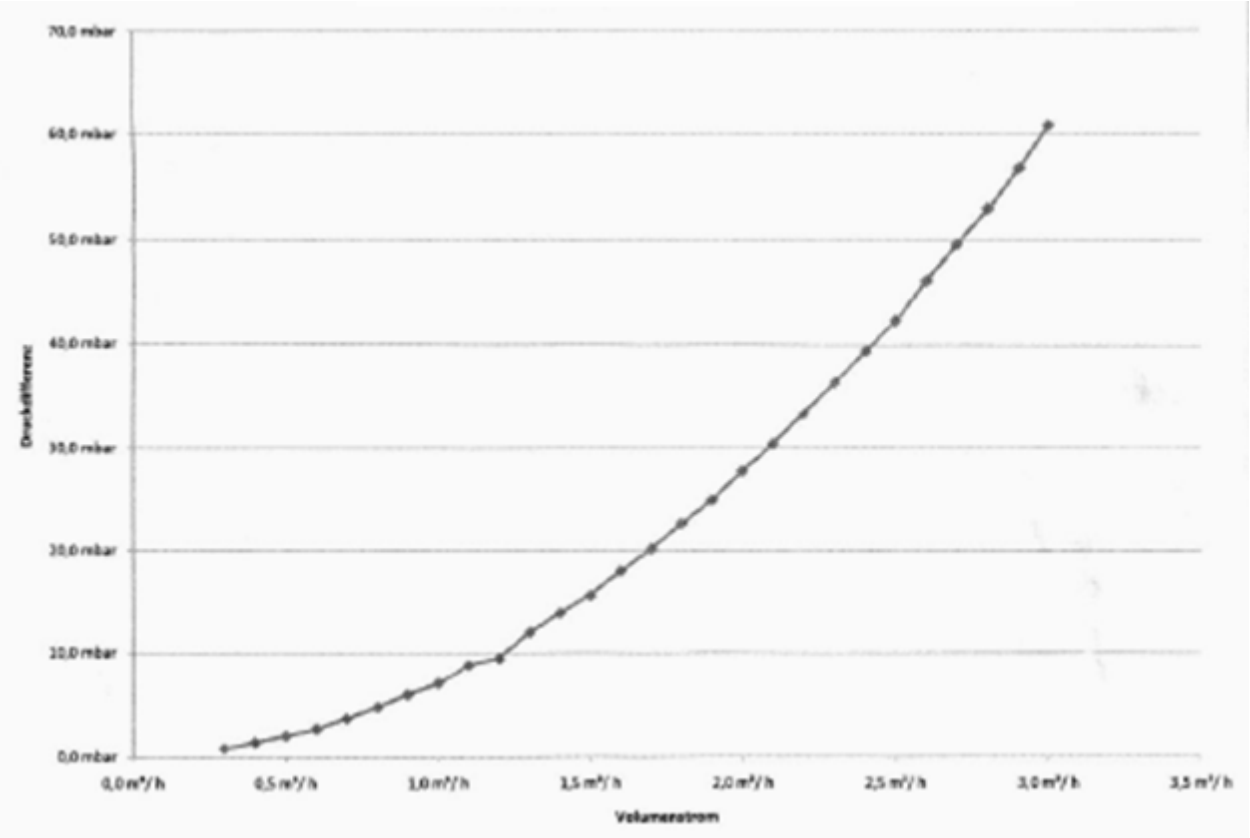
E Spezification

Housing	930x135mm (LxW (diameter)
Weight	9,5kg
Main-Cable	17x2,5qmm, 5m length
Sensors-Cable	4x0,75qmm, 5m length
Circulation-Pump	3x1,5qmm, 2m
Heating-Power	SH-S up to 6,5kW (9kW to SH-M) SH-V up to 13,5kW Sunloader up to 13,5kW
Matrix-Control	 SH- S up to 13 Steps á 500W SH- M up to 18 Steps á 500W SH- V stepless Sunloader stepless
Hydraulic connection	Threaded nipple 1 ", flat seal (MS), pipe 22x1x25mm, shutter: AF
Ambient temperature	+0 bis +50 Grad Celsius
Operating Pressure	3 Bar
Test pressure	5 Bar
Mounting position	horizontally, Nipple Up
Temperature limit (one-way trip)	<+100C
Temperatur under limit	>+5C (Frost-proof operation)
Permissible medium	Heating-water VDI 2035
Drying cycle	Not allowed
Surface loading	RHK max. 12 W/cm2
Manufacturing tolerance (Power)	+/- 10%
Warranty	24 Month

E1 Flow resistance graph



E2 Flow resistance, Table

Messung :	Druckdifferenz 25_1
Einbaulage :	1 (waagrecht)
Auswertezeitraum :	10:35 - 14:22 Uhr

Durchströmungsrichtung :

1 2

Anlagendruck : 2,0 bar

Volumenstrom	Druckdifferenz	Volumenstrom	Druckdifferenz
0,3 m³/ h	0,8 mbar	1,7 m³/ h	20,2 mbar
0,4 m³/ h	1,4 mbar	1,8 m³/ h	22,6 mbar
0,5 m³/ h	2,0 mbar	1,9 m³/ h	25,0 mbar
0,6 m³/ h	2,7 mbar	2,0 m³/ h	27,7 mbar
0,7 m³/ h	3,7 mbar	2,1 m³/ h	30,4 mbar
0,8 m³/ h	4,8 mbar	2,2 m³/ h	33,3 mbar
0,9 m³/ h	6,0 mbar	2,3 m³/ h	36,3 mbar
1,0 m³/ h	7,1 mbar	2,4 m³/ h	39,4 mbar
1,1 m³/ h	8,8 mbar	2,5 m³/ h	42,2 mbar
1,2 m³/ h	9,5 mbar	2,6 m³/ h	46,1 mbar
1,3 m³/ h	12,0 mbar	2,7 m³/ h	49,6 mbar
1,4 m³/ h	13,9 mbar	2,8 m³/ h	53,0 mbar
1,5 m³/ h	15,6 mbar	2,9 m³/ h	56,9 mbar
1,6 m³/ h	18,0 mbar	3,0 m³/ h	60,8 mbar

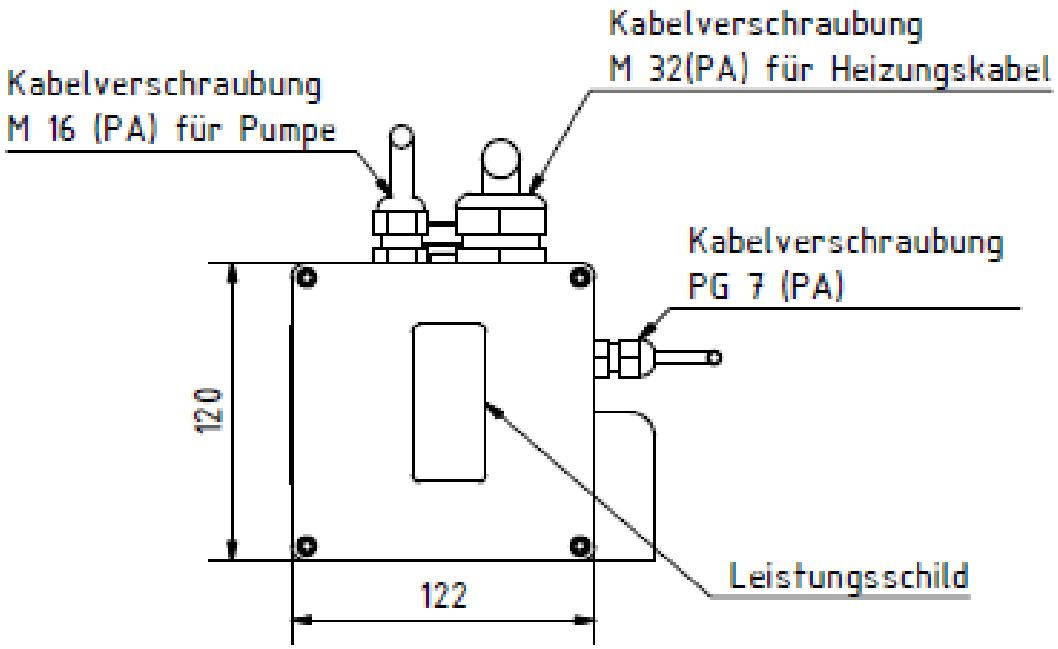
F Mechanical Installation

The DRUM-HEATER must be mounted with the enclosed fastening material to wall / support.

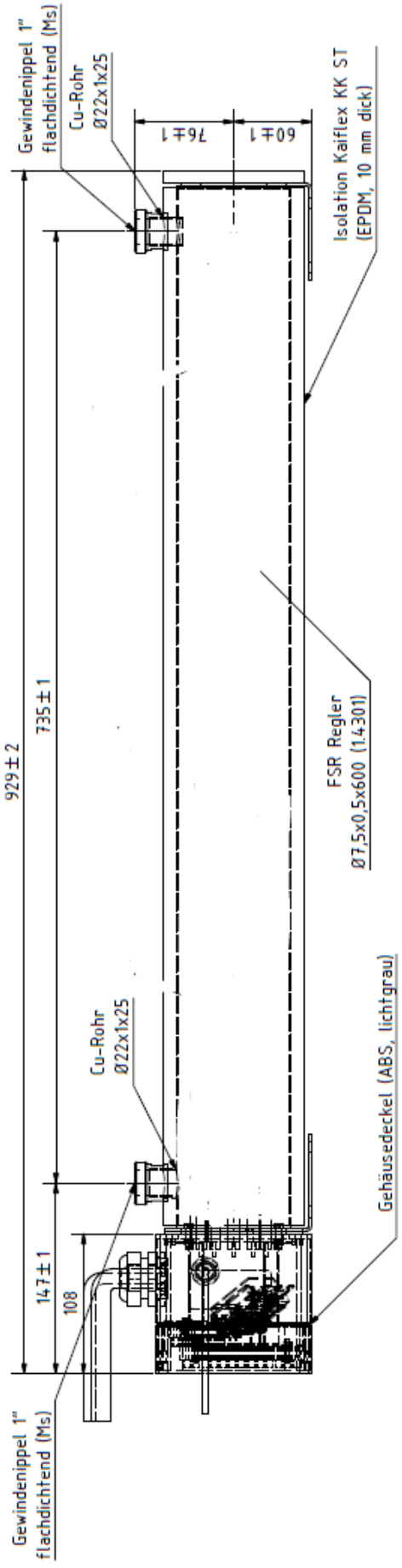
The instrument is designed and adapted exclusively for fixed cultivation and not for mobile purposes.

Look for a dry and solid mounting place.

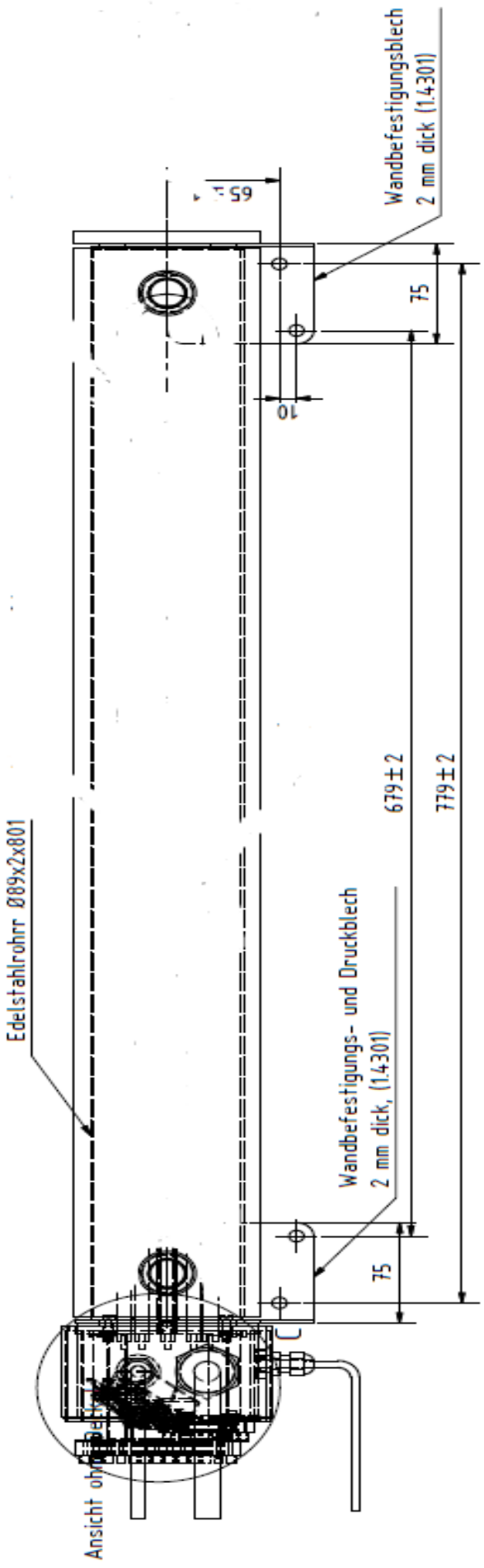
F1 Radiator, terminal box.



F2 Radiator, side view



F3 Radiator, top view



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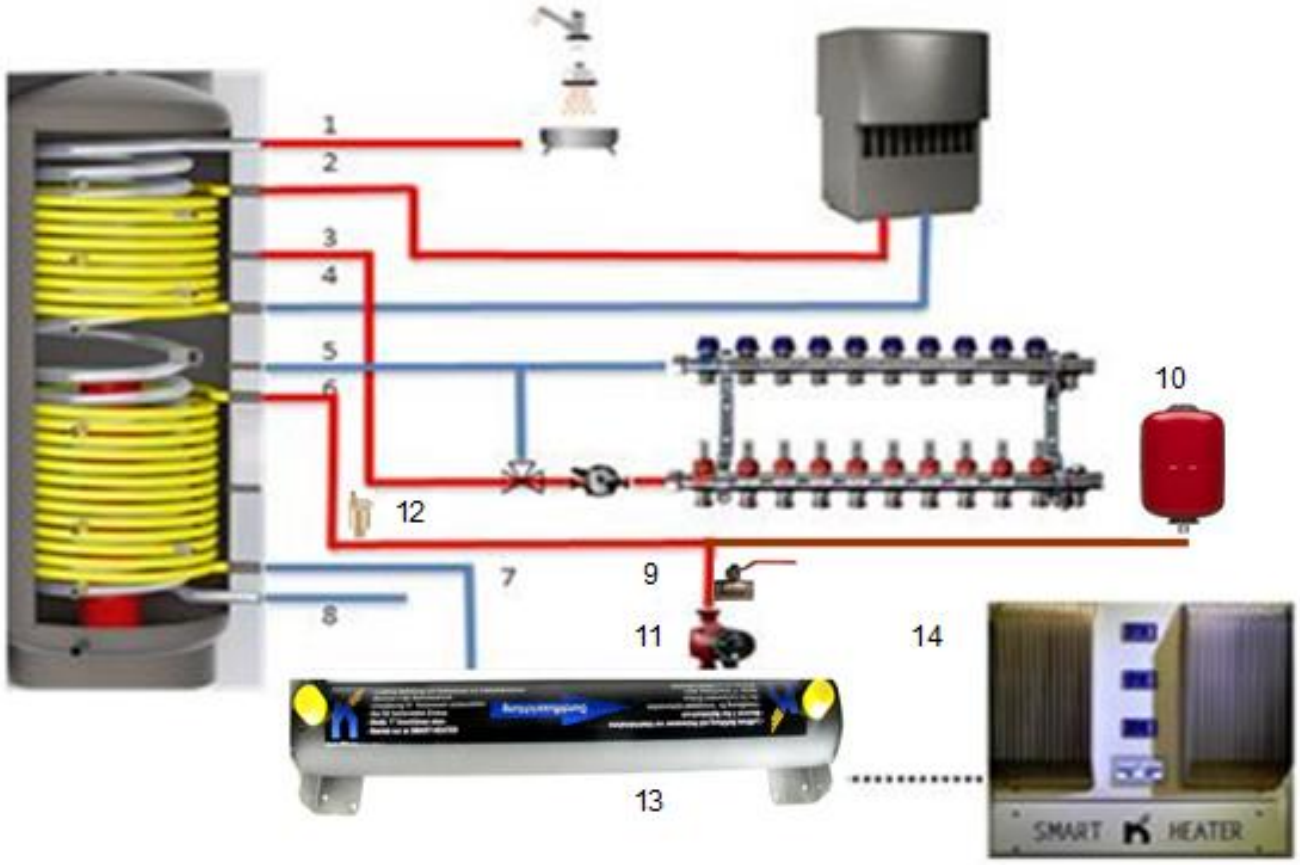
F4 Hydraulic connection (example: DH27 on buffer)



1.) Warmwasser
2.) Vorlauf Wärmepumpe
3.) Vorlauf Fußbodenheizung
4.) Rücklauf Wärmepumpe
5.) Rücklauf Fußbodenheizung
6.) Vorlauf DRUM-HEATER
7.) Rücklauf DRUM-HEATER
8.) Kaltwasser
9.) Befüllungsventil
10.) Ausdehnungsgefäß
11.) Umwälzpumpe
12.) Entlüfter
13.) DRUM-HEATER DH27
14.) SMART-HEATER

F5 Labels on the DH for connection and security

G Electrical Installation

Electrical Connection

Voltage on the cable of the DH27 may be depending on the external and internal wiring.

The DH27 and the adjacent units must be earthed anyway for reasons of personal safety, as well as to the reduction of electromagnetic interference and radiation. (PE)

The sensor cables (temperature) shall not be installed in combination with high-current cables, to avoid any inductive influence on the measured values.

The supply lines of the DH27 must occur on a multiple device installation of several SMART HEATER separately and not in series.

Warning: A short-circuit on the output cable of the DH27 leads to the immediate damage of the semiconductor power amplifiers in the SH.
This warranty and the warranty claims shall expire.

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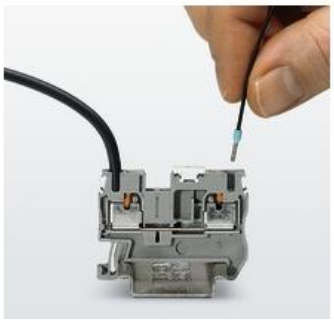
Warning: There is no dry-run of DH's allowed. Maintain a permanent filling the DH with water.
In the absence of water the overtemperature protection of DH's can trigger.
The DH is not used in this situation and must be sent for repair to the KRNTZEL. (Chargeable)

Warning: When operating in a buffer memory, it is necessarily a sufficient provide dimensioned expansion tank in the hydraulic system.

Cable / lead terminal

All electrical connections are made without tools via the State of the art push-in technology at the terminals in the cable compartment. As a result you can use, solid wires also stranded with and without wire end ferrules. You need no special tools: using the integrated operation handle loosen wires easily and quickly. Simply press the Orange control button and the contact is opened.



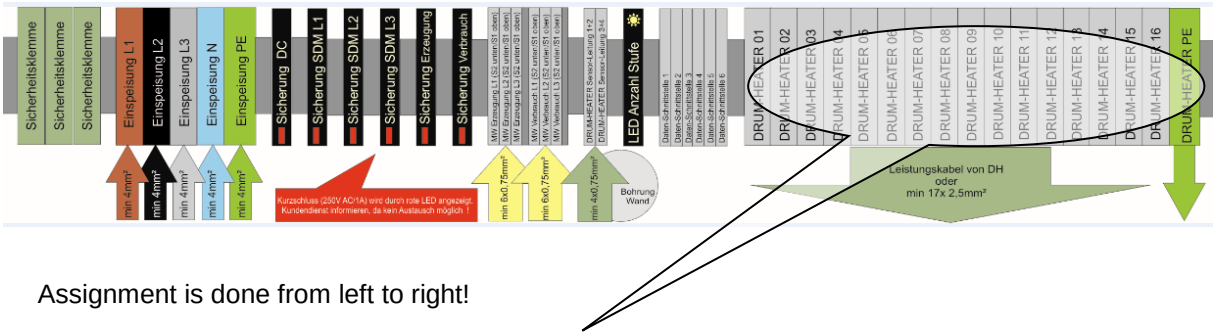
G1 Drum-Heater

To connection a drum heaters DH-27 take a 16 x 2, 5mm + PE line. This is only on the numbered order of assignment. The internal ceramic-elements of the DH and Thermo-monitoring are integrated in the DH and require no further connection.

By default, the operating parameters of the DH are stored as a set of parameters in the SH.
If you want to use a third-party product, to verify the specifications and operating parameters of the manufacturer. (no guarantee)

Warning:

Faulty operating parameters of the DH from third-party manufacturers, no function guarantees or warranty claims can be applied. If any damage can be this the SH. In this case, the certificate of conformity for the SH also loses its validity.



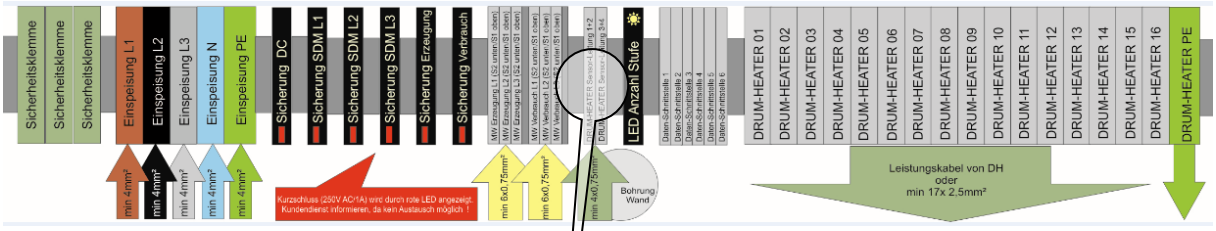
Assignment is done from left to right!

DRUM-HEATER DH-27	Wire 01
DRUM-HEATER DH-27	Wire 02
DRUM-HEATER DH-27	Wire 03
DRUM-HEATER DH-27	Wire 04
DRUM-HEATER DH-27	Wire 05
DRUM-HEATER DH-27	Wire 06
DRUM-HEATER DH-27	Wire 07
DRUM-HEATER DH-27	Wire 08
DRUM-HEATER DH-27	Wire 09
DRUM-HEATER DH-27	Wire 10
DRUM-HEATER DH-27	Wire 11
DRUM-HEATER DH-27	Wire 12
DRUM-HEATER DH-27	Wire 13
DRUM-HEATER DH-27	Wire 14
DRUM-HEATER DH-27	Wire 15
DRUM-HEATER DH-27	Wire 16
DRUM-HEATER DH-27	Wire PE

G2 Temperatur-Sensor

For the operation of DH27 on SH, only the core temperature sensor is necessary in addition to the power cable.
This is not significantly connected via the sensor cable (4-core) the SH because it is pure resistance measurement using PT/NTC sensors, is a reverse polarity of the connecting cables.

Make sure that the sensor lines separately and not be laid in a harness or a cable channel with high-current cables.
A measured value of distortion due to the induction of the high-current cables otherwise or the display of measured values shuttling remarkably strong.



Assignment is done from left to right!

DRUM-HEATER DH-27 Sensor-Wire	Wire 01
DRUM-HEATER DH-27 Sensor-Wire	Wire 02
DRUM-HEATER DH-27 Sensor-Wire	Wire 03
DRUM-HEATER DH-27 Sensor-Wire	Wire 04

G3 Operating with circulating pump

The SMART HEATER from 1.1 V or Modell S or Model M transfers also the supply voltage for a circulation pump (not included) via the power cable of the DH27.

From a matrix of > = 1 the circulation pump automatically switches from the SMART HEATER.

Warning:

If no pump is required, the pump cable of DH27 is put isolated in an extra touch and short-circuit boxes of junction to protect.

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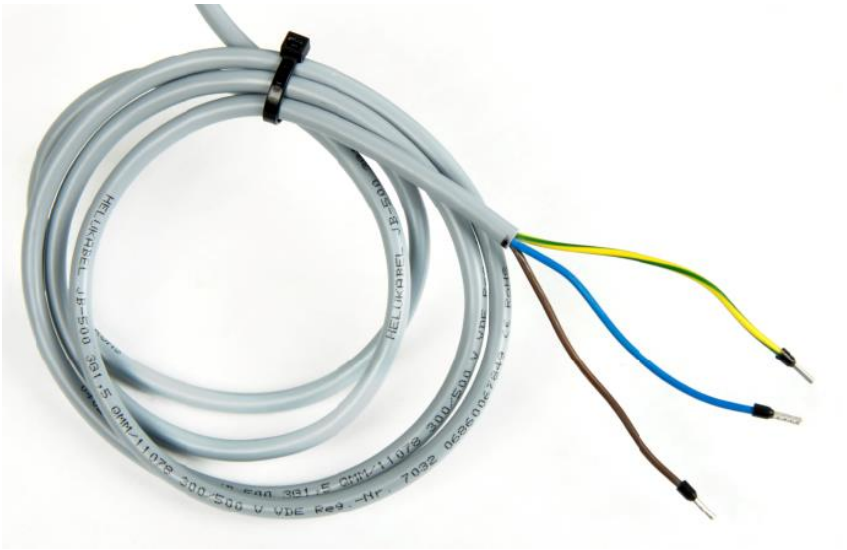


H Startup

After properly installing and connecting:

- The heater supply line (at Drum Heater 16x2,5qmm + PE)
- The sensor line of DH27 (4x0,75qmm)
- Possibly the circulation pump cable (3x1,5qmm)
- Filling the DH's with water is carried out
- The water circulation through the DH is ensured
- A compensation vessel for the buffer memory operation is mounted

The DH27 can be in conjunction with the SMART HEATER be switched on by means of the built-in power switch.

Warning: There is no dry-run of DH's allowed.

Maintain a permanent filling of DH's with water. In the absence of water the overtemperature protection of DH's can trigger. The DH is not used in this case and must be sent for repair to the KRNTZEL. (Chargeable). This error is 1.1 or V2 reported directly from the SH-S / M acoustically (7xPiep) or the SH-V as a fault.

Tell your installer about the need for a permanent filling and circulation of heating water in the DH.

In addition, an expansion tank for the hydraulic circuit is provided.

Warning: The special high-performance heating elements are integrated into magnesium.

So the condensat from the ambient air can be penetrate the magnesium-oxid in the DH and realize a leakage-current. (error by RCD) (if the DH is not installed for a long time without warm water inside)

Note:

If you should make the installation of the DH27 delay several days / weeks / months, an initial slow warming caused by manual operation of the stages is before start 1-6 at SH perform for each 1 hour per element, so that the condensate water possibly formed again from the elements can diffuse.

I Matrix-Control

I1 Matrix-Algorithmus

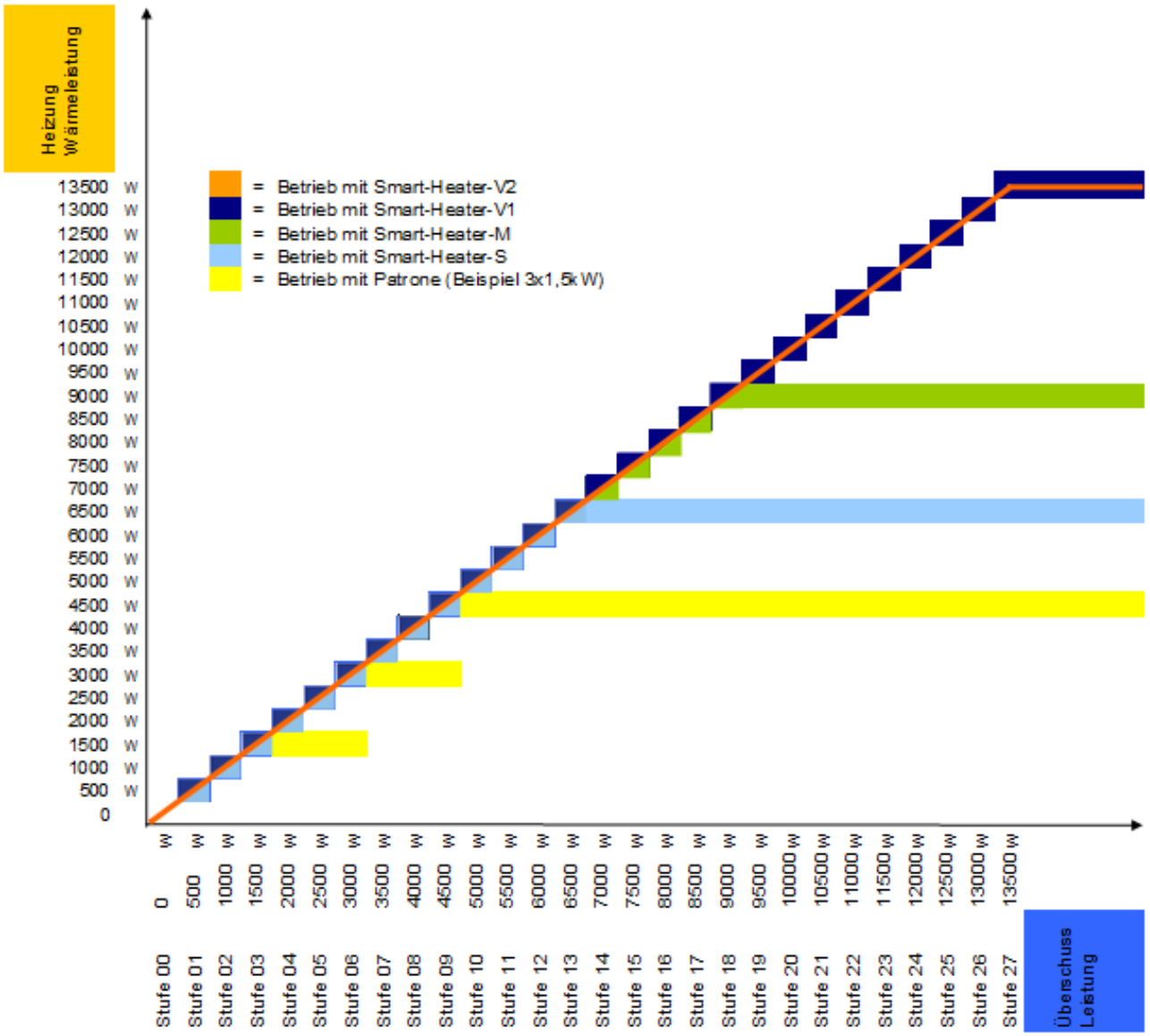
The matrix of the SH generated by an effective algorithm, the classification of excess capacity in the smallest possible partial services in dependence to the connected heat generation system in order to maximize the efficiency of the heat generation.

When a DH's the maximum matrix value of 27 is reached, in which a heating element can reach the value of 3 only if the individual performances of the heating elements have been selected accordingly.

Generally speaking, the larger the matrix value, the greater the efficiency of the system.

I2 Drum heater operation (matrix is from 0 to 27)

When using a drum Heaters its supply line is hang on the terminals of the Smart Heaters for terminal assignment. Pay attention to the potential equalization (PE).
The performance parameters of the Drum Heaters are already stored in the "control" of the smart Heaters.



J Safety-Information

Please read carefully all safety instructions in this manual before installing this DH.

 **Explanation of warning signs „Warning“**

This symbol indicates a potentially dangerous situation and that death or severe personal injury and/or property damage may result or has a potentially dangerous situation that can lead to low or moderate injury and/or property damage.

To reduce the risk, that goes hand in hand with dangerous voltages: the product may be altered in any way. Approved replacement parts may be used only by the Krentzel GmbH. Using the wall-mounted system not in damp environments. A damaged DH may not be used for wall mounting.

To reduce the fire and explosion risk: the DH do not dive or will wet.

To reduce the risk associated with environmental contamination: dispose of all system components according to the applicable regulations.

On request the free disposal of a DH can causes it by Krentzel GmbH.

 **KEEP THESE INSTRUCTIONS CAREFULLY**

J CE marking

The DRUM HEATER DH27 has the CE mark and is externally visible attached to the housing.

Note for electromagnetic compatibility and low voltage directive: see certificate of conformity and rating plate on the device.

K WEEE/RoHS

WEEE Notice

The following information has only valid in EU countries:

The character to the right corresponds to the guidelines of the Waste Electrical and Electronic Equipment Directive 2002/96 / EC (WEEE). The sign means that the device may not be disposed of with unsorted household waste, fed but the prescribed disposal Recycling System or Krentzel GmbH must be passed to free disposal.

RoHS information

The Krentzel GmbH can for the SH system, the provisions of the RoHS Directive correspond to issue a RoHS certificates.

European (EU) Restriction of Hazardous Substances (RoHS) directive, 2002/95 / EU, compliance with the RoHS directive means that the product or component any of the following Substances in higher concentrations than the following maximum concentrations in homogeneous Containing materials, unless the substance is in an application that from the RoHS directive is excluded: (a) 0.1% lead (by weight), mercury, hexavalent chromium, polybrominated Biphenyl (PBB) and polybrominated diphenyl ethers; or (b) 0.01% Cadmium (by weight). This information corresponds to the current knowledge of the Krentzel GmbH and may be based on knowledge that the Krentzel GmbH provided by third parties.

L Warranty

It is guaranteed that the DRUM-HEATER (DH) for a period of 730 days (24 months) from date of purchase is free from defects in material and workmanship.

It is guaranteed that all came with the DH accessories for a period of
730 days (24 months) from date of purchase are free from material and production defects.

Optional accessories that are not sold as part of DH's subject, to individual warranties.

EXCEPT FOR THE WARRANTIES STATED ABOVE INCLUDES ALL OTHER WARRANTIES Krentzel GMBH. THIS CONCERNS EXPRESS AND IMPLIED WARRANTIES, INCLUDING BUT NOT LIMITED TO THE IMPLIED WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE AND NON-INFRINGEMENT.

If this equipment does have within the above stated warranty period defects, this is only right to ask for a replacement unit. The exchanged unit will then become the property of Krentzel GmbH.
If approved warranty claim, subject to the warranty period for the replacement device only the remaining warranty period of the original device. In case of warranty, you must present proof of purchase with date of purchase, otherwise the encoded in the serial number manufacturing date is taken as the start of the warranty period.
The following are exceptions to the warranty conditions stated above:
a. This warranty does not Krentzel GmbH products, modified or damaged, or by misuse, improper storage, accidents, vandalism, false Installation, negligence, improper transport damage, or acts of war, Natural disasters (eg. As fire, flood, lightning), unsuitable electric Supply voltages, software problems and interactions with non-damaged Krentzel GmbH products or installation work by unauthorized electrical specialist personnel. Normal wear and tear is not covered under the warranty.

Operating instructions
The Krentzel GmbH product was developed for use in the typical indoor environment. D b. the warranty does not cover devices that are used outside of the following conditions:

- 100V-240V AC, 50/60 Hz
- -10 ° to 50 ° C
- 10 - 80% humidity (non-condensing)
- 0-1828m (0-6000 feet) above zero

a. The air inlet / outlet and the heat sink must not be clogged. Inadequate ventilation can lead to malfunction of the product and cause damage that is not covered by the warranty.
b. This warranty does not cover additional costs including, but not limited to the Dismantling, cleaning or installation of the Krentzel GmbH Product, adjustments, (mechanical or electronic) on Krentzel GmbH product.
c. This warranty does not cover consumables (fuses)
d. This warranty is not transferable.
e. The Krentzel GmbH does not guarantee orders if the Krentzel GmbH Logo, or the display have been removed with the operating data, or serial number, except in the cases where writing on the reasons for the modified labeling for partnership requirements.
f. This warranty does not cover transport costs or the costs of transport insurance, the incurred when the product is Krentzel GmbH sent to the Krentzel GmbH for warranty service. These costs are borne by the customer. If the damage can not be identified or reproduced, the customer the costs incurred can be calculated. If your warranty includes a "change out" service and the damage caused by the technician can not be identified or reproduced, the customer the costs incurred can be calculated.

ALL WARRANTIES AND LIMITED WARRANTIES ARE VOID IF THE Krentzel-GMBH PRODUCT DOES NOT OPERATE AS DEFINED Krentzel GMBH-OPERATING INSTRUCTIONS DESCRIBED IN USE.

M Legend

SH: Smart-Heater

DH: Drum-Heater

EVU: Power-Plant, Power-Supplier

PE: Potential equalization / ground

AC: Alternating current

DC: Direct current

Hz: Hertz, Frequency

W: Power in watts

N Manufacturer information / Copyright

Krentzel GmbH
D-28865 Lilienthal
Germany
Fax: 0049-4298-939229
Mail: ENERGIE@KRENTZEL.NET
Web: ENERGIE.KRENTZEL.NET

O Certificate of Conformity

Certificate of Conformity	
Manufaoturer	SIWD / ZOPPAS
Type / name of the devloe oombination	DRUM-HEATER
DIN EN (VDE) standards	See table
Date	22.6.2013
Sheet	1/1

All requirements of DIN / EN / VDE standards listed below are from the product DRUM HEATER Company SIWD fully met.

The DRUM-HEATER has been developed, designed and manufactured in accordance with the EC directives.
The applied harmonized standards are shown in the following table.

Germany, Lilienthal the 22.6.2013

Ingo Wilhelm
(Owner)

Standards	Description
VDE 0700 - DIN 60335-2-21	Heating-Elements
DIN EN 13501	Isolation
VDE 0100 - DIN 43880	Distribution Box, electrical engineering.
VDE0660 - DINEN50274	Terminals, e-technology

Note:

This certificate loses its validity if the product without express permission from the company SIWD.
modified, supplemented or changed in any other way, components that do not belong to the accessories, are built into the product, as well as in case of incorrect connection or incorrect use.

SIWD - D-28865 Lilienthal
Telefon: +49-4298-957737 - Telefax: +49-4298-279884
E-Mail: Info@SIWD.de – Web: www.siwd.de