

**OPP-TB-253519.050**

**Control Valves**

**Energy Valve Operation**

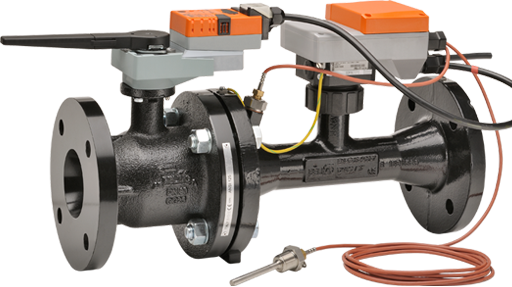
**Background**

“Energy Valves” are a type of Belimo actuator that has an integral flow meter and differential temperature sensors that measure and maintain an appropriate water-side temperature differential independent of the control system output.

In a typical setup, the control system will send a 0-10V (or 2-10V) signal to the control valve to maintain a discharge air setpoint. If the design water-side delta-T is not met (typically 12 degrees), the energy valve will take over control via the “delta-T manager” until the delta-T is met. **This ignores the output from the control system.**

This setup should be reflected in the control system, however, direct connection to the Ethernet connection on the valve may be required to view all valve settings.

**Diagnosis**

Energy Valves are easily identified visually, even through insulation, due to the additional orange control box located adjacent to the actuator, and supply water temperature sensor lead.

The control system should have a graphic that notifies you when the energy valve has taken over local control, as well as a link to view all available control points within the valve logic.

**Corrective Action**

If the ACF is not maintaining DAT, and the valve control is enabled, you must turn-off the delta-T manager via the control system or by directly connecting to the valve by the following procedure:

Important notes, read prior to connection:

* The static IP address located in the valve software must not be changed. If this value is modified, the valve connection will be lost, and the unit must be sent back to Belimo for refurbishment.
* The only BAS connection value that should be modified is the device ID number. The Environment Systems Administrator (EAS, currently Paul Scanlon) designates the Device ID number. Any new installations or modifications to the Device ID number must be coordinated with the EAS.
* The delta-T manager is an on-board control algorithm that does not utilize information or PID tuning from the control system. Do not modify the control PID loop when delta-T management is enabled.
* DO NOT CHANGE THE USER NAME, PASSWORD, OR IP ADDRESS. THIS WILL RENDER THE VALVE INACCESSIBLE.

Device Connection Quick Reference (Windows 7, XP is similar):

* Connect the Ethernet cable directly to the valve port.
* Open the Windows Control Panel
* Select “Network and Internet”
* Select “Network and Sharing Center”
* Select “Change Adapter Settings” from the left-left hand menu
* Right-Click “Local Area Connection”, select “Properties”
* In the new window, select “Internet Protocol Version 4 (TCP/IPv4)”, and click on the “Properties Button”
* Select the “Use the following IP Address” radio button.
* Enter 192.168.0.200 for the IP Address and 255.255.255.0 for the Subnet Mask.
* Click “OK”
* Open Internet Explorer, enter the address: <http://192.168.0.10:8080/index.html>
* The user name is “admin”, the password is “tlnsg”
* REMEMBER TO CHANGE THE IPv4 SETTING TO “Automatically Obtain IP Address” WHEN FINISHED, OR YOU WON’T BE ABLE TO CONNECT TO ETHERNET ANYWHERE ELSE.

Complete Valve Instructions are attached hereto as of the last revision date listed below. Current valve information is available at [www.belimo.com](http://www.belimo.com).

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*Last Revision:* March 8, 2013

Machine generated alternative text: Knowledge ¡s Power
BELIMO
Belimo Energy ValveTM Communication
• Web View
. BACnet
. ZTH-2
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Web View Settings 4-9
Connection to the Actuator 10-13
BACnet Protocol . 14-15
ZTH-2 16-18
Functionality ComQarison 19

Machine generated alternative text: Energy Valve
Web View
BELIMO
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 Relimo Energy Valve. The web view consis:s of the following page views:
Dashboard
The Dashboard view is a snapshot of
essential real time data with navigation
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The Overview is a snapshot of
essential real time data with
addition of heating/cooling energy
and current control mode.
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Machine generated alternative text: BELIMO
Override
Energy Valve
Web View
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‘ Override
• Airo (Defaulij
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voltage and equal percent flow characteiisüc
. Setpoint Position Override
Settings
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Machine generated alternative text: Energy Valve
Web View Settings
Application
Valve Size
. DN65—DN1SO
. This section should not be changed since it corresponds to the size of the valve.
Only to be used when replacing an actuator with a non configured one out of
the box.
Installation Posi:or
. Select this option based on the actual installation of the valve
‘ <- Valve installed on the return pipe of the coil
. -> Valve installed on the supply pipe ai the coil
Media
. Select the type of media used: []
. Wa:er
. Monoethenglycol
. 1.2 PoIyprap1englycol
Concentration cf Frost Mite
. Define the concentration of frost additive or glycol in the media:
. Valid Range 0-60%
Cable Lenth Remote Temp. Sensor (T21
. The Energy Valve leaves the factory with a 10 neter cable If the cable has to be cut it can only be cut in the following
length Please configure the length on the WEBview:
. 1.5-lOMeers
User
Language Power
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. nglish (Default) • kW _______
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, 9 (Default) • kBTLI/h (Default)
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. M3/h • kWIh
. Vs • MW/li
. Vmin • kBTU (Default)
. Vh • Ton/h
. GPM (Default)
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Machine generated alternative text: BELIMO
Energy Valve
Web View Settings
Configuration Control Funct.
Conrol Mode
‘ Pos. control
‘ On this mode the valve will oçerate as a pressure dependent valve
similar to a CCV or a globe valve
. Flow control
. On this mode the valve will work as a pressure independent valve similar
to an ePIV
Range Control Signa
. o3—1OVDC
. 2—1OVDCJefaulj
Inver Control Signa
. NO Norrrally Openi
. NC (Nornally Closed)- De’aut
Control Signal Characteristic
. Equal percentage (default): use this mode when controlling a heating or cooling oeil
. Linear: Use this node when contlling any device different than heating or cooling coi[
Configuration Limiting Funct.
Control saqnal characlenstic
equal peicentage Wr
Umhno Function Status
. None: Select this option to disable the Delta T manager algorithm
. Delta T: Select this option to eabIe the Delta T rnaagr algorithm
Limit
. This section defines the Delta T setpoint
. Valid Range 736DF (absolute)
. If valve is entered outside valid range. Delta T Manager will not operate
. This is only valid i the Delta T manager is enabled.
Minimum Flow ‘or Pressure Independent Mode
Delta T
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Range
7- 36W
12.0 W
O%otVniax
Range
30-100%
1%
0%
Range
30.100%
0%
. When the valve is working in Pressure Independent mode this property will prevent the Delta T manager to get active below
This f low
. Valid Range: 30-100% of Vnom
. This is only valid if the DeltaT manager is enabled.
Minimum Valve Angle for Posbon Control
. When the valve is working in pressure dependent mode this property will prevent the Delta T manager to get active below this
valve position
. Valid Range: 30-100% of valve position
. This is only valid if the Delta T manager is enabled.
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Machine generated alternative text: Energy Valve
Web View Settings
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BELIMO
Configuration Flow
Maxinum Flow Vmax 1% & Vnoml
. This is a se: value based on the cdl GPM capacit,.ç change this value to fit the
coil size.
• Valid Range 30-100% of Vnom
. Vnom: is the nominal flow of the valve or its high flow limit
Cade Disc lay Scaling
. Code required to be able to rescale the flow feedback, please contact Belirno
tech support for deails
Current Row
. This is used to match the flow feedback signal with the balancer’s external flow
meter neasuremen:.
. When performing a flow feedback rescaling, follow this procedure:
‘ Override the Valve ta Vrriax and wait for the flow to be stable
. Measure the flow with an external flow meter
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3170 GP!4
Range 30-100% 100%
0 1)
-1145 GPM error
new 0.0 GPM Factory 
. Qn me new box enter a flow value to match the flow feedback with the balancers measured flow
. Release the override and then override the valve again to the new Vmax.
. The flow feedback and the external measured flow should match. if not please repeat the procedure.
. Rescale/factory: shows if the feedback has being scaled or not. Rescale is scaled: Factory is not. If me flow feedback is too tar from
measurement please verify that the flow eedback has not being scaled. since this ca introduce errors.
Configuration Temperature Sensor
. This is used to ignore Power/Energy calculaions below this value.
. Valid Range 0°F - 3.6°F
. 0°F Default
. Normally used for troubleshooting
Configuration temperature
Ignore de4ta T smalle Iban
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Energy Valve
Web View Settings
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‘ 2-1OVDC
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. 32F as O VDC but if there is a heating applica:ion: may need o lift O VDC to 1 22F to have a
beter resolution for the temperature feedback
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Configuration Feedback Funct.
Feedback Infomiation
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Configuration feedback fund
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Energy Valve
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. Short term da2 ¡s captured every 30 seconds
. Long tern data is captured every 2 hours
Data Logging
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. Short Term Storage (7 Days uncompressed)
Long Term Storage (Compressed)
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BACnet Settings
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Machine generated alternative text: BELIMO
Energy Valve
Web View
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Machine generated alternative text: Energy Valve
Web View
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Version 4 (TCPI1Pv4
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Change the IP Address
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‘ Click OK
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Machine generated alternative text: BELIMO
Access the Actuator
. Open Internet Explorer and
en:er te following address:
httpl/1 92.168.0.1 Œ8080/index.htrnl
‘ 192168.10.10 is the standard
IP-Address of The k:uator
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the user name and passworc
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address ¡f changed
Energy Valve
Web View
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Login and User Access
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Machine generated alternative text: Energy Valve
BACnet Protocol Implementation Contormance statement BELIMO
Date: January 9, 2012
Vendor Name: BELIMO Automation AG
Product Name: P..W.. EV-BAC
Product Model Number: N/A
Application Sottware Version: 1.10.1 Firmware Revision: 1.0.2 BACnet Protocol Revision: 1.4
Product Description:
The device is a characterzed control valve (CCV) veTh adjustable flow rate sensor-operatec flow convoi arid monitohng of oo’ver and erergy The
set-point, configuraton oarameters and feedback values are communicated via BACnetIIP or BACnet MSTf P.
The corrrnissonirig of me calce (BACret Device Address, IP Address sen rigs. Foreign Device settings, MSTP) is done va me integrated web-server
BACnet Standardized Device Profile (Annex L):
D BACriet Operator Workstaton (B-OWS)
D BACnet Advanced Operator Workstation B-AWS)
D BACriet Operator Display (B-00)
D BACnet Building controller (S-BC1
[J BACnet Advanced Aoplication Controller (8-MC)
0 BACriet Apfricaton Specic Conroler (B-ASC)
D BACnet Smart Sensor (8-SS)
D BACnet Smart Actuator (B-$3
List all BACnet Interoperability Building Blocks Supported (Annex K):
Data Snanng - ReacPrcperty-B (US-kF-8;
Data Sharing - ReadPropertyMultple-B (DS-RPM-B)
Data Sharing - WreProperty-B (DS-WP-B:
Device Management - DynamicOeviceBinding-B (0M-0DB-B)
Device Management - DynamicobjectBinding-B (DM-DOB-Bj
Device Management - DevicecommuncaflonContro -B (DM-DCC-B;
10054311fl1 USA
Segmentation Capability:
D Able to transmit segmented messages
D Able to receive segmented messages
Standard Object Types Supported:
Object-Type Suoportec
Window Size
Window Size
Dynamically
Creataole
Dynamically
Deetable
Optional Properties Supported
Writable Propertes
Anaog Input
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Descriptor
Anaog Dutpu:
O
D
D
Descriptor
resert_Valte
Aiag Vaije
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Descriptor
Dresert ValLe
Descriptor
Active_Text
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Machine generated alternative text: Energy Valve
BELl MO BACnet Protocol Implementation Conformance Statement
Data Link Layer Options:
E BACnet IP. (Annex J)
E BACnet IP, (Annex J), Foreign Device
C Iso 8802-3, Ethernet (Clause 7)
C ATA 8781. 2.5 Mb. ARCNET Cl 8
C ATA 878.1, EIA-485 ARCNET (Clause 8), baud rate(s) ___________
E MS/i? master (Clause 9), caud rate(s): 115K.76.8K. 38.4K.19.21Ç9.6K
C MSJTP slave (Cause 9). baud rate(s): ___________
C Point-To-Porn. EIA 232 (Clause 10). baud rate(s): ____________
C Point-To-Pont modem, (Clause 10), baud rate(s): ______
C LonTalk, (Cause 11), medium: _______
C BACnetJZig Bee (ANNEX 
Device Address Binding:
Is statc device o’ ncing supported? (This is currertly necessary Ici’ two-way communication with MS/i? sLaves and certan ether devices.)
C ves E i’o
Networking Options:
D Router, Clause 6 - List all routing configurations. eg.. ARCNET-Ettiemet. Ethernet-MSÍTP, etc.
D Annex H. BACnet Tunneling Rcuter over IP
C BACneIJIP Bi’oadcast Management Device (BBMD)
Does the BBMD support reg istratons by Foreign Devices? C Yes D No
Does the BEMD support netvork address translaton? C Yes C No
Character Sets Supported:
E ISO 10646 (UTF-8) D IBM/Microsoft DBCS D ISO 8859-1
C ISO 10646 (IJCS-2) C 50 10646 (UCS-4,i C JS X 0208
Supported BACoet Objects:
Relative Positon in %
Abso ute Poson in
Relative Flow in % _____________ ___________________________
Absolute Flow in L!min _____________ ___________________________
Absoute Flow in m3M
Absolute Flow in gpm ____________ ________________________
Temperature  (rrnote) En C
°F
LII Temperature 2 (enbedj ii ‘C
4126
iëmperatjre 2 nbe&e in t
Deta Temperature in °C
Delta Temperature in °F
Power in l
A135 Power in kBTUJI1
4131
Cooling Energy in Kwh
4136
Cooling Energy in RBTU
4132
Heatng Energy in 4Nt
4137
Heating Energy in &TL
r
[ m-ni- LATiN AhWRICA/ CA.RIÆE4M J
15
4125
Read Oflcß
o
g
8
t,
t
a
«I
o
In
o
r’:
AO
Setpoint Relatve in %
MOl
DverrdeContro
1 - None/Auto
2 - Caen
3 - Close
4- Vmax
5 -Vnom
6—Stop
AV100
Vmax: Flow Limlt in %
Mvi 00
Control Mode
1 - Positon Control
2 - Flow Control
iœ
DeftaT limitation
0ff - Disabled
On - Enabled
“
a543-wne LISA

