Control components for VAV terminal units

Compact, static

With service interface and bus communication facility, for contaminated extract air or for pressure control

Compact component for VAV terminal units, especially for aggressive air or gases in extract air systems

- Controller, static differential pressure transducer and actuator are fitted together in one casing
- Volume flow rates $\dot{V}_{min}$ and $\dot{V}_{max}$ are factory set as parameters
- Ideal for carrying out service from the switch cabinet or control panel
- Change of parameters using adjustment devices
- Suitable for constant and variable volume flows as well as for $\dot{V}_{min}/\dot{V}_{max}$ switching
- Bus communication is possible due to the Sauter SLC interface

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	RS-485 (SLC, Sauter)	CS – 5

Application

Application

- Electronic volume flow controllers of Type Compact are compact, all-in-one control devices for VAV terminal units
- Static differential pressure transducer, electronic controller, and actuator are fitted together in one casing
- Suitable for different control tasks depending on how the input for the setpoint value signal is used
- The output signals (voltage signals or data points) of the room temperature controller, central BMS, air quality controller or similar units control variably control the volume flow
- Local override control by means of switches or relays
- Volume flow rate actual value is available as a linear voltage signal or data point

Description

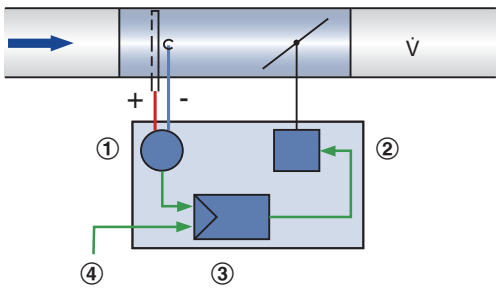
Parts and characteristics

- Sensor for static differential pressure measurements
- Mechanical stops for limiting the damper blade positions
- Actuators with overload protection
- Release button to allow for manual operation

Functional description

VAV terminal units control the volume flow in a closed loop, i.e. measurement – comparison – control.
The volume flow rate is determined by measuring the differential pressure (effective pressure). For this purpose the VAV terminal unit is fitted with a differential pressure sensor.
The integral differential pressure transducer transforms the effective pressure into a voltage signal, which is then analysed by the microprocessor of the controller. The volume flow rate actual value is available as a data point or voltage signal. The factory setting is such that a 10 V DC voltage signal always corresponds to the nominal volume flow rate ($\dot{V}_{Nom}$).
The volume flow rate setpoint value comes from a higher-level controller (e.g. room temperature controller, air quality controller, central BMS), either as a voltage signal or as a data point, or from local switch contacts. Variable volume flow control results in a value between $\dot{V}_{min}$ and $\dot{V}_{max.}$ It is possible to override the room temperature control, e.g. by a complete shut-off of the duct.
The controller compares the volume flow rate setpoint value to the actual value and controls the integral actuator accordingly.
Volume flow rate parameters and voltage ranges are factory stored in the controller. Changes on the customer's site can easily be carried out using an adjustment device, a notebook with service tool, or a bus interface.

Principle of operation – Easy and Compact controllers



① Differential pressure transducer
② Actuator
③ Volume flow controller
④ Setpoint value signal

Volume flow control

- The volume flow controller works independent of the duct pressure
- Differential pressure fluctuations do not result in permanent volume flow rate changes
- To prevent the control from becoming unstable, a dead band is allowed within which the damper blade does not move

Any attachments are to be defined with the order code of the VAV terminal unit.

Compact controllers for VAV terminal units

Order code detail	Part number	Type	Type of VAV terminal unit
SA0	A00000043584	ASV115CF132E	①
SC0	A00000043585	ASV115CF152E	①

① TVR, TVJ, TVT, TZ-Silenzio, TA-Silenzio, TVZ, TVA, TVRK

Application

- Electronic volume flow controllers ASV115CF132E and ASV115CF152E as Compact controllers
- Variable air or constant air volume flow control
- Second, integral controller for room temperature control or differential pressure control
- The flow rate is measured according to the static measurement principle
- Voltage range for the actual and setpoint value signals 0 – 10 V DC or 2 – 10 V
- Separate inputs for override control $\dot{V}_{min}$ ad $\dot{V}_{max}$
- RS-485 communication interface (Sauter local communication)
- Setpoint value defaults and overrides by means of data exchange with a higher-level system
- Status values such as volume flow rate actual value and damper blade position are sent to the interface
- Functionality and I/O assignment to be parameterized by the customer

Construction

For TVR, TVJ, TVT, TZ-Silenzio, TA-Silenzio, TVZ, TVA, TVRK

- SA0: ASV115CF132E with integral actuator
- SC0: ASV115CF152E with integral fast-running actuator

Communication interface

- RS-485 (SLC, Sauter local communication)
- Up to 31 devices per segment

Operating modes

- Variable volume flow control: $\dot{V}_{min}$ – $\dot{V}_{max}$
- $\dot{V}_{min}$: Minimum volume flow rate
- $\dot{V}_{max}$: Minimum volume flow rate

Commissioning

- Complete project-specific parameterization and commissioning with manufacturer software and interface adapter required
- For C-values, see installation instructions for VAV controllers

SA0, SC0

① Position indicator
② Blade shaft clamp
③ Connections for differential pressure sensor
④ Connecting cable
⑤ Service socket

Compact controller ASV115CF132E

Compact controller ASV115CF132E

Supply voltage (AC)	24 V AC ± 20 %, 50/60 Hz
Supply voltage (DC)	24 V DC –10/+20 %
Power rating (AC)	5.7 VA max.
Power rating (DC)	3.3 W max.
Torque	10 Nm
Running time for 90°	30 – 120 s, adjustable
Setpoint value signal input	0 – 10 V DC, R_a > 100 kΩ
Actual value signal output	0 – 10 V DC, max. 0.1 mA
Input for flow rate shift signal or output for flow rate deviation, configurable	As input: 0 – 10 V DC, R_a > 100 kΩ; as output: 0 – 10 V DC, 0.1 mA max.
Input for switch contact $\dot{V}_{min}$ or temperature sensor, configurable	Volt-free or Ni1000, 0 – 50 °C
Input, switch contact $\dot{V}_{max}$	connect volt-free
Communication	RS-485, not galvanically isolated, 115 kBd
Communication format	Sauter local communication (SLC)
Network	Linear, no branches, up to 31 devices per segment
Cable termination	Cable length 200 – 500 m, 120 Ω both ends
IEC protection class	III (protective extra-low voltage)
Protection level	IP 54
EC conformity	EMC to 2014/30/EU
Weight	0.8 kg

Compact controller ASV115CF152E

Supply voltage	24 V AC ± 20 %, 50/60 Hz
Power rating	15 VA max.
Torque	10 Nm
Running time for 90°	3 – 15 s, adjustable
Setpoint value signal input	0 – 10 V DC, R_a > 100 kΩ
Actual value signal output	0 – 10 V DC, max. 0.1 mA
Input for flow rate shift signal or output for flow rate deviation, configurable	As input: 0 – 10 V DC, R_a > 100 kΩ; as output: 0 – 10 V DC, 0.1 mA max.
Input for switch contact $\dot{V}_{min}$ or temperature sensor, configurable	Volt-free or Ni1000, 0 – 50 °C
Input, switch contact $\dot{V}_{max}$	connect volt-free
Communication	RS-485, not galvanically isolated, 115 kBd
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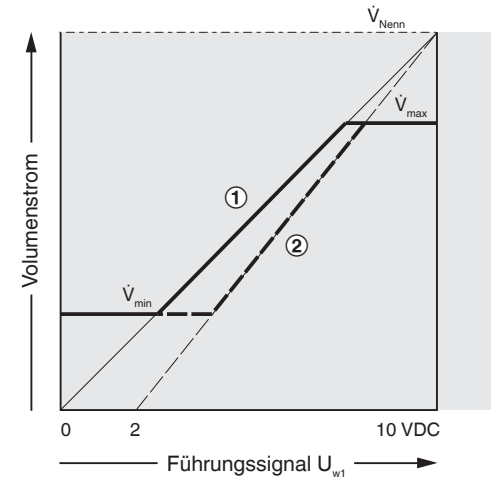
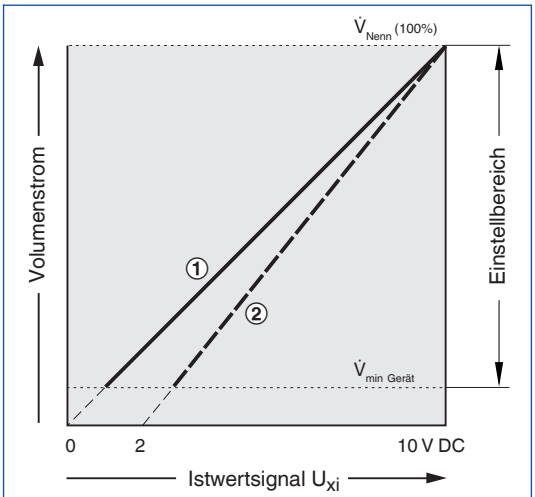
SA0, SC0, Characteristic of the setpoint value signal



① 0 – 10 V DC
② 2 – 10 V DC

ASV115CF132E, ASV115CF152E

SA0, SC0, Characteristic of the actual value signal



① 0 – 10 V DC
② 2 – 10 V DC

ASV115CF132E, ASV115CF152E

Volume flow rate setpoint value

0 – 10 V DC
$\dot{V}_{Soll} = \frac{U_{w1}}{10} \dot{V}_{Nenn}$

SA0, SC0

Volume flow rate actual value

0 – 10 V DC
$\dot{V}_{Ist} = \frac{U_{xi}}{10} \dot{V}_{Nenn}$

SA0, SC0

Volume flow rate setpoint value

2 – 10 V DC
$\dot{V}_{Soll} = \frac{U_{w1} - 2}{8} \dot{V}_{Nenn}$

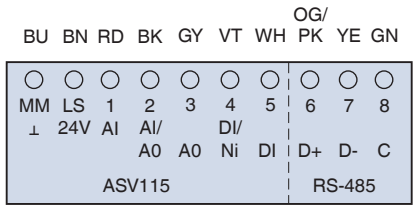
SA0, SC0

Volume flow rate actual value

2 – 10 V DC
$\dot{V}_{Ist} = \frac{U_{xi} - 2}{8} \dot{V}_{Nenn}$

SA0, SC0

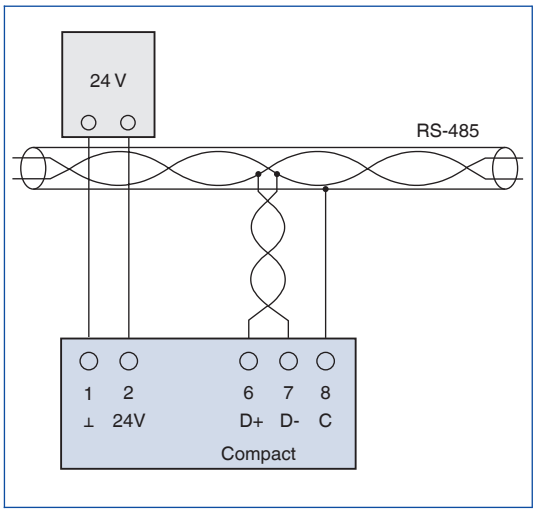
SA0, SC0, connecting cable core identification



1 ⊥: Ground, neutral
2 24V: Supply voltage
3 AI: Setpoint value signal
4 AI/AO: Setpoint shift (AI) or volumetric flow deviation (AO)
5 DI/NI: Switching contact $\dot{V}_{min}$ (DI) or temperature sensor (NI)
6 DI: Switch contact $\dot{V}_{max}$
7 D+: Data A
8 D–: Data B
9 C: Shield

Compact: ASV115CF132E, ASV115CF152E
Note: Pin assignment depends on the parameterization of the controller by others!

SA0, SC0, Volume flow control



Compact: ASV115CF132E, ASV115CF152E