[Document Name] Claims

[Claim 1]

A water quality sensor calibration system comprising:

a water quality measurement value management device;

a water quality monitoring device;

a water quality analysis unit; and

a calibration value input unit,

wherein:

the water quality measurement value management device manages water quality measurement values,

the water quality monitoring device is installed in a water quality control room, includes a communication unit, a water quality sensor calibration processing device, and a water quality sensor, and has functionality for transmitting a water quality measurement value measured by the water quality sensor to the water quality measurement value management device;

the water quality analysis unit has functionality for manually analyzing water quality at a site where the water quality monitoring device is installed;

in a case that there is an unacceptable deviation between a manual analysis value manually analyzed by the water quality analysis unit and the water quality measurement value managed by the water quality measurement value management device:

the calibration value input unit inputs a calibration value for calibrating the water quality measurement value obtained based on the manual analysis value and transmits the calibration value to the water quality measurement value management device; and

the communication unit accesses the water quality measurement value management device and downloads the calibration value stored in a database of the water quality measurement value management device;

the water quality sensor calibration processing device receives the calibration value downloaded by the communication unit, calibrates the water quality measurement value from the water quality sensor based on the calibration value, and remotely calibrates the water quality sensor based on the calibration value downloaded from the water quality measurement value management device, wherein the water quality management system further includes:

an automatic drainage device installed in a drainage chamber to manage a drainage operation;

a user terminal for use by a user; and

a water quality management device for remotely managing the automatic drainage

device, and
in a case that a drainage operation control request that designates drainage control for starting or stopping a drainage operation at a particular date and time is received from the user terminal, a drainage control instruction is transferred from the water quality management device to the automatic drainage device that requests that the drainage control be performed at the particular date and time, and
in a case that the automatic drainage device receives the drain control instruction from the water quality management device, the drainage control is performed at the particular date and time, and
in a case that the water quality measurement value measured by the water quality sensor of the water quality monitoring device does not satisfy a predetermined water quality criterion, an abnormality notification is transmitted from the water quality monitoring device to the water quality management device;
in a case that the water quality management device receives the abnormality notification from the water quality monitoring device, a drainage execution instruction is transmitted to the automatic drainage device that requests starting of a drainage operation; and
in a case that the automatic drainage device receives the drainage execution instruction from the water quality management device, the drainage operation is started.

[Claim 2]
The water quality sensor calibration system according to claim 1, wherein the water quality sensor calibration processing device includes:
a water quality value calibration control unit having functionality for calibrating, in a case that there is a deviation between the manual analysis value manually analyzed by the water quality analysis unit and the water quality measurement value managed by the water quality measurement value management device, the water quality measurement value measured by the water quality sensor to the calibration value obtained from the manual analysis value based on the calibration value obtained based on the manual analysis value.

[Claim 3]
The water quality sensor calibration system according to either of claim 1 or 2, wherein:
the water quality sensor is any one selected from the group consisting of a residual chlorine concentration meter, a chromaticity meter, a turbidity meter, and a pH meter;
the water quality analysis unit is any one selected from the group consisting of a portable residual chlorine measurement device, a portable chromaticity measurement device, a portable turbidity measurement device, and a portable pH measurement device;

the water quality measurement value management device is any one selected from the group consisting of a cloud-side server and a personal computer;

the calibration value input unit is a terminal including a tablet or a smartphone;

the communication unit is a communication terminal that includes a magnet switch, and is configured such that when a magnet is brought close to the magnet switch after the calibration value is transmitted from the calibration value input unit to the cloud, the magnet switch activates to initiate communication, and the communication unit accesses the water quality measurement value management device and downloads the calibration value stored in the database; and

the water quality sensor calibration processing device is a processing device that calibrates the water quality sensor based on the calibration value.

[Claim 4]

A water quality management method for a water quality management system that includes at least a water quality monitoring device that is installed in a water quality control room and that has functionality for transmitting a water quality measurement value measured by a water quality sensor to a water quality measurement value management device for managing water quality measurement values, the water quality management method comprising steps that cause the water quality monitoring device to perform:

a water quality analysis step of manually analyzing water quality at a site where the water quality monitoring device is installed;

a calibration value input step of inputting, in a case that there is an unacceptable deviation between a manual analysis value manually analyzed in the water quality analysis step and a water quality measurement value managed by the water quality measurement value management device, a calibration value for calibrating the water quality measurement value obtained based on the manual analysis value and transmitting the calibration value to the water quality measurement value management device;

a communication step of accessing the water quality measurement value management device and downloading the calibration value stored in a database of the water quality measurement value management device;

a water quality sensor calibration processing step of receiving the calibration value downloaded in the communication step and calibrating the water quality measurement value of the water quality sensor based on the calibration value; and

a remote calibration step of remotely calibrating the water quality sensor based on the calibration value downloaded from the water quality measurement value management

device,

the water quality management system further includes:

an automatic drainage device installed in a drainage chamber to manage a drainage operation;

a user terminal for use by a user; and

a water quality management device for remotely managing the automatic drainage device, and

the water quality management method further includes:

a drainage control instruction step of transferring, in a case that a drainage operation control request that designates drainage control for starting or stopping a drainage operation at a particular date and time is received from the user terminal, a drainage control instruction from the water quality management device to the automatic drainage device that requests that the drainage control be performed at the particular date and time, and

a drainage operation control step of performing, in a case that the automatic drainage device receives the drain control instruction from the water quality management device, the drainage control at the particular date and time,

an abnormality notification step of transmitting, in a case that the water quality measurement value measured by the water quality sensor of the water quality monitoring device does not satisfy a predetermined water quality criterion, an abnormality notification from the water quality monitoring device to the water quality management device;

a drainage execution instruction step of transmitting, in a case that the water quality management device receives the abnormality notification from the water quality monitoring device, a drainage execution instruction to the automatic drainage device that requests starting of a drainage operation; and

a drainage operation start step of starting, in a case that the automatic drainage device receives the drainage execution instruction from the water quality management device, the drainage operation.

[Claim 5]

The water quality management method according to claim 4, further comprising:

an improvement notification step of transmitting, in a case that a second water quality measurement value measured by the water quality sensor after the abnormality notification was transmitted to the water quality management device satisfies the predetermined water quality criterion, a water quality improvement notification that

indicates that water quality has improved from the water quality monitoring device to the water quality management device;

a drainage stop instruction step of transmitting, in a case that the water quality management device receives the water quality improvement notification from the water quality monitoring device, a drainage stop instruction to the automatic drainage device that requests stoppage of the drainage operation; and

a drainage operation stop step of stopping, in a case that the automatic drainage device receives the drainage stop instruction from the water quality management device, the drainage operation.