SIEMENS

ACVATIX™

Intelligent valves - Control valves with integrated energy measurement

EVG.., EVF..

Intelligent Valve – control valve with integrated energy data acquisition for ventilation and air conditioning plants as well as precontrol circuits. Sensor-guided dynamic flow control.

- Threaded valves EVG4U10E..:
  - DN 15…50
  - Nominal volume flow 1.5…18 m^3/h
  - Externally threaded connection per ISO-228
- Flanged valves EVF4U20E..:
  - DN 65…125
  - Nominal volume flow 30…120 m^3/h
  - Flange connection per ISO 7005-1
- System integration in building control technology over BACnet IP
- Supports the direct transfer to Siemens Building Operator
- Ultrasonic volume flow measurement at measuring accuracy ± 2 %
- Temperature measurement with paired immersion temperature sensors

Use

The Intelligent Valve is a 2-port pressure-independent control valve (PICV) with volume flow, temperature and power measurement for heating, ventilation, and air conditioning plants.

The valve can be integrated as analog (DC 0/2...10 V or 4...20 mA) or digital (BACnet IP) into the temperature control circuit. All process data (volume flow, power, primary flow and return temperature, etc.) can still be read out digitally even if integrated as analog.

The Intelligent Valve also has local limitation and optimization functions that support energy-efficient plant operation.

In addition to digital integration in the building automation and control system, integration in the cloud with the Siemens Building Operator app supports the building operator to operate and monitor the system as well as evaluate energy consumption.

The Intelligent Valve 4 applications:

- Dynamic control valve
- Differential pressure controller
- Flow temperature controller
- Outside temperature-dependent flow temperature controller

The functions for volume flow limitation and energy acquisition are available at any time in all 4 applications.

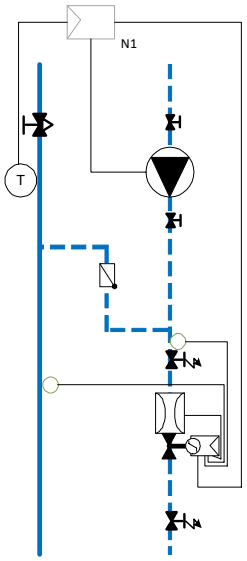
Intelligent Valve as **dynamic control valve**

In this application, the Intelligent Valve is part of a temperature control circuit and receives a setpoint from a superposed automation station that it interprets, depending on the control type, as valve position, volume flow, or output and controls accordingly.

The example to the right depicts this based on a precontrol circuit for chilled ceilings.

Automation station N1 controls the flow temperature of the chilled ceiling circuit by demand and specifies the setpoint of 0…100 % on the Intelligent Valve. This can occur in analog (0…100 % = DC 0…10 V) form or remotely over BACnet IP.

The Intelligent Valve follows this setpoint and sets, for example in volume flow control mode, the appropriate volume flow.

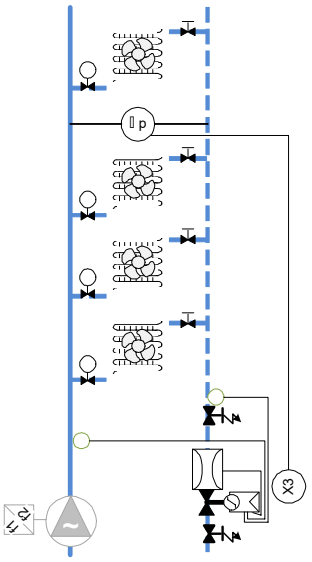


Intelligent Valve as **differential pressure controller**

The Intelligent Valve can act as a differential pressure controller for a section of the plant.

In this application, the Intelligent Valve controls independently of an automation station. Using an auxiliary differential pressure sensor [X3], it acquires the present differential pressure in the plant section and adjusts the valve position resulting in a constant differential pressure.

In this application, the Intelligent Valve does not receive an external setpoint, but rather controls to a fixed local setpoint that the user sets with ABT Go.

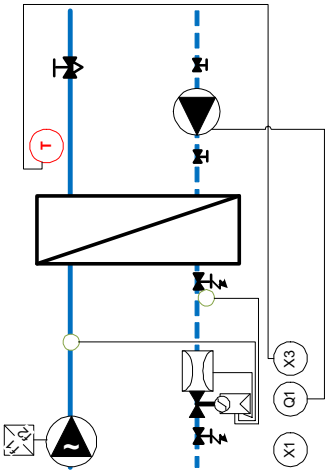


Intelligent Valve as **flow temperature controller without outside air temperature sensor**

In this application, the Intelligent Valve assumes the role of the automation station.

Using an auxiliary secondary flow temperature sensor [X3], it acquires the flow temperature and controls to the present temperature setpoint by adjusting the volume flow.

The temperature setpoint can either be fixed (ABT Go) or preset externally (remote or analog).



Intelligent Valve as **weather-dependent flow temperature control**

The Intelligent Valve can control the valve in a heating group to a flow temperature based on the weather. In this application, the Intelligent Valve assumes the role of the automation station.

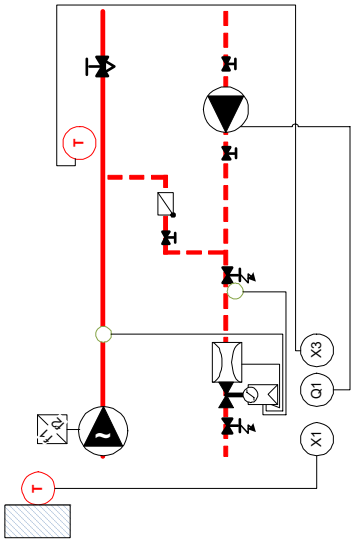
In weather-dependent control, the flow temperature [X3] is assigned to the prevailing outside air temperature [X1] via the heating curve.

The secondary flow temperature sensor [X3] acquires the present flow temperature and the Intelligent Valve controls it to the formed flow temperature setpoint by adjusting the volume flow.

In addition to the heating curve, a weekly timeswitch can also preset the room operating mode (Comfort, Pre-Comfort, Economy, Protection).

The heating curve and the weekly scheduler are set in ABT Go.

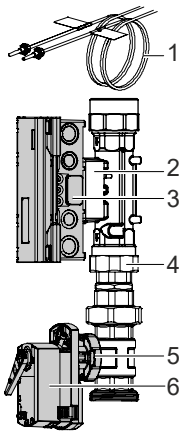
The heating circuit pump can be released or locked with relay Q1.



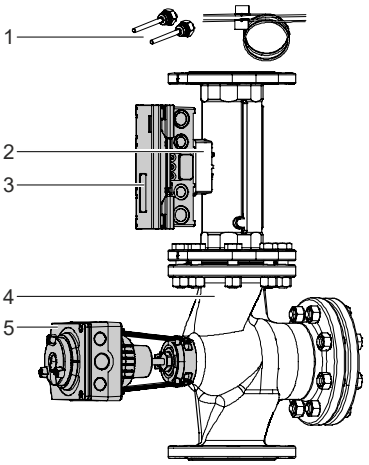
Basic design

The Intelligent Valve combines four main functions:

- Exact, continuous volume flow measurement with an ultrasonic flow sensor
- Precise temperature measurement using paired Pt1000 temperature sensors
- Precise volume control using a control valve with a high-resolution actuator
- Dynamic hydraulic balancing, power and energy calculations, storage of cumulated flow and energy data as well as network integration via a central control unit



1	Temperature sensor pair (>DN 50 with protective pockets)	1
2	Ultrasonic flow sensor	2
3	Intelligent Valve controller – Sensor interface – Dynamic volume flow control – Power and energy measurement – Heat exchanger optimized – Storage of cumulated flow and energy data – Network integration	3
4	Flow sensor/valve interface	-
5	Flow control valve	4
6	High-resolution actuator	5



Volume flow is acquired continuously in the ultrasonic flow sensor and provided to the Intelligent Valve controller, where the controller applies it as the actual value for control or limitation by guiding the control valve position until the volume flow actual value for the applicable setpoint is achieved.

Control types as dynamic control valve

The Intelligent Valve supports 3 control types in this application:

- Volume flow control
- Position control
- Output control

Volume flow limitation is active on all four control types!

Volume flow control

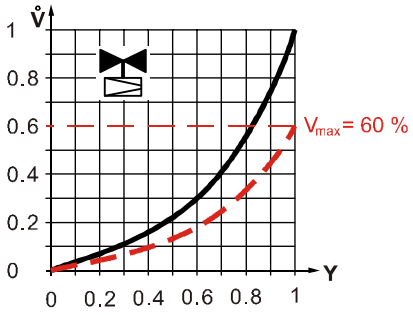
In the basic configuration, the Intelligent Valve operates as an electronic PICV (*pressure-independent control valve*). This control type is referred to as volume flow control. The positioning signal is proportional to the volume flow to be controlled (setpoint 0 % = closed; setpoint 100 % = $\dot{V}_{100}$). The setpoint range reflects new limit values (setpoint 0 % = $\dot{V}_{min}$, setpoint 100 % = $\dot{V}_{max}$), if volume flow limitation ($\dot{V}_{min}$ and/or $\dot{V}_{max}$) is activated. In volume flow control, the flow characteristic curve can be adapted to the heat exchanger's transfer behavior.

3 characteristic curves are available:

Equal percentage, optimized in the opening range (factory setting)

Recommended for heating and cooling registers, where the transfer characteristic is unknown.

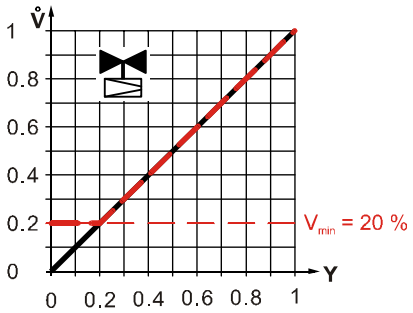
— — —: Modified characteristic curve with volume flow maximum limitation at 60 %



Linear

Recommended for plate heat exchangers water/water or injection circuits in precontrol circuits.

— — —: Cut characteristic at the volume flow minimum limitation

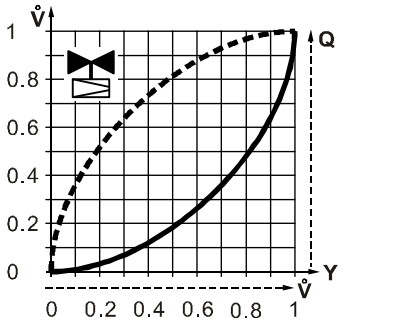


Heat exchanger optimized

Recommended for heating and cooling registers, where the transfer characteristic (a-value) is known.

– – – – – –: Q = f(V) Heat exchanger characteristic

————: V = f(Y) Flow characteristic for Intelligent Valve



V̇ = Volume flow V̇ / V̇ 100
Y = Positioning signal
Q = Heating output

In the event of volume flow maximum limitation, the curve always adapts to the entered limitation setpoint (example for equal percentage curve).

During volume flow minimum limitation, the characteristic is cut off below the minimum flow (example for a linear characteristic curve).

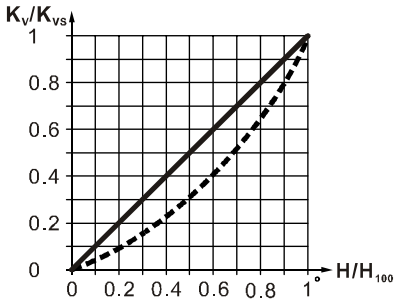
Position control

The control valve position is proportional to the setpoint (setpoint 0 % = closed; setpoint 100 % = H_{100}) – whereby the limitation to the applicable maximum volume flow ($\dot{V}_{100}$ or $\dot{V}_{max}$) remains active.

Dynamic volume flow control is inactive in position control mode and the k_{VS} valve characteristic curve is not electronically modified.

The k_{VS} valve characteristic curve is derived by combining the control valve or control ball valve characteristic and the resistance characteristic of the flow sensor.

This results in an equal percentage k_{VS} valve characteristic curve with a ngl 2.2 for valves with a threaded connection EVG..; the k_{VS} valve characteristic curve for flanged valves EVF.. is nearly linear.



Output control

The design output is the reference variable. It is defined by:

- Design volume flow $\dot{V}_{max}$
- Design temperatures $T_{VL,\ design}$ and $T_{RL,\ design}$

Design output = c × design volume flow × difference of the design temperatures

$\dot{Q}_{design} \sim \dot{V}_{max} \times (T_{VL,\ design} - T_{RL,\ design})$

whereby $\dot{Q}_{max}$ is the output limitation in %, relating to the design output of the consumption (heat exchanger/precontrol circuit).

The setpoint for the output for control is interpreted by referencing the output limitation – (Y = 0…100 % $\dot{Q}_{max}$; 0 % = closed; 100 % = $\dot{Q}_{max}$),

The "Sizing" section provides a table of the output values for water at typical temperature differences (Sizing as dynamic control valve [→ 7]).

The volume flow maximum limitation ($\dot{V}_{100}$ or $\dot{V}_{max}$) also remains active in the output control mode. In output control, the dynamic volume flow control is inactive, since any undesired change in volume flow automatically results in a change in output, which is controlled anyway.

The flow characteristic curve is not relevant to output control.

Operating limits

Nominal volume flow and minimum required differential pressure – the Intelligent Valve has, as does any dynamic PICV, a nominal flow $\dot{V}_{100}$ by build design that may not be exceeded during operation. A minimum differential pressure (Δp_{min}) is required to achieve nominal volume flow; it is calculated from the Intelligent Valve k_{vs} value. In contrast to mechanical PICVs, the electronic volume flow control on the Intelligent Valve remains active below the minimum differential pressure – so that the network is always optimally balanced.

The Intelligent Valve supports different limitation functions:

- Volume flow maximum limitation
- Volume flow minimum limitation
- Output maximum limitation
- Return temperature min./max. limitation

Volume flow maximum limitation

We recommend activating the volume flow maximum limitation if the design volume flow for the partial plant (heating coil/cooler/precontrol circuit) as controlled by the Intelligent Valve, is lower than the nominal flow of the Intelligent Valve. In volume flow control mode, the set volume flow $\dot{V}_{max}$ – which can be anywhere between 30...100 % of the nominal volume flow – is interpreted as the 100 % setpoint. It only serves as the limitation value in the other control types.

Volume flow minimum limitation

The volume flow minimum limitation achieves a minimum flow through the controlled partial plant where this appears to be appropriate. The limitation is of course pressure independent so that there is no over or under-supply as the local differential pressure changes.

Output maximum limitation

In contrast to volume flow limitation, the output limitation adapts dynamically to the temperature distribution in the plant. As a consequence, output control is more suitable for critical users than volume flow limitation.

Return temperature min./max. limitation

Modern, high-efficiency output generators must have sufficient low/high return temperatures to achieve their output numbers/degree of efficiency. With Intelligent Valve, you can precisely limit the return temperature value as needed by the given plant.

A return temperature maximum limitation is available if the Intelligent Valve is used in a heating application; a return temperature minimum limitation is available in a cooling application. The setting is made in two steps:

1. Enable function
2. Set limitation setpoint
   - Factory setting for maximum limitation = 40 °C
   - Factory setting for minimum limitation = 10 °C

Not all limitations are available to each control type. The following limitations are available based on control type:

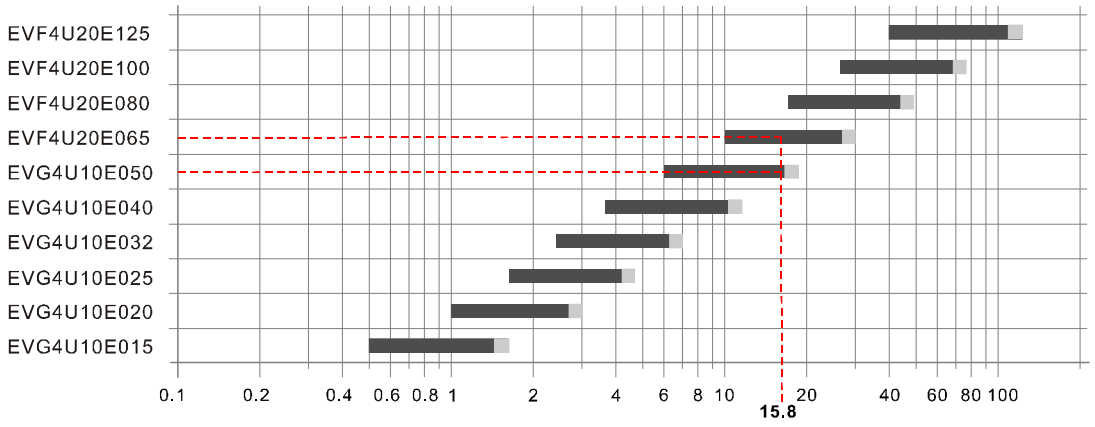
	Position control	Volume flow control	Output control
Setpoint	External		
Volume flow maximum limitation	Always active		
Volume flow minimum limitation	Selectable		
Output maximum limitation	-		Always active
Return temperature limitation	Selectable		

Sizing

Sizing as dynamic control valve

As a pressure-independent solution, it is generally easy to size the Intelligent Valve. If the volume flow is already a known variable, simply select the corresponding valve from the diagram below. The electronic volume flow controller ensures that the valves always achieve the specific nominal volume flow. The nominal volume flow cannot however be exceeded.

We recommend selecting the valves so that the maximum volume flow $\dot{V}_{max}$ must be preset to a value of 30...90 %. Just in case that a somewhat higher volume flow is required during installation than was originally calculated.



= Recommended design range that permits a subsequent increase in volume flow during the installation phase = 30…90 % of $\dot{V}_{100}$

= Maximum design range with no reserve to increase the volume flow = 90...100 % of $\dot{V}_{100}$

Example			
Required volume flow $\dot{V}_{max}$	**Intelligent Valve selection**		
15.8 m³/h	EVG4U10E050:	$\dot{V}_{100}$ = 18 m³/h	⇒ $\dot{V}_{max}$ = 88 %
	EVF4U20E065:	$\dot{V}_{100}$ = 30 m³/h	⇒ $\dot{V}_{max}$ = 53 %

Maximum consumer output range at typical temperature differences:

Type	**Order number**	**DN**	**$\dot{V}_{100}$ [m³/h]**	**Q̇ [kW] at**			
				ΔT 6 K	**ΔT 10 K**	**ΔT 15 K**	**ΔT 20 K**
EVG4U10E015	S55300-M100	15	1.5	10.4	17.4	26.1	34.5
EVG4U10E020	S55300-M101	20	3	20.9	34.8	52	70
EVG4U10E025	S55300-M102	25	4.5	31.3	52	78	104
EVG4U10E032	S55300-M103	32	7	49	81	122	162
EVG4U10E040	S55300-M104	40	11.5	80	133	200	267
EVG4U10E050	S55300-M105	50	18	125	209	313	418
EVF4U20E065	S55300-M106	65	30	209	348	522	696
EVF4U20E080	S55300-M107	80	48	334	557	835	1114
EVF4U20E100	S55300-M108	100	75	522	870	1305	1740
EVF4U20E125	S55300-M109	125	120	835	1392	2088	2784

Sizing as flow temperature controller

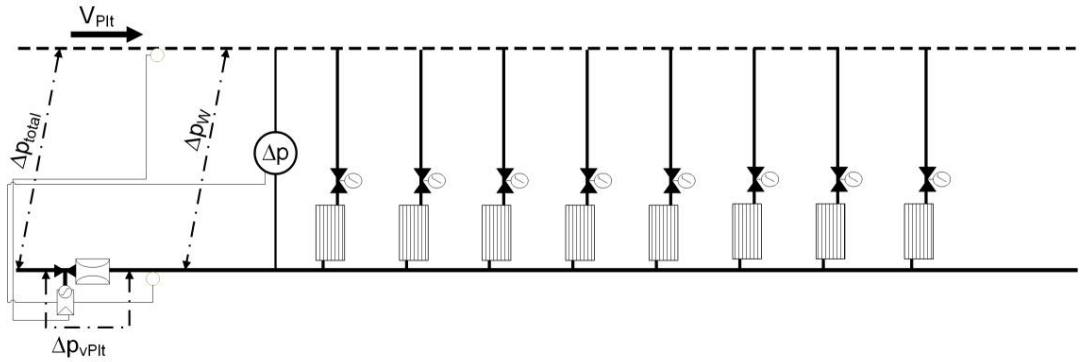
As a rule, the output for transmission in this application is available at the indicated primary design temperatures as design variables.

This information can be used to calculate the required plant design volume flow which then influences the valve selection. See Engineering examples [→ 9].

Sizing as differential pressure controller

4 design parameters are required for the design as differential pressure controller:

1. The differential pressure Δp_w to control; it may be between 25...120 kPa.
2. The minimum pending total differential pressure $\Delta p_{total, min}$
3. The maximum pending total differential pressure $\Delta p_{total, max}$
4. The design flow $\dot{V}_{Plt}$ for the section of the plant controlled by the Intelligent Valve



Δp_{total}	=	Available plant differential pressure
$\dot{V}_{Plt}$	=	Design volume flow to control the partial plant
Δp_w	=	Required differential pressure to control the partial plant
Δp_{VPlt}	=	Available differential pressure for the Intelligent Valve

In an initial step, the minimum differential pressure available to the Intelligent Valve is calculated:

$\Delta p_{VPlt} = \Delta p_{total, min} - \Delta p_w$

The minimum required k_V value for the Intelligent Valve can be determined using the Δp_{VPlt} and the design flow $\dot{V}_{Plt}$:

min $k_v = \dot{V}_{Plt} / \sqrt{(\Delta p_{VPlt})}$

Select the valve with the next higher k_{VS} value from the Type summary [→ 12].

Engineering examples

Intelligent Valve as dynamic control valve or flow temperature controller

Calculation basis

1. Determination of heating or cooling demand $\dot{Q}$ [kW]
2. Determination of temperature difference ΔT [K]
3. Calculation of volume flow

$$\dot{V}[m^3/h] = \frac{Q[kW] \times 3600[s]}{4190[kJ/kgK] \times \Delta T[K]}$$

4. Select the suitable Intelligent Valve EV..

Example

1.	Heating/cooling power	$\dot{Q}$ = 110 kW
2.	Temperature difference	ΔT = 6 K
3.	Volume flow $\dot{V}[m^3/h] = \frac{110\ kW \times 3600\ s}{4190\ kJ/kgK \times 6\ K} = 15.8\ m^3/h$ Note: You can use the valve slider to determine volume flow.	
4.	Select EV.. Select the Intelligent Valve to operate at 90% of the nominal volume flow. This permits setting higher heat or cooling output as needed.	
	Selection:	EVG4U10E050 Δp_{min} = 28 kPa
		EVF4U20E065 Δp_{min} = 8 kPa
5.	Evaluate presetting	
	EVG4U10E050: 15.8 / 18 = 88 %	Optimum selection
	EVF4U20E065: 15.8 / 30 = 53 %	

Intelligent Valve as differential pressure controller

Calculation basis

1. Determination of the minimum available differential pressure for the Intelligent Valve *min* Δp_{VPlt} [kPa]
2. Determination of the plant flow $\dot{V}_{Plt}$ [m³/h]
3. Calculation of the minimum required k_V value

   $$min\,k_v[m^3/h] = \frac{\dot{V}_{Plt}[m^3/h]}{\sqrt{min\,\Delta p_{VPlt}[bar]}}$$

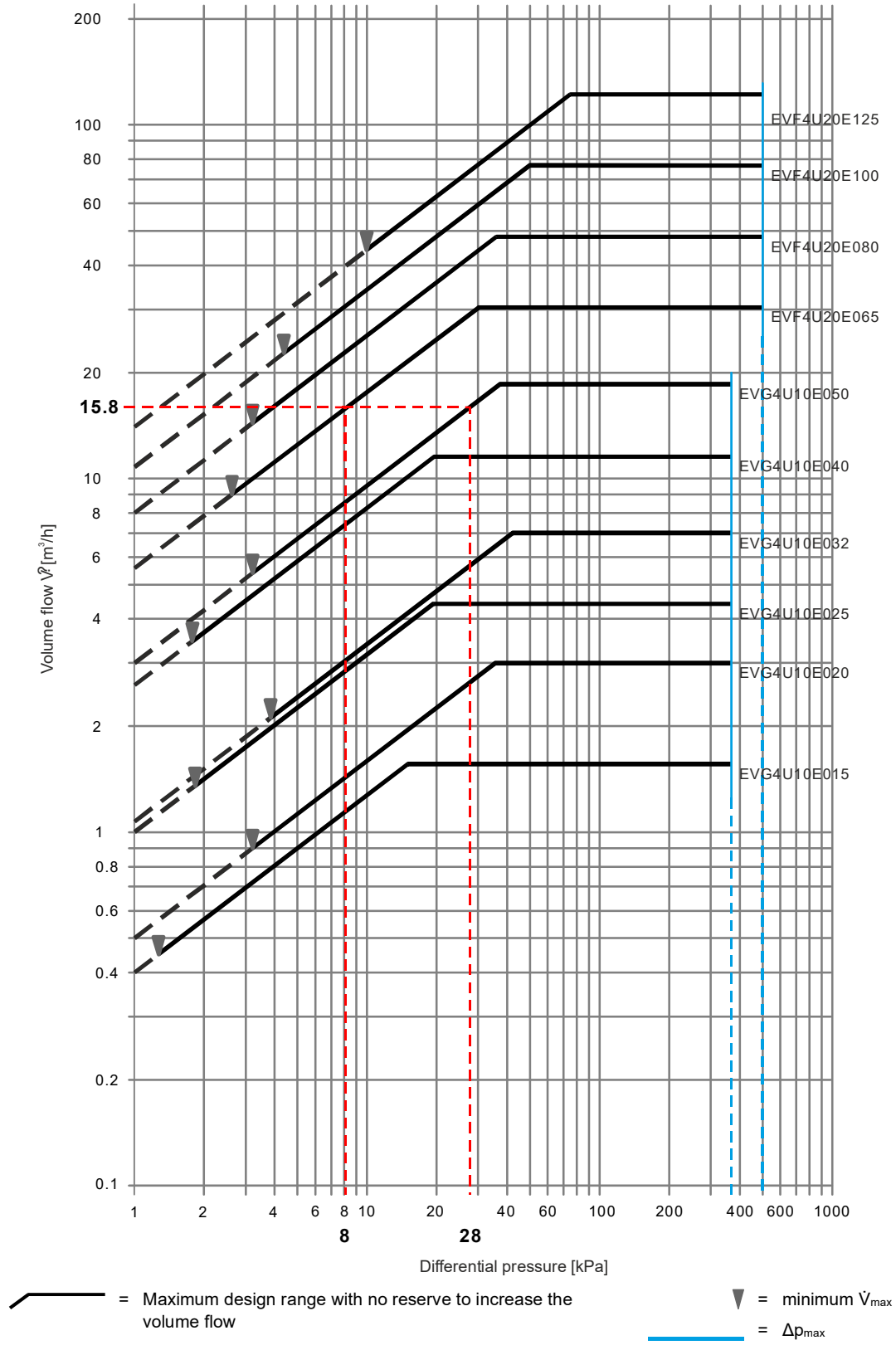
4. Select a suitable Intelligent Valve EV..: k_{VS} > *min* k_V

Example

1.	Required plant differential pressure	Δp_w = 35 kPa (0.35 bar)
	Available minimum total differential pressure	$\Delta p_{total,\ min}$ = 50 kPa (0.5 bar)
	Minimum available differential pressure for the Intelligent Valve	*min* Δp_{VPlt} = 50 – 35 = 15 kPa (0.15 bar)
2.	Plant flow	$\dot{V}_{Plt}$ = 16m³/h
3.	Required minimum k_V value $min\,k_v[m^3/h] = \frac{16\ m^3/h}{\sqrt{0.15\ bar}} = 41.3\ m^3/h$	
4.	Select EV.. Select an Intelligent Valve with a minimum k_{VS} of 41.3 m³/h. This ensures that a required volume flow of 16 m³/h can be supplied even at the minimum available differential pressure.	
	Selection:	EVF4U20E065 k_{VS} = 55 m³/h Δp_{V100} at 16 m³/h = 8.5 kPa
5.	Evaluate presetting	
	EVF4U20E065: 16 / 30 = 53 %	Optimum selection

Sizing diagram

You can rely on the k_{vs} value under Type summary (page Type summary [→ 12]) to determine the pressure drop at the requested maximum volume flow.



Calculated volume flow V̇	Intelligent Valve selection	Differential pressure [kPa]
15.8 m³/h	EVG4U10E050	28
	EVF4U20E065	8

Type summary

Threaded Intelligent Valve EVG4U10E..

Type	Order number	DN	$\dot{V}_{100}$	*min*$\dot{V}_{max}$	Δp_{V100}	Δp_{V50}	Δp_{max}	Δp_s	p_s	k_{VS}
			[m^3 / h]		[kPa]					[m^3 / h]
EVG4U10E015	S55300-M100	15	1.5	0.45	14	4	350	1400	1600	4
EVG4U10E020	S55300-M101	20	3	0.9	36	9				5
EVG4U10E025	S55300-M102	25	4.5	1.35	20	5				10
EVG4U10E032	S55300-M103	32	7	2.1	40	10		1000		11
EVG4U10E040	S55300-M104	40	11.5	3.45	20	5		800		26
EVG4U10E050	S55300-M105	50	18	5.4	36	9		600		30

Flanged Intelligent Valve EVF4U20E..

Type	Order number	DN	$\dot{V}_{100}$	*min*$\dot{V}_{max}$	Δp_{V100}	Δp_{V50}	Δp_{max}	Δp_s	p_s	k_{VS}
			[m^3 / h]		[kPa]					[m^3 / h]
EVF4U20E065	S55300-M106	65	30	9	30	7	500	1600	1500	55
EVF4U20E080	S55300-M107	80	48	14.4	36	9			1200	80
EVF4U20E100	S55300-M108	100	75	22.5	44	11			1600	113
EVF4U20E125	S55300-M109	125	120	36	71	18				142

DN = Nominal size

$\dot{V}_{100}$ = Volume flow through a fully open valve

min$\dot{V}_{max}$ = The smallest possible preset volume flow through a fully open valve

Δp_{V100} = Required minimum differential pressure to guarantee nominal flow $\dot{V}_{100}$

Δp_{V50} = Pressure over the fully opened valve at 50 % of nominal flow

Δp_{max} = Maximum permissible differential pressure over the valve control path, valid for the entire positioning range of the valve-actuator unit

Δp_s = Maximum permissible differential pressure (closing pressure) at which the valve-actuator unit securely closes against the pressure

p_s = Permissible operational pressure

k_{VS} = Nominal flow value for cold water (5…30 °C) through a fully opened valve at a differential pressure of 100 kPa (1 bar)

Scope of delivery

The Intelligent Valve is supplied as a complete set consisting of:

EVG.. Threaded	**EVF.. Flanged**
Intelligent Valve controller	
Actuator	
Flow section (control valve and flow sensor are preinstalled)	Flow sensor
	Control valve
Temperature sensor pair for direct installation (order protective pockets separately)	Temperature sensor pair including protective pockets

The devices are supplied without fittings, mating flange, and gaskets.
Welding sleeves, e.g. WZT-G12, for protective pockets must be ordered separately!

Accessories/spare parts

Accessories

Type	**Order number**	**Designation**	
EZT-M40	S55845-Z231	Protective pockets, brass, for DN 15...50	DN 65...125 include protective pockets!
EZU-WA	S55845-Z234	Wall mount for Intelligent Valve controller	At high media temperatures (>90°C)
EZU-WB	S55845-Z236	Spacers for Intelligent Valve controller	For risk of condensation due to low media temperatures
EZU10-10060	S55845-Z237	Immersion temperature sensor pair Pt1000	PL Ø 6 x 105 mm, cable length 6 m
ALX15	S55845-Z174	Filter with internal threading, DN 15	Filter
ALX20	S55845-Z175	Filter with internal threading, DN 20	
ALX25	S55845-Z176	Filter with internal threading, DN 25	
ALX32	S55845-Z177	Filter with internal threading, DN 32	
ALX40	S55845-Z178	Filter with internal threading, DN 40	
ALX50	S55845-Z179	Filter with internal threading, DN 50	
QAD22		Strap-on temperature sensor LG-Ni1000	Temperature sensor for the applications ● Flow temperature control ● Outside air temperature controlled flow control
QAC22		LG-Ni1000 outdoor sensor	
QAE2120..		Immersion temperature sensor LG-Ni1000, with protective pocket	
QBE3000-D1.6	S55720-S174	Differential pressure sensor for liquids and gases (0...10 V) for the application ● Differential pressure control	0...1.6 bar
QBE3000-D2.5	S55720-S175		0...2.5 bar
QBE3000-D4	S55720-S176		0...4 bar

Spare parts

Type	Order number	Designation
ASE4U10E	S55845-Z205	Intelligent Valve controller for PICVs, series EVG4U.. and EVF4U..
AVG4E015VAG	S55845-Z223	Control valve section PN 16 (control ball valve + flow sensor premounted) for Intelligent Valve EVG4..1.E015, DN 15 with threaded connection, k_{vs} 4 m^3/h
AVG4E020VAG	S55845-Z224	Control valve section PN 16 (control ball valve + flow sensor premounted) for Intelligent Valve EVG4..1.E020, DN 20 with threaded connection, k_{vs} 5 m^3/h
AVG4E025VAG	S55845-Z225	Control valve section PN 16 (control ball valve + flow sensor premounted) for Intelligent Valve EVG4..1.E025, DN 25 with threaded connection, k_{vs} 10 m^3/h
AVG4E032VAG	S55845-Z226	Control valve section PN 16 (control ball valve + flow sensor premounted) for Intelligent Valve EVG4..1.E032, DN 32 with threaded connection, k_{vs} 11 m^3/h
AVG4E040VAG	S55845-Z227	Control valve section PN 16 (control ball valve + flow sensor premounted) for Intelligent Valve EVG4..1.E040, DN 40 with threaded connection, k_{vs} 26 m^3/h
AVG4E050VAG	S55845-Z228	Control valve section PN 16 (control ball valve + flow sensor premounted) for Intelligent Valve EVG4..1.E050, DN 50 with threaded connection, k_{vs} 30 m^3/h
AVF4E065	S55845-Z213	Ultrasonic flow sensor for Intelligent Valve DN 65 mounting length 300 mm, flanged DN 65, PN 16
AVF4E080	S55845-Z214	Ultrasonic flow sensor for Intelligent Valve DN 80 mounting length 300 mm, flanged DN 80, PN 16
AVF4E100	S55845-Z215	Ultrasonic flow sensor for Intelligent Valve DN 100 mounting length 360 mm, flanged DN 100, PN 16
AVF4E125	S55845-Z216	Ultrasonic flow sensor for Intelligent Valve DN 125 mounting length 360 mm, flanged DN 100, PN 16
ALF4E065	S55845-Z218	Control valve mounting set PN16 for Intelligent Valve DN 65 (EVF4..2..E065), flanged
ALF4E080	S55845-Z219	Control valve mounting set PN16 for Intelligent Valve DN 80 (EVF4..2..E080), flanged
ALF4E100	S55845-Z220	Control valve mounting set PN16 for Intelligent Valve DN 100 (EVF4..2..E100), flanged
ALF4E125	S55845-Z221	Control valve mounting set PN16 for Intelligent Valve DN 125 (EVF4..2..E125), flanged
EZU10-2615	S55845-Z229	Temperature sensor pair Pt1000, DS M10x1, Ø 5.2 x 26 mm, cable length 1.5 m
EZU10-10025	S55845-Z230	Temperature sensor pair Pt1000, PL Ø 6 x 105 mm, cable length 2.5 m
EZT-S100	S55845-Z232	Protective pocket G ½ B", G ¼ B", stainless steel, Ø 6.2 x 92.5 mm, for temperature sensors Ø 6 x 105 mm
VVF42.65KC [1)]	S55204-V182	Pressure relief control valve DN 65, PN16, flanged for Intelligent Valve EVF4U20E65, k_{VS} 63
VVF42.80KC [1)]	S55204-V183	Pressure relief control valve DN 80, PN16, flanged for Intelligent Valve EVF4U20E80, k_{VS} 100
VVF42.100KC [1)]	S55204-V184	Pressure relief control valve DN 100, PN16, flanged for Intelligent Valve EVF4U20E100, k_{VS} 160
VVF42.125KC [1)]	S55204-V185	Pressure relief control valve DN 125, PN16, flanged for Intelligent Valve EVF4U20E125, k_{VS} 200
GLA161.9E/HR	S55499-D444	Rotary actuator for ball valves, AC/DC 24 V, 10 Nm, NSR, modulating 0…10 V Highly accurate positioning signal, only for use with Intelligent Valve EVG4U10E..
SAX61.03/HR	S55150-A142	Valve actuator 800 N, 20 mm stroke, AC/DC 24 V, modulating 0…10 V Highly accurate positioning signal, only for use with Intelligent Valve EVF4U20E.., DN 65 and DN 80
SAV61.00/HR	S55150-A146	Valve actuator 1600 N, 40 mm stroke, AC/DC 24 V, modulating 0…10 V Highly accurate positioning signal, only for use with Intelligent Valve EVF4U20E.., DN 100 and DN 125

[1)] Only available as spare part for EVF4U20E..

Product documentation

Title	Content	Document ID
Intelligent Valve - Control valve with integrated energy data acquisition	Data sheet: Product description EVG.., EVF..	A6V11444716
Rotary actuators for ball valves in combination with the Intelligent Valve controller	Data sheet: Product description GLA161.9E/HR	A6V11418678
Electromotive actuators in combination with the Intelligent Valve controller	Data sheet: Product description SAX61.03/HR, SAV61.00/HR	A6V11418660
Actuators SAX.., SAY.., SAV.., SAL.. for valves	Basic document: Comprehensive information on the new generation of SAX.., SAV.. actuators.	P4040
EVF.. / EVG..	Mounting instructions	A6V11449479
GLA161.9E/HR	Mounting instructions	A6V11418688
AVG4..VAG	Mounting instructions	A6V11449852
AVF4..	Mounting instructions	A6V11478285
Intelligent Valve – Commissioning with ABT Go	Commissioning instructions: Step-by-step description to configure and commission with ABT Go	A6V11422293
Intelligent Valve – Engineering/Commissioning in Desigo	Engineering instructions: Step-by-step description of integration in Desigo PX plants	A6V11572317
Intelligent Valve – BACnet Objects	List of BACnet objects for Intelligent Valve	A6V11757108
Readme OSS "Intelligent Valve – 1.1"	OSS document Open source software components, copyrights, licensing agreements	A6V11676101

Related documents such as environmental declarations, CE declarations, etc., can be downloaded at the following Internet address:
http://siemens.com/bt/download

Notes

Safety notes

Comply with the following safety notes to protect life, limb, and property.
The safety notes in the document include the following elements:

- Symbol for hazard
- Signal word
- Type and source of hazard
- Consequences in the event the hazard occurs
- Measures or prohibitions to prevent the hazard

Symbol for hazard

This is the symbol for hazard. It warns you of **Risks of injury**.
Comply with all measures designated by this symbol to prevent injury or death.

Additional hazard symbols

These symbols indicate general hazards, type of hazard, possible consequences, measures and prohibitions, a sample of which is displayed in the following table:


General hazard

Potentially explosive atmospheres


Voltage/electrical shock


Laser light


Battery


Heat

Signal word

The signal word classifies the hazard as defined in the following table:

Signal word	Danger level
DANGER	'DANGER' identifies a dangerous situation, that **results directly in death or serious injuries**, if you do not avoid this situation.
WARNING	'WARNING' identifies a dangerous situation, that **can result in death or serious injuries**, if you do not avoid this situation.
CAUTION	'CAUTION' identifies a dangerous situation, that **can result in minor or moderate injuries**, if you do not avoid this situation.
Note	'*NOTE*' identifies a possible situation that may cause damage if not observed. '*NOTE*' does not reference possible injury.

Depiction of risk of injury

Notes on risk of injury is depicted as follows:

	⚠ **WARNING**
	Type and source of hazard Consequences in the event the hazard occurs ● Measures/prohibitions to prevent the hazard

DEPICTION for possible damage to property

Notes on possible damage to property is depicted as follows:

	***NOTICE***
	Type and source of hazard Consequences in the event the hazard occurs ● Measures/prohibitions to prevent the hazard

Safety

	**⚠ CAUTION**
	National safety regulations Failure to comply with national safety regulations may result in personal injury and property damage. ● Observe national provisions and comply with the appropriate safety regulations.

Qualified personnel

	NOTICE
	Qualified personnel! Improper installation may override safety measures that a lay person may not recognize. ● Specialized knowledge of heating and air conditioning plants is required for installation. ● Only properly trained personnel may install the equipment. ● Prevent access to lay persons, especially children.

Only persons who can be reasonably expected to reliably conduct the work may actually perform the tasks. Do not permit persons whose reactions may be impaired, for example, by drugs, alcohol, or medications to perform the tasks.

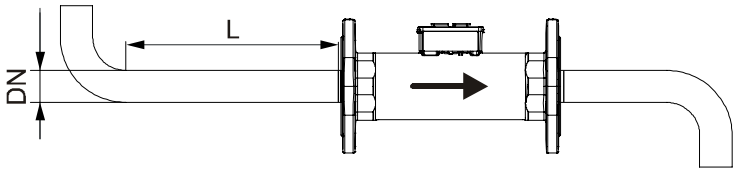
Heating specialist

Heating specialists are persons who are capable of performing the mechanical work on heating and air conditioning plants and to independently recognize and avoid hazards due to their technical training, knowledge and experience as well as their knowledge of applicable standards and regulations.

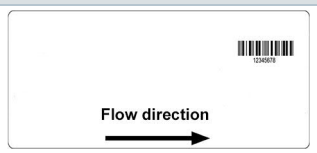
Heat specialists are specially trained for the work environment where they are active and know the relevant standards and regulations.

Engineering

An unhindered inlet section of L ≥ 5 x DN must be maintained upstream of the flow sensor to guarantee the indicated measurement and control accuracy.

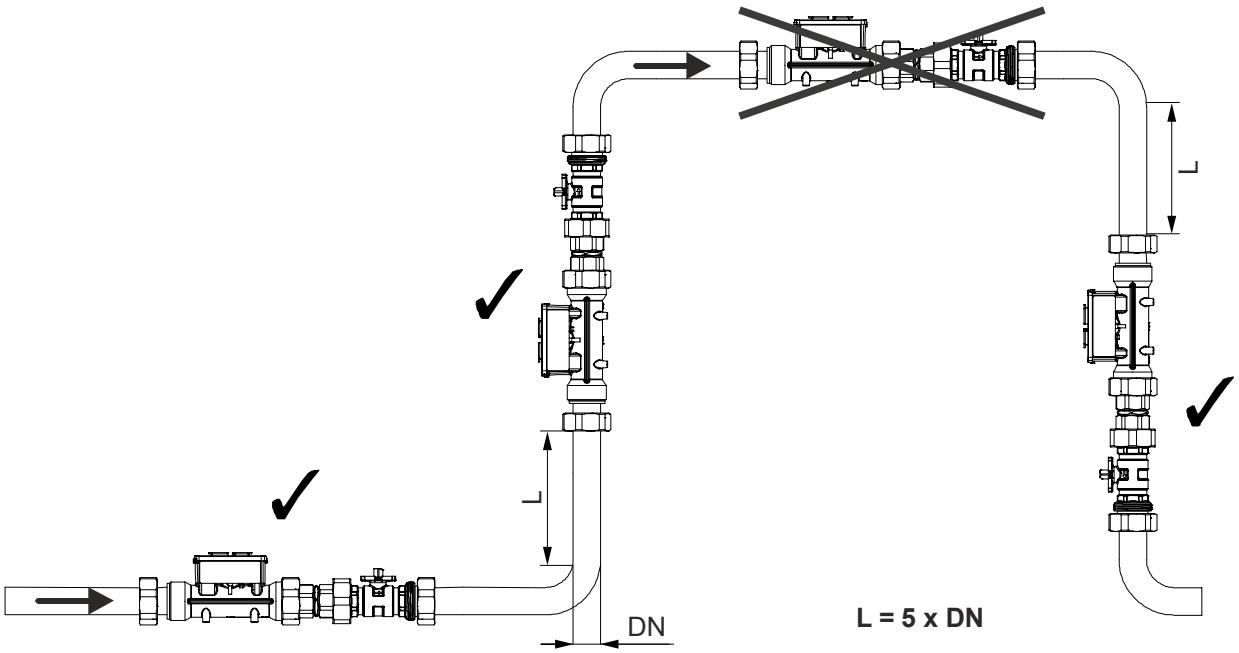


L ≥ 5 x DN

Valve	Symbol / flow direction EVG.. / EVF..	Flow in control mode		Valve stem	
		Input	Output	SAX.. / SAV..: Retracts	SAX.. / SAV..: Extends
				GLA..: Clockwise rotation	GLA..: Counterclockwise rotation
Intelligent Valve		Variable		Closes	Opens

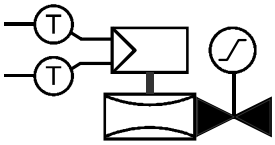
The indicated flow direction (arrow on the flow sensor and valve body) must be correct; the Intelligent Valve cannot otherwise be operated!

Do not install it at the highest point on the partial plant since air bubbles may otherwise collect in the flow meter.



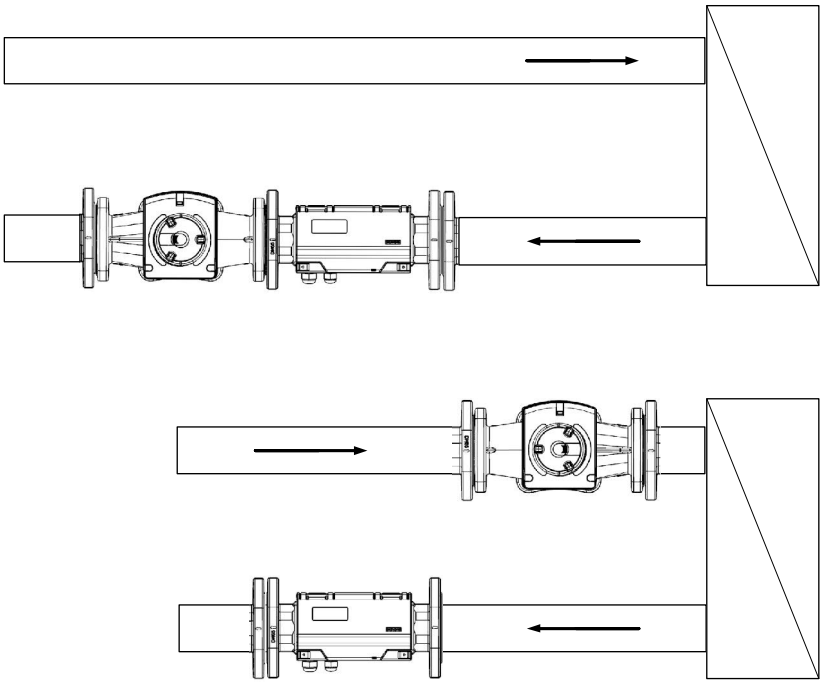
The rule is: Measure first, then control – in other words, the flow sensor must always be mounted upstream of the control valve in a compact installation.

The Intelligent Valve must be installed in the return for optimum performance. The components are subject to less wear and tear due to the lower temperatures.

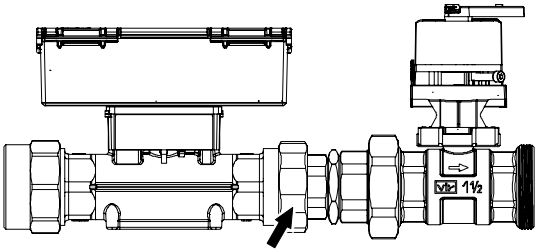
Symbol in catalogs and application descriptions	Symbol in diagrams
	There are no standard symbols for PICVs in the diagrams

We recommend installing a filter or strainer, e.g. ALX.., in the flow to the heat exchanger. This increases the reliability and life cycle of the Intelligent Valve.

The flow sensor and control valve can be installed separately:



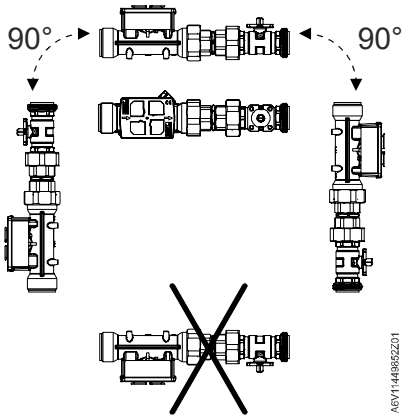
Threaded versions: In general, note that the torque of the threading is very high (75...500 Nm).

	Torque for fittings	
 Bonding DN 15, DN 32, and DN 50	DN 15	< 75 Nm
	DN 20	< 90 Nm
	DN 25	< 150 Nm
	DN 32	< 300 Nm
	DN 40	< 410 Nm
	DN 50	< 500 Nm

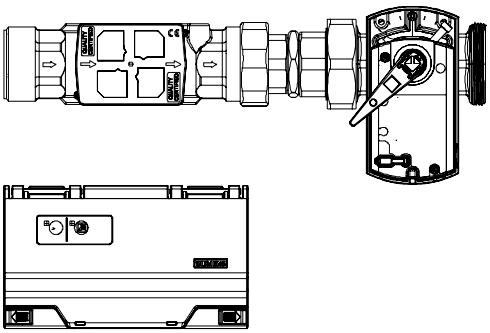
!	***NOTICE***
	DN 15, DN 32, and DN 50 Please note that the insertion part of the fitting is bonded to the flow sensor and cannot be removed! ● The fitting must remain on the flow sensor.

The Intelligent Valve is assembled at the mounting location. No adjustments, with the exception of configuring with the ABT Go app (see Commissioning [→ 22]) nor special tools are required. Separate mounting instructions are included with the valve and flow sensor.

Mounting positions



Mount the flow sensor in the return if the media temperatures exceed 90 °C. If not possible, mount the Intelligent Valve controller remotely from the flow sensor and use the wall-mount plate EZU-WA.

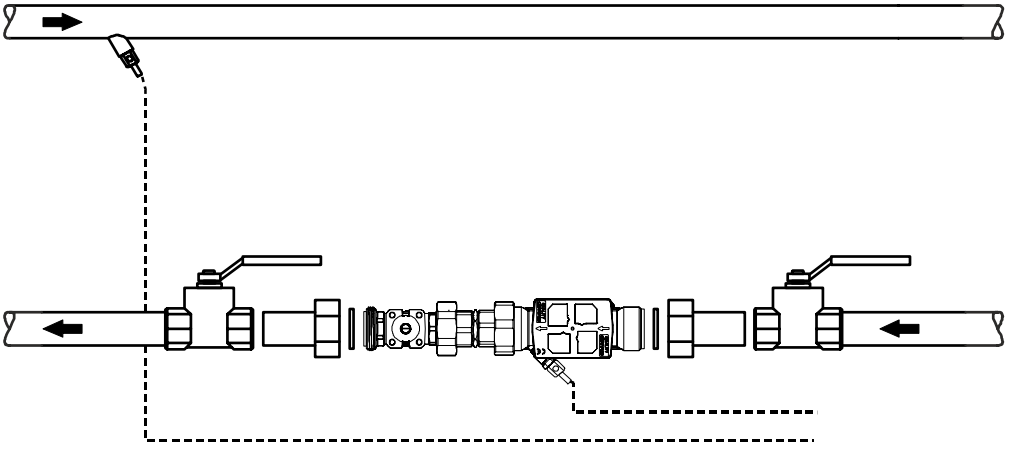


Mounting the temperature sensors

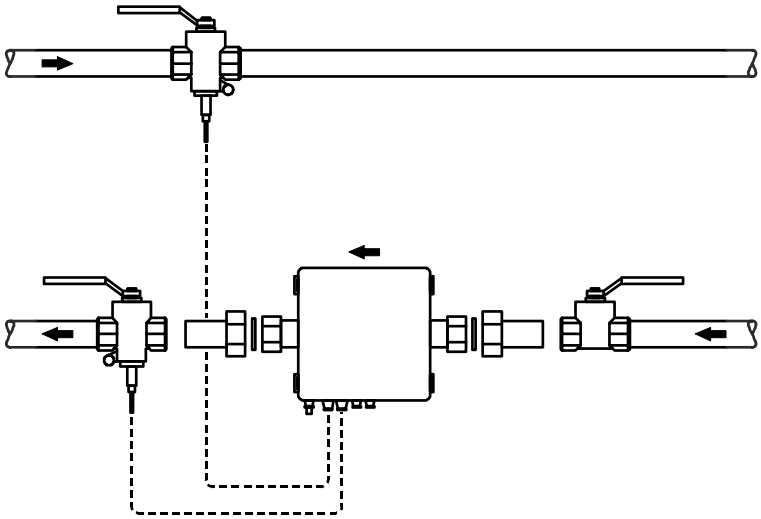
Threaded valves **EVG4U10E..**

The EVG.. threaded valves are supplied with direct immersion temperature sensors EZU10-2615.

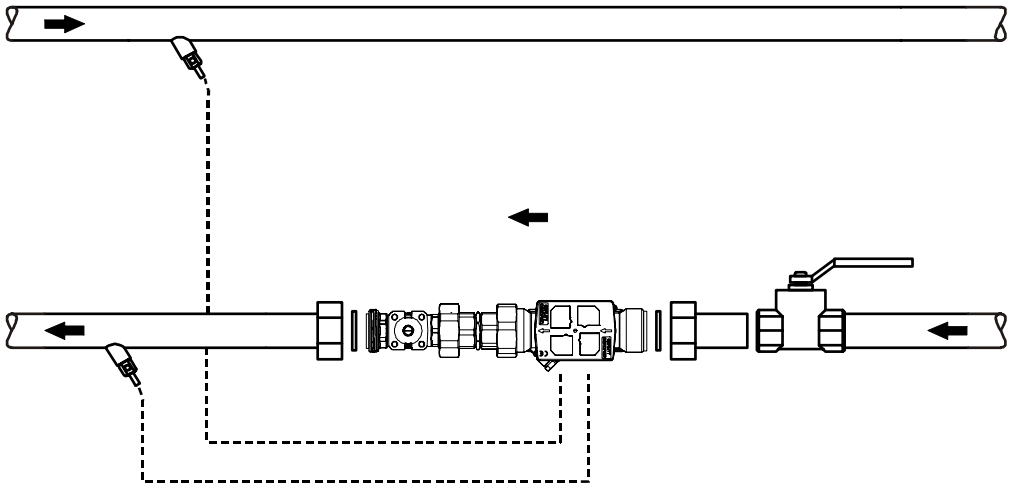
The sensors with the M10x1 threaded connection can be directly immersed in the flow sensor. The second temperature sensor is also directly immersed with the WZT-G10 welding sleeve (available as accessory).



As an alternative, the sensors can be immersed directly in off-the-shelf ball valves with integrated measuring points (e.g. Siemens WZT-K.. / Jumo 902442/11) or t-pieces (e.g. Jumo 902442/31).



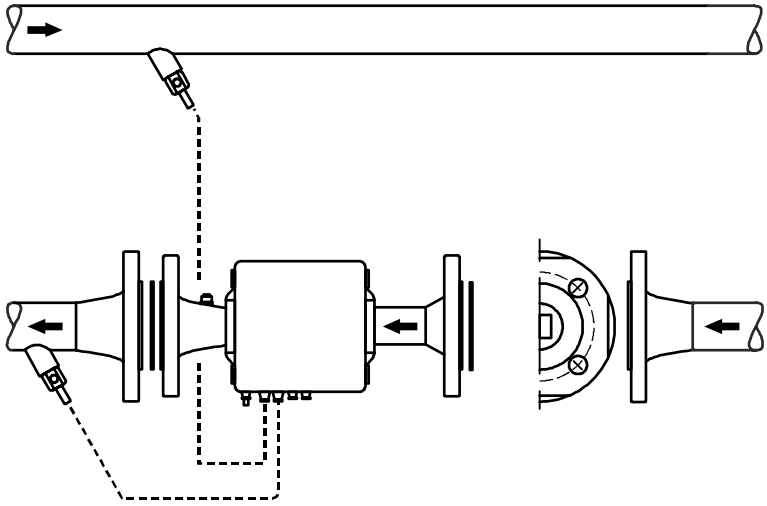
The brass protective pockets EZT-M40 are available for mounting with protective pockets.



Flanged valves **EVF4U20E..**

The EVF.. flanged valves include the temperature sensors EZU10-10025 for installing in the protective pockets EZT-S100 (also included).

Welding sleeves must be planned on the construction side (e.g. WZT-G12) – Installation example with protective pocket.



The device has only a simple user interface.

Siemens ABT Go app is used to actually commission the device.

ABT Go App (Version 3.3.1 or later)

The Siemens ABT Go app is available in iOS and Android versions in the corresponding app stores and can be used on smartphones and tablets. It connects directly over WLAN. The Intelligent Valve's own WLAN button activates the device's WLAN access point.

The following are the most important setting parameters for commissioning the Intelligent Valve:

Parameter	Value range	Description	Factory setting	Access level
Use	• Dynamic control valve • Differential pressure controller • Flow temperature controller • Outside temperature-dependent flow temperature controller	See Use [→ 2]	Dynamic control valve	Measuring and control technician
Control type	• Volume flow control • Position control • Output control	See Control types as dynamic control valve [→ 4]	Volume flow control	Measuring and control technician
$\dot{V}_{max}$	30...100 %	Maximum volume flow applicable to all control types. It is used for hydraulic balancing of the consumer. Can be set in the ABT Go app in the units m^3/h, l/h, l/min or l/s.	Active 100 %	Installer
$\dot{V}_{min}$	2.5...20 %	Minimum volume flow applicable to all control types. Can be set in the ABT Go app in the units m^3/h, l/h, l/min or l/s.	Inactive	Installer
Setpoint source	• Terminal • BACnet IP (remote) • local	Selection whether to interpret input X1 as the setpoint, whether it originates from a BACnet network, or whether it is set (e.g. in the event of differential pressure control) locally to a fixed value.	Terminal	Measuring and control technician
Setpoint signal type	• 0...10 V • 2...10 V • 4...20 mA	Signal type pending at input X1	0...10 V	Measuring and control technician
Actual value parameter	• Position • Volume flow 0...V_{100}	Selection whether the analog signal on output X2 represents the valve position or volume flow. In the event of volume flow, 0...V_{100} = 0...100 %.	Volume flow 0...V_{100}	Measuring and control technician
Actual value signal type	• 0...10 V • 2...10 V • 4...20 mA	Signal type pending at output X2	-	Measuring and control technician
Flow characteristics	• Linear • Equal percentage • Heat exchanger optimized	The flow characteristic flow can be selected in the volume flow control type.	Equal percentage	Measuring and control technician

User interface on the device

Service LED [1]

- Indicates the operating state (see table below)

Service button [2]

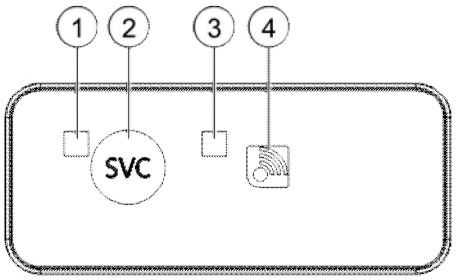
- Override setpoint and set $\dot{V}_{100}$ for 10 minutes (press for 3...6 s)
- Start flow test (press for 6...8 s)

Communication LED [3]

- Indicates the communication state (see table below)

WLAN button [4]

- Enable integrated WLAN Access Point for 10 min (press for ca. 0.5 s)



- Reset device to factory settings
  - Press both buttons ([2], [4]) at the same time for 10...15 s: The LEDs ([1], [3]) slowly flash orange for 10 s
    You can cancel the process during these 10 seconds by releasing the buttons.
  - After flashing for 10 s, the LEDs flash quickly for ca. 5 s and the reset is triggered by releasing the buttons.
  - The controller returns to normal operation without resetting if you continue to press the buttons.

!	***NOTICE***
	All configurations, network settings, commissioning parameters, and passwords are set to factory settings! ● This action cannot be cancelled nor reversed.

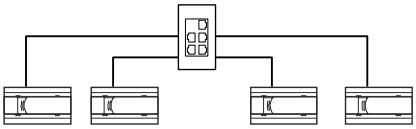
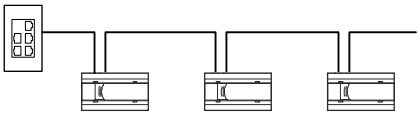
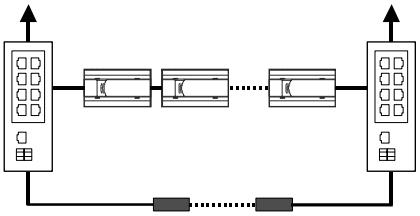
Service LED			SVC
Color	**Blinking pattern**		**Description**
	On	**Off**	
White	Continuous	-	Device starting up
Green	0.5 s	0.5 s	Device in configuration mode
	4.75 s	0.25 s	Normal operation
	0.25 s	0.25 s	Stop local forced control
Blue	0.5 s	0.5 s	Local forced control – Flow test
Yellow	0.5 s	0.5 s	Local forced control – Continuous nominal flow
Red	0.5 s	0.5 s	Fault input/output or component: ● Flow sensor – Wrong direction of flow – Air in sensor – Sensor connection faulty ● Temperature sensor – Damaged cable – Short circuit ● Actuator – Blocked – Faulty connection ● Setpoint input terminal – Faulty connection – Invalid signal
	Continuous	-	Fault
Orange	0.5 s	0.5 s	Reset to factory settings being prepared
	0.1 s	0.1 s	Reset to factory settings is triggered
-	-	-	Undervoltage

Communication LED			
Color	**Blinking pattern**		**Description**
	On	**Off**	
-	-	-	● No communication ● Ethernet cable unplugged ● Device starting up
Blue	0.5 s	0.5 s	WLAN enabled
	Continuous	-	WLAN data transmission
Green	0.5 s	0.5 s	TCP/IP communications error – IP address not available
	Continuous	-	TCP/IP data transmission
Purple	0.5 s	0.5 s	TCP/IP data transmission with Siemens Building Operator (Cloud)
Orange	0.5 s	0.5 s	Reset to factory settings being prepared
	0.1 s	0.1 s	Reset to factory settings is triggered

Network integration

The Intelligent Valve can be integrated over TCP/IP in a BACnet IP network.

The device supports:

● Star topologies	
● Line topologies (daisy chain)	
● Ring topologies – Note here that network switches with "Rapid Spanning Tree Protocol (RSTP)" are used.	

Up to 20 Intelligent Valves can be used in a BACnet segment.

A complete list of supported BACnet data points is included in the document "Intelligent Valve – BACnet Objects" (Product documentation [→ 15]).

ABT Go app configures the network parameters (IP address, subsegment, etc.).

Maintenance

Control valves EVF.. and EVG.. are maintenance free.

Disposal

	The device is considered an electronic device for disposal in terms of the European Directive and may not be disposed of as domestic waste. ● Use only designated channels for disposing the devices. ● Comply with all local and currently applicable laws and regulations.

Warranty service

Intended use

⚠ WARNING

Intended use

Improper use can result in injury as well as damage to the product or plant.

- Siemens product may only be used with user cases set forth in the catalog and associated technical documentation.
- User-related technical data are only guaranteed in connection with the products listed in this document. Siemens rejects any and all warranties in the event that third-party products are used.
- Trouble-free and safe product operation presupposes transport, storage, setup, mounting, installation, commissioning, operation, and servicing as intended.
- You must comply with permissible ambient conditions. Comply with all notes in the associated documentation.

Exemption from liability

The content of this document was reviewed to ensure it matches the hardware and firmware described herein. Nevertheless, differences may occur so that we are unable to fully guarantee a complete match. The information provided in this document is reviewed on a regular basis and any required corrections are added to the next edition. We always welcome suggestions on how to improve documentation.

Directive on Radio Equipment

The device uses a harmonized frequency in Europe and also meets the requirements under the Directive on Radio Equipment (201453/EU, previously 1999/5/EG).

Open Source Software (OSS)

Software license overview

These devices use Open Source Software (OSS); see the OSS document on the specific controller type and VVS.

Title: Readme OSS "Intelligent Valve – 1.1"

All Open Source Software components used in the product (to include copyrights and licensing agreement) are available in document A6V11676101 at http://siemens.com/bt/download.

Cyber security disclaimer

Siemens provides a portfolio of products, solutions, systems and services that includes security functions that support the secure operation of plants, systems, machines and networks. In the field of Building Technologies, this includes building automation and control, fire safety, security management as well as physical security systems.

In order to protect plants, systems, machines and networks against cyber threats, it is necessary to implement – and continuously maintain – a holistic, state-of-the-art security concept. Siemens' portfolio only forms one element of such a concept.

You are responsible for preventing unauthorized access to your plants, systems, machines and networks which should only be connected to an enterprise network or the internet if and to the extent such a connection is necessary and only when appropriate security measures (e.g. firewalls and/or network segmentation) are in place. Additionally, Siemens' guidance on

appropriate security measures should be taken into account. For additional information, please contact your Siemens sales representative or visit https://www.siemens.com/global/en/home/company/topic-areas/future-of-manufacturing/industrial-security.html.

Siemens' portfolio undergoes continuous development to make it more secure. Siemens strongly recommends that updates are applied as soon as they are available and that the latest versions are used. Use of versions that are no longer supported, and failure to apply the latest updates may increase your exposure to cyber threats. Siemens strongly recommends to comply with security advisories on the latest security threats, patches and other related measures, published, among others, under https://www.siemens.com/cert/en/cert-security-advisories.htm.

Technical data

Dimensions and weight
See Dimensions [→ 36]

Power supply		EVG4U10E..	EVF4U20E.. DN 65…80	EVF4U20E.. DN 100…125
Operating voltage		AC 24 V ~ ±20 % (19.2...28.8 V ~) DC 24 V ⎓ ±20 % (19.2...28.8 V ⎓)		
Frequency		50/60 Hz		
Power consumption including connected field devices				
	Operation	5 W	6.25 W	8 W
	Normal position	2.7 W	3.5 W	3.5 W
	Sizing	8.5 VA	14 VA	16 VA
Power consumption ASE4U10E				
	Operation	3.5 W		
	Normal position	2 W		
	Sizing	6 VA (controller without actuator!)		
Internal fuse		Irreversible		
External fusing of supply line		• Fuse slow 6…10 A • Circuit breaker: Max. 13 A, type B, C, D per EN 60898 • Power source with current limitation of max. 10 A		

Interfaces	
Ethernet	Plugs: 2 x RJ45, screened Interface type: 100BASE-TX, IEEE 802.3 compatible Bitrates: 10/100 Mbps, autosensing Protocol: BACnet over UDP/IP
USB (2.0)	Plug: Micro-B Data rate: 1.5 Mbps and 12 Mbps No galvanic isolation to ground
L-bus	Baud rate: 2.4 kBaud Bus power: 10 mA Short-circuit proof Protection against faulty wiring at max. AC 24 V

Function data

Control valve	EVG4U10E..	EVF4U20E..
Nominal flow	See Type summary [→ 12]	
Adjustable flow as [%] of V_{100}	30...100 %	
Control accuracy	±6 %	
Permissible media	Chilled and hot water	
Medium temperature	1…120 °C	
Operating pressure p_s	1600 kPa	See Type summary [→ 12]
Differential pressure Δp_{max} / Δp_s	See Type summary [→ 12]	
Flow characteristic curve (Control type "Volume flow control")	Selectable (linear, **equal percentage** optimized in closing range with ngl 1...4, compensation for heat exchanger characteristic curve)	

Control valve	EVG4U10E..	EVF4U20E..
Leakage rate	Waterproof per EN 60534-4 L/1, improved class 5	0...0.03 % of k_{VS} value
Mounting position	Upright to horizontal	
Valve body	Brass	Cast iron
Blank flange	-	
Valve stem, seat, ball	Brass	Stainless steel
Stem sealing gland	EPDM	

Actuator	EVG4U10E.. GLA161.9E/HR	EVF4U20E.. SAX61.03/HR	EVF4U20E.. SAV61.00/HR
Positioning time (at the specified nominal stroke)	90 s	30 s	120 s
Positioning force	-	800 N	1600 N
Nominal torque	10 Nm	-	
Nominal rotational angle	90°		
Nominal stroke	-	20 mm	40 mm

Flow measurement		EVG4U10E..	EVF4U20E..
Ultrasonic volume flow measurement		Yes	
Measuring accuracy		±2 %	
Minimum flow measurement		1 % of V_{100}	
Material of measuring pipe			
	DN 15...50	Brass	-
	DN 65	-	Brass
	DN 80		Nodular cast iron EN-GJS-500
	DN 100...125		Brass

Temperature measurement		EVG4U10E..	EVF4U20E..
Measuring accuracy absolute temperature		±0.6 °C at 20 °C ±0.8 °C at 60 °C (Pt1000 EN60751, class B)	
Measuring accuracy temperature difference		±0.2 K at ΔT = 20 K	
Resolution		0.085 °C	
Prototype test certificate Module B per MID		A0445/2112/2007	DE-06-MI004-PTB011
Permissible operating pressure for direct immersion sensor		PN 16	-
Housing for direct immersion sensor DS M10x1, Ø 5.2 x 26 mm, cable length 1.5 m		Stainless steel	-
Protective pocket G ½ B", Ø 6.2 x 92.5 mm for temperature sensors Ø 6 x 105 mm			
	Permissible operational pressure	PN 25	
	Material	Brass	Stainless steel

Inputs

The inputs are protected against incorrect wiring AC/DC 24 V.

Positioning signal input, analog (input X1)			
Type	**Range (over range)**	**Resolution**	**Input resistance (R_{in})**
AI 0...10 V	0...10 V (-1...11 V)	1 mV	100 kΩ
AI 0...10 V	2...10 V (1...11 V)	1 mV	100 kΩ
AI 4...20 mA [1)]	4...20 mA (0...20 mA)	2.3 µA	<460 Ω
Open connection: Negative voltage -3.1 V (line failure detection)			

Positioning signal input, analog (input X1)		
Type	**Range (over range)**	**Resolution**
AI (LG-)Ni1000	-40...150 °C (-45...160 °C) -40...302 °F (-49...320 °F)	55 mK 0.099 °F
AI Pt1000 (385/EU)		85 mK (CIOR -50...400 °C) 0.153 °F
AI Ni1000 DIN		45 mK 0.081 °F

Position feedback, analog (Input U)			
Type	**Range (over range)**	**Resolution**	**Input resistance (R_{in})**
AI 0...10 V	0...10 V (-1...11 V)	1 mV	100 kΩ
Open connection: Negative voltage -3.1 V (line failure detection)			

Temperature measurement for power measurement, analog (Inputs B7, B26)		
Type	**Range (over range)**	**Resolution**
AI Pt1000 (385/EU)	-40...150 °C (-45...160 °C) -40...302 °F (-49...320 °F)	85 mK 0.153 °F

Temperature and voltage measurement, analog (Input X3)			
Type	**Range (over range)**	**Resolution**	
AI Pt1000 (385/EU)	-40...150 °C (-45...160 °C) -40...302 °F (-49...320 °F)	85 mK 0.153 °F	
AI (LG-)Ni1000		55 mK 0.099 °F	
AI Ni1000 DIN		45 mK 0.081 °F	
AI 0...10 V	0...10 V (-1...11 V)	1 mV	100 kΩ
AI 0...10 V standard	0...100 % (-10...110 %)	1 mV	
Open connection: Negative voltage -1.5 V, 8 µA (line failure detection)			

Flow measurement, digital (Input DU)
Use only the flow sensors specified in the data sheet.

[1)] Not available as a flow temperature controller in the app.

Outputs

The outputs are protected against short circuiting and incorrect wiring AC/DC 24 V.

Position feedback, analog (output X2)			
Type	**Range (over range)**	**Resolution**	**Output current / output impedance**
AO 0-10 V	0...10 V (0...10.5 V)	11 mV	Max. 1 mA
AI 4…20 mA	4…20 mA (4…20 mA)	22 µA	<650 Ω

Signal output, analog (Output Y)			
Type	**Range (over range)**	**Resolution**	**Output current**
AO 0-10 V	0...10 V (0...10.5 V)	11 mV	Max. 1 mA

Switching outputs relay (Outputs Q13, Q14)	
Type	Relay
Switching voltage	AC 24 V / DC 30 V
Permissible load current	100 mA

Supply for field devices (outputs V~)	
Output voltage	AC / DC 24 V
Permissible load current	10 A
Protection against overload	None

Conformity

Protection class		
Housing from vertical to horizontal (see Mounting [→ 20])		IP 54 as per EN 60529
Insulation class		As per EN 60730
	AC / DC 24 V	III

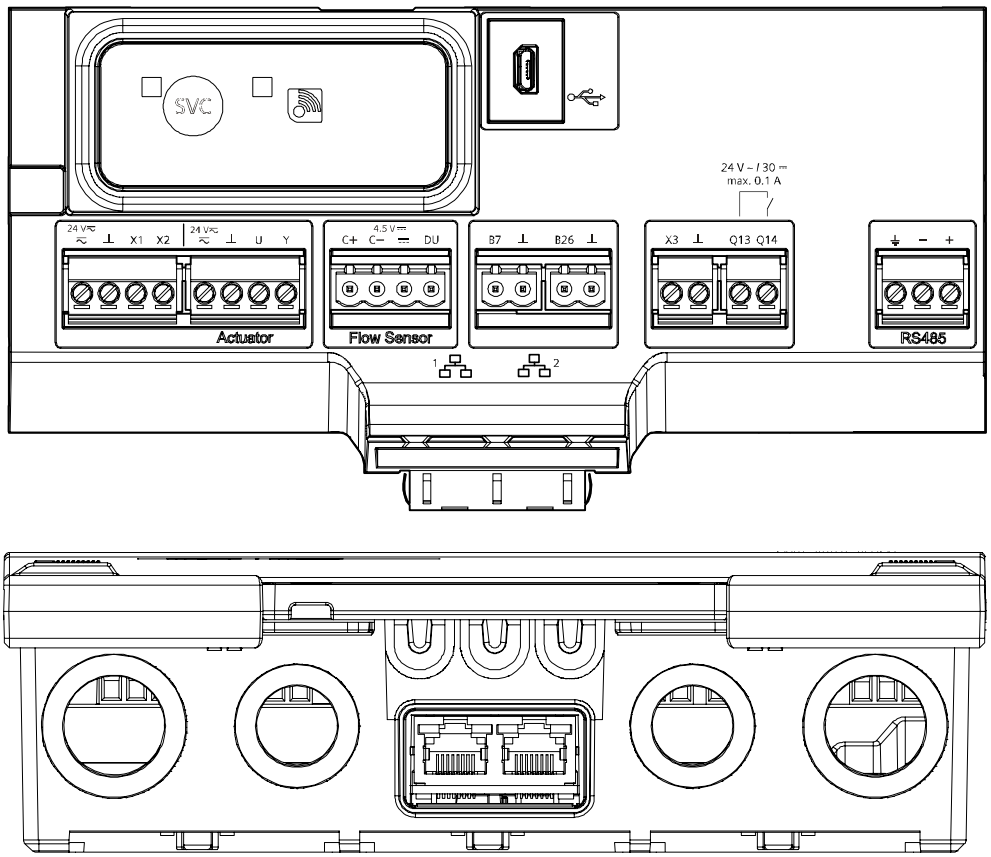
Ambient conditions		
Operation		as per EN 60721-3-3
	Climatic conditions	Class 3K5
	Mounting location	Indoors (weather-protected)
	Temperature (general)	-5...< 55 °C
	Humidity (non-condensing)	5...95 % r.h.
Transportation		as per EN 60721-3-2
	Climatic conditions	Class 2K3
	Temperature	-25...70 °C
	Humidity	< 95% r.h.
Storage		Per IEC 60721-3-1
	Climatic conditions	Class 1K5
	Temperature	-5...55 °C
	Humidity	5...95 % r.h.
Max. media temperature when mounted on valve		120 °C

Directives and standards		
Product standards		EN 60730-x
Electromagnetic compatibility (field of use)		For residential, commercial, and industrial environments
EU conformity (CE)		
	EVG.. / EVF..	A6V11692721 [1)]
	ASE4U10E	A6V11664685 [1)]
	AVG4E..VAG / AVF4E..	A6V11692707 [1)]
	GLA161.9E/HR	A6V101082021 [1)]
	SAV61.00/HR	A6V10455624 [1)]
	SAX61.03/HR	A6V10321559 [1)]
	EZU10-..	A6V11692688 [1)]
RCM Conformity		
	EVG.. / EVF..	A6V11694334 [1)]
	ASE4U10E	A6V11692702 [1)]
	AVG4E..VAG / AVF4E..	A6V11692730 [1)]
	GLA161.9E/HR	A6V101082027 [1)]
	SAV61.00/HR	A6V10455626 [1)]
	SAX61.03/HR	A6V10402431 [1)]
EAC compliance		Eurasian compliance for all EVG../EVF..

Environmental compatibility		
The product environmental declarations below contain data on environmentally compatible product design and assessments (RoHS compliance, material composition, packaging, environmental benefit, and disposal).		
	ASE4U10E	A6V11684717 [1)]
	AVG4E..VAG	A6V11654066 [1)]
	AVF4E..	A6V11654064 [1)]
	ALF4E..	A6V11654081 [1)]
	EZU10-..	A6V11684742 [1)]
	GLA161.9E/HR	A6V101033533 [1)]
	SAV61.00/HR	A6V10450170 [1)]
	SAX61.03/HR	A6V10691442 [1)]
	VVF42..KC	A6V10824366 [1)]
	EZT..	A6V11684744 [1)]
	EZU-WA, EZU-WB	A6V11654200 [1)]

[1)] Documents can be downloaded at http://www.siemens.com/bt/download

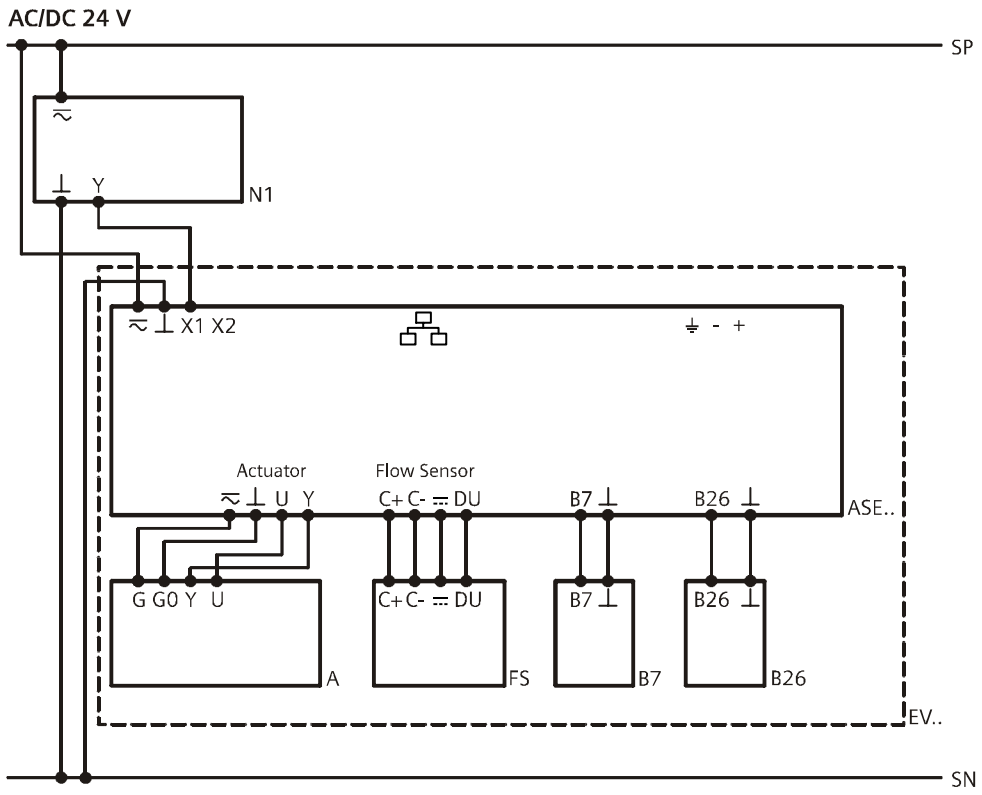
Connection terminals



Connecting thread	Description	Terminal
1, 2 Ethernet	2 x RJ45 interface for 2-port Ethernet switch	
	Power SELV/PELV AC/DC 24 V	~
	System zero	⊥
	Setpoint input Intelligent Valve: DC 0/2...10 V; 4...20 mA (Passive temperature sensor in the application as outside temperature-dependent flow temperature controller)	X1
	Actual value output Intelligent Valve: DC 0/2...10 V; 4...20 mA	X2
USB	USB interface	
Actuator	Field supply AC 24 V for actuator	~
	System zero	⊥
	Position feedback actuator DC 0...10 V	U
	Positioning signal actuator DC 0...10 V	Y
Flow sensor	L-bus potential	C+
	L-bus neutral (Galvanically insulated)	C-
	Power flow sensor (DC 4.5 V)	⎓
	Pulse input	DU
Inputs analog	Passive temperature input	B7
	System zero	⊥
	Passive temperature input	B26
	System zero	⊥
	Universal input (DC 0...10 V / passive temperature sensor input)	X3
	System zero	⊥
Outputs	Switching output AC 24 V; DC 30 V; 0,1 A	Q13
		Q14
RS485	Currently unused	⏚
		-
		+
Service	Service button	SVC
Display	Operation LED	
Com/WLAN	WLAN button	
Display	Communication LED	

Connection diagram

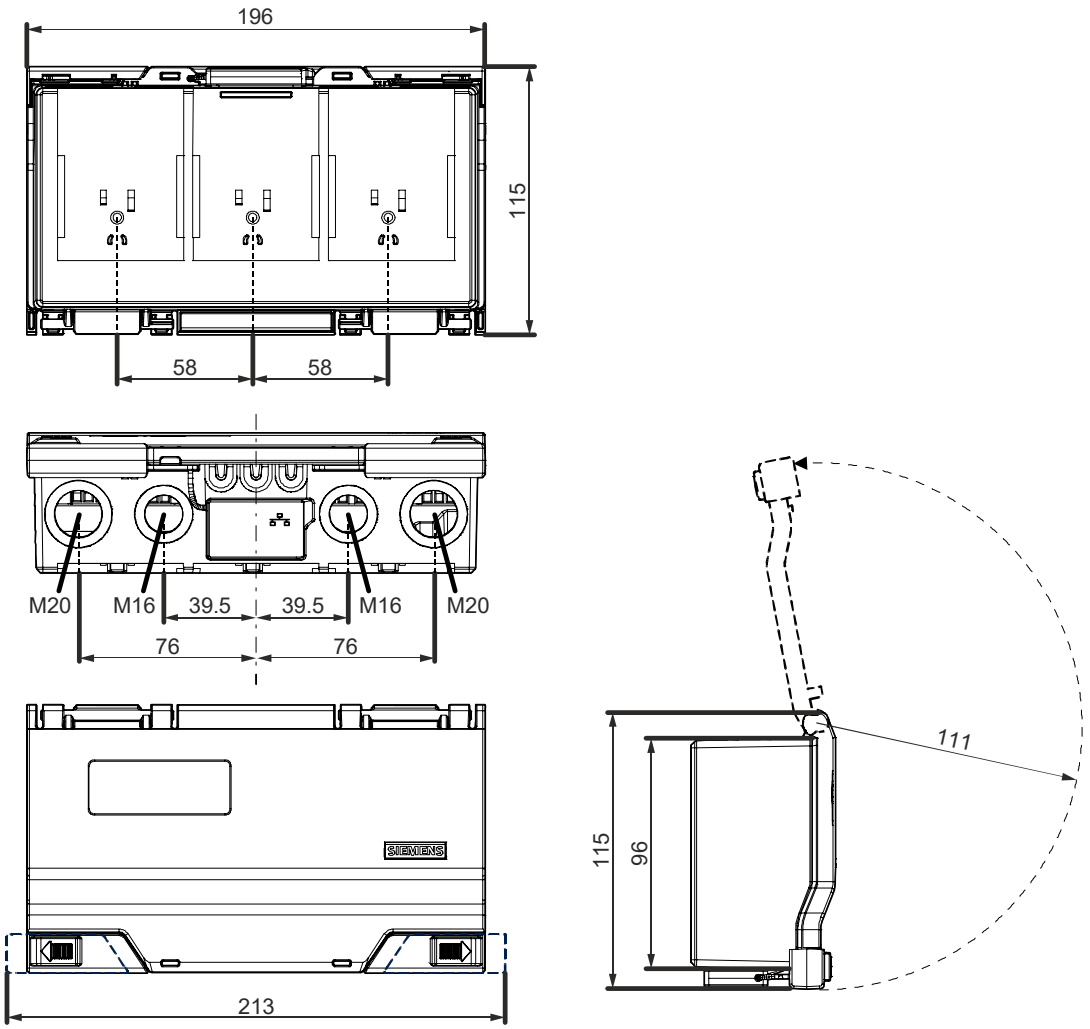
For the application as dynamic control valve – Setpoint source terminal



N1	Automation station
ASE..	Intelligent Valve controller
A	Actuator (e.g. GLA161.9E/HR)
FS	Flow sensor
B7	Temperature sensor blue
B26	Temperature sensor red

Dimensions

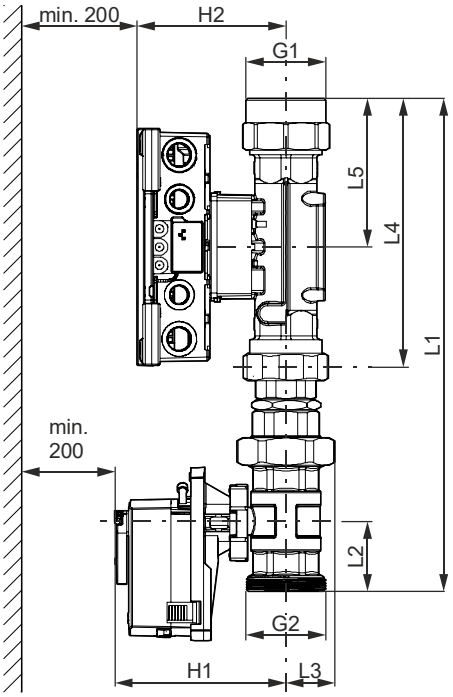
Intelligent Valve controller, ASE4U10E

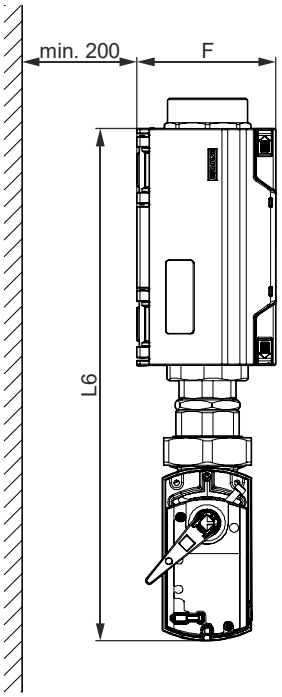


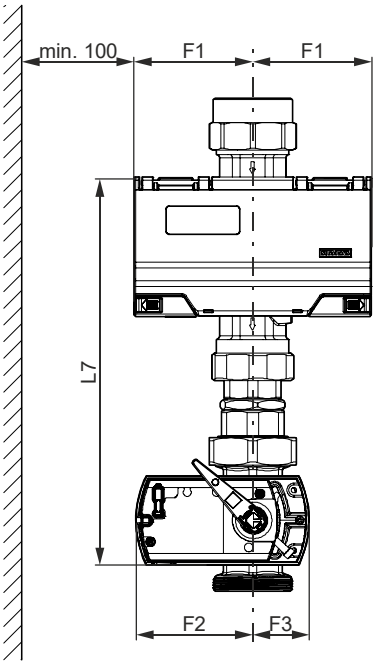
Dimensions in mm

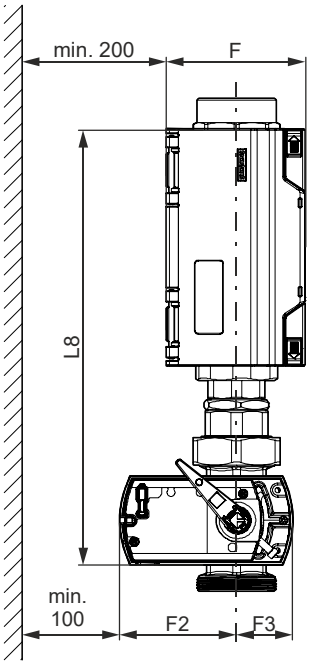
kg
0,5

Threaded, EVG4U10E..









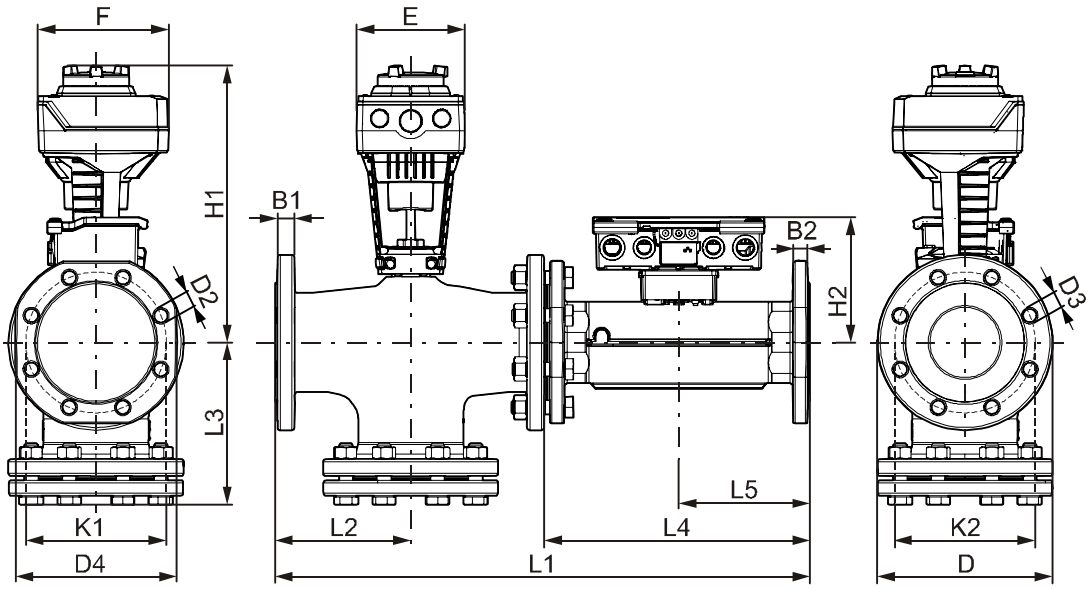
Dimensions in mm

Valve type	F	F1	F2	F3	G 1 G2	H1	H2	L1	L2	L3	L4	L5	L6	L7	L8	kg
EVG4U10E015	115	98	98	46	G 1 B	130	110	232.5	43.5	21,5	115	60	382	- [1]	321	2.5
EVG4U10E020					G 1¼ B	130	112	273	45	26	130	65	351.5		291	2.9
EVG4U10E025					G 1½ B	132.5	116	302		29	150	75	377		317	3.5
EVG4U10E032					G 2 B	136		254.5	50	35	145	77.5	380		320	3.7
EVG4U10E040					G 2¼ B	142	123	410	58	40.5	223	123	423	324	-	6.3
EVG4U10E050					G 2¾ B	155		358.5	62.5	49			367	367		7.0

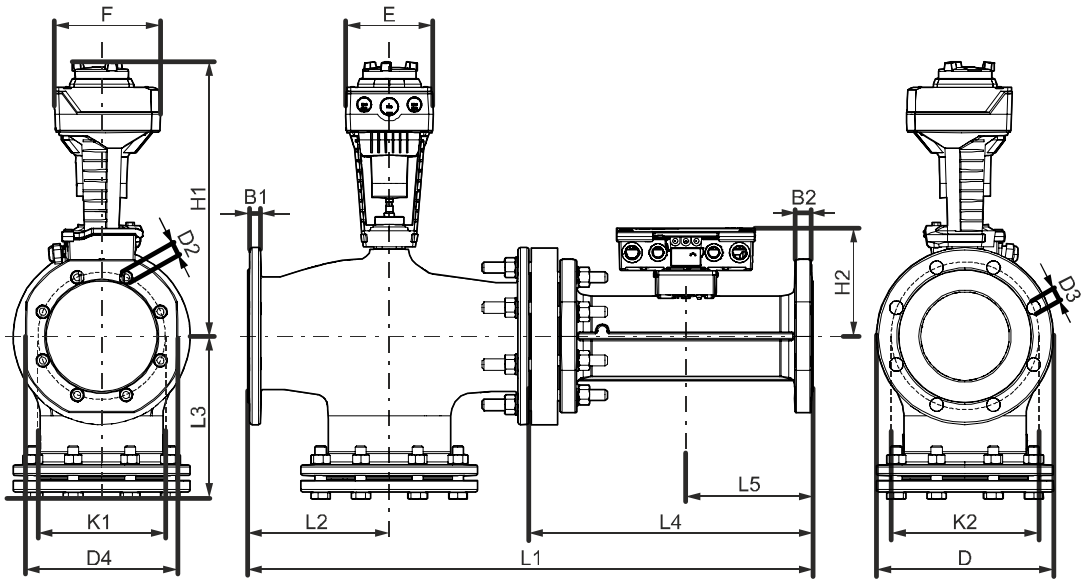
[1] Arrangement not possible

Flanged, EVF4U20E..

DN 65…100



DN 125

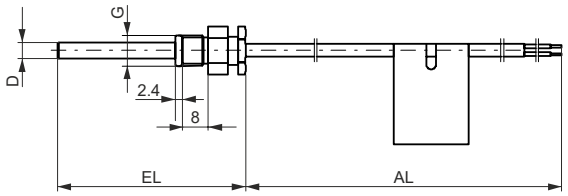


Dimensions in mm

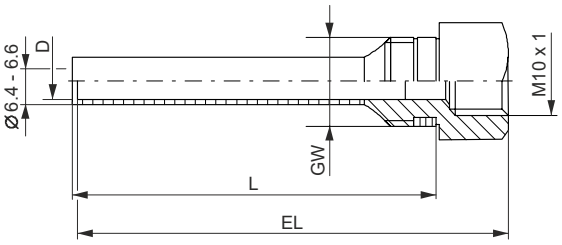
Valve type	B1	B2	D	D2	D3	D4	E	F	H1	H2	K1	K2	L1	L2	L3	L4	L5	kg
EVF4U20E065	17	19	184	18 (4x)	19 (4x)	170	124	150	316	136	145	145	591	145	174	300	150	30.3
EVF4U20E080	19	18	200	19 (8x)	19 (8x)	185				143	160	160	611	155	186			40.9
EVF4U20E100	20	23	220	19 (8x)		216			375	154	180	180	711	175	206	360	180	61.6
EVF4U20E125	15		250						388			210	800	200	228			81.6

Temperature sensors EZU.., protective pockets EZT..

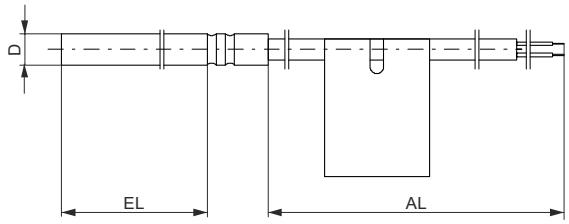
EZU10-2615



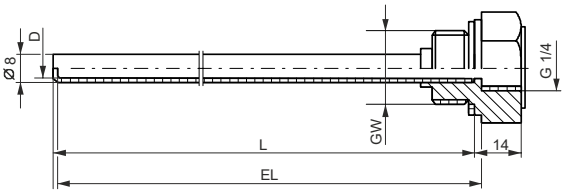
EZT-M40



EZU10-10025 / EZU10-10060



EZT-S100



Dimensions in mm

Temperature sensors				
Type	**D**	**EL**	**G**	**AL**
EZU10-2615	5.2	26.5	M10x1	1500
EZU10-10025	6	92.5	-	2500
EZU10-10060				6000

Protective pockets					
Type	**D**	**EL**	**L**	**GW**	**SW**
EZT-M40	5.2	50	40	G ¼	17
EZT-S100	6.2	100	92.5	G ½	27

Revision numbers

Type	Valid from rev. no.	Type	Valid from rev. no.
EVG4U10E015 S55300-M100	..A	EVF4U20E065 S55300-M106	..A
EVG4U10E020 S55300-M101	..A	EVF4U20E080 S55300-M107	..A
EVG4U10E025 S55300-M102	..A	EVF4U20E100 S55300-M108	..A
EVG4U10E032 S55300-M103	..A	EVF4U20E125 S55300-M109	..A
EVG4U10E040 S55300-M104	..A		
EVG4U10E050 S55300-M105	..A		

Model info	ASN=ASE4U10E; HW=2.1.0
Firmware revision	03.54.02.04; APP=1.15.1591; SVS-300.6.SBC=15.00; ISC=01.00
Application software version	AAS-20:SU=SiUn; APT=HvacFnct34; APTV=2.000; APS=1

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Siemens Switzerland Ltd
Smart Infrastructure
Global Headquarters
Theilerstrasse 1a
CH-6300 Zug
Tel. +41 58 724 2424
www.siemens.com/buildingtechnologies

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