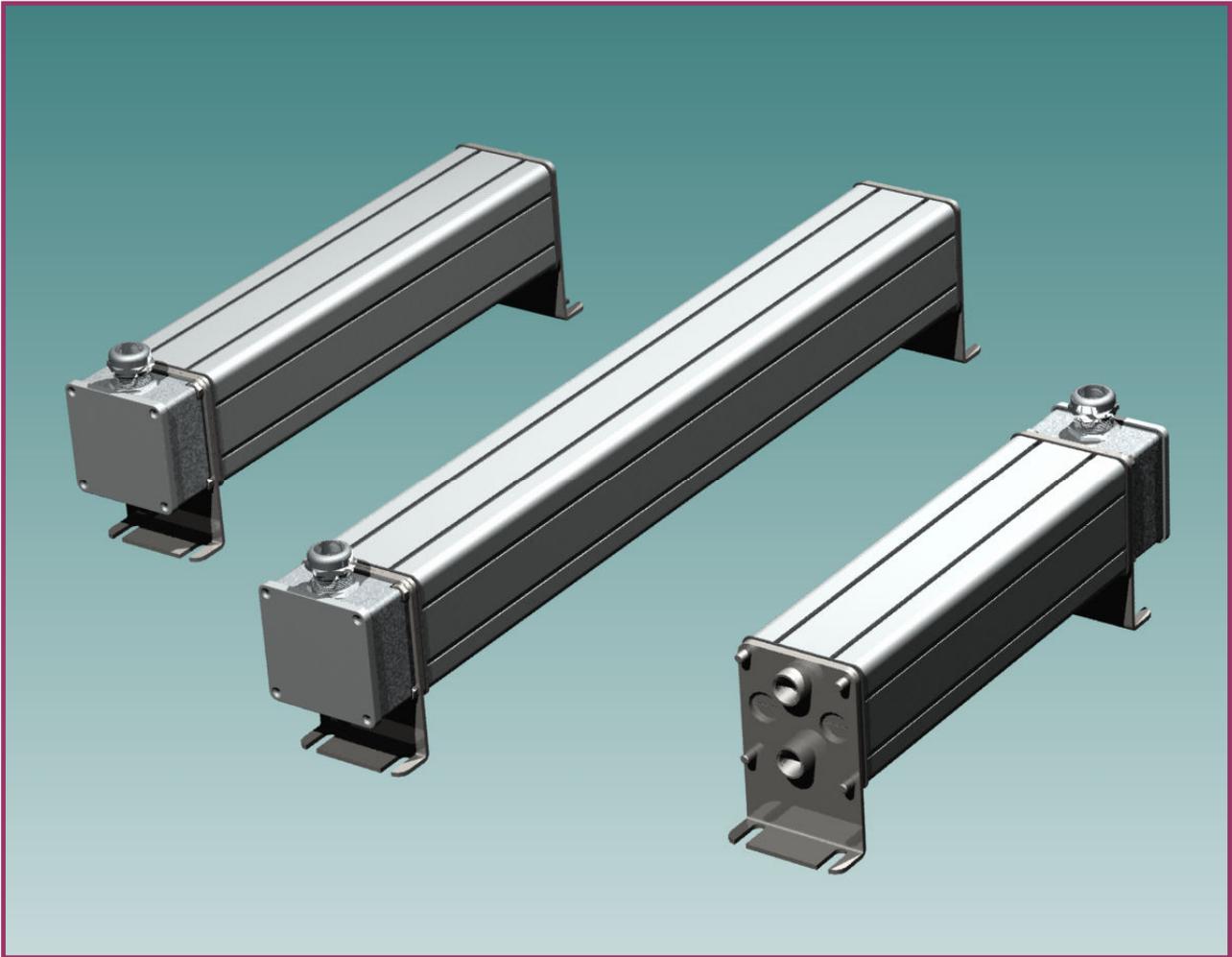


Ω OHMEGA

WHB-OHMEGA

Water Cooled Steel Tube Wirewound
HIGH POWER BRAKE RESISTORS
Standard range: 8 kW – 20 kW (steady state)



VHB16/750-3, VHB16/1000-3, VHB16/1600-3 and SV16/2000-3 is a range of water cooled medium power brake resistors.

The resistors consist of stainless steel tube (AISI 316L) resistors with diameter 16 mm and length 600mm to 2000 mm mounted in stainless steel (AISI 304)

Danotherm has developed **thermal models** for all

resistor types and resistor values. By using these thermal models we are able to calculate the temperature rises in water. The electrical connections comply with protection class IP 00 to IP 65 according to customer specifications.

We offer our assistance to our customers to find the optimum solution for any situation.



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Construction

The WBH resistor elements are wirewound ceramic resistors. The heavy resistor wire is non-coated but fixed in the ceramic tube. With this technique the wire can be powered with 10 – 12W/cm² steady state and higher for pulse loads. The aluminium housing is double insulated with Mica tubes closest to the resistor elements and a heavy PVC tube on the inside of the aluminium profile

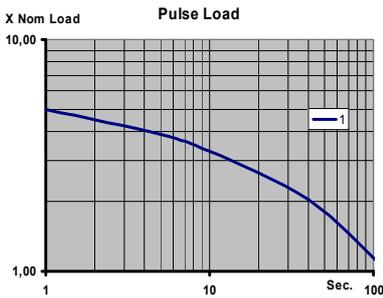
Connection

Power cables with cable shoes are connected through a M25 cable gland directly to a M8 screw. By removing the PG21 nylon covers and loosening the cable glands directly access to the M8 screws is obtained.



PULSE LOAD

The curves show the pulse load ability compared to the nominal load for the resistors under the following conditions: The load is a periodic pulse load with a constant **period time of 120 sec** and a pulse width from **one second to 40 sec**. The elements are 40 OHM elements.



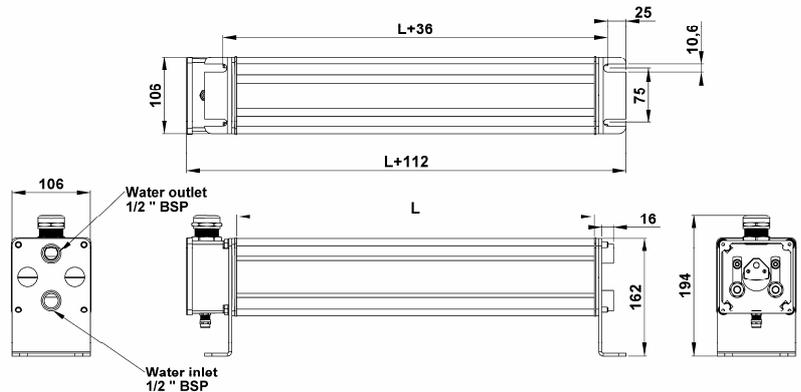
these models the temperature of the resistor wire during any pulse load conditions can be simulated with a standard soft ware like P-Spice. Alternatively Danotherm offers to make thermal simulation for our customers

Type Length and POWER of resistor is optimized to th particular application These are examples:	PN kW @40°C	Pulse Load in 5 s each 120 s. P5/120 W @40°C	Pulse Load in 10s each 120 s. P10/120 kW @40°C	Pulse Load in 40 s each 120 s P40/120 kW @40°C	Time Const. sec. (Element, Steady state)	R Ω ±10% Elements in parallel
WBH 16/ 700-03	8	30	24	12	18	1-50
WBH 16/950-03	12	45	35	18	18	1-50
WBH 16/1500-03	20	80	55	30	18	1-50

Pulse Ratings for short pulses depend on the ohmic value. (Resistors with lower resistance have more resistor wire than resistors with higher resistance). The ratings in this table refer to resistors of about 40 OHMS/element

General Specifications	
Temperature Coefficient:	≤±100ppm
Max resistor wire temperature:	1000 °C
Dielectric strength:	4500 VAC 1 minute
Working Voltage:	2500VAC; 3500VDC
Isolation Resistance:	> 20 MΩ
Overload:	x in 10 sec; x in 1 s
Environmental:	0 °C – 60 °C
Working pressure:	8 Bar
Test pressure:	16 Bar
Conductivity of cooling water	< 5µS/ cm ²

Mechanical Data



Type	WBH 16/ 700-03 7 kW	WBH 16/950-03 10kW	SV16/1500-03 17kW
L mm	385	490	790
Weight (Empty)	7Kg	9 Kg	14 Kg
Weight incl. water	10Kg	13Kg	20 Kg
Heat capacity of water(no flow) kJ/K	12	16	25
Min. Water flow @ PN (Max conf.) ΔT = 30 K	3,4 l/min	4,8 l/min	8 l/min
Pressure los @ X l/min	0,5 BAR		
Water connection	½ " BSP (Internal)		

Type identification:

WBH 16/950-03 B (T) 20R (567)

- (XXX): Customer specified version
- Ohm Value (Examples: 2R2=2.2Ω; 22R=22 Ω; 220R=220Ω; 2K2 = 2.2 kΩ)
- Thermostat (NC; Adjustable)
- Connection; B: IP65 S: Screw Terminals, IP00
- No of elements
- Element type (Diameter / Length)
- Type WHB