GF Piping Systems

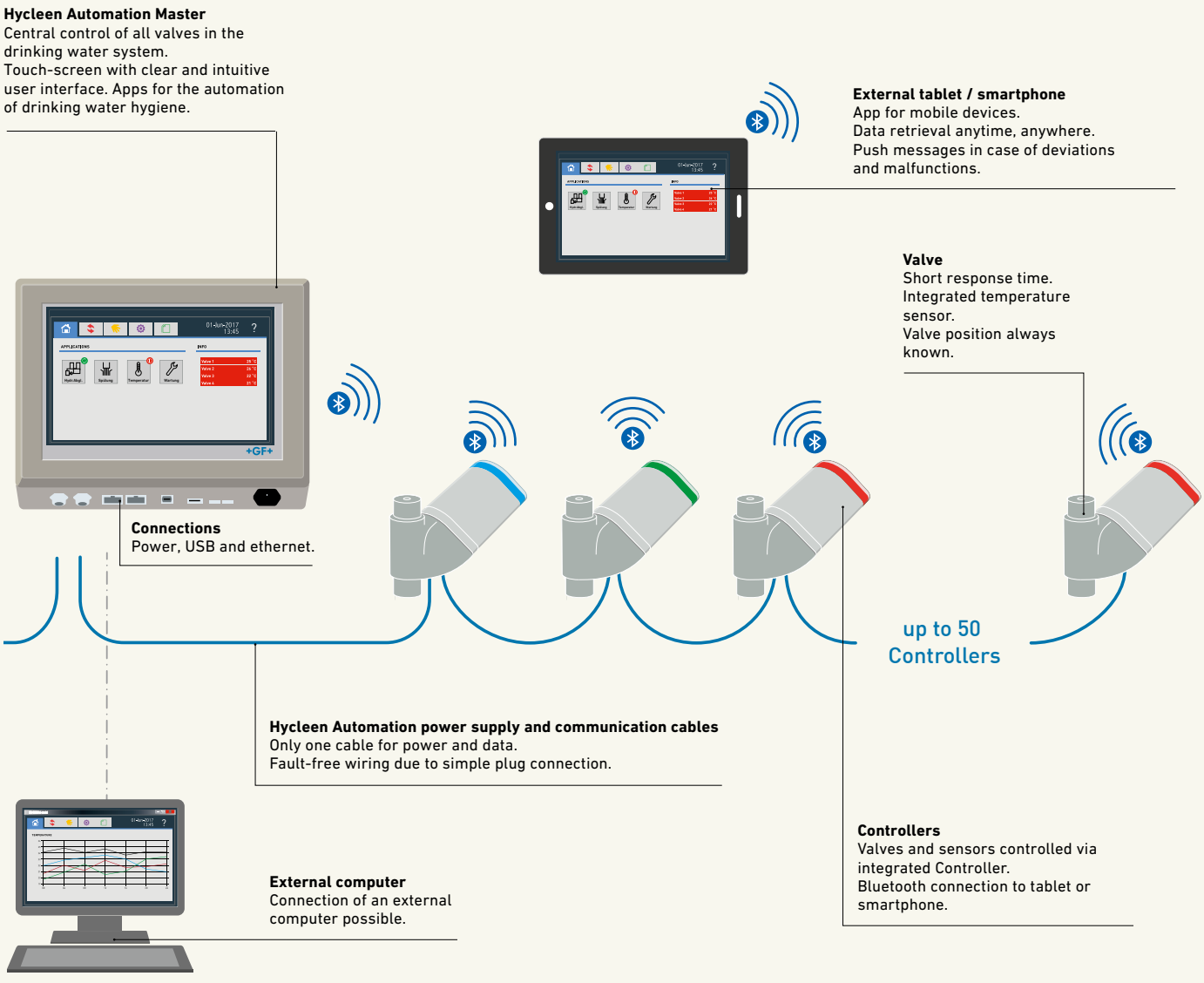
Hycleen Automation System

Revolutionising Sanitary Automation Processes and Securing Safe Supply of Drinking Water

Hycleen Automation System

Simply Controlling all Valves with One Master

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.



Hycleen Automation System

Your Benefits

Hygiene

Uniformly high temperatures and regular water exchange
Prevention of biofilm formation and Legionella infestation thanks to hydraulic alignment and automatic flushing.

Automation

Central control and status display
Easy control of sanitary technology via central user interface without manual intervention at valves and sensors.

Monitoring and Safety

Logging and reporting
Monitoring and storage of temperature data in automatically generated reports.
Retrieving data through a building management system possible.

Remote monitoring
Monitoring via external devices such as smartphone, tablet or computer possible.

Planners

Safe and fast to plan
Dimensioning the system according to simple rules.
Applications and all parameters easily programmable through Master.
Hydraulic alignment without complicated 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 runs 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.

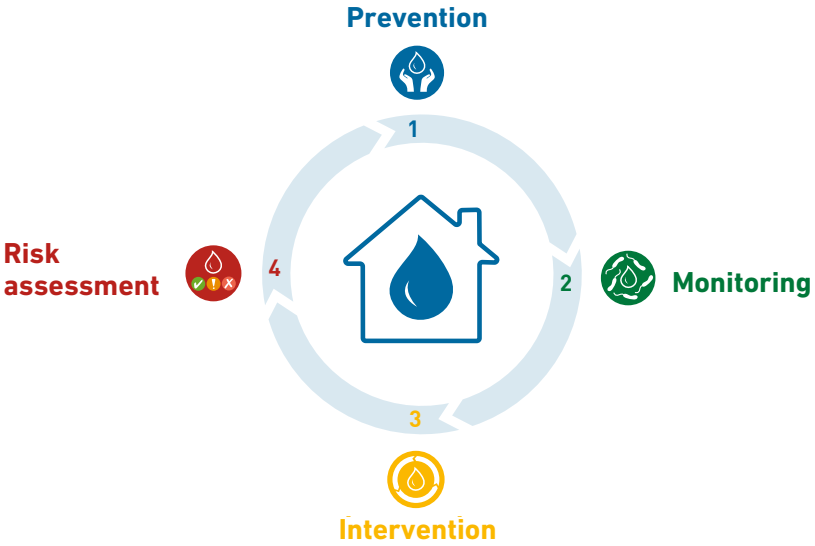
Hycleen Automation System

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

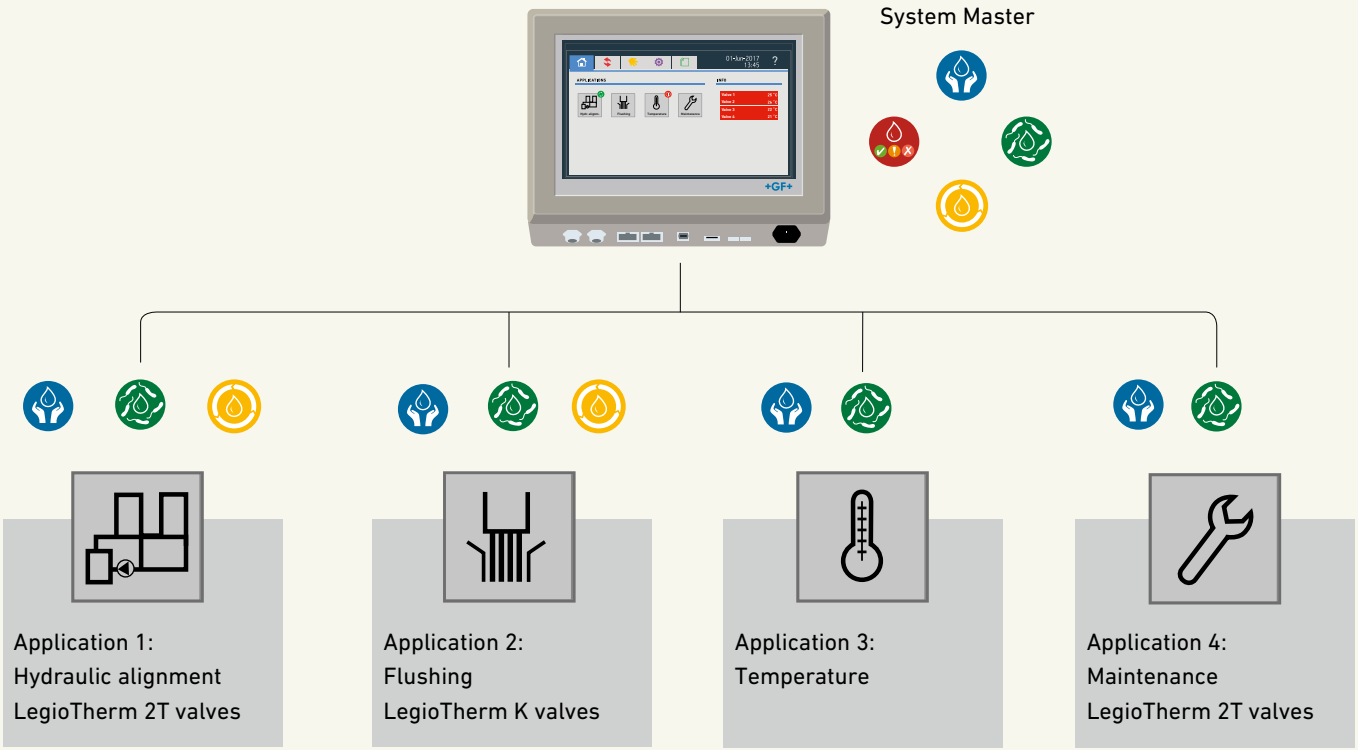
"Hycleen – Securing optimum drinking water hygiene in 4 steps"



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 alignment in all operating phases Regular water exchange through automatic flushing
	Monitoring	Continuous temperature monitoring Storing measuring data and logging of hygienic precautions
	Intervention	Regular thermal disinfection / chemical disinfection
	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.

In addition to the supplied standard applications, additional applications can be freely defined in the future without any programming effort, depending on time, sensor values or external data.

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 System

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

Application 1: Hydraulic alignment – LegioTherm 2T

- Temperature-sensitive hydraulic alignment for cold and hot water
- Thermal disinfection
- Temperature monitoring
- Adjustable leakage rate

Application 2: Flushing – LegioTherm K

- Flushing the cold and hot water system
- Temperature monitoring

Application 3: Temperature

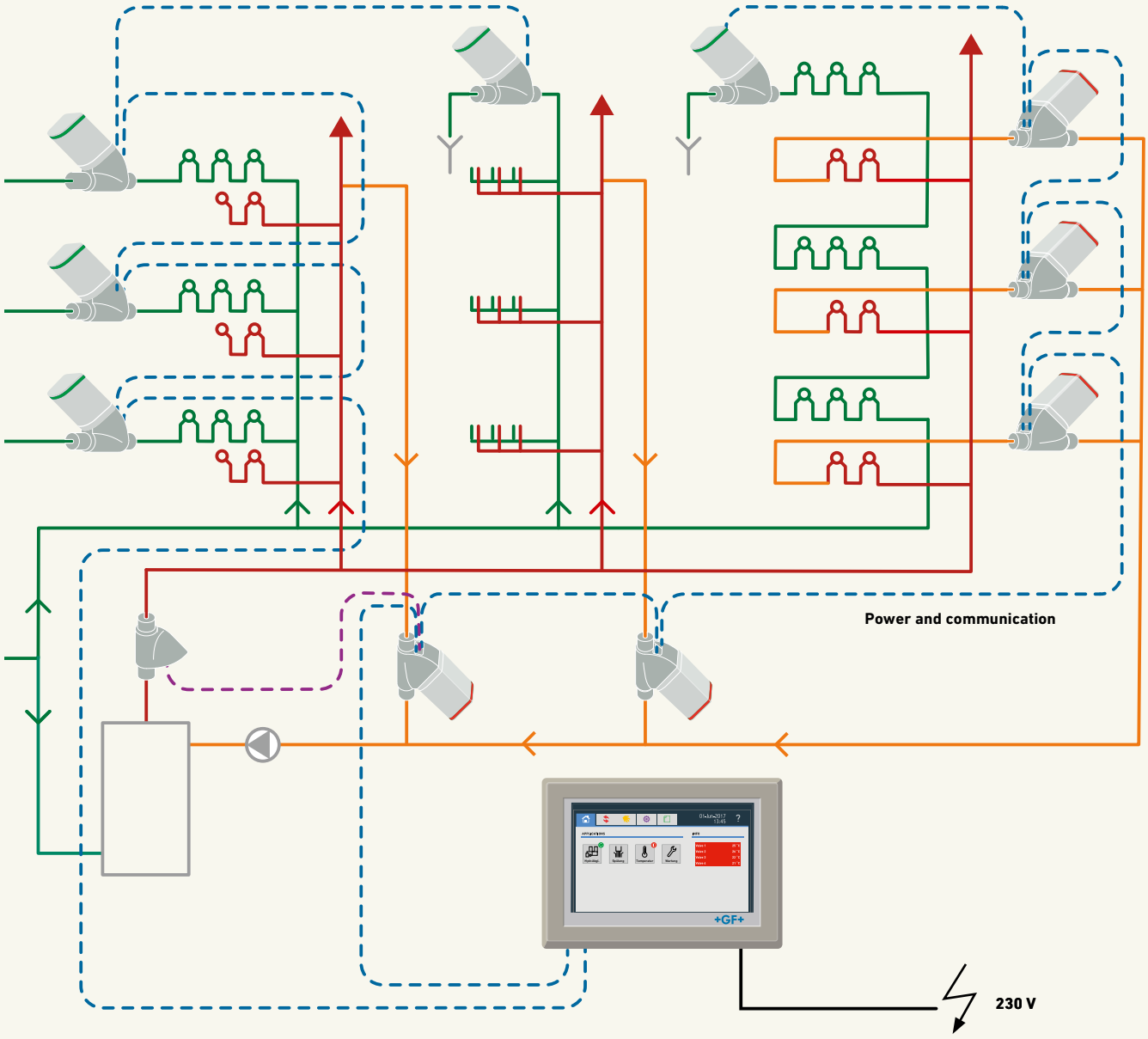
- Display of all temperatures in real time
- Clear graphical representation
- Storage of all valve temperatures in the log

Application 4: Maintenance – LegioTherm 2T

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

Hycleen Automation System

Installation Diagram



System components

LegioTherm 2T valve
Hydraulic alignment

LegioTherm K valve
Flushing

T-sensor
Temperature reading

Master

Sensor cable

Power cord and communication cable

Temperature-Sensitive Hydraulic Alignment

Especially in larger hot water distribution systems – e.g. in hospitals, hotels, nursing homes – stagnation, rough surfaces 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.

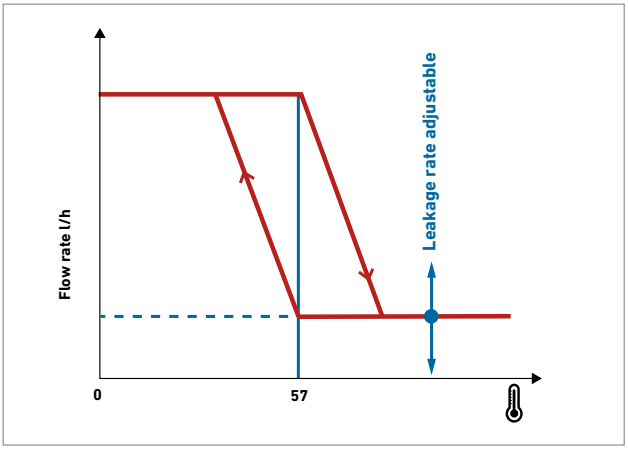
Planners are required to put a lot of computing effort into the proper distribution of hot water volumes in the entire piping system. Moreover, theoretical assumptions seldom correspond to the real conditions in the installation.

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 alignment

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.

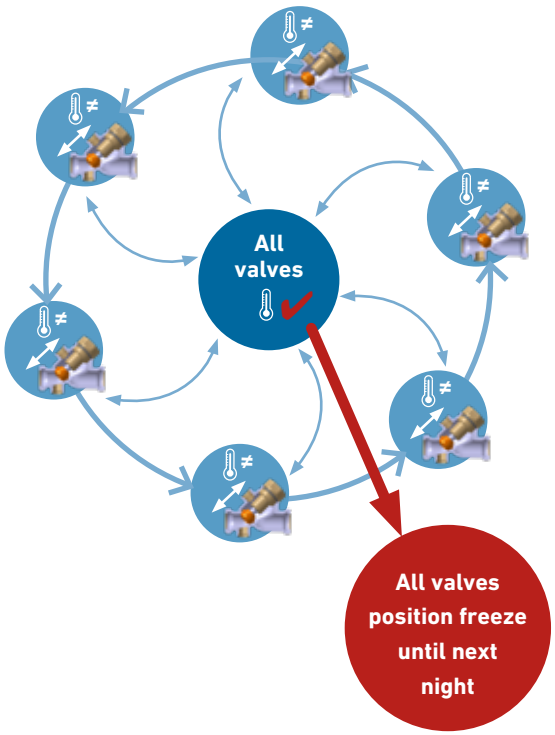
Dynamic hydraulic alignment



Static, temperature-sensitive hydraulic alignment

Once a day at the programmed time, the Hycleen Automation Master searches for the ideal flow rate for each individual circulation controller until the calibration temperature is reached at all circulation controllers. The circulation controllers will remain in this position until next hydraulic calibration. It is advisable to set this time at night, when water consumption is lowest.

This eliminates the need for manual presetting the circulation controllers during commissioning 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 controllers one after the other.
Even during thermal disinfection, the system remains hydraulically calibrated. 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.

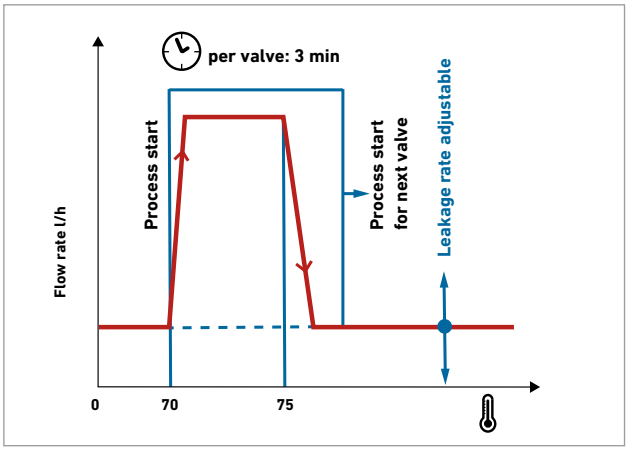
Safety thanks to monitored threshold temperature

Plant safety is additionally increased thanks to permanent monitoring of the threshold temperature and automatic maintenance. 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 calibration, the valve opens automatically to compensate for the temperature drop.

Automatic maintenance for both types of hydraulic calibration

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.

Thermal disinfection



Automatic Flushing

Depending on Temperature, or Programmed

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 the bacteria concentration drops to a harmless level.
The Hycleen Automation System allows automatic flushing of cold and hot water supply lines depending on the temperature or a specific time of day (timer).

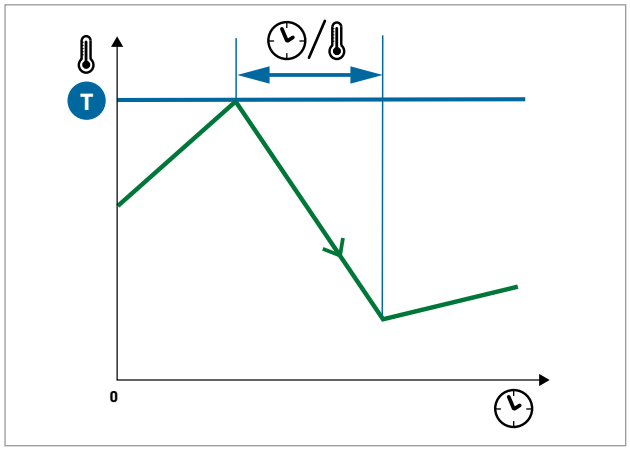
Temperature controlled flushing

As soon as the threshold temperature at the temperature sensor of a LegioTherm K 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.

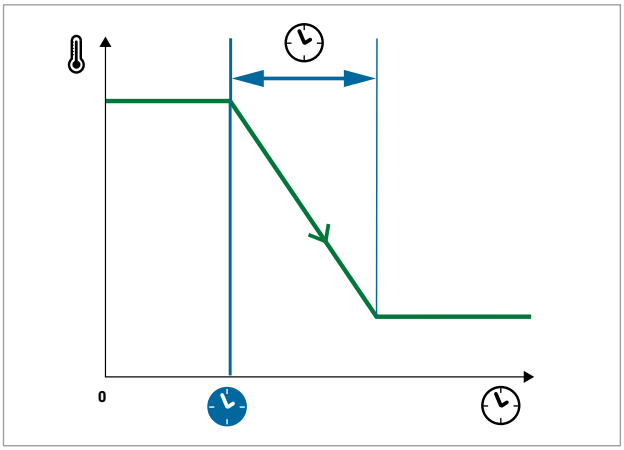
Timed flushing

All LegioTherm K 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 - Components

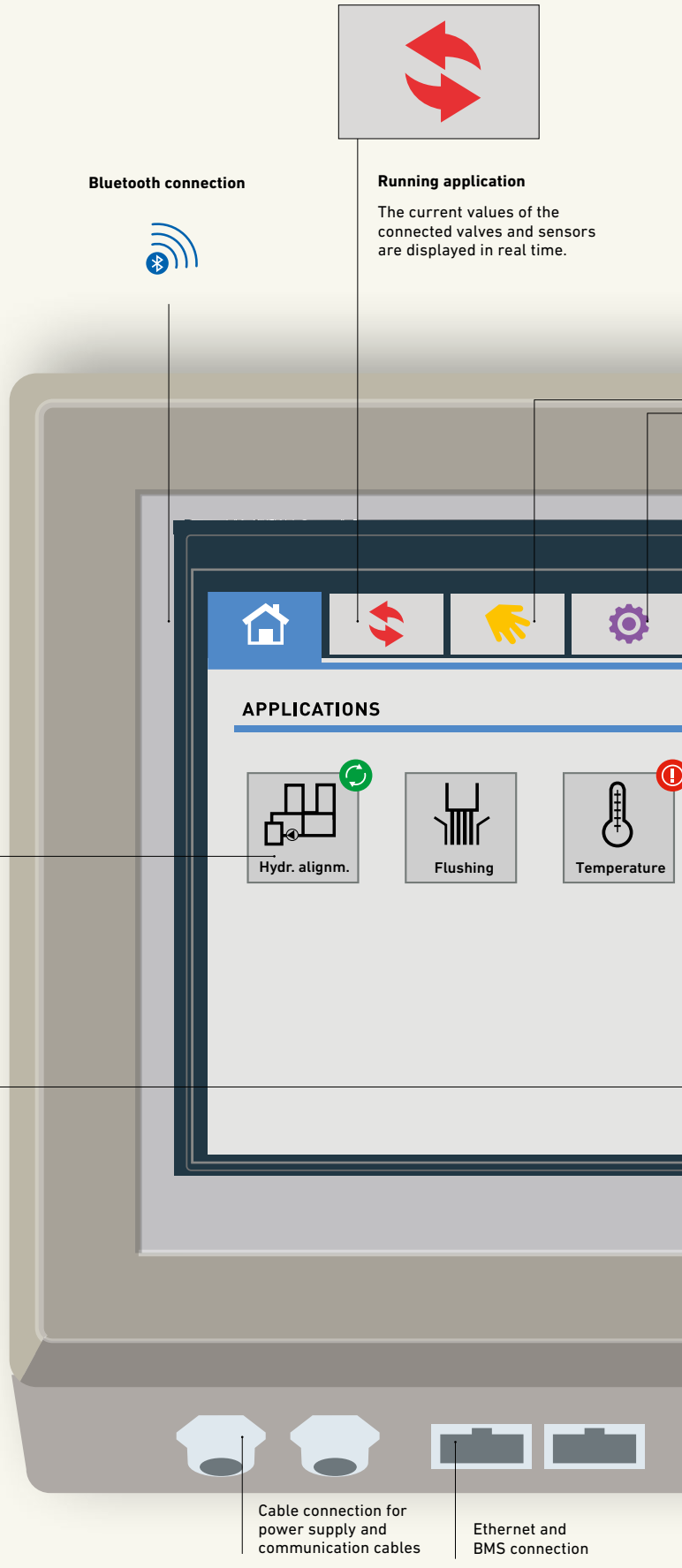
The Master

The Hycleen Automation Master controls up to 50 controllers on two cable harnesses (each 500 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.

If an uninterruptible power supply module (UPS) is connected to the Master, all valves move to a predefined, safe position in the event of a power failure.



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.

Context-sensitive help

?

UPS connection

USB connection

Potential-free contact connection

230 V

Logging Data and Creating Reports

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

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:

- Temperature for hydraulic alignment
- Temperature for flushing
- Thermal disinfection
- Automatic flushing
- Error message

The report period is adjustable: one day, one week or one month. The data is evaluated for each individual valve and the most important information is displayed in either a clear chart or diagram. All reports can be exported in PDF and XML formats. The information is given in three levels of detail.

Level 1

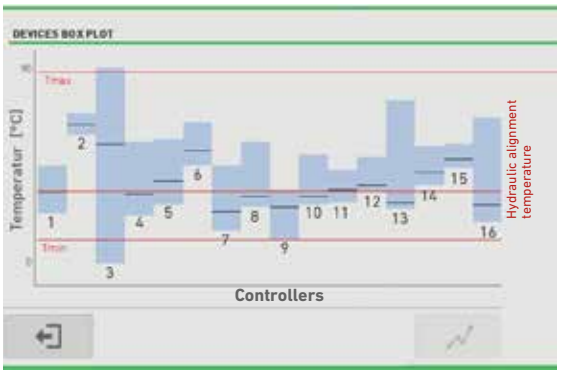
Monitoring the threshold temperature

Valve with outdoor temperatures

number	count (how often under Tmin)	cumulative time (hours)	count (how often over Tmin)	cumulative time (hours)
3	5	4	4	2
12	1	1	0	0
15	10	24	0	0
22	8	2	0	0

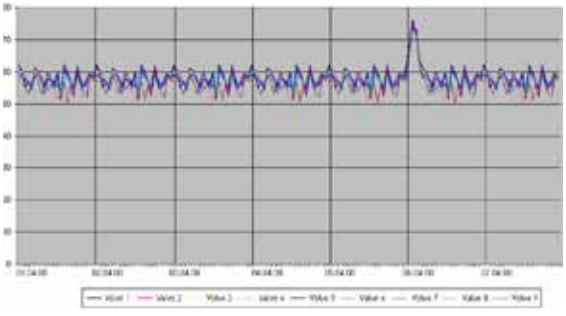
Level 2

Evaluation of temperature fluctuation and threshold temperature



Level 3

Exact temperature profile
This illustration shows the exact temperature profile at each valve and provides detailed information on how to solve the problem, e.g. when the problem occurred.



All data can be exported.

Hycleen Automation System – Components

Valve

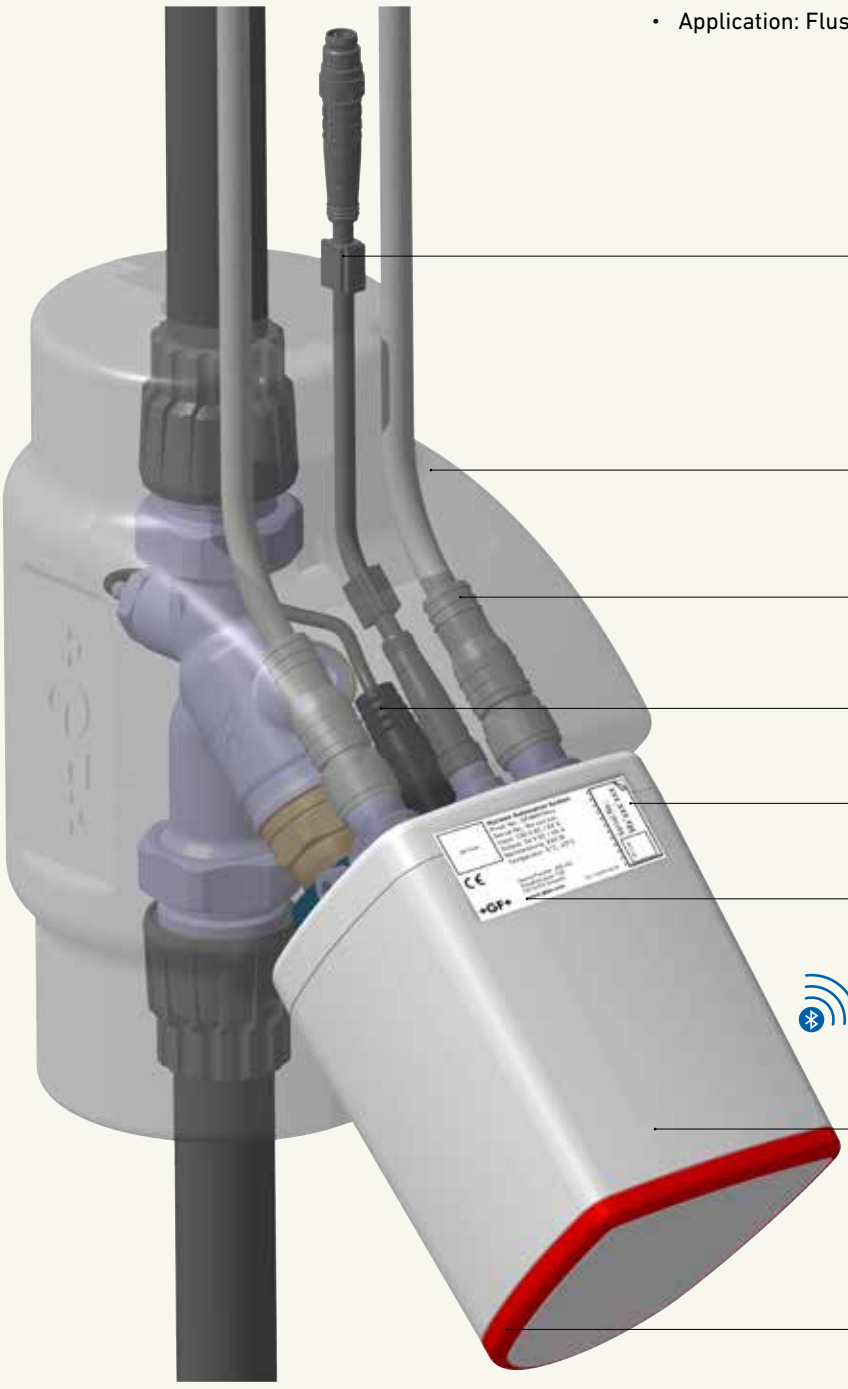
The LegioTherm 2T and LegioTherm K valves, together with the Master, are at the heart of the Hycleen Automation System. Water temperature readings are permanently taken by the valves; the values are passed on to the Master. The valves are activated dependent on preprogrammed parameters. During commissioning,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

JRG LegioTherm 2T circulation controller

- Adjustable leakage rate flow rate when the valve is closed
- Higher linearity and more precise regulation thanks to special cone profile
- Application: hydraulic calibration, thermal disinfection, maintenance flushing (once a week)

LegioTherm K flush 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)

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 calibration 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.

Old people's homes

Hygiene is very important in old people's 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.

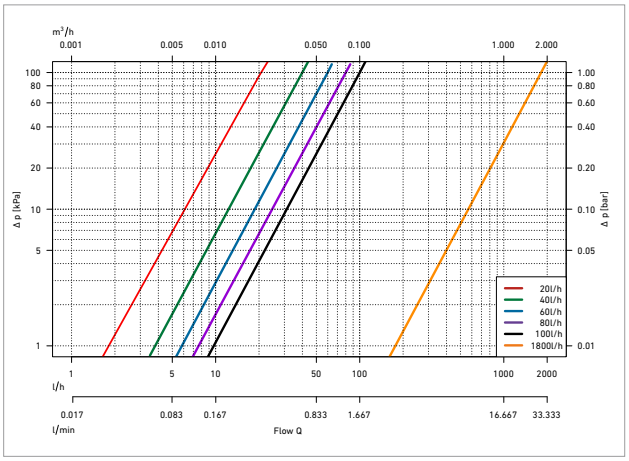

Made
for you

Hycleen Automation System

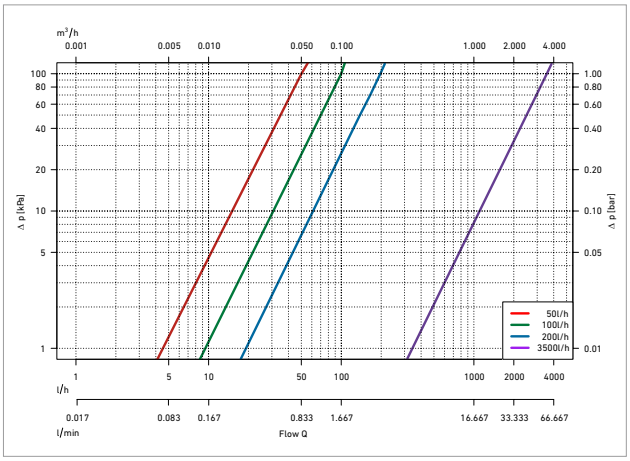
Specifications

Nomograms

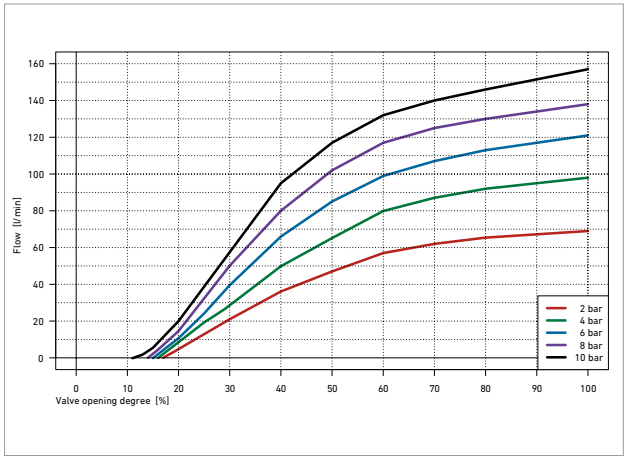
Pressure loss LegioTherm 2T DN15



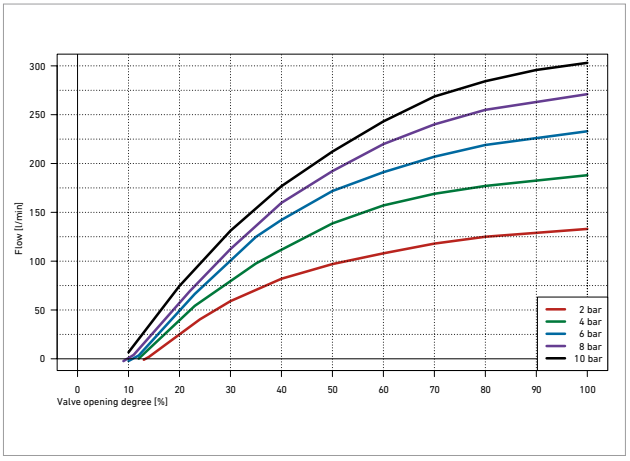
Pressure loss LegioTherm 2T DN20



Flushing capacity LegioTherm K DN15



Flushing capacity LegioTherm K DN20



Products

Hycleen Automation Master

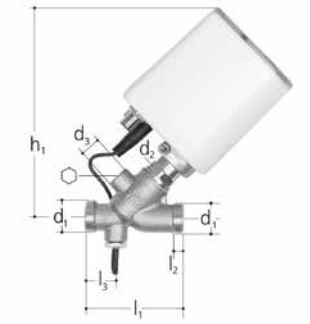
- Description: master for max. 50 controller
- Material: plastic
- Consisting of: touchscreen 10.1", power supply, bluetooth connection, 2 plugs M12 for 2x 300m cable (500m with powerbox), 2 Rj45 jacks (Ethernet), 2 USB connections (read/write), USB jack (read only), relay output, screw set

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
- Material: plastic
- 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



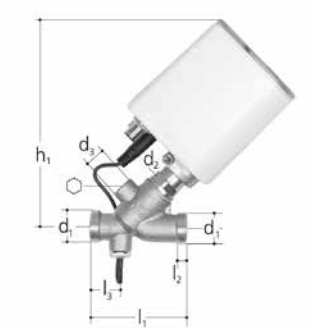
JRG LegioTherm 2T Circulation valve with controller, PN 10

- 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

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

Products



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

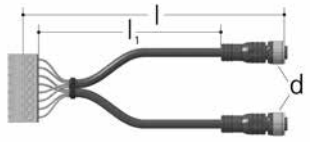
- Description: For serial connection of Hycleen Automation System components (master, controller), incl. 2x M12 plugs, ROHS

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

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



Hycleen Automation Retrofit cable kit

- Description: Adapter cable kit for JRG LegioTherm cable

d	JRG Code	Weight (kg)	GF Code	l (mm)	l1 (mm)
M12	**9942.000**	0.090	**351 110 588**	350	300

GF Piping Systems

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www.gfps.com

Argentina / Southern South America
Georg Fischer Central Plastics Sudamérica S.R.L.
Buenos Aires / Argentina
Phone +54 11 4512 02 90
Fax +54 11 4512 02 93
gfcentral.ps.ar@georgfischer.com
www.gfps.com/ar

Australia
George Fischer Pty Ltd
Riverwood NSW 2210
Phone +61 (0) 2 9502 8000
Fax +61 (0) 2 9502 8090
australia.ps@georgfischer.com
www.gfps.com/au

Austria
Georg Fischer Rohrleitungssysteme GmbH
3130 Herzogenburg
Phone +43 (0) 2782 856 43 0
Fax +43 (0) 2782 856 64
austria.ps@georgfischer.com
www.gfps.com/at

Belgium / Luxembourg
Georg Fischer NV/SA
1600 Sint-Pieters-Leeuw / Belgium
Phone +32 (0) 2 556 40 20
Fax +32 (0) 2 524 34 26
be.ps@georgfischer.com
www.gfps.com/be

Brazil
Georg Fischer Sist. de Tub. Ltda.
04571-020 São Paulo/SP
Phone +55 (0) 11 5525 1311
br.ps@georgfischer.com
www.gfps.com/br

Canada
Georg Fischer Piping Systems Ltd
Mississauga, ON L5T 2B2
Phone +1 (905) 670 8005
Fax +1 (905) 670 8513
ca.ps@georgfischer.com
www.gfps.com/ca

China
Georg Fischer Piping Systems Ltd
201319 Shanghai
Phone +86 21 3899 3899
Fax +86 21 3899 3888
china.ps@georgfischer.com
www.gfps.com/cn

Denmark / Iceland
Georg Fischer A/S
2630 Taastrup / Denmark
Phone +45 (0) 7022 1975
Fax +45 (0) 7022 1976
info.dk.ps@georgfischer.com
www.gfps.com/dk

Finland
Georg Fischer AB
01510 Vantaa
Phone +358 (0) 9 586 58 25
Fax +358 (0) 9 586 58 29
info.fi.ps@georgfischer.com
www.gfps.com/fi

France
Georg Fischer SAS
95932 Roissy Charles de Gaulle Cedex
Phone +33 (0) 1 41 84 68 84
Fax. +33 (0) 1 41 84 68 85
fr.ps@georgfischer.com
www.gfps.com/fr

Germany
Georg Fischer GmbH
73095 Albershausen
Phone +49 (0) 7161 302 0
Fax +49 (0) 7161 302 25 9
info.de.ps@georgfischer.com
www.gfps.com/de

India
Georg Fischer Piping Systems Pvt. Ltd.
400 076 Powai, Mumbai
Phone +91 22 4007 2000
Fax +91 22 4007 2020
branchoffice@georgfischer.com
www.gfps.com/in

Indonesia
PT Georg Fischer Indonesia
Karawang 41371, Jawa Barat
Phone +62 267 432 044
Fax +62 267 431 857
indonesia.ps@georgfischer.com
www.gfps.com/id

Italy
Georg Fischer S.p.A.
20063 Cernusco S/N (MI)
Phone +39 02 921 86 1
Fax +39 02 921 86 24 7
it.ps@georgfischer.com
www.gfps.com/it

Japan
Georg Fischer Ltd
530-0003 Osaka
Phone +81 (0) 6 6341 2451
jp.ps@georgfischer.com
www.gfps.com/jp

Korea
Georg Fischer Piping Systems
463-824 Seoul
Phone +82 31 8017 1450 3
Fax +82 31 8017 1454
kor.ps@georgfischer.com
www.gfps.com/kr

Malaysia
George Fischer (M) Sdn. Bhd.
41200 Klang, Selangor Darul Ehsan
Phone +60 (0) 3 3122 5585
Fax +60 (0) 3 3122 5575
my.ps@georgfischer.com
www.gfps.com/my

Mexico / Northern Latin America
Georg Fischer S.A. de C.V.
CP 66636 Apodaca, Nuevo Leon / Mexico
Phone +52 (81) 1340 8586
Fax +52 (81) 1522 8906
mx.ps@georgfischer.com
www.gfps.com/mx

Middle East
Georg Fischer Piping Systems (Switzerland) Ltd
Dubai / United Arab Emirates
Phone +971 4 289 49 60
Fax +971 4 289 49 57
gss.ps@georgfischer.com
www.gfps.com/int

Netherlands
Georg Fischer N.V.
8161 PA Epe
Phone +31 (0) 578 678 222
Fax +31 (0) 578 621 768
nl.ps@georgfischer.com
www.gfps.com/nl

New Zealand
Georg Fischer Ltd
5140 Upper Hutt
Phone +64 (0) 4 527 9813
Fax +64 (0) 4 527 9834
nz.ps@georgfischer.com
www.gfps.com/nz

Norway
Georg Fischer AS
1351 Rud
Phone +47 67 18 29 00
Fax +47 67 13 92 92
no.ps@georgfischer.com
www.gfps.com/no

Philippines
George Fischer Representative Office
1604 Pasig City
Phone +632 571 2365
Fax +632 571 2368
sgp.ps@georgfischer.com
www.gfps.com/sg

Poland
Georg Fischer Sp. z o.o.
05 090 Sekocin Nowy
Phone +48 (0) 22 3131 050
Fax +48 (0) 22 3131 060
poland.ps@georgfischer.com
www.gfps.com/pl

Romania
Georg Fischer Rohrleitungssysteme (Elvetia)
S.A. SUCURSALA BUCURESTI
020257 Bucuresti
Phone +40 311 040 492
Fax +40 212 317 479
ro.ps@georgfischer.com
www.gfps.com/int

Russia
Georg Fischer Piping Systems (Switzerland) Ltd
Moscow Representative Office
125040 Moscow
Phone +7 495 748 11 44
ru.ps@georgfischer.com
www.gfps.com/ru

Singapore
George Fischer Pte Ltd
528 872 Singapore
Phone +65 6747 0611
Fax +65 6747 05 77
sgp.ps@georgfischer.com
www.gfps.com/sg

Spain / Portugal
Georg Fischer S.A.
28046 Madrid / Spain
Phone +34 (0) 91 781 98 90
Fax +34 (0) 91 426 08 23
es.ps@georgfischer.com
www.gfps.com/es

Sweden
Georg Fischer AB
11743 Stockholm
Phone +46 (0) 8 506 77 50 0
Fax +46 (0) 8 749 23 70
info.se.ps@georgfischer.com
www.gfps.com/se

Switzerland
Georg Fischer Rohrleitungssysteme (Schweiz) AG
8201 Schaffhausen
Phone +41 (0)52 631 3026
Fax +41 (0)52 631 2800
ch.ps@georgfischer.com
www.gfps.com/ch

Taiwan
Georg Fischer Co. Ltd.
24158 New Taipei City
Phone +886 2 8512 2822
Fax +886 2 8512 2823
tw@georgfischer.com
www.gfps.com/tw

Turkey
Georg Fischer Hakan Plastik
Boru ve Profil San. Tic. A.S.
59500 Cerkezkoy / Tekirdag
Phone +90 282 726 64 43
Fax +90 282 726 94 67
hpsales@hakan.com.tr
www.hakan.com.tr

United Kingdom / Ireland
George Fischer Sales Ltd
CV2 2ST Coventry / United Kingdom
Phone +44 (0) 2476 535 535
Fax +44 (0) 2476 530 450
uk.ps@georgfischer.com
www.gfps.com/uk

USA / Caribbean
Georg Fischer LLC
92618 Irvine, CA / USA
Phone +1 714 731 88 00
Fax +1 714 731 62 01
Toll Free 800/854 40 90
us.ps@georgfischer.com
www.gfps.com/us

Vietnam
George Fischer Pte Ltd
Representative Office
Ho Chi Minh City
Phone + 84 28 3948 4000
Fax + 84 28 3948 4010
sgp.ps@georgfischer.com
www.gfps.com/vn

International
Georg Fischer Piping Systems (Switzerland) Ltd
8201 Schaffhausen / Switzerland
Phone +41 (0) 52 631 3003
Fax +41 (0) 52 631 2893
info.export@georgfischer.com
www.gfps.com/int

37 777 62
e / 11.18 / DH

Hauptstrasse 130
CH-4450 Sissach/Switzerland
Telefon +41 (0) 61 975 22 22
info.jrg.ps@georgfischer.com
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