GF Piping Systems

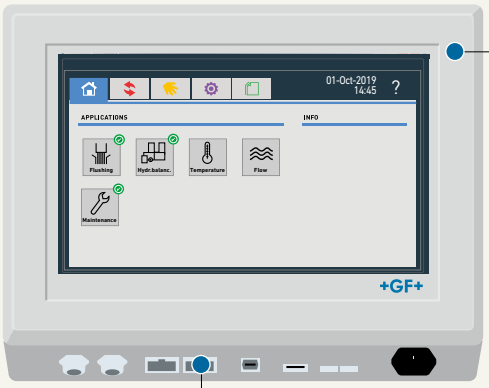
Hycleen Automation System

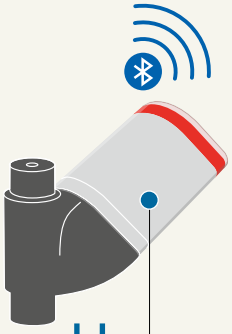
Revolutionising Sanitary Automation Processes and Securing Safe Supply of Drinking Water

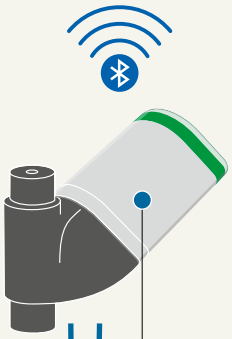
Hycleen Automation System

Simply Controlling all Valves with One Master

Hycleen Automation Master
Central control of all valves in the drinking water system.
Touch-screen with clear and intuitive user interface.

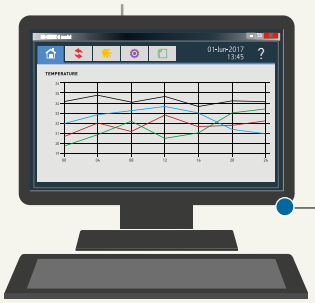






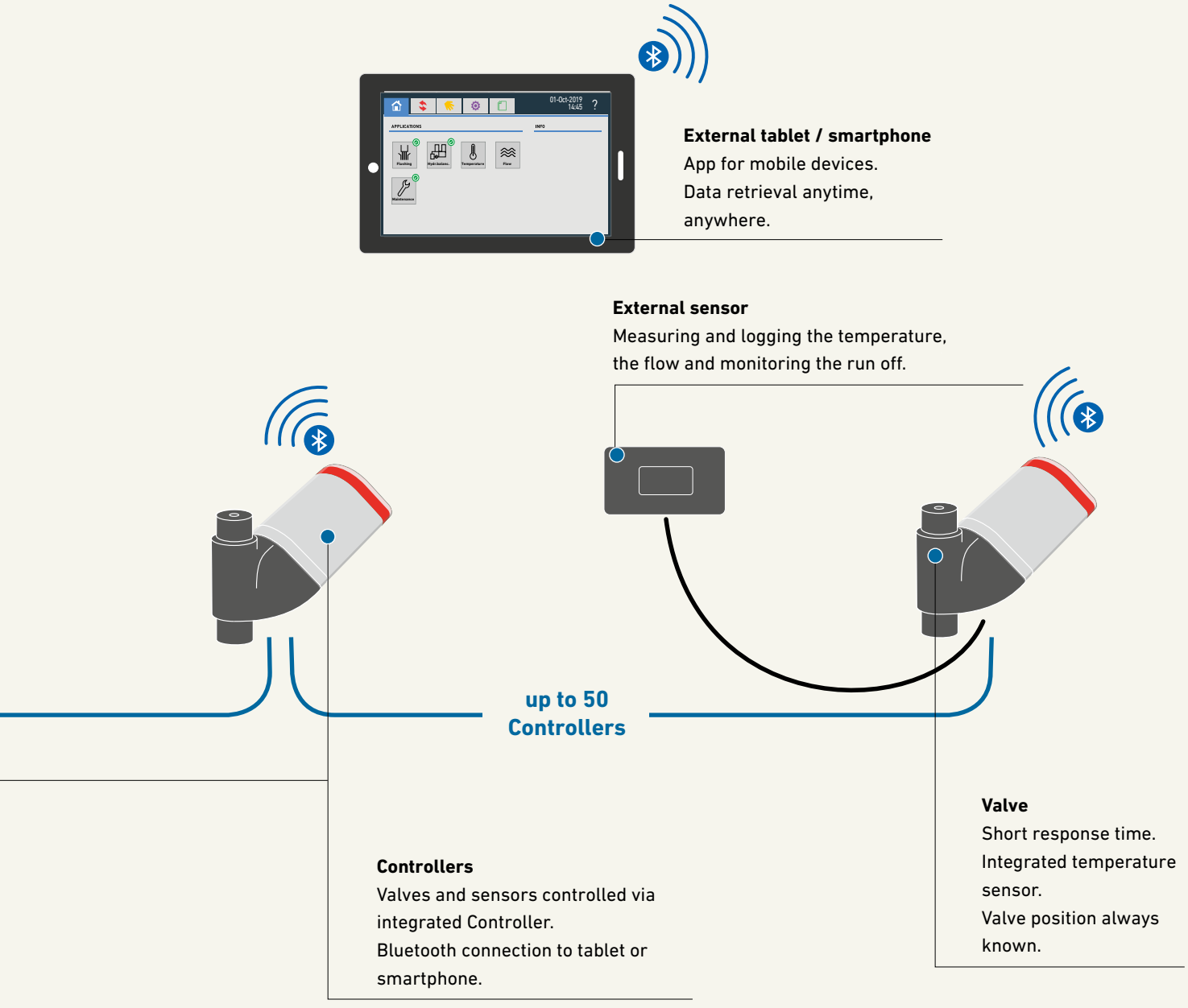
Connections
Power, USB and ethernet.

Hycleen Automation power supply and communication cables
Only one cable for power and data.
Fault-free wiring due to simple plug connection.



External computer
Connection of an external computer possible.

The Hycleen Automation System by GF Piping Systems offers a sophisticated package for the automation of drinking water installations. Sensors and Controllers integrated in the valves log the required data. The Master controls all processes and supports with its applications a hygienically impeccable, optimized drinking water installation through logging and reporting. The synchronised components are wired to each other in a way which is easy to handle.

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Hycleen Automation System

Your Benefits

Hygiene

- System for hydraulic balancing and water flushing with preventive maintenance
- Quick reaction time and problem resolution based on constant monitoring
- Flexible adjustment of the valve opening
- Reduction of biofilm formation through the automatic flushing of all lines

Convenience

- User-friendly programming
- The desired water temperature is reached immediately
- Monitoring and logging the limit temperatures

Energy optimization

- Optimized balance of energy and hygiene, no need for security back ups (temperature)
- No unnecessary waste of resources and expenses
- Constant temperature monitoring and adjustment
- Short reaction times in case of temperature losses

Simplicity

- Simple planning, installation and initial start-up
- Simple system design, 1 Master for all applications
- Quick installation time
- Intuitive user interface

Planners

Safe and fast to plan
System configuration according to simple rules, supported by our BIM and CAD database.
Applications and all parameters easy to program with the Master.
Hydraulic balancing for cold and hot water without elaborate calculations.

Plumbers

Plug & Play
Simple installation with only one cable for power and data.
Fast, software-assisted commissioning.
Master automatically detects type and ID of all connected Controllers.

Smart operation
Clear and easy-to-use interface.
Bluetooth connection via smartphone or tablet possible.

Property Operators

Low-maintenance drinking water system
Thorough flushing of all circulation lines in an automated cleaning process.

Low risk application
Monitoring and logging of hygienic precautions.
Safe data access by detecting approved external devices.

Services
Support during planning and commissioning. Data analysis and advice during operation.
Data read-outs and software updates.

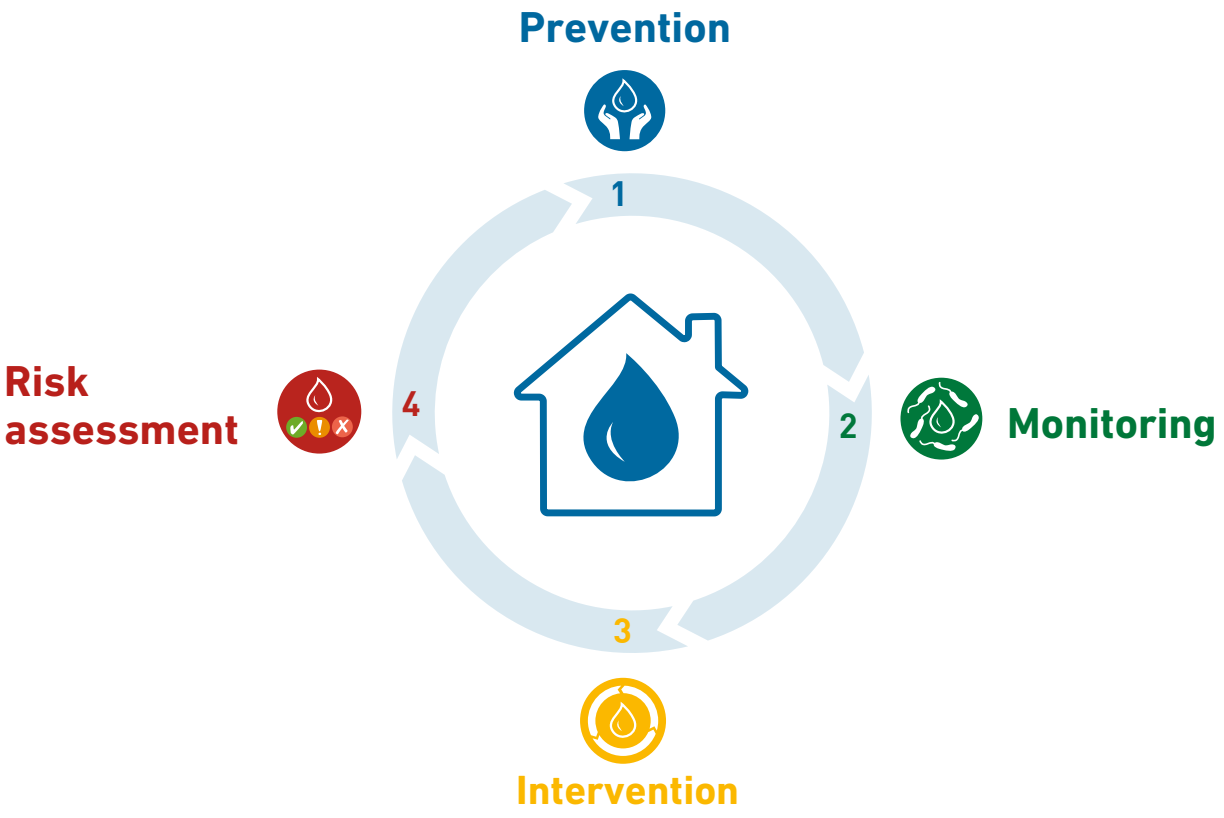
Hycleen Automation System

Safe and Hygienically Optimized Drinking Water Installation

Utility companies regularly check the drinking water quality, but are only responsible up to the domestic water inlet. In the building, the drinking water quality is the operator's responsibility. There is a risk of bacterial growth due to inadequate temperatures, stagnation and biofilm formation. In view of this, drinking water installations in buildings must be carefully planned, designed and operated.

Hygiene Concept

"Hycleen – Securing optimum drinking water hygiene in 4 steps"



With its Hycleen Automation System, GF Piping Systems supports planners, installers and property operators in a variety of ways to implement the concept of „Hycleen – Securing optimum drinking water hygiene in 4 steps“.

The central data storage and control through the Master, the powerful LegioTherm valves and sensors as well as the easy-to-operate software and the smart LegioTherm applications make it possible to automate important hygienic precautions.

	Prevention	Sufficient circulation in all piping sections Ensuring the minimum temperature in hot water circulation according to the country-specific standard Constant hydraulic balancing in all operating phases
	Monitoring	Continuous temperature monitoring Storing measuring data and logging of hygienic precautions
	Intervention	Implementation of controlled thermal disinfection possible
	Risk assessment	Comprehensive database for status and risk assessment

Hycleen Automation System Applications

The Hycleen Automation System offers versatile, ready-to-use applications for a safe and hygienically optimized drinking water installation.

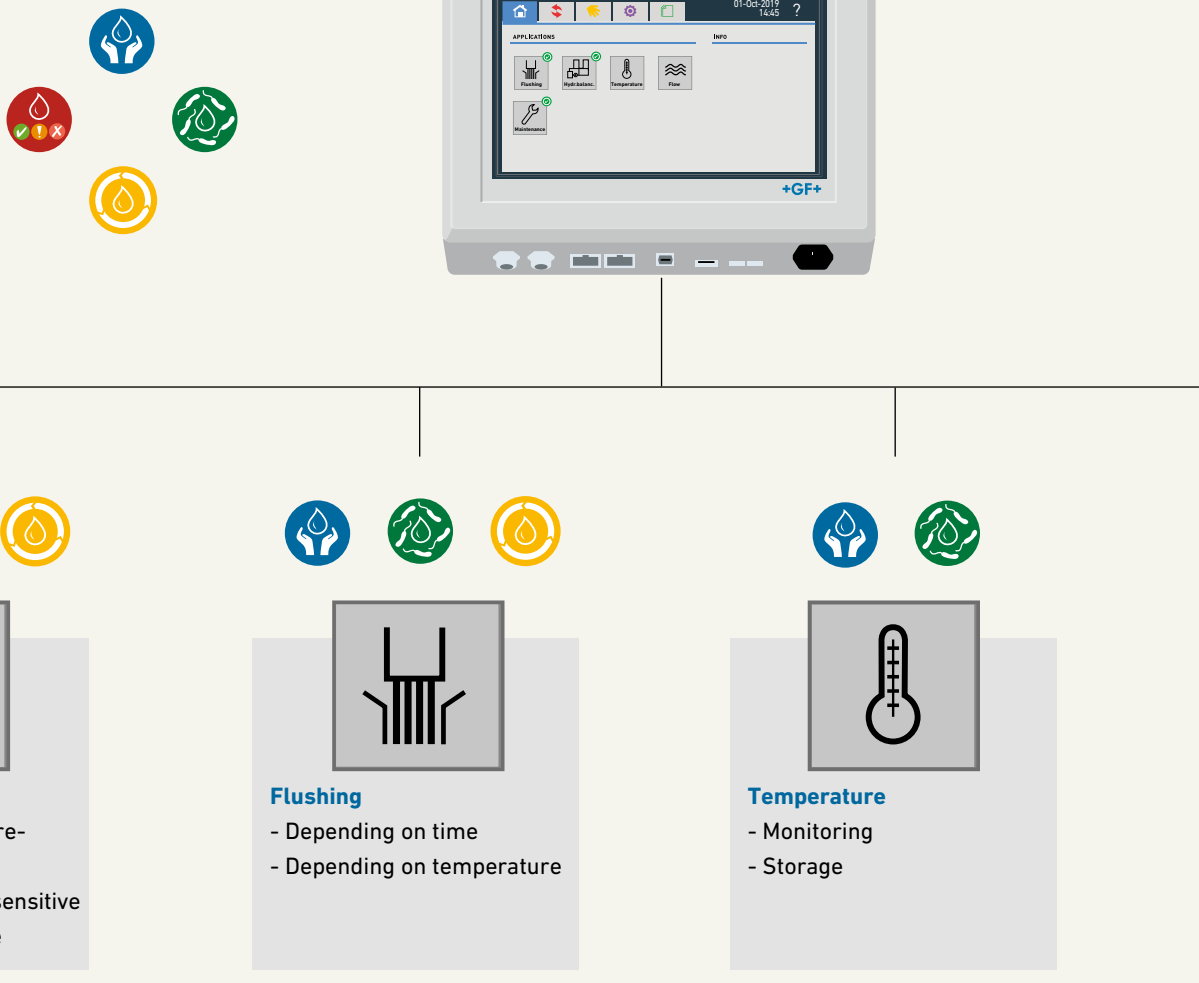
All programs and functions can be intuitively operated via the touch-screen on the Hycleen Automation Master. The Master is connected to the Controllers that control the individual valves and sensors. All sensors are permanently monitored and deviations immediately reported.

Hycleen Automation Master

- Only one Master for all applications with intuitive operating concept
- Individually customizable monitoring and reporting functions with data storage

Hydraulic balancing – LegioTherm 2T valve

- Temperature-sensitive hydraulic balancing for cold and hot water
- Thermal disinfection
- Temperature monitoring
- Adjustable leakage rate and opening degree



Flushing – LegioTherm K valve

- Flushing the cold and hot water system
- Temperature monitoring

Temperature

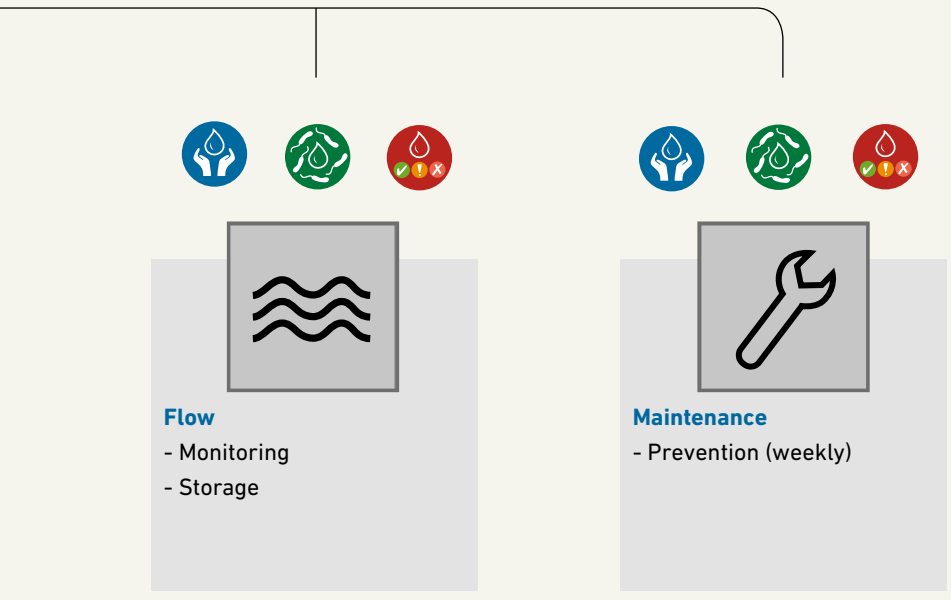
- Display of all temperatures in real time
- Clear graphical representation
- Storage of all valve temperatures in the log

Flow

- Display of the flow in real time
- Storage of flow and volume

Maintenance – LegioTherm 2T valve

- Automatic maintenance once a week
- Prevents the valves from getting stuck or clogged



Flow
- Monitoring
- Storage

Maintenance
- Prevention (weekly)

Hydraulic Balancing

Especially in larger hot water distribution systems – e.g. in hospitals, hotels, nursing homes – stagnation, non-compliant materials and temperatures below 50 °C can promote the formation of biofilms and thus the proliferation of Legionella. That is why the prevention of Legionella, sufficiently high temperatures and regular water exchange are of paramount importance.

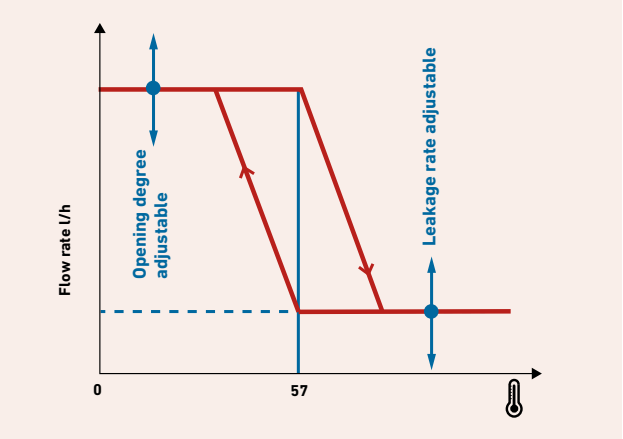
Planners are required to put a lot of computing effort into the proper distribution of hot water volumes in the entire piping system. Moreover, theoretical assumptions seldom correspond to the real conditions in the installation.

The Hycleen Automation System therefore offers several options for an automatic hydraulic calibration. Temperature sensors in the circulation controllers do the installer's job to adjust the calibration process.

Dynamic, temperature-sensitive hydraulic balancing

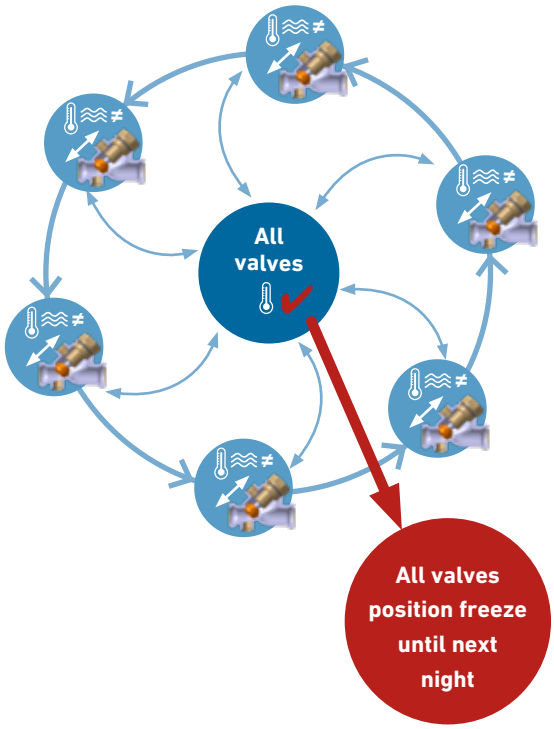
The circulation controllers with temperature sensor open and close automatically and regulate the flow as a function of the water temperature. If the temperature rises above the pre-programmed calibration temperature (default 57 °C), the circulation controller closes to leakage level (minimum flow). As soon as the temperature drops below the calibration temperature, the circulation controller opens again. The permanent calibration of all circulation regulators results in a constantly high water temperature in the entire hot water circulation, which considerably limits germ formation.

Dynamic hydraulic balancing



Static hydraulic balancing according to temperature or flow

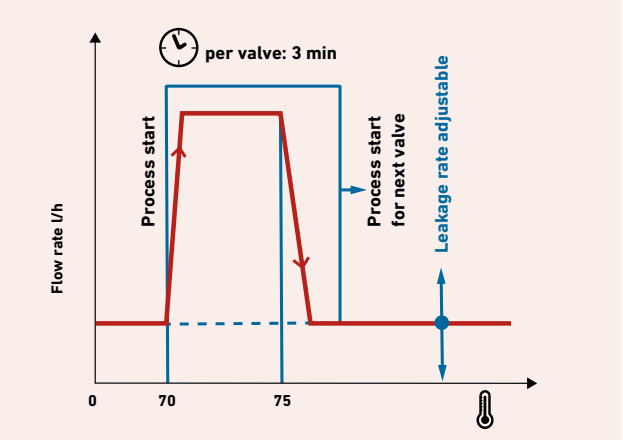
Once a day at a predetermined time, the Hycleen Automation Master, searches, based on historic data, for the ideal leakage rate of each individual circulation valve, until the set balancing temperature or nominal flow rate is reached on all circulation valves. The circulation controllers remain in this position until the next regulation phase. We recommend this process to take place overnight when water consumption is at the lowest. This makes manual presetting of the circulation controllers during initial start-up no longer necessary and saves the installer time during installation.



Thermal disinfection

The thermal disinfection starts automatically or at a pre-set time when the hot water temperature is raised above start temperature (default 70 °C) at which Legionella are killed.
All circulation controllers reduce the flow to minimum. The circulation controller, which first detected the start temperature for thermal disinfection, remains open for a period of three minutes and then closes again to leakage rate. If the calibration temperature for thermal disinfection (default 75 °C) is reached within this period, the circulation controller closes before the three minutes have elapsed. This process is repeated at all further circulation valves one after the other.
Even during thermal disinfection, the system remains hydraulically balanced. When thermal disinfection is completed, the system returns to normal operation with hydraulic calibration.
If a temperature sensor is installed at the outlet of the water heater and this is selected for the detection of the start temperature, the Hycleen Automation Master will already fully open the first valve in the system. Combined with the cascaded opening of the valves, this procedure reduces the overall time for thermal disinfection and saves energy and costs compared to circulation systems in which all valves are always open during thermal disinfection.

Thermal disinfection



Safety thanks to monitored threshold temperature

Permanent monitoring of the limit temperature and automatic maintenance additionally increase safety. If the temperature in the drinking water system falls below a pre-set threshold temperature (default 50 °C), an alarm is issued. For static hydraulic balancing, the valve opens automatically to compensate for the temperature drop.

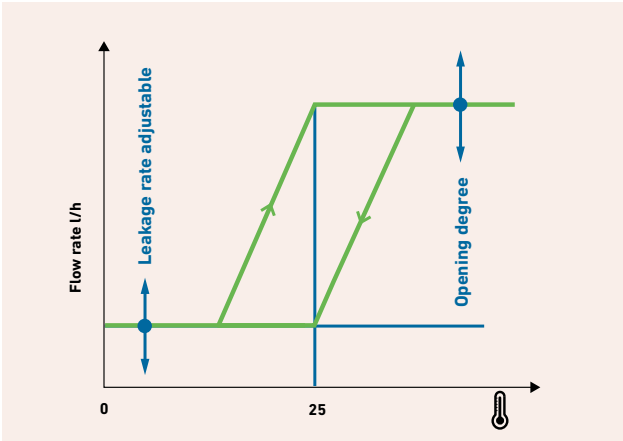
Automatic maintenance

In order to prevent particles such as lime or sand from depositing in the valve and clogged it, a maintenance process is started automatically once a week, thoroughly flushing all runs. All circulation controllers reduce the flow to minimum. Each circulation controller opens one after the other for one minute and then closes again.
Both after a temperature alarm and after automatic maintenance, the valves return to the stored position for hydraulic calibration. If the temperature values no longer match those stored, the hydraulic calibration will be restarted.

Hydraulic balancing cold water circulation

To prevent stagnation in the cold water lines and to keep the temperature below 25 °C, which is critical for hygiene, a cold water circulation can be installed.
This is based on the fact that inside the building cold water in the pipes heats up relatively quickly. The heating up depends on the pipe diameter, temperature and time. This leads to stagnating cold water in small pipe dimensions heating up considerably within a few hours (over 25 °C). For this reason, the hydraulic balancing valves, as shown in the graph depicted below, can maintain the drinking water temperature at the set temperature level.

Hydraulic balancing cold water circulation



Automatic Flushing

Depending on Temperature or Time

If water stagnates over a longer period, bacteria can multiply in it until a dangerous concentration is reached. If the entire volume in the drinking water distribution (cold and hot water) is exchanged within three days, the bacteria are flushed out of the drinking water installation and a high bacteria concentration can be counteracted sustainably. The Hycleen Automation System allows automatic flushing of cold and hot water pipes depending on the temperature or a specific time.

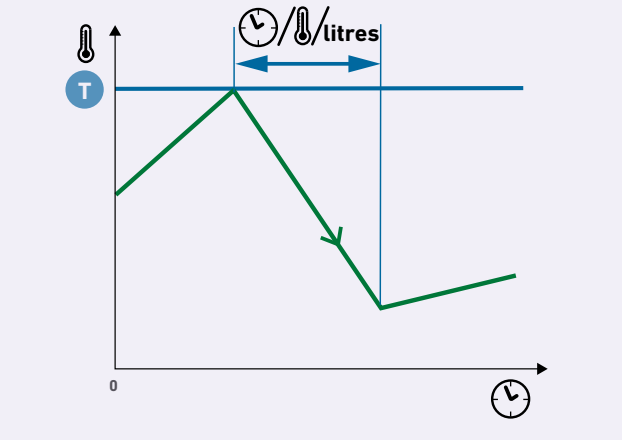
Temperature controlled flushing

As soon as the threshold temperature at the temperature sensor of a flush valve is exceeded (cold water) or undershot (hot water), the flush valve opens and closes again after the pre-programmed time or when a certain temperature is reached.

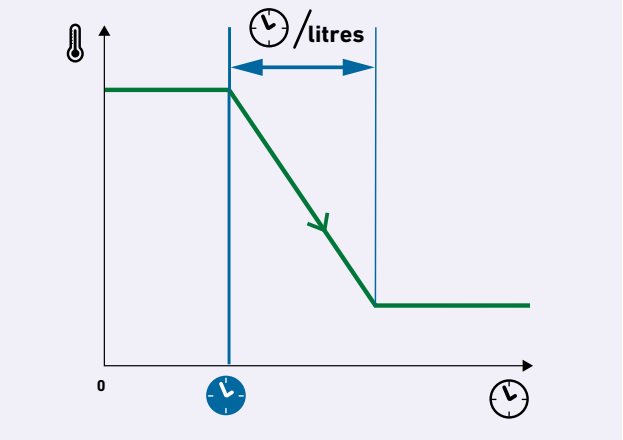
Timed flushing

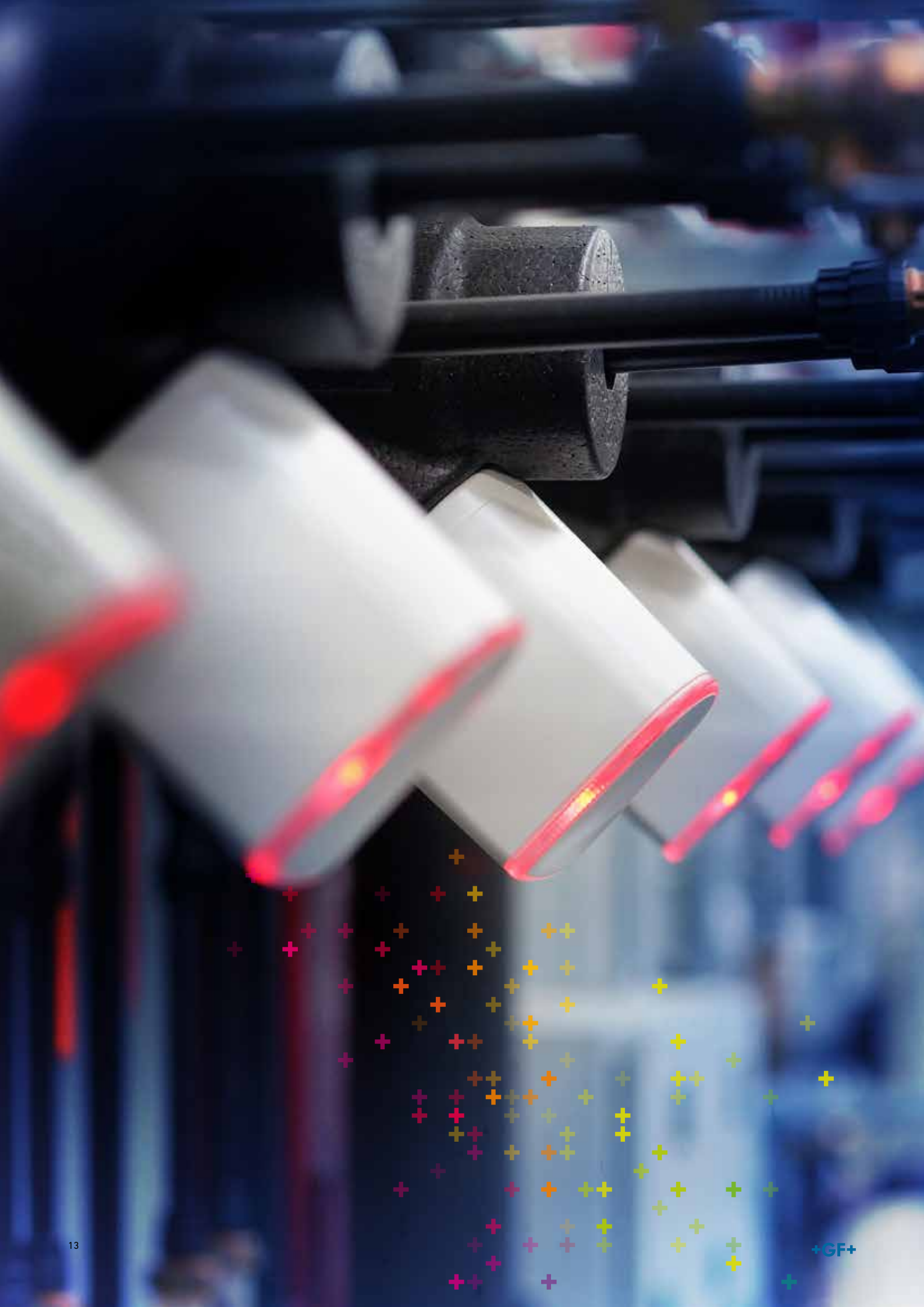
All flush valves open as soon as the pre-set time is reached and close after the defined flushing period. The time interval between two flushing cycles can be set at will, so that several flushing cycles per day are possible. Each flushing process is logged.

Temperature controlled flushing



Timed flushing





Hycleen Automation System

Installation Diagram

System components

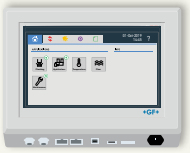
LegioTherm 2T
Hydraulic balancing

LegioTherm K
Flushing

T-Sensor
Temperature reading

Flow sensor

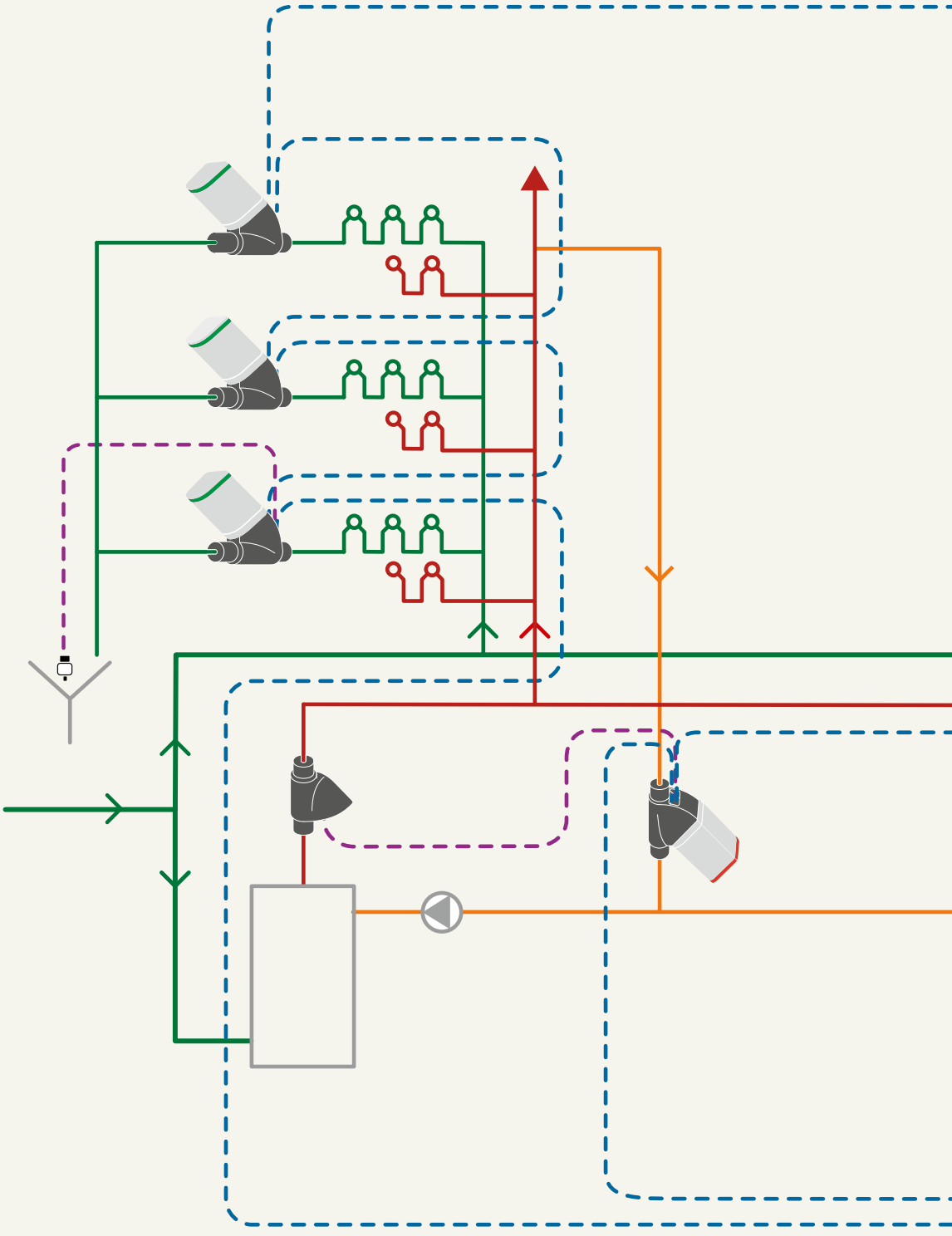
Drain surveillance

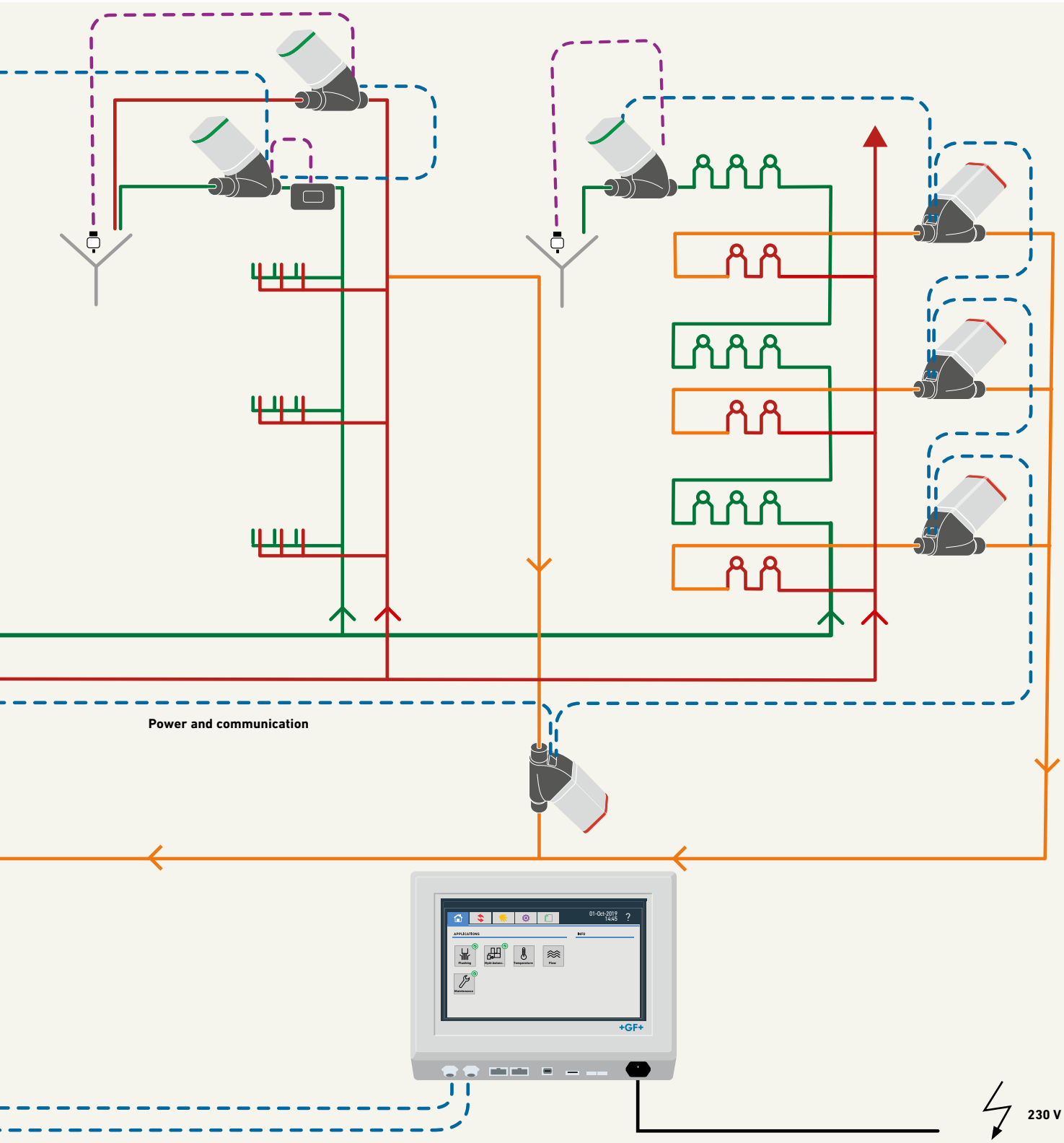


Master

Sensor cable

Power cord and communication cable



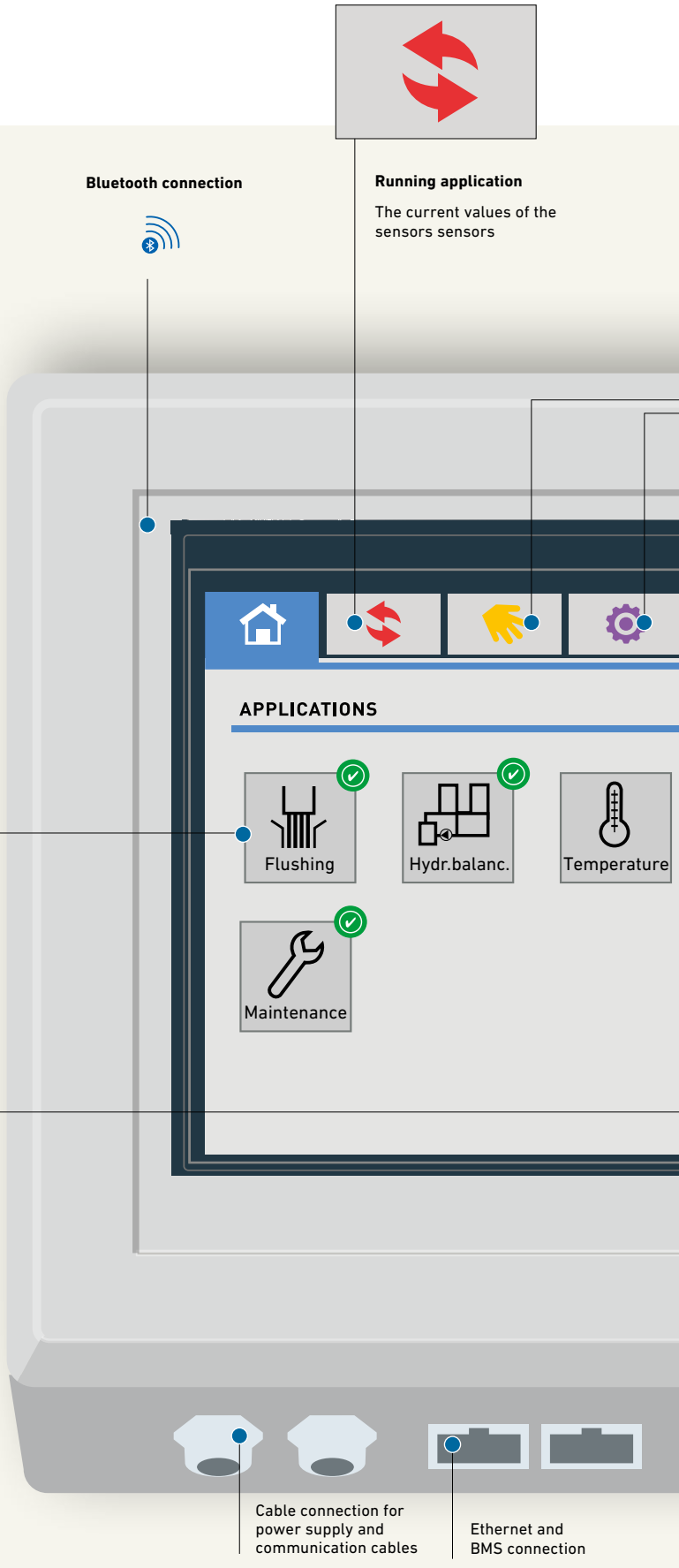

Power and communication
+GF+
230 V

Master

The Hycleen Automation Master controls up to 50 controllers on two cable harnesses (Total max. 1000 m).

During commissioning, the Master detects all valves and sensors in the system with ID and type and assigns them to the appropriate applications.

With predefined values, the system is immediately ready to start. However, all parameters can also be conveniently adapted to individual needs, not only via the Master, but also via a connection to a computer, a tablet or a smartphone.



Only one cable for power supply and data transmission

The pre-assembled Hycleen Automation power supply and communication cables are available in several lengths. The cables can be easily extended by means of suitable cable couplings.

When connecting the cable to the valve, the valve automatically detects input and output. All plug connections (M12) are designed to rule out installation errors.

Manual mode

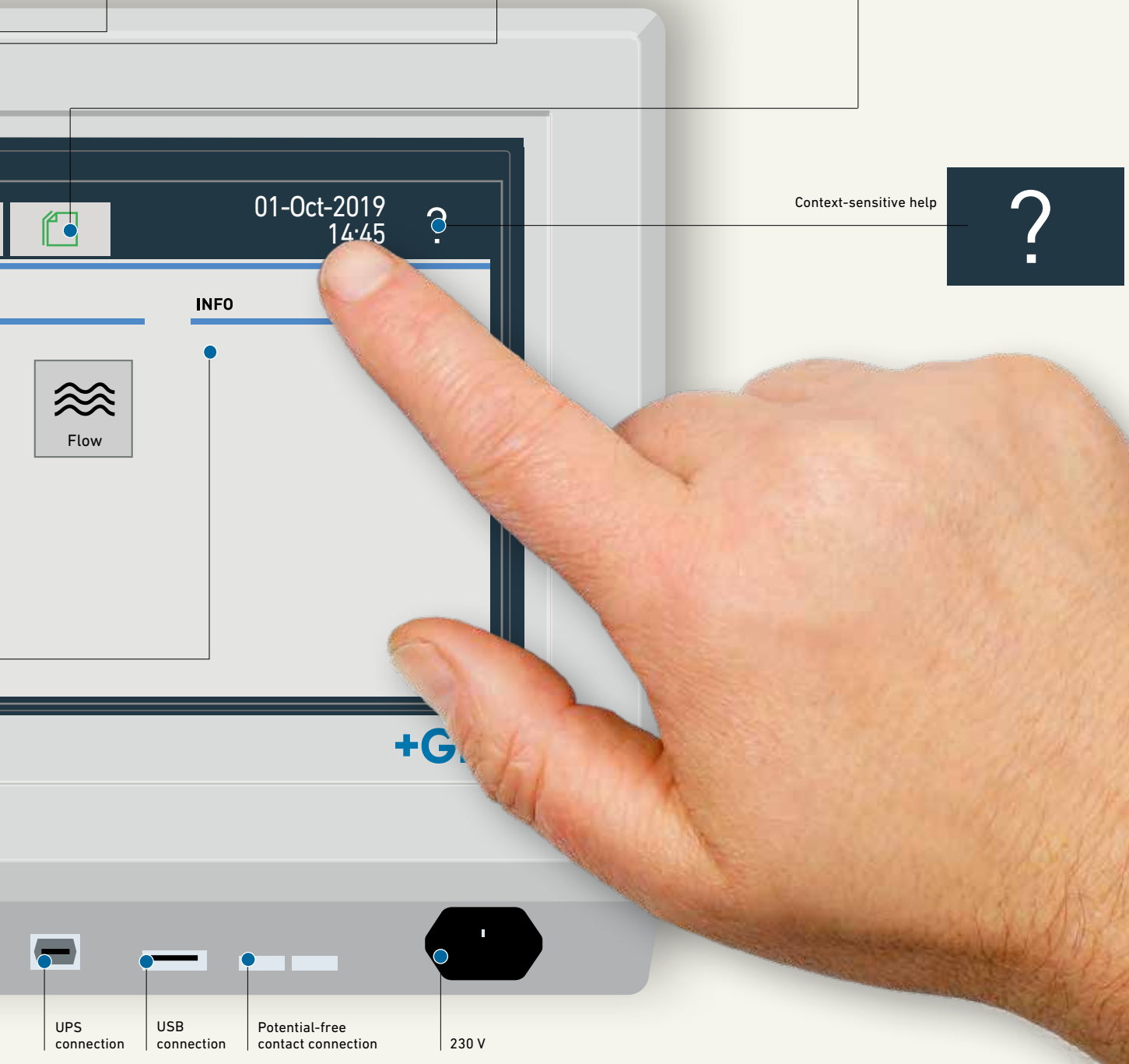
All valves and sensors can also be controlled directly.

Settings

System parameters (date, time, units and language) can be adjusted at any time.

Logs

Automatically created logs, e.g. for example, for temperature curve or thermal disinfection, can be displayed and retrieved.



Valve

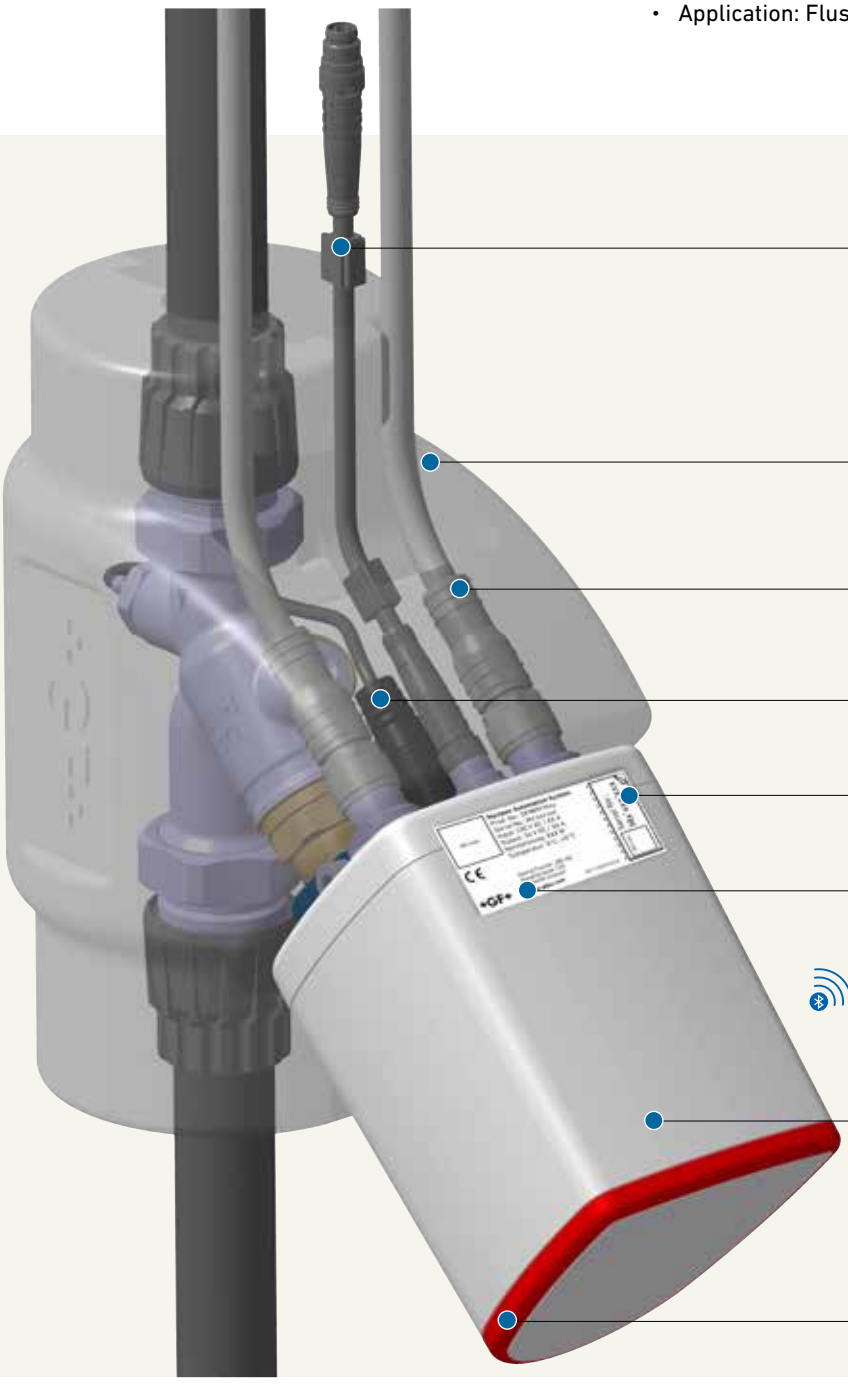
The LegioTherm 2T and LegioTherm K valves, together with the Master, are at the heart of the Hycleen Automation System. Water temperature readings are permanently taken by the valves; the values are passed on to the Master. The valves are activated dependent on preprogrammed parameters. During commissioning, all valves are automatically detected by the Master by their ID.

JRG LegioTherm 2T circulation valve

- Adjustable position of leak rate and maximum opening degree
- Higher linearity and more precise regulation thanks to special cone profile
- Application: hydraulic balancing, thermal disinfection, automatic maintenance (once a week)

JRG LegioTherm K flushing valve

- Adjustable valve stroke: Flow rate with open valve
- Application: Flushing of cold or hot water installation



Connection (M8) for external sensor
4 to 20 mA input, directly to the valve

Insulation

Fast, error-free wiring
Automatic detection of input and output during commissioning

PT1000 temperature sensor
Integrated in valve and completely immersed in water

Peelable label
With serial number of the valve to be pasted in the installation plan

Nameplate
With valve ID and QR code with further information

Bluetooth connection to external tablet / smartphone
Can be switched on and off

Controller including electric actuator with encoder
Valve position always known
Short opening and closing time of 15 s

Activity indicator (LED ring)
Colour of the LED ring depends on the valve – red (LegioTherm 2T) or green (LegioTherm K) – and state of the valve (open / closed)

Sensors

All sensors are automatically detected and monitored by the Master

T-Sensor
The external temperature sensor monitors the temperatures at additional locations, for example at the input/output of the hot water treatment.

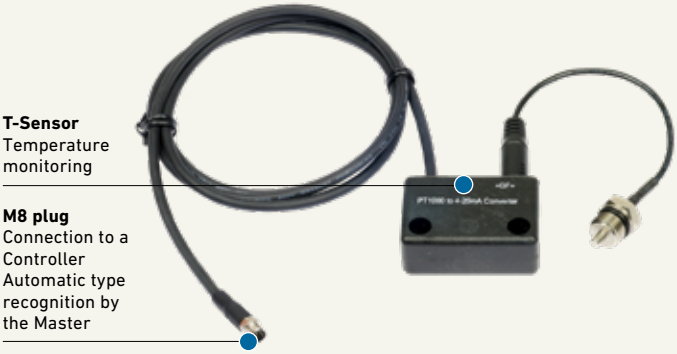
Flow sensor
The flow sensor is connected to any Hycleen Automation valve. Therefore, the flow sensor measures the volume and the flow rate. The flow sensor connected to a circulation valve allows a statuc hydraulic balancing after a set flow rate.

Drain surveillance
The drain surveillance adds safety to the flushing process. It is inserted in the drain pipe and connected to a controller. The additional safety element initiates a signal when the water level rises, which results in an interruption of the flushing process.

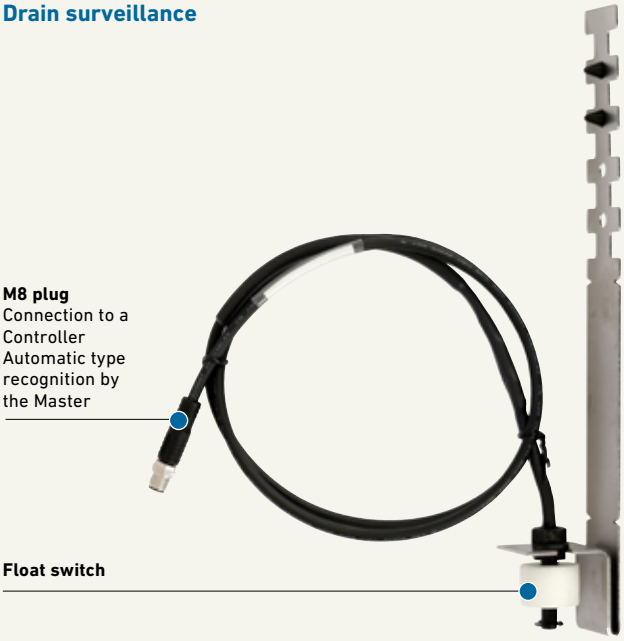
Flow sensor

T-Sensor

Dimension-independent or available with gunmetal housing



Drain surveillance



Hycleen Automation System – Product range

Building Automation

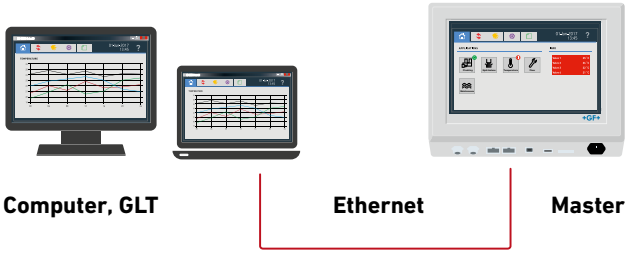
On the one hand, there is the option of using BACnet IP (Building Automation and Control network), and on the other, a connection can be established via Rest API (Representational State Transfer Application Programming Interface).
Data communication is through the applied interface.

Both interfaces allow connection of the Building Management System (BMS) with reading rights. BACnet is compatible with standard BMS systems, while Rest APi is the interface of the future.

When acquiring the license, the following Automation System data can be read out via the superior BMS.

Available options:

- Real-time data monitoring
- Data logging
- Alarmmanagement



Logging Data Temperature and Flow

Temperature monitoring is the most important instrument for property operators to assess the state of a drinking water installation and to reliably and quickly detect risks. In addition, those in charge can prove this way that all necessary precautions for a hygienically impeccable cold and warm water supply in the building have been taken.

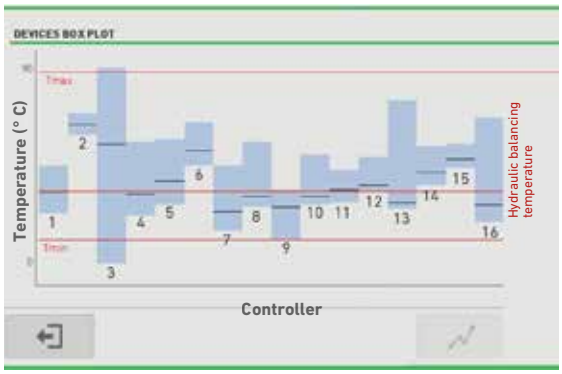
The Hycleen Automation Master does not only log the temperature at all valves, but also provides pre-programmed reports containing a clear overview of all readings. Thus, even the non-specialist can easily interpret trends and react immediately in case of deviations.

Logging the temperature and the flow
Depending on the desired accuracy, temperature readings can be logged every 5, 15, 30 or 60 minutes.

Pre-programmed reports
The following reports are available:
- Hydraulic balancing
- Flushing
- Manual operation
- Maintenance

The time period for a report is adjustable: a day, a week, or a month. The data is evaluated for each individual valve and the most important information presented as a clearly structured table or diagram. All reports can be exported in the PDF and XML formats. The information is presented on three levels with different detail levels.

Evaluation of temperature fluctuation and threshold temperature



All data can be exported.

Hycleen Automation System – Applications

App

The Hycleen Automation System app allows monitoring on the go. You no longer have to go to the office or equipment room. It is enough to be in the vicinity of a valve. Simply connect the Smartphone to a valve for immediate access to the data on the master (reading rights only). With a simple Bluetooth connections, which can be turned on and off on the master.

Possible uses

In hygienically sensitive environments special care must be given to monitoring drinking water systems and keeping them safe. But drinking water hygiene also poses a challenge in large properties with fluctuating water consumption e.g. hotels as well as in public buildings with a lot of coming and going such as schools or offices.

Planning errors and improper operation can lead to stagnation and unfavourable temperatures in the piping system. This can lead to microbiological contamination of drinking water by Legionella and other pathogens. Consequences: It often proves difficult to ensure high drinking water quality in spacious properties.

However, in view of tightened legal regulations facility operators are pushed to take measures to ensure high drinking water quality to avoid complaints, negative publicity, loss of revenue or even criminal penalties.

The Hycleen Automation System reliably and simply supports the planning, installation, operation and maintenance of drinking water installations, especially in large building complexes:

- The hydraulic balancing ensures sufficiently high temperatures and sustainably prevents biofilm formation.
- Automatic flushing cycles prevent stagnation and ensure regular water exchange in cold and hot water distribution.
- Permanent temperature monitoring is the most crucial factor when ensuring drinking water hygiene.
- Regular thermal disinfection kills existing germs.
- Continuous data logging of all readings for seamless documentation of the operating values and presentation to a supervisory body.

Retirement homes

Hygiene is very important in retirement homes because their inhabitants are of older age and often immunocompromised. That is why, safety of the drinking water is of central importance. Retirement home operators are well advised to pay special attention to hygiene in the drinking water installation in order to exclude health risks for their inhabitants as far as possible.

Hotels

In many hotels, rooms and tapping points are not permanently in use. Especially in view of occasional vacancies, it is advisable to pay particular attention to the hygiene in the drinking water installations and to flush them regularly. Highest drinking water quality is important, since hotels provide accommodation to people with diverse health condition – an important point for operators in their effort to make all guests feel comfortable.

Hospitals

Hospital hygiene must meet the highest standards. Safe and hygienically impeccable water supply is crucial here. Drinking water is in use everywhere – when washing your hands before surgery, cleaning surgical instruments and hospital equipment, providing catering services, up to cleaning the hospital or doing the laundry.

You simply cannot do without hygienically impeccable water. Rules of conduct in hospitals help combat the spread of infections. The Hycleen Automation System ensures efficient protection from contamination in the piping system, a sustainable protection from infection and helps to prevent nosocomial infections.

Apartment buildings

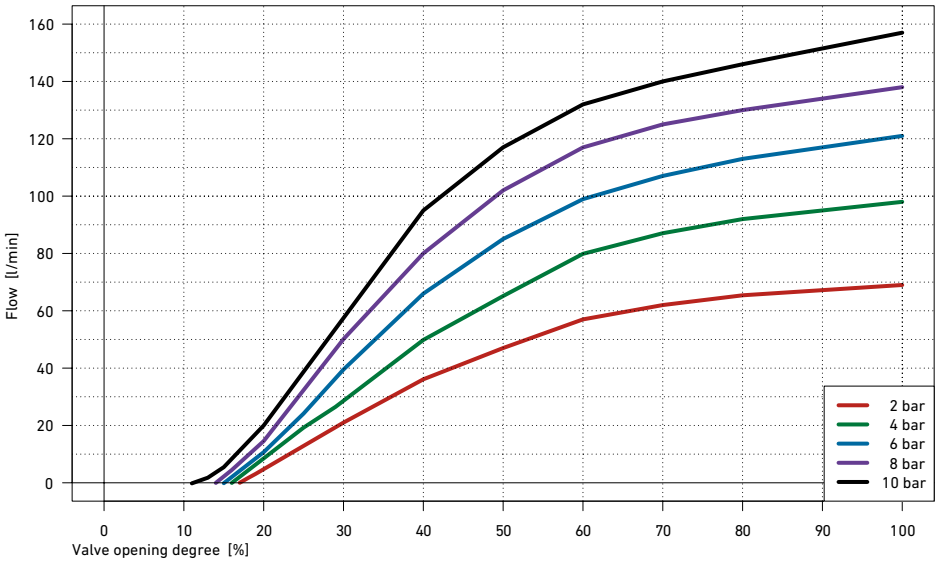
For the increasingly aging population the lack of hygiene of drinking water constitutes a higher risk. In addition, optimal hydraulic balancing ensures constant hot water temperatures, which in turn leads to increased user comfort and an energy-optimized design.

Made for you

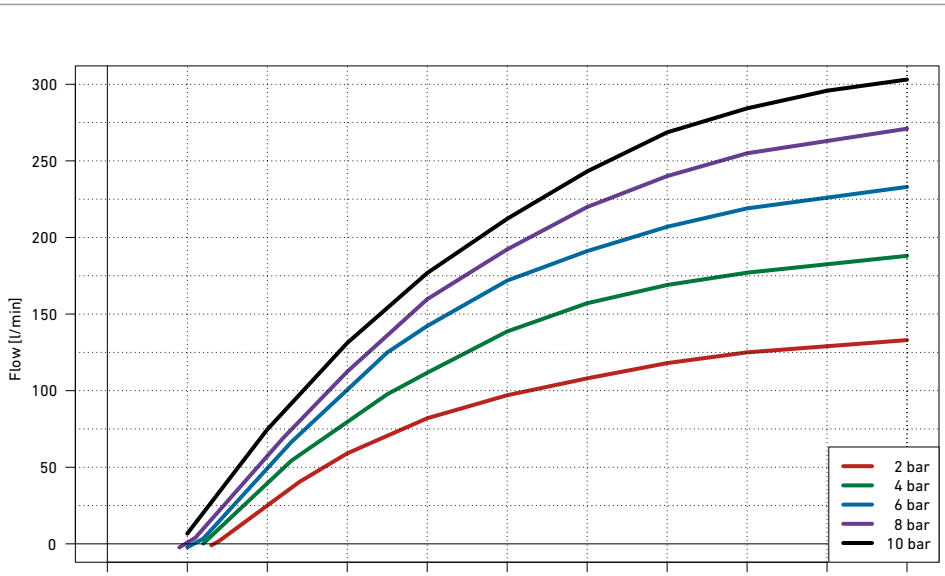
Specifications

Nomogram JRG LegioTherm K

Flushing capacity DN 15

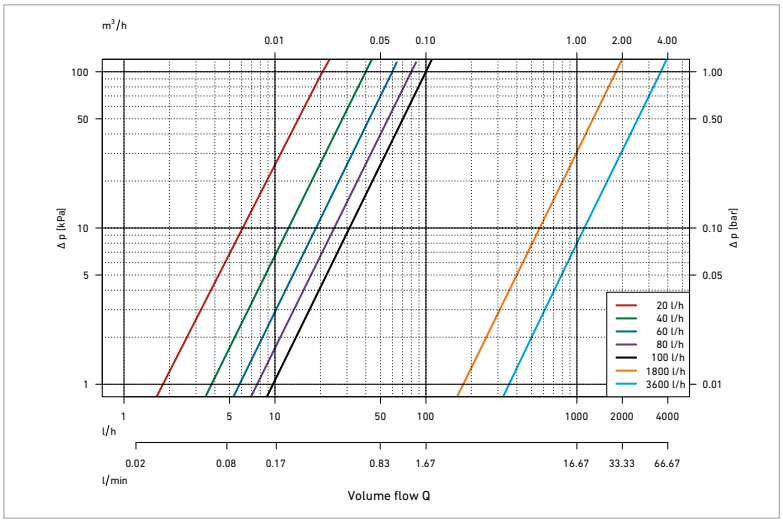


Flushing capacity DN 20

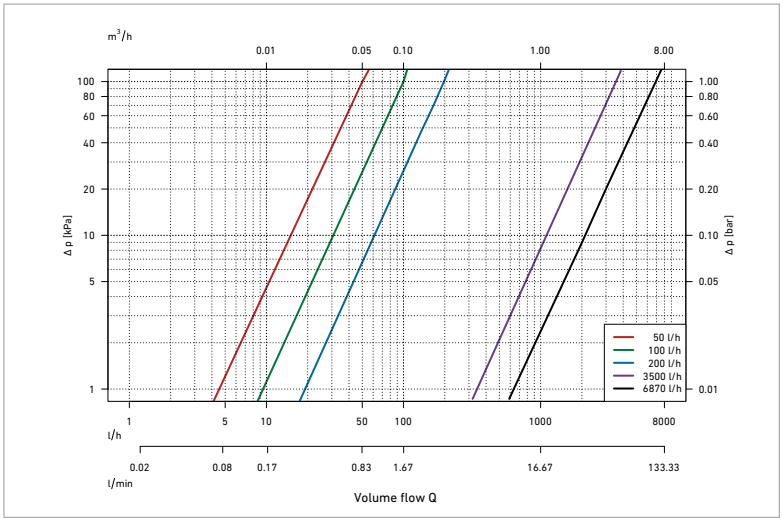


Specifications

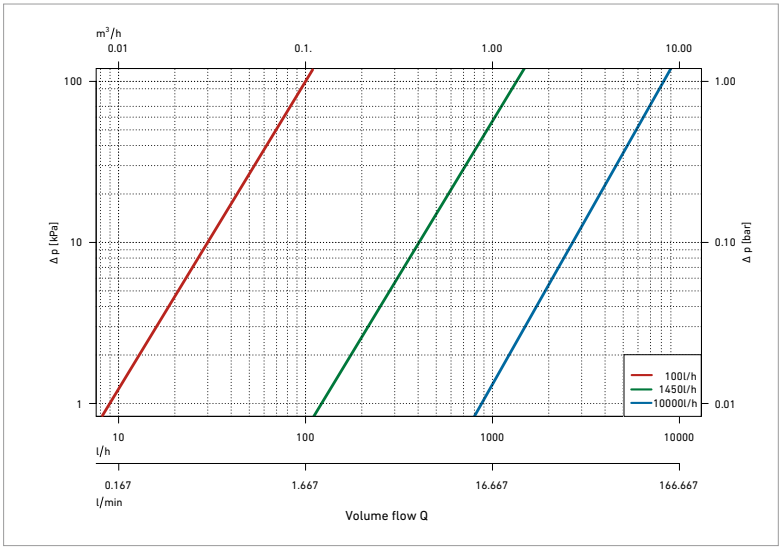
Nomogram JRG LegioTherm 2T



Pressure loss DN 15



Pressure loss DN 20

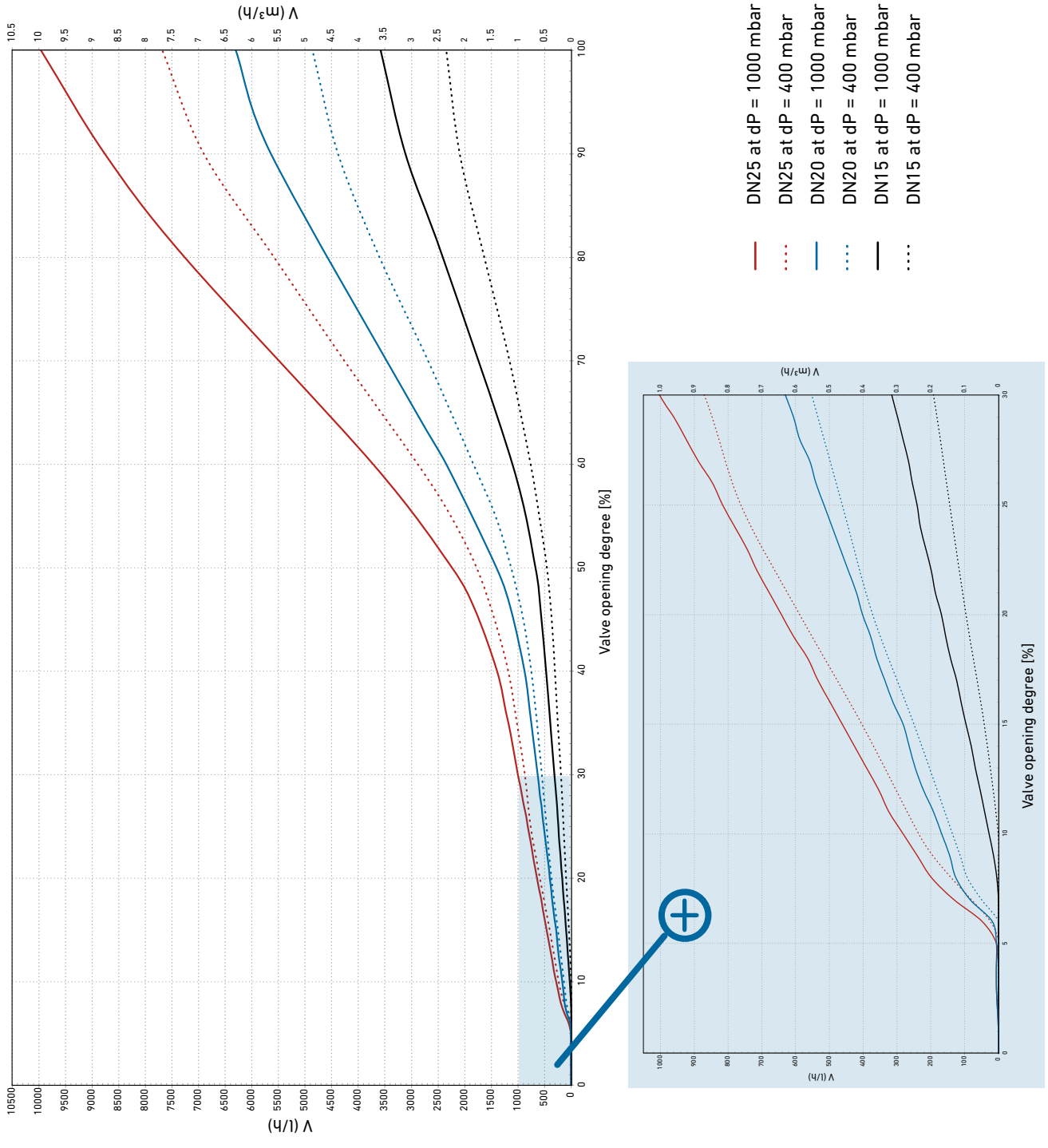


Pressure loss DN 25

Specifications

Nomogram JRG LegioTherm 2T

Caracteristic curve opening degree valve

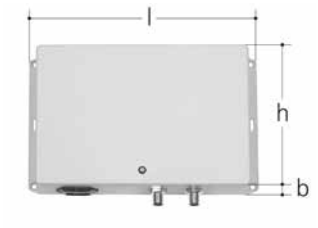


Product range

Hycleen Automation Master

- Description: master for max. 50 controller
- Consisting of: touchscreen 10.1", power supply, bluetooth connection, 2 plugs M12 for 2x 300m cable (500m with powerbox), 2 Rj45 jacks (Ethernet), 2 USB connections (read/write), USB jack (read only), relay output, screw set

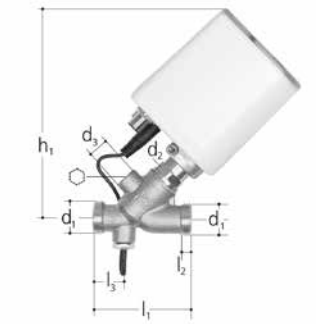
Voltage	JRG Code	GF Code	Weight (kg)	l (mm)	b (mm)	h (mm)	Version
230V / 36V	**9900.000**	**351 110 656**	2.300	326	84	214	EU
230V / 36V	**9900.001**	**351 110 655**	2.300	326	84	214	CH



Hycleen Automation Powerbox

- Description: Power supply of Hycleen Automation System for expansion of 300m cable length to max. 500m per cable line
- Consisting of: 2m power cable, screw set

Voltage	JRG Code	GF Code	Weight (kg)	l (mm)	b (mm)	h (mm)	Version
230V / 36V	**9901.000**	**351 110 626**	1.000	244	64	164	EU
230V / 36V	**9901.001**	**351 110 625**	1.000	244	64	164	CH



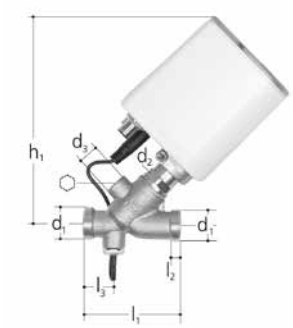
JRG LegioTherm 2T Circulation valve with controller, PN 10

- Temperature: max. 90°C
- Material: gunmetal, stainless steel, EPDM
- Factory setting: 57°C (adjustable 0 - 90°C) thermal desinfection 70°C (adjustable 60 - 90°C)
- Connection: male thread (for union connection with flat gasket)

DN (mm)	JRG Code	GF Code	Weight (kg)
15	**9910.015**	**351 110 550**	0.820
20	**9910.020**	**351 110 590**	1.050
25	**9910.025**	**351 110 630**	1.400

DN (mm)	d1 G (inch)	d2 G (inch)	d3 Rp (inch)	l1 (mm)	l2 (mm)	l3 (mm)	l4 (mm)	b (mm)	h1 (mm)	h2 (mm)	⬡
15	¾	½	¼	75	6	24	173	90	162	50	6
20	1	¾	¼	87	7	24	206	92	169	54	6
25	1 ¼	1	¼	99	8	24	233	100	179	56	6

Product range



JRG LegioTherm K Flushing valve with controller, PN 10

- Temperature: max. 90°C
- Material: gunmetal, stainless steel, EPDM
- Factory setting: 20°C (adjustable 0 - 90°C)
- Connection: male thread (for union connection with flat gasket)

DN (mm)	JRG Code	GF Code	Weight (kg)
15	**9920.015**	**351 110 600**	0.810
20	**9920.020**	**351 110 610**	1.020

DN (mm)	d1 G (inch)	d2 G (inch)	d3 Rp (inch)	l1 (mm)	l2 (mm)	l3 (mm)	l4 (mm)	b (mm)	h1 (mm)	h2 (mm)	⬡
15	¾	½	¼	75	6	24	173	90	162	50	6
20	1	¾	¼	87	7	24	206	92	169	54	6

Hycleen Automation power supply and communication cable

- Description: For serial connection of Hycleen Automation System components (master, controller), incl. 2x M12 plugs, ROHS

L (m)	Voltage	JRG Code	GF Code	Weight (kg)	d (mm)	d1 (mm)
1.5	36V	**9940.001**	**351 110 581**	0.110	14.5	6.8
5	36V	**9940.005**	**351 110 582**	0.300	14.5	6.8
10	36V	**9940.010**	**351 110 583**	0.630	14.5	6.8
20	36V	**9940.020**	**351 110 584**	1.240	14.5	6.8
50	36V	**9940.050**	**351 110 585**	3.200	14.5	6.8

Hycleen Automation Coupling

- Description: Coupling between 2 Hycleen Automation power supply and communication cable
- Connection: plug M8

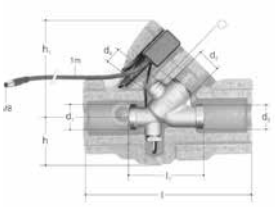
JRG Code	Weight (kg)	GF Code	l (mm)	h (mm)
9941.000	0.100	**351 110 586**	58	14

Product range

Sensor Extension Cable

- Description: connection between sensor and controller
- Connection: plug M8

GF Code	JRG Code	Weight (kg)	l (m)	l1 (mm)	l2 (mm)
351 110 662	**9943.005**	0.110	5	34	42



T-Sensor

- Description: Temperature sensor PT 1000
- Temperature: max. 90°C
- Material: gunmetal
- Connection: male thread, plug M8

d (mm)	JRG Code	Weight (kg)	GF Code	d1 G (inch)	d2 G (inch)	d3 G (inch)	d4 Rp (inch)	l (mm)	l1 (mm)	h (mm)	h1 (mm)
15	**9951.015**	0.460	**351 110 535**	¾	½	¾	¼	173	75	50	162
20	**9951.020**	0.570	**351 110 661**	1	¾	1	¼	206	87	52	168

T-Sensor, dimension indipendent

- Description: Temperature sensor PT 1000
- Temperature: max. 90°C
  Connection: plug M8

d (inch)	GF Code	JRG Code	Weight (kg)	l (m)	⬡
1/4	**351 110 611**	**9952.000**	0.150	1	17

Flow Sensor, PN 16

- Temperature: max. 90°C
- Material: brass
- Connection: male thread, plug M8

d (inch)	DN (mm)	GF Code	JRG Code	Weight (kg)	l (m)	l1 (mm)	h (mm)	h1 (mm)	h2 (mm)
1	20	**351 110 772**	**9950.020**	0.250	60	15	999	49	32

Product range

Drain Surveillance

- Description: to 9910, 9920
- Connection: plug M8
- Consisting of: float switch, bracket, cable, cable ties

GF Code	JRG Code	Weight (kg)	l (mm)	l1 (mm)	h (mm)	b (mm)
351 110 763	**9953.000**	0.162	1000	24	250	30

Hycleen Automation Commissioning

JRG Code	GF Code
9970.000	**351 110 783**

BMS Gateway BACnet IP

- Description: interface for data communication

JRG Code	GF Code
9980.001	**351 110 791**

BMS Gateway REST API/JSON

- Description: interface for data communication

JRG Code	GF Code
9980.000	**351 110 790**

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