

CLAIMS:

1. A building facility water management method for controlling at least one operational parameter associated with a volume of water used by a water control device during a device operation of the water control device in a building facility, the method comprising the steps of:
 - obtaining a water operation value associated with a volume of water for the water control device during the device operation;
 - determining whether the water operation value is outside of a defined threshold associated with the device operation;
 - upon a determination that the water operation value is outside of the defined threshold, adjusting an operational parameter associated with the water control device during the device operation to enable the water control device to be effectively operated.
2. The method of claim 1, wherein the water operation value is a measured real-time water operation value.
3. The method of claim 1, wherein the water operation value is a stored water operation value.
4. The method of claim 1, wherein the water operation value is one or more of an inlet water pressure at the water control device, a water supply pressure value associated with a water supply for the water control device, a water level of the volume of water associated with the device operation; an inlet flow rate associated with the device operation; an outlet flow rate associated with the device operation; a water volume associated with the device operation;
5. The method of claim 1, wherein the water operation value is obtained based on one or more previous device operations.
6. The method of claim 1, wherein the at least one operational parameter comprises at least one water regulating value of an inlet water valve associated with the device operation.
7. The method of claim 6, wherein the water regulating value is a time value associated with the device operation comprising one or more of an inlet water valve on-time, an inlet water valve off-time, a sequence of an inlet water valve on-time and off-time.

8. The method of claim 6, wherein the water regulating value is a flow rate value of the inlet water valve associated with the device operation.
9. The method of claim 1, wherein the operational parameter is adjusted using artificial intelligence and/or machine learning.
10. The method of claim 1, wherein the adjusting of the operational parameter adjusts the volume of water available to the water control device to complete the device operation and/or subsequent device operations.
11. The method of claim 1, wherein the adjusting of the operational parameter comprises the step of controlling at least one inlet water valve associated with the water control device, wherein the controlling of the inlet water valve is based on the obtained water operation value.
12. The method of claim 11, wherein the operational parameter comprises one or more of a time period that the inlet water valve is open, a time period that the inlet water valve is closed, a sequence of time periods in which the inlet water valve is open and closed, a flow rate of the inlet water valve, or any combination thereof.
13. The method of claim 11, wherein the adjusting of the operational parameter comprises the step of controlling the at least one inlet water valve to perform a maintenance device operation.
14. The method of claim 13, wherein the maintenance device operation is determined using artificial intelligence and/or machine learning based on a plurality of water operation values obtained from a plurality of water control devices.
15. The method of claim 11, wherein a water outlet of the inlet water valve is in direct fluid connection with the water control device.
16. The method of claim 15, wherein a water inlet of the inlet water valve is connected to a header.

17. The method of claim 11, wherein the water outlet of the inlet water valve is in indirect fluid connection with the water control device.
18. The method of claim 17, wherein the water outlet of the inlet water valve is connected to an inlet of a cistern, where the cistern provides the volume of water for the water control device during the device operation.
19. The method of claim 1, wherein the step of obtaining the water operation value comprises detecting a volume of water that was previously used by the water control device during one or more previous device operations, and adjusting the operational parameter associated with the volume of water to be used by the water control device in one or more subsequent device operations to enable the water control device to be effectively operated.
20. The method of claim 1, wherein the step of obtaining the water operation value comprises obtaining a water pressure value of water associated with the device operation.
21. The method of claim 1, wherein the method further comprises the steps of:
obtaining a previous water pressure value;
comparing the obtained water pressure value with the obtained previous water pressure value and
determining whether the water pressure value is outside of the defined threshold based on a calculated pressure difference value based on a difference in water pressure between the water pressure value and the previous water pressure value.
22. The method of claim 1, wherein the step of obtaining the water operation value comprises obtaining a water flow rate value of water associated with the device operation.
23. The method of claim 22, wherein the water flow rate value is based on one or more water flow rate values and obtained during one or more previous device operations.
24. The method of claim 1, wherein the step of obtaining the water operation value comprises obtaining a water level value of water associated with the device operation.

25. The method of claim 1, wherein enabling the water control device to be effectively operated comprises the step of operating in accordance with one or more manufacture specifications associated with the water control device so that the volume of water during the device operation is in accordance with the one or more manufacture specifications.
26. The method of claim 1, wherein enabling the water control device to be effectively operated comprises the step of operating in accordance with one or more technical standards associated with the water control device so that the volume of water during the device operation is in accordance with the one or more technical standards.
27. The method of claim 1, wherein enabling the water control device to be effectively operated comprises the step of operating in accordance with one or more legal standards associated with the water control device so that the volume of water during the device operation is in accordance with the one or more legal standards.
28. The method of claim 1, wherein the adjusting of the operational parameter comprises selecting, obtaining, adjusting or applying a profile associated with the device operation based on the obtained water operation value.
29. The method of claim 28, wherein the profile defines at least one relationship between the operational parameter and the water operation value.
30. The method of claim 29, the method further comprising the step of adjusting the profile using artificial intelligence and/or machine learning based on the at least one relationship over time.
31. The method of claim 28, wherein the profile is associated with one or more of a water control device mode of operation, water control device code, a water control device type, a water control device group, a unique water control device ID, a location of a water control device.
32. The method of claim 1, wherein the device operation comprises a plurality of modes of operation, and the adjusting of the operational parameter for the device operation is dependent on a selected mode of operation selected from the modes of operation.

33. A building facility water management system for controlling at least one operational parameter associated with a volume of water used by a water control device during a device operation of the water control device in a building facility, the system comprising at least one water control device and at least one controller, wherein the controller is arranged to:

obtain a water operation value associated with a volume of water for the water control device during the device operation;

determine whether the water operation value is outside of a defined threshold associated with the device operation;

upon a determination that the water operation value is outside of the defined threshold, adjust an operational parameter associated with the water control device during the device operation to enable the water control device to be effectively operated.

34. The system of claim 33, wherein the controller is a water control device controller, a computer system controller, an electronic device controller, a building management system controller or a server controller.

35. The system of claim 33, wherein the water operation value is a measured real-time water operation value.

36. The system of claim 33, wherein the water operation value is a stored water operation value.

37. The system of claim 33, wherein the water operation value is one or more of an inlet water pressure at the water control device, a water supply pressure value associated with a water supply for the water control device, a water level of the volume of water associated with the device operation; an inlet flow rate associated with the device operation; an outlet flow rate associated with the device operation; a water volume associated with the device operation;

38. The system of claim 33, wherein the water operation value is obtained based on one or more previous device operations.

39. The system of claim 33, wherein the at least one operational parameter comprises at least one water regulating value of an inlet water valve associated with the device operation.

40. The system of claim 33, wherein the water regulating value is a time value associated with the device operation comprising one or more of an inlet water valve on-time, an inlet water valve off-time, a sequence of an inlet water valve on-time and off-time.

41. The system of claim 40, wherein the water regulating value is a flow rate value of the inlet water valve associated with the device operation.

42. The system of claim 33, wherein the operational parameter is adjusted using artificial intelligence and/or machine learning.

43. The system of claim 33, wherein the adjusting of the operational parameter adjusts the volume of water available to the water control device to complete the device operation and/or subsequent device operations.

44. The system of claim 33, wherein the adjusting of the operational parameter comprises the step of controlling at least one inlet water valve associated with the water control device, wherein the controlling of the inlet water valve is based on the obtained water operation value.

45. The system of claim 44, wherein the operational parameter comprises one or more of a time period that the inlet water valve is open, a time period that the inlet water valve is closed, a sequence of time periods in which the inlet water valve is open and closed, a flow rate of the inlet water valve, or any combination thereof.

46. The system of claim 44, wherein the adjusting of the operational parameter comprises the step of controlling the at least one inlet water valve to perform a maintenance device operation.

47. The system of claim 46, wherein the maintenance device operation is determined using artificial intelligence and/or machine learning based on a plurality of water operation values obtained from a plurality of water control devices.

48. The system of claim 33, wherein a water outlet of the inlet water valve is in direct fluid connection with the water control device.

49. The system of claim 48, wherein a water inlet of the inlet water valve is connected to a header.

50. The system of claim 33, wherein the water outlet of the inlet water valve is in indirect fluid connection with the water control device.

51. The system of claim 50, wherein the water outlet of the inlet water valve is connected to an inlet of a cistern, where the cistern provides the volume of water for the water control device during the device operation.

52. The system of claim 33, wherein the controller is arranged to obtain the water operation value by detecting a volume of water that was previously used by the water control device during one or more previous device operations, and further arranged to adjust the operational parameter associated with the volume of water to be used by the water control device in one or more subsequent device operations to enable the water control device to be effectively operated.

53. The system of claim 33, wherein the controller is arranged to obtain the water operation value by obtaining a water pressure value of water associated with the device operation.

54. The system of claim 33, wherein the controller is further arranged to:
obtain a previous water pressure value;
compare the obtained water pressure value with the obtained previous water pressure value and
determine whether the water pressure value is outside of the defined threshold based on a calculated pressure difference value based on a difference in water pressure between the water pressure value and the previous water pressure value.

55. The system of claim 33, wherein the controller is arranged to obtain the water operation value by obtaining a water flow rate value of water associated with the device operation.

56. The system of claim 55, wherein the water flow rate value is based on one or more water flow rate values and obtained during one or more previous device operations.

57. The system of claim 33, wherein the controller is arranged to obtain the water operation value by obtaining a water level value of water associated with the device operation.

58. The system of claim 33, wherein the controller being arranged to enable the water control device to be effectively operated comprises the controller operating the water control device in accordance with one or more manufacture specifications associated with the water control device so that the volume of water during the device operation is in accordance with the one or more manufacture specifications.

59. The system of claim 33, wherein the controller being arranged to enable the water control device to be effectively operated comprises the controller operating the water control device in accordance with one or more technical standards associated with the water control device so that the volume of water during the device operation is in accordance with the one or more technical standards.

60. The system of claim 33, wherein the controller being arranged to enable the water control device to be effectively operated comprises the controller operating the water control device in accordance with one or more legal standards associated with the water control device so that the volume of water during the device operation is in accordance with the one or more legal standards.

61. The system of claim 33, wherein the controller is arranged to adjust the operational parameter by selecting, obtaining, adjusting or applying a profile associated with the device operation based on the obtained water operation value.

62. The system of claim 61, wherein the profile defines at least one relationship between the operational parameter and the water operation value.

63. The system of claim 62, wherein the controller is further arranged to adjust the profile using artificial intelligence and/or machine learning based on the at least one relationship over time.

64. The system of claim 61, wherein the profile is associated with one or more of a water control device mode of operation, water control device code, a water control device type, a

water control device group, a unique water control device ID, a location of a water control device.

65. The system of claim 33, wherein the device operation comprises a plurality of modes of operation, and the controller is arranged to adjust the operational parameter for the device operation dependent on a selected mode of operation selected from the modes of operation.