

进排气阀式自动密封真空水箱充水设备的研制

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摘 要:

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The Development of Full Water Equipment of Self-sealing Vacuum Water Tank Based on Air Intake and Evacuation Valve in Pump Station

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Abstract: In order to solve the full water problems in pumps, this paper designed a full water equipment of self-sealing vacuum water tank based on air intake and evacuation valve. It was designed according to the negative pressure balance principle to achieve automatic open and self-sealing water tank by way of the air intake and evacuation valve and it resulted in being automatic full water and supplement water. As a result, it not only led out the water inlet bottom value of water pump but also the full water system of vacuum pump.

Keywords: Pump station; vacuum water tank; full water equipment; piping design

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1 设备构成

1 4 5 6
 7 8 9 10 13 14 7 6
 6 7 2 15 7
 4 13 7 15
 8 7 14 10 7 7 8
 7 7 9

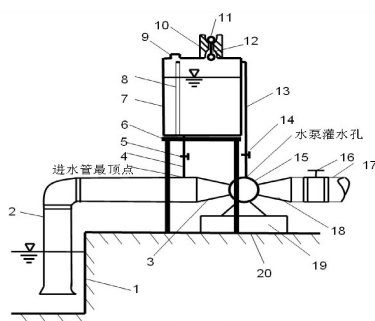


图 1 泵站进排气阀式自动密封真空水箱充水设备示意图

Fig.1 A schematic diagram showing the design of full water equipment of self-sealing vacuum water tank

1-进水池; 2-水泵进水管; 3-正心渐缩管; 4-充水排气管; 5-充水排气管闸阀; 6-支架; 7-水箱; 8-水位计; 9-灌水孔; 10-进排气阀; 11-浮体; 12-连杆; 13-排气补水管; 14-排气补水管闸阀; 15-水泵; 16-水泵出水管闸阀; 17-水泵出水管; 18-正心渐扩管; 19-机组基础; 20-泵房地面
 1-suction sump; 2-inlet pipe of water pump; 3-positive heart gradually shrinking tube; 4-water filled exhaust pipe; 5-gate valve of water filled exhaust pipe; 6-support; 7-water tank; 8-water level gauge; 9-hole of water inlet; 10-inlet and outlet valve of air; 11-floating body; 12-connecting rod; 13-exhaust and water supply pipe; 14-gate valve of exhaust and water supply pipe; 15-water pump; 16-gate valve of the water pump outlet pipe; 17-outlet pipe of water pump; 18- positive heart gradually expanding tube; 19-foundation of pump unit; 20-the ground of pump station room

2 工作原理

2.1 水泵充水过程

5 9 7
 9 16 5
 4 15 2
 7 10

4 4 13
 13

7 5

2.2 水箱补水过程

13 7
 10 11
 10 5

9

5

9

3 操作步骤

- 1 5 14 9 7
- 2 16 16
- 3 5 14 7 4 2
- 15 16 13 4 7
- 4 8 5
- 15
- 5 13 7 7
- 7 10 10
- 6 14
- 7 15 7

4 设备的特点

- 1
- 2 4
- 3 13
- 4

5 结语

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