

水泵接合器的接管点位置

姜文源

提要 水泵接合器的设置在我国《建筑设计防火规范》和《高层民用建筑设计防火规范》中均作了规定,但接管点位置在我国现行规范中未曾明确。就室内消防水泵接合器在不同使用方式,不同给水分区方式和不同自动喷水灭火系统时的接管点位置作简要说明。

关键词 水泵接合器 消防水泵接合器 室内消防水泵接合器 接管点

水泵接合器全称消防水泵接合器,是消防给水系统的一个重要组件,其性质属于临时供水设施。当室内其他消防供水设施因故不能供水时,消防车到达火灾现场后,车上的消防水泵从城市给水管网或从消防水池、天然水源取水经加压后通过水泵接合器向室内给水管网供水,以满足消防用水量和水压要求。

水泵接合器分室内消防水泵接合器和室外消防水泵接合器两种。

室内消防水泵接合器设在室外,但它是室内消防给水管网的组成部分。

室外消防水泵接合器也设在室外,是室外消防给水管网的组成部分,用于消防水源离建筑物或构筑物较远,建筑物和构筑物本身无室内消防给水管网,为灭火需要,在室外敷设消防专用给水管道,其始端设置室外消防水泵接合器。

消防时,消防车从水源池取水,通过室外消防水泵接合器向室外消防给水管网供水,在管网终端出流用于建筑物或构筑物消防用水所需。目前,工程设计和消防规范涉及的消防水泵接合器大多数为室外消防水泵接合器,简称水泵接合器。

1 不同使用方式的接管点位置

室内消防水泵接合器有以下使用方式:

(1) 临时消防给水系统室内不设消防水泵或虽设有消防水泵,但因消防水泵有机械故障、动力供应中断等原因消防水泵不能运行。当火灾发生消防车到达火灾现场后,车上的消防泵从水源取水,向水泵接合器供水,以满足室内消防用水量和水压的要求。

(2) 临时消防给水系统室内设有消防水泵,但由于消防水泵选型不当或水泵性能不佳,技术参数不

符合设计要求,或灭火现场实际用水超过设计流量等原因,造成消防供水量不足。消防车上消防泵通过水泵接合器和室内消防水泵并联工作共同向室内消防给水管网供水,以满足室内消防用水量的要求。

(3) 临时消防给水设有消防水泵,但由于消防水泵选型不当,或水泵性能不佳,技术参数不符合设计要求,或建筑物内灭火设施使用情况改变等情况,造成消防用水量水压不足。消防车上消防泵通过水泵接合器和室内消防水泵串联工作,向室内消防给水管网供水,以满足室内消防用水水压要求。

(4) 临时高压消防给水系统室内消防水池由于条件所限,消防用水量贮备不足,消防车上消防泵在火灾发生后,通过水泵接合器供水至消防水池,以满足消防水池贮水量所需并通过室内消防水泵供水至室内消防给水管网。

水泵接合器的不同使用方式,接管点的位置不同。上述第(1)种方式对接管点没有特殊要求。第(2)种方式应尽量将接管点位置与室内消防水泵的供水点位置相对置,这有利于室内消防给水管网压力工况的平衡。第(3)种方式接管点位置应在室内消防水泵的吸水管上。第(4)种方式接管点应在消防水池内。

不同国家室内消防水泵接合器的使用方式不同,我国采用第(1)和第(2)两种方式,美国规范禁用第(3)种方式。

2 不同给水分区方式的接管点位置

消防给水竖向分区有很多方式,在“建规”和“高规”中未予明确。上海市工程建设规范《民用建筑水灭火系统设计规范》(DG08-94-2001)对消防给水竖向分区有以下规定:

“6.1.7 当建筑高度低于或等于 120 m 时,消防给水竖向分区宜采用减压阀、分区水泵、多出口泵等并联消防泵给水系统。”

“6.1.8 当建筑高度大于 120 m,消防给水竖向分区宜采用多台消防泵直接串联或设中间水箱传输的串联消防给水系统。”

同时还对 6.1.9 条重力水箱消防给水系统的水箱数量、水箱容积等作出规定。按以上条文,在现有的消防规范中关于消防给水竖向分区有以下几种:

减压阀分区并联给水方式; 分区水泵并联给水方式; 多出口泵并联给水方式; 水泵串联给水方式; 水箱串联给水方式。

并联给水方式水泵接合器应按不同给水分区并联设置;串联给水方式水泵接合器可在消防供水高度内的高区设置,其他给水分区可从高区供水,不需再另设水泵接合器。

3 不同自动喷水灭火系统的接管点位置

消防规范规定自动喷水灭火系统应设置水泵接合器。而自动喷水灭火系统有报警阀,对水泵接合器接管点位置应在报警阀前还是在报警阀后存在不同认识。

认为应在阀前的其理由是:《自动喷水灭火系统设计规范》规定消防水箱的出水管应在报警阀前连接。这样,当喷头喷水,水箱或水泵供水时,报警阀能及时报警。认为应在阀后的其理由是:水泵接合器由消防车上的消防泵供水,此时对火灾已经知情,不存在还需要报警阀报警问题。而且在报警阀后接管供水,可以减少水流通过报警阀的水头损失。

对自动喷水灭火系统水泵接合器的接管点位置,美国规范有规定,转述如下,可供参考:

(1)湿式系统。水泵接合器的接管点位置应在湿式报警阀后,见图 1a,以减少水头损失。

(2)干式系统。水泵接合器的接管点位置应在报警阀前,见图 1b,以避免有压气体通过水泵接合器的止回阀泄漏。

(3)湿式和干式并联系统。水泵接合器的接管点的位置应在报警阀前,见图 1c,这是由于干式系统的要求所致。

(4)报警阀为两个或两个以上的湿式系统。水泵接合器的接管点的位置应在报警阀前,因为报警

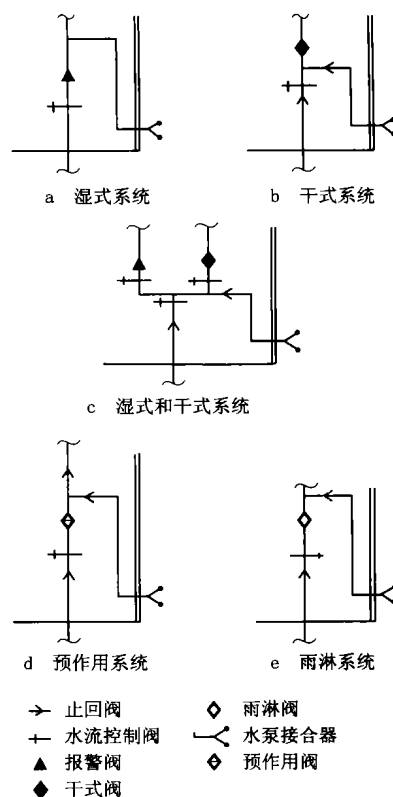


图 1 允许的阀门布置举例

阀的构造属于止回阀,接管点在阀后无法向整个喷水灭火系统供水。如硬性规定接管点接在阀后则必然增加接管点的数量,显然也是不合理的。

(5)预作用系统。一般认为:在准工作状态时预作用系统相当于干式系统,因此接管点位置可在报警阀前。而美国规范 A - 4 - 6.1.1 条则将接管点位置设在报警阀后,见图 1d。其原因在于预作用阀处于关闭位置时,水泵接合器接管点在阀后是较妥当的,与其他图示不同还在于接管点后增设了一个止回阀,以增加管道系统的密封性能。

(6)雨淋系统。雨淋系统的水泵接管点位置在雨淋阀之后,见图 1e。因为阀后是空管,消防车上消防泵供水时,水流不经过雨淋阀可以减少水头损失。更主要的还在于防止雨淋阀处于关闭状态时,阀后接管可以增加供水的可靠性。

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wastewater to the organisms in the reactor could be overlooked; the reactor started and granular activated sludge grown up successively. For normal operating under condition when the inlet COD in range of 7 000 ~ 13 000 mg/L and the pH, HRT and volume loading of the reactor in range of 6.8 ~ 7.2, 3 ~ 5 hours and 15.8 kg COD/(m³·d) respectively, the removals of COD and SO₄²⁻ of 75 % and 60 % ~ 70 % were obtained respectively. The removals of organic substances and SO₄²⁻ of EGSB reactor are remarkable.

Treatment of Pharmaceutical Wastewater by Anaerobic-Contact Oxidation and Stabilization Pond Liu Jinda et al (42)

Abstract : The wastewater from pharmaceutical production contains high-level toxic organic compounds, and these substances can not be biodegraded easily. The composed process of anaerobic-contact oxidation and stabilization pond is applied for wastewater treatment. This process is compatible to the local natural and climate conditions. In this paper the design parameters and operating performance are presented.

Pilot Plant Research On Reuse of Petro-Chemical Wastewater for Circulating Cooling Water System ... Yao Hong et al (43)

Abstract : The effluent of a secondary wastewater treatment plant treating petro-chemical wastewater in Daqing Oil Field was appointed to reuse for the make up to circulating cooling water system. The data of water quality before and after reuse were studied, and technical investigation was done. A pilot plant with processes of aerobic biofilter (BAF), ozonization and biological activated carbon (BAC) treatment was conducted. The experimental results show that these processes are enough to produce water suitable to use for circulating cooling water system.

Hot Water Preparation by Air Condition Heat Sink Lan Yan et al (55)

Abstract : On the basis of an investigation of central air condition capacity for star hotels, it is believed that 50 % of the radiating heat of air condition will be sufficient to hot water preparation in summer time for the hotel itself according to the Design Norm of Building Hot Water System GBJ 15. So at season when the air condition operated at full capacity, the hot water boiler or electric water heater could be closed. Furthermore in this paper the technical scheme and thermal analysis of air condition heat recovery are discussed.

Construction Supervise and Acceptance of High Expansion Foam Fire Control System Li Changyu (71)

Abstract : High expansion foam fire control system was adopted for the 5 story underground parking yard in the business building of the Industrial and Commercial Bank of Guangdong Province. In this paper the construction of this project, including the aptitude censor of the constructor, the examination of construction materials, the construction operating, trial operation and final acceptance are presented. In conclusion the construction supervision of this project was expounded.

Trial Run of Wastewater Output Pumping Station Li Zhongtian et al (78)

Abstract : The effluent discharging of a wastewater treatment plant situated at the mouth of Qiantang River was frequently obstructed by the tidal fluctuation, so an output pumping station was constructed. In trial run of this pumping station, the dynamic tidal pattern at the outfall of wastewater was studied and a post-tank water level based pump assembly control plan has been set down for this output pumping station.

Attentions in Energy-Saving Renovation of Water-Supplying Pumping Station Yu Fangtian (80)

Abstract : In the design stage of an energy-saving project of a water-supplying pumping station, at beginning the pumping assemblies were rationalized for best arrangement on the basis of flow and delivery lift calculation. Also over the common problems on pump layout such as the installation altitude, the rotation direction and speed etc are worked, and countermeasures to solve these problems are discussed.

Roles of Neural Network in Wastewater Treatment Automation Liu Jianyong et al (85)

Abstract : The rapid technical development and persistent theoretical perfection of neural networks (NN) have made a reliable foundation of its application for various fields including wastewater treatment, and complicated non-linear system. It is feasible and necessary to control wastewater treatment process using NN technology. In this paper, the different roles of NN in automation of wastewater treatment plant were discussed, and the further study problems were pointed out.

On Location of Connector of Water Pumps in Building Fire System Jiang Wenyuan (95)

Abstract : According to the national Design Norm of Building Fire Control System and Design Norm of Fire Control System For High-Rise Building, the water pump connector has to be installed but the inlet point of the connection not indicated clearly. In this paper the author gives a brief presentation on the locations of the inlet points for different water supplying segments at automatic sprinkling system in various forms.