BELIMO®

Belimo Energy Valve™
Communication Document

5 YEAR WARRANTY
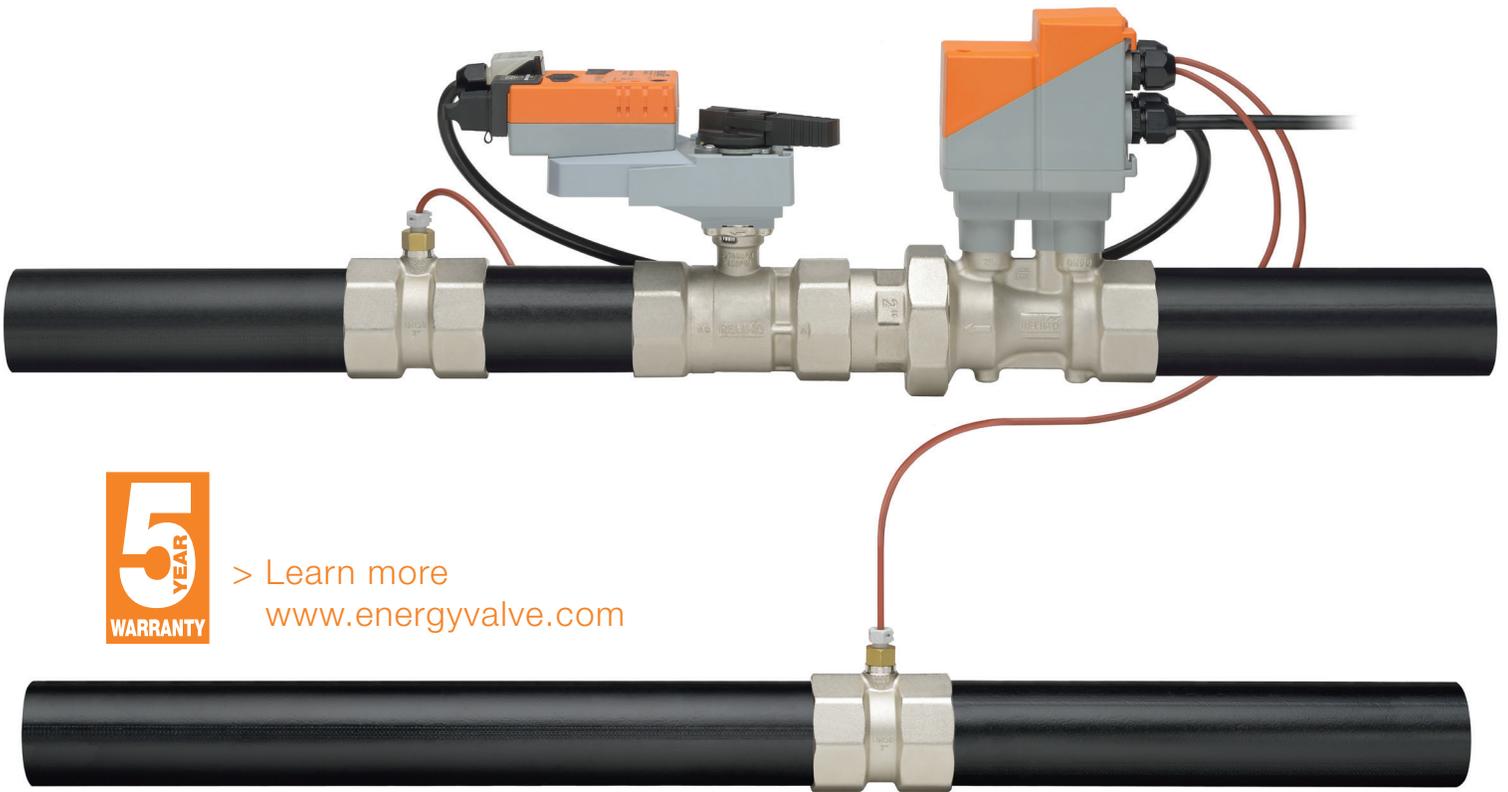
> Learn more
  www.energyvalve.com

| Measures Energy | Controls Power | Manages Delta T |

EXPERIENCE EFFICIENCY

hvacUSA.com
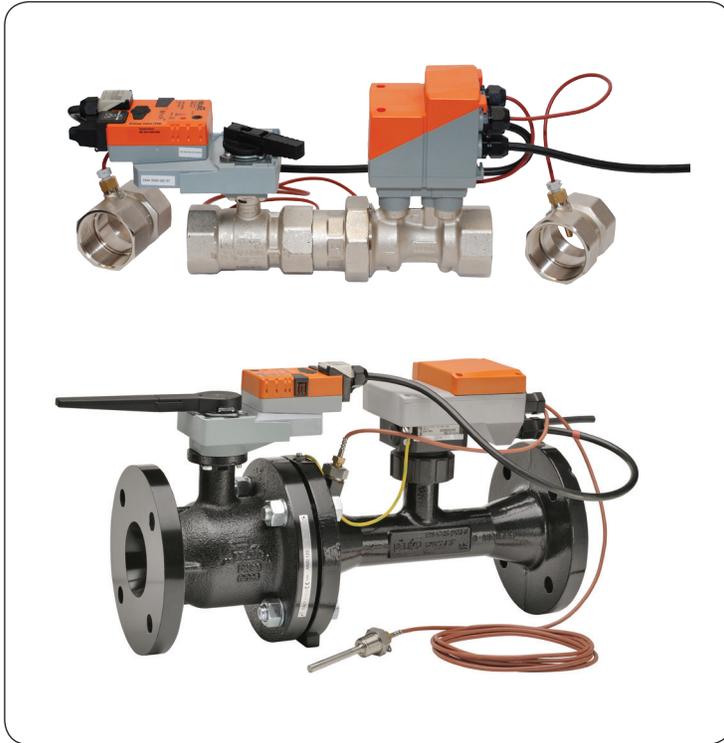A MechTronics Controls Company

www.hvacusa.com
Phone (877) 632-4876

Actuator Communication

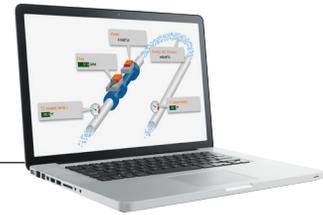The Energy Valve has multiple communication platforms and tool capabilities

BACnet IP or BACnet MS/TP

**ZTH US with
MP Protocol**

Analog Signal

Web View

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The Energy Valve Web View is a built-in web server that is used to configure the valve settings and view current and historical data. It can be accessed from a computer with a web browser. The Energy Valve must be connected to a TCP/IP network.

Connecting the Energy Valve to Ethernet:

To configure the Energy Valve using Web View, the Energy Valve must be connected to a TCP/IP network. If connecting the Energy Valve to a laptop computer directly without connecting to a LAN, configure the laptop IP address to 192.168.0.200 before connecting to the Energy Valve.
Open a web browser. Then, type one of the following addresses in the web browser address bar:
http://belimo.local:8080 or
http://192.168.0.10:8080
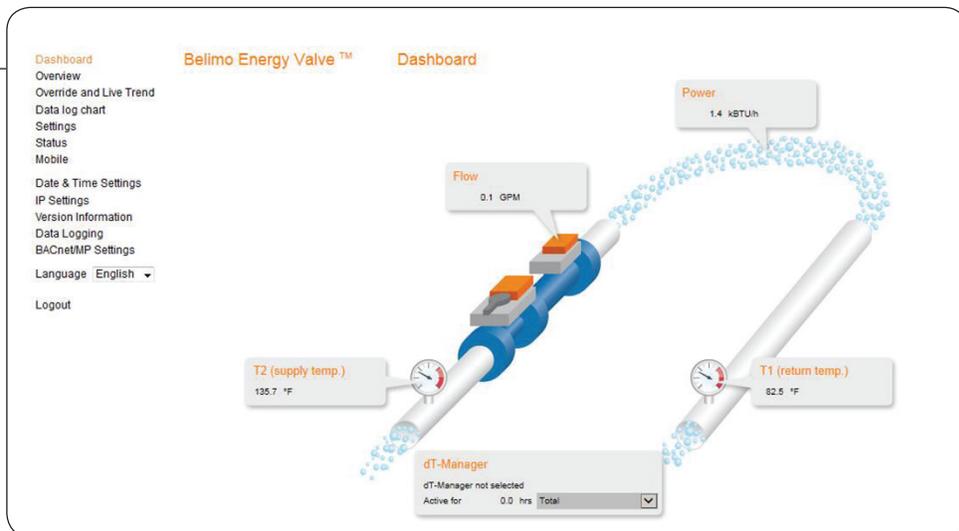
Compatible Browsers

Browsers must be capable of running Javascript.
*   Internet Explorer 8 or newer
*   Firefox 27 or newer
*   Chrome 33 or newer
*   Safari 5.17 or newer
*   Android browser
*   Windows Phone

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Login

- Access to the actuator is protected by the user name and password.

- Three default user types are available to login. Each user type has different security rights to the Web View. Refer to Web View user table below.

- Belimo cannot recover IP address. IP address can be viewed with ZTH US tool.

Windows Security

The server ev51.belimo.ch at sharedLogic requires a username and password.

guest

●●●●●●●●●●●

☑ Remember my credentials

OK   Cancel

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 Settings	--	Read/Write	Read/Write
IP Settings	--	Read/Write	Read/Write
Version Information	--	Read/Write	Read/Write
Mobile	Read	Read	Read/Write
Data Logging	Read	Read	Read/Write
BACnet / MP Settings	Read	Read	Read/Write

*Password is case sensitive

The Energy Valve Web View is a graphical user interface accessed via a network or internet to set up, calibrate and change the parameters of the Belimo Energy Valve. The Web View consists of the following page views:
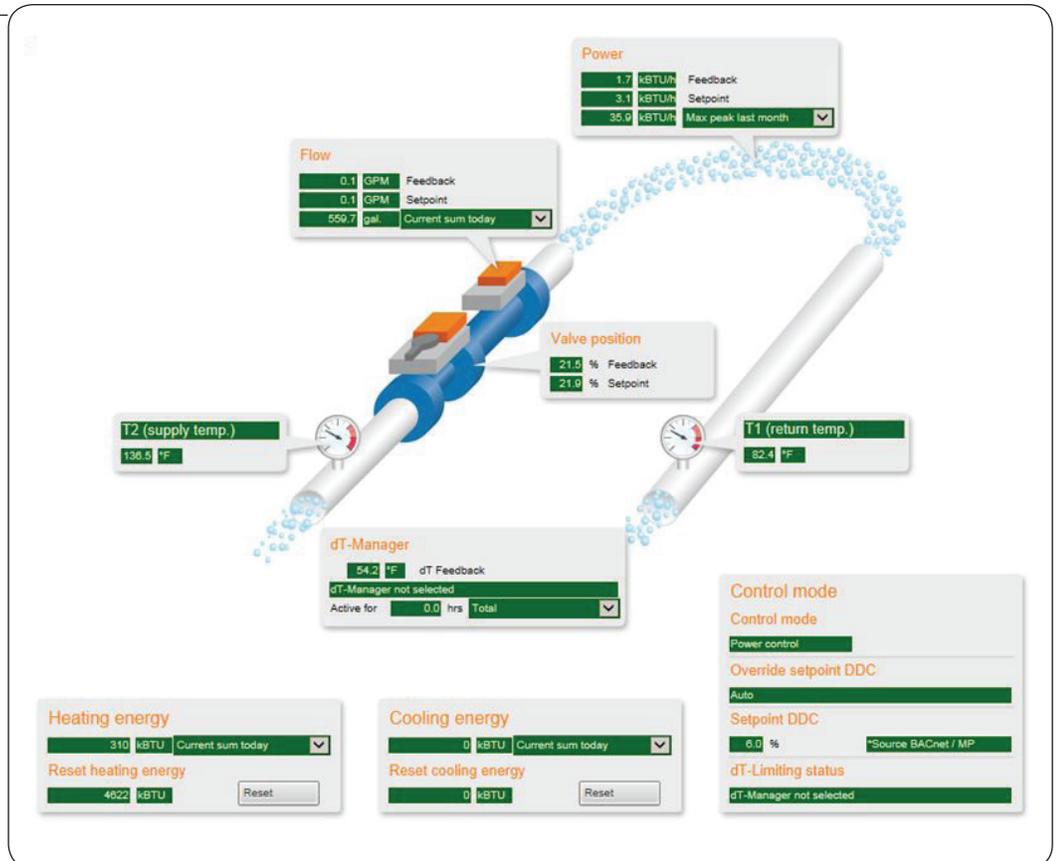
Dashboard

Provides a dynamic view of the current flow, power and temperature values.
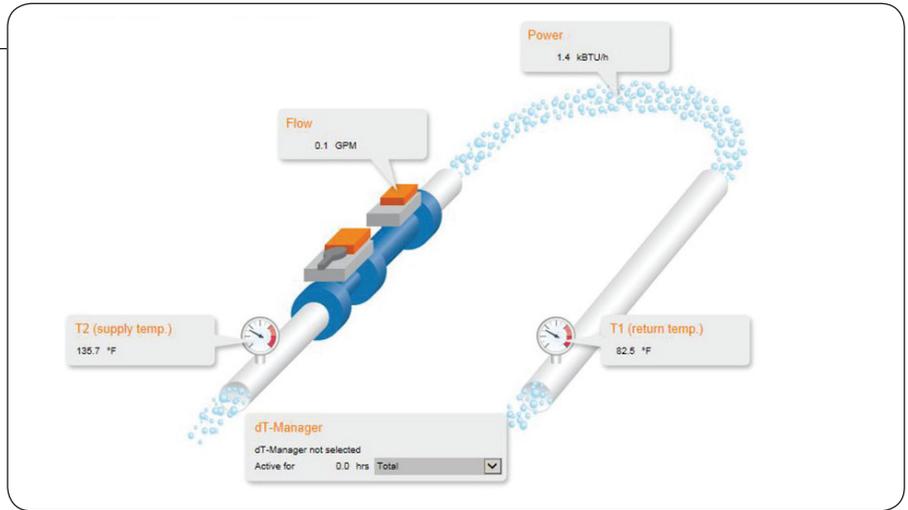
Overview

Similar to the dashboard view along with the ability to see the set point and accumulated total to the power, flow, and heating and cooling energy. It also shows current critical modes of operation.

Overview and Live Trends:

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 an override to the actuator. Any override will be reverted to auto after 2 hours.

Override:

- Auto (Default)
- Open
- Close
- V'max
- Motor Stop
- V'nom
- Setpoint Simulation: When using the override option, consider the relationship between voltage and equal percent flow characteristic
- Setpoint Position Override: Entered as a % of V'max
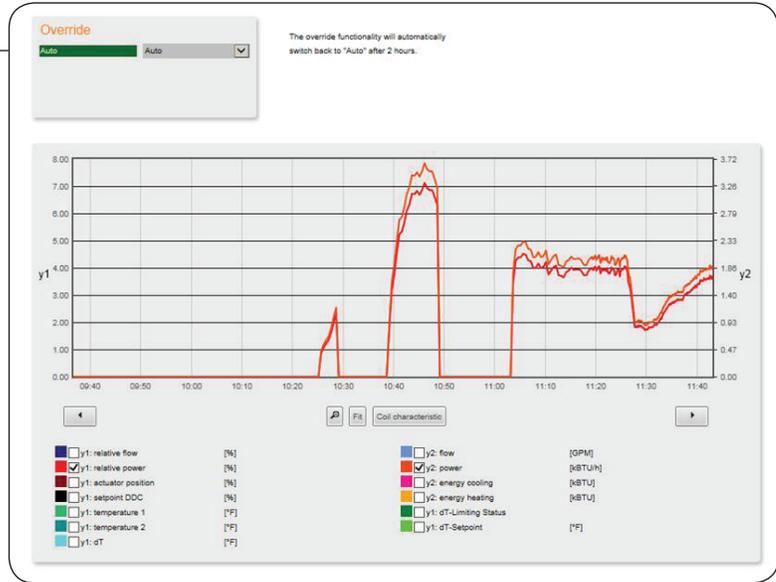
Data Log Chart

An analytical view of the historical data with the ability to select the type and monthly period to be analyzed.
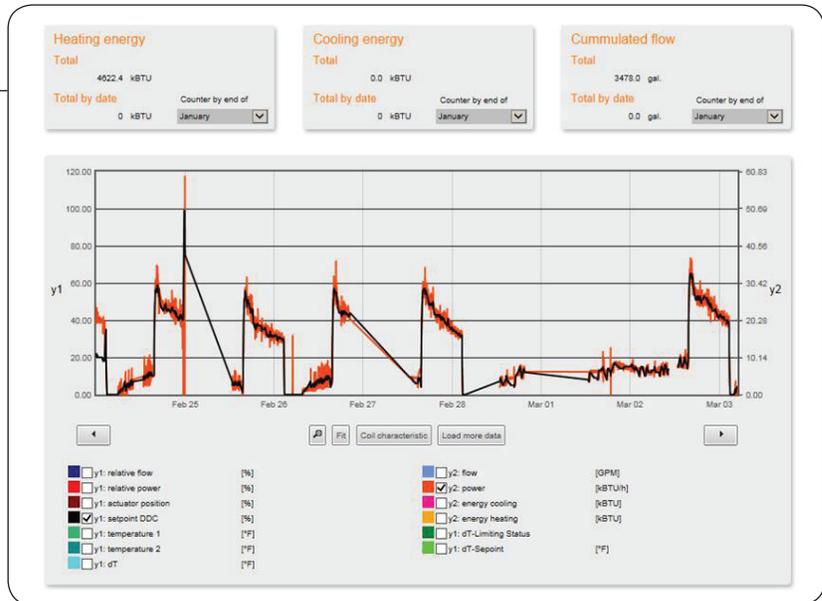
Settings

Access and adjust the operating settings. Refer to Web View Settings table on page 30.

Application

Valve size

DN 15

V'nom   5.5 GPM

P'nom   102.5 kBTU/h

Installation position

Valve in supply pipe ▼

Media

Water ▼

Cable length remote temp. sensor

3m ▼

User

Temperature

°F ▼

Flow

GPM ▼

Power

kBTU/h ▼

Energy

kBTU ▼

Configuration control funct.

Control mode

Power control ▼

Control signal range

2 - 10 V ▼

Invert control signal

no ▼

Configuration feedback funct.

Feedback information

Flow ▼

Feedback signal range

0.5 - 10 V ▼

Set maximum

1.7 GPM

Range   1.7 - 5.5   0.0

Configuration dT-Manager

dT-Limiting function

- ▼

Configuration flow

Maximum flow V'max

1.7 GPM = 30.0 %

Range   1.7 - 5.5   1.3

Configuration power

Maximum power P'max

51.2 kBTU/h = 50.0 %

Range   1.0 - 102.5   51.2

Status

Provides an error count by type and time elapsed of last occurrence.

• T1 error
• T2 error
• Flow sensor error
• Actuator cannot move
• Flow with closed valve
• Too many air bubbles
• Flow not realized
• Power not realized

These errors can be reset to zero.

Current status

Occurrences

	counter	days	hrs 1)
T1 error	0		
T2 error	0		
Flow sensor error	0		
Actuator cannot move	0		
Flow with closed valve	0		
Too many airbubbles	0		
Flow not realized	1	6	5.9
Power not realized	1	6	5.9

Reset

An error is detected when a problem lasts for at least:

5s for "T error", "Flow sensor error" and "Too many airbubbles"

600s for "Flow not realized" and "Power not realized"

180s for "Actuator cannot move" and "Flow with closed valve"

The error is then displayed for at least 5s

1) Time since last occurrence

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Date and Time Settings

Provides different ways to set the date and time. It allows the time to 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 automated through BACnet.

Date & Time Settings

Local Client

14:12:02	Time
04.03.2014	Date
GMT+1	Time Zone

Energy Valve

14:12:10	Time
04.03.2014	Date
CET	Time Zone

[Synchronize Time]

NPT Server (optional)
- ● Local RTC
- ○ Time Server

	IP Address Timeserver

[Submit]

IP Settings

To configure the valve communication on a TCP/IP network. It allows the valve to have a dynamic IP address (requires an active DHCP server) or a static IP address (requires an IP address, Network Mask, Gateway, and Broadcast addresses (DNS)).

IP Settings

50:2D:F4:05:E0:A1	MAC Address

- ○ DHCP/Zeroconf
- ● Static/Zeroconf

192.168.0.10	Host Address
255.255.255.0	Network Mask
192.168.0.1	Gateway
192.168.0.255	Broadcast Address

[Change IP Configuration]

Version Info

Displays current software version.

Version Information

Hardware

13186-00002	OC Module Material Number

Software

2.6.30-ksp0079-8.0.8G20	Operating System Version
1.33.4	Core Software Version

Application Model

ev-app-1-01-034-013304.bcz	Model Name

Mobile

This page is an optimized overview for smart phones and tablets providing similar data as the Overview page.
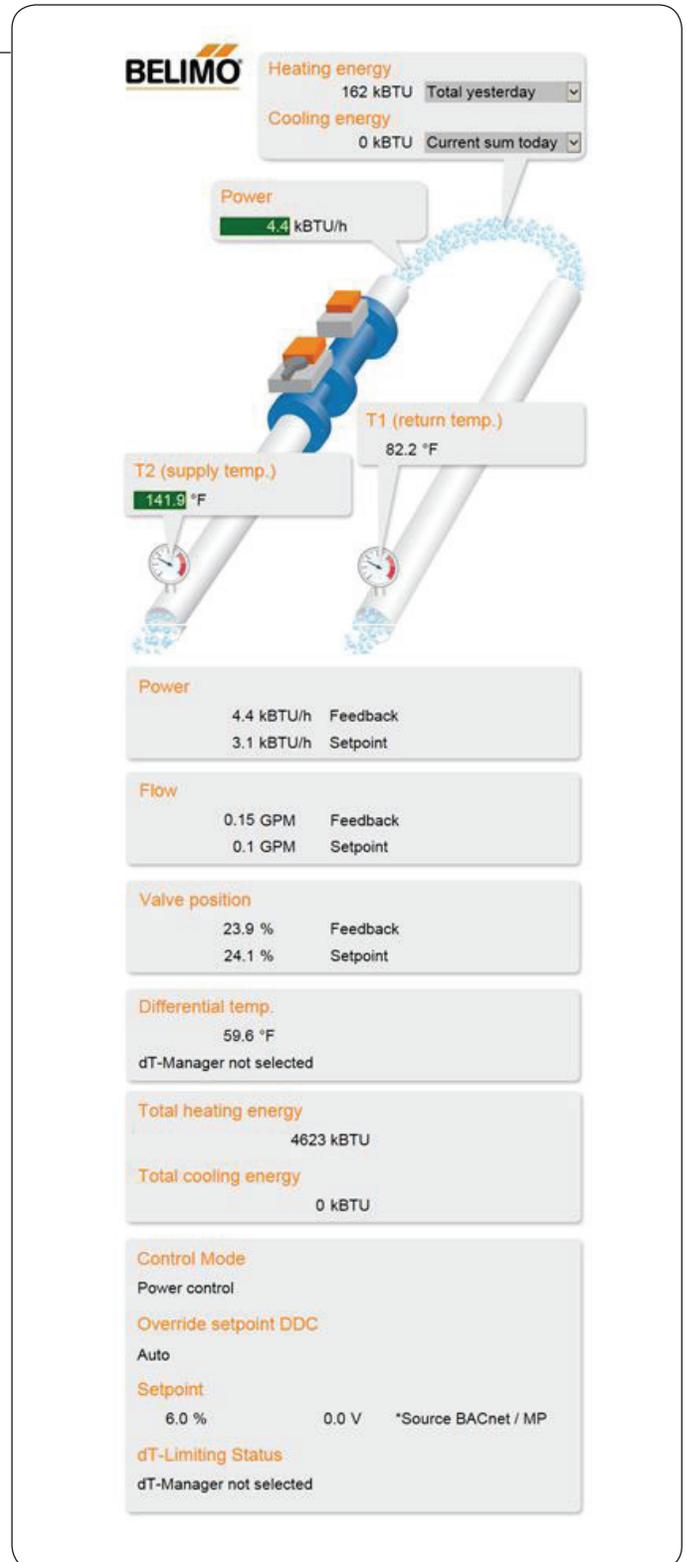
Data Logging

An area to download all the historical data in a generic spreadsheet format (.csv) that can be uploaded to the Data Analysis Tool™ for further analysis and commissioning settings. See Data Analysis Tool™ on page 34.

BACnet/MP Settings

This page is used to set the type of communication and settings for the Energy Valve.

- BACnet is a building automation communication protocol worldwide standard.
- MP is a Belimo protocol that allows for communication to multiple Belimo devices at the same time.

BACnet Device Object Settings

Instance ID: A 32 bit device with a unique ID in the BACnet network. A read-only value.

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

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

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

BACnet IP Settings

Port: The UDP port value defaulted to 47808

Simple/Foreign Device: A Simple Device communicates over the local network only. A Foreign Device communicates across multiple networks and requires the IP BBMD to be set.

IP BBMD: IP address applies to devices set as Foreign Device only. IP entered must be the IP of the BBMD router.

Time to Live: The frequency of the Energy Valve address broadcasting. This setting must match the BBMD router TTL setting.

BACnet MS/TP Settings

Baud Rate: The transmission speed within the MS/TP network. All devices on the same network must be set to the same baud rate.

MS/TP Address: The MAC address on the MS/TP network. This number must be unique within the network. Available values range from 1 to 127.

120 Ohm Termination: In some cases, a physical RS485 termination using a resistor may be required. Checking this box may provide
a solution. Hardwired termination resistor will provide a permanent solution.

Field Programing and Commissioning Options

All Energy Valve actuators can be field programmed with either the ZTH US handheld tool or with an Ethernet cable connected to a computer with web browser to access the actuators web page (Web View). Refer to the table below for a list of settings than can be changed in the field.

Belimo Energy Valve ™   Settings

Application ①
Valve size

V'nom
P'nom

Installation position
Valve in supply pipe

Media
Water

Glycol concentration
%   Range 0 - 60 %   0 %

Cable length remote temp. sensor
3m

User ②
Temperature
°F

Flow
GPM

Power
kBTU/h

Energy
kBTU

Configuration control funct. ③
Control mode
Power control

Control signal range
2 - 10 V

Invert control signal
no

Control signal characteristic
linear

Configuration feedback funct ④
Feedback information
Flow

Feedback signal range
0.5 - 10 V

Set maximum
Range   -   0.0

Set minimum
Range   -   0.0

Configuration dT-Manager ⑤
dT-Limiting function
-

dT-Limiting value
Range   -   35.0

Flow saturation value
Range   1.7

Configuration flow ⑥
Maximum flow V'max
=   %
Range   -   1.3

Configuration power ⑦
Maximum power P'max
=   %
Range   -   51.2

Web View Settings

TAB	SETTING	FUNCTION	DEFAULT / RANGE
1. Application	Valve Size	Defines the full flow cataloged capacity (V'nom) of the valve.	**(Default factory set to the valve size)** ½" – 6" [DN 15 – DN 150]
	Installation Position	Identify the installed water service location of the valve and its embedded temperature sensor, or sensor piped in series with the valve (T2). The sensor w/ longer cable is remote (T1) and will be assigned the opposite water service of the valve.	**Valve in Return Pipe** Valve in Supply Pipe
	Media	Water or water/glycol composition used with glycol concentration to accurately calculate: flow, thermal power and energy.	**Water** Monoethylene Glycol Polyethylene Glycol
	Glycol Concentration	Percent of glycol .	(User defined) 0-60%
	Cable Length Remote Temp. Sensor	Cable length selection. (For proper operation do not cut cables.) Remote sensor cable length setting adjusts wire resistance to accurately calculate thermal power and energy.	*½"- 2" models* **9.8 ft. [3 M]** 4.9 ft. [1.5 M] *2½" – 6" models* **32.8 ft. [10 M]** 16.4 ft. [5 M] 9.8 ft. [3 M] 4.9 ft. [1.5 M]
2. User	Temperature	Units: water supply, return, and delta T	**Fahrenheit** Celsius
	Flow	Units: water flow rate through the valve	**GPM** M3/h, l/s, l/min, l/h
	Power	Units: thermal power rate of the heat exchanger	**kBTU/h,** kW/h, MW/h, Ton/h
	Energy	Units: total thermal power of heating and cooling.	**kBTU,** kW/h, MW/h, Ton/h

TAB	SETTING	FUNCTION	DEFAULT / RANGE
3. Configuration Control Function	Control Mode	Controlled variable assigned to the actuator analog input y-signal, wire #3.	**Flow Control** Power Control Position Control
	Control Signal Range	Signal range options for the Control Mode.	**2-10 VDC** 0.5 -10 VDC
	Invert Control Signal	"No" valve modulate open when a 10 VDC is received. "Yes" 10 VDC signal closes the valve.	**No** Yes
	Control Signal Characteristic	Setting when Control Modes is set to Flow or Position. • Equal Percentage flow yields coil thermal power roughly equal to the control signal. (Refer to Equal Percentage Flow table). • "Linear" 50% controller command yields 50% flow output or position.	**Equal Percentage** Linear
4. Configuration Feedback Function	Feedback Information	Actuator analog feedback signal output on wire #5, u-signal.	**Flow** Power, T supply T return, delta T, Valve position
	Feedback Signal Range	Actuator analog feedback linear signal range.	**2-10 V** 0.5-10 V 0-10 V
	Set Maximum Feedback	Setting to equate 10 VDC or maximum feedback Information. Setting must match the DDC range maximum setting.	<u>Flow:</u> **0 to V'nom**
	Set Minimum Feedback	Setting to equate 0, 0.5, or 2 VDC or the minimum feedback Information. Setting must match the DDC range minimum setting.	<u>Position:</u> 0 to 100% (0-90 deg.) <u>Temperature:</u> 32°F to 212°F 0°C to 100°C <u>Power:</u> 0 to P'nom
5. Configuration Delta T Manager	Delta T Limiting Function	Setting to disabled or enabled with limiting logic: dT Manger or dT Manager Scaling. Both use settings"Delta T Limiting Value" but only dT Manager Scaling uses the "Flow Saturation Value".	**Disabled = "-"** dT Manager dT Manager Scaling
	Delta T Limiting Value	Low limit parameter for dT setpoint: • For dT Manger this is the dT setpoint. • For dT Manager Scaling this will reset so the dT setpoint is scaled, or variable. Use the Energy Valve Analysis Tool to select this setting. See Data Analysis Tool on page 34.	**10°F** 7-60°F 4-33°C
	Flow Saturation Value	Parameter used with dT Manager Scaling to reset the Delta T Limiting Value. When dT Manager Scaling is active: • If actual flow is less than this parameter the dT setpoint will be reset below the Delta T Limiting Value. • If actual flow is equal to this parameter the dT setpoint will be equal to Delta T Limiting Value. • If actual flow is greater than this parameter the dT setpoint will be reset above the Delta T Limiting Value. Use the Energy Valve Analysis Tool to select this setting. See Data Analysis Tool on page 34.	(User defined) >30%-100% of V'max
6. Flow	V'max	Used with Flow Control mode, this is the maximum flow setting of the valve with a full flow output signal from the controller. Value can be changed manually using the Adaption button.	**V'nom** 30%-100% of V'nom*
7. Power	P'max	Used with Power Control Mode, this is the maximum power setting with a full flow output signal from the controller. Power = (500)*Flow*ΔT = coil design load.	(User defined)

The ZTH US is a tool created to easily adapt the flow settings of the Energy Valve in the field. It directly connects to the Belimo actuator.

CONNECTION PROCESS:

LR, NR, AR, GR, AKR, GKR Series
Use the interface on the top of the actuator. Quarter turn to lock in place. Connect the other end of the cable into the ZTH US. The actuator must be powered for the ZTH US to function.(Leave all of the wires of the actuator installed.)

Technical Information

Supply	24 VAC/DC
Communication	PP
Used with actuator types	LR, NR, AR, GR, AKR, GKR

RE-PROGRAMMING PROCESS:

Initial Screen
When connected the display will show "Startup Progress" this process will take approximately 30 seconds.

Screen 1
Start Energy Valve process by pressing the down arrow. The first screen displays setpoint relative in % (SpRel). Press the down arrow to advance.

ZTH US SETTINGS

Move through the displays. The chart below shows the complete list.

Setting	Description	Range and UOM	Capability
Write	Analog Input signal as a % of full signal	0 – 100%	Read Only
RelPos	Valve position as a % of full opening	0 – 100%	Read Only
RelFlow	Current flow as % of V'max	0 – 100%	Read Only
AbsFlow	Flow in GPM	GPM	Read Only
T1 remote	Temperature opposite valve side	F	Read Only
T2 embedded	Temperature at valve	F	Read Only
DeltaT	Supply and return temperature differential	F	Read Only
RelPower	Current power as % of P'max	%	Read Only
Abs power	Current power output	KBTU/h	Read Only
Cooling Energy	Total cooling power since last reset	KBTU	Read Only
Heating Energy	Total heating power since last reset	KBTU	Read Only
Override	1=Auto,　　6=MotorStop, 2=Close,　　7=P'nom, 3=Open,　　8=P'max, 4=V'nom,　　9=Set Point Position Override 5=V'max,	1-9	Read/Write
SpPos Override		0 – 100%	Read/Write
Mode	(0 = 0.5 – 10 V, 1= 2 – 10 V)	0 - 1	Read/Write
ModeY Inv	(0 = not inverted, 1= inverted)	0 - 1	Read/Write
V'max	Can be a percentage or flow.	30 – 100% 0 – 1000GPM	Read/Write
P'max	Can be a percentage or power	1 – 100% 1 – 15000KBTU/h	Read/Write
Control Mode	0=Position Control, 1=Flow Control, 2=Power Control	0 - 2	Read/Write
Install Pos	0= Return Flow, 1= Supply Flow	0 - 1	Read/Write
IP-Address	Valve IP on LAN		Read Only
DeltaT Limit	0 = Disabled, 1 = dT-Manager, 2 = dT-Manager Scaling	0 - 2	Read/Write
SpDeltaT	Delta T Limiting Valve	7 – 60 F	Read/Write
SpFlowDeltaT	Flow Saturation Value	0 – 1000 GPM	Read/Write
SensorStatus	0 = OK, 1 = Not OK, 2 = OK Air bubbles	0 - 2	Read Only
IP-Address	Valve IP on LAN		Read Only
DeltaT Limit	0 = Disabled, 1 = dT-Manager, 2 = dT-Manager Scaling	0 - 2	Read/Write
SpDeltaT	Delta T Limiting Valve	7 – 60 F	Read/Write
SpFlowDeltaT	Flow Saturation Value	0 – 1000 GPM	Read/Write
SensorStatus	0 = OK, 1 = Not OK, 2 = OK Air bubbles	0 - 2	Read Only

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