

Belimo Energy Valve™



Operating Manual

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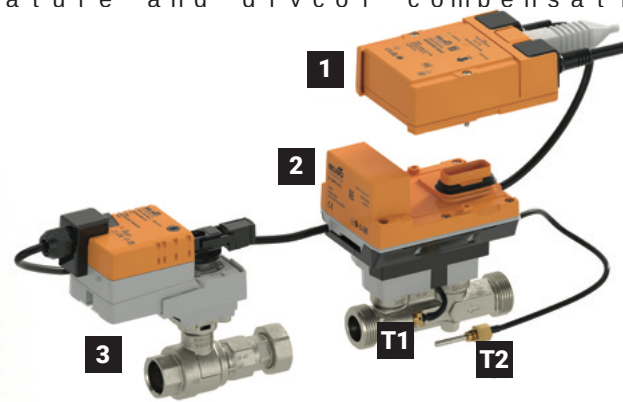
Glossary

Component Identification

Overview

Ultrasonic flow meter with temperature and glycol compensation is wet calibrated to obtain published flow rates. Belimo Energy Valve 4 is now an energy management based services which can benchmark glycol concentration, store energy commission for optimal performance.

The Energy Valve 4 is a pressure and manages coil energy by using meter, along with supply and return. The Energy Valve 4 also has the Belimo Delta T Manager™ logic performance and optimizes the maintaining the Delta T. In addition DDC and feedback wiring, it communicates its data to the Building Management System (BMS) via BACnet MS/TP or BACnet/IP as well as Modbus RTU and Modbus TCP/IP. The built-in web server collects up to 13 months of data that can be downloaded to external tools for further optimization.



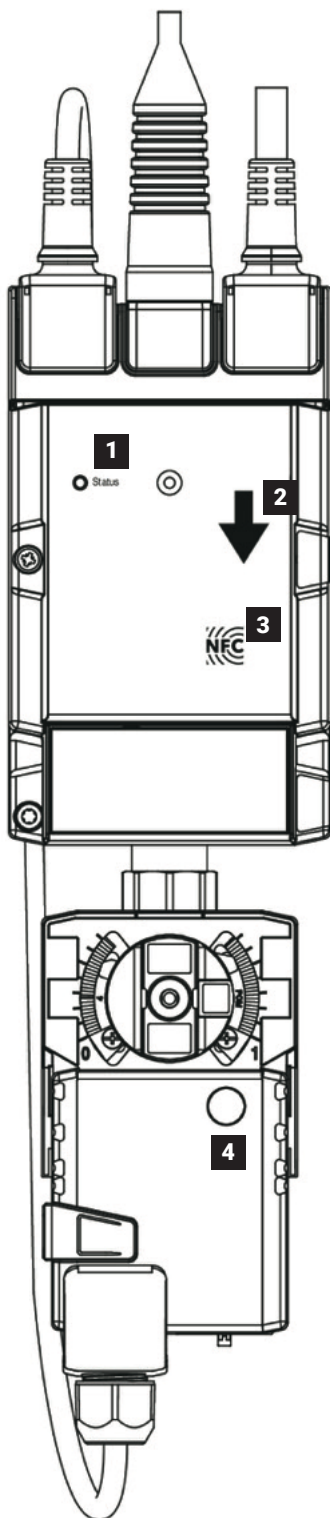
Components

The Belimo Energy Valve 4 consists of a valve, an actuator and a thermal energy meter with a logic and sensor module. The logic module provides the power supply, the communication interface and the NFC connection of the energy meter. All relevant data are measured and recorded in the sensor module. This modular design of the energy meter means that the logic module can remain in the system if the sensor module is replaced.

Flow Tolerances

Flow Measurement Tolerance +2% of the actual Flow.
Flow Control Tolerance of +5% of the actual Flow.
V'nom = flow rating of valve as listed in catalog.

Product Structure



1 LED Display green

On : In operation (Power ok)

Off : No Power

Flashing Action needed with Belimo A

2 Flow Direction

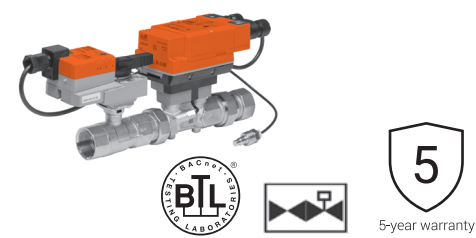
3 NFC Interface

4 Operating Button

Product Range Overview

Valve Nominal Size				Type	Suitable Actuators	
GPM Range		Inches	DN [mm]	2-way	Non Fail-Safe	Electronic Fail-Safe
NPT	1.65...6.6*	½	15	EV050	LRX-E, ARX-E (N4)	AKRX-E (N4)
	2.7...11*	¾	20	EV075		
	4.5...18.2*	1	25	EV100		
	7.1...28.5*	1¼	32	EV125	NRX-E, ARX-E (N4)	
	11...44*	1½	40	EV150		
	16.5...66*	2	50	EV200	ARX-E (N4)	
	25...100*	2	50	EV200H**		

* V'nom = Maximum flow for each valve body size.
 ** Fluid temperature [20°C] is 39...250 °F [4



MODE OF OPERATION

The Energy Valve is an energy independent control valve for heating documents, and proves water

PRODUCT FEATURES

Measures Energy: using its built-in flow sensor and supply and return sensors.

Controls Power: with its Power Control providing linear heat transfer regardless of temperature and pressure variations.

Manages Delta T: on board logic manages Delta T optimizing coil, controlling reducing pumping cost.

ACTUATOR SPECIFICATIONS

Control type	modulating
Manual override	LR, NR, AR, AKR
Electrical connection	3-core (11 mm) cable with fitting
Communication	BACnet IP, BACnet Modbus TCP, Modbus Webserver, Belimo Modbus Analog

VALVE SPECIFICATIONS

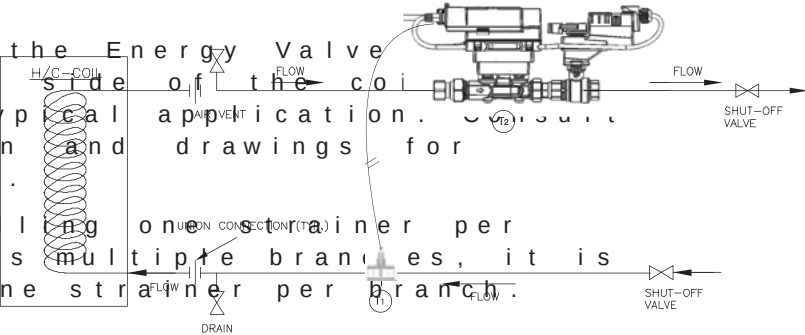
Fluid	chilled or hot water glycol max
Sizes	½", ¾", 1", 1¼", 1½"
End fitting	NPT female
Materials	Body Valve forged brass, nickel Sensor housing brass, nickel Ball stainless steel Stem stainless steel Characteristic $\frac{1}{2}$ inch disc
Fluid temperature range	40...50 °F [- 10... + 39...250 °F [4...120
Body pressure rating	160 psia
Close-off pressure	20 psia
Differential pressure range (ΔP)	see technical documents
Remote temperature sensor length	½...2" 9.8 ft. [3 m]
Leakage	0%
Rangeability	100:1
Flow control tolerance	± 5%
Flow measurement tolerance	± 2%

Installation

Piping

It is recommended that the Energy Valve be installed on the return side of the coil. The diagram illustrates a typical application. Consult your engineering specification and drawings for particular circumstances.

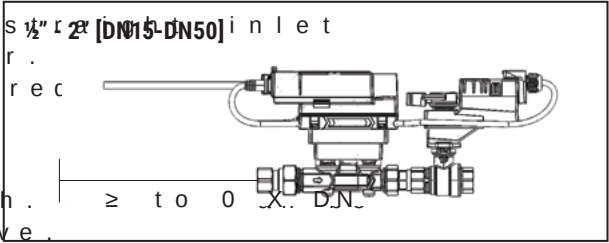
Belimo recommends installing one strainer per system. If the system has multiple branches, it is recommended to install one strainer per branch.



Installation

Inlet Length

There are no requirements for straight inlet sections prior to the flow sensor. The valve has been tested to and fulfils the requirements of EN1434-4:2022.



Outlet Length

No requirements for outlet length. The valve can be installed directly after the valve.

Differential Pressure Sensor

When installing the differential pressure sensor, refer to the corresponding installation instructions for the sensor. The connection of the differential pressure sensor is described in the installation instructions for the Energy Valve.

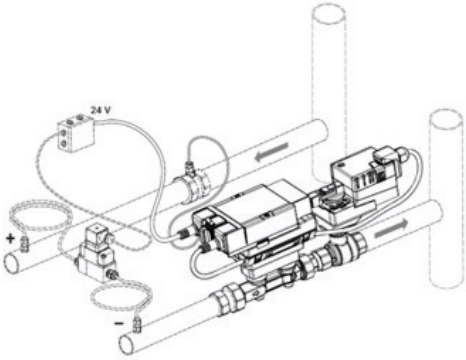


Figure: installation 22WDP-51XXX

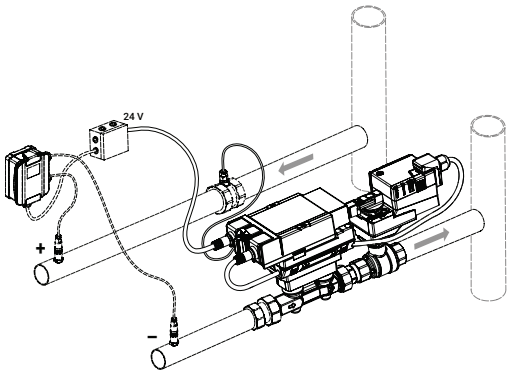


Figure: installation 22PDP-58XXX

Control Mode Sequence of Operation

Flow Control

To set the Energy Valve 4 to Flow Control, the setting is made in the Valve 4 Mode to Flow Control in the Setting Mode. To do this, refer to the Settings table on page 22.

Flow Control Application

Use Flow Control to achieve precise pressure control in a heating system. The valve will react to changes in system pressure to match the flow setpoint.

Flow Control Sequence of Operation

The Energy Valve 4 uses its ultrasonic flow sensor and logic to throttle its characteristic control valve (CCV) to maintain the flow set point. The valve will respond to the control signal DDC except when the control signal DDC is within $\pm 5\%$ of the control signal DDC.

When the Delta T Manager is enabled, the valve will activate its logic when the actual ΔT drops 2°F below the ΔT set point. The valve then throttles the valve closed until the ΔT set point is reached. The Energy Valve 4 will resume its normal operation based on the control signal DDC. When the Delta T Manager DDC signal drops 5% of V'_{max} below the Delta T Manager ΔT set point, the Delta T Manager will not operate. The Delta T Manager will engage when the ΔT is above 30% of V'_{max} . In addition, the Delta T Manager will always be greater than 30% of V'_{max} for 5 minutes. The Delta T Manager will engage. 30% is the minimum flow rate. In applications it is possible to set the Delta T Manager down to 10% of V'_{nom} . This setting is available in the Settings tab under the Delta T Manager.

The Energy Valve 4 is pressure independent over its entire throttling range with available differential pressure. When the available differential pressure is less than V'_{nom} , this setting is available in the Settings tab under the Delta T Manager.

When Flow Control, the Energy Valve 4 is pressure independent over its entire throttling range with available differential pressure. When the available differential pressure is less than V'_{nom} , this setting is available in the Settings tab under the Delta T Manager.

Power Control

To set the Energy Valve 4 to Power Control, the setting is made in the Valve 4 Mode to Power Control in the Setting Mode. To do this, refer to the Settings table on page 22.

Power Control Application

Use Power Control to achieve precise pressure control in a heating system. The valve will react to changes in system pressure to match the flow setpoint.

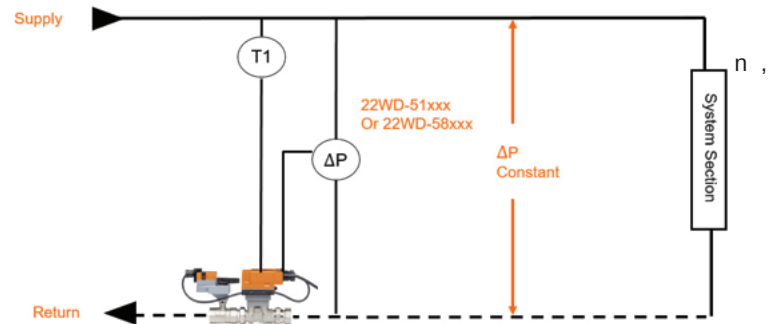
The Energy Valve 4 uses its ultrasonic flow sensor and logic to throttle its characteristic control valve (CCV) to maintain the flow set point. The valve will respond to the control signal DDC except when the control signal DDC is within $\pm 5\%$ of the control signal DDC.

Power Control / Sequence of Operation

When the Delta T Manager is enabled, the valve will activate its logic when the actual ΔT drops 2°F below the ΔT set point. The valve then throttles the valve closed until the ΔT set point is reached. The Energy Valve 4 will resume its normal operation based on the control signal DDC. When the Delta T Manager DDC signal drops 5% of V'_{max} below the Delta T Manager ΔT set point, the Delta T Manager will not operate. The Delta T Manager will engage when the ΔT is above 30% of V'_{max} . In addition, the Delta T Manager will always be greater than 30% of V'_{max} for 5 minutes. The Delta T Manager will engage. 30% is the minimum flow rate. In applications it is possible to set the Delta T Manager down to 10% of V'_{nom} . This setting is available in the Settings tab under the Delta T Manager.

Differential Pressure Control Application

The electronic differential pressure controller is used to maintain the differential pressure value between two points in the system. It can be used as a flow rate stand-alone mode and cannot be used in the Building Manager. See figure overview.



Differential Pressure Control Sequence of Operation

In this operating mode, the Energy Valve does not receive a setpoint from the building management system. The differential pressure is measured with the differential pressure sensor connected to the Energy Valve. This value is monitored by the Energy Valve and compared with the preset setpoint. If a deviation is detected between the measured value and the setpoint, this is compensated automatically by the logic integrated in the Energy Valve. To accomplish this, the Energy Valve either opens or closes the valve. The following three operating states could occur at this time:

- 1. Measured differential pressure is less than the differential pressure setpoint:** To reduce the pressure drop across the Energy Valve and increase the differential pressure between the measuring points, the valve is opened further until the setpoint is reached. If the differential pressure on the system side is not sufficiently high, the setpoint may not be reached. In this case, the Energy Valve moves to the maximum opening position of 90°.
- 2. Measured differential pressure corresponds to the differential pressure setpoint:** No action is taken by the Energy Valve. The opening position is retained.
- 3. Measured differential pressure is greater than the differential pressure setpoint:** To reduce the differential pressure between the two measuring points, more pressure drop must be generated across the Energy Valve. In this case, the valve opening is reduced until the setpoint, or minimum position, is reached. The Energy Valve is never completely closed during standard differential pressure control mode in order to ensure that changes in the system (change in pump head or flow changes due to controlling control valves) can be detected.

Easily adjustable setpoint

The desired setpoint is simple to adjust on the device. Various options are available for this purpose:

- Belimo Assistant App, simple communication with the Energy Valve thanks to NFC
- Web server integrated in the Energy Valve
- Belimo Cloud, value change from anywhere
- Bus Communication, via BACnet, Modbus or MP-Bus

Adjustable flow limitation

A maximum flow V'_{max} can be specified for the Energy Valve. Even if the effective differential pressure is below the setpoint, the Energy Valve will not open further when V'_{max} is reached. This makes it possible to limit the flow in which other parts of the hydronic system have too little flow.

Flow limitation adjustment range: $V'_{max} = 25\% \dots 100\%$ of V'_{nom}

Adjustable maximum power

A maximum power Q'_{max} can be specified for the Energy Valve. When the set maximum heating power is reached, the valve position is not increased further. This setting can be used as a simple way to limit the power of a controlled system segment is not able to draw too much power.

Maximum power adjustment range: $Q'_{max} = 1\% \dots Q'_{nom}$

Sensor drift compensation

After a longer operating time, a drift can occur on the differential pressure sensor, which can be compensated for as follows:

1. Close the Energy Valve completely (web server, Belimo Assistant App or manually)
2. The measured differential pressure is displayed (web server or Belimo Assistant App)
3. Measure the existing differential pressure via the measurement point (additional system-side measurement connections necessary)
4. Calculate and enter the required offset (web server, Belimo Assistant App or manually)

Sizing for Differential Pressure Control

If the Energy Valve will be used to control the differential pressure then an additional differential pressure sensor is needed. This is not included in the scope of delivery of the Energy Valve. Two different versions are available and can be obtained from Belimo.

Sensor Part Number	Measuring Range (psi)	Differential Pressure Set Point Range (psi)
22WDP-511	0...15	1.5...12
22WDP-512	0...30	3...24
22WDP-514	0...50	5...40
22WDP-515	0...100	10...50
22PDP-585	0...100	1.5...50
22PDP-588	0...250	2.5...50

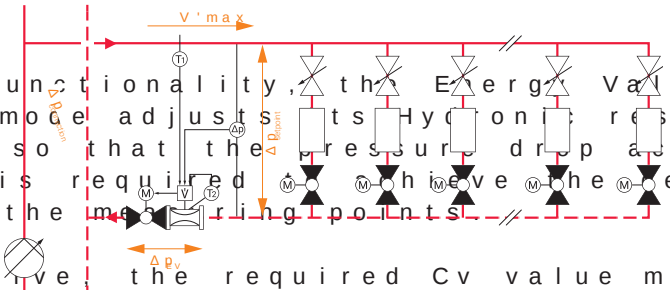
As described in the chapter Functionality, the Energy Valve in differential pressure control mode adjusts its hydraulic resistance by changing the valve opening so that the pressure drop across the Energy Valve occurs that is required to achieve the desired differential pressure between the measuring points.

To select a suitable Energy Valve, the required Cv value must be calculated. The sizing is made for nominal flow.

Required specifications:

- Nominal flow V_{max} in the branch
- Desired differential pressure $dp_{setpoint}$ between the measurement points
- System differential pressure $dp_{connection}$ across the connection points of the system segment

The specifications regarding accuracy and long-term stability listed in the data sheet of the 22WDP-51.. and 22PDP-51.. must be observed.



1. Calculation of the necessary pressure drop across the Energy Valve

$$\Delta p_{EV} = \Delta p_{\text{connection}} - \Delta p_{\text{setpoint}}$$

Note: If additional high pressure losses occur between $\Delta p_{\text{connection}}$ and $\Delta p_{\text{setpoint}}$ (e.g. long pipeline), these must also be taken into account.

2. Calculation of the necessary flow coefficient of the Energy Valve

$$C_{vEV} = \frac{V'_{\max}}{\sqrt{\Delta p_{EV}}}$$

3. Selection of the Energy Valve

The previous calculation creates the C_{vEV} value. The selected valve type.

$C_{v\text{theor.}}$ and $V'_{\max}$ for differential pressure control with Energy Valve

Model	Size	$C_{v\text{theor.}}$ [GPM]	$V'_{\max}$ range [GPM]
EV 050 + ...	½" [DN 15]	3.67	1.65...6.6
EV 075 + ...	¾" [DN 20]	6.17	2.7...11
EV 100 + ...	1" [DN 25]	10.14	4.5...18.2
EV 125 + ...	1¼" [DN 32]	16.32	7.1...28.5
EV 150 + ...	1½" [DN 40]	21.18	11...44
EV 200 + ...	2" [DN 50]	35.20	16.5...66
EV 200 + ...	2" [DN 50]	35.20	25...100

For the best possible control capability, the smallest possible diameter should be selected. Δp_{max} must be considered.

Example: $V'_{\max} = 40.9$ GPM

$$\Delta p_{\text{setpoint}} = 6.5 \text{ PSI}$$

$$\Delta p_{\text{connection}} = 15.9 \text{ PSI}$$

$$1. \Delta p_{EV} = \Delta p_{\text{connection}} - \Delta p_{\text{setpoint}} = 15.9 \text{ PSI} - 6.5 \text{ PSI} = 9.4 \text{ PSI}$$

$$2. C_{vEV} = \frac{V'_{\max}}{\sqrt{\Delta p_{EV}}}$$

3. Selection: EV 12520 + 1 = 8.1/1 ($C_{v\text{theor.}} = 16.32$, $V'_{\max} = 28.5$)

Operating Range for Differential Pressure Control

In differential pressure control mode, the Energy Valve automatically changes its opening position to achieve the pressure drop required to reach the desired differential pressure setpoint. The flow that occurs is specified by the system segment supplied. The following limitations must be taken into account:

Maximum flow

The specified value of the Energy Valve must not be exceeded.

V'nom Energy Valve

Valve type	Size	V'nom [GPM]
EV 0 5 0 + ...	½ " [DN	15 6 . 6
EV 0 7 5 + ...	¾ " [DN	2 0 1
EV 1 0 0 + ...	1 " [DN	2 5 1 8 . 2
EV 1 2 5 + ...	1 ¼ " [DN	3 2 8 . 5
EV 1 5 0 + ...	1 ½ " [DN	4 0 4
EV 2 0 0 + ...	2 " [DN	5 0 6
EV 2 0 0 + ...	2 " [DN	5 0 1 0 0

Maximum flow at which is reached:

$$\text{max. } V' = C_{v\text{theor.}} \cdot \sqrt{\Delta p_{EV}}$$

Minimum flow with flow reduction

Reduction of the flow through the control valves in the system section. Differential pressure control is carried out up to minimum flow of 0.7% V'nom

Behavior when the minimum flow rate is undercut

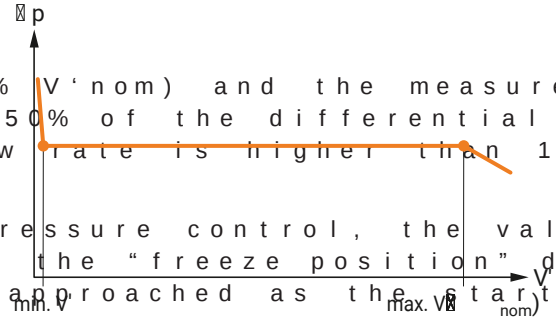
The position of the angle reached at 0.7% of V'nom is retained ("freeze position")

Start-up behavior after the flow rate has fallen below the minimum flow rate

Differential pressure control mode is resumed when one of the following conditions is fulfilled:

If a flow rate is detected ($\geq 0.2\% V'_{nom}$) and the measured differential pressure falls below 50% of the differential pressure setpoint value or the measured flow rate is higher than $1.2\% V'_{nom}$.

Note: In control mode differential pressure control, the valve never completely closed. Instead of the “freeze position” described above, a valve opening of 27% is approached as the starting position for control operation if:



Differential pressure control operating range

- The valve is restarted
- After a power failure
- The manual override was previously operated
- No differential pressure is present at a flow rate $< 0.7\% V'_{nom}$

If the flow rate cannot be measured due to a malfunction in the flow sensor or due to air bubbles in the system, the differential pressure is controlled within the valve opening range from 27% to 100%.

The system switches from actuator opening position 27% to control mode when:

- A flow rate higher than $0.2\% V'_{nom}$ is detected

Control Mode

Sequence of Operation

Position Control

To set the Energy Valve 4 to Position Control, set the Control Mode to Position Control in the Settings area of the Web View, under Configuration Control Function. Refer to the Web View Settings table on page 22.

Position Control Application

Use Position Control to achieve pressure dependent valve performance or to verify control response during installation, maintenance and troubleshooting. The flow meter will report actual flow at all valve positions.

Position Control Sequence of Operation

The Energy Valve 4 uses position feedback and logic to throttle its characterized control valve to maintain the valve position. The valve will respond to the control signal DDC except when the position is within $\pm 5\%$ of the control signal DDC.

Delta T Manager Options

To configure the Delta T Manager options, set the Configuration dT-Manager in the Settings area of the Web View. Refer to the Web View Settings table on page 22.

The Delta T Manager monitors the ΔT across the coil. When the ΔT drops below the set point, the Delta T Manager logic throttles the valve close to increase ΔT above the setpoint. When the Delta T Manager is enabled, it will activate its logic when the actual ΔT drops 2°F below the dT Setpoint. It does that by throttling the valve close until the dT setpoint is reached. The Energy Valve will resume its normal operation based on the control signal DDC when the DDC setpoint drops 5% of V'_{max} below the Delta T Manager's current flow. The Delta T Manager will not operate when the flow is below 30% of V'_{max} . In addition, the Delta T Manager minimum flow will always be greater than 30% of V'_{max} . The flow also needs to be above 30% of V'_{max} for 5 minutes before the Delta T Manager will engage. Two Delta T Manager options are available: dT Manager and dT Manager Scaling. 30% is the default. However, for specific applications it is possible to operate the Delta T Manager down to 10% of V'_{nom} . This setting is available in Webview on the Settings tab under the Delta T Management section.

Control Mode

Sequence of Operation

dT Manager Application

Use dT Manager to assure circuit the Delta T Limit Value. Limit Control Modes of operation; Flow suggests using this mode with

Sequence of Operation

This logic, when activated, will a fixed dT setpoint by reducing equal to the Delta T Limiting

dT Manager Scaling Application

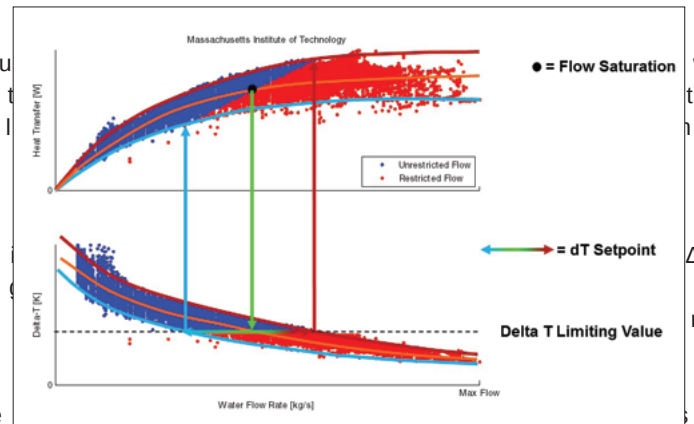
This limiting function can be operation: flow and power. Built circuit overflow is eliminated setpoint. Belimo suggests using this mode with changing temperature of the inlet air flow or inlet water supply.

Sequence of Operation

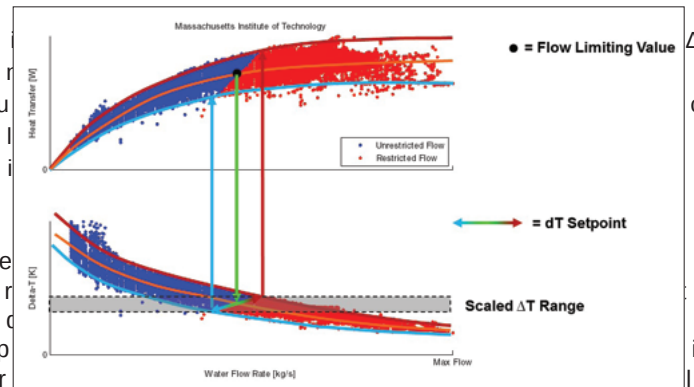
This logic, when activated, will a scaled (variable) dT setpoint setpoint = (Delta T Limit Value flow). The Flow Saturation Value required setting for this logic

Graphical dT Manager and dT Manager Scaling Operation

In the graphs shown here, the captured by allowing the Energy Delta T Manager disabled and conditions for a sufficient power from light to full load. Unrestricted data points, occurs when the dT manager is inactive. Restricted flow, shown with red data points, would be eliminated when dT Manager is active.



Typical Representation of dT Manager Function with Flow Control or Power Control



Typical Representation of dT Manager Scaling Function with Flow Control or Power Control

Configuration of the Energy

The Energy Valve 4 can be configured locally two different ways. Assistant App or using the local Web View interface via belimo.li. Valve 4 using the Belimo Assistant App first then followed by con

Configuring the Energy Valve 4 Using NFC and

The NFC logo on the Energy Valve 4 indicates that the device can with the Belimo Assistant App.

Requirement:

Device must be powered. Refer to wiring section for connecting.

NFC or Bluetooth-enabled smartphone

Belimo Assistant App (Google Play and Apple App Store)

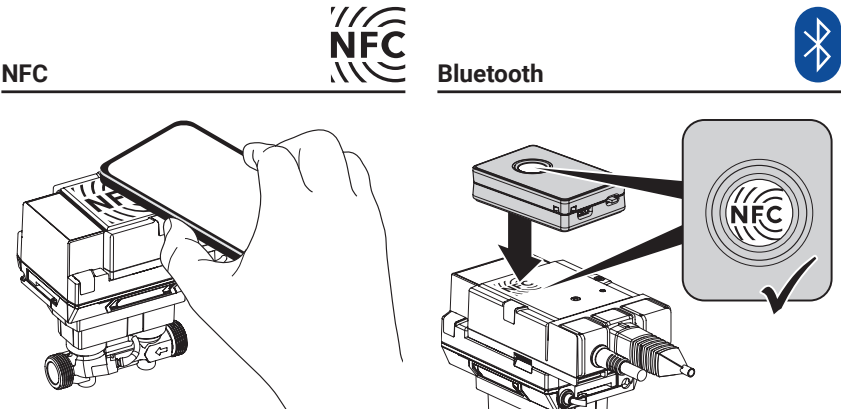


NFC: Position the NFC-enabled smartphone on the thermal energy meter that both NFC antennas of the smartphone and thermal energy meter top of each other.



Bluetooth: Connect the Bluetooth-enabled smartphone to the thermal energy meter via "Bluetooth NFC converter" ZIP-BT-NFC.

Technical data and operating instructions can be found on the ZIP data sheet.



Configuration using Web View

The Energy Valve 4 Web View is a tool that is used to configure the valve and to view the current and historical data. It must be used on a computer with a web browser. The computer must be connected to a TCP/IP network.

Connecting the Energy Valve to Ethernet Prior to Version 4.2

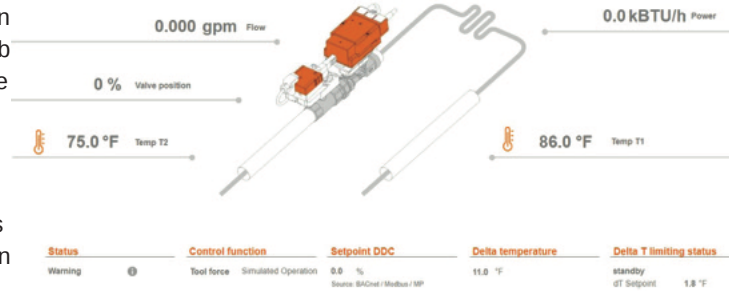
Released April 25, 2019

To configure the Energy Valve 4 using Web View, the Energy Valve 4 must be connected to a TCP/IP network. If connecting the computer directly to the valve using a static IP connection, configure the computer to connect to a LAN, configure the IP address to 192.168.0.200 before connecting to the Energy Valve 4. Then, open a web browser and type in the following address in the web browser: <http://192.168.0.10:80>

If connecting the Energy Valve 4 to a laptop computer using a peer connection without a laptop IP configuration is required, open a web browser and type in the following address in the web browser: <http://192.168.0.10:80>



EV4 ottbe test (22044-10014-022-028) pm 4 9



Login

- Access to the actuator is protected by the user name and password.
- Three default user types are available: guest, maintenance, and admin. Each user type has different security rights to the Web View. Refer to the Web View User Table.

Web View User Table

Username	guest	maintenance	admin
Password	guest	belimo	Contact Belimo Tech Support
Web View Page			
Dashboard	Read	Read	Read
Overview	Read	Read / Write	Read / Write
Override and Trend Control	Read	Read / Write	Read / Write
Data Log Chart	Read	Read	Read / Write
Settings	Read	Read	Read / Write
Status	Read	Read / Write	Read / Write
Date & Time - Set	Read / Write	Read / Write	Read / Write
IP Settings - -	Read / Write	Read / Write	Read / Write
Version Information	Read / Write	Read / Write	Read / Write
Mobile	Read	Read	Read / Write
Data Logging	Read	Read	Read / Write
BACnet / Modbus Settings	Read	Read	Read / Write

*Password is case sensitive

Web View

Connecting the Energy Valve to Ethernet with Version 4 April 25, 2024

For Energy Valve version 4.2 release an additional security feature added. This requires a secure certificate Energy valve and loaded in the web it is required to configure the cer

The following steps show

- 1. How to login to the device
 - 2. How to install the secure certificate and how to configure the certificate
- The secure certificate is not mandatory using https if desired the Energy valve using http://169.254.1.1

Login

- How to login to the Energy Valve
- Enter IP address http://169.254.1.1 enter
- Click Advanced to proceed Fig. 1
- Scroll down and select Proceed device in this case it is 10.200 differ by browser
- Enter Default User name and password Fig. 3
 - User: admin (all lower case)
 - Password: tlmsg (all lower case)
- Overview page will be displayed

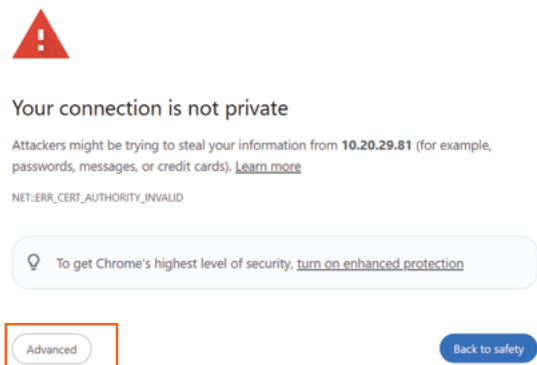


Figure 1

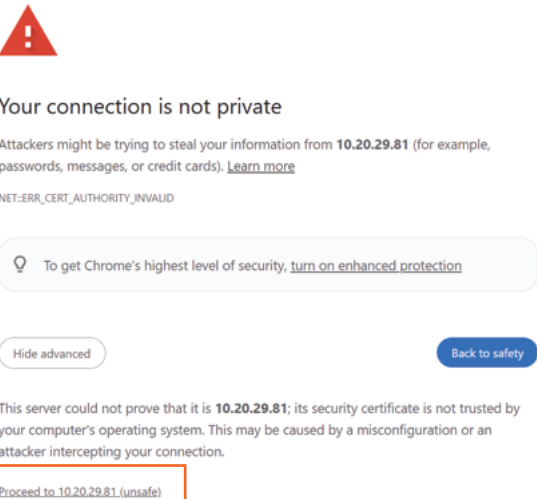


Figure 2



Figure 3

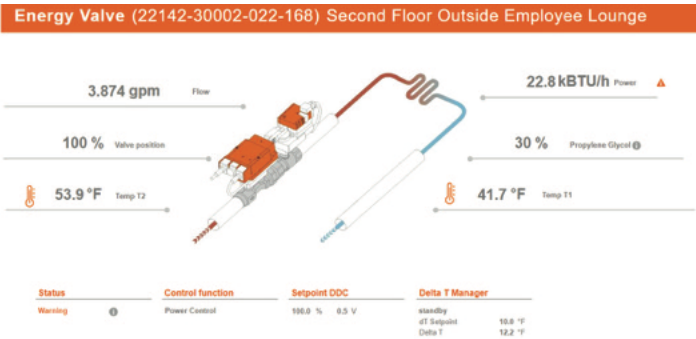


Figure 4

Installing Trusted Certificate in Web browser Step 1. Download Certificate

- The following steps are not mandatory and only needed if https:// is desired. The t to be loaded once into the web browser
- Under Maintenance page select
- Select Ok
- Note location where you save
- This will imported into web b

Overview
Data
Status
Settings
Application
Site Information
Date & Time
User Administration
BACnet/MP/Modbus
IP
Maintenance
Commissioning Report
Configuration

Configuration Import Export

No selected file Choose file Import Configuration

Export Configuration

Activation Codes

Feature Name

No selected file Choose file Upload And Apply Activation Code

Software Update

Apply Available Updates Upload And Apply Update Files

Configure encrypted connection to webserver

Changes are only applied after a reboot of the device.

☒ HTTPS with redirect from HTTP
☐ HTTPS without redirect from HTTP

Keystore

Truststore

✓

✓

Configure Certificates

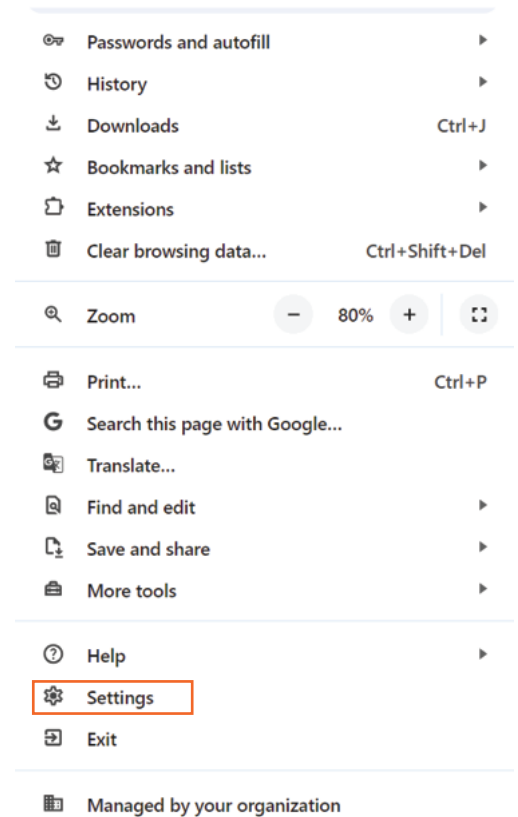
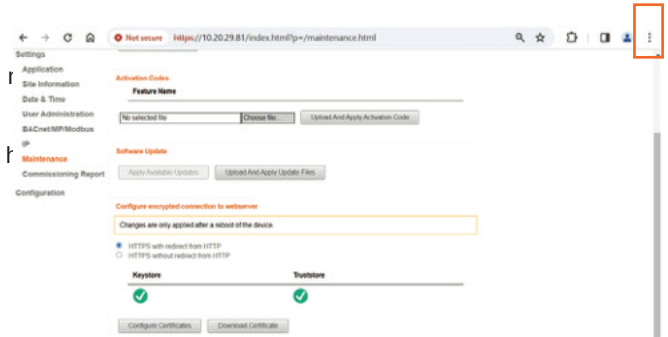
Download Certificate

Press 'OK' to download the file 'ca.pem'. This file is a CA certificate that establishes a secure connection to all device-based web servers. You can designate this certificate as trusted within your browser and/or operating system. For Windows users, ensure that the certificate is installed under 'Trusted Root Certification Authorities'.

OK

Installing Trusted Certificate in Web browser Step 2.**Access the section to load certificate**

- The process may vary depending on the browser you are using
- Click on 3 dots in upper right corner
- Scroll down to Settings



Installing Trusted Certificate in Web browser Step 2 continued.**Access the section to load certificate**

- Select Privacy and security
- Select Security
- Scroll down & click Manage Certificates

The screenshot shows the Chrome Settings application. On the left, the 'Settings' menu is visible with 'Privacy and security' highlighted. The main content area shows the 'Privacy and security' section, with 'Security' highlighted. Below 'Security', the 'Manage certificates' option is highlighted, which leads to the 'Manage HTTPS/SSL certificates and settings' screen.

Settings

- You and Google
- Autofill and passwords
- Privacy and security**
- Performance
- Appearance
- Search engine
- Default browser
- On startup
- Languages
- Downloads
- Accessibility
- System
- Reset settings

Search settings

Your browser is managed by your organization

Safety Check

Chrome found some safety recommendations for your review
Passwords [Go to Safety Check](#)

Privacy and security

- Clear browsing data
Clear history, cookies, cache, and more
- Third-party cookies
Third-party cookies are blocked in Incognito mode
- Ad privacy
Customize the info used by sites to show you ads
- Security**
Safe Browsing (protection from dangerous sites) and other security settings
- Site settings

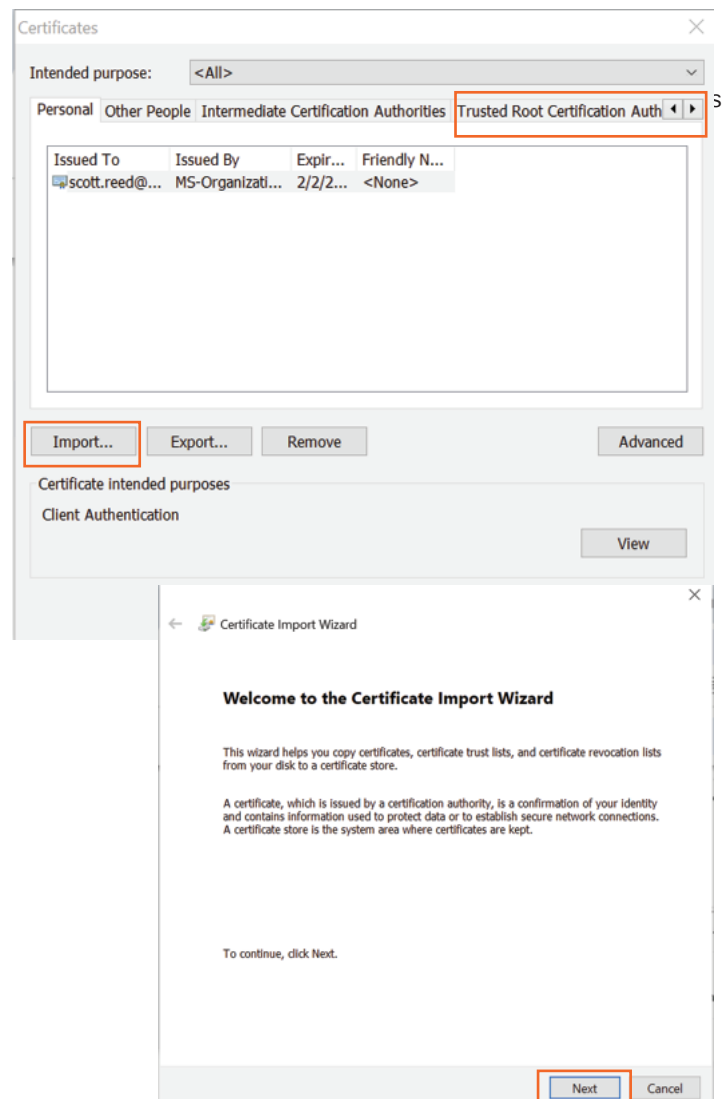
Advanced

- Always use secure connections
Use HTTPS whenever possible and get warned before loading sites that don't support it
- Use secure DNS
This setting is disabled on managed browsers
- Manage phones
Control which phones you use as security keys
- Manage certificates**
Manage HTTPS/SSL certificates and settings
- Certificates managed by Chrome
Information about how Chrome manages its root certificates
- Google Advanced Protection Program
Provides Google's strongest account security for people at risk of targeted attacks

Installing Trusted Certificate in Web browser Step 3.

Import certificate

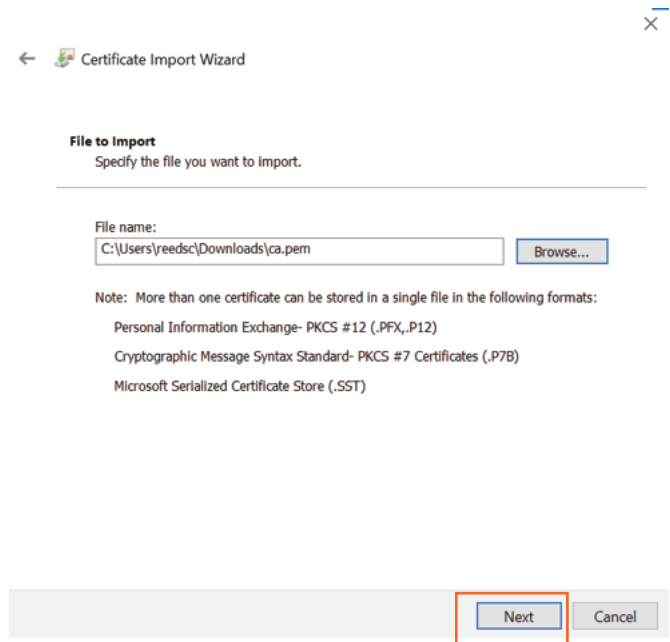
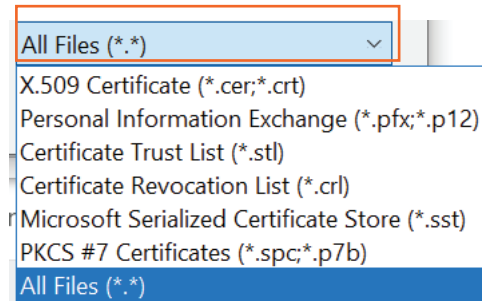
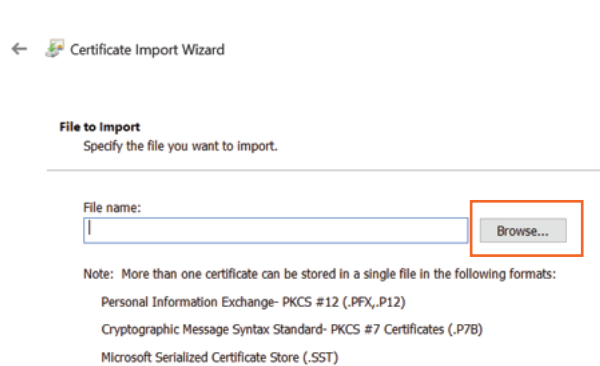
- Select 4th tab on top Trust
- Click Import
- Import Wizard will start
- Click Next



Installing Trusted Certificate in Web browser Step 3 continued.

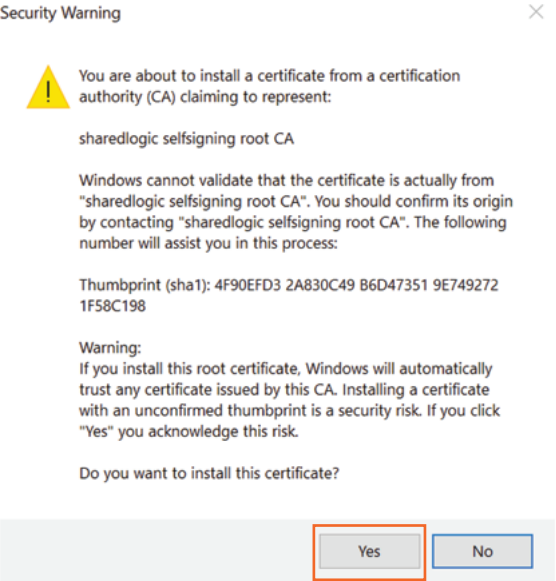
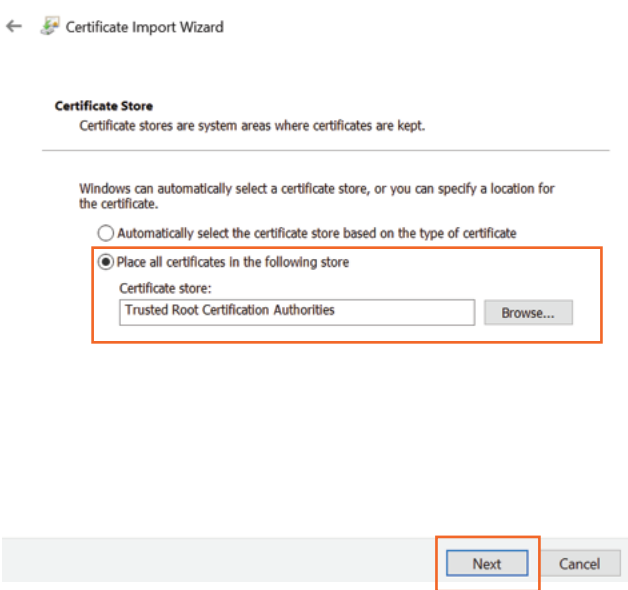
Load ca.pem file

- Select Browse
- Select all files to see the ca.pem file downloaded in step 1
- Click Next on Files to Import window



Installing Trusted Certificate in Web browser Step 4
Finish import

- Select Place all certificates in the following store
- Click Next
- Click Yes to acknowledge security warning
- Click Finish
- Import Successful click ok to finalize

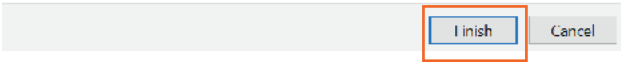
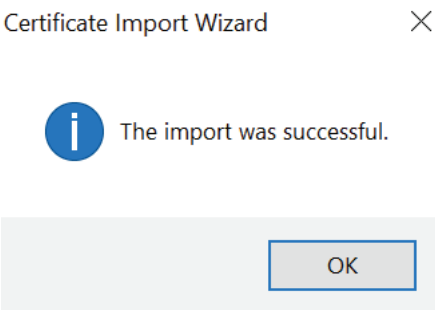


Completing the Certificate Import Wizard

The certificate will be Imported after you click Finish.

You have specified the following settings:

Certificate Store Selected by User	Trusted Root Certification Authorities
Content	Certificate
File Name	C:\Users\reedsrj\Downloads\ca.pem



Step 5 Configure the certificate on the Energy valve. This step needs to be done on every Energy Valve using https://

- It is recommended that the IP address step is completed. This is done in the settings. If the IP address is not completed, this step will need to be done first to establish the secure connection between the device and the browser.
- Under Maintenance page select Configuration
- Click Create Option from the dropdown menu
- The process will run it may take a few minutes before the message Certificate changes were applied appears
- Click OK to reboot the device

BELIMO EV 4.2 RC01 (22308-10003)

Network Configuration

50:2d:14:0f:dd:22 MAC Address

443 HTTP Port

☐ DHCP/Zeroconf
☒ Static/Zeroconf

10.20.29.81 IP Address

255.255.0.0 Network Mask

10.20.0.1 Gateway

10.10.100.90 DNS Nameserver 1

10.10.100.92 DNS Nameserver 2

10.20.255.255 Broadcast Address

169.254.150.21 ZeroConf Address

Change IP Configuration

Configuration Import Export

No selected file Choose file Import Configuration

Export Configuration

Activation Codes

Feature Name

No selected file Choose file Upload And Apply Activation Code

Software Update

Apply Available Updates Upload And Apply Update Files

Configure encrypted connection to webservice

Changes are only applied after a reboot of the device.

☒ HTTPS with redirect from HTTP
☐ HTTPS without redirect from HTTP

Keystore Truststore

Configure Certificates Download Certificate

Configure Certificates

This dialogue allows you to configure encrypted traffic between the device and your web browser (https). You can choose to let the device auto generate self signed certificates or you can upload proper CA signed certificates. Self signed certificates might issue a warning when you connect with your browser. After configuring the keystore and truststore, the device must be rebooted.

Keystore

Create Action

Truststore

Create Action

OK Cancel

Certificate changes were applied

The certificate changes were applied on the device. Please reboot your device now for the changes to take effect.

After rebooting, your browser might show a warning indicating a security risk. This is because not all browsers accept certificates for IP addresses. Most browsers have an 'Advanced' or 'Details' section where you can choose to visit the page anyway.

Confirm Reboot

Are you sure you want to reboot the system?

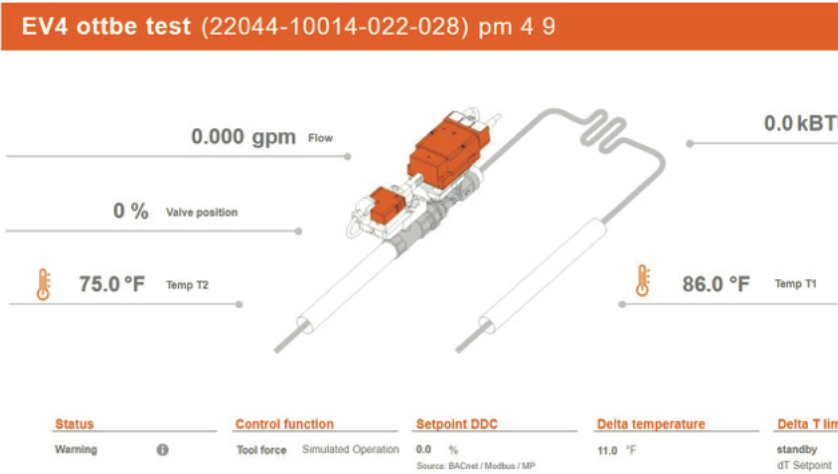
OK Cancel

Web View

The Energy Valve 4 Web View is a graphical user interface access parameters of the Belimo Energy Valve 4. Web View consists of the

Overview

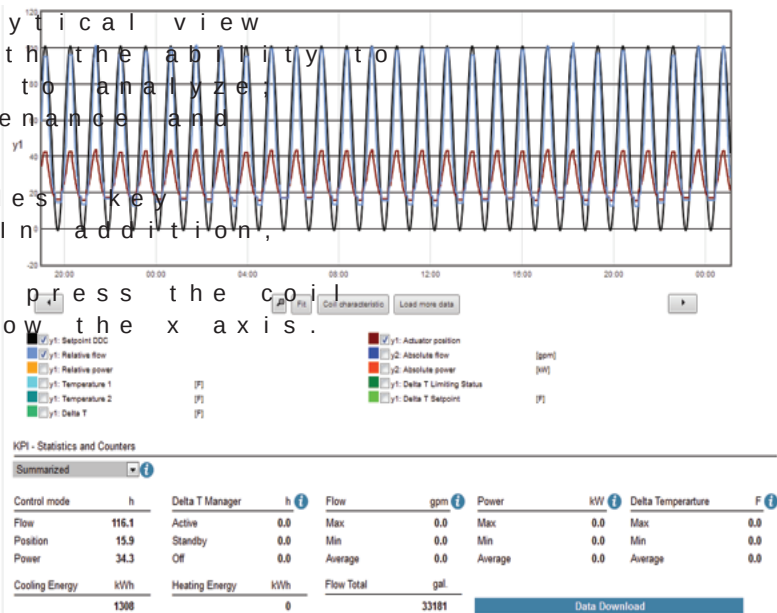
The overview page allows you to see the setpoint, flow, differential pressure, glycol percentage if a mode of operation. Do heading item to see all the data.



Data

Web View provides an analytical view of the historical data with the ability to select the type of data to analyze, primarily used for maintenance and troubleshooting.

This view also provides key performance indicators. In addition, the Delta T set point suggestion is also integrated. To calculate, press the coil characteristic button below the x axis.



Web View

Status

Status provides an error count by type and time elapsed of last occurrence. The Show details button accesses additional information with possible solutions to the error.

These errors can be reset to zero, and should be reset after commissioning, to clear any errors that may have occurred due to the valve and system not being fully operational.

Description	
Media	OK
Flow sensor	OK
Power	OK
Sensor	OK
Actuator	OK
History	counter
Total errors seen	3
Show details	

Settings

Access and adjust the o to the Web View Setting

EV4 ottbe test (22044-10014-022-028) pm 4 9

Belimo Energy Valve3/4" | DN 20

Vnom5.548 gpmPnom171 kBTU/h

Startup AssistantCommissioning Report

Settings ImportSettings Export

Configuration

Units

Temperature°F

Flowgpm

PowerkBTU/h

EnergykBTU

Application

MediumWater

Installation positionReturn

Actuator sync positionSync at 0%

Override

Simulated Operation

Simulated Operation1 h 22 min

Control settings

Control modeFlow Control

Setpoint sourceBUS

Additional sensor input modeNone

Additional temperature sensorNone

Maximum and limitation

Vmax1.39 gpm

VminRange1.387 - 5.548

Configuration Options

Date and Time Settings

These settings provide different ways to set the date and time. The time can be entered manually, synchronized through a computer, or synchronized with a Time Server.

If BACnet communication is enabled, Local Client Date and Time will be automatically updated through BACnet.

IP Settings

The IP Settings configure the valve communication on a TCP/IP network. They allow the valve to have a dynamic IP address (requires an active DHCP server) or a static IP address (requires an IP address, Network Mask and Gateway address from IT manager). The Broadcast address will be generated automatically.

The DNS Servers are listed here by default. If different ones are preferred, they will need to be assigned by the customer IT infrastructure responsible for the Energy Valve 4 installation.

Version Information

The current software version is displayed.

Local Client

11:38:31

Time

07.02.2017

Date

GMT-5

Timezone

Remote Node

17:35:38

Time

07.02.2017

Date

CET

☒

Timezone

Synchronize Time

NTP Server (optional)

☒ Local RTC

☐ Time Server

IP Address Timeserver

Submit

Network configuration

50:20:F4:67:8B:5

MAC address

☒ DHCP/ZeroConf

☐ Static/Zeroconf

192.168.0.10

IP address

255.255.255.0

Network mask

192.168.0.1

Gateway

208.67.220.220

DNS nameserver 1

8.8.8.8

DNS nameserver 2

192.168.0.255

Broadcast address

169.254.1.1

ZeroConf Address

Change IP configuration

Hardware

EV4

Type Code

22044-10014-022-028

Serial Number

2265649-450049

Sensor Module Serial Number

02049-30344-009-161-130

Actuator Serial Number

14127-00003

OC Module Material Number

imx6ull2-ksp0655-oc15

Platform

Software

13.3.0

Operating System Version

4.16.0

Core Software Version

01.00.0001 - [Co-uC]

Communication Module Firmware Version

system1

Active Boot Slot

01.00.0000

Flow Sensor Firmware Version

Application Model

development

Model Name

EvHvacApplication.bcz

Model file name

1.0.0

Model version

Data Logging

This shows the location to download all the historical data into a spreadsheet (.csv) that can be uploaded to the Data Analysis Tool™ for further analysis. See Data Analysis Tool™ page.

The screenshot shows a web interface for data logging. At the top, there are two radio buttons under the heading 'Filetype': 'Short Term Storage (31 Days uncompressed)' (selected) and 'Long Term Storage (Compressed)'. Below this is a table with the heading 'Filename'. The table contains five rows of CSV files, all named 'Default Datalog Configuration-2017-02-03.csv' through '2017-02-09.csv'. At the bottom of the table are three buttons: 'Download', 'Erase Data Log', and a checkbox labeled 'Select all files'.

User Administration

Add, delete, and edit user information, including password management. See the Web View User Table for User Profiles.

The screenshot shows a web interface for user administration. At the top, there is a heading 'Web Users'. Below it, there is a search bar with 'Show 10 entries' and a search input field. Below the search bar is a table with two columns: 'Name' and 'Group'. The table contains three rows: 'admin' with 'adminGroup', 'guest' with 'guestGroup', and 'maintenance' with 'maintenanceGroup'. Below the table, there is a pagination bar showing 'Showing 1 to 3 of 3 entries' and buttons for 'Previous', '1', and 'Next'. At the bottom, there are four buttons: 'Delete Selected User', 'Edit Selected User', 'Add User', and 'Reset'.

Maintenance

Maintenance: Configuration Import / Export

This feature allows the Energy Valve 4 settings to be downloaded (configuration) from one valve and imported to another valve via file format. The valve size and actuator type need to be the same function.

Activation Codes: This is used for uploading a code for additional features, such as a Configuration Import/Export codes, along with pricing, Technical Support.

Update: Last Update indicates the security and operational performance.

No Updates applied – none of been executed.

Update available in cloud

No new updates available

Apply available updates: downloaded

Upload and apply update: updates available

Misc: Reboot - performs the function of power cycling the actuator for a restart. Factory Reset restores the Energy Valve 4 actuator settings to settings when it left the Belimo factory.

The screenshot shows a web interface for maintenance. It is divided into three main sections. The first section is 'Configuration Import/Export' and contains a file input field with a 'Browse...' button and an 'Import Configuration' button. The second section is 'Activation Codes' and contains a table with columns 'Feature Name', 'Feature Id', 'Creation Time', 'Period Start', and 'Period End'. Below the table is a file input field with a 'Browse...' button and an 'Upload And Apply Activation Code' button. The third section is 'Update' and contains a 'Last update:' label, a message 'No update applied: No update applied.', a message 'Update available in cloud:', a message 'No new update available.', and four buttons: 'Apply Available Updates', 'Upload And Apply Update File', 'Reboot', and 'Factory Reset'.

BACnet , MP - Secondary and Modbus

This page is used to set the type of communication and settings Energy Valve 4. All BACnet configurations must be set prior connecting to the BACnet network to avoid communication and sett problems.

- BACnet is a building automation communication protocol worldwide standard.
- MP is a Belimo protocol that allows for communication to mult Belimo devices at the same time.
- Modbus is also a building automation communication protocol.
- None is the default value, when selected the valve will no communicate via BACnet.

Communication Protocol

☒ BACnet IP

☐ BACnet MS/TP

☐ MP

☐ Modbus TCP

☐ Modbus RTU

☐ None

BACnet/IP Settings

Port: The UDP port value defaulted to

Simple/Foreign Device: A Simple Device requires only on its own IP subnet, or when subnet to handle routing of broad subnets. A Foreign Device communic other than its own and to do so, mu on a remote subnet.

Instance ID: A unique ID number for the E BACnet network (between 1 and 4194 only value.

Device Name: Name used to represent the system.

Device Description: General detail of the devi

System Status: Indicates that the valve is read only value. 0 is operational,

Protocol Version and Revision: These are read only show the BACnet protocol version communication software follows.

IP BBMD: IP address entered must be the router on a different subnet.

Time to Live: The time in seconds between with the BBMD router. If the BBMD value should match the router's.

Communication Protocol

☒ BACnet IP

☐ BACnet MS/TP

☐ MP

☐ Modbus TCP

☐ Modbus RTU

☐ None

BACnet IP Settings

47808

Port

☒ Simple Device

☐ Foreign Device

Device Object Settings

4096

Instance ID

EV55 Demo

Device Name

DeviceDescription

Device Description

0

System Status

1

Protocol Version

12

Protocol Revision

Submit

☐ Simple Device

☒ Foreign Device

127.0.0.1

IP BBMD

30

Time-to-Live

Operating Manual - 5/25 Subject to change. © Belimo Aircontrols (USA), Inc.

BACnet MS/TP Settings

Baud Rate: The transmission speed within devices on the same network must be the same. Available rates: 9600, 19200, 38400.

MAC: The MAC address on the MS/TP network must be unique within the network. The range is from 0 to 127.

Max Master: Max_Master must be large enough to encompass all MAC addresses are within it. If using 120 Ohm Termination networks require resistors on end-of-line devices. - the required 120 Ohm termination resistor should be set with great caution as adding a device in the middle of a network can cause problems.

Instance ID: A unique ID number for the device on the BACnet network (between 0 and 4194). Only one device can have the same value.

Device Name: Name used to represent the device in the system.

System Status: Indicates that the valve is operational. 0 is operational, 1 is faulted.

Protocol Version and Revision: These are read only values that show the BACnet protocol version and revision the communication software follows.

BACnet, MP-Slave and Modbus Settings

Communication Protocol

- ☐ BACnet IP
☒ BACnet MS/TP
☐ MP
☐ Modbus TCP
☐ Modbus RTU
☐ None

BACnet MS/TP Settings

38400 Baud rate
 3 MAC Address
 127 Max Master
☐ 120 Ohm Termination

Device Object Settings

4096 Instance ID
 EV55 Demo Device Name
 DeviceDescription Device Description
 0 System Status
 1 Protocol Version
 12 Protocol Revision

Submit

BACnet, MP-Slave and Modbus Settings

Communication Protocol

☐ BACnet IP

☐ BACnet MS/TP

☐ MP

☒ Modbus TCP

☐ Modbus RTU

☐ None

Modbus TCP Settings

1	Modbus Address
502	TCP Port
30	Keep open timeout [seconds]

BACnet, MP-Slave and Modbus Settings

Communication Protocol

☐ BACnet IP
☐ BACnet MS/TP
☐ MP
☐ Modbus TCP
☒ Modbus RTU
☐ None

Modbus RTU Settings

Modbus Address
 Baud rate
☐ Termination
 Parity

Cloud Settings

Datalog Service Connection Status: The status of the cloud connection

Cloud Server: The address of the connect

Datalog and Task Mode: The connection to PUB

MAC Address: The MAC address of the co

Datalog Service: Allows for data transfer 4 and the cloud

Task Service: Allows for automatic update flow and Delta T setpoints based on cloud

Update Mode: Allows for automatic update flow and Delta T setpoints based on cloud

Log Levels: Status of Java Log and Sys

Disabled: No updates are downloaded

Device Controlled: Updates are shown on the Web View and not installed automatically

Cloud Controlled Manual: The updates need to be installed by the device owner in the cloud. The device installs the update immediately after release.

Cloud Controlled Auto: The updates are released by Belimo and propagated to the devices. The device installs the update immediately after release.

Current Owner: The individual that has current ownership of the device. This is typically the name of the user that configured the cloud settings and corresponds to the email address provided during initial set up.

Refresh Current Owner: Simple refresh button to export the device to the cloud to tell us the current owner (for example after the product is transferred in the cloud).

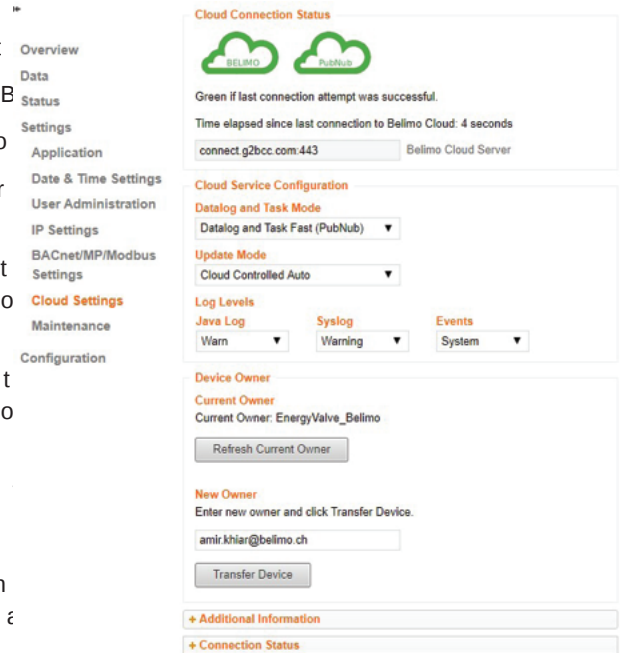
New Owner: Used when starting a transfer from a current owner (or no owner yet) to a new owner which requires pressing the transfer device button after new owner is entered.

Additional Information: By clicking on the load button, it displays more ownership information and device details.

Connection Status: Runs a routine that will help troubleshoot connection to the Belimo cloud

Connectivity Requirements: Customer provided Ethernet Cable
Dedicated Internet Connection

Requirements for Cloud Connection: Gateway IP Address that allows a route to the internet. In case of DNS restrictions, addresses of internal DNS servers.



Firewall rule to allow communication

Action: Pass

Address family: IPv4

Protocol: https
Port: 443

Destination: connect.g2bcc.com

Destination: connect.g2bcc.com

Communication details

Used for connecting the device to the cloud.

Port of the server endpoint

DNS addresses of cloud servers

https://connect.g2bcc.com

Field Programming and Commissioning Options

All Energy Valve 4 act programmed with either Assistant App or with connected to a computer to access the actuator View). Refer to the ta than can be changed in

Belimo Energy Valve

Vfrom28.500 gpm

Vto1200 kBTU/h

1 1/4" | DN 32

1

Startup Assistant

Commissioning Report

Settings Import

Settings Export

2

Configuration

3

Units

Temperature

°F

Flow

gpm

Power

kBTU/h

Energy

kBTU

4

Application

Medium

Propylene Glycol

Glycol override

☒ ⓘ

30.0 %

Installation position

Supply

5

Analog feedback

Feedback

Relative flow

Range

0-10V

Maximum

28.50 gpm

Range7.125 - 34.200

6

Override

None ⓘ

None

7

Control settings

Control mode

Flow Control

Setpoint source

Analog

Control signal DDC

User defined range

Invert signal

inverted

Voltage minimum

0.50 V

Voltage maximum

10.00 V

8

Maximum and limitation

Vmax

28.500 gpm

Range7.125 - 34.500

Vmin

0.000 gpm

Range0.000 - 28.500

9

Delta T Manager

dT Limiting function

☐ ⓘ

On

dT Limiting value

9.99 °F

Range1.8 - 99.0

dT Vmin

9.00 gpm

Range2.137 - 28.500

Without Differential Pressure Control Mode

Web View Settings

TAB	SETTING	FUNCTION	DEFAULT / RANGE
1. General Information	Valve Size	Defines the full flow cataloged capacity (V'nom) of the valve.	(Default factory set to the valve size) ½" – 6" [DN 15 – 150]
	Set Up Assistant	A set up routine that runs on first power to assist the installer with configuring the valve. Can also be run again by selecting here and any changes made will be applied.	N / A
2. Functions	Import/ Export	Allows the export of valve settings and Import into another valve in XML Format.	N / A
	Commissioning Report	Generates a PDF of valve configuration settings for records.	N / A
3. Units	Temperature	Units: water supply, return, and delta T.	Fahrenheit Celsius, Kelvin
	Flow	Units: water flow rate through the valve.	GPM M3/s, M3/h, l/s
	Power	Units: thermal power through the valve.	kBTU/h W, kW, BTU/h, Tons
	Energy		kBTU J, kWh, MWh, kBTU, Tons
4. Application	Installation Position	Identify the installed water service location of the valve and its embedded temperature sensor, or piped in series with the valve. The sensor w/ longer cable is remote (T1) and will be assigned opposite the water service of the valve.	Valve in Return Pipe Valve in Supply
	Medium	Water or water/glycol composition used to accurately calculate flow, thermal power, and energy.	Water Monethylene Glycol Polyethylene Glycol

Web View Settings Continued

TAB	SETTING	FUNCTION	DEFAULT / RANGE
5. Analog Feedback	Feedback	Actuator analog feedback signal u-signal.	Flow output on wire Power, T supply T return, delta Valve position
	Range	Actuator analog feedback linear	2-10 V signal range. 0.5-10 V 0-10 V
	Maximum	Setting to equate 10 VDC or maximum feedback information. Setting must match the VDC range maximum setting. The grey box is an entry field not the actual measured feedback and 100% hold value entered in it. The factory setting is 0.90 (0.90 deg. on the Temperature 32 °F to 212 °F 0 °C to 100 °C Power 0 to P'nom	Flow output on wire Power, T supply T return, delta Valve position
6. Override	Override Functions	Override functions to move the valve to a part point or position which can be used for testing and commissioning purposes. All engaged overrides and go back to normal operation automatically two hours.	Flow output on wire Power, T supply T return, delta Valve position
	Auto	Normal operation no override.	Auto
	Close	Moves actuator to close valve.	N / A
	Open	Moves actuator to open valve.	N / A
	V'nom	In fow control moves the actuator	N / A to full open
	V'max	In fow control moves the actuator	N / A to V'max set
	Motor Stop	Stops the valve at current position.	N / A.
	P'nom	In power control mode moves the actuator to P' position (full open).	N / A.
	P'max	In Power control mode moves the actuator to P' setting.	N / A.
	Simulated Operation	Engages simulation of fow and temperature that be viewed on the overview page.	N / A.

Web View Settings Continued

TAB	SETTING	FUNCTION	DEFAULT / RANGE
7. Control Settings	Setpoint Source	Defines how the BMS valve set point is sent to either analog on wire 3 or via BACnet, Modbus, or other protocols.	Analog BACnet Modbus
	Control Mode	Controlled variable assigned to the valve actuator. DDC, wire # 3.	Flow Control Power Control Position Control
	Invert Control Signal DDC	"No" valve modulates open when 10 VDC is received. "Yes" 10 VDC control signal closes the valve.	No Yes
	Additional Sensor Input Mode	The Meter has the capability to read each input to collect system data via a 4-20mA or 0-10VDC signal.	4-20mA 0-10VDC
	Additional Temperature Sensor	Allows the selection of additional temperature sensors. NTC10k2, NTC10k3, etc.	NTC10k2, NTC10k3, etc.
8. Maximum & Limitation	Vmax	Used with Flow Control mode, this is the maximum flow setting of the valve with full output from the controller.	25% is 100% max flow
	Pmax	Used with Power Control Mode this is the maximum setting of the valve with full output from the controller.	25% is 100% max flow
	Vmin	Used with Flow Control mode, this is the minimum setting of the valve to maintain a minimum flow for particular applications.	5% is 100% max flow
9. Delta T Manager	Delta T Limiting Function	Setting to disabled or enabled with dT Manager Scaling. Both use settings "Delta Value" but only dT Manager Scaling uses "Delta Saturation Value."	Off On
	Delta T Limiting Value	Low limit parameter for dT setpoint. • For dT Manager this is the dT setpoint. • For dT Manager Scaling this is the dT setpoint. Default >30% of Data Analysis Tool may be used to help determine the grey box is an entry field and not the actual Delta T and will hold the last value that is set.	100°F 100°F 55°F
	Flow Saturation Value	Parameter used with dT Manager Scaling. When dT Manager Scaling is active: • If actual flow is less than this parameter will be reset below the Delta T Limiting Value. • If actual flow is equal to this parameter will be equal to Delta T Limiting Value. • If actual flow is greater than this parameter setpoint will be reset above the Delta T Limiting Value. Data Analysis Tool may be used to help determine the grey box is an entry field and not the actual Flow Saturation Value and will hold the last value that is set.	>30% - 100% of Vmax

Field Programming and Commissioning Options with Differential Pressure Control Mode

All Energy Valve 4 act programmed with either Assistant App or with connected to a computer to access the actuator View). Refer to the ta than can be changed in

Belimo Energy Valve

Vinot66.043 gpm
dipnom68.62 psi

2" | DN 50

Pinom895 kW

Startup Assistant

Commissioning Report

Settings Import

Settings Export

Configuration

Units

Temperature°F

Flowgpm

PowerkW

EnergykWh

Pressurepsi

Application

MediumWater

Installation positionReturn

Actuator sync positionSync at 0%

Override

None

Control settings

Control modeDiff. Pressure Control

Differential pressure sensor22PDP-588

Sensor rangeRange10 - 210.00 psi

Differential pressure setpoint28.00 psi

Differential pressure sensor offset0.00 psi

Maximum and limitation

Vinot47.561 gpm

Pinot210.0 kW

With Differential Pressure Control Mode

Web View Settings with Differential Pressure Control Mode

TAB	SETTING	FUNCTION	DEFAULT / RANGE
1. General Information	Valve Size	Defines the full flow capacity (V'nom) of the valve.	(Default factory set to the valve size) ½" – 6" [DN 15 – 150]
	Set Up Assistant	A set up routine that runs on first power up to assist the installer with configuring the valve. Can also be run again by selecting here and any changes made will be applied.	
2. Functions	Import/ Export	Allows the export of valve settings and Import into another valve in XML Format.	
	Commissioning Report	Generates a PDF of valve configuration settings for records.	
3. Units	Temperature	Units: water supply, return	Fahrenheit delta T, Celsius, Kelvin
	Flow	Units: water flow rate through the valve.	GPM, M3/s, M3/h, l/s,
	Power	Units: thermal power through the valve.	kBTU/h, W, kW, BTU/h, Tons
	Energy		kBTU, J, kWh, MWh, kBTU, Tons
	Pressure	Measures the Differential Pressure.	kPa, Pa, bar, psi, mb
4. Application	Installation Position	Identify the installed water service location of the valve and its embedded temperature sensor, or piped in series with the valve. The sensor w/ longer cable is remote (T1) and will be assigned opposite the water service of the valve.	Valve in Return Pipe, Valve in Supply Pipe
	Medium	Water or water/glycol accurately calculate: flow and energy.	Water, Monothermal, Rewe Glycol, Polyethylene Glycol

Web View Settings Continued

TAB	SETTING	FUNCTION	DEFAULT / RANGE
5. Override	Override functions	Override functions to move the valve to a part point or position which can be used for testing commissioning purposes. All engaged overrides stop and go back to normal operation automatically after 24 hours.	
	Auto	Normal operation no override.	Auto
	Close	Moves actuator to close valve.	N / A
	Open	Moves actuator to open valve.	N / A
	V'nom	In fow control moves the actuator to V'nom full open position.	N / A
	V'max	In fow control moves the actuator to V'max stop position.	N / A
	Motor Stop	Stops the valve at current position.	N / A
	P'nom	In power control mode moves the actuator to P'nom position (full open).	N / A
	P'max	In Power control mode moves the actuator to P'max setting.	N / A
	Simulated operation	Engages simulation of fow and temperature that is viewed on the overview page.	N / A
6. Control Settings	Control Mode	Controls Differential pressure or Differential pressure sensor selected.	Differential Pressure Control
	Differential Pressure Sensor	Selection of the installed differential pressure sensor.	None
	Sensor Range	Selection of ranges 1 to 4 for the measuring range set on the 22PDP-58XXX (this selection option is available with the 22WDP-51XXX).	None
	Differential Pressure Setpoint	Adjustment of the desired differential pressure.	None
	Differential Pressure Offset	Provides the ability to correct sensor drift.	None
	Maximum and Limitation	V'max is the maximum fow rate of the valve. When set V'max value is reached, the differential pressure is not increased any further, even if the setpoint has been reached.	V'nom
	Maximum and Limitation	P'max is the maximum power of the valve. When P'max value is reached, the differential pressure is not increased any further, even if it falls below the setpoint.	P'nom