

串联谐振电路可控硅中频电源装置

Series Resonance SCR Medium Frequency Power Supply

装置的特点:

- 节能。由串联逆变电路的特征决定，吨钢电耗可控制在530~600kWh/t。
- 对电网无谐波污染，符合国家标准对电能质量和公用电网谐波GB/T14549-93要求，不需另加“消谐装置”。
- 成套设备对电网的功率因数高。不需外加任何补偿措施，在运行的全过程中自动将电网功率因数保持在0.97以上。
- 可靠性高，故障很少。
- 恒功率输出。可以做到从冷料到浇注，全过程都能保持满功率，大大提高了运行效率。熔化率高。
- 可以实现“一拖二”。自动浇注生产线上的感应熔化电炉，为了优化工艺、提高生产率、节电，要求一台电源双输出，可同时向两台电炉供电，实现“一拖二”，总功率可在两台炉体上无级分配。每台炉体上功率都可在0~100%之间分配，但两台电炉分得的功率之和不超过100%。实践中一台炉体熔化，另一台炉体保温浇注，且二台炉体均可相互置换使用。

Features

- Save energy. depending on the characteristics of series inverter circuit, power consumption of every ton of steel can be controlled at the range of 530~600kWh/t.
- Without harmonic pollution to power grid, coincide with GB/T 14549-93 National Standards of Power Quality Public Power Grid Harmonic. It does not need equip extra harmonic eliminator.
- There is high power factor to power grid of the complete equipment without any power compensation device. The power factor keeps more than 0.97 automatically in the whole process of working.
- Reliable operation and few faults.
- Constant output power. The system will keep full load power in the whole process of working, enhance working efficiency and melting rate.
- Dual-track will be realized by series resonance circuit. The dual-track system of induction melting furnace is required by the automatic casting production line, in order to optimize process, improve the productivity and save energy. The power will be stepless distributed to two furnace bodies simultaneously at the range of 0~100% from one power supply cabinet. Such will be easy to realize and switch any one furnace body in melting and another in holding.



GW-CL1600kW-B型（一拖二）内部结构照片和外观照片

The sight of internal structure and appearance of GW-CL1600kW-B Type dual-track power supply cabinet



(一拖二) 串联谐振可控硅中频熔炼炉应用场景

Series Resonance Circuit SCR Medium Frequency Dual-track Melting Furnace Working Site

图中左炉达到浇注温度受控分配总功率的10%~20%作保温浇注，而其余的80%~90%的功率自动分配到右炉作升温熔炼。等左炉铁水出毕，这时右炉铁水也熔化达到额定温度，可减小功率出铁水，这时总功率自动向左炉转送，左炉加料进入熔化，周而复始。提高生产率、节电、优化工艺。

In the left picture, the molten iron in furnace has reached the casting temperature and preserved by 10%~20% of total power distributed by power supply control system. The balance 80%~90% of total power is automatically distributed to another furnace for melting. When the left furnace finished casting, the molten iron in right furnace will just reach the rated temperature. The power supplied will be reduced and switched automatically to previous furnace for melting. Feed raw material to the left furnace and start another melting cycle. The technology will enhance the productivity, save energy, and optimize the craft process.



串联谐振型可控硅中频电源系列主要技术参数

No	参数名称	1t-800-0.35-B	1.5t-1200-0.35-B	2t-1500-0.3-B	2.5t-2000-0.3-B	3t-2500-0.3-B	5t-3000-0.2-B	10t-6000-0.2-B
01	炉体额定容量	1t	1.5t	2t	2.5t	3t	5t	10t
02	炉体最大容量	1.1t	1.6t	2.2t	2.8t	3.2t	5.5t	11t
03	额定总功率	800kW	1200kW	1500kW	2000kW	2500kW	3000kW	6000kW
04	单炉最大功率	600kW	1000kW	1200kW	1600kW	2000kW	2500kW	5500kW
05	进线电压相数	6相	6相	6相	6相	6相	6相	6相
06	电源整流模式	12脉	12脉	12脉	12脉	12脉	12脉	12脉
07	进线电压	380V	380V	380V	380V	480V	480V	575V
08	进线电流	480A	920A	1150A	1520A	1520A	1810A	3050A
09	直流电压	1000V	1000V	1000V	1000V	1250V	1250V	1500V
10	直流电流	600A	1200A	1500A	2000A	2000A	2400A	4000A
11	中频频率	350Hz	350Hz	300Hz	300Hz	200Hz	200Hz	200Hz
12	感应器电压	2000V	2200V	2500V	2500V	2500V	2500V	3000V
13	工作温度	1600℃	1600℃	1600℃	1600℃	1600℃	1600℃	1600℃
14	熔化率	1t/h	1.5t/h	2t/h	2.5t/h	3t/h	5t/h	9t/h
15	耗电量	550kWh/t	550kWh/t	550kWh/t	550kWh/t	550kWh/t	550kWh/t	550kWh/t
16	电源冷却水	15m ³ /h	25m ³ /h	35m ³ /h	50m ³ /h	60/h	80m ³ /h	160m ³ /h
17	电炉冷却水	30 m ³ /h	50m ³ /h	80m ³ /h	100m ³ /h	120m ³ /h	160m ³ /h	400m ³ /h
18	电网功率因数	≥0.95						
19	电网谐波影响	符合 电能质量 公用电网谐波 GB/T 14549-93 国家标准						
20	供电变压器： 电炉专用油浸式整流变压器	ZS-800-10/0.4	ZS-1200-10/0.4	ZS-1500-10/0.4	ZS-2000-10/0.4	ZS-2500-10/0.48	ZS-3150-10/0.48	ZS-6000-10/0.575
		一次3相10kV、 二次6相 D/d0,Y11接法、阻抗8%						
		380V			480V		575V	
21	控制电源低压配电柜容量： 从变电所通用低压配电柜中，将3相380V电源用“三相四线”接到“控制电源低压配电柜”（安装在中频电源室内）。	液压站电机5kW 电源冷却塔10kW 电炉冷却塔10kW 照明10 kW 小计容量：35kW				液压站电机5kW 电源冷却塔15kW 电炉冷却塔20kW 照明10 kW 小计容量：50kW		

Series Resonance Circuit SCR Medium Frequency Power Supply Technical Parameter

No	Parameter name	1t-800- 0.35-B	1.5t-1200- 0.35-B	2t-1500- 0.3-B	2.5t-2000- 0.3-B	3t-2500- 0.3-B	5t-3000- 0.2-B	10t-6000- 0.2-B
01	Rated capacity	1t	1.5t	2t	2.5t	3t	5t	10t
02	Max capacity	1.1t	1.6t	2.2t	2.8t	3.2t	5.5t	11t
03	Rated power	800kW	1200kW	1500kW	2000kW	2500kW	3000kW	6000kW
04	Max power of single furnace	600kW	1000kW	1200kW	1600kW	2000kW	2500kW	5500kW
05	Phase of input voltage	6phase	6phase	6phase	6phase	6phase	6phase	6phase
06	Rectification model	12pulse	12pulse	12pulse	12pulse	12pulse	12pulse	12pulse
07	Input voltage	380V	380V	380V	380V	480V	480V	575V
08	Input current	480A	920A	1150A	1520A	1520A	1810A	3050A
09	DC voltage	1000V	1000V	1000V	1000V	1250V	1250V	1500V
10	DC current	600A	1200A	1500A	2000A	2000A	2400A	4000A
11	MF frequency	350Hz	350Hz	300Hz	300Hz	200Hz	200Hz	200Hz
12	Inductor voltage	2000V	2200V	2500V	2500V	2500V	2500V	3000V
13	Working temperature	1600℃	1600℃	1600℃	1600℃	1600℃	1600℃	1600℃
14	Melting rate	1t/h	1.5t/h	2t/h	2.5t/h	3t/h	5t/h	9t/h
15	Power consumption	550kWh/t	550kWh/t	550kWh/t	550kWh/t	550kWh/t	550kWh/t	550kWh/t
16	Cooling water of power supply	15m ³ /h	25m ³ /h	35m ³ /h	50m ³ /h	60/h	80m ³ /h	160m ³ /h
17	Cooling water of furnace body	30 m ³ /h	50m ³ /h	80m ³ /h	100m ³ /h	120m ³ /h	160m ³ /h	400m ³ /h
18	Power factor	≥0.95						
19	Harmonic impact	Accord with power quality public power grid harmonic GB/T 14549-93 national standards						
20	Transformer: rectify transformer for MF furnace specially	ZS-800-10/0.4	ZS-1200-10/0.4	ZS-1500-10/0.4	ZS-2000-10/0.4	ZS-2500-10/0.48	ZS-3150-10/0.48	ZS-6000-10/0.575
		Primary: 3 phase/ 10 kV, Secondary: 6 phase, D/d0,Y11 connection, Impedance 8%						
		380 V			480 V		575 V	
21	The capacity of low voltage Switch cabinet: from transformer connect 3N/380 V power supply to power supply LV switch control cabinet in 3 phase 4 lines(installed in MF power supply room).	Motor of hydraulic station: 5kW, Power supply cool water tower: 10kW, Furnace body cool water tower: 10kW, Lighting: 10kW, Total capacity: 35kW				Motor of hydraulic station: 5kW, Power supply cool water tower: 15kW, Furnace body cool water tower: 20kW, Lighting: 10kW, Total capacity: 50kW		