AQUA 3000 OPEN

Managing water efficiently and wirelessly

DVS

Dart Valley Systems
a **FRANKE** company

FRANKE

MANAGING WATER EFFICIENTLY, SUCCESSFULLY AND WIRELESSLY

The responsible and efficient use of water as a natural resource is a central objective for modern buildings. Franke Washroom Systems provides optimally devised sanitary solutions to assist building and facility designers in their quest to achieve a sustainable level of operation. The AQUA 3000 open water management system establishes a balance between ecology and economy, between hygiene and consumption and between planning and operation.

A sophisticated, complete water management system facilitates economical operation of all connected components. Shower fittings, wash taps as well as flush valves can be connected. The system can be individually programmed and expanded as required. Water volumes, hygiene flushing, thermal disinfection and respective temperature limits can be set individually for each room and even for each fitting. Malfunctions are immediately detected and reported by the system. Efficient water heating reduces power consumption. The resulting potential savings significantly reduce the payback period.
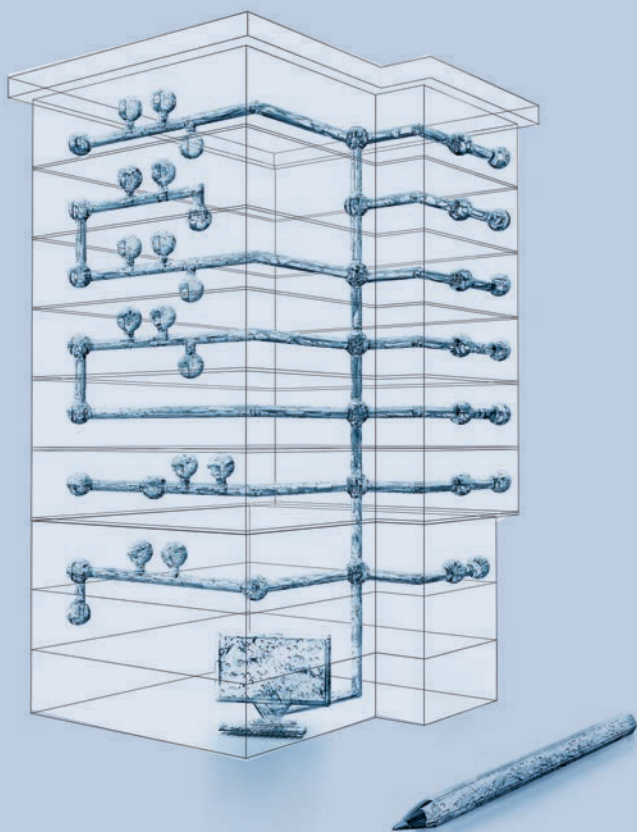
The AQUA 3000 open water management system is based on an innovative electronic platform featuring advanced architecture that presents installers and operators with a much easier, more reliable, functional, hygienic and economical system which is even easier to integrate into host networks.

The further enhanced AQUA 3000 open intelligent water management system is consistently structured into two levels – fittings and network – which can communicate with each other via different data protocols such as Ethernet, BacNet, KNX, ModBus or OPC. The most important water delivery functions are controlled at the fittings level.
The ECC2 (ECC = Ethernet–CAN–Coupler) function controller and the integrated WEB server facilitate additional functions ranging up to a CAFM connection.

Two different supplementary modules provide optional choices for expansion: I/O module with digital inputs and outputs for sequential controls, and GSM module for mobile phone remote maintenance.

ECONOMICAL

The efficient and demand-optimised use of resources (water, energy, time) makes the sanitary system a profitable investment.

HYGIENIC

Regular hygiene flushing and thermal disinfection programs guarantee high quality drinking water.
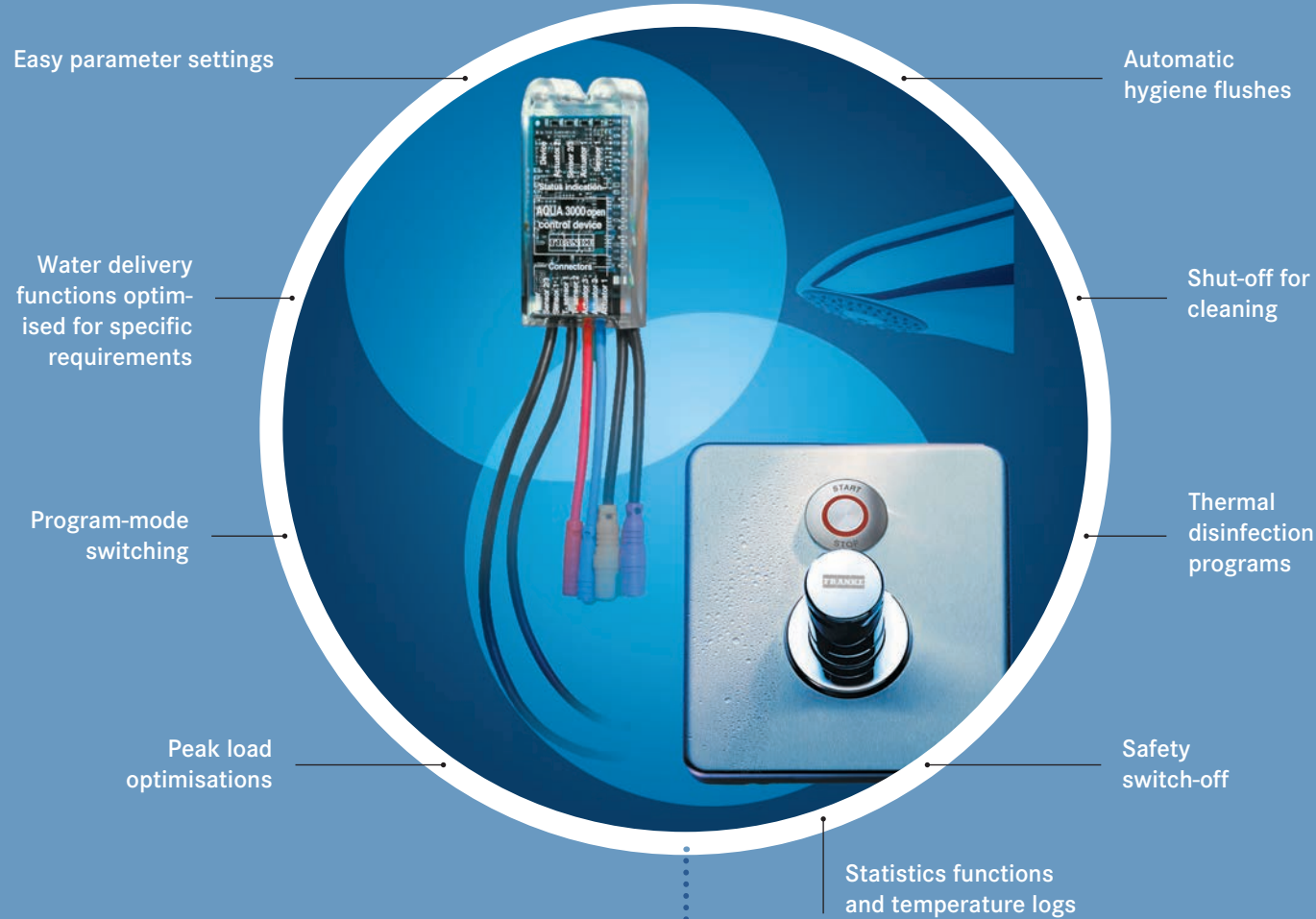
SUSTAINABLE

A flexible, expandable and thus future-proof system that can be integrated into the computer aided facility management system.
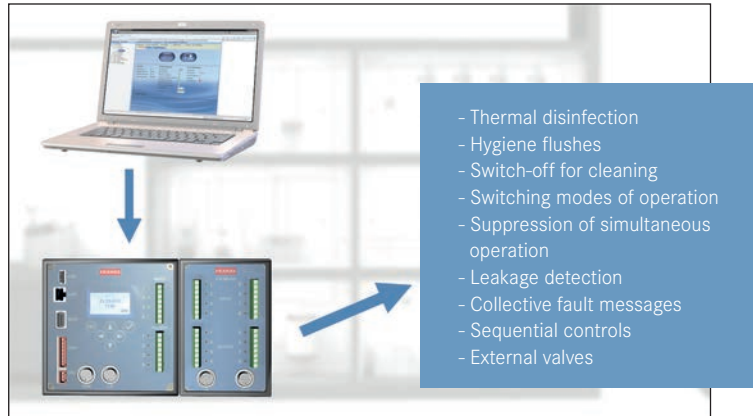
THE FITTING THAT THINKS FOR ITSELF

The intelligent electronic module is the core of the respective fitting. Even at the fittings level it combines water delivery and control functions that are independent of a host control unit. Thanks to the factory-programmed electronic modules, fittings can be easily commissioned by simple »plug and play«. The integrated electronic module of each fitting has an application-specific function program for all important water-delivery functions. Also, a unique serial number provides the basis for additional control functions.

Easy parameter settings

Automatic hygiene flushes

Water delivery functions optimised for specific requirements

Shut-off for cleaning

Program-mode switching

Thermal disinfection programs

Peak load optimisations

Safety switch-off

Statistics functions and temperature logs

+ Easy parameter settings

Facility-specific program parameters can be set by means of a WEB browser.

- Thermal disinfection
- Hygiene flushes
- Switch-off for cleaning
- Switching modes of operation
- Suppression of simultaneous operation
- Leakage detection
- Collective fault messages
- Sequential controls
- External valves

+ Demand-optimised water delivery functions

The electronic module automatically controls application-related basic functions such as Start/Stop for water flow and flow duration. Different program modifications such as individual hygiene flushing functions and peak load programs, are individually customisable during commissioning.
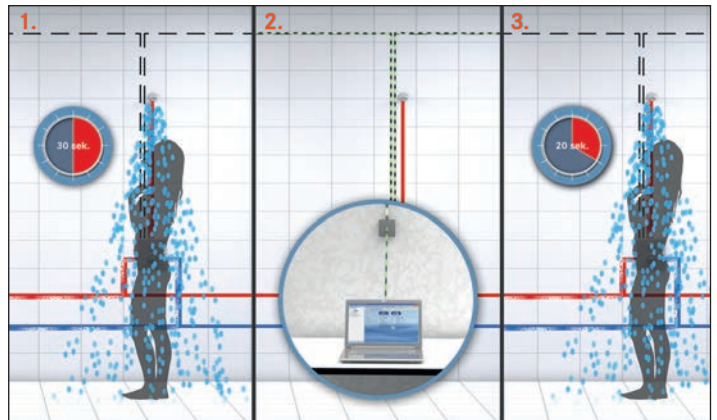

+ Switching program modes

All fittings are provided with 2 alternative control programs (water delivery functions) backed up in the electronic module. To select different modes, e.g. day/night, school/ association, paid/unpaid water delivery, classes/holidays, stadium/intermission, room occupied/vacant etc., the respective programs can be switched via an ECC2 function controller or the WEB browser. The optional AQUAPAY module for paid water delivery ensures additional efficiency because users become more conscious of how they handle water resources.
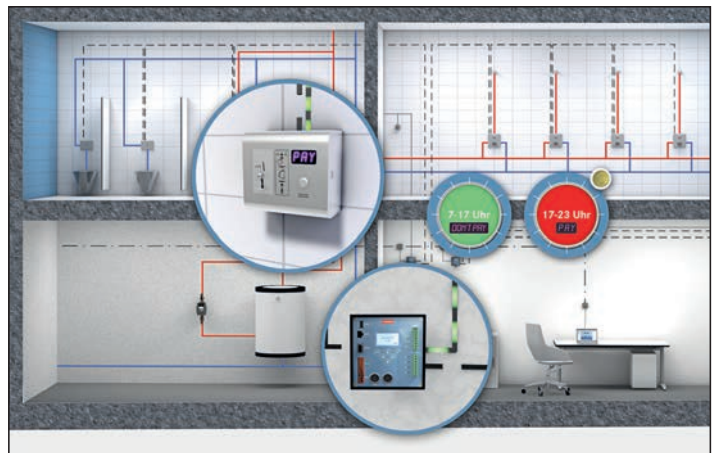

+ Peak-load optimisations

The peak-load optimisation processes are stored in the electronics modules and can be enabled in the function program.
The program for a user-dependent reduction of the flow-duration controls water delivery as a function of the frequency of usage of the fitting. The simultaneous-operation suppression feature flushes the fittings one at a time.
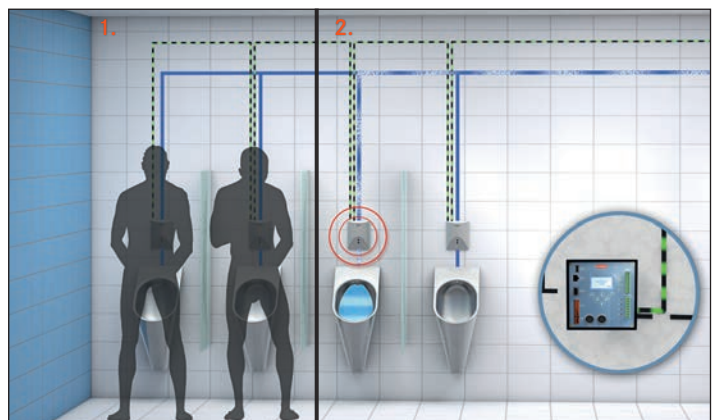
By combating germs and bacteria (Legionella), the following two functions are particularly designed to avoid contamination of the piping system and to maintain or re-establish the quality of the drinking water. The duration and intervals of necessary thermal disinfections can be set just as specifically as the separate hygiene flushing functions for preventing water stagnation. The success of the hygiene measures must be checked by means of regular sampling.
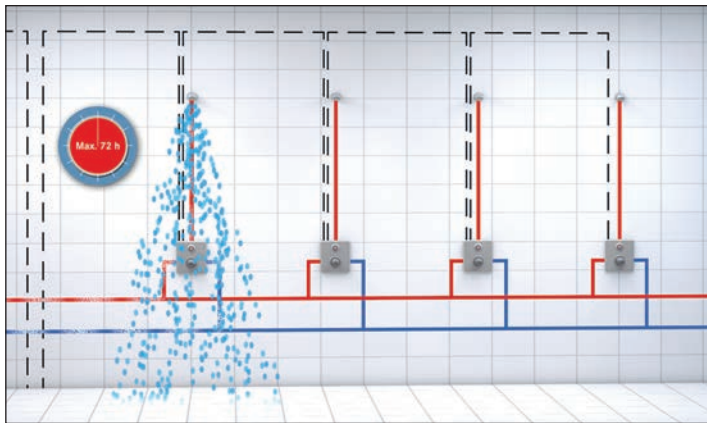
+ Automatic hygiene flushing

Three control functions specific to the facility can be called up with the hygiene flushing programs backed up in the electronic modules:

- An automatic hygiene flush is performed for a fitting within certain fixed intervals.

- Dynamic hygiene flushes are performed after a certain time of disuse of a fitting (factory- programmed to 24 hours after last use).

- Temperature-controlled hygiene flushes are performed in conjunction with optional temperature sensors via a hot- or cold-water-side temperature control system.
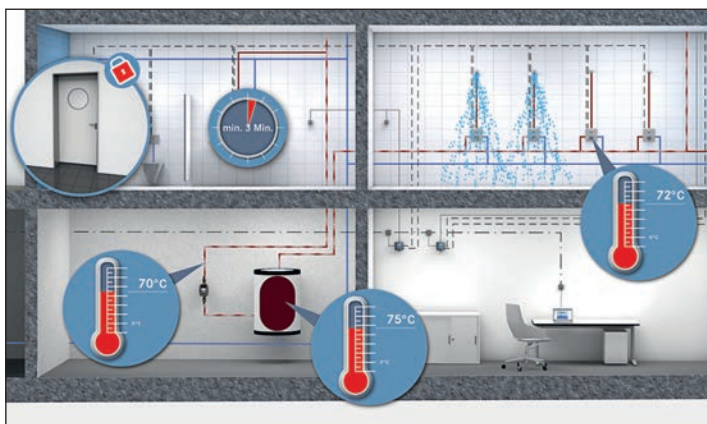

+ Thermal disinfection programs

The most important parameters (treatment time, water-flow duration, temperature control) of the thermal disinfection process (TD) are stored in the electronic module of each individual fitting. The temperature logs are stored there as well. The thermal treatment process can be started via a digital input on the ECC2 function controller or a WEB browser. Operators can choose between a dynamic temperature-controlled program or a time-scheduled disinfection program. Furthermore, optional water delivery via the last fitting in the circuit ensures a speedy flow of hot water through the circulation pipe, and the thermal disinfection process can be performed in a time efficient manner.

+ Safety shut-off

In the event that a fitting is operated while thermal disinfection is being performed, the TD program immediately interrupts the process. The safety shut-off feature also triggers when a fitting is activated continuously, e.g. due to improper use, and thus stops the flow of water.
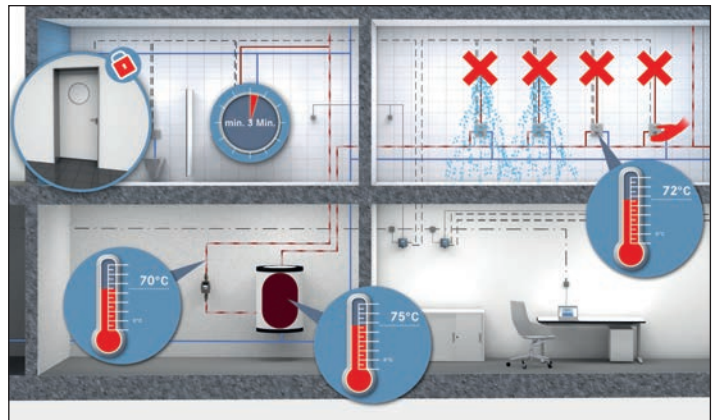
+ Shut-off for cleaning

This function ensures that sanitary facilities can be cleaned. It prevents fittings from being inadvertently triggered.
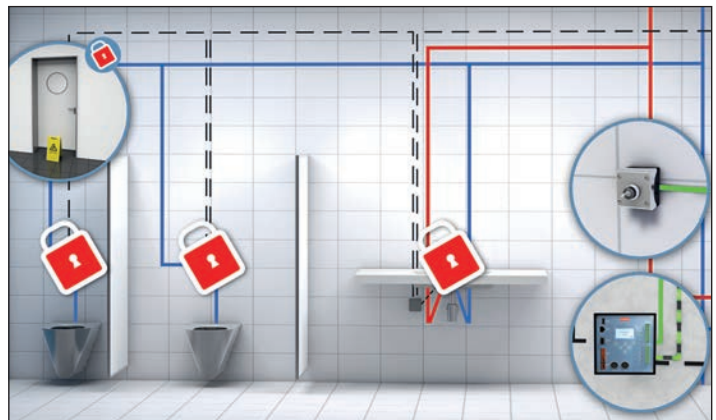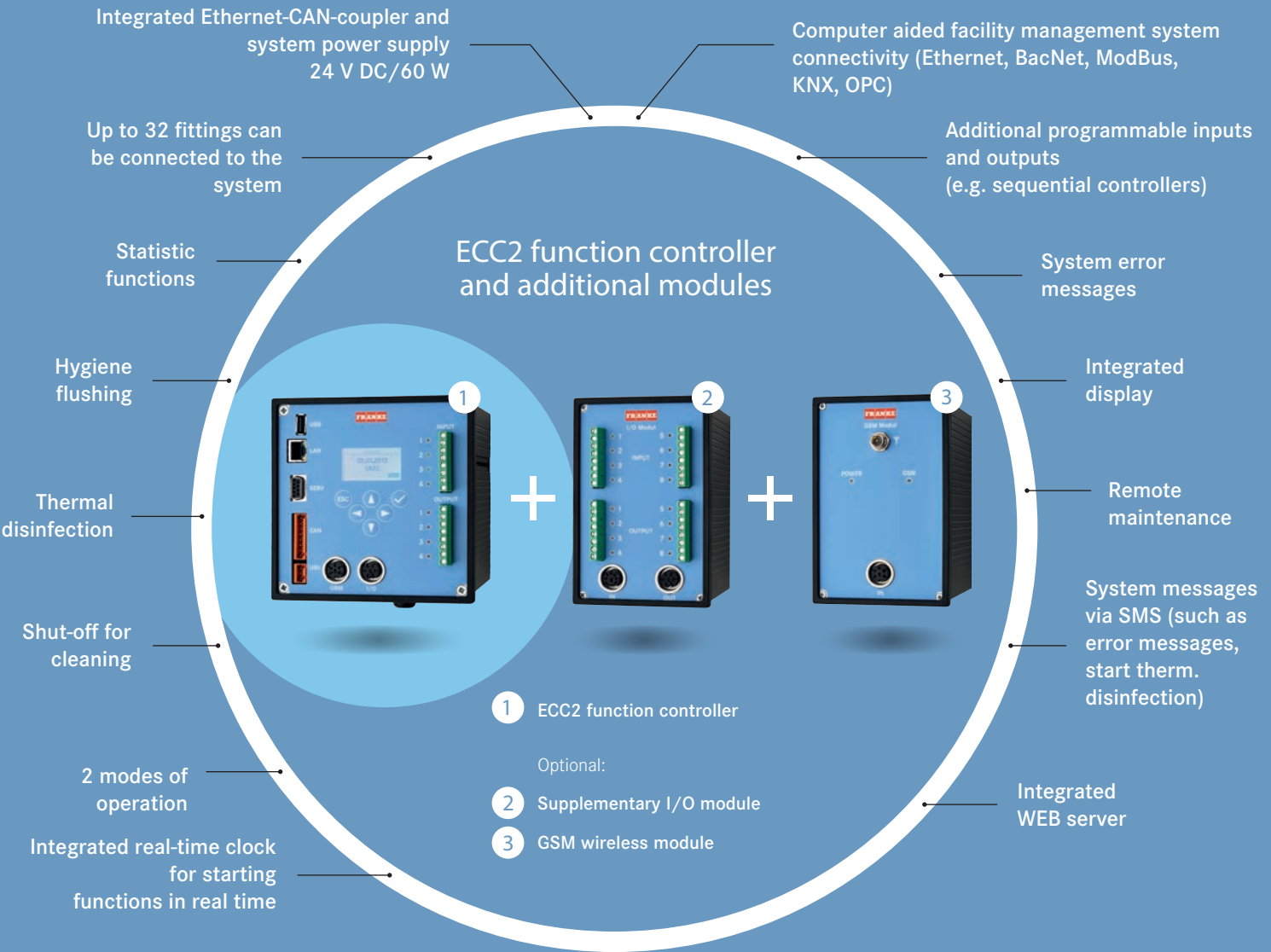

+ Statistics functions and temperature logs

Temperature values and other important system data are stored. This data can be output to a USB stick or downloaded with the WEB browser.

THE ECC2 FUNCTION CONTROLLER AND ADDITIONAL MODULES

Integrated Ethernet-CAN-coupler and system power supply 24 V DC/60 W

Computer aided facility management system connectivity (Ethernet, BacNet, ModBus, KNX, OPC)

Up to 32 fittings can be connected to the system

Additional programmable inputs and outputs (e.g. sequential controllers)

Statistic functions

ECC2 function controller and additional modules

System error messages

Hygiene flushing

Integrated display

Thermal disinfection

Remote maintenance

Shut-off for cleaning

System messages via SMS (such as error messages, start therm. disinfection)

1   ECC2 function controller

Optional:

2   Supplementary I/O module

3   GSM wireless module

2 modes of operation

Integrated WEB server

Integrated real-time clock for starting functions in real time

8

+ Factory-programmed digital outputs

- Thermal disinfection active

- Thermal disinfection cancelled

- Safety shut-off for thermal disinfection

- Collective fault messages

+ Factory-programmed digital inputs

- Start thermal disinfection

- Cancel thermal disinfection

- Switching modes of operation

- Acknowledgement of outputs,
  e.g. for collective fault messages

When 5 or more functions are desired via the digital inputs and outputs, a supplementary I/O module is ② required.

When fittings are connected to the ECC2 function controller via the system cable, this function controller takes over as a power supply and also provides data communication within the CAN island network. The multifunctional unit also offers features for sequential controls. In combination with the GSM wireless module ③ it is possible to send remote maintenance and system messages via SMS.

+ Data communication

The ECC2 function controller has a standardised Ethernet communication interface for connecting to a PC or a computer aided facility management system (CAFM). The data protocols provided are Ethernet, BacNet, KNX, ModBus and OPC.

+ System connection for fittings

Two system cables can be connected to the ECC2 function controller for providing power and data communication, with a total length of up to 200 metres and a total number of up to 32 fittings.

+ Real-time data storage

At adjustable intervals the ECC2 function controller's internal data memory stores temperature values, actuator counts and run-times, operating hours, hygiene flushes, thermal disinfections and shut-offs for cleaning together with the respective specific date and time. The data can be output in csv format to a USB stick or downloaded with the WEB browser; it can then be visualised, for example with Excel.

SYSTEM SOLUTIONS WITHIN A NETWORK

The intelligent fittings technology and the open system structure of AQUA 3000 open facilitate customised water delivery functions and ready adaptation or expansion to accommodate facility-specific conditions.

Welcome to AQUA 3000 open

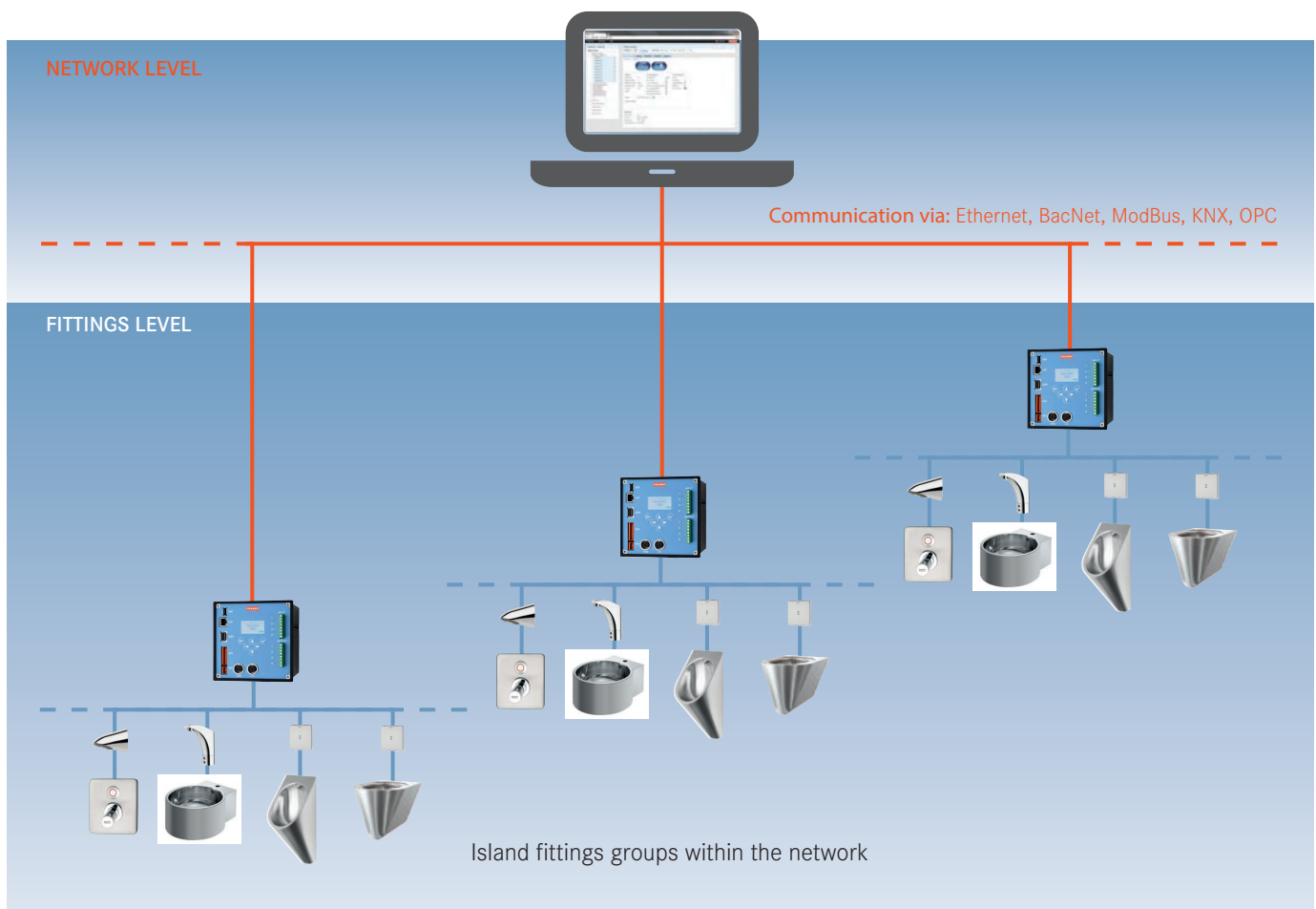Start

WASHROOM SYSTEMS

FRANKE

Levels of communication

AQUA 3000 open makes it possible to integrate every sanitary room into the building network and to connect to an existing computer aided facility management system using different data protocols. The ECC2 function controller serves as the interface to the building network. The associated island network is controlled with CAN-Bus technology. The serial CAN-Bus system (Controller Area Network) provides a speedy, reliable and cost-efficient system for networking fittings. The network incorporates several peer-to-peer control units (Bus participants) linked to each other to provide fast data transmission.

The CAN-Bus system was developed in 1983 by Bosch and is designed to network control units in automobiles to reduce the amount of cables in cable harnesses and to minimise weight. CAN Bus systems are used particularly in safety-relevant environments, where a high level of data reliability is required (automation, medicine, aircraft technology).

LEVEL STRUCTURE WITHIN AQUA 3000 OPEN

The AQUA 3000 open water management system is subdivided into a fittings level and a network level. At the fittings level, an ECC2 function controller has a CAN island network with up to 32 fittings assigned to it. At the same time, the ECC2-function controller serves as the transfer point to the network level.

For larger facilities, several ECC2-function controllers can be installed. The RJ45 ports of the individual ECCs can be used to connect all fittings within a building to a single PC or to the existing computer-aided facility management system (CAFM) from which they can then be jointly managed and/or controlled.

NETWORK LEVEL

Communication via: Ethernet, BacNet, ModBus, KNX, OPC

FITTINGS LEVEL

Island fittings groups within the network

Wireless water management

The GSM wireless module can be used to access the system via the Internet to perform remote maintenance. This module can also be used to send fault messages via SMS to up to five recipients.

This functionality requires the use of a SIM card, a mobile phone service contract, a UMTS mobile network, and an optional antenna depending on the individual strength of the signal received in the building.
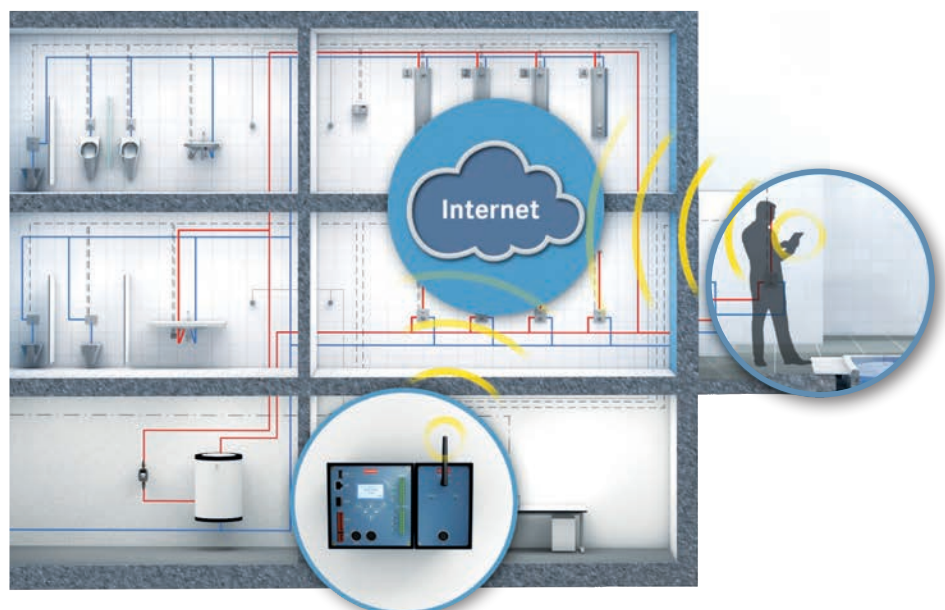
MANAGING WATER ON-SITE
OR VIA THE INTERNET

With the help of the WEB server integrated in the ECC2 all sanitary engineering processes can be viewed, controlled and logged in a very user-friendly manner via a WEB browser. Furthermore, it is easy to set the parameters of system components. The optional GSM wireless module can be used to individually send alarms and event messages.

All fittings working in conjunction with a specific ECC2 function controller are clearly depicted as island networks. Besides being able to set media-flow durations (water, soap, air, etc.) and communication parameters, it is possible to perform and record hygiene flushes and thermal disinfections.

With the help of the virtual fitting Islands, which can be grouped, moved and rearranged, the entire real sanitary system can be displayed on a standard WEB browser.

For applications in security-related areas, for example in correctional facilities, where scheduling functions, possible usage restrictions and monitoring are required. These are ensured by means of individually adjustable functions and program sequences within the WEB server.

Overviews of network and fittings
The »Network« level shows all connected ECC2 function controllers. Here the user can select an ECC island network and display it in a fittings overview. The »ECC« level shows the operating condition of every sanitary fitting e.g. current temperature, operating mode and the state of connected sensors and actuators. Here the user can select the »TD« tab to configure thermal disinfection processes.
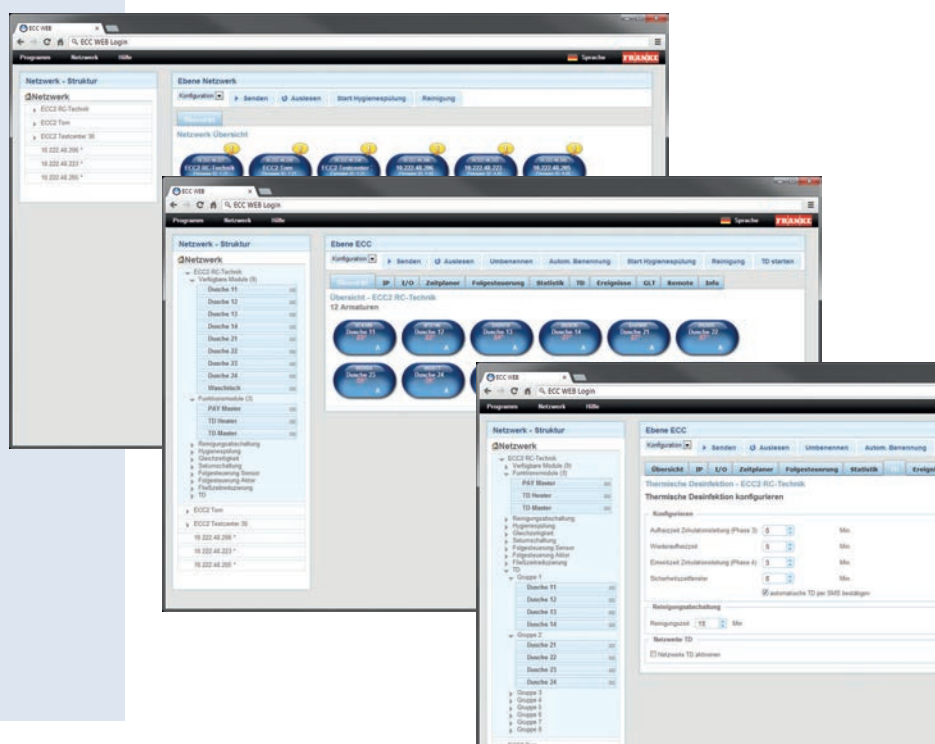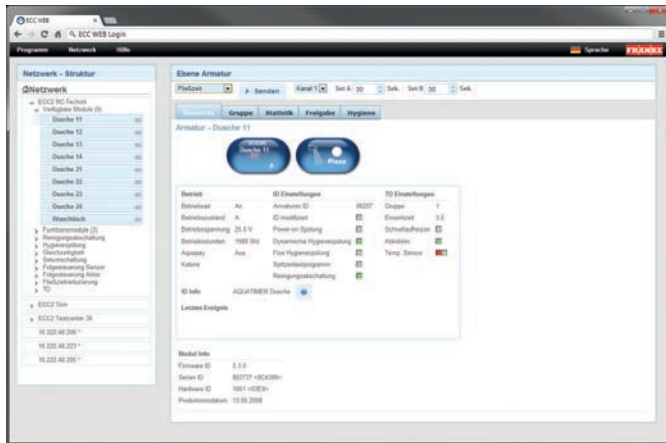
Fittings overview with program processes
An automatic overview is generated for each fitting; this overview displays all parameters that are necessary for operation.
The fittings function – e.g. shower with Piezo pushbutton – is thus shown with an easy to understand pictogram. Flow durations and sensor ranges can be set from here.

Overviews of network and fittings
Tabs «Enable» and «Hygiene» can be used to optimally adapt each and every fitting to the operating process. Thus, for example, hygiene flushes and thermal disinfection parameters such as exposure time and temperature can be configured for each individual fitting. Furthermore, the parameters for peak load programs and shut-offs for cleaning can be entered here.
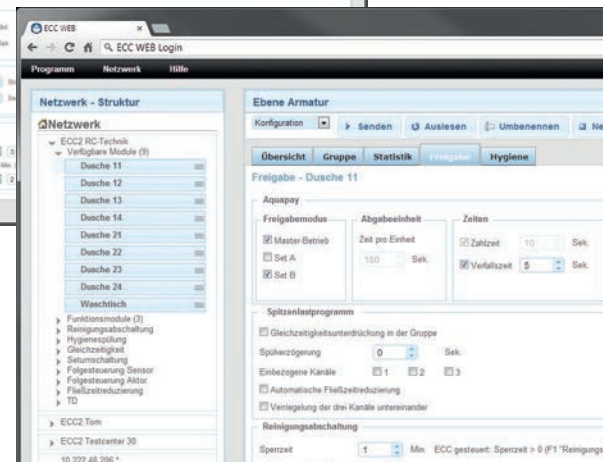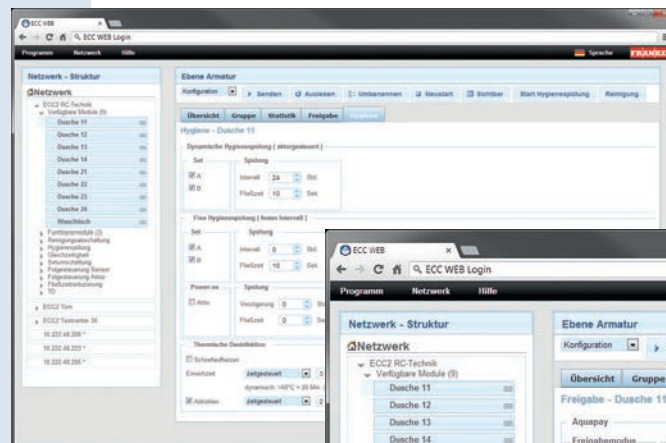
Statistics function for fittings
The "Statistics« / »Fittings« tab shows all counter values (number of times solenoid valve has triggered), operating hours, temperature courses, as well as the time passed since the last hygiene flushing of each individual fitting. Also status information relating to the last thermal disinfection. When the ECC's statistics function is activated, the ECC continuously records the most important data, which can then be exported in a csv file for further analysis.
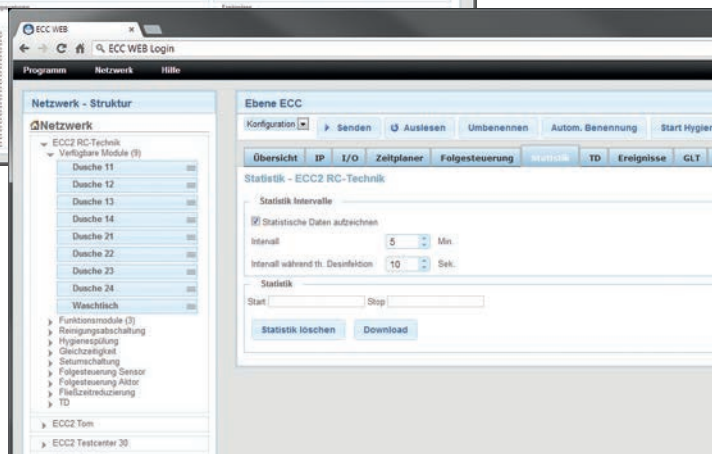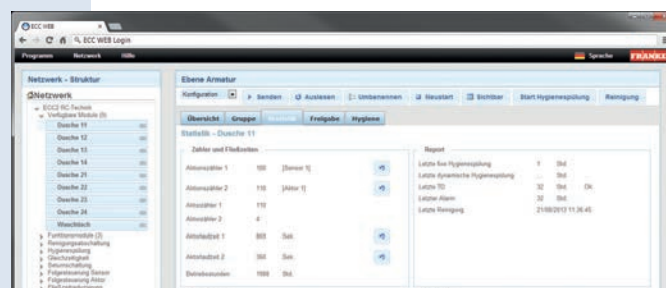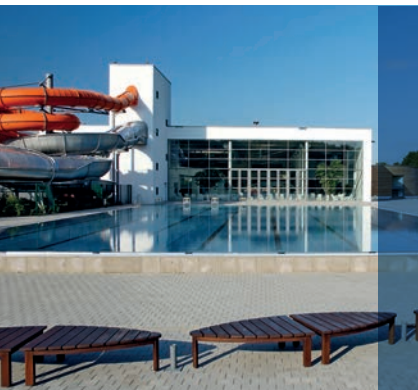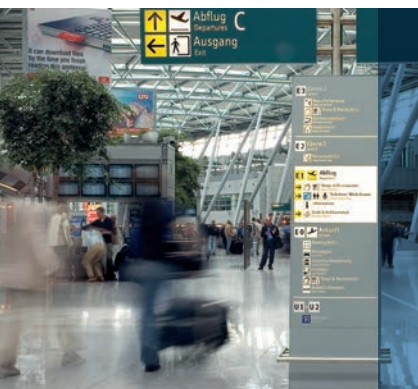
// RECREATION
Swimming pool halls,
fitness studios,
spas,
etc.

// EDUCATION
schools,
nursery schools,
educational and
training institutions, etc.

// TRAVEL
airports,
railway stations,
campgrounds,
motorway services,
etc.

// HEALTH
hospitals,
nursing homes,
etc.

// SECURITY
prisons,
police stations,
military
installations,
etc.

SYSTEMATIC APPLICATIONS

Because the requirements for efficiency, comfort and hygiene in the construction of building facilities are constantly growing, water management is becoming more and more important in this field. Just as is the case in the entire field of facility management. AQUA 3000 open stands for future-proof water management that can be easily expanded to accomodate the growing needs of a building. It is an open system that can be integrated into existing building management systems. Changes in the use of the building present no problem. Fittings can be easily added or removed even years after the initial construction.

Shower areas are increasingly the focal point of consideration with respect to possible sources of infection from drinking-water systems. Thermal disinfection methods have emerged as the recognised state of the art in technology for preventing such infection. In bus-networked fitting systems, hygiene requirements can be ideally complied with. The individual setting options are as varied as the conditions of the building itself. The water management system can learn from its users and adapt accordingly.

Specialists from Franke Washroom Systems supervise commissioning, provide appropriate training and are also available during regular operation at any time.

Examples of applications and system representations provide suggestions and impulse for detailed designs and sample installations of AQUA 3000 open.

ECC2,
optional

Maximum 32 fittings
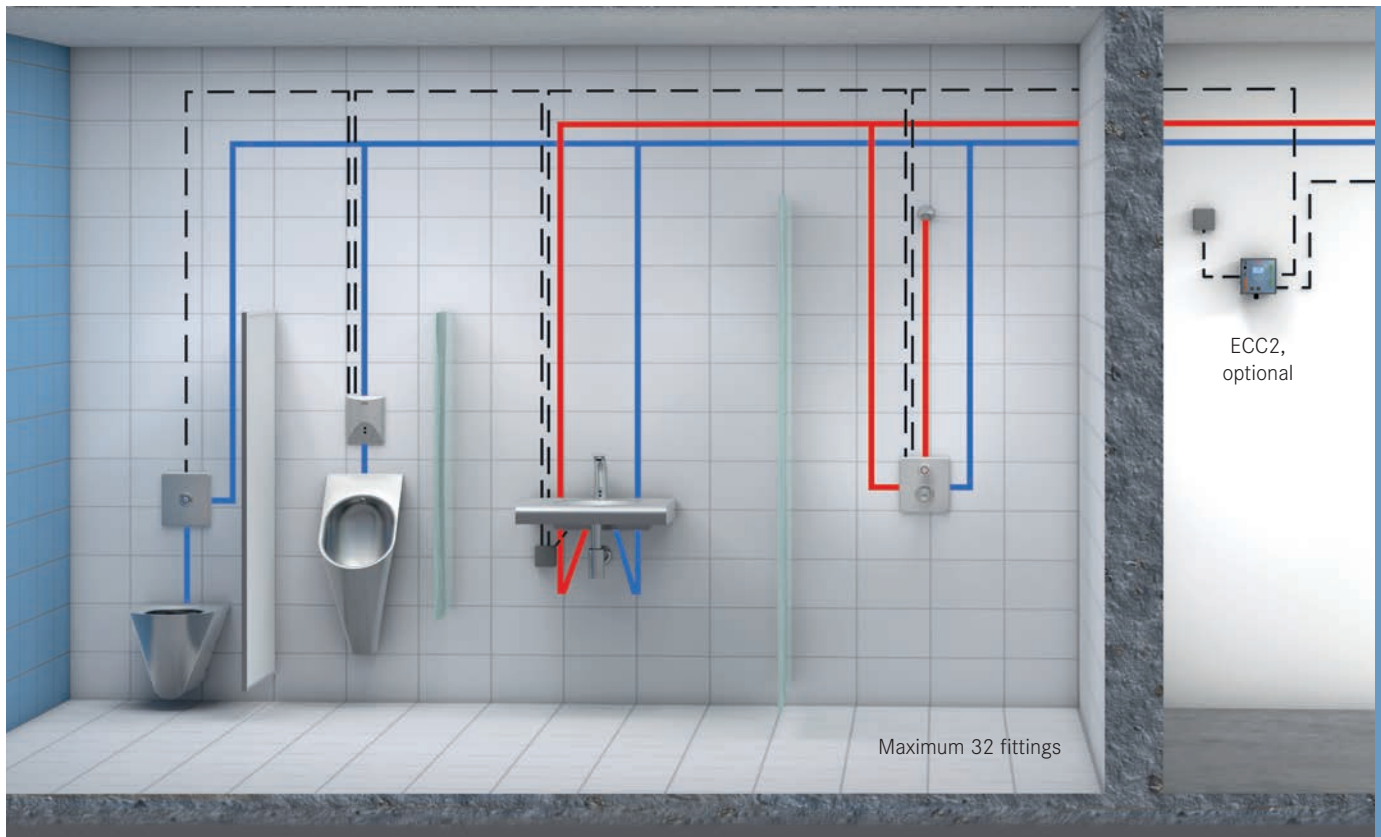
Legend:

— PWC (potable water cold)

— PWH (potable water hot)

- - - 24 V DC system cable

THE STRUCTURE OF THE INTEGRATION

The fittings are simply installed in series along a system line providing a 24 V DC power supply. Due to the power consumption, cable lengths and the CAN-bus data protocol used, the number of fittings in this installation variant is limited to 32. Factory commissioning is not necessary for standard water delivery functions, because the electronic modules integrated in the fittings are already factory-programmed and operate on a "plug and play" basis. Additional control functions, such as hygiene flushing, are part of this basic programming. The system cable must be laid out in an empty tube leading all the way to the fittings.

Optional:
When integrating an ECC2 function controller into the overall system, the system cable has a dual function: power supply and data communication within the CAN island network. A terminating resistor on both sides ensures proper data communication between the ECC2 function controller and the individual fittings. Here the ECC2 performs central management functions and supplies power to the fitting network. To adapt the control processes of the ECC and of the electronic modules of the fittings to the specific conditions prevalent at a particular facility, the customer service team can perform a commissioning routine.
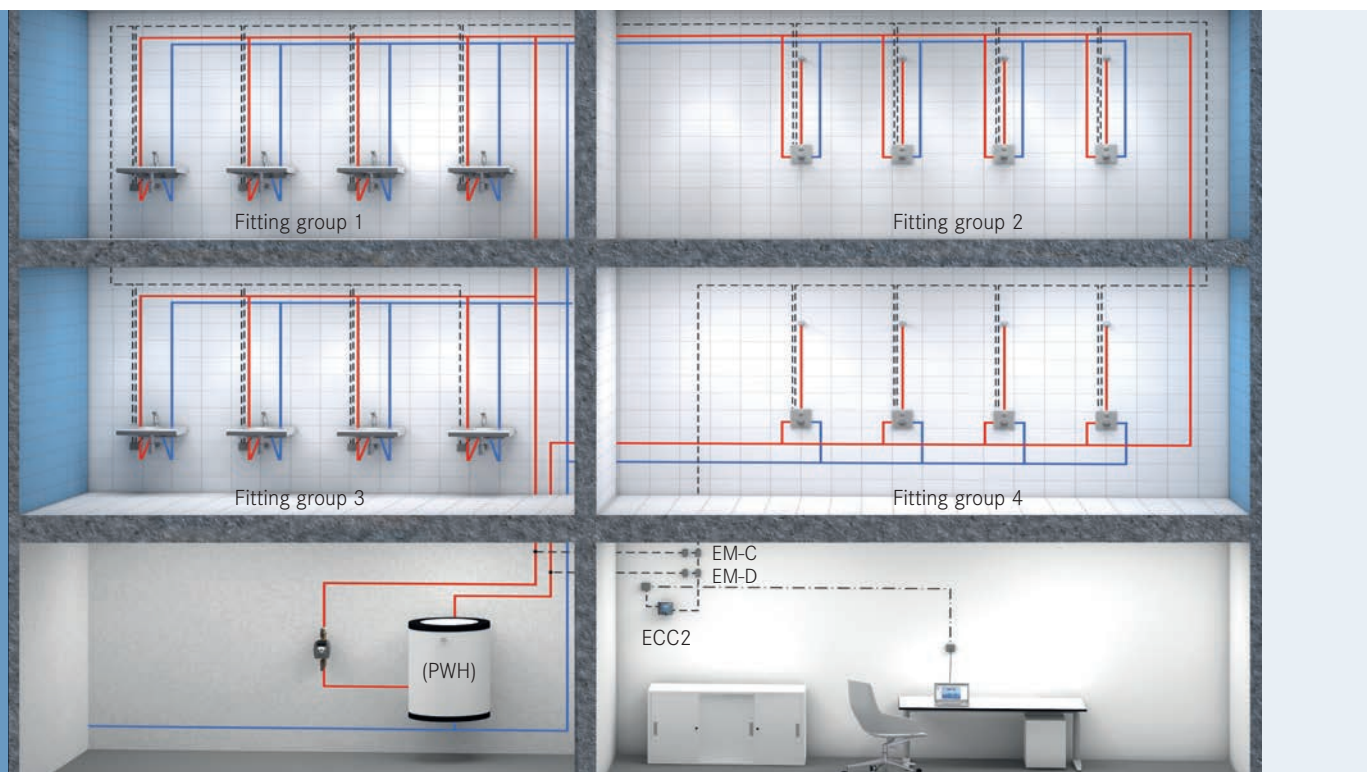
MODELS FOR THERMAL DISINFECTION

Data protocols operating via the freely programmable digital inputs of the ECC2 or of the optional I/O add-on module can be used to start and stop thermal disinfections (TD), group hygiene flushes as well as group shut-offs for cleaning. Optionally, temperature sensors can be integrated on each fitting to monitor the various processes.

Performing thermal disinfection on thermostatic valves requires the use of a bypass solenoid valve cartridge in the function block of the respective fitting. Within a CAN island network with an ECC2, the fittings that are to be given TD can be arranged in up to 8 successively opening groups. For example, with smaller drinking water heaters, this could be 8 groups with 4 taps each, which are successively thermally disinfected, thus giving the system the chance to re-heat. Parallel to the factory-pro-grammed fittings functions, commissioning by the service team

ECC2

Maximum 32 components
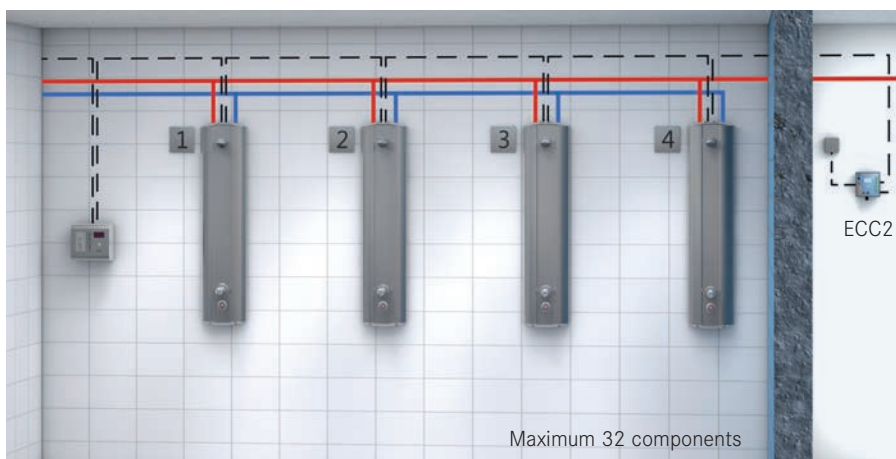
System overview for thermal disinfection, in combination with paid water delivery.

is also required for data communication and thermal disinfection. It is possible to integrate AQUAPAY coin-activated controllers for paid water delivery in the entire fittings network. Here one coin controller with a maximum of 31 fittings must be provided with one ECC2.

Fitting group 1

Fitting group 2

Fitting group 3

Fitting group 4

EM-C
EM-D

ECC2

(PWH)

Thermal disinfection incorporating the drinking-water heater.

Forming groups of fittings facilitates efficient performance of thermal disinfection, particularly for drinking-water heaters that have rather low storage capacity. In this system arrangement, the number of fittings is limited to 30. Added to the arrange-ment is a system electronic module to control the drinking

water heater (EM-D) and a system electronic module for the circulation line (EM-C) for thermal disinfection. The latter ensures that heated drinking water is quickly provided for the circulation line by selectively withdrawing water from the circulation feedback line.

| Network Group 1 | Network Group 2 |

ECC2 (Master) — ECC2

EM-C   EM-D   EM-T/EM-C

ECC2   ECC2

(PWH)   (PWH)
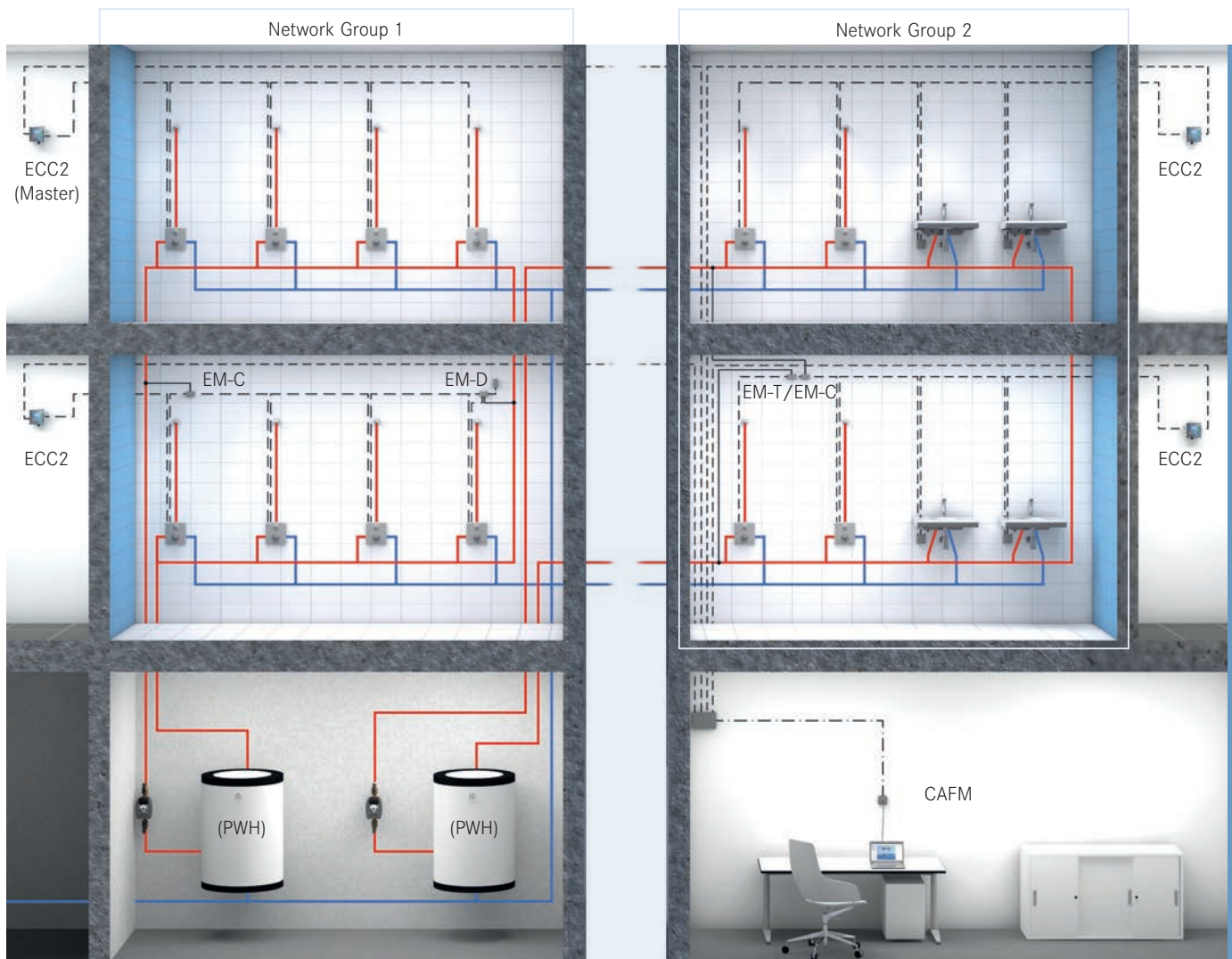
CAFM

Network-wide thermal disinfection

WATER MANAGEMENT AT THE HIGHEST LEVEL OF QUALITY

This plan version is suitable for buildings with different distances between the hydraulic line system and the A3000 open system cables. In this system configuration, the fittings are subdivided into a maximum of 8 groups. One of the ECC2 function controllers used in a building is defined as the »Master« via the data protocol, and thus serves to provide reliable communication with the defined areas. The program processes taking place during thermal disinfection (TD) are readily programmable, the fittings can be selected and the individual TD zones can be started.

With this system architecture, the TDs can be easily adapted to the specific conditions within a facility and to changing parameters. These network-wide TDs for up to 8 network groups can be started in any selectable order via the digital inputs.
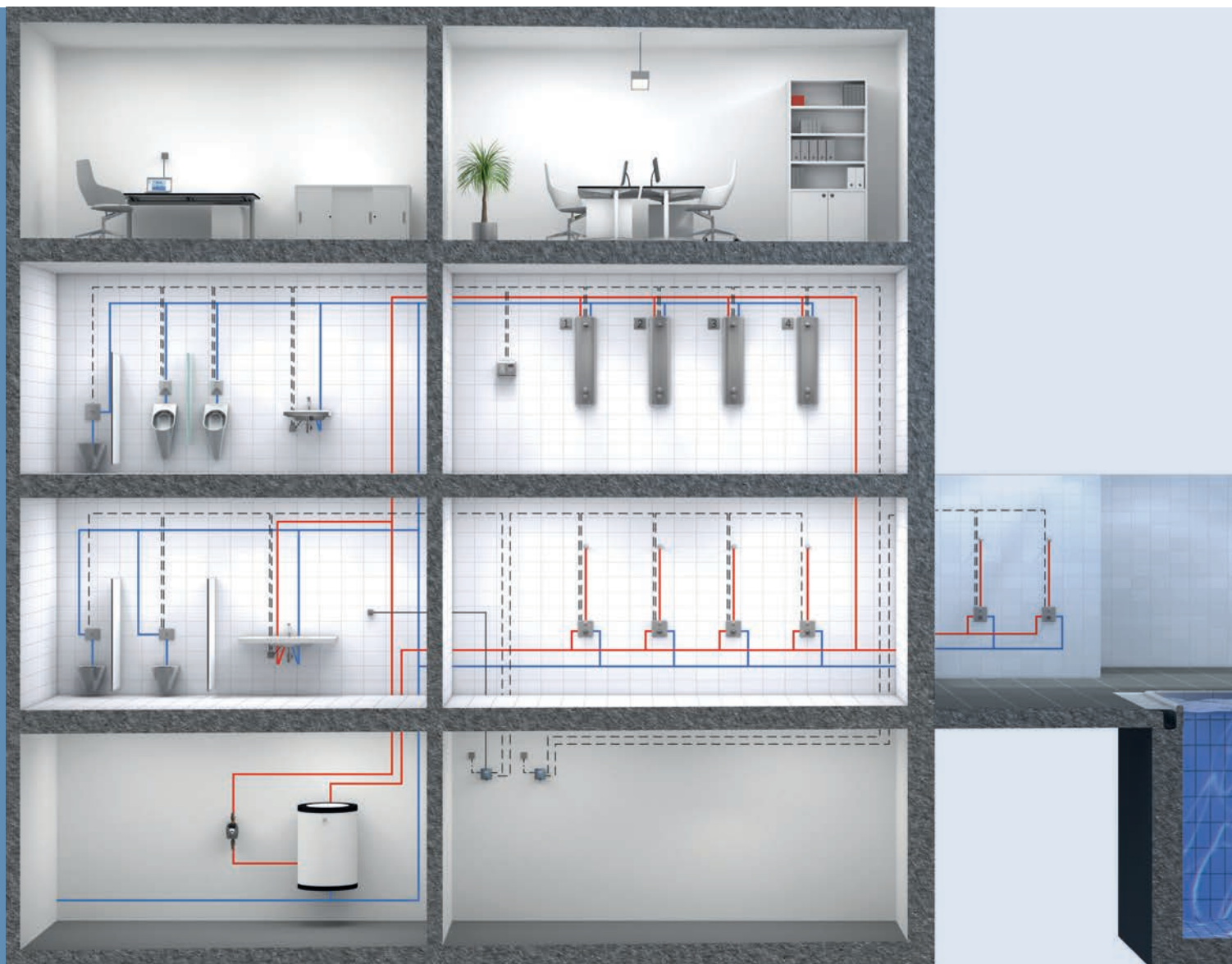
Building integration with
AQUA 3000 open

TRANSPARENCY ENSURES OPTIMUM EFFICIENCY

Fittings installed within a building can be made visible on a PC or brought online to the existing computer aided facility management via the ECC2 function controller and the data protocol connections.

Forming logical function units, e.g. arranging fittings in groups based on building floors or user zones, simplifies the specific optimisation of water delivery functions within these units. These functions include water flow durations, hygiene flushes, thermal disinfection, shut-off for cleaning, day and night switching, paid/unpaid water delivery as well as sequential controls in shower facilities.

With the help of monitoring and control functions it is possible to analyse usage frequencies and control maintenance management on a demand basis. Of course the network level also serves to monitor the system and facilitates rapid corrective measures in the event of any faulty functioning.

AQUA 3000 OPEN SYSTEM COMPONENTS

As easy as possible – as flexible as necessary:
The AQUA 3000 open system is based on the
principle of a clear and simple system architecture.
To accomplish this, only those components are used
that are actually necessary for the specific applica-
tion requirements. An optimised water management
system can be accomplished with just a few system
components.

All the main components of AQUA 3000 open are
shown on the following pages.
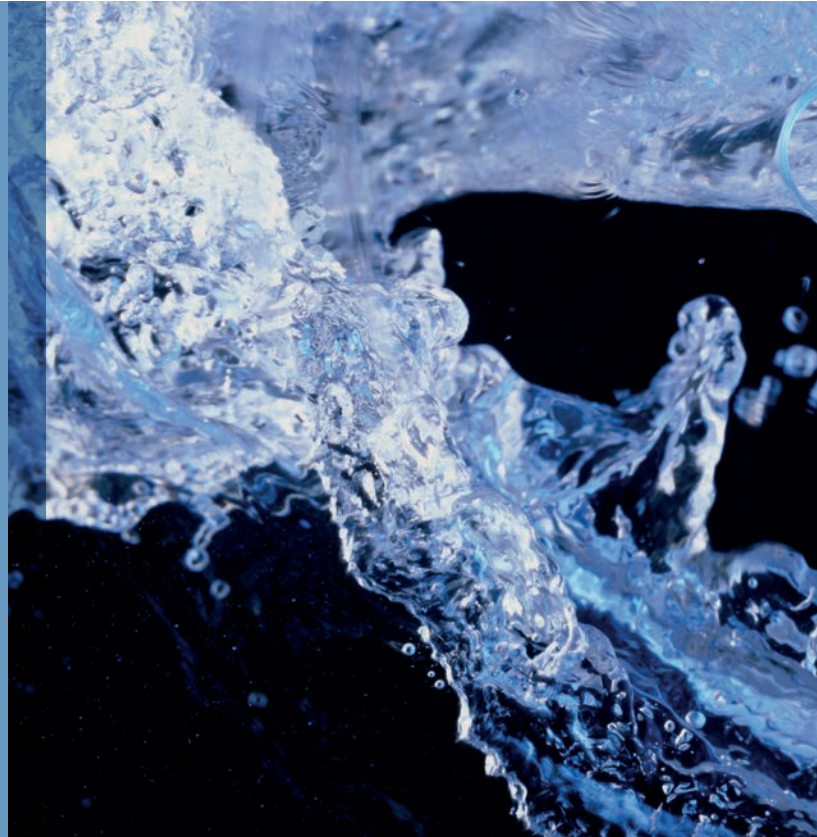
From a concept to its realisation

The basis for an optimum sanitary-room design is
solid preliminary planning. This planning phase is
oriented towards the actual conditions present at
the facility and the user-dependent requirements for
the sanitary rooms. Qualified and proper consulting
to comply with technical standards and require-
ments is the most important component for driving
a conceptual idea to its final planning stage. We
would be pleased to assist you in such planning and
will pass on our know-how to you.
We accompany you in all phases of planning
implementation – even and particularly when
dealing with complex system solutions.

AQUA 3000 OPEN – PRODUCT OVERVIEW

SHOWER FITTINGS FOR IN-WALL INSTALLATION

AQUATIMER – A3000 open thermostatic mixer with Piezo pushbutton for in-wall mounting

AQUA604	Basic installation kit **with** adhesive flange
AQUA602	Basic installation kit **without** adhesive flange
AQUA622	Finished installation kit

AQUATIMER – A3000 open shower fitting with Piezo pushbutton for in-wall mounting

AQUA605	Basic installation kit **with** adhesive flange
AQUA603	Basic installation kit **without** adhesive flange
AQUA627	Finished installation kit

AQUATIMER – A3000 open shower fitting with Piezo pushbutton for concealed mounting

AQUA629

SHOWER PANELS FOR SURFACE INSTALLATION

AQUATIMER – A3000 open stainless steel shower panel with Piezo pushbutton and thermostatic mixer, for surface installation

AQUA612
AQUA614   with integrated shower gel tray

with InoxPlus surface finish –
easy to clean
AQUA616
AQUA618   with integrated shower gel tray

AQUATIMER – A3000 open stainless steel shower panel with Piezo pushbutton, for surface installation

AQUA623
AQUA621   with integrated shower gel tray

with InoxPlus surface finish –
easy to clean
AQUA619
AQUA625   with integrated shower gel tray

PROTRONIC – A3000 open stainless steel shower panels with optical sensor and thermostatic mixer, for surface installation

AQUA641
AQUA642   with integrated shower gel tray

with InoxPlus surface finish –
easy to clean
AQUA643
AQUA644   with integrated shower gel tray

PROTRONIC - A3000 open thermostatic mixer with optical sensor for in-wall mounting

AQUA604   Basic installation kit
          with adhesive flange
AQUA602   Basic installation kit
          without adhesive flange
AQUA640   Finished installation kit

PROTRONIC - A3000 open shower fitting with optical sensor, for concealed mounting

AQUA615

AQUAPAY - coin-activated controller for chargeable water delivery, for controlling 2–31 showers

for surface installation
AQUA802   for tokens
AQUA803   for €0.50

for in-wall installation
AQUA806   for tokens
AQUA807   for €0.50

Accessories:
Z-AQRP001 tokens (50 pieces)

AQUATIMER - A3000 open shower panels made of MIRANIT-S with Piezo pushbutton and thermostatic mixer, for surface installation

AQUA653
AQUA654   with seamlessly moulded
          shower gel tray

AQUATIMER - A3000 open shower panels made of MIRANIT-S, with Piezo pushbutton, for surface installation

AQUA647
AQUA648   with seamlessly moulded
          shower gel tray

AQUATIMER - A3000 open stainless steel shower panel with glass front, Piezo pushbutton and thermostatic mixer, for surface installation

AQUA620

Customer-specific printing of the glass front on request.

WASH TAPS

PROTRONIC-T – A3000 open
washbasin mixer

PR3O0003

PROTRONIC-T – A3000 open
washbasin tap

PR3O0002

PROTRONIC-C – A3000 open
washbasin mixer

AQUA102

PROTRONIC-C – A3000 open
washbasin tap

AQUA103

PROTRONIC – A3000 open washing unit
with optical sensor, for in-wall mounting

AQUA105   Basic installation kit
AQUA107   Finished installation kit

PROTRONIC – A3000 open washing unit
with thermostatic mixer and optical sensor,
for in-wall mounting

AQUA104   Basic installation kit
AQUA106   Finished installation kit

PROTRONIC – A3000 open washing unit
with optical sensor, for concealed installation

AQUA109

FLUSH VALVES

PROTRONIC – A3000 open urinal
flush valve with optical sensor, for
in-wall mounting

AQUA400   Basic installation kit
AQUA401   Finished installation kit

AQUATIMER – A3000 open
WC control with Piezo pushbut-
ton, for concealed toilet cistern

AQUA503

PROTRONIC – A3000 open
WC control with optical sensor,
for concealed toilet cistern

AQUA504

PROTRONIC – A3000 open urinal
flush valve with optical sensor, for
concealed installation

AQUA402

AQUATIMER – A3000 open WC flush valve with
Piezo pushbutton, for in-wall mounting

AQUA500   Basic installation kit
AQUA501   Finished installation kit

PROTRONIC – A3000 open WC flush valve with
optical sensor, for in-wall mounting

AQUA500   Basic installation kit
AQUA502   Finished installation kit

PROTRONIC – A3000 open WC flush valve
with optical sensor, for concealed installation

AQUA505

SYSTEM ACCESSORIES

ECC2 function controller

Z-A3OP0011

Expansion module I/O

Z-A3OP0012

GSM wireless module

Z-A3OP0013

Necessary accessories (options):

Z-A3OP0015   rod antenna
Z-A3OP0016   wall antenna
Z-A3OP0017   antenna with amplifier

Uninterruptible power supply

Z-AQUA006

Compact power supply

Z-AQUA007

(2 pieces)

Electronic module – system flushing

Z-AQUA029

Electronic module – circulation line

Z-AQUA030

Electronic module for drinking water heater

Z-AQUA031

System cable

Z-AQUA077   100 m/ring
Z-AQUA078   25 m/ring

Halogen-free system cable

Z-AQUA011   100 m/ring
Z-AQUA012   25 m/ring

Terminating resistor

Z-AQUA014

Coupling for system cable

Z-AQUA013

Electric T-junction

Z-AQUA075

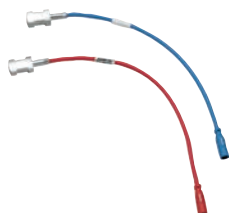Solenoid-valve cartridge bypass

Z-AQUA015

Key switch

Z-AQUA022

Screw-in temperature sensor for function block

Z-AQUA017

Insertable temperature sensor for water-flow volume control

Z-AQUA018   hot water side
Z-AQUA019   cold water side

Clip-on temperature sensor

Z-AQUA020   hot water side
Z-AQUA021   cold water side

3-way valve

Z-AQUA023   DN 20
Z-AQUA024   DN 25
Z-AQUA025   DN 32
Z-AQUA090   DN 40

Electronic module for 3-way valve

Z-AQUA076

Power switch

Z-AQUA026

Safety transformer 230/24V AC

Z-AQUA027   100 VA
Z-AQUA028   250 VA

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