

Digital mixing valve with connectivity

6003 series



LEGIOMIX[®] evo



Technical documentation:



Function

The digital mixing valve is used in centralized systems that produce and distribute domestic hot water. Its function is to guarantee and maintain the temperature of the domestic hot water delivered to the user when there are variations in the temperature and pressure of the hot and cold water at the inlet or in the draw-off flow rate.

The controller is designed for remote management via Caleffi Cloud and using specific transmission protocols used in BAS (Building Automation Systems). The controller features a set of programs that can be enabled to perform thermal disinfection to control Legionella in the recirculation loop. The disinfection cycles are fully automatic based on the day of the week and time of day selected. All parameters are constantly updated and logged.

Certifications



NSF/ANSI/CAN 61
NSF/ANSI/CAN 372

Product range

6003 series	Digital mixing valve with connectivity. Threaded version	3/4", 1", 1 1/4", 1 1/2", 2"
6003 series	Digital mixing valve with connectivity. Flanged version	2 1/2", 3"

Technical specifications

Valve body

Materials*:

- Body: DZR low-lead brass, EN 12165 CW724R
- Ball: AISI 316 stainless steel
- Slip-on flanges for sizes 2 1/2" & 3": galvanized carbon steel
- Hydraulic O-ring seals sizes 3/4" - 2": peroxide-cured EPDM
- Hydraulic O-ring seals sizes 2 1/2" - 3": NBR
- Ball seats: PTFE

*Meets the "lead free" requirement of Section 1417 of the Safe Drinking Water Act (SDWA). This product has a weighted average lead content of less than 0.25% for its wetted surfaces contacted with consumable water.

Mixing valve performance

Accuracy:	± 3 °F (± 2 °C)
Max. operating differential pressure (dynamic):	70 psid (5 bar)
Max. ratio between inlet pressures (H/C or C/H):	2:1
Max. body pressure rating:	230 psi (16 bar)
Max working pressure:	150 psi (10 bar)
Max. differential pressure:	70 psi (5 bar)
Max. inlet temperature:	212 °F (100 °C)
Temperature gauge scale:	32 - 176 °F (0 - 80 °C)
Suitable fluids:	water
Max. water hardness:	10 grains
Main connections:	
• NPT male, sweat and press union	3/4", 1", 1 1/4", 1 1/2" and 2"
• ANSI B16.5 150 CLASS RF	2 1/2" & 3"

System specifications

Electric supply:	24 V~(AC) ± 10% 50/60 Hz
	115/24 VAC transformer included in package
Average power consumption:	5 VA
Stand-by power consumption:	3.5 VA
Max. power consumption:	
• Controller:	9 VA
• Actuator:	sizes 3/4" - 2": 6 VA; sizes 2 1/2" & 3": 10 VA
• Total:	sizes 3/4" - 2": 15 VA; sizes 2 1/2" & 3": 19 VA
Ambient temperature:	
• Operation:	32 - 120 °F (0 - 50 °C), max humidity 95% EN 60721-3-3 Cl. 3K4
• Transportation:	-20 - 160 °F (-30 - 70 °C), max. humidity 95% EN 60721-3-2 Cl. 2K3
• Storage:	-5 - 160 °F (-20 - 70 °C), max. humidity 95% EN 60721-3-1 Cl. 1K2
Adjustment temperature range:	70 - 185 °F (20 - 85 °C)
Disinfection temperature range:	100 - 185 °F (40 - 85 °C)
Charge reserve:	15 days in the event of electric supply failure, with a rechargeable backup button battery
Battery recharging time:	12 h
Cable for connection to the electricity supply:	Insulated cable equivalent or greater than SJ00W, 16 - 18 AWG

Controller

Display:	Touch screen, capacitive color, 4.3"
Housing:	self-extinguishing A EN 60721-3-3 Cl. 3K4 BS VO, color black
Electric supply:	24 V ~ (AC) $\pm 10\%$ 50/60 Hz 115/24 VAC transformer included in package
Max power consumption:	9.0 VA
Average power consumption:	5.0 VA
Stand-by power consumption:	3.5 VA
Adjustment temperature range:	70 - 185 °F (20 - 85 °C)
Disinfection temperature range:	100 - 185 °F (40 - 85 °C)
Ambient temperature:	
• Operation:	32 - 120 °F (0 - 50 °C), max. humidity 95% EN 60721-3-3 Cl. 3K4
• Transportation:	-22 - 160 °F (-30 - 70 °C), max. humidity 95% EN 60721-3-2 Cl. 2K3
• Storage:	-5 - 160 °F (-20 - 70 °C), max. humidity 95% EN 60721-3-1 Cl. 1K2
Protection class:	IP 54 (Class II appliance) surface mounted, includes hardware

Additional digital controller specifications 24 V (EN 60730-1)

Control type:	Type 1
Environmental pollution grade:	grade 2
Nominal pulse voltage:	500 V peak for over voltage category

Additional electrical specifications

Contact rating (24V):	
• 3-point mixing valve control:	1 A max / 24 V~(AC)
• Mixing valve control (0–10 V):	0 –10 V signal, (DC) / 500 mA
Relay:	10 (2) A / 24 V~(AC)
PTC self-recovery fuse:	30 V / 3.5 A

Compliant with directives:

24 V version:	FCC, IC, CE, UKCA
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Mixed outlet and recirculation return temperature sensors

Body material:	stainless steel
Type of sensitive element:	NTC
Working temperature range:	14 - 255 F (-10 - 125 °C)
Resistance:	10 kΩ at 75 °F (25 °C)
Cable length:	39" (1 m)

Water storage temperature sensor

Body material:	stainless steel
Type of sensitive element:	NTC
Size:	Ø 6 mm
Working temperature range:	-13 - 230 F (-25 - 110 °C)
Resistance:	100 kΩ at 75 °F (25 °C)
Cable length:	75" (1.9 m)

Actuator for sizes ¾" - 2" with fail-safe* function

Electric supply from the regulator:	24 V (AC/DC) $\pm 15\%$ 50/60 Hz
Control signal:	0–10 V
Power consumption:	6 VA
Ambient temperature:	
• Operation:	32 - 130 °F (0 - 55 °C), max. humidity 95 % EN 60721-3-3 Cl. 3K4
• Transportation:	-22 - 160 °F (-30 - 70 °C), max. humidity 95 % EN 60721-3-2 Cl. 2K3
• Storage:	-4 - 160 °F (-20 - 70 °C), max. humidity 95 % EN 60721-3-2 Cl. 2K3
Supply cable length:	32" (0.8 m)

Actuator for sizes ¾" - 2" with fail-in-place function

Electric supply from the regulator:	24 V (AC) $\pm 10\%$ 50/60 Hz
Control signal:	3-point
Power consumption:	6 VA
Ambient temperature:	
• Operation:	14 - 130 °F (-10 - 55 °C), max. humidity 95 % EN 60721-3-3 Cl. 3K4
• Transportation:	-22 - 160 °F (-30 - 70 °C), max. humidity 95 % EN 60721-3-2 Cl. 2K3
• Storage:	-4 - 160 °F (-20 - 70 °C), humidity 95 % EN 60721-3-1 Cl. 1K2, max
Supply cable length:	32" (0.8 m)

Actuator for 2 ½" - 3" flanged sizes with fail-safe* or fail-in-place function

Electric supply from the controller:	24 V (AC/DC) $\pm 15\%$ 50/60
Control signal:	0–10 V
Power consumption:	10 VA
Ambient temperature:	
• Operation:	32 - 130 °F (0 - 55 °C), max. humidity 95 % EN 60721-3-3 Cl. 3K4
• Transportation:	-22 - 160 °F (-30 - 70 °C), max. humidity 95 % EN 60721-3-2 Cl. 2K3
• Storage:	-4 - 160 °F (-20 - 70 °C), max. humidity 95 % EN 60721-3-1 Cl. 1K2
Supply cable length:	75" (1.9 m)

Additional actuator specifications (EN 60730-1/-2-14)

Protection cover:	self-extinguishing V0
Protection class:	IP 65
Compliance with Directives:	CE, UKCA, FCC, IC
Control type:	Type 1
Environmental pollution grade:	grade 2
Activation type:	multi-position
Nominal pulse voltage:	500 V peak for over voltage category II
Dynamic torque (threaded versions):	11 lb-ft (15 Nm)
Dynamic torque (flanged versions):	25 lb-ft (35 Nm)

*The fail-safe function automatically closes the hot inlet port in case of power failure.

Certifications

- ASSE 1017, certified and listed by ASSE.
- NSF/ANSI/CAN 61 and NSF/ANSI/CAN 372, US and Canadian Low-Lead and Lead-Free materials contents laws for drinking water system components. Certified by ICC-ES.
- CSA B125.3, UPC, IPC, IRC and NPC compliance for use in accordance with U.S. and Canadian plumbing codes. Certified and listed by IAPMO R&T.

Note: Cable extensions:

If extending the cables is necessary, contact Caleffi for information.

LEGIOMIXevo Valve Sizing & Selection

1. Determine the project's peak domestic hot water demand (GPM) from the design documents.
2. Select a value with a design flow rate (7.5 psid pressure drop) equal to or greater than the calculated peak demand. A 7.5 psid pressure drop is recommended to provide optimum modulating control. Higher flow rates, up to 20psid, may occur during intermittent peak demand but should not be used as the bases for valve sizing.
3. Pipe velocity values are provided for reference only. Maximum allowable velocity depends on the piping material and applicable plumbing code. For example, the Uniform Plumbing Code recommends a maximum velocity of 5 ft/s for 140 °F (60 °C) water in copper pipe, which corresponds to approximately 29 GPM in 1-1/2" pipe. For this application, a 1" LEGIOMIXevo valve provides the appropriate design flow.

		GPM @ PSID across valve <i>velocity (FPS) by pipe size</i>								GPM by pipe size to comply with UPC			
Valve Specifications		Valve Size	PSID across valve	1	3	5	7.5	10	15	20	Copper Pipe size	GPM @ 5 FPS (hot water up to 140°F)	GPM @ 10 FPS (4)
Cv 9.7	2.2	3/4" (5)	GPM @ above PSID	10	17	22	27	31	38	43	3/4"	8.1	16
GPM min 1	27		<i>FPS in 3/4" pipe</i>	6	10	13	16	19	23	27	1"	14	27
GPM design 2	43		<i>FPS in 1" pipe</i>	4	6	8	10	11	14	16	1 1/4"	20	41
GPM max 3			<i>FPS in 1-1/4" pipe</i>	2	4	5	7	8	9	11	1 1/2"	29	57
Cv 21	3.1	1"	GPM @ above PSID	21	36	47	58	66	81	94	2"	49	99
GPM min 1	58		<i>FPS in 1" pipe</i>	8	13	17	21	24	30	34	2-1/2"	76	153
GPM design 2	94		<i>FPS in 1-1/4" pipe</i>	5	9	11	14	16	20	23	3"	109	218
GPM max 3			<i>FPS in 1-1/2" pipe</i>	4	6	8	10	12	14	16	4"	190	380
Cv 24	4.4	1 1/4"	GPM @ above PSID	24	42	54	66	76	93	107	5"	295	590
GPM min 1	66		<i>FPS 1-1/4" pipe</i>	6	10	13	16	19	23	26	6"	424	848
GPM design 2	107		<i>FPS 1-1/2" pipe</i>	4	7	9	12	13	16	19			
GPM max 3			<i>FPS 2" pipe</i>	2	4	5	7	8	9	11			
Cv 34	6.6	1 1/2"	GPM @ above PSID	34	59	76	93	108	132	152			
GPM min 1	93		<i>FPS in 1-1/2" pipe</i>	6	10	13	16	19	23	27			
GPM design 2	152		<i>FPS in 2" pipe</i>	3	6	8	9	11	13	15			
GPM max 3			<i>FPS in 2-1/2" pipe</i>	2	4	5	6	7	9	10			
Cv 48	8.8	2"	GPM @ above PSID	48	83	107	131	152	186	215			
GPM min 1	131		<i>FPS in 2" pipe</i>	5	8	11	13	15	19	22			
GPM design 2	215		<i>FPS in 2-1/2" pipe</i>	3	5	7	9	10	12	14			
GPM max 3			<i>FPS in 3" pipe</i>	2	4	5	6	7	9	10			
Cv 105	17	2-1/2"	GPM @ above PSID	105	182	235	288	332	407	470			
GPM min 1	288		<i>FPS in 2-1/2" pipe</i>	7	12	15	19	22	27	31			
GPM design 2	470		<i>FPS in 3" pipe</i>	5	8	11	13	15	19	22			
GPM max 3			<i>FPS in 4" pipe</i>	3	5	6	8	9	11	12			
Cv 120	22	3"	GPM @ above PSID	120	208	268	329	379	465	537			
GPM min 1	329		<i>FPS in 3" pipe</i>	6	10	12	15	17	21	25			
GPM design 2	537		<i>FPS in 4" pipe</i>	3	5	7	9	10	12	14			
GPM max 3			<i>FPS in 5" pipe</i>	2	4	5	6	6	8	9			

Note:
Because of the high flow capacity of the LEGIOMIXevo ball valve, it is not uncommon for the valve to be installed in piping that is one or two sizes larger than the valve body.

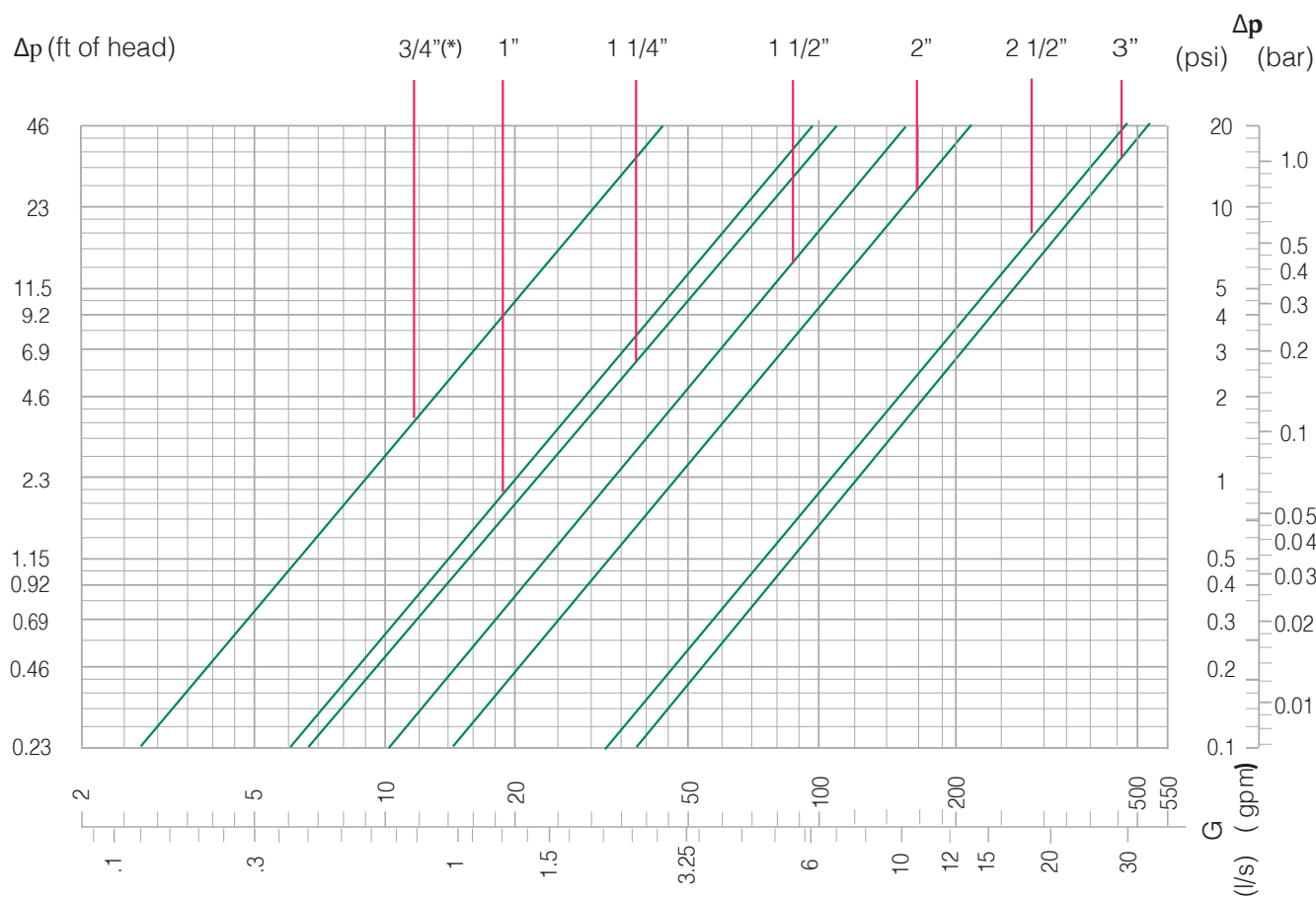
Note:

Because of the high flow capacity of the LEGIOMIXevo ball valve, it is not uncommon for the valve to be installed in piping that is one or two sizes larger than the valve body.

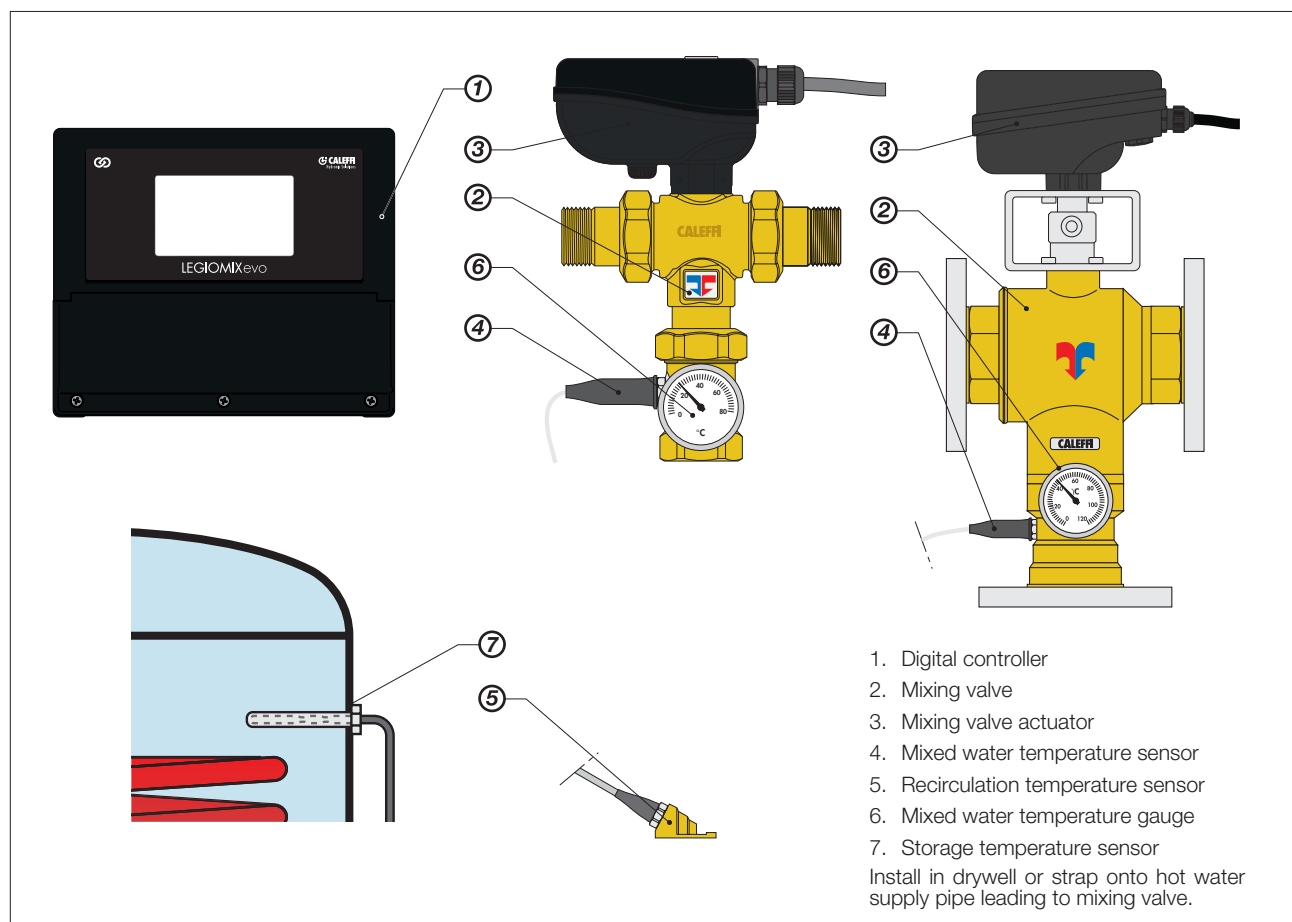
Footnotes:

1. GPM minimum for guaranteed stable control; size the recirculation pump to deliver at least this flow rate.
2. GPM at 7.5 PSID, suggested maximum flow for optimum modulating control
3. GPM maximum @ 20 PSID; max short term pressure drop and flow for the valve
4. For fluid velocity > 5 fps, verify with pipe manufacturer's guidelines.
5. Includes 3/4 inch body models with 1 inch connections, Cv 9.7. Includes 3/4 inch body models with 1" connections, Cv 9.7.

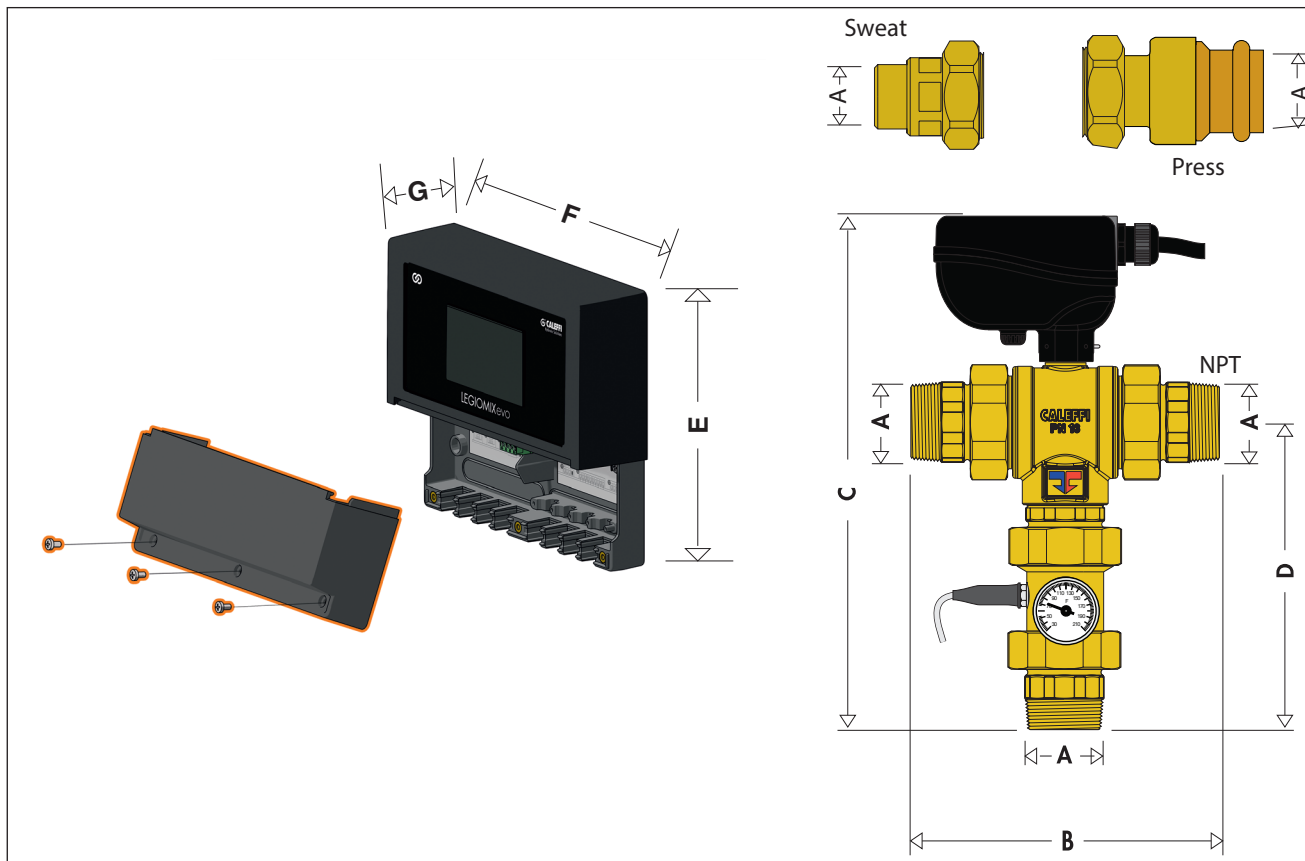
Hydraulic characteristics



Characteristic components



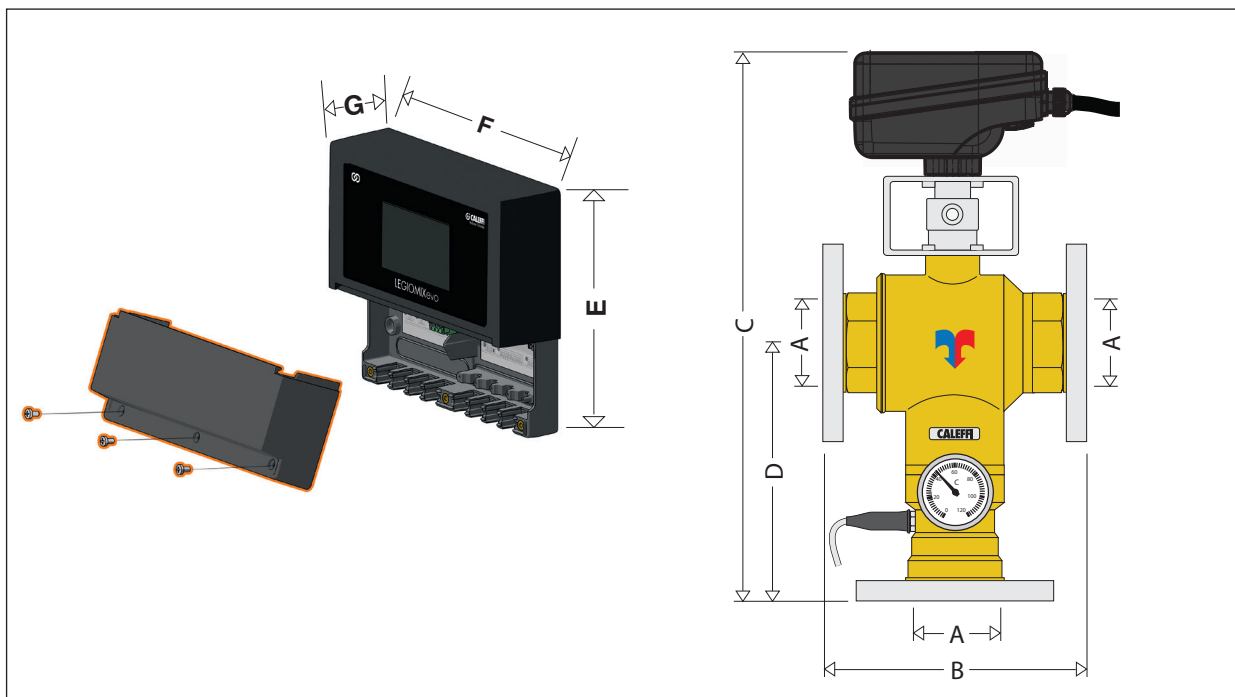
Dimensions



Code (*)	A	B	C	D	Lay length	E	F	G	Wt (lb)
600354A, AF	¾" MNPT	5"	9 ⅜"	5 ⅜"	--	8 ⅜"	9 11/16"	2 11/32"	5.1
600359A, AF	¾" sweat	4 ¾"	9 ¼"	5 ¼"	--				5.1
600356A, AF	¾" press	5 ⅜"	9 9/16"	5 9/16"	4 1/16"				5.1
600364A 001**	1" MNPT	5 5/16"	9 13/16"	5 13/16"	--				5.3
600364AF 001**									
600369A 001**	1" sweat	4 7/8"	9 9/32"	5 9/32"	--				5.3
600369AF 001**									
600366A 001**	1" press	6 7/8"	10 ¼"	6 ¼"	4 13/16"				5.2
600366A 001**									
600364A, AF	1" MNPT	6 ¼"	11"	6"	--				7.3
600369A, AF	1" sweat	4 ¾"	10 ¼"	5 ¼"	--				7.3
600366A, AF	1" press	7"	11 ⅜"	6 ⅜"	5 ½"				7.3
600374A, AF	1¼" MNPT	7 ¼"	11 7/8"	6 ¼"	--				8.2
600379A, AF	1¼" sweat	5 7/8"	11 1/8"	5 ½"	--				8.2
600376A, AF	1¼" press	9 ¾"	13 1/8"	7 ½"	7 ¾"				8.2
600384A, AF	1½" MNPT	9 1/8"	14 ⅜"	9 ½"	--				21.0
600389A, AF	1½" sweat	7 7/8"	13 1/8"	8 ¼"	--				21.0
600386A, AF	1½" press	10 1/8"	14 7/8"	10"	7 ⅜"				21.0
600394A, AF	2" MNPT	9 ½"	14 ½"	7 5/16"	--				22.0
600399A, AF	2" sweat	8"	13 11/16"	6 ½"	--				22.0
600396A, AF	2" press	13 ¾"	16 5/8"	9 7/16"	10 ¾"	22.0			

*A corresponds to 3 point floating control fail-in-place actuator; AF corresponds to 0-10 V fail-safe actuator.

**These codes are 3/4" bodies (Cv=9.7) with 1" end connections as listed.



Code (*)	A	B	C	D	E	F	G	Wt (lb)
600360A, AF	2½" FLG	9¼"	22 5/16"	9 7/16"	5 ½"	7"	2 11/32"	30
600380A, AF	3" FLG	9¼"	22 5/16"	9 7/16"	5 ½"			42

*A is 0-10V fail-in-place actuator; AF is 0-10V fail-safe actuator.

Legionella-distribution temperature

Systems with domestic hot water storage are typically maintained at 140 °F (60 °C) to control Legionella bacteria. Temperatures in this range can also create a scalding hazard if water is delivered directly to fixtures. For example, exposure to water at 130 °F (54 °C) can result in burn injuries in approximately 30 seconds. At 140 °F (60°C), burn injuries can occur in as little as 5 seconds.

Periodic thermal disinfection may also be used to help control bacterial growth throughout the distribution system. To support Legionella control and user safety, a digital mixing valve can be used to:

- Reduce the distributed water temperature to an adjustable value below storage temperature.
- Maintain a consistent mixed-water temperature despite changes in inlet temperature, pressure, or demand.
- Support scheduled thermal disinfection cycles by temporarily allowing higher water temperatures throughout the system, typically during times of low demand (night).

For best practices on Legionella risk management, refer to ASHRAE standard 188 and ASHRAE guideline 12 as well as local plumbing, mechanical and public health regulations.

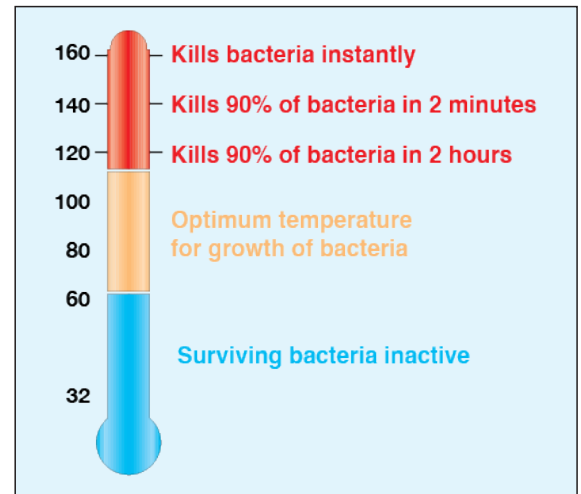
Thermal disinfection

The image above illustrates the relationship between water temperature and Legionella pneumophila survival under laboratory conditions.

Thermal disinfection is commonly performed by elevating water temperatures throughout the system for a specified period. Temperatures of 140 °F (60 °C) or higher are typically used to support thermal disinfection programs and help control bacterial growth.

Applications

Digital mixing valves are commonly used in domestic hot water systems that require precise temperature control, scald protection, and support for thermal disinfection programs, including: hospitals, assisted living facilities, stadium venues, shopping centers, hotels, campsites and schools.



Thermal Disinfection Legionella

Operating principle

The mixing valve combines hot water from storage with cold water from the water supply to deliver mixed water at the desired outlet temperature.

A temperature sensor located at the valve outlet continuously monitors the mixed-water temperature. The controller automatically adjusts the valve position to maintain the programmed setpoint.

The controller includes a programmable clock that can be used to schedule thermal disinfection cycles. During these cycles, the controller temporarily raises the water temperature for a specified period to support system disinfection.

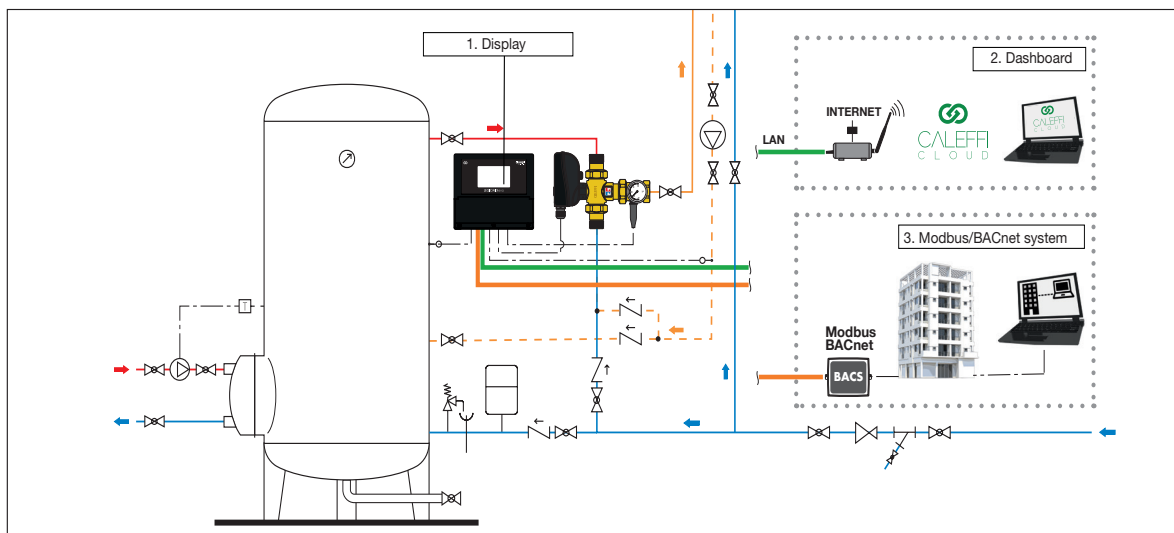
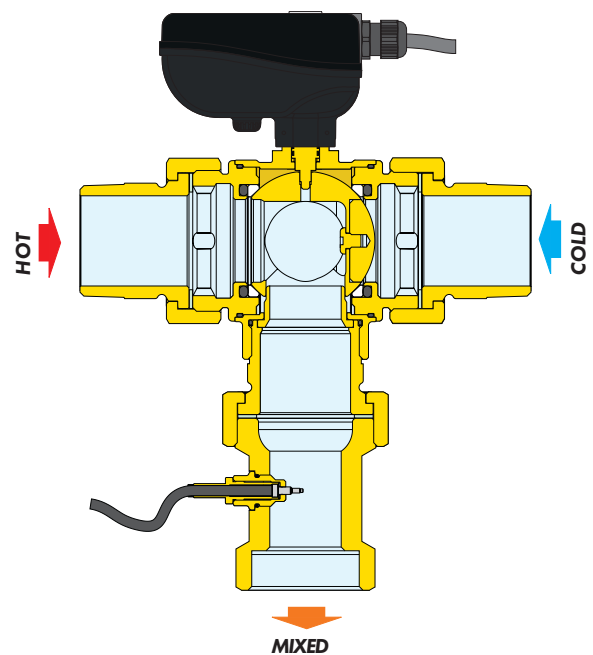
An optional recirculation sensor can be used to monitor return water temperatures. Monitoring the return water temperature can be used to verify the required temperature has been achieved at remote points within the system during thermal disinfection.

For additional system monitoring, an optional storage sensor can be used to measure storage water temperature.

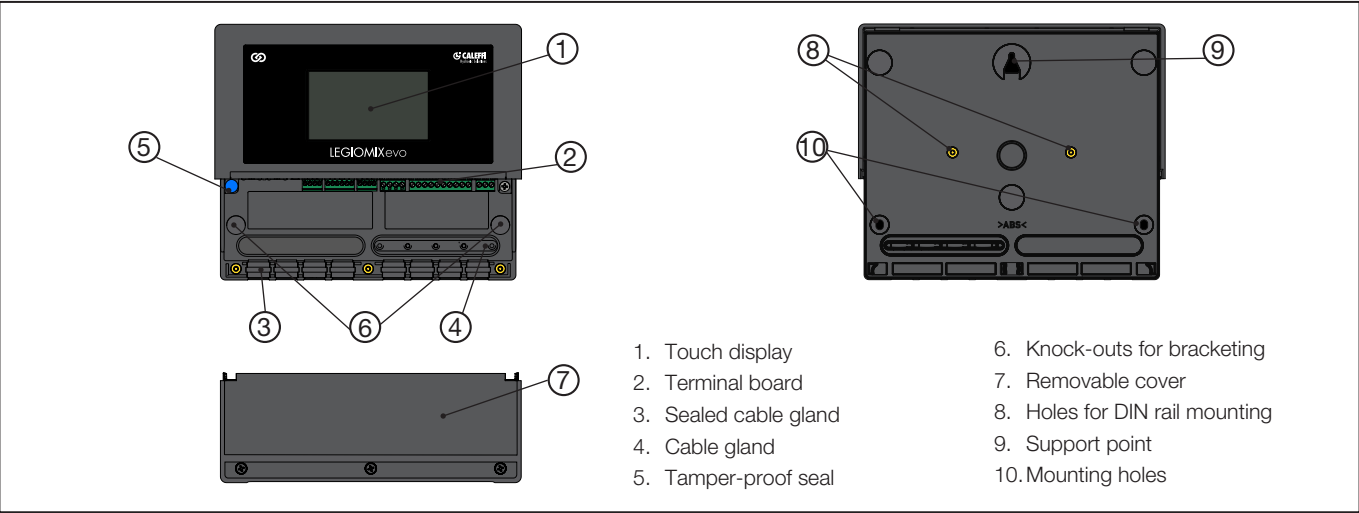
The controller is equipped with RS-485 and Ethernet interfaces with Modbus/BACnet protocol for remotely setting the operating parameters and monitoring the functions. Dedicated relays can activate alarm signals and commands for other system devices.

Control types

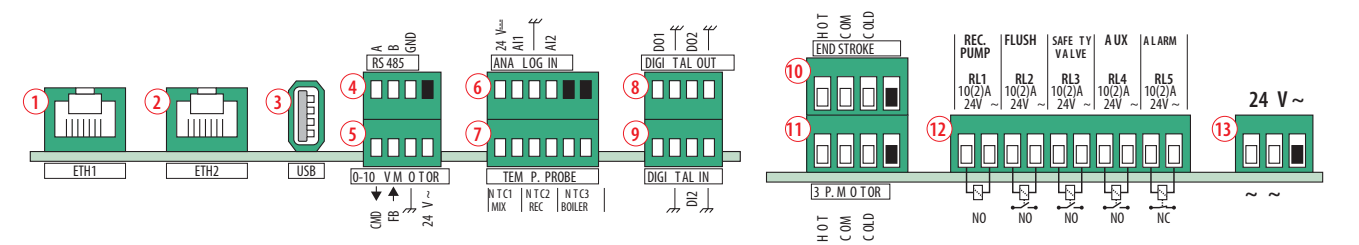
- Display;
- Dashboard (Caleffi Cloud via Ethernet interface 1 (Eth1));
- Modbus/BACnet system (external Building Automation system management via Ethernet interface 2 (Eth2) or RS-485 interface).



Digital controller



Terminal board description



1. Ethernet Port 1 (PC-Cloud connectivity)	9. Digital input
2. Ethernet port 2 (Modbus/BACnet)	10. 3-point actuator end stroke
3. USB port	11. 3-point actuator motor control
4. RS-485	12. Relays (voltage-free)
5. 0-10 V actuator motor control	RL1 RECIRCULATION PUMP relay - NO
6. Analog input	RL2 FLUSHING relay - NO
7. NTC temperature sensors:	RL3 SAFETY relay - NO
NTC1 mixed outlet flow sensor	RL4 AUXILIARY relay - NO
NTC2 recirculation sensor	RL5 ALARM relay - NC
NTC3 water storage sensor	13. Electric supply
8. Digital output	

Important: Alternative connections, depending on the motor type

Important Alternative connections, depending on the connection type (see user's manual)

USB port: The USB port is to be used for downloading data only (see user's manual)



CAUTION: Electric shock risk. The regulator and mixing valve contain live circuits. Disconnect the electric supply before carrying out any work. Failure to follow these instructions may result in injury of persons or damage to property and the electronics in use.

Main features

Touch display

The touchscreen provides intuitive access to controller settings, operating data, and system status. Navigate between screens to view the system information, adjust settings, and configure operating parameters.

Home screen

The home screen displays the active operating mode (Mixing, Disinfection, Flush, Anti-clog, Shock, or Safety Valve) along with the current system status.

The icon corresponding to the temperature of the mixed water can be selected and is used to quickly set the temperature value, while the icon relating to alarm status may appear in two modes:



No alarm.



Alarms present (in this case the icon can be selected and can be used to access the **Alarms** screen quickly).

Further indications correspond to the connection to Caleffi Cloud, the unit of measurement for temperature values (select between °C and °F) and the date/time.

Failsafe function

The actuator incorporates a fail safe function that automatically closes the hot water port during controller power loss to help protect the system and its users.

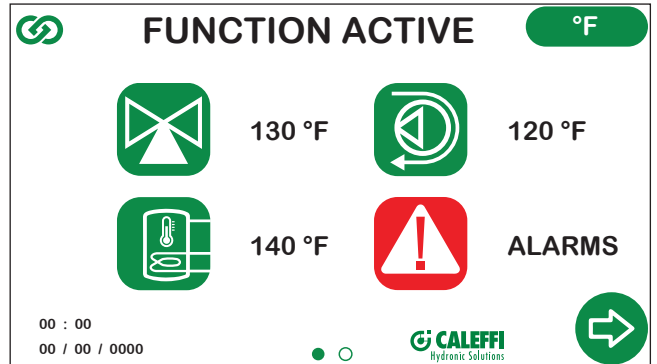
Temperature sensors

The controller monitors system temperature using 3 sensors:

1. Mixed outlet sensor: Measures the mixed-water outlet temperature.
2. Recirculation sensor: Measures the temperature of water returning from the distribution system.
3. Storage sensor: Measures the hot water storage temperature.

Recirculation pump management

The controller allows up to three programmable recirculation pump schedules per day. Operating periods can be customized to match building demand, helping reduce energy consumption while maintaining hot water availability. During thermal disinfection and thermal shock cycles, the recirculation pump operates continuously to ensure circulation throughout the distribution system.



Operating status

Depending on the selected operating schedule, the controller operates in one of the following modes:

- Mixing;
- Disinfection;
- Flush;
- Anti-clog;
- Shock;
- Safety valve (temperature restriction).

Mixing

In mixing mode, the controller continuously monitors the outlet temperatures using the supply sensor and automatically adjusts the mixing valve to maintain the programmed temperature setpoint.

Disinfection

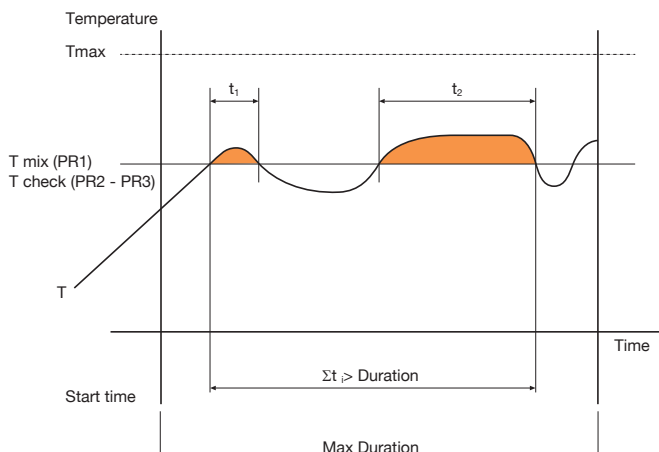
In disinfection mode, the controller raises the system water temperature by adjusting the mixing valve to achieve the programmed value for a specified duration during a thermal disinfection cycle.

Disinfection cycles can be scheduled to run daily or weekly by selecting the desired days of operation.

After disinfection, the controller records the disinfection event in the system log.

The controller automatically starts and ends the disinfection cycle based on the configured *Max Duration* setting created by the user.

DISINFECTION CHECK



A disinfection cycle is considered successful when the programmed temperature is maintained for the set Duration without exceeding the *Max Duration*.

A disinfection cycle is considered unsuccessful when the required temperature is not maintained for the set Duration within the Max Duration window and generates an alarm. The alarm is automatically cleared after the next successful disinfection cycle.

Example:

Start time: 2:00
Duration: 30 min
Max Duration: 1 hour
Program: 1
Tmix: 140 °F

If the system maintains 140 °F (60 °C) for at least 30 minutes between 2:00 and 3:00, the disinfection cycle is successful. If the required temperature is not maintained for the programmed duration before 3:00, the cycle ends with an alarm.

Thermal Disinfection Programs

The controller supports 3 thermal disinfection programs. The appropriate program depends on the system configuration and the desired method of temperature verification.

Program 1

The controller maintains the supply water temperature at or above the programmed T_{mix} setpoint for at least the programmed Duration. The recirculation sensor is not used.

Program 2

A recirculation sensor is required. The controller maintains the supply water at the programmed T_{mix} setpoint. Successful disinfection is verified in line with T_{check} using the recirculation sensor.

Program 3

A recirculation sensor is required. Operation is the same as Program 2. If the return water temperature does not reach T_{check} within the programmed time, the controller automatically increases the T_{mix} setpoint by the difference between T_{check} and the measured return temperature ($T_{check} - T_{return}$). The compensation continues until T_{check} is achieved or the programmed T_{max} limit is reached.

Program	Use of recirculation sensor	Disinfection check	Disinfection temperature	Alarm	History
1	NO	Mixed outlet sensor	$\geq T_{mix}$	YES	YES
2	YES	Recirculation sensor	$\geq T_{check}$	YES	YES
3	YES	Recirculation sensor	$\geq T_{check}$ (+ T_{mix} compensation)	YES	YES

Stopping disinfection

Operating parameters cannot be changed while a disinfection cycle is in progress. To stop an active cycle, open the *Advanced* menu and select *Disinfection stop*.

Flush

After a disinfection cycle, the controller automatically adjusts the flush valve to discharge high-temperature water and return the system to its normal operating setpoint.

Anti-clog

The controller automatically performs a daily mixing valve exercise to ensure proper operation and cleaning. This procedure is carried out after a disinfection cycle (if active), or in any case at 3:00 am if no disinfection cycle is active.

This function can be enabled or disabled in the Settings -> Advanced menu, via the option Anti-clog. Disabling this function increases the risk of deposits forming on moving parts of the valve.

Shock

In Shock mode, the controller raises the mixed-water temperature to the programmed shock setpoint for the specified duration.

To start a thermal shock cycle, select START. The cycle begins after the programmed countdown period. An active cycle can be paused by selecting STOP. After the cycle is complete, the controller automatically returns to mixing mode. The Shock procedure does not include a check to confirm correct completion; it will be the user's responsibility to check the temperature values.

Shock mode does not verify cycle completion. Users should confirm that the required temperature has been achieved.

Safety valve (temperature restriction)

If the water temperature exceeds the programmed safety limit, the controller can close an external two-way valve installed on the hot water inlet to the mixing valve.

Power loss

An internal battery maintains the controller's date and time settings for up to 15 days during a power outage. If power is not restored within that period, the controller launches the Setup Wizard at the next startup to restore the date and time.

Reboot

The controller can be restarted by selecting Settings->Advanced->Reboot. A reboot does not affect the configured settings.

Restoring the factory settings

To restore the controller to its factory default settings, select Settings->Advanced->Factory Reset. Factory Reset clears all user settings and stored logs.

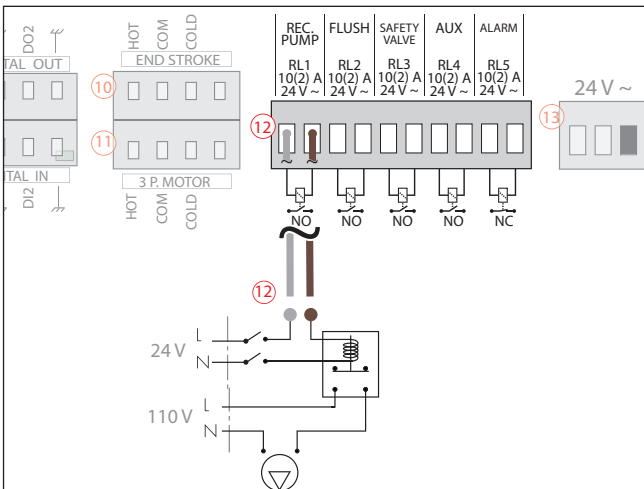
If the controller is connected to Caleffi Cloud, the data in the cloud will be retained.

Note: if necessary, download logs before restoring the factory settings.

Actuation relays

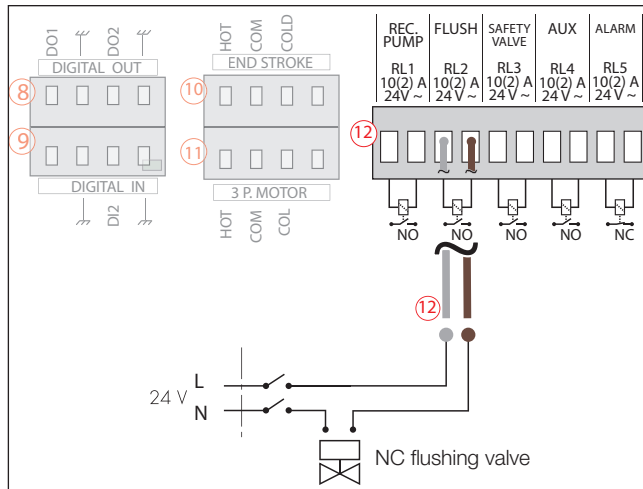
Contact for recirculation pump (RL1)

The contact closes to start the pump according to the time slots set on the digital controller or during the disinfection and thermal shock phases.



Contact for disinfection flushing valve (RL2)

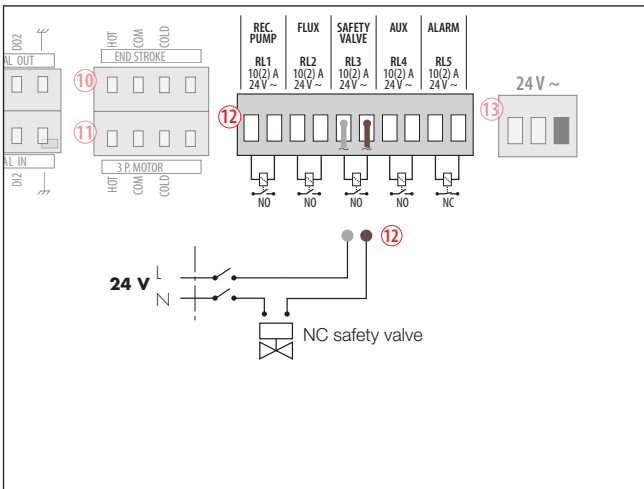
The contact closes to open the flush valve at the end of the disinfection phase in order to restore the circuit temperature to its operating value faster.



Contact for temperature restriction safety valve (RL3) Solenoid valve

The controller keeps the contact closed during normal operation. If the temperature rises above the danger level, the contact opens to activate the temperature restriction valve.

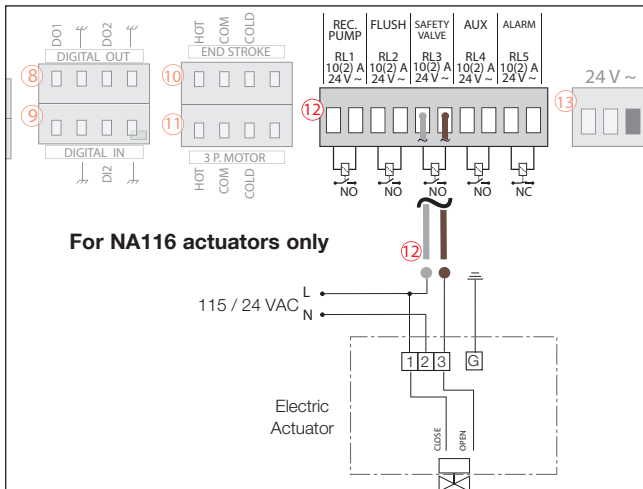
If the solenoid valve is of the normally open type, an SPDT switch relay must be used.



Contact for temperature restriction safety valve (RL3) 3-contact motorized valve

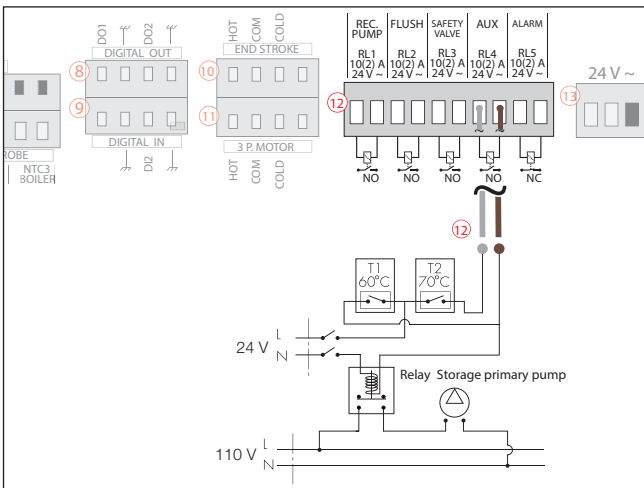
The controller keeps the contact closed during normal operation. If the temperature rises above the danger level, the contact opens to activate the temperature restriction valve.

Use a changeover switch relay to ensure the three-contact motorized valve operates correctly.



Auxiliary contact for water storage thermostat (RL4)

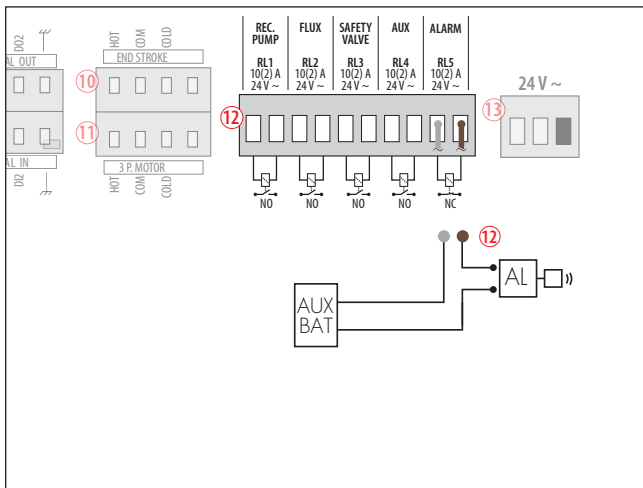
The auxiliary contact can be used to raise the storage temperature during the disinfection phases.



Contact for alarm management (RL5)

The contact remains open during normal operation.

In the event of an alarm or electric supply failure, the contact closes to activate a warning buzzer and/or light.



Connectivity

LEGIOMIXevo can be configured and monitored directly from the controller touchscreen. Users can view system temperatures, operating status and thermal disinfection history from the local display.

When connected to the internet, the controller can also be monitored and configured remotely through Caleffi Cloud. The cloud dashboard provides access to temperature trends, system logs, and controller settings.

The controller also supports integration with Building Automation Systems (BAS) using supported communication protocols.

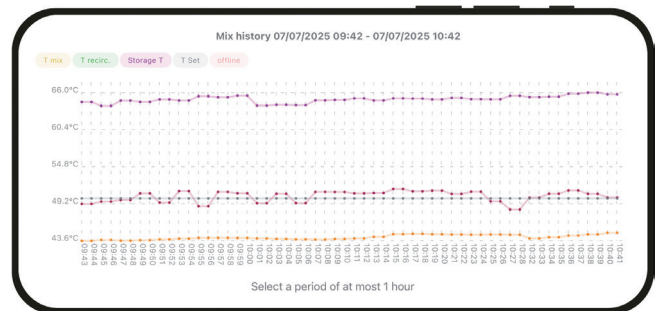
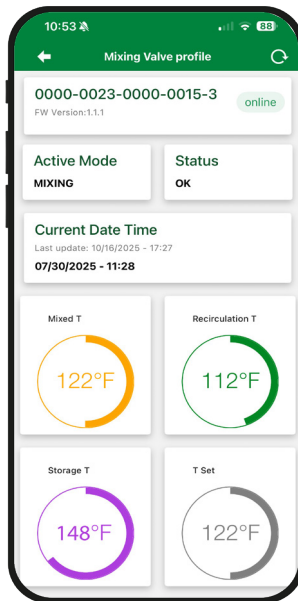
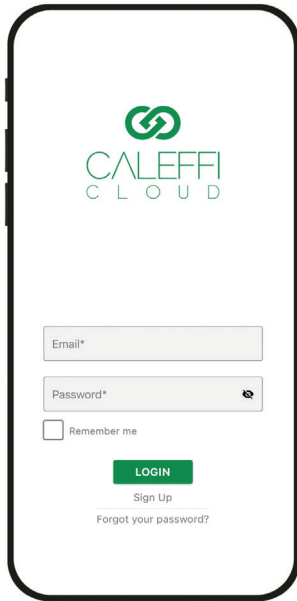
Caleffi View app



When the controller is connected to the Caleffi Cloud, the Caleffi View app provides remote access to operating status, temperatures, alarms, and controller settings.

During commissioning, use the app to register the controller with Caleffi Cloud:

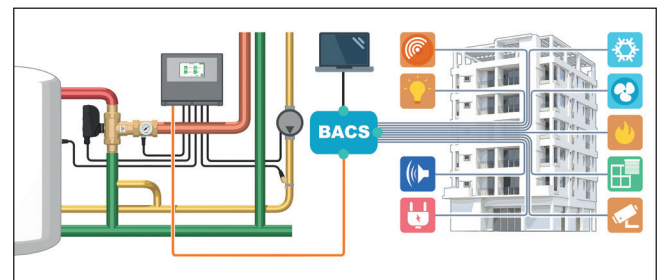
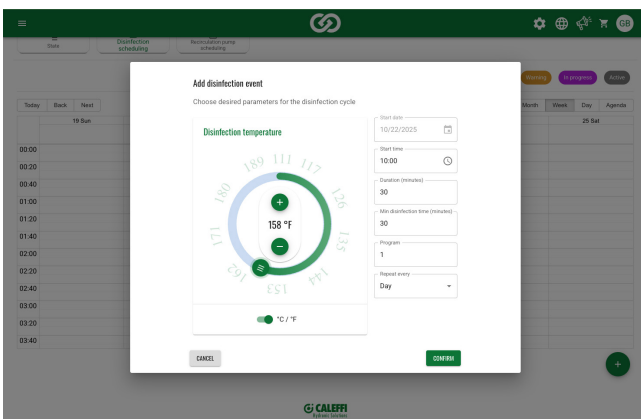
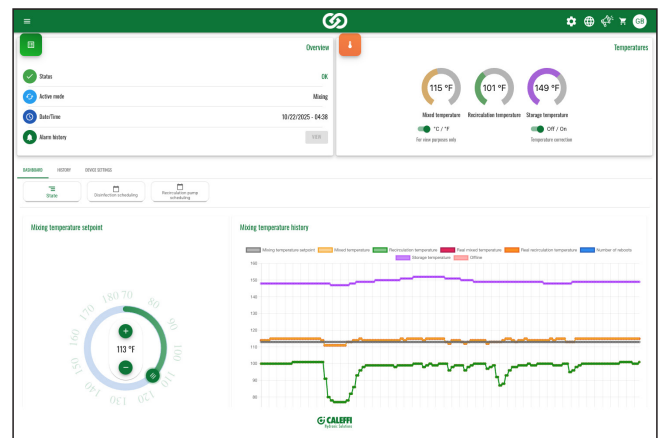
1. Download the Caleffi View app from the Apple App Store or Google Play.
2. Sign in or create a Caleffi Cloud account.
3. Follow the wizard on the app to create a building, users and branches and to add the LEGIOMIXevo(s).



Dashboard – Caleffi Cloud

When the controller is connected to the internet, Caleffi Cloud can be accessed through a standard web browser. The cloud dashboard allows users to:

1. Monitor controller status and operating parameters in real time.
2. View and modify controller settings remotely.
3. Review temperature trends, alarms and system logs.



Modbus/BACnet in BAS

The device can be managed via its connection with an RS-485 or Ethernet 2 (Eth2) interface, through Modbus/BACnet protocols which can be used in BAS to remotely set the operating parameters and control the functions.

Logs

The digital controller can be used to view a series of information saved on the device. The Download function can be used to download data on external units.

Disinfection history

This section can be used to view the log of the disinfection cycles carried out. The last 32 disinfections are saved, after which the data relating to the least recent disinfection is overwritten.

The parameters saved in this section are:

- DATE: disinfection date;
- TIME: disinfection end time;
- PR: disinfection program;
- TM: mixed temperature;
- TC: control temperature;
- TR: return temperature;
- TS: storage temperature;
- RSL: disinfection result.

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DISINF. HISTORY

DATE	TIME	PR	TM	TC	TR	TS	RSL
20/10/2025	11:04	03	150	150	145	160	OK
06/10/2025	11:03	03	150	150	143	158	OK
28/09/2025	11:08	03	152	150	146	158	OK
24/09/2025	11:34	03	152	150	146	160	OK
23/09/2025	09:47	03	150	150	146	156	OK
08/09/2025	10:14	03	152	150	145	154	OK
22/08/2025	08:54	03	150	150	140	130	FAIL
15/08/2025	08:31	03	154	150	145	158	OK

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Alarm history

This section can be used to view the last 10 alarms that arose in the system. Each alarm is represented by a 3-digit code.

The parameters saved in this section are:

- ERROR: error description;
- CODE: error code;
- TIME: time at which the error occurred;
- DATE: date on which the error occurred.

For alarm encoding, please refer to the specific section in the User's Manual NA11371.

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ALARM HISTORY

ERROR	CODE	TIME	DATE
Hot water storage sensor fault	030	11:04	20/10/2025
Recirculation sensor fault	020	11:03	06/10/2025
Hot water storage sensor fault	030	11:08	28/09/2025
Hot water storage sensor fault	030	11:34	27/09/2025
Hot water storage sensor fault	030	09:47	26/09/2025
Disinfection error	001	10:14	08/09/2025
Hot water storage sensor fault	030	08:54	22/08/2025
Flush error	004	08:31	15/08/2025
Disinfection error	001	09:22	03/08/2025
Mix sensor fault	010	10:43	20/07/2025

Data download via USB

The controller can be used to download operational data, alarms and disinfections saved on the device, in .csv format.

The following files can be downloaded:

- LEVOALR.csv (alarm log);
- LEVOHISR.csv (timed operation log);
- LEVODISE.csv (disinfection settings);
- LEVODISU.csv (disinfection summary);
- LEVODISD.csv (disinfection detail log).

For the correct download procedure, please refer to the specific section in the User's Manual NA11371.

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ADVANCED

Download

Reboot

Factory reset

Disinfection stop

Anticlog

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Reset

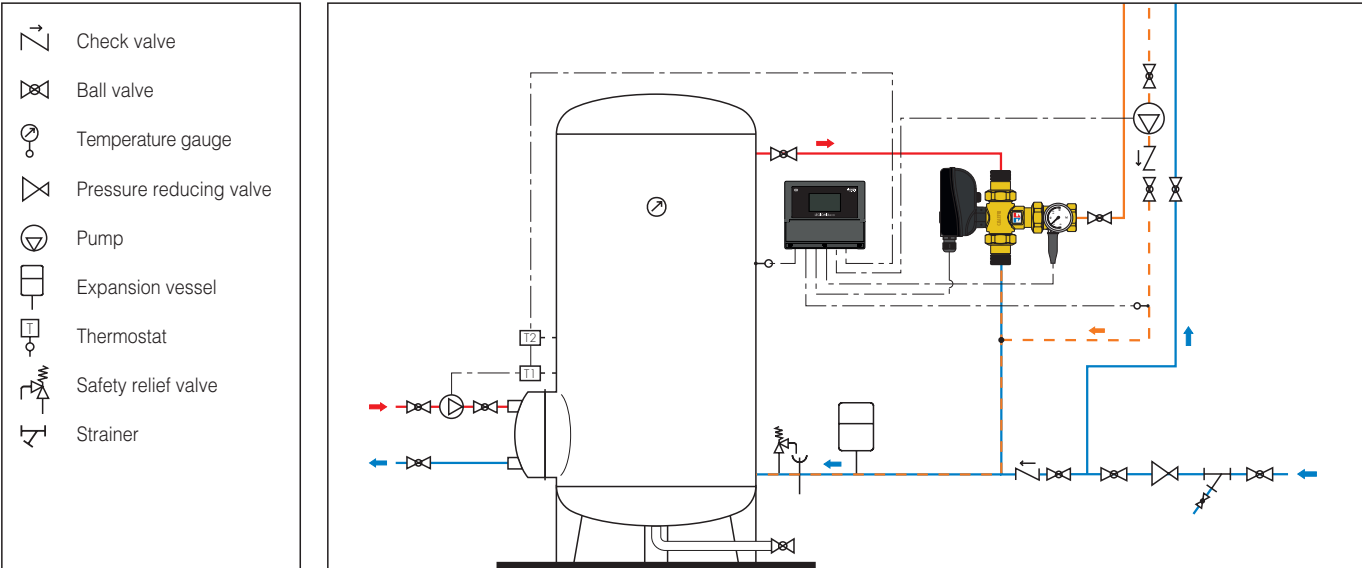
STOP

Enabled

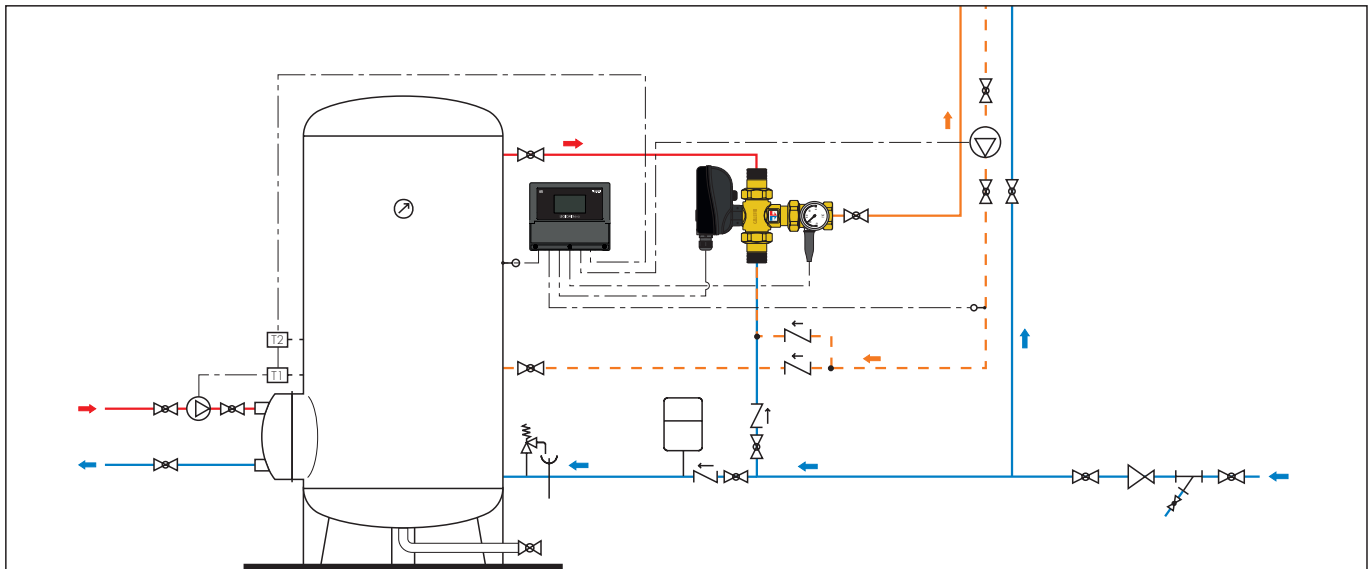
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Application diagrams

Domestic hot water system with no recirculation connection at storage tank



Domestic hot water system with recirculation connection at storage tank



SPECIFICATION SUMMARIES

6003 series

Valve body, union connections: Threaded NPT male, sweat or press connections from 3/4" to 2" with unions and tailpieces. Certified and listed by ASSE to standard 1017. DZR Low-lead brass body (<0.25% Lead content), complies with NSF/ANSI/CAN 372 and NSF/ANSI/CAN 61, low lead, as certified by ICC-ES, file PMG-1360; complies with codes IPC, IRC, UPC and NPC, as certified by ICC-ES, file PMG-1357; and meets the requirement of CSA Z317.1 Special Requirement for Plumbing Installations in Health Care Facilities certified by ICC-ES. Low-lead brass, stainless steel ball, peroxide-cured EPDM hydraulic seals and PTFE seat ring. Maximum body pressure rating 230 psi (16 bar) except press models 200 psi (13 bar) max.

Maximum working pressure 150 psi (10 bar). Maximum inlet temperature 212°F (100°C). Complete with mixed outlet temperature gauge, 30°F to 210°F scale, 2 inch diameter. Flow ranges: 3/4 inch and 3/4 inch body with 1 inch connections: Cv 9.7, 2.2 to 43 gpm (8.3 to 172 lpm); 1 inch: Cv 21, 3.1 to 94 gpm (11.7 to 356 lpm); 1 1/4 inch: Cv 24, 4.4 to 107 gpm (16.6 to 405 lpm); 1 1/2 inch: Cv 34, 6.6 to 152 gpm (25 to 575 lpm); 2 inch: Cv 48, 8.8 to 215 gpm (33.3 to 814 lpm). Maximum recommended operating differential pressure (dynamic) 20 psi (1.4 bar). Maximum inlet pressure ratio (H/C or C/H) 2.1. Temperature stability $\pm 3^\circ\text{F}$ ($\pm 2^\circ\text{C}$). Maximum water hardness: 10 grains.

Valve body, flanged connections: ANSI B16.5 150 CLASS RF flange connections from 2 1/2" to 3" sizes. Certified and listed by ASSE to standard 1017. DZR Low-lead brass body (<0.25% Lead content), complies with NSF/ANSI/CAN 372 and NSF/ANSI/CAN 61, low lead, as certified by ICC-ES, file PMG-1360; complies with codes IPC, IRC, UPC and NPC, as certified by ICC-ES, file PMG-1357; and meets the requirement of CSA Z317.1 Special Requirement for Plumbing Installations in Health Care Facilities certified by ICC-ES. 316 stainless steel ball, galvanized carbon steel slip-on flanges, peroxide-cured EPDM hydraulic seals and PTFE seat ring.

Maximum body pressure rating 230 psi (16 bar). Maximum working pressure 150 psi (10 bar). Maximum inlet temperature 212°F (100°C). Complete with mixed outlet temperature gauge, 30°F to 210°F scale, 2 inch diameter. Flow ranges: 2 1/2 inch: Cv 105, 17 to 470 gpm (64 to 1,780 lpm); 3 inch: Cv 120, 22 to 537 gpm (83.3 to 2,033 lpm). Maximum recommended operating differential pressure (dynamic) 20 psi (1.4 bar). Maximum inlet pressure ratio (H/C or C/H) 2.1. Temperature stability $\pm 3^\circ\text{F}$ ($\pm 2^\circ\text{C}$). Maximum water hardness: 10 grains.

Actuator: 3-wire floating fail-in-place or 0-10 V proportional fail-safe with integral position indicator, electric supply 24 VAC - 50/60 Hz direct from controller. Power consumption 6 VA. Self-extinguishing VO cover, protection class IP65 (NEMA 4/4X). Ambient temperature range 14°F to 130°F (-10°C to 55°C). Supply cable length 31 1/2" (0.8 m).

Controller: Electric supply 24 VAC - 50/60 Hz. Power consumption 6.5 VA. Adjustment temperature setting range 70°F to 185°F (20°C to 85°C), Disinfection temperature range 100 to 185°F (40 to 85°C). Ambient temperature range 32°F to 120°F (0°C to 50°C). Protection class IP 54 (wall mounting) Class II appliance. CE and FCC part 15 approvals. Choice of 11 languages with set of programs for selectable automatic scheduling circuit thermal disinfection to kill Legionella, configurable via keypad, or local or remote controller; with additional functions of daily ball rotation cycle to flush debris, flush valve relay output, alarming, and status indication.

Sensors: Provided with two NTC element 10,000 ohm stainless steel temperature sensors for mixed outlet water temperature and return water temperature, strap-on style, for recirculation. Also provided with one NTC element 100K ohm stainless steel sensor for hot water supply temperature.

We reserve the right to make changes and improvements to our products and the related technical data in this publication, at any time and without prior notice.

The latest version of this document is available at www.caleffi.com and should be used for all technical verification.