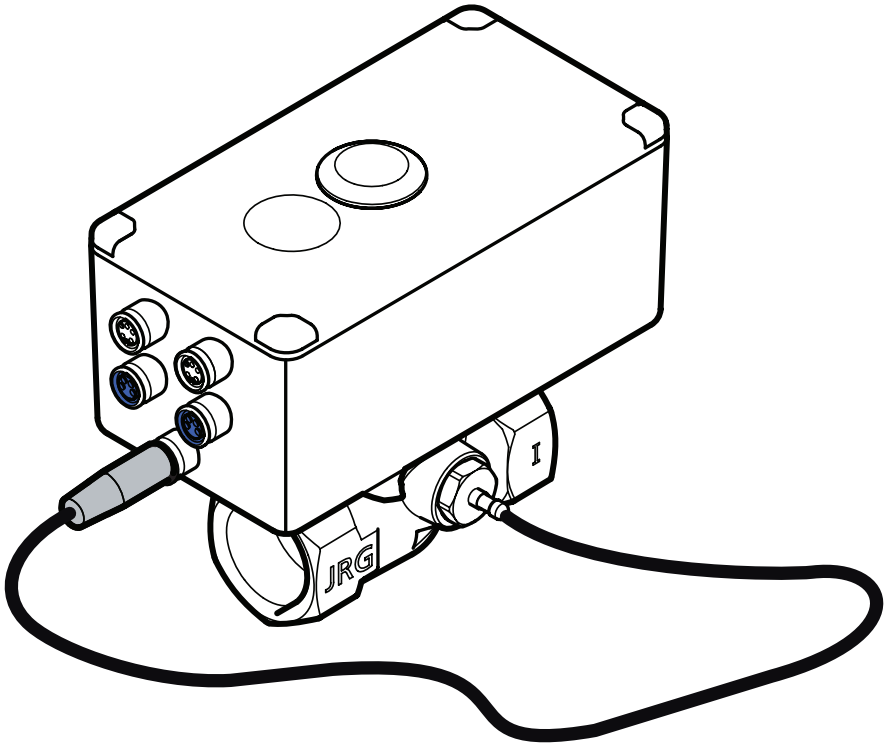
GF Hycleen Balance

JRG code 9960.xxx

EN Technical information



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1 System description

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1.1 Function and benefits

The Hycleen Balance is an electronically controlled valve that controls the circulation of warm and cold water based ontheir respective temperatures. It controls the flow with continuous measurement of the water temperature. The controller is in charge of the procedure for measurement values. If the actual temperature is different to the temperature setpoint, the circulation valve opens and closes to adjust the flow that it is necessary to correct. This is done by an actuator. The system also supports thermal disinfection and regularly runs a self-maintenance function. The measured temperatures are recorded and are available to download for one year.

Because of this, the Hycleen Balance supplies accurate, temperature-controlled water distribution in the circulation system. This has many advantages:

Safety: The precise control of recommended temperatures stops the growth of dangerous microorganisms, and their biofilm.

Sustainability and convenience: The equal distribution of uniform water temperatures in all parts of the building keeps energy losses to a minimum. The necessary temperature occurs immediately and at each extraction point, which not only increases the quality of living, but also keeps water losses because of long waiting times or flushing times to a minimum.

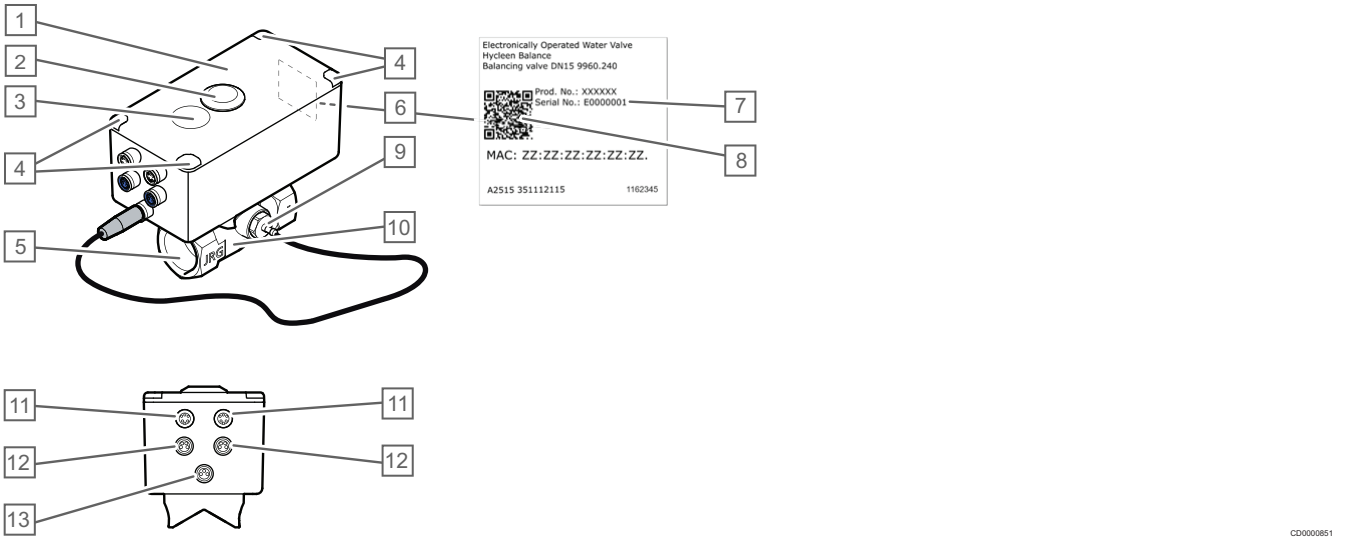
Hycleen Balance makes every building with a circulation line correct for operation today and, in many respects, operation in the future. Digital documentation of temperatures helps owners and operators of buildings to show compliance with regulations and recommendations for drinking water safety. The self-maintenance function and equal distribution of temperatures extends the life of the entire installation.

The thermal disinfection support for warm water circulation increases safety in buildings where there was already a positive test for Legionella contamination that is more than the permitted value, or in buildings where special safety levels are necessary (for example, hospital operators, hotel chains, retirement homes).

Easy installation, intuitive operation and automatic documentation, maintenance and alarm functions keep the work for installers, operators, owners and facility managers to a minimum.

It is possible to use the system in all commercial and public buildings, such as multi-family homes, hotels, hospitals, care facilities, schools, sports facilities etc. It is also possible and easy to install the system in new buildings and to retrofit it in existing buildings.

1.2 Structure of the GF Hycleen Balance balancing valve



Item	Description
1	Controller/actuator
2	Protection cap for hexagon socket screws (open/close valve)
3	Interaction button
4	Information LED
5	Bottom part of the valve
6	Label with MAC address
7	Serial number (the name of the valve in the app)
8	QR code: Link to online documentation and instructions
9	Temperature sensor PT1000
10	Arrow to show the direction of flow
11	M8 connector for the external sensor connection
12	M8 connector for the power supply and bus communication
13	Connector for the temperature sensor PT1000

2 Components

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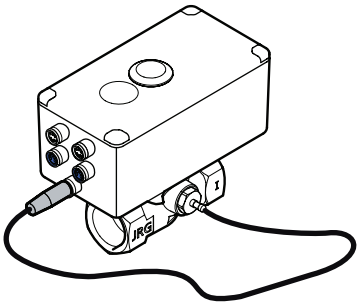
2.1 GF Hycleen Balance balancing valve



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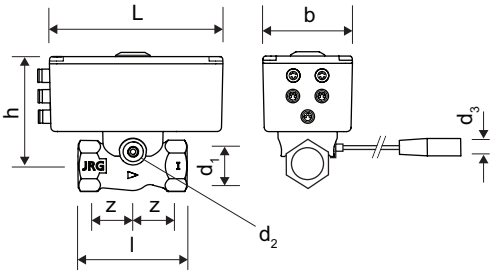

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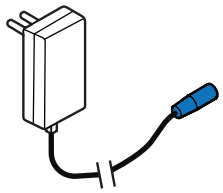
- Digital operation
- Material: Lead-free gunmetal (RG+), chrome-nickel steel, EPDM
- Factory setting: 57 °C (adjustment range: 0 – 90 °C)
- Thermal disinfection (60 – 90 °C)

JRG code	GF code	Uponor code	DN	Weight (kg)	d1, Rp (inch)	d2, Rp (inch)	d_3	h (mm)	l (mm)	L (mm)	z (mm)
9960.240	351112115	1162345	15	0,800	1/2	1/2	M8	80	60	120	18
9960.320	351112120	1162346	20	0,960	3/4	3/4	M8	92	75	120	24

2.2 GF Hycleen power supply unit



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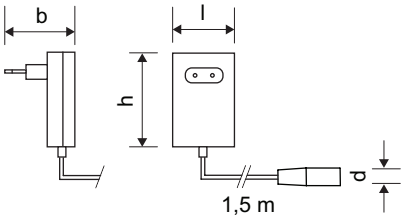
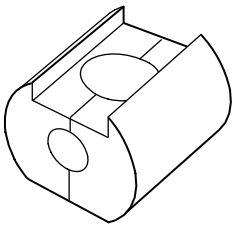


ZD0000135

- For Hyclean Balance / Flush
- Power connection: 30 V DC
- Cable length: 1,5 m
- Can be extended up to a maximum cable length of 100 m and a maximum of 10 valves

JRG code	GF code	Uponor code	Voltage	Weight (g)	l (mm)	b (mm)	h (mm)	d	Version
9964.000	351112141	1162883	30 V	0,280	48	35	77	M8	EU, UK, CH

2.3 GF Hycleen insulation DN 15/20



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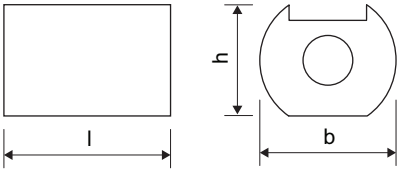

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- For Hycleen Balance / Flush valves DN 15 and DN 20
- Self-closing, black, EPP

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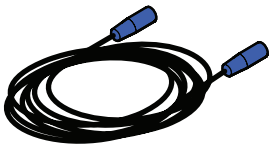
JRG code	GF code	Uponor code	DN	Weight (kg)	l (mm)	b (mm)	h (mm)
9963.000	351112161	1162882	15/20	0,031	118	100	83

2.4 GF Hycleen power supply and communication cable



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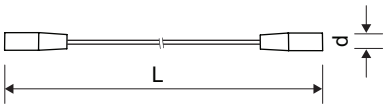

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- To connect Hycleen Balance / Flush components (valves, power supply unit) in series, including 2x M8 push/pull connectors, ROHS

JRG code	GF code	Uponor code	Weight (kg)	l (m)	d
9965.001	351112151	1162884	0,055	1,5	M8
9965.003	351112152	1162885	0,108	3	M8
9965.005	351112153	1162886	0,180	5	M8
9965.010	351112154	1162887	0,355	10	M8
9965.020	351112155	1185329	0,620	20	M8

2.5 GF Hycleen cable coupling

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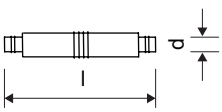

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- To connect two Hycleen Balance or to extend the power supply cable, with a pre-assembled push/pull connector
- Connector: M8

JRG code	GF code	Uponor code	Weight (kg)	l (mm)	d
9966.002	351112156	1162888	0,015	47	M8

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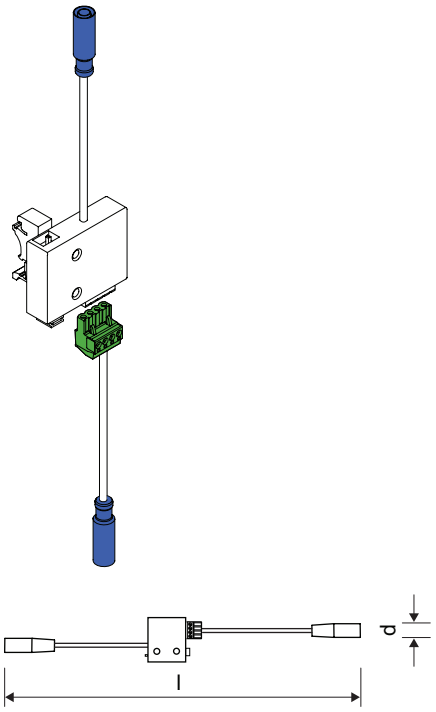
2.6 GF Hycleen BMS connection and bus extension

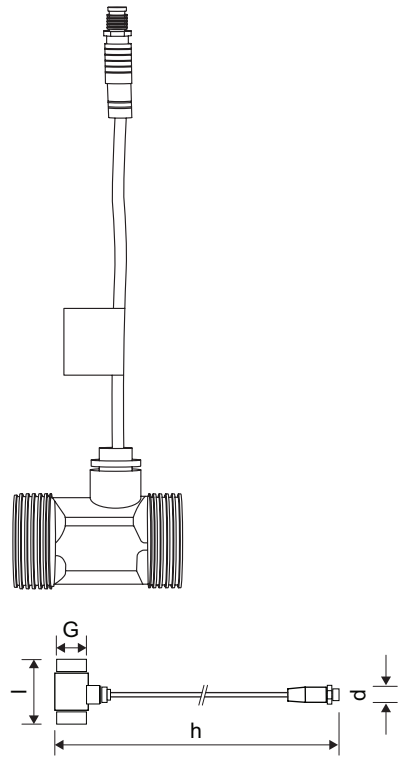


ZD0000146

- To connect to the building management system through Modbus RTU and to expand bus communication with an additional power supply.
- Connection: 2-wire cable

JRG code	GF code	Uponor code	Weight (kg)	l (mm)	d (mm)
9966.000	351112157	1185326	0,30	336	11,5

2.7 GF Hycleen flow sensor

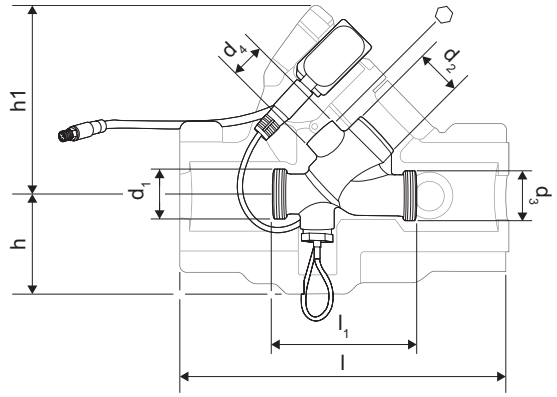


ZD0000147

- Temperature: max. 90°C
- Nominal pressure: PN16
- Material: Brass
- Connection: M8

JRG code	GF code	Uponor code	Weight (kg)	d1 (inch)	d	l (mm)	h (mm)
9950.020	351110772	1149751	0,25	1	M8	60	999

2.8 GF Hycleen AS temperature sensor



- Temperature sensor PT 1000 with valve
- Temperature: max. 90°C
- Material: Brass
- Connection: M8

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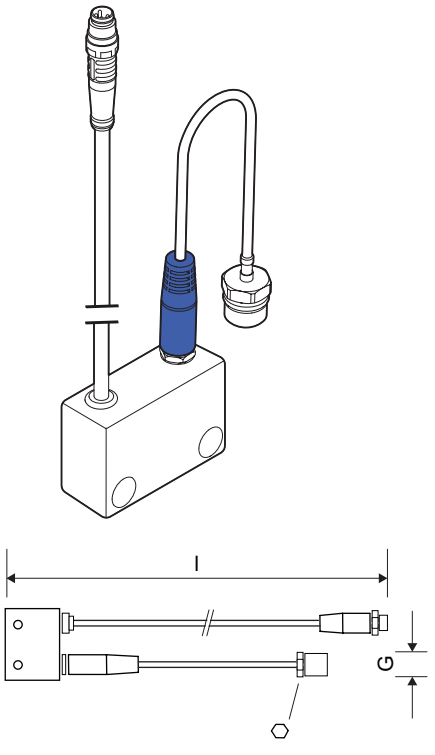
JRG code	GF code	Uponor code	DN	Weight (kg)	d1 G (inch)	d2 G (inch)	d3 G (inch)	d4 Rp (inch)	l (mm)	l1 (mm)	h (mm)	h1 (mm)
9951.015	351110535	1149707	DN 15	0,46	3/4	1/2	3/4	1/4	173	75	50	162
9951.020	351110661	1149732	DN 20	0,57	1	3/4	1	1/4	206	87	52	168

2.9 GF Hycleen temperature sensor



ZD0000148

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

JRG code	GF code	Uponor code	Weight (kg)	G (inch)	l (m)	⬡
9952.000	351110611	1149721	0,15	1/4	1	17

2.10 GF Hycleen extension cable for sensor

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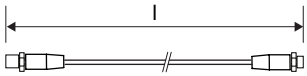

ZD0000150

- Connection between sensor and controller
- Connection: M8

JRG code	GF code	Uponor code	Weight (kg)	l (m)
9943.005	351110662	1149733	0,011	5

3 Example system

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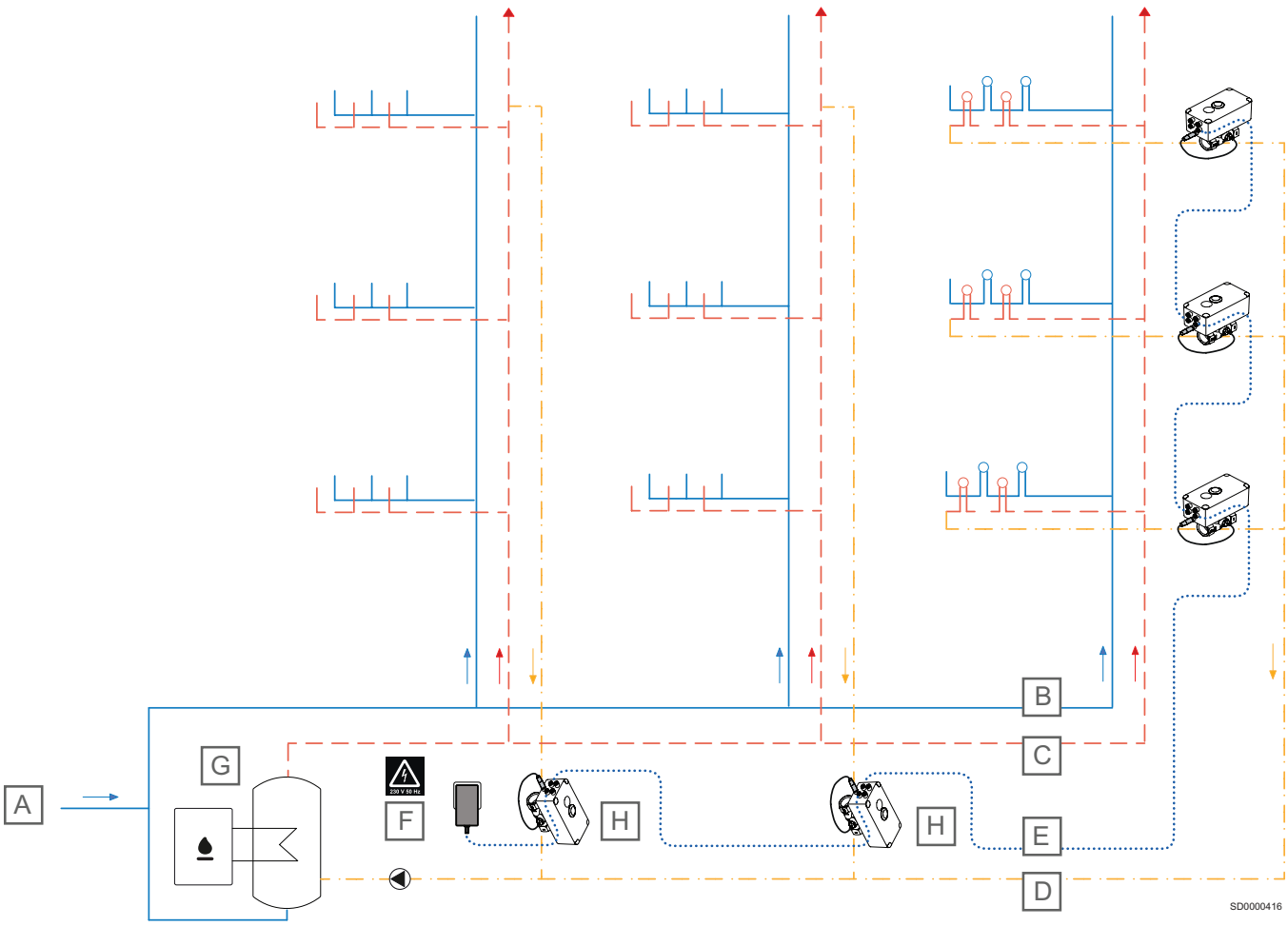

Item	Description
A	Cold water supply
B	Cold water line
C	Hot water line
D	Circulation line
E	Power and communication line
F	Power supply unit
G	Hot water supply
H	GF Hycleen Balance balancing valve

4 Installation

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Note

The controller is pre-programmed in accordance with the type and size of the valve. Do a careful check of whether the colour of the label on the controller aligns with the colour of the protection cap of the valve:

~~The GF Hycleen Balance can be installed anywhere on the line~~. For revision purposes, install the valve in a position with access. We recommend the GF Hycleen shut-off units (JRG code 8339) and screw connection 8724 are installed.

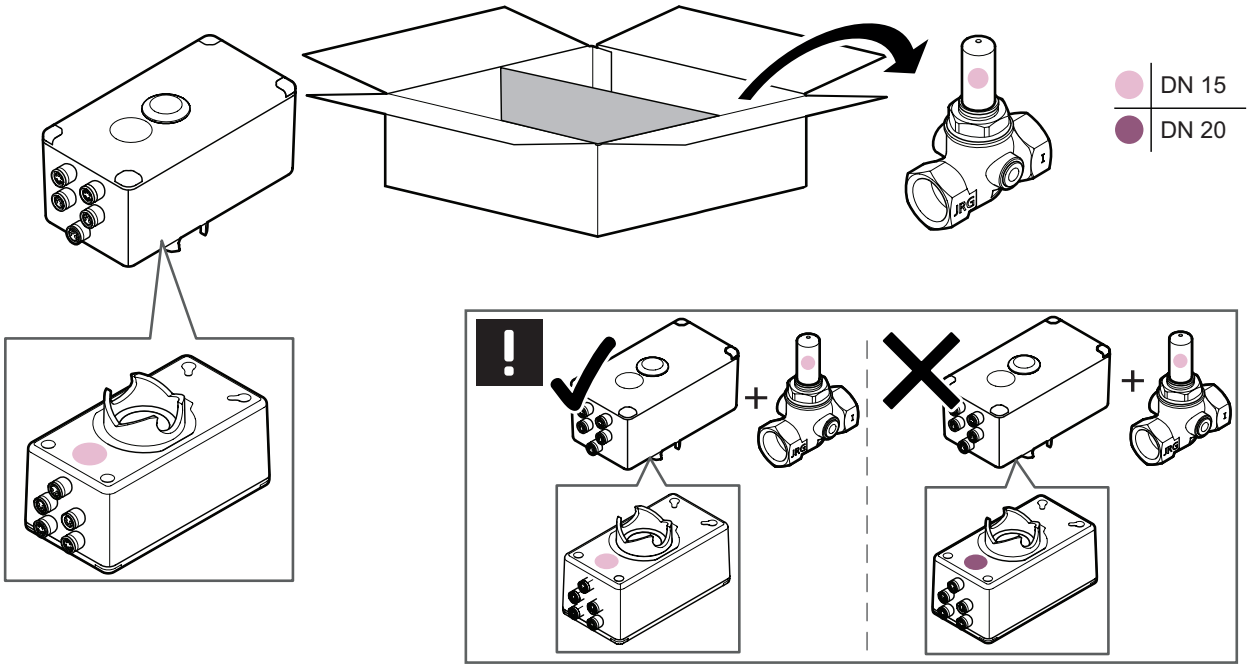
The arrow on the valve body must align with the flow direction of the water.

Use the Hycleen insulation to keep heat loss to a minimum.

The dimensions of the drain must prevent backing-up. If there is a risk of backing-up, install a backflow preventer.

For additional protection, we recommend the installation of a Hycleen monitoring sensor

To prevent damage to the valve, keep the protection cap on the upper insert during installation.



4.1 Install the controller

Note

For revision purposes, there must be a distance of 8 cm between the controller and the nearest surface.

Flushing

Before the Hycleen Balance is installed, flush the lines thoroughly.

Seals

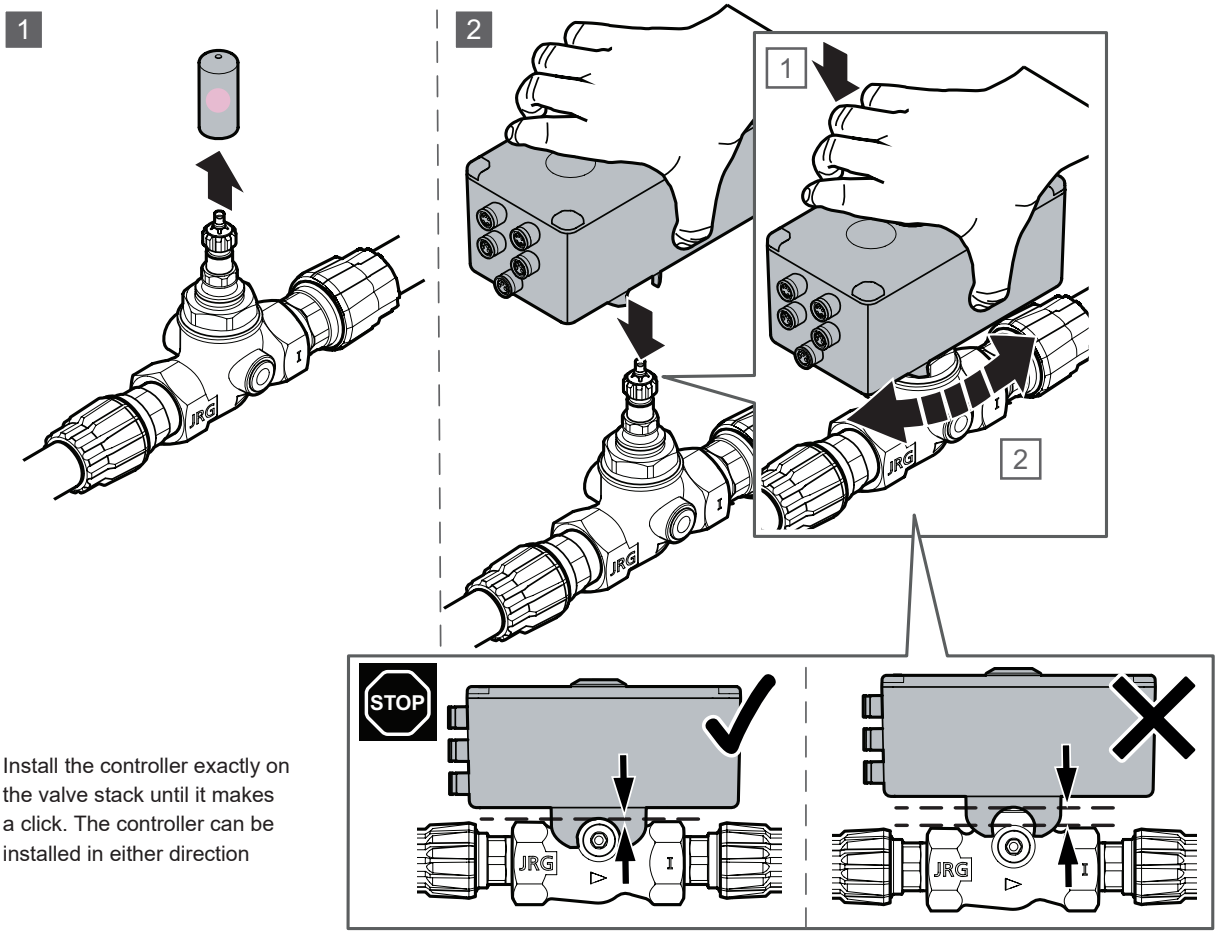
Only AFM 34 seals are permitted. Do not apply oil or grease to the seals.

Soldering

If solder connections are used, do not install the Hycleen Balance valve during the soldering procedure. If the valve becomes too hot, this can cause damage.

Have the controller for the valve prepared. Do a check of whether the colour coding on the label below the controller housing aligns with the colour coding on the cap. The size of the valve is also specified on the controller label.

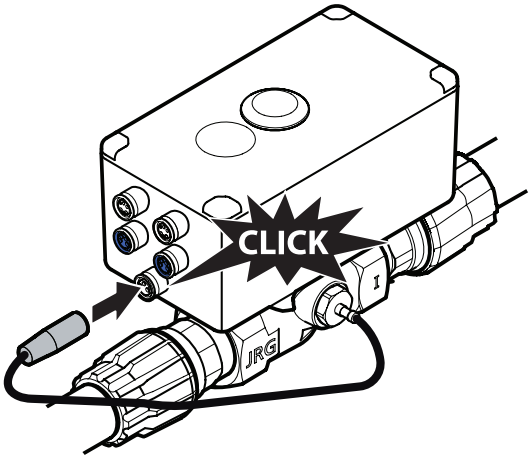
1. Remove the cardboard protection cap.
2. Connect the controller to the valve. The tooth system in the controller must align with the tooth system of the spindle. If necessary for this alignment, turn the controller slightly.



Install the controller exactly on the valve stack until it makes a click. The controller can be installed in either direction

4.2 Temperature sensor

Attach the connector for the temperature sensor onto the controller bush with screws. If insulation is to be used, drill through the insulation first to put the connector in the insulation and then connect the connector to the valve. The M8 connector on the other end of the cable is put into the lower bush on the controller (→ makes a click).



4.3 Cabling in series

Note

Components that are not permitted can cause malfunctions!

Note

To remove the cable, only pull the blue connector, not the cable.

Note

You must connect all components in series (one after the other, connected to one another).

It is not permitted to connect the components in parallel or in a star shape!

It is not permitted to do modifications to the components and cables!

The connecting cables contain four wires: two to supply power and two to transmit signals. The two ends of the cable have the same female M8 connector and are twist-proof. The M8 connector holds the connection in place reliably, even in harsh conditions.

4.4 Cable connection between the controllers

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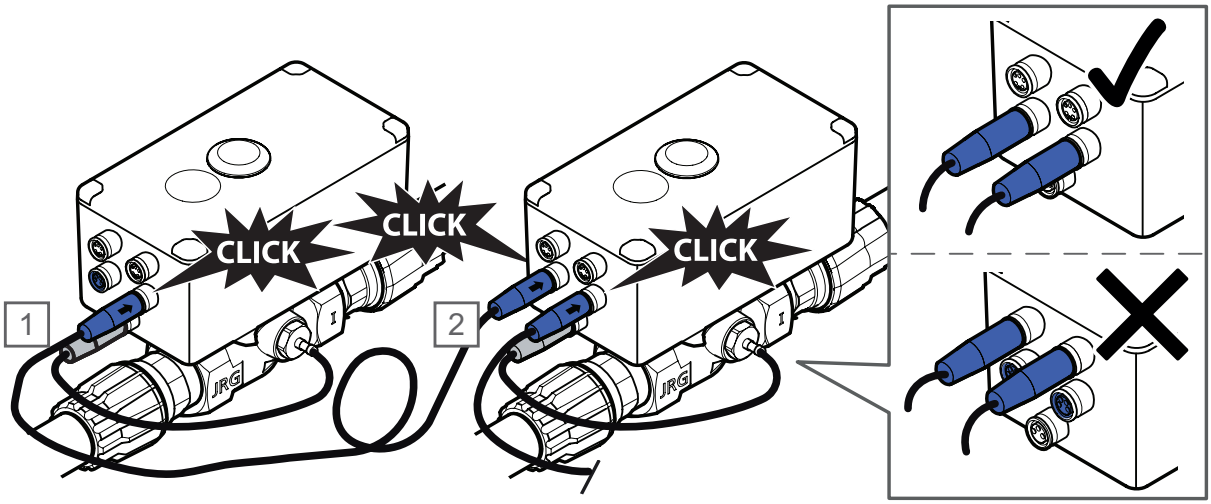
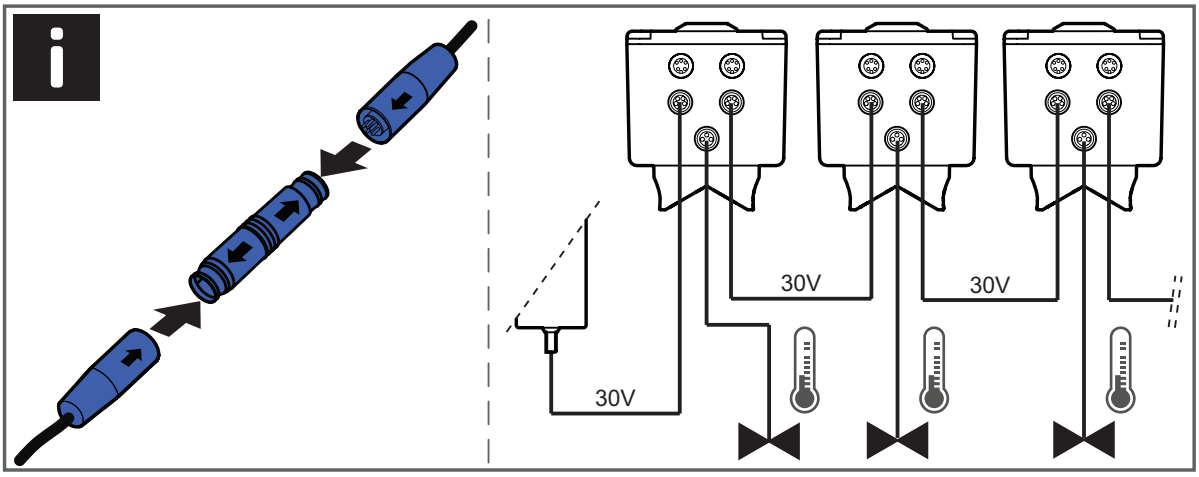
Note

Never connect or disconnect the cable when the power supply is active!

1. Connect the first connector of the connecting cable to one of the two M8 bushes on the controller (→ makes a click).
2. Connect the other connector of the connecting cable to one of the two M8 bushes on the next controller (→ makes a click). It is not relevant which of the two lower M8 bushes is used for this purpose.

Connect all other Hycleen Balance controllers with the same procedure.





Note

The connecting cables can be extended with a Hycleen coupling. Obey the maximum length of the cables: See the instructions that follow.

Note

Maximum length of the sum of the connecting cables in a chain attached to a power supply unit: 100 m.

Maximum number of controllers in a chain that are attached to a power supply unit: 10 pieces.

If the building contains more than 10 valves and/or 100 m of cable, use an additional power supply unit.

Note

Risk of malfunction due to inadequate installation.

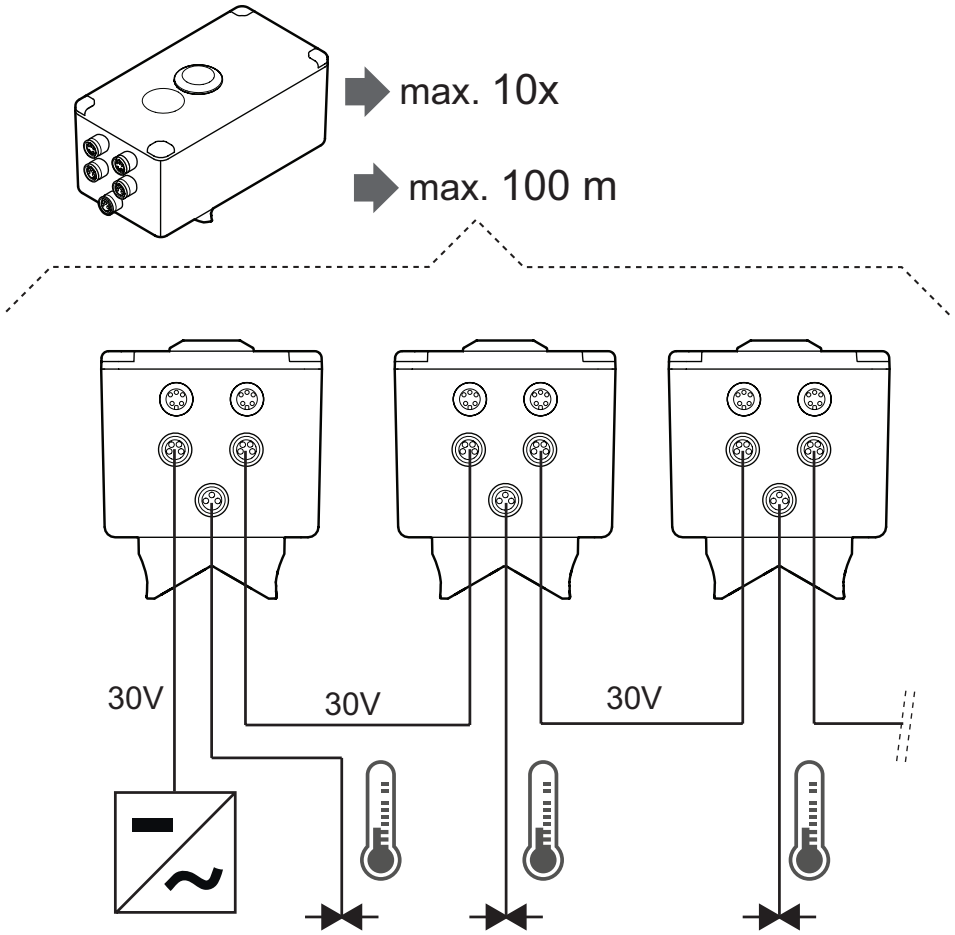
If the M8 connector is not put into the bush correctly, the connector can become loose. This can cause a loss of functionality! Make sure that all the connectors of the connecting cables are correctly connected.

Note

Never connect or disconnect the cable when the power supply is active.

Note

The cables can be put directly on the circulation line. If necessary, the cables can be put on the outside of the insulation. Use binding ties that are resistant to temperatures up to 90°C.


max. 10x
max. 100 m
30V
30V
30V

5 Commissioning

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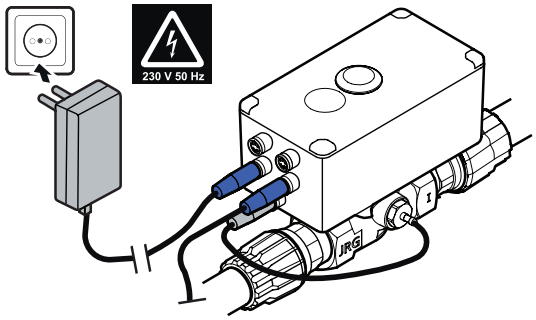
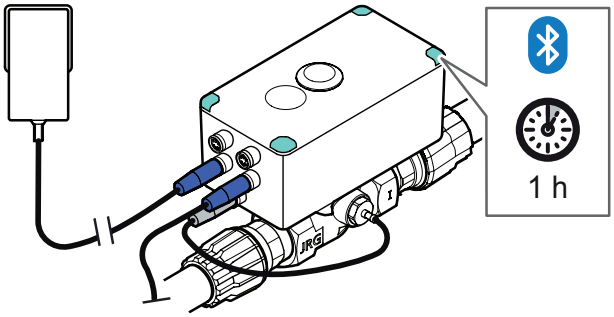
5.1 Electrical connection

Note

Connect only the first valve to the power connection. The downstream valves are then supplied with power via the connecting cables.

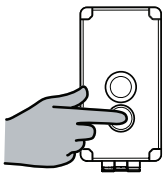
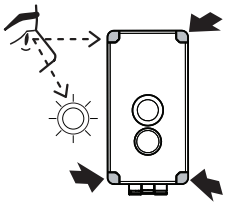
As soon as the valves are connected in series, the first valve can be connected to the power connection with the power supply unit and energised for commissioning.





5.2 Interaction button

The button can be used to do various actions:

	ON	OFF	reboot	reset	Standard operation, no action
	< 5 s	> 5 s < 10 s	> 10 s < 15 s	> 15 s < 20 s	> 20 s
					

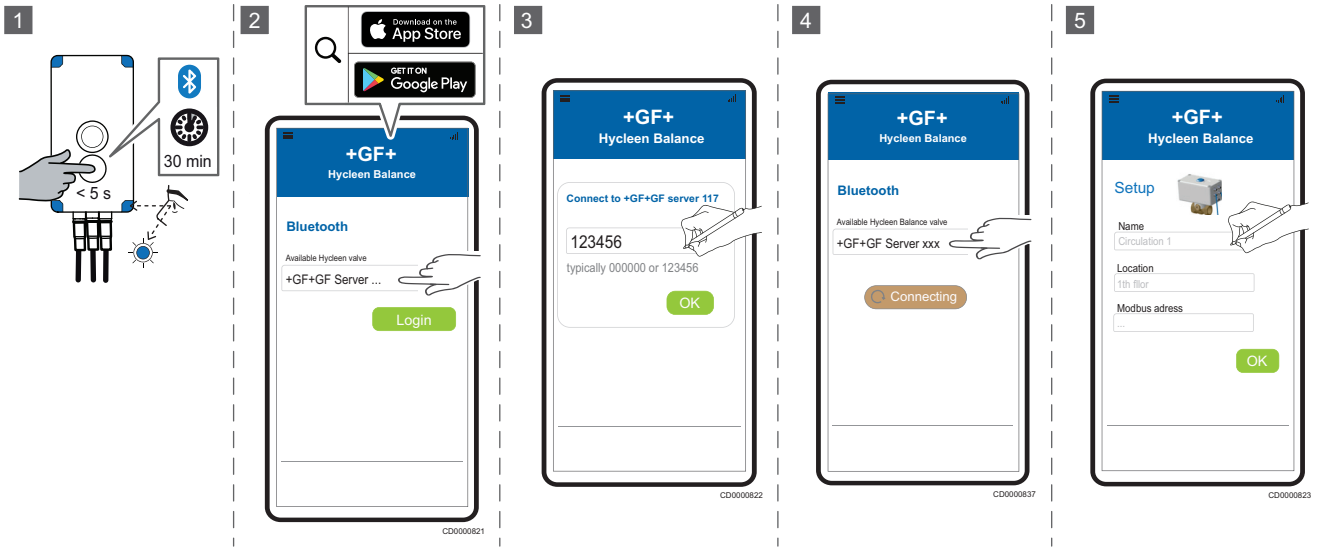
5.3 Commissioning/Bluetooth connection

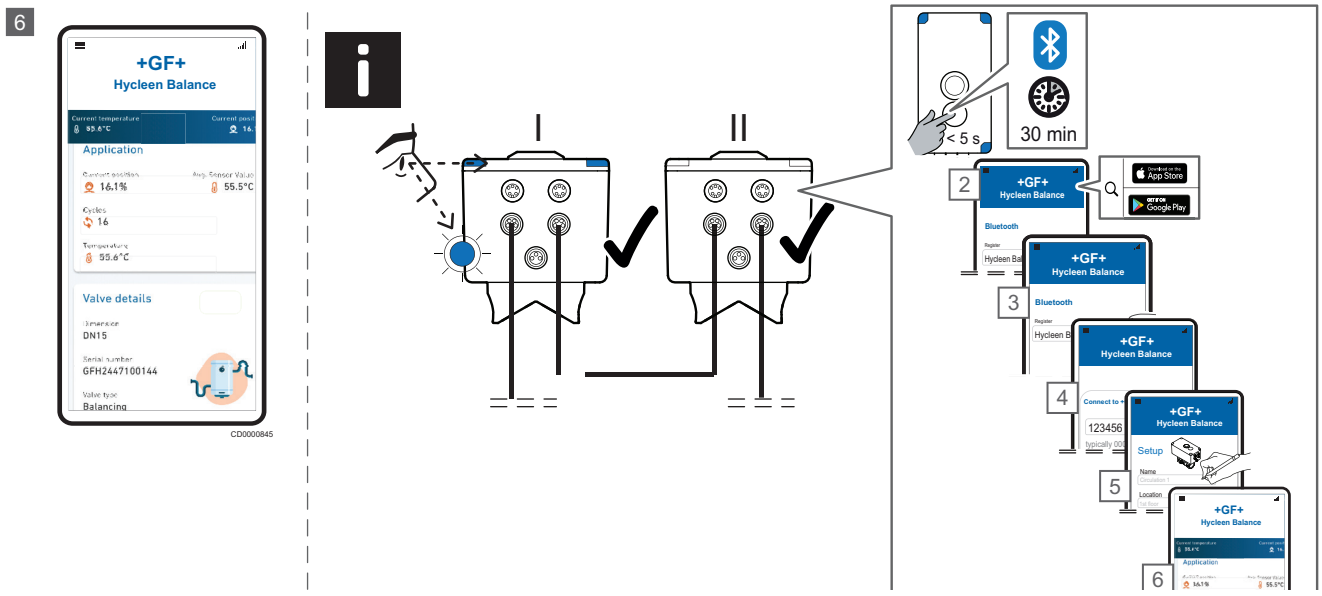
Connection to the app

For the Bluetooth connection, download the Hycleen Balance / Flush app to your smartphone. Continue as follows:

1. Push the button for < 5 seconds.
2. Start the app and select a valve. If no valve is shown, click "Available".
3. Enter the Bluetooth password for the connection: Select the valve and enter **123456**. Click OK.
4. The related Hycleen valve is connected.
5. Commissioning screen, input: Name of the valve, language etc. The Modbus address is given automatically at random. Click OK.
6. Home screen: When this screen is shown, the valve is commissioned and the next valve is supplied with power. The next valve can be commissioned as the app goes back to the home screen that shows the list of valves.

Do the procedure again for each controller in the network chain.





5.4 LED coding

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If a valve is connected to the power supply, the LEDs come on. The frequency or light colour shows the visual information that follows:

Colour	LED	Info
Green	Flashes 1x every 30 seconds	Difference between the temperature setpoint and average temperature in the last 24 hours: +/- 2 °C
	Flashes 2x every 30 seconds	Difference between the temperature setpoint and average temperature in the last 24 hours: +/- 2 °C to +/- 5 °C
	Flashes 3x every 30 seconds	Difference between the temperature setpoint and average temperature in the last 24 hours: >+/- 5 °C
Red	Flashes	Error
Blue	Flashes	Bluetooth connection with smartphone/tablet
Light green	Constant	Flushing procedure in progress
Light blue	Constant	Start, calibration
	Flashes	Maintenance

6 Connection to building control technology (BMS)

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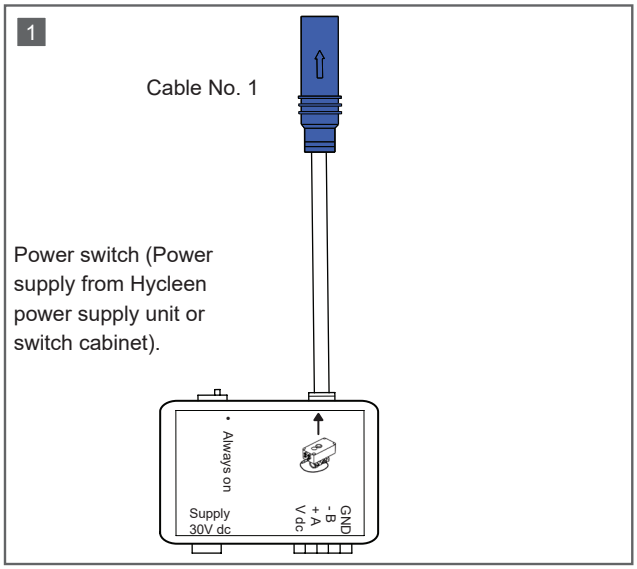
Use the GF Hycleen BMS connection and bus extension to integrate the Hycleen Flush valves into the Building Management System (BMS) (see cable no 1 in the wiring diagram that follows). Install the GF Hycleen BMS connection and bus extension between the power supply and the first valve. The power and communication cables can be used to communicate with all valves connected to the bus.

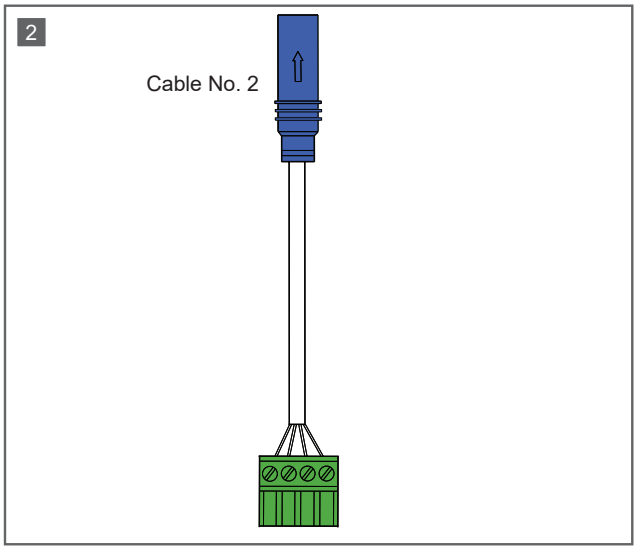
If more than 10 valves are to be connected to the bus, extend the bus between the tenth and eleventh valve. At this location, another cable no 1 and the associated cable no 2 are connected. Connect another power supply (see wiring diagram that follows).

Max. number of valves on the same bus: 245 valves

RS-485 interface: The valve has a receiver impedance of 1/8 unit load.

For BMS programming, see separate document, GF Hycleen Modbus Register.





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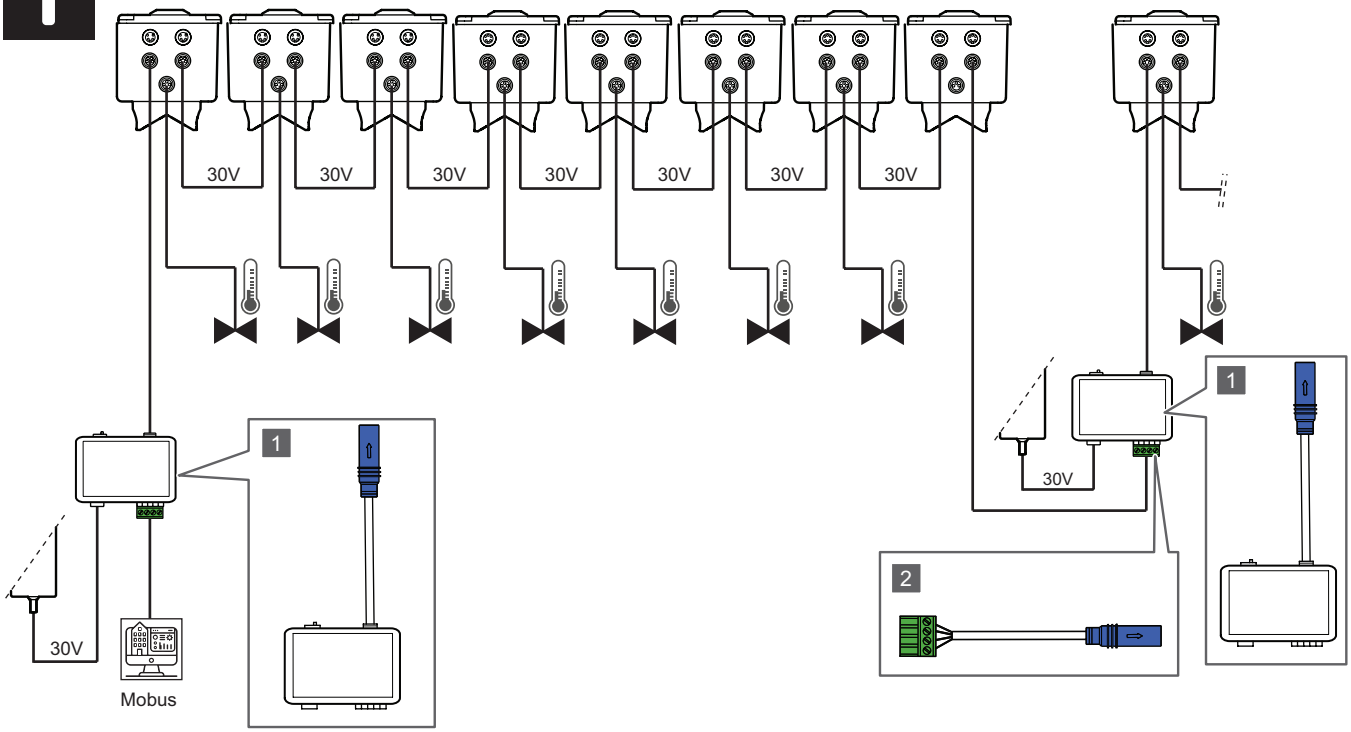

7 Technical data

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Maintenance

Do a check of the seals of the GF Hycleen Balance yearly. After a long power failure, do a check of the valve and manually close the valve if necessary.

Customer Service hotline: +41 61 975 23 77, info.jrg.ps@georgfischer.com

Checks

Yearly check of the seals of the GF Hycleen Balance valve.

Disposal

System components of the GF Hycleen Balance valve can be discarded in accordance with local regulations.

Item	Value
Housing:	Lead-free gunmetal (RG+)
Tappet/seat:	Stainless steel
Valve cone:	RG+ / EPDM
Seals:	EPDM
Intended for operation with:	Medium drinking water
Dimensions:	DN 15/20
Water temperature:	1 – 80 °C
Control accuracy:	< ± 1 °C
Max. operation temperature:	90 °C
Max. operating pressure:	10 bar
Ambient temperature:	0 – 45 °C
Power supply:	30 V DC
Actuator, stroke:	Stroke 5/7 mm
Valve delivery state:	50% open
Operating voltage:	30 V DC
Open/close power consumption:	5 W
Idle power consumption:	1 W
Close/open time:	approx. 15 s/20s
Housing class:	IP 44
BLE operating frequency:	2402 ~ 2480 MHz
BLE peak:	2,2 dBm
RS-485 interface	1/8-unit-load

8 Error messages and troubleshooting

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You can see the troubleshooting in the Hycleen App, in the Notifications chapter.

8.1 Error categories

Error code		Description	Category
xx0xxx		**System**	
	300001	Initialisation necessary	Info
	300002	Device initialisation started	Notification
	300003	Device initialisation completed	Notification
	100006	Controller communication error	Error
	100008	PT 1000 not connected	Error
	200009	Drive defective	Fatal error
	100011	Unknown error -> do a restart of the valve	Error
	300013	Memory almost full	Info
	300014	Memory full, historical data deleted	Info
	100015	Sensor1 (4 − 20 mA) not connected	Error
	100016	Sensor2 (4 − 20 mA) not connected	Error
xx1xxx		**Network**	
	301002	Bluetooth connection made	Info
	301003	Bluetooth connection stopped	Info
xx2xxx		**Configuration**	
	602001	Max. position changed	Change log
	602004	Min. position changed	Change log
	302039	Calibration started	Info
	102040	Calibration not completed	Error
	302041	Calibration done	Info
xx5xxx		**Updates**	
	305003	SW update started	Info
	105004	SW update download not completed	Error
	305005	SW update downloaded	Notification
	405006	SW update in progress	Wait
	305008	SW update completed	Info
	105007	SW update not completed	Error
	305001	Current SW version	Info
	305002	Current FW version	Info
xx6xxx		**Maintenance**	
	606001	Maintenance day changed	Change log
	606002	Maintenance start time changed	Change log
	306003	Maintenance process started	Notification
	306004	Maintenance process completed	Notification
	306020	Device is at life cycle 55000	Info
	306021	Device is at life cycle 60000, replace the device	Info

8.2 Troubleshooting

Error code	Error description	Description
100006	Controller communication error	Contact Technical Support if the valve does not operate or if the problem occurs more than once a day, otherwise the valve will only do a restart.
100008	PT 1000 not connected	Do a check to make sure that the temperature sensor is correctly connected to the controller.
		Do a restart from the app
		If the valve still does not operate, the cable can have damage or the sensor can be defective. Replace the sensor.
200009	Motor defective	Do a check to make sure that the controller is correctly installed on the valve.
		Start the calibration process again from the app ("Settings").
		Push and hold the interaction button for 15 seconds or set the controller to the factory default settings via the app ("Settings").
		If the problem continues, contact technical support or replace the controller.
100011	Unknown error	Start the controller again
100015	Sensor1 (4−20 mA) not connected	Occurs when the sensor is configured in the app but is not connected.
		Remove the configuration from the app if the sensor is not available.
		Otherwise:
		Do a check to make sure that the sensor is correctly connected to the controller.
		Start the app or push the interaction button.
		If the valve still does not operate, the cable can be damaged or the sensor can be defective.
100016	Sensor2 (4−20 mA) not connected	Occurs when the sensor is configured in the app but is not connected.
		If no sensor is available, remove the configuration from the app.
		Otherwise:
		Do a check to make sure that the sensor is correctly connected to the controller.
		Start the device again from the app or push the interaction button.
		If the valve still does not operate, the cable can be damaged or the sensor can be defective.
301003	Bluetooth connection stopped	If the valve still does not operate, the cable can be damaged or the sensor can be defective.
		If the valve still does not operate, the cable can be damaged or the sensor can be defective.
102040	Calibration not completed	Do a check to make sure that the controller is correctly installed on the valve.
		Start the calibration process again from the app ("Settings").
		Push and hold the interaction button for 15 seconds or set the valve to the factory default settings via the app ("Settings").
		If the problem continues and the valve is stuck:
		Remove the controller and release the valve spindle lock with a spanner.
		If the problem continues, replace the controller.
302041	Calibration done	

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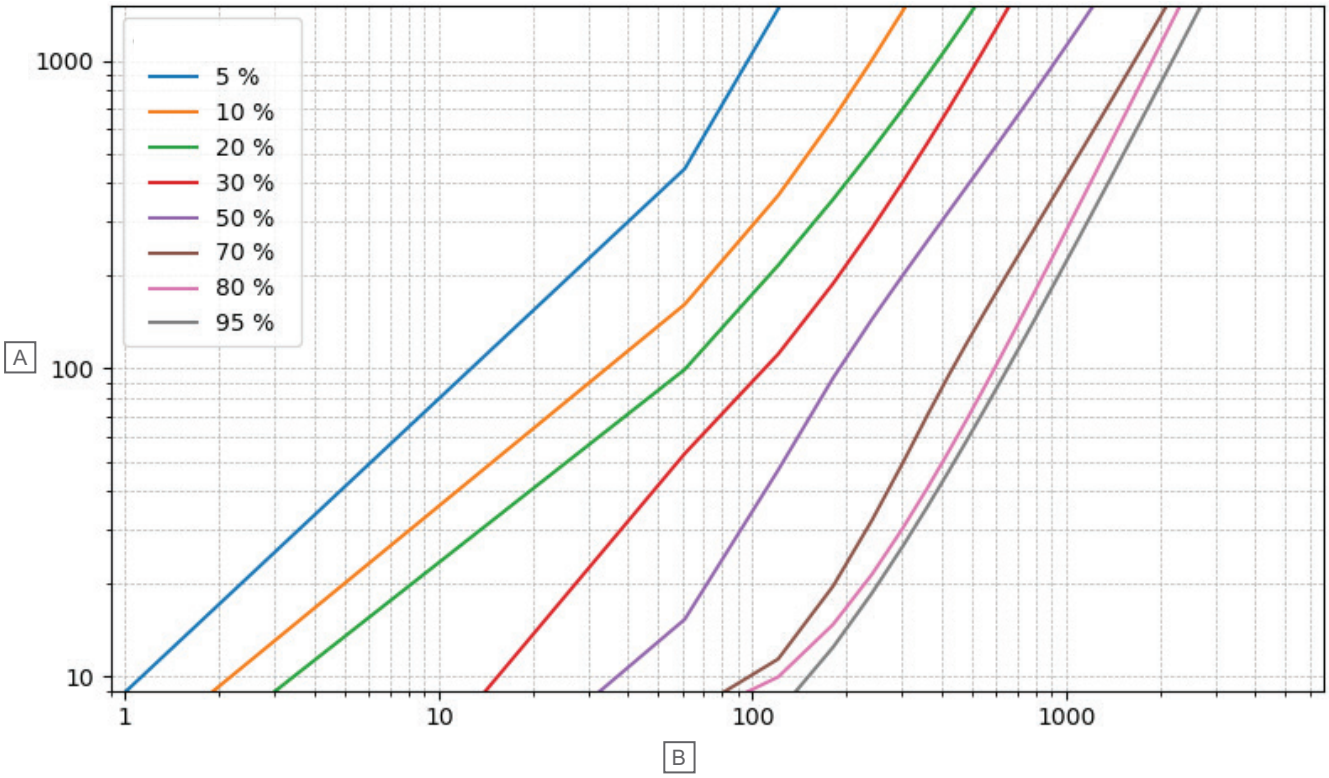
Error code	Error description	Description
105004	SW update download not completed	Try to upload again. If the upload is not completed again, continue as follows:
		Download the software again from the Internet and try again.
305005	SW update downloaded	If the valve still does not operate, contact Technical Support.
105007	SW update not completed	Start the controller again either via the app or the interaction button.
305001	Current SW version	If the valve still does not operate, contact Technical Support.
308010	T_{min} (mean value) for 24 h below the threshold	Do a check of the valve opening degree. If the valve is fully open, the problem is somewhere else in the system.
		Do a check of the hot water temperature.
		Do a check of the circulation pump.
		Do a check to make sure that the valves on the circulation line are closed.
		~~Do a check to make sure that there is air in the circulation lines.~~
		Do a check of the backflow preventer. It is possible that cold water can go back into the warm water circuit.
-	The valve is not supplied with power (no indicator light, no flash, no response).	During the commissioning procedure: Do the commissioning procedure for the first/previous valve. The valve will not supply current to the next valve until it is fully operational.
		Do a check of the connection setting in the app settings: The last valve in the chain must have connection 1, the other valves must have connection 0.
-	The valve does not receive current.	Do a check to make sure that the connector is plugged into this valve and the previous valve.
		Do a check of the connection on the previous valve; it must be 0.
		Do a check of the power supply.
		Do a check of the wiring for damage.
-	The valve does not move and the indicator light does not come on.	Do a check of the power supply. Do a check of the cable for damage.
-	I cannot connect my smartphone/tablet to the valve via Bluetooth.	Do a check of your smartphone/tablet Bluetooth settings/permissions.
-	How can I import the CSV file into Excel?	Use the CSV function: Open Excel, Data > From Text/CSV > Select the necessary file.
-	What do I do after the update if it still does not work?	Do a restart of the valve.
		Do a check of the application parameters in the app.

9 Pressure drop curves

9.1 Hycleen Balance DN 15



Item	Description
A	Differential pressure [mbar]
B	Flow [l/h]

Valve degree of opening	Flow rate at 1 bar Pressure drop (l/h)	K_v (m^3/h)	
5%	98	0,1	$K_{v,\ min}$
10%	240	0,24	
20%	390	0,39	
30%	522	0,52	
50%	930	0,93	
70%	1656	1,66	$K_{v,\ TD}$
80%	1884	1,88	
95%	2184	2,18	$K_{v,\ TD}$

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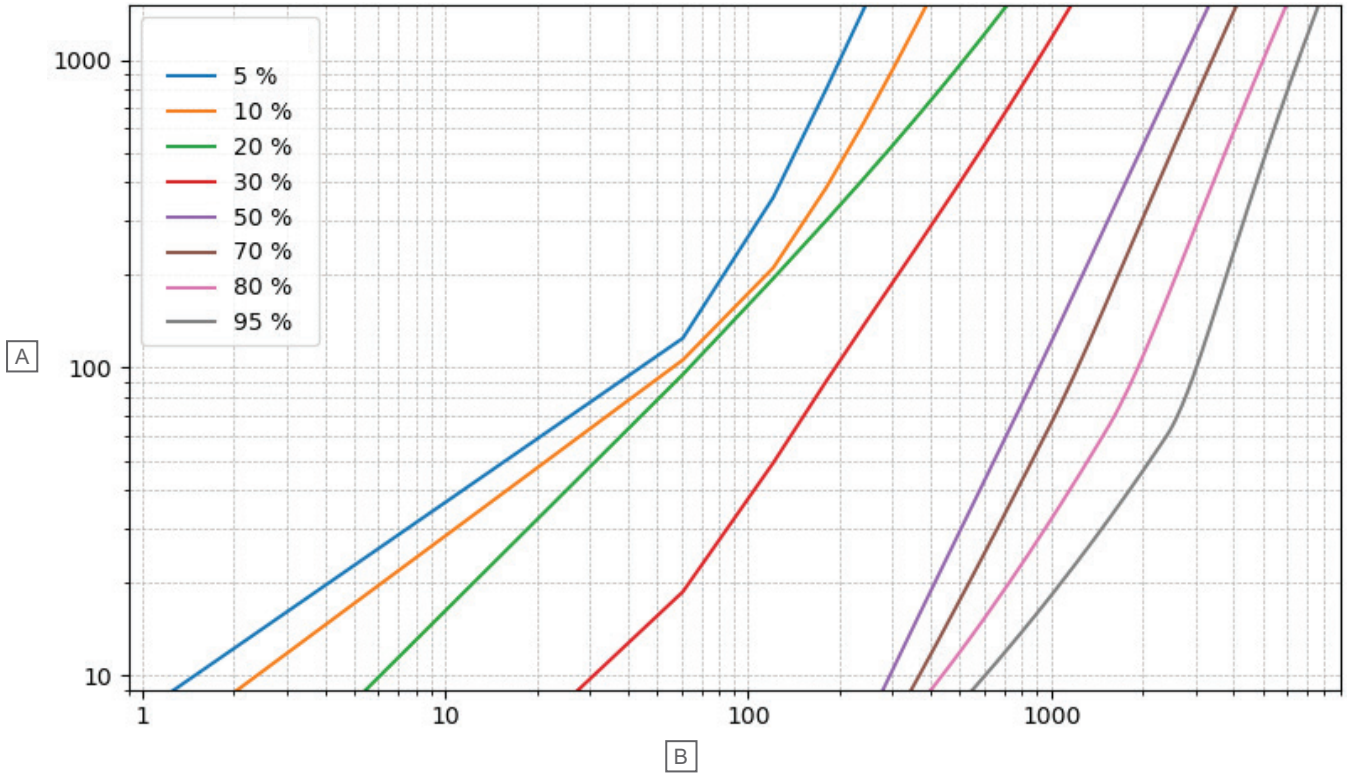
9.2 Hycleen Balance DN 20



Item	Description
A	Differential pressure [mbar]
B	Flow [l/h]

Valve degree of opening	Flow rate at 1 bar Pressure drop (l/h)	K_v (m^3/h)	
5%	201	0,2	$K_{v,\ min}$
10%	312	0,31	
20%	516	0,52	
30%	1026	1,03	
50%	2790	2,79	
70%	3402	3,4	$K_{v,\ TD}$
80%	5016	5,02	
95%	6552	6,55	$K_{v,\ TD}$

10 Mass flow rate as a function of valve opening and pressure drop

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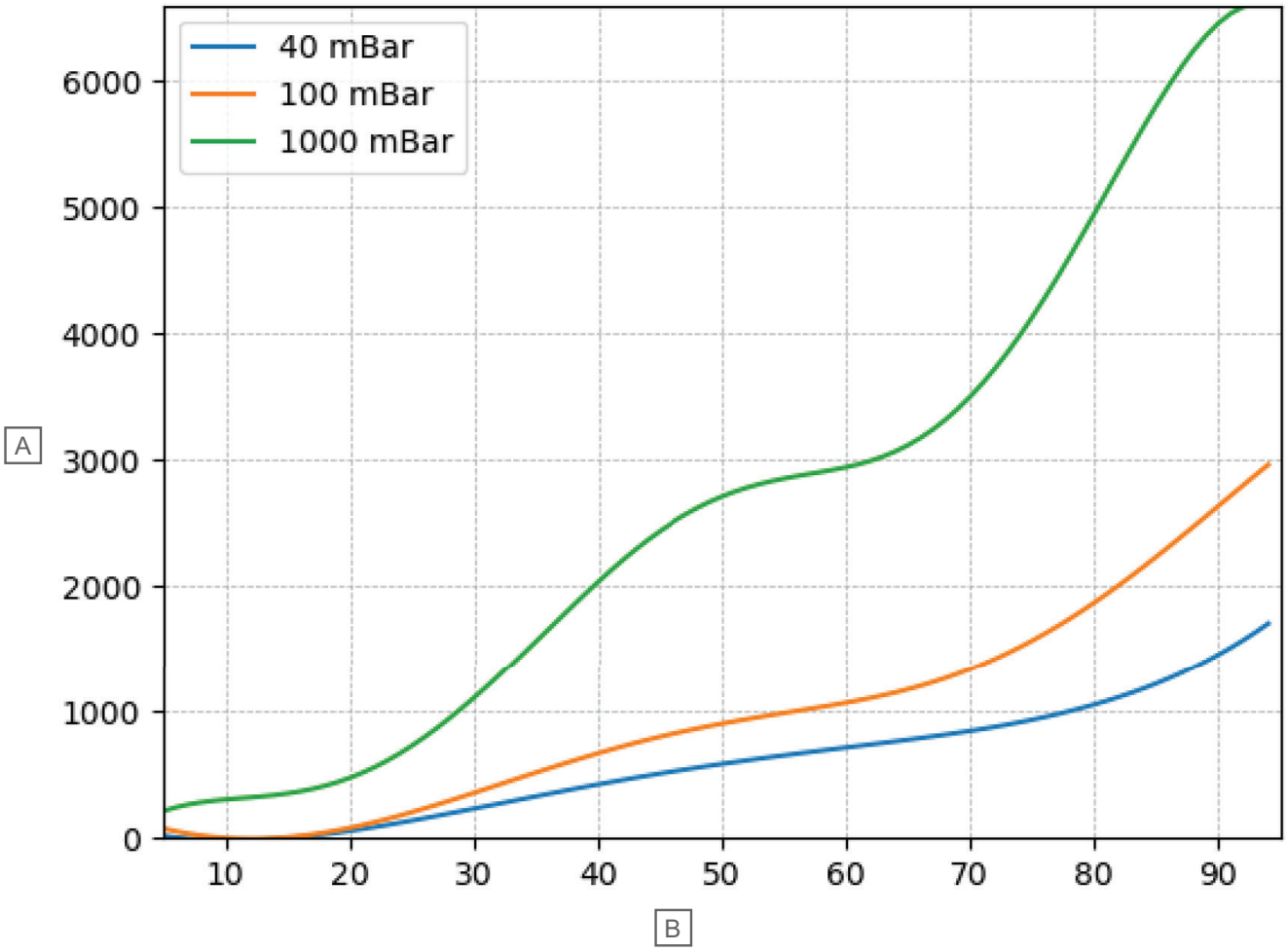
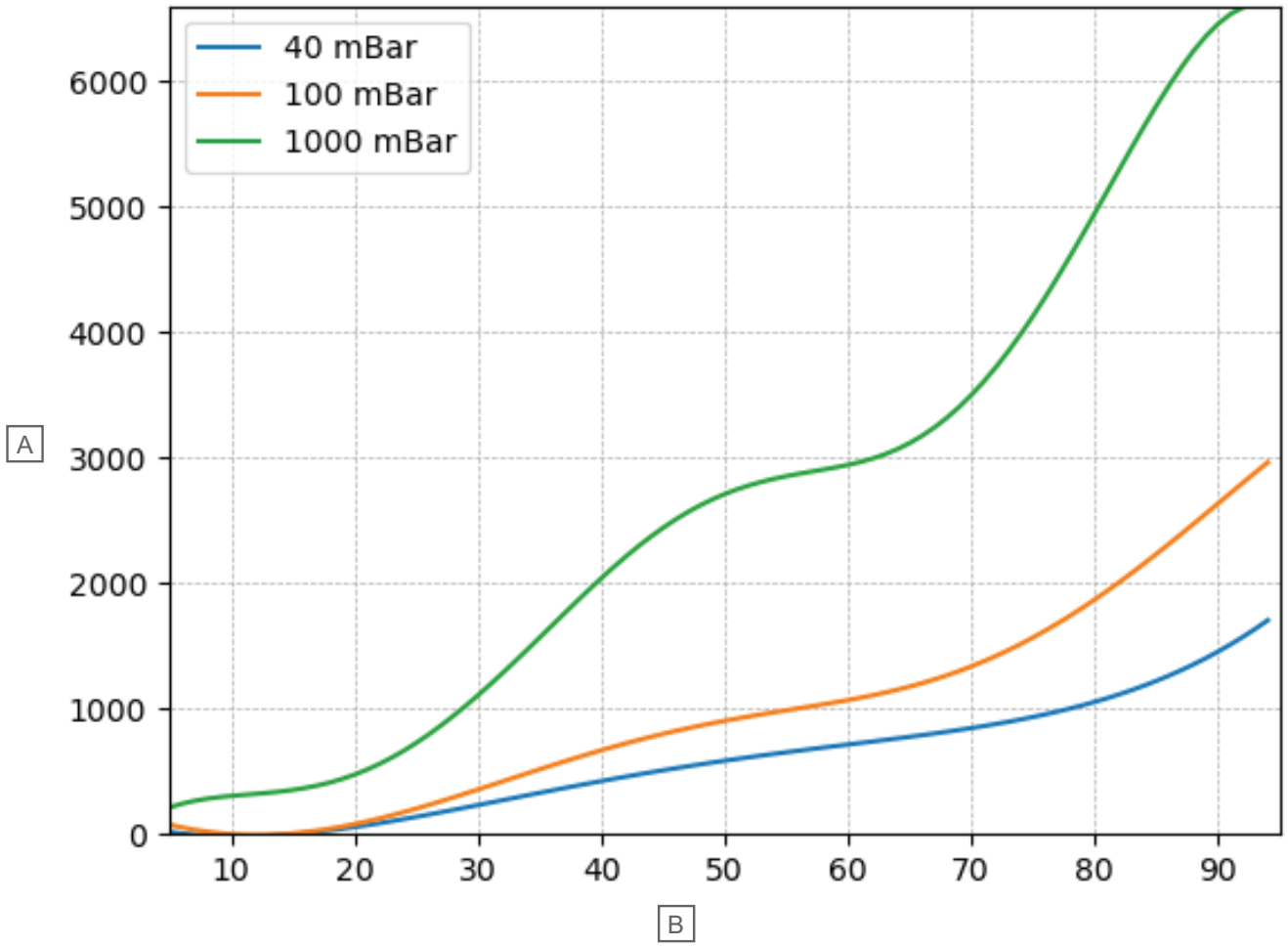
10.1 Hycleen Balance DN 15



Item	Description
A	Flow [l/min]
B	Opening degree [%]

10.2 Hycleen Balance DN 20



Item	Description
A	Flow [l/min]
B	Opening degree [%]

11 Regulatory conformance

The GF Hycleen Balance and GF Hycleen Flush & Shut-Off wireless products obey the guidelines that follow:

- CE
- UKCA
- EAC (869 MHz wireless version only, not 868,3 MHz version)

EU/UK Declaration of Conformity

GF hereby declares that the wireless equipment GF Hycleen Balance and GF Hycleen Flush & Shut-Off obey the relevant EU harmonisation legislation. [1)]

The full text of the EU/UK Declaration of Conformity is available on the Internet at:
https://www.uponor.com/doc/1162345

1) The certification and conformity marks indicated are on the corresponding GF product.

Notes:

This device obeys part 15 of the FCC regulations (US Federal Communications Commission). Operation is subject to the two conditions that follow:

1. This device must not cause harmful interference.
2. This device must accept any interference, including interference that can cause undesired operation.

Note: A test of this device was done in accordance with part 15 of the FCC regulations and obeys the limits for Class B digital devices. These limits are designed to provide sufficient protection against harmful interference in residential buildings. This device supplies, uses and can radiate high-frequency energy. If the device is not installed and used in accordance with the instructions, it can cause harmful interference to radio communications. But, there is no guarantee that interference will not occur in a particular installation. If this device causes interference to radio or television reception, which can be shown if the equipment is set to on and then set to off, the user can try to correct this with one or more of the measures that follow:

- Align the receiving antenna again or change its routing.
- Increase the distance between the device and the receiver.
- Connect the device to a socket that is not connected to the same circuit as the receiver.
-

This device contains licence-exempt transmitters/receivers that obey the Canadian Innovation, Science and Economic Development Authority's licence-exempt RSS.

Importer for the United Kingdom:
GEORG FISCHER BUILDING FLOW SOLUTION Ltd Paradise Way, Coventry CV2 2ST, United Kingdom

Please note that changes that are not expressly approved by the regulatory authority can void the permission for the user to operate the equipment.

Georg Fischer JRG AG

Hauptstrasse 130
4450 Sissach, Switzerland

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