

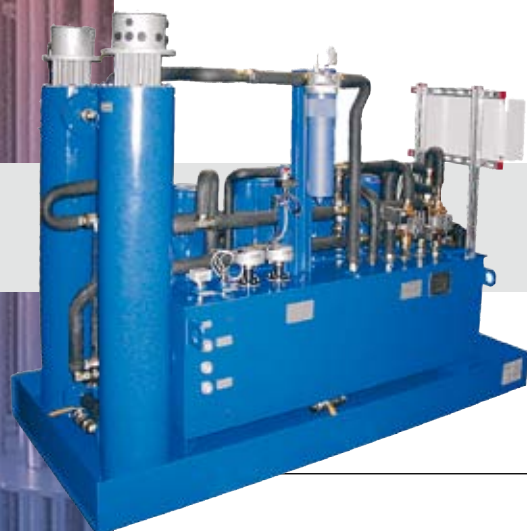
**Electrical Oil Pre-heaters**  
for mechanical and plant engineering



## With partnership into the future

FUNKE is a leader in the development and production of quality heat exchangers with a heat transfer area of up to 2 400 m<sup>2</sup>. The range of products comprises shell-and-tube heat exchangers, bolted and brazed plate heat exchangers as well as oil/air cooling units and electrical oil pre-heaters. Thus, as one of the few producers worldwide, FUNKE offers solutions with optimum thermodynamic designs for different industries and virtually all applications.

FUNKE focuses on customer orientation, highest quality standards, flexibility and advisory skills – important benefits a company of just the right size is able to offer.



Example of application:  
Oil supply system  
of „Schnupp“ with  
electric oil preheaters  
of high temperature  
design



Electro-junction box  
with temperature  
limiter



Construction easy  
to maintain by  
drawable heating  
rod bundle

## Optimizing machine-tool efficiency – with FUNKE electrical oil pre-heaters

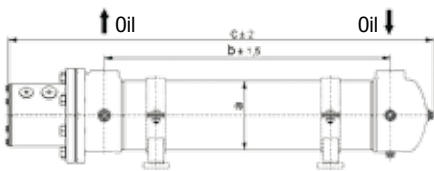
Using electrical oil pre-heaters is of high importance for assuring ideal machine-tool efficiency, minimization of energy consumption and wear protection. FUNKE offers a highly developed modular program with 11 sizes for the typical requirements of mechanical- and plant engineering with a heating power of 3 to 100 kW.

### Applications

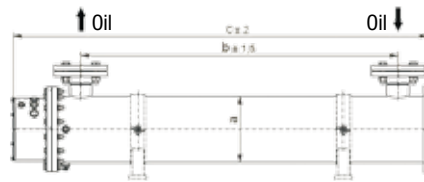
Heating of oil, flame resistant liquids and emulsions by electrical energy, especially for machines and facilities outdoors and on test stands which require selected oil temperatures.

### Function

The medium to be heated flows around a bundle of u-shaped bent heating rods. The distance of the switching segments guarantees an adequate flow velocity, even at the allowed minimum flow rate. The standard heat transfer per unit surface area is approx. 2 W/cm<sup>2</sup>. The surface temperature of the heating rod is only 110°C at minimum flow rate and at oil inlet temperature of 60°C. Thus, the temperature is far below the coking temperature of oil. The temperature limiter installed cuts off at 80°C.

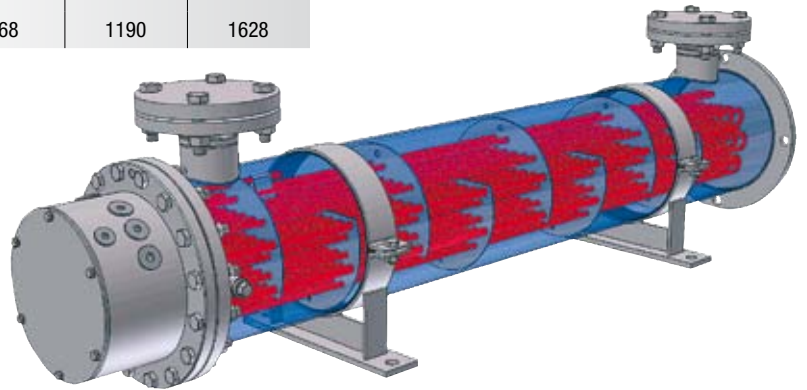
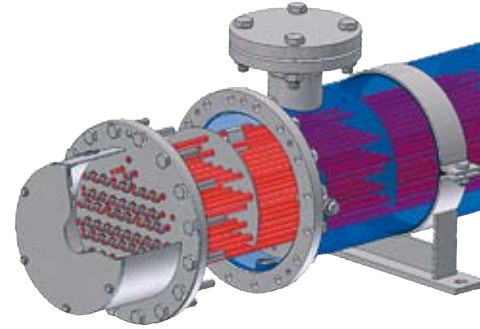


Type series 0.0805



Type series 0.0806 - 0.0809

Type series	Heating power	Minimum oil flow	Operating pressure	Operating temperature	Dimensions mm		
	kW				l/min	bar	°C
0.0805	3	35	25	110	133	550	810
	6	35	25	110	133	1040	1300
0.8006	9	60	16	110	193.7	485	749
	13,5	60	16	110	193.7	855	1164
	18	60	16	110	193.7	1105	1414
0.0807	27	110	16	110	229	1085	1417
	33,7	110	16	110	229	1435	1767
0.0808	45	140	16	110	279	1070	1419
	56,2	140	16	110	279	1420	1769
0.0809	81	220	16	110	360	1040	1478
	101,2	220	16	110	368	1190	1628



#### Special design

- High temperature unit up to 200°C
- Complete range of current special voltages
- Reduced heat surface stress of 1 W/cm<sup>2</sup>

#### Advantages

- Standard type series of 3 -100 kW
- Optional: High temperature version
- From 27 kW: Power can be set in 3 steps

Electrical oil pre-heaters are carefully mounted and have to pass adequate quality and pressure tests before being dispatched



### Advantages of pre-heating

The viscosity of oils and flame resistant liquids highly increases at low temperatures. This can cause very high pressure losses within tubes, filters and cooling systems. Cold starts of systems, especially when oil/air cooling units are set up outside, a much too high start-up pressure can cause heavy losses on pumps, filters, heat exchangers and other parts. If the oil in the tank has already reached a selected temperature by adequate pre-heating, the start-up of systems and machines will be considerably eased. Since nowadays hydraulic systems usually are operated by bypass flow cooling and filtering, an oil pre-heater can easily be integrated in such a loop.

Quality means safety. Each unit built by FUNKE is design and pressure tested. Additional approvals are also available in accordance with quality authorities such as:

- American Bureau of Shipping (ABS)
- Bureau Veritas (BV)
- Det Norske Veritas (DNV)
- Germanischer Lloyd (GL)
- Lloyds Register of Shipping (LRS)
- Schweizerischer Verein für technische Inspektionen (SVTI)
- Technischer Überwachungsverein (TÜV)

as well as customers' test and inspection regulations.



FUNKE has been certified according to DIN EN ISO 9001:2008 and is an approved manufacturer according to:

- EU Pressure Equipment Directive 97/23/EC (PED), Module H/H1
- HP0 in connection with DIN EN 729-2
- ASME U-Stamp
- GOST R (incl. RTN & hygiene certificate)
- China Certificate



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