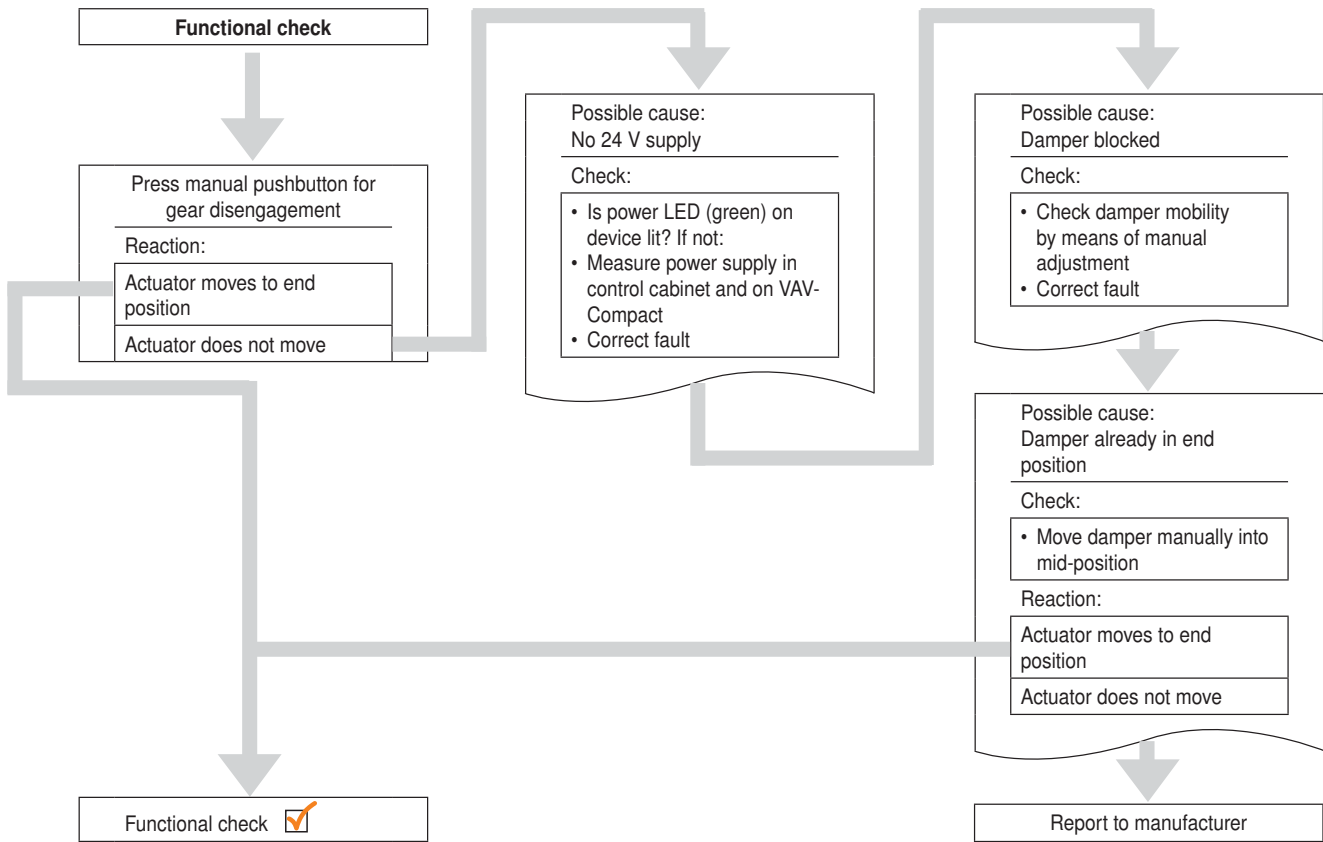


Flow chart

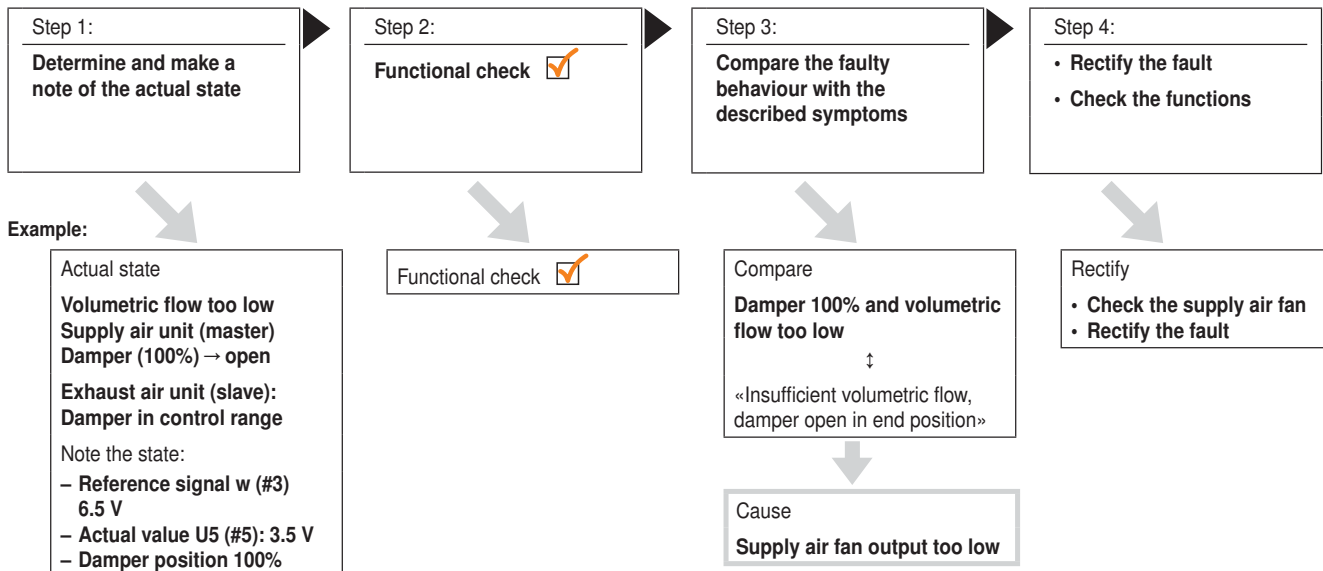


Analysing faulty behaviour

Symptoms, causes and rectification

Various fault symptoms, their possible causes and recommended rectification steps are described below.

Based on past experience, the faulty behaviour is probably due to the settings or control mode rather than to the air volume controller itself. A structured approach is essential to identify the most efficient remedy regardless of the particular malfunction:



### Fault descriptions, symptoms, causes and rectification

#### Insufficient volumetric flow, damper OPEN in end position

Symptom	Possible cause	Rectification steps
Set volume not reached although damper is 100% open (end stop)	Air hoses between pick-up device and pressure sensor have been interchanged or are not connected	Monitoring with ZTH-GEN Connect air hoses correctly. Observe + / -
	Fan failure	Check the fan, including the control functions, and rectify the fault
	Fire dampers tripped, i.e. closed	Check whether all fire and/or shut-off dampers between the fan and the VAV unit are open
	Fan air output too low	Check whether all fire and/or shut-off dampers between the fan and the VAV unit are open
	Some or all rooms are often set positively (manually) to maximum volumetric flow when the system is started up. Consequence: The fan is unable to produce the required air output (simultaneity factor)	Deactivate override control and/or reduce the reference signal

#### Insufficient volumetric flow, master damper OPEN / slave damper CLOSED

Symptom	Possible cause	Rectification steps
Set volume not reached: • Damper of master unit is open • Damper of slave unit is closed	VAV units in master / slave connection: • Master in air shortage situation (fan defective or OFF), i.e. damper is 100% open	Check the fan in the line of the master unit and rectify the fault
	• Slave does not receive reference signal from master because master does not measure actual volume → damper CLOSED	Check whether all fire and/or shut-off dampers between the fan and the master unit are open

#### Volumetric flow too high, damper CLOSED

Symptom	Possible cause	Rectification steps
Set volume not reached and damper closed although reference signal is present	see «Behaviour in the lower control range», page 14	Increase the $\dot{V}_{\min}$ parameter Adjust the reference signal or correct the VAV-Compact mode setting
Damper closes (0%) instead of opening to $\dot{V}_{\min}$ value	VAV-Compact set to 2 ... 10 V mode but controlled with 0 ... 10 V reference signal	Change the VAV-Compact mode setting to 0 ... 10 V

#### Volumetric flow too high, damper OPEN

Symptom	Possible cause	Rectification steps
Actual volume too high, damper open at end stop	Pressure hose squeezed off (jammed)	Check the pressure hoses: – Mark the $\pm$ connections – Pull the pressure hoses off of the VAV-Compact – Blow through the hose lines
	pick-up device, pressure hose or pressure sensor contaminated  <b>Note:</b> The differential pressure sensor of the VAV-Compact does not normally need to be cleaned	Check the parts and clean them if necessary: – Mark the $\pm$ connections – Pull the pressure hoses off of the VAV-Compact – Clean and blow out the pick-up device – Blow through the hose lines – Blow out the pressure sensor on the VAV-Compact and connect the hand pump to the (minus) connection. Remove any visible dirt – Mount the pressure hoses – Carry out a functional check

#### Volumetric flow too low, damper in control range

Symptom	Possible cause	Rectification steps
Required volumetric flow not reached	Reference signal (DDC, room controller) limited by software	Check the reference signal (DDC, room controller) and adjust the limitation
	VAV-Compact set to 2 ... 10 V mode but controlled with 0 ... 10 V reference signal	Correct the VAV-Compact mode setting

**Fault descriptions, symptoms, causes and rectification** (continued)

**Volumetric flow too high, damper in control range**

Symptom	Possible cause	Rectification steps
Steady-state deviation of volumetric flow (too high) relative to reference signal	VAV-Compact set to 0 ... 10 V mode but controlled with 2 ... 10 V reference signal	Adjust the reference signal or correct the VAV-Compact mode setting

**Positive / negative room pressure, damper in control range**

Symptom	Possible cause	Rectification steps
Undesirable positive or negative pressure in room	Clamp loose, turns without spindle driver	Check the clamp mounting
	Room pressure ratio not set correctly	Check the operating volumetric flow setting
	Master / slave application with limited operating volumetric flow setting on slave controller	Check the operating volumetric flow setting. If the room pressure is balanced, the slave setting should be as follows: $\dot{V}_{\min}$ 0% / $\dot{V}_{\max}$ 100% (for an identical nominal width and air volume)
	Wiring incorrect, VAV units interchanged (master / slave or parallel connection)	Check the wiring and correct it if necessary
	<b>Example:</b> Supply air office a and exhaust air office b Supply air office b and exhaust air office a VAV units set to master / slave but controlled in parallel	

**Air volume controller does not react to reference signal**

Symptom	Possible cause	Rectification steps
VAV controller adjusts to fixed value and does not react to reference signal changes	0 / 2 ... 10 V reference signal has no reference, i.e. ground connection (GND) is missing	Measure the signal between VAV-Compact terminals 1 (GND) and 3 (0 / 2 ... 10 V) Check the wiring and correct it if necessary
	Polarity of reference signal and ground (GND) reversed	Measure the signal between VAV-Compact terminals 1 (GND) and 3 (0 / 2 ... 10 V) Check the wiring and correct it if necessary
	AC 24 V connection reversed. If several devices are connected to the same AC 24 V transformer, this connection must be in phase	Check the wiring and correct it if necessary
	Operating mode (override control) active	Check the controller

**Damper does not move**

Symptom	Possible cause	Rectification steps
Damper does not move	Clamp loose, turns without spindle driver	Check the clamp mounting