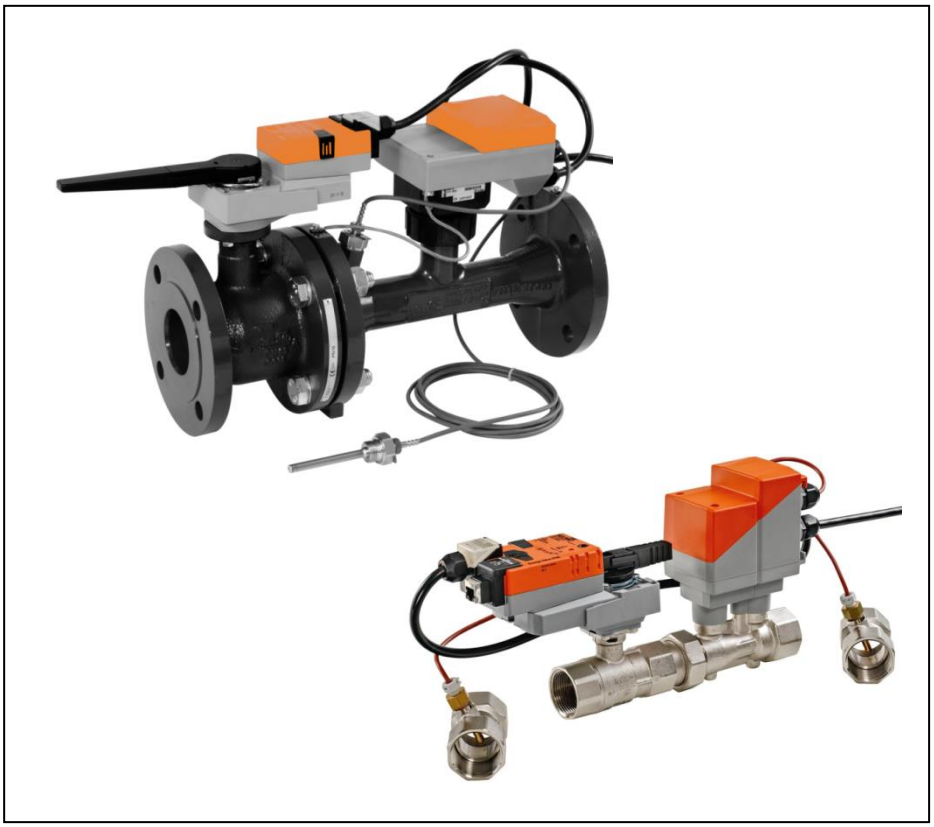


Characterised control valve (CCV) with adjustable flow rate and sensor-operated flow control, power control, and power and energy-monitoring function

Contents

General

Versions Information

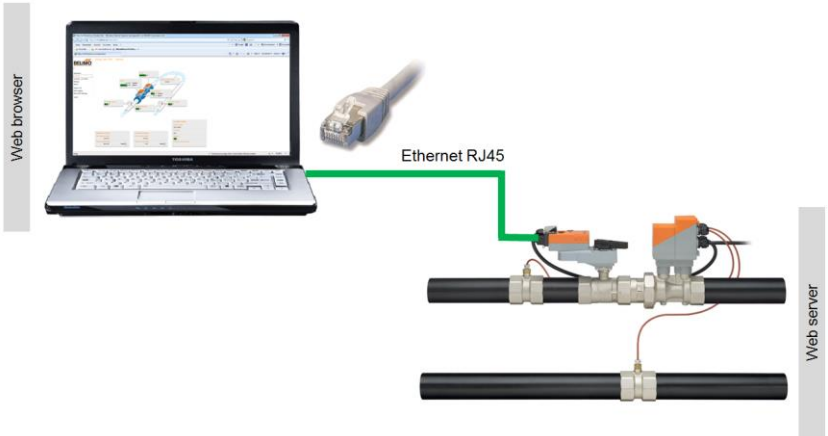
- This manual relates to the following listed products with a production date from 24th March 2014.
  - Belimo Energy Valve™ DN15 to DN50
    - EV015R+BAC
    - EV020R+BAC
    - EV025R+BAC
    - EV032R+BAC
    - EV040R+BAC
    - EV050R+BAC
  - Belimo Energy Valve™ DN65 to DN150
    - P6065W800EV-BAC
    - P6080W1100EV-BAC
    - P6100W2000EV-BAC
    - P6125W3100EV-BAC
    - P6150W4500EV-BAC
- Earlier versions might have different views and functions. In case of doubt, please contact your Belimo Representative.

Requirements

- For a direct-access a PC with an installed web browser and a network cable (RJ45) is needed.
- The following web browsers are supported:
  - Microsoft Internet Explorer 8.x / 9.x / 10.x
  - Mozilla Firefox V3.xx bis V25.xx
  - Safari on platform iOS 3.x / 4.x / 7.x
  - Standard web browser on platform Android:
    - 2.3.x Gingerbread
    - 3.x.x Honeycomb
    - 4.0.x Ice Cream Sandwich
    - 4.3.x Jelly Bean
- To display the trend views in the web browser, the "Adobe Flash Player" has to be installed. Download of the newest version: www.adobe.com/de/products/flashplayer/
- The current version of Java has to be installed. Download: http://www.java.com/de/download/.

Access to the Energy Valve

- Connect the PC/Laptop to the Energy Valve with the RJ45 cable

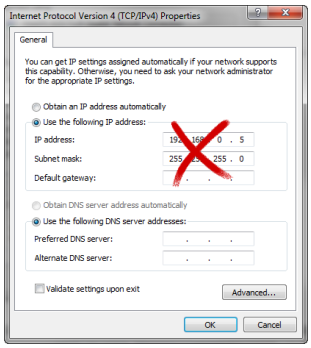


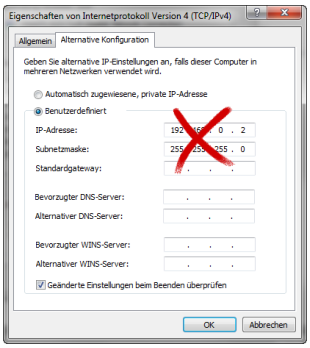
- Note: The Energy Valve must be supplied with voltage.

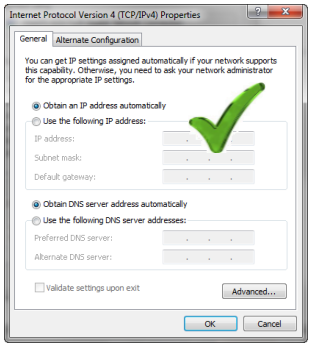
General *(continued)*

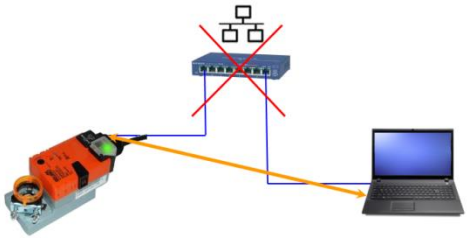
Access to the Energy Valve by means of a "Peer to Peer" connection

- Easy access to the valve possible.
- The IP address has not to be known.
- The following conditions have to be considered:
  - Direct connection valve – PC. This access method can not be used in a network with other devices.
  - No static IP address is configured
  - No alternative IP address is configured
  - DHCP mode is set









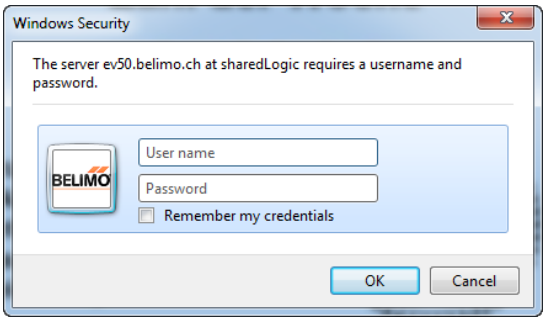
- Open Internet Explorer and enter the following address: **http://belimo.local:8080**

Access to the Energy Valve by means of the IP address

- As an alternative to the "Peer to Peer" connection an access by using the IP address is also possible.
- This type of connection can be used in a network with several devices.
- In case of several Energy Valves in the network different IP addresses must be assigned first.
- 192.168.0.10 is the IP address assigned at the time of delivery
- Open Internet Explorer and enter the following address: **http://192.168.0.10:8080**

General *(continued)*

User name and password



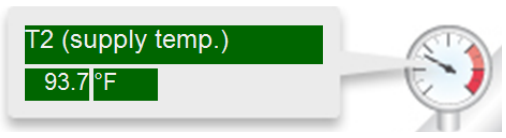
- Access to the Energy Valve is password-protected
- 3 users have different reading and writing access

User name:	guest	maintenance	admin
Password:	guest	belimo	1)
Dashboard	R	R	R
Overview	R	R / W	R / W
Override and Live Trend	R	R / W	R / W
Data log chart	R	R	R
Settings	R	R	R / W
Status	R	R / W	R / W
Mobile	R	R	R
Date & Time Settings	-	R	R / W
IP settings	-	R	R / W
Versions Information	-	R	R
Data Logging	R 2)	R / W	R / W
BACnet/MP Settings	R	R	R / W

- Legend:
  L = Read access
  S = Write access
  - = Page is not displayed
  1) = Please contact your Belimo Representative
  2) = Download csv-files possible

General information regarding operation

- A brief display of a value against a green background indicates that this value has changed

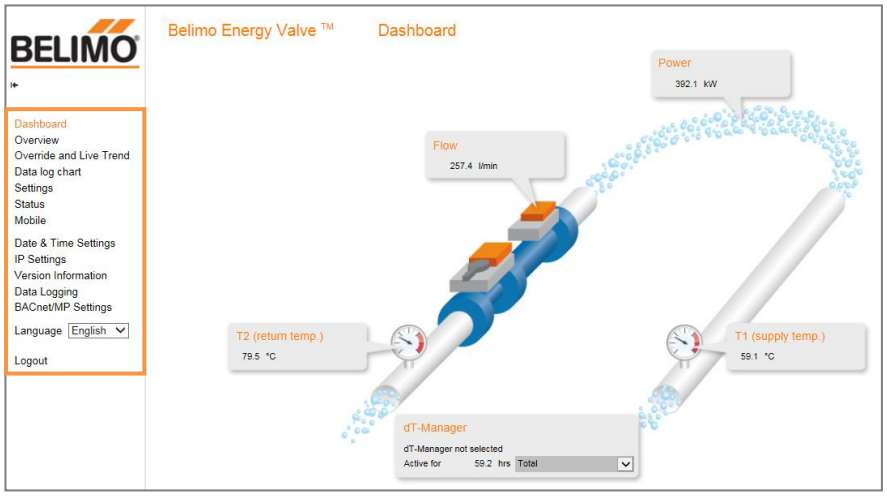


- Changing settings:
- When a new setting is selected (dropdown menu), it will be applied automatically
- A new value is applied automatically after it has been entered and the ENTER key has been pressed. It is not necessary to press a 'Save' button.

Web server

Dashboard

- After entry, the dashboard displays an overview of the most important ACTUAL values



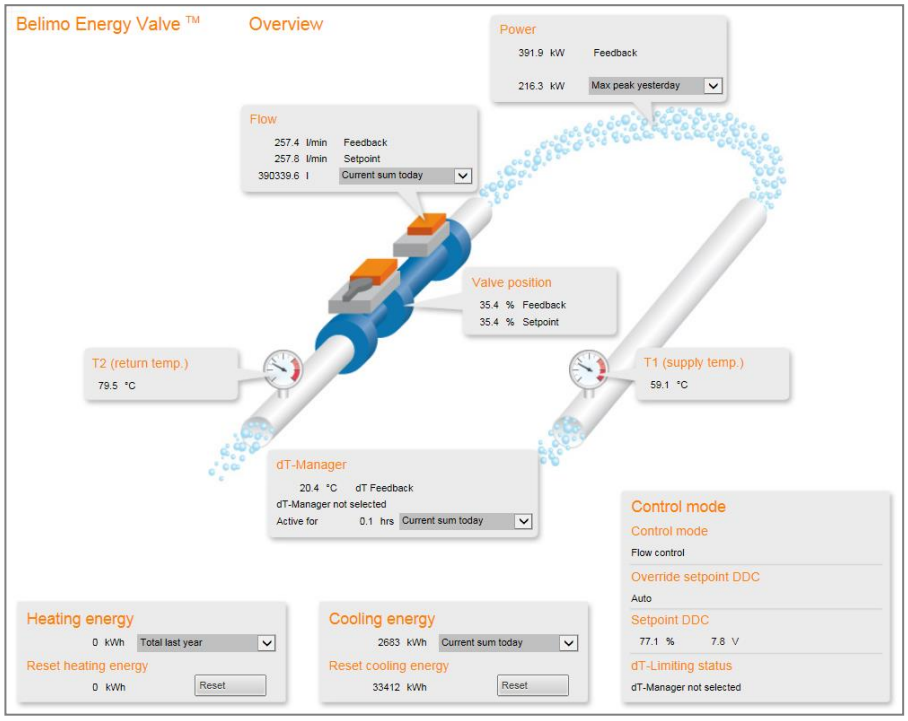
- The navigation option for accessing the other pages is to be found on the left-hand side of the monitor

Language selection

- The language displayed on the web server is selected automatically according to the current PC settings
- Available languages: English and German
- If the language is not available, English is selected as the display language
- If necessary, the display language can be selected manually
-

Overview

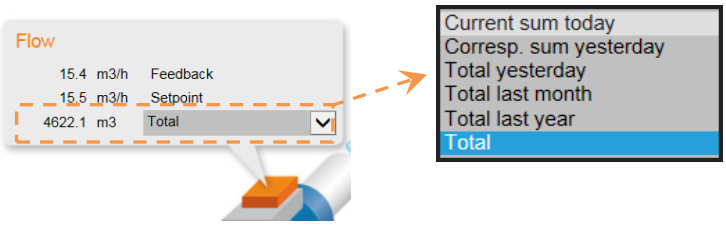
- In addition to the most important ACTUAL values, this page also shows the heating/cooling energy that has been consumed and the current NOMINAL values. Furthermore different KPI information (see next page) can be chosen with the dropdown selections.



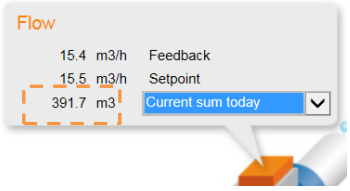
Web server *(continued)*

KPI

- KPI = Key Performance Indicator
- KPI values allow a fast and easy display of comparative information
- Example taking flow rate



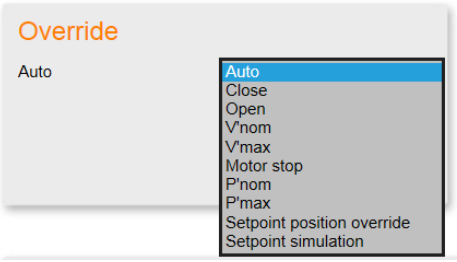
◦ Chosen comperative value is displayed:



Web server *(continued)*

Override and Live Trend

- The current control signal can be overridden with the help of the Override function.

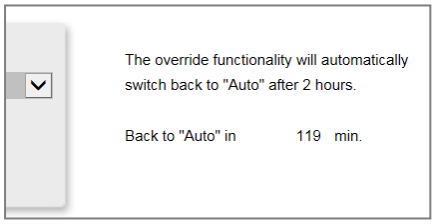


- The following options are available:
  - **Auto:** No manual override
  - **Close:** Valve is closed
  - **Open:** Valve is opened completely
  - **Vnom:** The nominal flow rate of the valve (catalogue value) is controlled [1)]
  - **Vmax:** The set maximum volumetric flow (100% requirement) is controlled
  - **Motor stop:** The actuator remains at its current position
  - **P'nom**: The nominal power Q'nom of the valve is controlled [1)]
  - **P'max**: The set maximum power Q'max (100% requirement) is controlled
  - **Setpoint position override:** Selection of a certain opening angle → *Input as percentage value (X% of 90°)!*
  - **Setpoint simulation:** Simulation of the control signal → *Input voltage [V]*

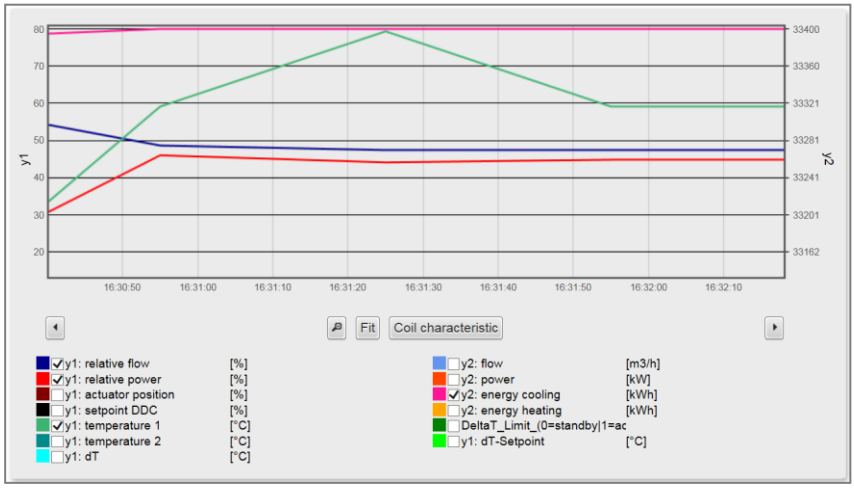
> Note
>
> The definition of the values V'nom, V'max, P'nom and P'max is provided in the Appendix to this document.

- As Vnom/P'nom may be greater than the maximum required (set) V'max/P'max of the installation, achieving the nominal value is dependent on the output of the pump.

- The override function is deactivated automatically after 2 hours.
- The time remaining before deactivation is displayed.



- The Live Trend function visualizes the values of the system.
- The Live Trend function shows the valve values since entry/login and first clicking on "Override and Live Trend".
- The displayed values can be selected in the lower range.

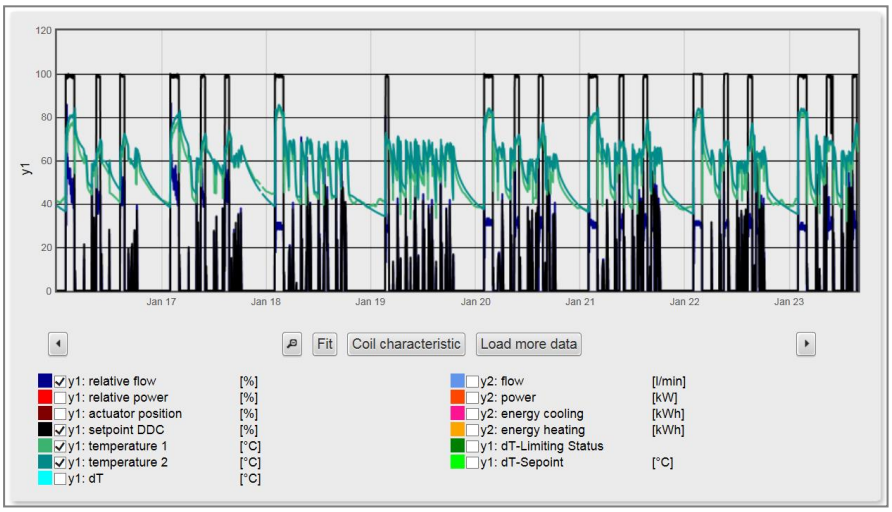


Web server *(continued)*

Data log chart

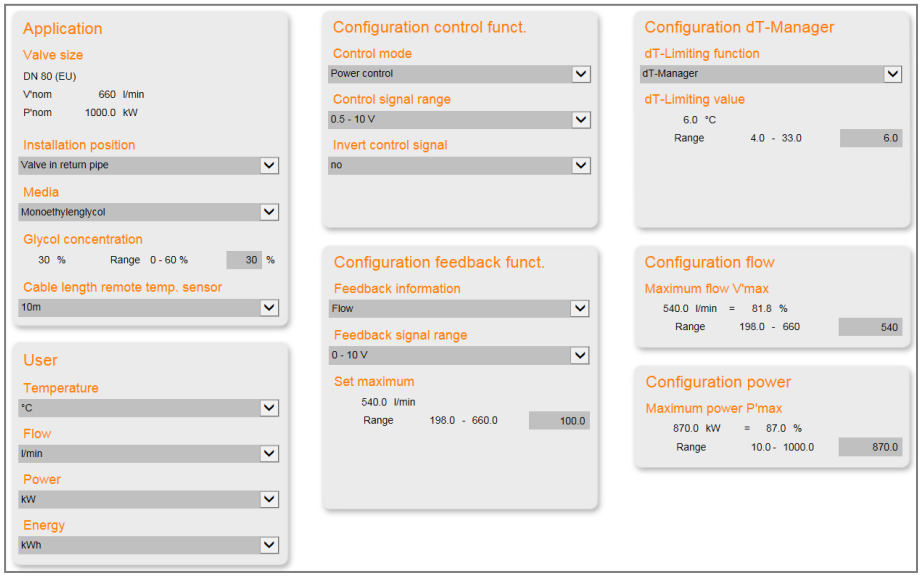
- Display of the recorded energy consumptions and cumulated flow rate

- This page allows the visualization of the values of the system.
- In contrast to the page **Override and Live Trend** additional data which are stored in the actuator are imported (data of the last 8 days).
- By clicking the button 'Load more data' all data stored in the actuator are imported.



Settings

- All settings can be made on this page.

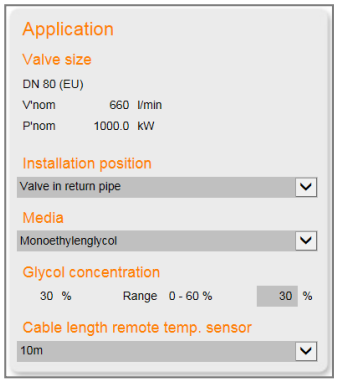


Note

The various setting options are explained in detail below.

Web server *(continued)*

Settings - Application



- Valve size
  - Information only
- V'nom
  - Information only
- P'nom
  - Information only
- Installation position
  The correct setting is important for the allocation of the consumed energy as cooling or heating energy
  - Valve in return pipe
  - Valve in supply pipe
- Media
  Selection of the medium used:
  - Water
  - Monoethylenglycol
  - 1.2 Polypropylenglycol
- Concentration
  - Percentage concentration of the glycol
  - The selection is only displayed when ' Monoethylenglycol' or '1.2 Polypropylenglycol' has been selected
- Cable length
  - The cable length of the sensor which is away from the valve is setted to the correct value of 3 meters (DN15…DN50) or 10 meters (DN65…150) ex works.

The cables between valve unit and temperature sensors may not be either shortened or lengthened.

The setting of the cable length may not be changed!

Settings - user

- Setting the desired language and value units

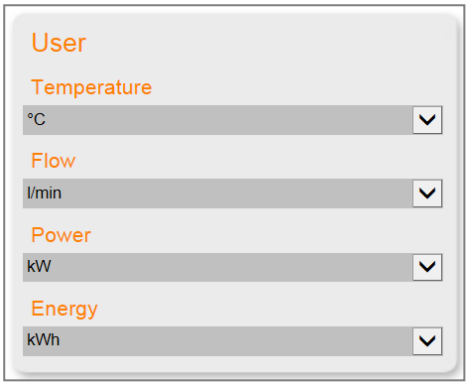
Temperature
- °C (*)
- °F

Flow rate
- m^3/h
- l/s
- l/min (*)
- l/h
- GPM

Power
- W
- kW (*)
- BTU/h
- kBTU/h
- Ton

Energy
- kWh (*)
- MWh
- kBTU
- TonH

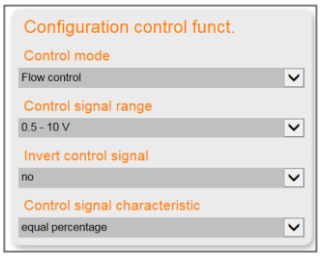
(*) = presetting ex-works



Web server *(continued)*

Settings – Configuration control function

- Parameterisation of the analogue control signal Y
  - Control mode
    - **Position control:** In this setting, the valve functions as a pressure-dependent valve, e.g. like a conventional characterized control valve
    - **Flow control:** Operation as a pressure-independent valve analogous to an EPIV
    - **Power control:** The control signal requests directly a certain power output at the exchanger. The valve works temperature- and pressure-independent
  - Control signal range
    - **0.5 – 10 VDC**
    - **2 – 10 VDC**
  - Invert control signal
    - **no:** no inversion → 0V = valve closed / 10V = valve open
    - **yes**: inversion → 10V = valve closed / 0V = valve open
  - Control signal characteristics
    - **equal percentage:** equal-percentage characteristic curve
    - **linear:** linear characteristic curve
    - This selection is not available when 'Power control' is selected. For power control the characteristic is always linear

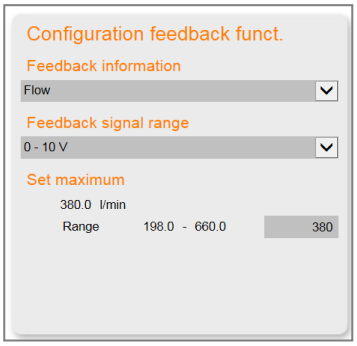


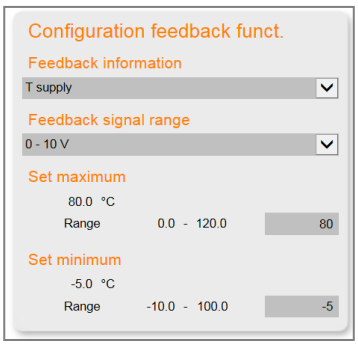
Settings – Configuration feedback function

Note

These settings configure the analogue feedback signal U5

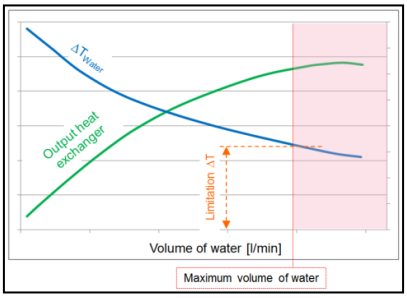
- Feedback Information: U5 corresponds to one of the following values. The units correspond to the units set in the 'User' range.
  - **Flow:** Flow rate
  - **Power:** Current consumer power
  - **T supply:** Supply temperature
  - **T return:** Return temperature
  - **Delta T:** Differential temperature, supply and return
  - **Valve Position:** Valve opening angle [°]
- Feedback signal range:
  - 0 – 10 VDC
  - 0.5 – 10 VDC
  - 2 – 10 VDC
- Upper limit selection: Setting the maximum value for the feedback signal
  - 10 V = set value
- Lower limit selection (only for T Supply, T Return): Setting the minimum value for the feedback signal
  - 0 V = set value
  - Only displayed when 'T supply' or 'T return' has been selected
  - 0 V corresponds to the value 0 with all other selections



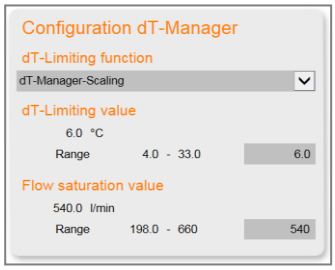


Web server *(continued)*

Settings – Configuration dT-Manager



- This function can be used in order to prevent an increase in the volumetric flow when levels fail to reach a set supply/return differential temperature.
- The valve will not be opened further in such cases, even with an increasing control signal
- Limitation function
  - **-:** Delta-T limitation switched off
  - **dT-Manager:** Simple Delta-T limitation switched on
    - **Lower dT-limit:** No increase in the volumetric flow when levels fall below this setting value
  - **dT-Manager-Scaling:** Advanced Delta-T limitation switched on
    - **Lower dT-limit:** No increase in the volumetric flow when levels fall below a (dynamic) setting value
    - **Flow rate at saturation:** Corresponding flow rate when achieving Delta-T



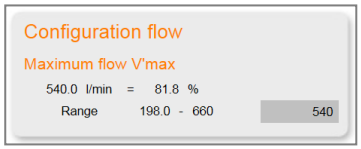
The limitation function monitors the differential temperature only when the flow rate is ≥ 30% of V'max
- In the range below 30% V'max too low differential temperatures are not corrected
- This operating behavior ensures the correct start-up of the system after a downtime

Settings – Configuration flow

Note

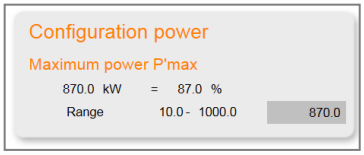
The definition of the values V'nom and V'max is provided in the Appendix to this document.

- Maximum flow rate V'max
  - This value is to be set on the basis of the design data of the consumer
  - Input as absolute value in the selected unit



Settings – Configuration power

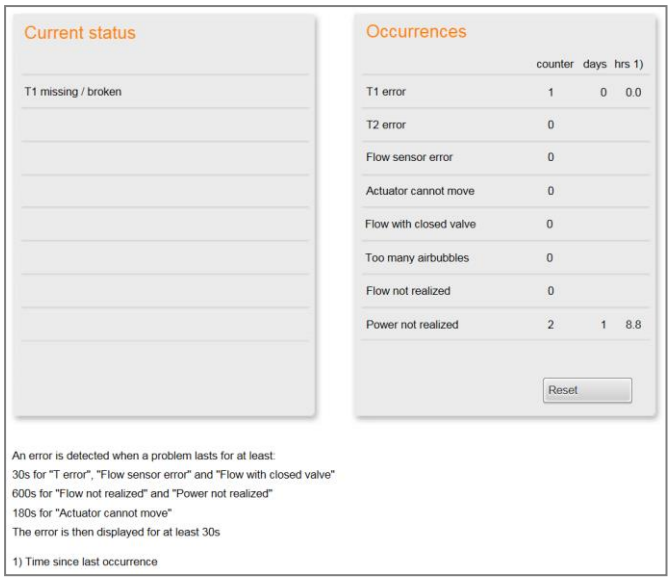
- Maximum power P'max
  - Is shown when control function 'Power' is selected
  - This value is to be set on the basis of the design data of the consumer
  - Input as absolute value in the selected unit



Web server *(continued)*

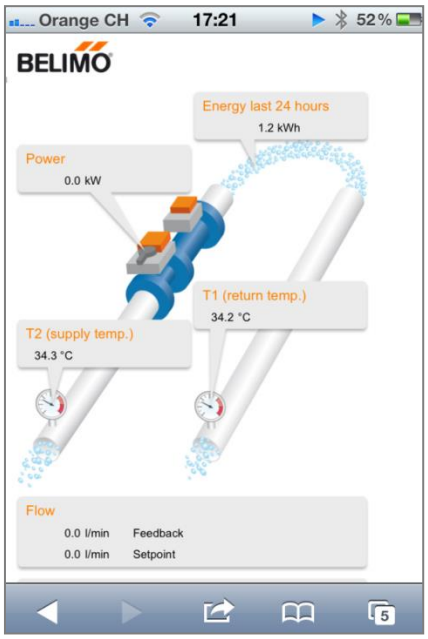
Status

- Display of the current error messages and the error history
- Current error messages are presented on the left-hand side
- The error history is displayed on the right-hand side
- The error history can be reset by users with the respective authorisation.



Mobile

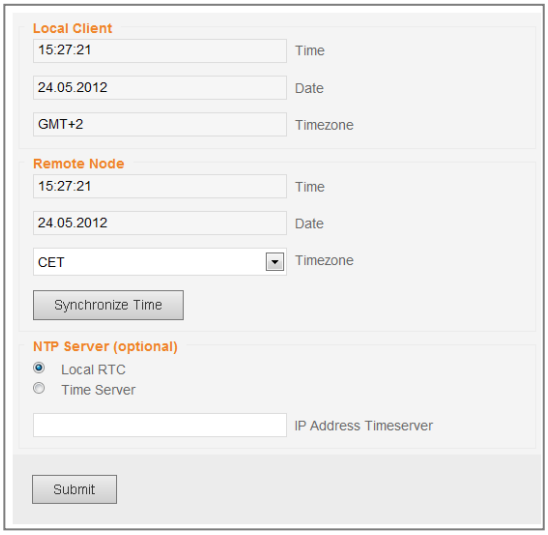
- For access with a view optimised with a smartphone



Web server *(continued)*

Date & Time Settings

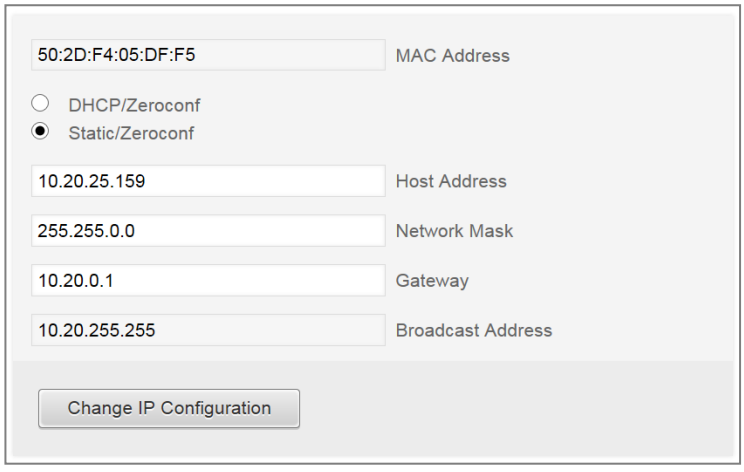
- Possible settings: Date, Time and Time Zone



- Local Client: Date and time of the connected PC
- Remote Node: Date and time which is set on the Energy Valve
- Synchronize Time: Clicking on "Synchronize Time" causes the Date and Time settings of the attached PC (Local Client) to be adopted on the Energy Valve (Remote Node).
- NTP Server: As an option, time and date can be obtained from a Time Server.
- When using several Energy Valve it is possible to define one Energy Valve as the Time-Master. For this purpose the IP address of the Time-Master must be entered at all other Energy Valves.

IP Settings

- IP settings
- This settings are to be set on the basis of the instruction of the network administrator

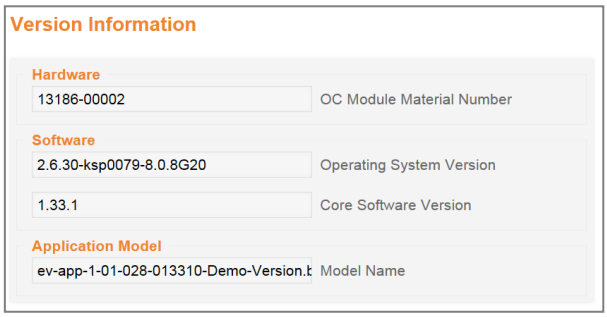


- **Static IP-address:** With this setting, the possibility is given to assign a pre-defined IP-address to the Energy Valve, as well to assign the subnet mask and gateway to it. This method can be used, if the network administrator is managing the network addresses without a DHCP server.
- **DHCP/Zeroconf:** With this setting it is possible, to assign automatically an IP-address to the Energy Valve. If a DHCP Server is available in the network, the Energy Valve is able to receive an IP-address from it.
  If there is no DHCP Server in the network, the Energy Valve is able, via Zeroconfig, to calculate an IP-address based on the ZeroConfig specification.

Web server *(continued)*

Versions Information

- Display of the current software and hardware version

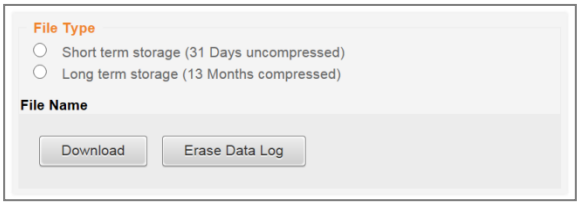


Note

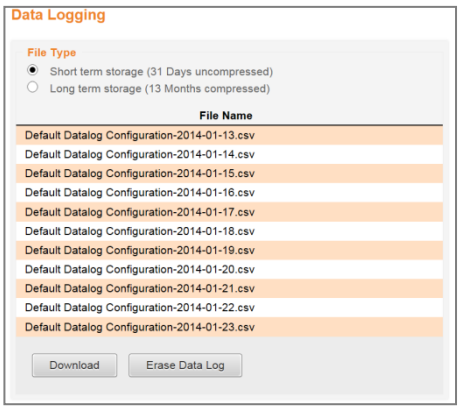
Please communicate the information on this page to your local Belimo representative in the event of malfunction.

Data logging

- Download of the csv files stored in the Energy Valve



- **Short Term Storage:** One file is available per day for the last 31 days. A measurement series is stored every 30 seconds.
- **Long Term Storage:** One file is available per month for the last 13 months. A measurement series is stored every 2 hours.



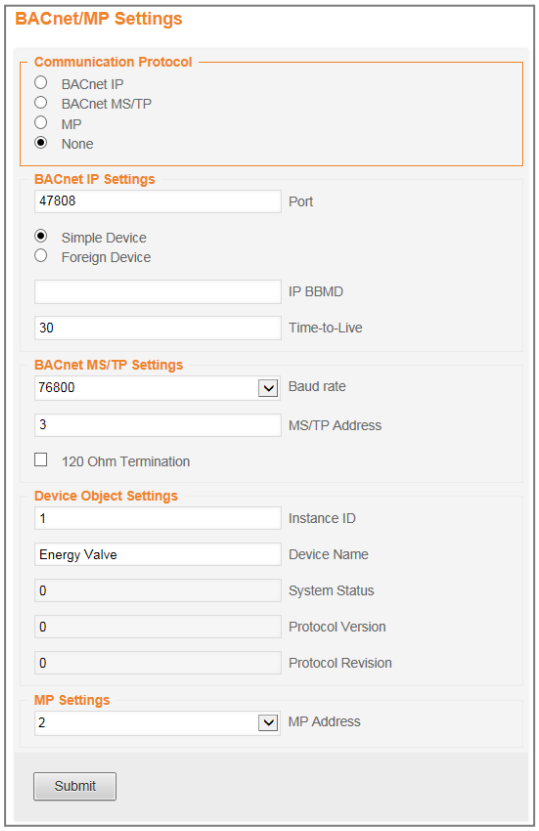
Deleted data cannot be restored!

- The files on the actuator can be deleted by users with the respective authorisation.

Web server *(continued)*

BACnet/MP Settings

- Selection of the communication protocol
  - BACnet IP
  - BACnet MS/TP
  - MP
  - None (conventional control)
- Perform all relevant settings in accordance with the specifications of the onsite equipment.



Logout

- Exiting the web server

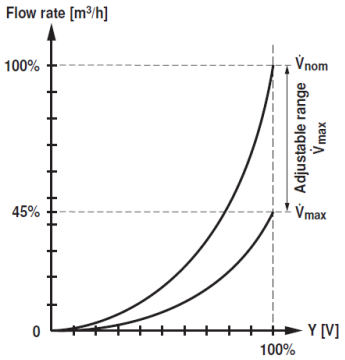
Attachment

Definition of V'nom

- Is the maximum possible flow rate. V'nom represents the as-delivered condition.

Definition of V'max

- Is the maximum flow rate which has been set with the greatest control signal, e.g. 10V.



Definition of P'nom

- P'nom is the maximum controllable power output Q'nom at the heat exchanger (fixed by the valve).

Definition of P'max

- P'max ist he maximum power output Q'max which has been set with the greates control signal, e.g. 10V.
- For control mode 'Power'.