

UVC102MF065...100: Dynamic flow control system with 2-way valve and energy monitoring, eValveco

How energy efficiency is improved

The SAUTER eValveco flow control system is the energy-efficient solution for variable flow control and energy monitoring in HVAC installations

Features

- Patented pressure-independent variable flow control
- Dynamic hydronic balancing at full and partial load
- Integrated flow measurement with feedback and temperature measurement
- Energy monitoring
- Remote commissioning and troubleshooting
- Bluetooth interface for commissioning and maintenance via smartphone app
- Available as 2-way globe valve, version DN 65...DN 100

Technical data

Power supply		
Power supply 24 V~		±10%, 50 Hz
Power supply 24 V=		±10%
Power consumption		DN 65: 6.5 W / 8 VA DN 80: 9.5 W / 11 VA DN 100: 13.5 W / 19 VA
Power consumption when idle		DN 65: 5.5 W / 6 VA DN 80: 8.5 W / 9 VA DN 100: 8.5 W / 9 VA
Input signal		Y ₁ : 0...10 V= (0.17 mA) R _i ≥ 60 kΩ
Feedback signal ¹⁾		X ₁ : 0...10 V= (max. 2 mA)
Additional sensor input		Y ₂ : 0...10 V= (0.17 mA)
Feedback signal resolution		Approx. 100 mV

Parameters		
Volume flow control	Setpoint adjustment ²⁾	Analogue (Y ₁) or via Modbus RTU (can be switched to BACnet MS/TP)
	Type of sensor	TTM ultrasonic sensor, no moving parts
	Unit of measurement ³⁾	[m ³ /h], l/s, l/min, gpm (UK)
	Readiness for operation	5...10 min. after switching on
	Control characteristic ⁴⁾	[Equal percentage] or linear
	Control accuracy	5% of setpoint
	Measuring accuracy	±3% (in relation to the measured actual flow)
	Actuator running time	4 s/mm
Valve	Nominal pressure	PN 16 (16 bar)
	Medium	Water (glycol-free)
	Media quality	According to VDI 2035
	Media temperature ⁵⁾	5...130 °C
	Leakage rate	Class III as per DIN EN 60534-4 (0.001 × k _{VS})
Temperature sensor	Type of sensor	2 × Pt1000 as per EN 60751, class B
	Cable length	2 m per sensor
Interfaces, communication		
	Wireless	Bluetooth (max. range 10 m)

¹⁾ In relation to the measured actual flow

²⁾ In relation to the measured actual flow

³⁾ Factory setting in []

⁴⁾ Factory setting in []

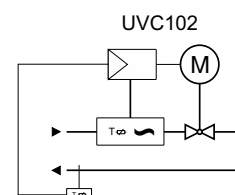
⁵⁾ For media temperatures above 100 °C, use temperature adapter (DN 65 and DN 80).



UVC102MF065



UVC102MF100



ValveDim app



Electric wiring (incl. bus connection)	PVC cable, 7 × 0.5 mm ² , cable length 2 m
Protocol	Modbus RTU/TCP, slave BACnet MS/TP, slave
Connection ⁶⁾	RS-485 twisted pair cable with shared lead
Cable type	Shielded 2-core cable, STP or FTP
Baud rate ⁷⁾	9600, 19 200 or [38 400] 1 start bit Parity [even]/odd/no parity 8 data bits 1 stop bit
Topology	Multi-drop bus, max. length 1000 m
Terminating resistor	At both ends 120 Ω
Indicator/display	Status LEDs

Construction

Material of water-bearing parts	Brass, bronze, EPDM, stainless steel (1.4401, 1.4122, 1.4301), thermoplastic, ceramic
Material of flow meter housing	Steel, polypropylene
Material of actuator housing	Flame-retardant plastic
Connections	PN16, flange as per EN 1092-2 type 21

Ambient conditions

Operating temperature	10...45 °C
Storage and transport temperature	-20...50 °C
Humidity	5...85% rh (non-condensing)
Maintenance / calibration	Maintenance-free / factory calibrated
Max. altitude	2000 m above sea level

Standards, directives

	Type of protection	IP54 (EN 60529), horizontal
	Protection class	III (EN 60730-1)
CE conformity according to	Measuring Instruments Directive 2014/32/EU	EN 1434-4:2007
	EMC Directive 2014/30/EU	Volume flow sensor: EN 61000-3-2, EN 61000-3-3 EN 61000-6-1, EN 61000-6-3 AVM234: EN 61000-6-2, EN 61000-6-4 AVM322: EN 61000-6-1, EN 61000-6-2 EN 61000-6-3, EN 61000-6-4
	PED 2014/68/EU	Fluid group II, no CE label
	Low-Voltage Directive 2014/35/EU	AVM 322 and AVM 234 EN 60730-1, EN 60730-2-14
	Pressure and temperature data	EN 764, EN 1333
	Flow parameters	EN 60534

Overview of types

Type	Nominal diameter	Volume flow range	Volume flow at 30 kPa pressure drop	K _{VS} value	Weight
UVC102MF065	DN 65	0.175...48.8 m ³ /h	26.7 m ³ /h	48.8 m ³ /h	37.4 kg
UVC102MF080	DN 80	0.280...70.7 m ³ /h	38.7 m ³ /h	70.7 m ³ /h	46.1 kg
UVC102MF100	DN 100	0.420...118.7 m ³ /h	65 m ³ /h	118.7 m ³ /h	69.5 kg

⁶⁾ Not electrically isolated

⁷⁾ Standard factory setting in []

Accessories

UVC102MF065, UVC102MF080

Type	Description
0510480004	Double auxiliary contact
0500240001	Adaptor for media temperature above 100 °C to 150 °C for AVM322(S)
0378369101	Complete replacement stuffing box for DN 65...150

UVC102MF100

Type	Description
0372333001	Auxiliary changeover contacts (sets of 2), 12...250 V~, infinitely variable, min. 100 mA and 12 V permissible load 6(2) A
0372333002	Auxiliary changeover contacts (sets of 2), 12...250 V~, gold-plated contacts, from 1 mA, to max. 30 V, wider range 3(1) A
0378369101	Complete replacement stuffing box for DN 65...150

Flow rate

	DN [mm]	K _{vs} [m ³ /h]	V _{Min} [m ³ /h]	V ₅ [m ³ /h]	V ₁₀ [m ³ /h]	V ₂₀ [m ³ /h]	V ₃₀ [m ³ /h]	V _{Max} [m ³ /h]
UVC102MF065	65	48.8	0.175	10.9	15.4	21.8	26.7	48.8
UVC102MF080	80	70.7	0.280	15.8	22.3	31.6	38.7	70.7
UVC102MF100	100	118.7	0.420	26.5	37.5	53.0	65.0	118.7

Δp Maximum closing pressure

V_{Min} Minimum controllable flow

K_{vs} Actual flow rate with valve fully open and 1 bar (100 kPa) pressure difference

V₅ Flow range at Δp 5 kPa

V₁₀ Flow range at Δp 10 kPa

V₂₀ Flow range at Δp 20 kPa

V₃₀ Flow range at Δp 30 kPa

V_{Max} Maximum controllable flow. The maximum flow is reached at a differential pressure of 1 bar (100 kPa). The target flow can be set to a value that is equal to or less than the maximum flow

Description of operation

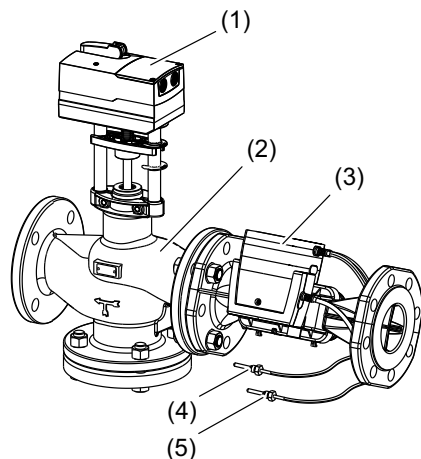
The eValveco flow control system from the UVC family is an electronic, pressure-independent VAV controller. The system combines three functions in a single device: a pressure-independent flow control valve, a shut-off valve and energy monitoring through integrated ΔT measurement.

The UVC 102 is used in HVAC systems (heating and cooling) with variable flow. With this combined function, the UVC 102 replaces both a line control valve and a regulating valve. This means dynamic hydronic balancing is ensured in the system.

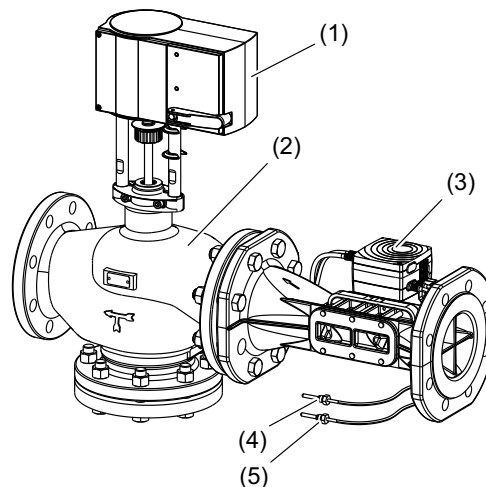
System structure

The dynamic flow control system consists of the following main components:

UVC102MF065/80

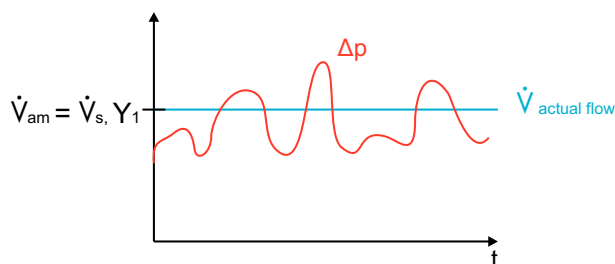


UVC102MF100



- (1) AVM322SF132 valve actuator (DN100: AVM234SF132)
- (2) VQE***F300 globe valve
- (3) Measuring and control unit with ultrasonic flow sensor
- (4) Supply temperature sensor
- (5) Return temperature sensor

The UVC series is designed for automatic hydronic balancing and simultaneous real-time flow control. Additional balancing valves are therefore not required. The hydraulic system is controlled independently of pressure fluctuations in full and partial load operation without additional devices.



Note



Correct flow control is only possible if there is sufficient system pressure.

To prevent cavitation, the static system pressure must be at least 1 bar. At static pressures below 1 bar, air bubbles can form in the system and accumulate in the measuring chamber. If this happens, the measurement is stopped and the actual value output is set to 0.

The UVC 102 receives a setpoint, e.g. from an external control or optionally via the integrated bus connection. The setpoint is internally converted into a flow rate setpoint. The target flow is achieved by adjusting the valve opening based on the comparison of the actual and target value. The actual flow is continuously monitored by the built-in ultrasonic flow sensor and readjusted accordingly.

Bluetooth and “eValveco Configurator” app

The UVC102MF065...100 has an integrated Bluetooth interface. This makes it possible to connect to the control system via smartphone and to check and set all values wirelessly. The system settings can be accessed via the “eValveco Configurator” app. The app is available for Apple iOS and Google Android and can be installed via the respective app stores.

Intended use

The eValveco flow control system is designed for the dynamic flow control in control circuits with water (glycol-free). All associated product instructions must be observed. Modifying or converting the product is not admissible.

Improper use

The eValveco flow control system cannot be used as a measuring device according to Directive 2014/32/EU.

The eValveco system cannot be used instead of a calibrated heat meter for the purposes of energy billing.

The system is not suitable for use in drinking water systems according to the directives 98/83/EC and 2015/1787/EU.

Engineering and fitting notes

The energy module (0500570001) and the 230 V module (0500570003) of the actuator are not compatible with the sensor unit and therefore cannot be used with the UVC.

The parameters of the communication protocol are identical for all devices in the UVC series. There are no differences between the flanged and screwed versions.

NOTICE!



Screws can become loose during transport and installation.

► Check all screw connections before commissioning and retighten them if necessary.

Fitting position

NOTICE!

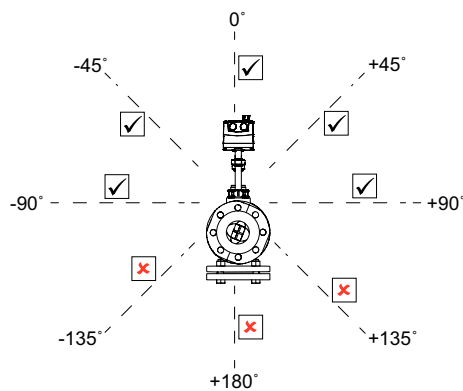


Damage to the actuator due to penetrating condensation or dripping water.

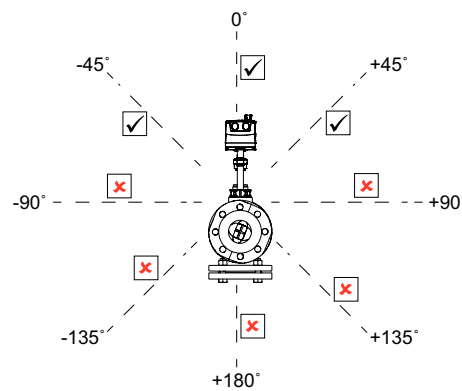
► Do not install the UVC102MF065...100 in a suspended position.

► Also, do not install the UVC102MF80 and UVC102MF100 in a sideways position.

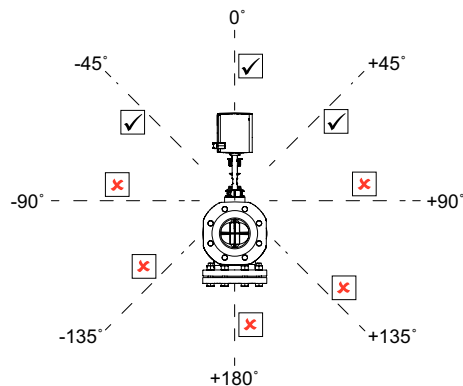
UVC102MF065



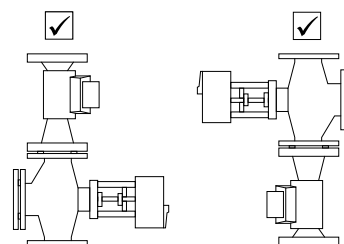
UVC102MF80



UVC102MF100



Recommended fitting positions



No air bubbles can be trapped in a vertical installation position



Valve design

SAUTER provides various tools for valve design and engineering:

- ValveDim smartphone app
- ValveDim PC program
- ValveDim slide rule

You can find the tools under the link www.sauter-controls.com/en/performance/valve-calculation/ or scan the QR code



Design and materials

Valve body made of grey cast iron as per EN 1561, code EN-GJL-250, material number EN-JL 1040 with smooth drilled flanges as per EN 1092-2, seal form B.

Valve body protected by matt paint RAL 9005 jet black.

Fitted in the piping with welding flange as per EN 1092-1. Valve fitting length as per EN 558-1, basic series 1. Flat seal on valve body made of asbestos-free material.

Materials of water-bearing parts according to DIN

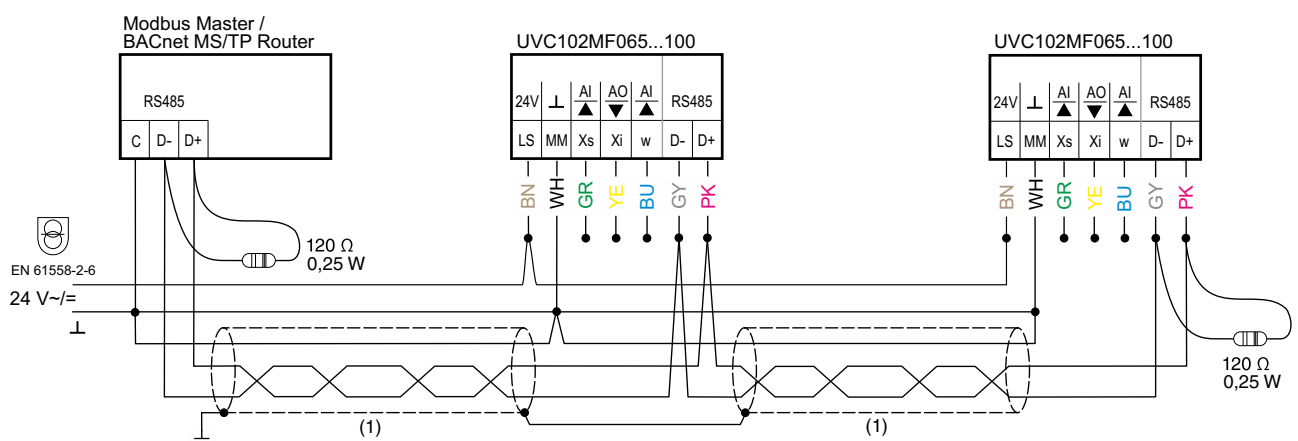
	DIN material no.	Designation
Valve body	EN-JL 1040	EN-GJL-250 (GG25)
Valve seat	EN-JL 1040	EN-GJL-250 (GG25)
Spindle	1.4021	X20Cr13
Plug	1.4021	X20Cr13
Stuffing box	1.4104	X12CrMoS-17
Fitting, measuring path	CuAl10Fe2	Aluminium bronze
Transducer, ultrasonic flow sensor	CuAl10NiFe4	Aluminium bronze
Reflector plate	CuZn36Pb2As	Brass (lead)
O-ring	EPDM	Terpolymer
Seal	EPDM	Terpolymer
Immersion sleeve, temperature sensor	1.4301	X5CrNi18-10

System integration

The system is equipped with an RS-485 interface. Depending on the product version, the Modbus protocol is available on the interface by default. The protocol can be switched to BACnet MS/TP by changing the setting, e.g. via the smartphone app.

The Modbus parameters and BACnet MS/TP objects are listed in the manual P100017780.

RS-485 bus connection



The maximum admissible bus length (1) depends on the cable type used and the correct termination with terminating resistors. In general, a 2-wire shielded cable with twisted wire pairs must be used. Use of one of the following cable types is recommended:

- LAPP UNITRONIC® BUS LD 2170204
- LAPP UNITRONIC® BUS LD FD P 2170214
- Belden 9842
- Belden 3106A
- Belden 3107A

NOTE



Observe the correct polarity of all signals.

Connect the cable shield of the entire bus line continuously, and connect it to protective earth as directly as possible at one location.

Earth the shielding in the plant as follows:

- Shielding earthed at one end is suitable for protection from electrical interference, e.g. from overhead power lines, static charges etc.
- Shielding earthed at both ends is suitable for protection from electromagnetic interference, e.g. from frequency converters, electric motors, coils etc.

NOTICE!



Faulty wiring can result in damage to the device.

► Connect all devices in a network to the same power supply.

For Ethernet CAT-5 cables and J-Y(ST)Y cables, a bus length of up to 500 m is possible. The length of the bus line is limited by the following parameters:

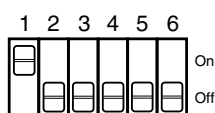
- Number of connected devices
- Cross-section of cable used

In the case of RS-485 interfaces, the bus wiring must follow line topology. Star, tree or branch topologies are not recommended. The devices do not have internal terminating resistors. Therefore, a terminating resistor of 120 Ω (0.25 W) must be connected at the start and end of the bus line, parallel to the D+/D- data lines.

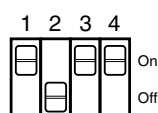
DIP switches

The DIP switches of the actuator must remain in the factory setting, otherwise the calibration will be invalid. When replacing the actuator, set the DIP switches accordingly.

AVM322SF132
(DN 65, DN 80)



AVM234SF132
(DN 100)

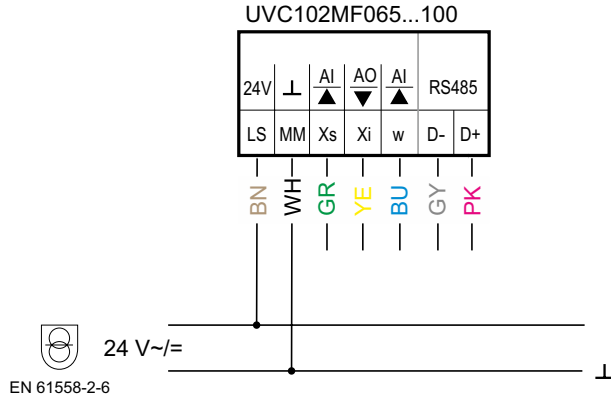


Disposal

When disposing of the product, observe the currently applicable local laws.

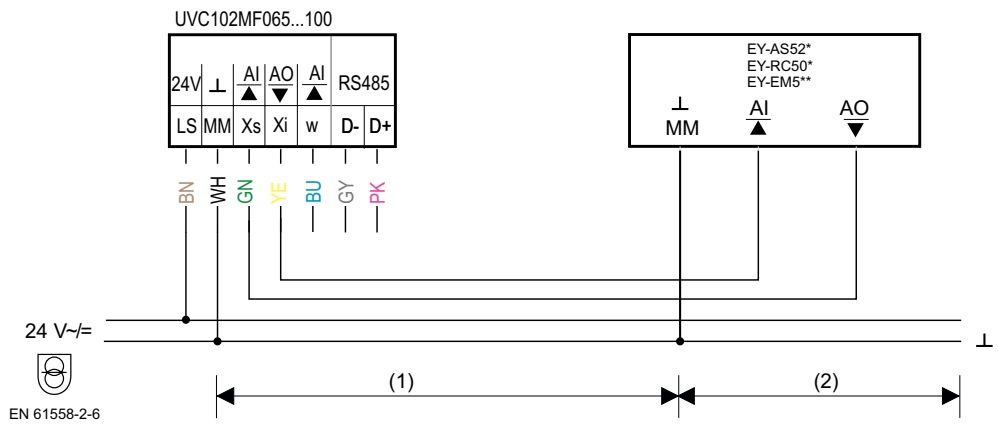
More information on materials can be found in the Declaration on materials and the environment for this product.

Connection diagram



Type	Function	Colour
LS	24 V~	Brown (BN)
MM	Power supply ground	White (WH)
Xs (setpoint)	0...10 V	Green (GR)
Xi (actual value)	0...10 V	Yellow (YE)
w=Y ₂ (AI on Modbus register / BACnet AI object)	0...10 V	Blue (BU)
Modbus / BACnet MS/TP, RS-485	D-	Grey (GY)
Modbus / BACnet MS/TP, RS-485	D+	Pink (PK)

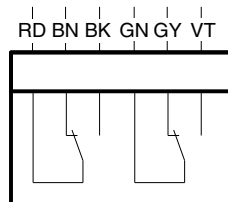
Application with analogue actual value and setpoint



- (1) Components with distance to power source
- (2) Power source close to the controller

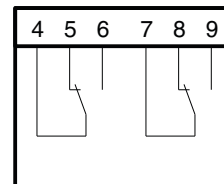
Accessories

Double auxiliary switch unit
0510480004



RD = red
BN = brown
BK = black
GN = green
GY = grey
VT = violet

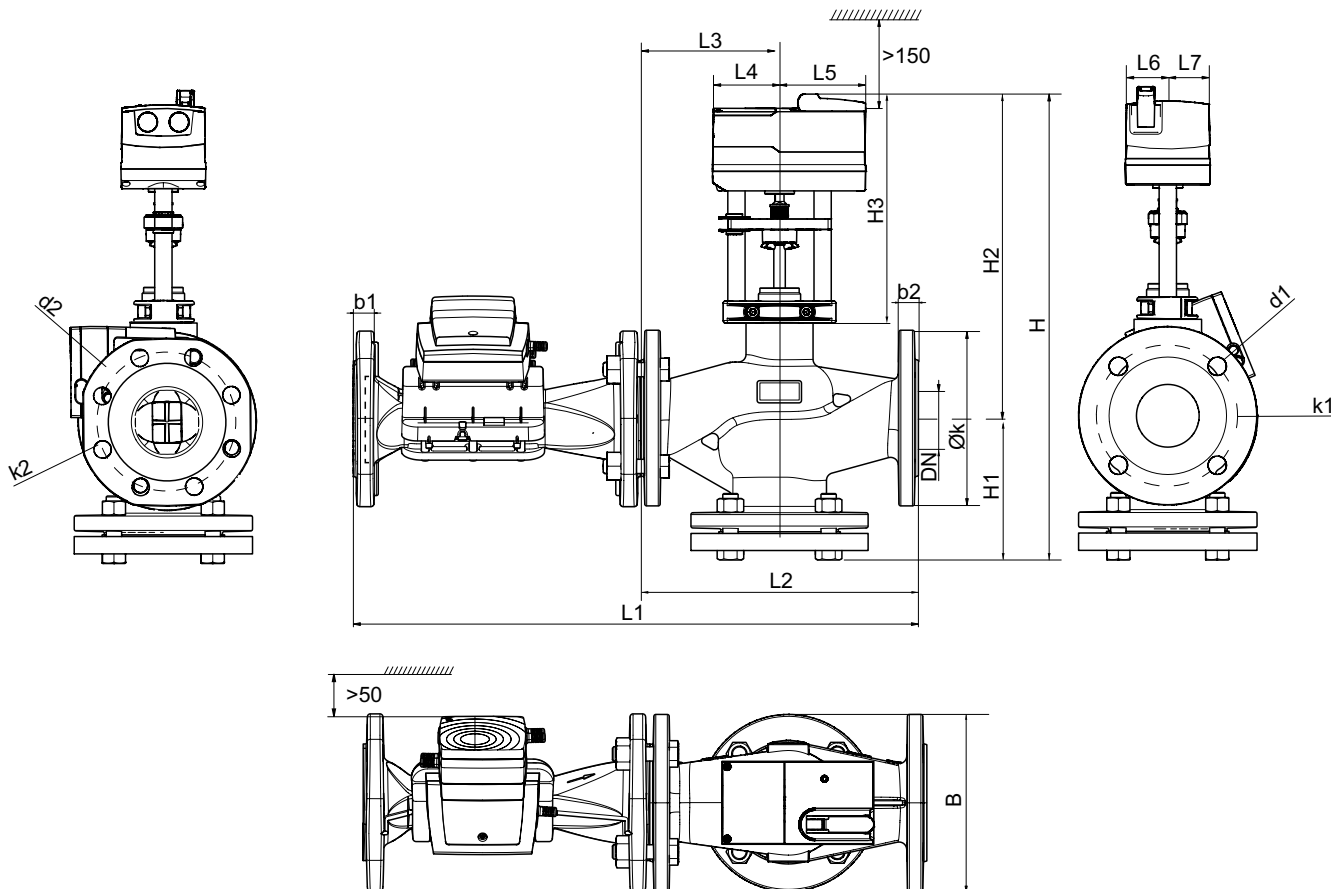
Auxiliary change-over contacts
0372333001 / 0372333002



Dimension drawings

All dimensions in mm.

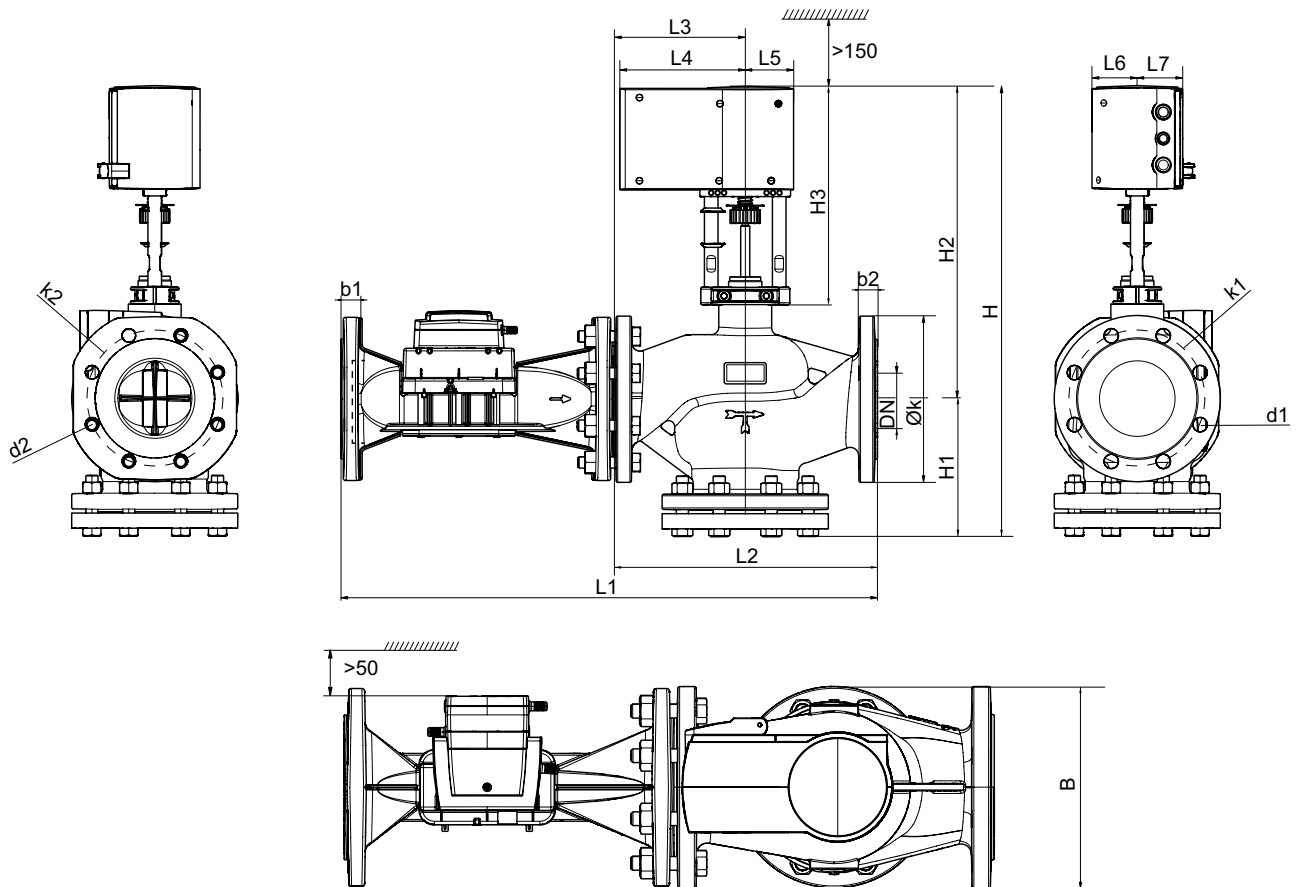
UVC102MF065/080



Type	DN [mm]	L1 [mm]	L2 [mm]	L3 [mm]	L4 [mm]	L5 [mm]	L6 [mm]	L7 [mm]	b1 [mm]	b2 [mm]	B [mm]
UVC102MF065	65	593	290	145	70	90	44	44	22	20	185
UVC102MF080	80	613	310	155	70	90	44	44	24	22	200

Type	DN [mm]	H [mm]	H1 [mm]	H2 [mm]	H3 [mm]	d1 [mm]	d2 [mm]	k1 [mm]	k2 [mm]	Øk [mm]
UVC102MF065	65	492.5	149.5	343	241	4 × 19	8 × 18	145	145	145
UVC102MF080	80	514.5	161.5	353	241	8 × 19	8 × 18	160	160	160

UVC102MF100

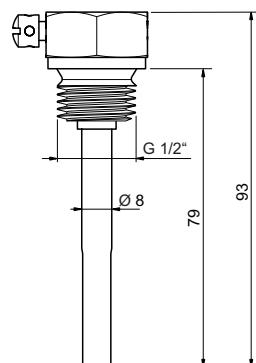


Type	DN [mm]	L1 [mm]	L2 [mm]	L3 [mm]	L4 [mm]	L5 [mm]	L6 [mm]	L7 [mm]	b1 [mm]	b2 [mm]	B [mm]
UVC102MF100	100	713	350	175	64	166	57	60	24	24	220

Type	DN [mm]	H [mm]	H1 [mm]	H2 [mm]	H3 [mm]	d1 [mm]	d2 [mm]	k1 [mm]	k2 [mm]	Øk [mm]
UVC102MF100	100	597.5	181.5	416	289	8 × 19	8 × 18	180	180	180

Accessories

Immersion sleeve for temperature sensors 1 and 2 (supplied)



Fr. Sauter AG
 Im Surinam 55
 CH-4058 Basel
 Tel. +41 61 - 695 55 55
 www.sauter-controls.com