

## 水冷变压器(SWT) Water-cooled Transformer

### ■ 产品概述(Product Introduction)

水冷变压器适用在散热环境很差的场合。有两种方式的水冷变压器，一种是水电一体的内循环产品，即用空芯导线作水管冷却装置进行冷却；另外一种水电分离式外循环冷却方式，水路不通过绕组，水电分离互不影响，通过冷却板间接地将绕组和铁芯的热量吸收。水冷变压器主要应用于电解电镀等大功率直流电源和大功率电炉，是变流设备上重要部件之一。对于散热条件不良的常规变压器产品，也可使用水冷结构。

Water-cooled transformers are suitable for situations where the heat dissipation environment is poor. There are two types of water-cooled transformers. One is an internal circulation product integrating water and electricity, which uses hollow wires as water pipe cooling devices for cooling; the other uses a water-electricity separated external circulation cooling method, in which the waterway does not pass through the winding, the water and the electricity does not affect each other, and the heat of the winding and the core is absorbed indirectly through the cooling plate. Water-cooled transformers are mainly used in high-power DC power supplies and high-power electric furnaces in electrolytic plating. They are one of the important components of AC equipment. For conventional transformer products with poor heat dissipation conditions, water-cooled structures can also be used.

### ■ 产品特点(Product Feature)

- 1.水路使用材料全部为不锈钢材质，强度高，耐腐蚀，使用寿命达20年以上
- 2.水管和接头连接方式采用强力锁紧结构，保证冷却介质不渗漏，最大工作压力10bar
- 3.水管尺寸为外8mm内6mm，流量可达19L/分钟，热效率高
- 4.水路采用串联结构，四进四出，然后各接到一个总水接头，接头为不锈钢管螺纹，尺寸为G3/8、G1/2、G1/4或根据客户图纸要求制作非标螺纹



- 1.All materials used in the waterway are stainless steel, which has high strength, corrosion resistance and a service life of more than 20 years
- 2.The connection of water pipes and joints adopts a strong locking structure to ensure that the cooling medium does not leak, and the maximum working pressure is 10bar
- 3.The water pipe is 8mm O.D. and 6mm I.D. the flow rate can reach 19L/min, and the heat dissipation efficiency is high
- 4.The waterway is series structure, with four inlets and four outlets, and then each is connected to a main water joint. The joints are stainless steel pipe threads with sizes G3/8, G1/2, G1/4 or customized non-standard threads

### ■ 产品分类(Product Classification)

#### 1.板式水冷变压器

水冷散热板安置在板式水冷变压器线圈中。变压器产生的热量通过散热板导热后由水介质将热量导出，以达到降低温升的目的。变压器水电分离，无漏电流产生。本公司生产水冷变压器负载电流1000 ~ 25000A，电压等级低于10kV，广泛使用在风力发电、大功率整流、大功率电热等电器设备中。

#### 2.管式水冷变压器

绕组采用空心铜管制造，铜损耗产生的热量通过铜管内的导热介质（纯净水或混合液）将热量导出。导热介质与发热导体之间热接触良好，导热系数高，绕组可承受较大电流。电流1000 ~ 25000A，电压等级100V以内，广泛应用在冶炼、感应加热等工业设备上。

#### 1.Plate water-cooled transformer

The water-cooled heat sink is placed in the coil of the plate water-cooled transformer. The heat generated by the transformer is conducted through the heat sink and then exported through the water medium to reduce the temperature rise. The transformer separates water and electricity, so there is no leakage current. Our company have produced water-cooled transformers with load currents of 1000 ~ 25000A and voltage levels below 10kV. They are widely used in electrical equipment for wind power generation, high-power rectification, high-power electric heating.

#### 2.Tubular water-cooled transformer

The winding is made of hollow copper tubes, and the heat generated by copper loss is dissipated through the heat-conducting medium (pure water or mixed liquid) in the copper tube. The thermal contact between the heat-conducting medium and the heating conductor is good, the thermal conductivity is high, and the winding can withstand large currents. The load current is 1000 ~ 25000A, the voltage level is within 100V, and it is widely used in industrial equipment for smelting and induction heating.

## ■ 技术规格 (Technical Specification)

- 1.冷却方式: 水冷, 水路部分工作压力为0.15 ~ 0.2MPa, 水流流量: 16L/min
- 2.绝缘等级: F
- 3.过载要求: 过载5% (长期运行)、过载10% (30min), 过载50% (10s)
- 4.温升: 线圈和磁芯温升小于100°C
- 5.耐受电压: 绕组、磁芯、支架两两之间, AC 3500V/50Hz/10mA, 1分钟
- 6.绝缘电阻: 绕组、磁芯、支架两两之间, >10MΩ (DC 1000V)
- 7.噪声: 小于65dB (1米处)
- 8.防护等级: IP00
- 9.存储温度: -40 ~ +70°C
- 10.使用环境: -30 ~ +55°C, 50°C以上降额使用
- 11.工作海拔: 1000米以下, 额定电流; 1000米以上每升高100米降额1%使用
- 12.应用场合必须有供冷却的水源, 冷却水中不得有机械杂质, 硬度不超过10个单位
- 13.变压器投入运行时, 不得断水, 进水温度不得超过33°C, 出水温度不得超过45°C

- 1.Cooling Method: water cooling, the working pressure of the waterway is 0.15 ~ 0.2MPa, and water flow rate is 16L/min
2. Insulation Class: F
3. Overload Requirements: overload 5% (long-term operation), overload 10% (30min), overload 50% (10s)
4. Temperature Rise: The temperature rise of the coil, magnetic core is less than 100°C
5. Withstand Voltage: core-winding, winding-bracket, bracket-core, AC 3500V/50Hz/10mA, 1 minute
6. Insulation Resistance: core-winding, winding-bracket, bracket-core, >10MΩ (DC 1000V)
7. Noise: ≤65dB (at 1 meter)
8. Protection Class: IP00
9. Storage Temperature: -40 ~ +70°C
10. Operation Environment: -30 ~ +55°C, use with derated values when above 50°C
11. Working Altitude: rated current when below 1000 meters, and rated current derated by 1% for every 100 meters when above 1000 meters
12. There must be a water source for cooling at application site. There must be no mechanical impurities in the cooling water, and the hardness should not exceed 10 units
13. When the transformer is put into operation, the water must not be cut off, the inlet water temperature must not exceed 33°C, and the outlet water temperature must not exceed 45°C

## ■ 执行标准 (Applicable Standard)

VDE0550

## ■ 产品识别码 (Product Identification Code)

|                                      |                |                       |                        |
|--------------------------------------|----------------|-----------------------|------------------------|
| SWT                                  | 100kVa         | 400                   | 400                    |
| 水冷变压器<br>Water Cooled<br>Transformer | 容量<br>Capacity | 初级电压<br>Input Voltage | 次级电压<br>Output Voltage |