

SGU100: Датчик хода скользящей рамы

Как повышается энергетическая эффективность

Активирует предустановленное, энергоэффективное и безопасное управление воздушным потоком вытяжных шкафов в комбинации с компактным контроллером ASV115CF152 для ответственных применений.

Область применения

Постоянное, плавное измерение позиции вертикальной рамы вытяжного шкафа.

Характеристики

- Изолированное и точное определение позиции рамы с точностью хода < 1 мм (F010) или < 2 мм (F011)
- Возможность быстро и без колебаний управлять потоком
- Простота установки, предпочтительно на противоположной раме
- Функция Teach-in для настройки под длину хода рамы
- Шина данных RS-485 до 31 абонентов в сегменте, SLC (Sauter Local Communication) протокол
- Лёгкая настройка при помощи программы SAUTER CASE VAV
- Встроенная тревога превышения хода
- Кабель питания длиной 2.5 м, 7 × 0.32 мм², закреплён в корпусе
- Поставляется с кабелем без содержания галогенов
- Удаленный доступ и обслуживание: настройка и эксплуатация через шину или внешнюю кнопку
- Сервисное обслуживание системы в тестовом режиме через функцию "напряжение контроллера"
- 3-цветный светодиод отображения состояния
- Звуковая сигнализация статуса или тревоги (может быть отключена)

Техническое описание

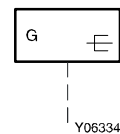
- Напряжение питания 24 V~/=
- Рабочий диапазон (устанавливаемый диапазон)
 - F010 от 200...800 мм для стационарных вытяжных шкафов (макс. ход пружины 1000 мм)
 - F010 от 400...1,600 мм для напольных вытяжных шкафов (макс. ход пружины 2000 мм)
- Выходной сигнал 0/2...10 V или программируемый в диапазоне между 0...11.5 V
- Нелинейность макс. 1.5%
- Интерфейс RS-485 для настройки

Продукция

Тип	Рабочий диапазон (мм)	Вес (кг)
SGU100F010	200...800	0.68
SGU100F011	400...1600	0.68

Техническая информация

Электропитание		Версия	
Питание	24 V~ ± 20%, 50...60 Hz 24 V= ± 20%	Время аппаратного ответа	< 100 ms ³⁾
Потребляемая мощность	24 V~ тип: 2 VA / 0.75 W / без бипера ¹⁾ макс: 4 VA / 1.5 W / с бипером ¹⁾ 24 V= Обычно: 0.6 W / без бипера ¹⁾ макс: 1.1 W / с бипером ¹⁾	Постоянная времени фильтра	0...5.22 s, настройка через SAUTER CASE Sensors
входы/выходы		Допустимые условия среды	
Цифровые входы DI	I _{out_source} макс: 1 mA V _{out} макс: 18 V при R _{Load} = ∞ (при режиме настройки)	Рабочая температура	0...55 °C
Выходы напряжения АО ²⁾	0/2...10V, 1mA макс / V _{out} макс: 11.5 V настраиваемый, зав. настр. 2...10 V	Хранение и транспортировка	-20...70 °C
Ошибка линейности макс.	1.5% по отношению к диапазону например: (2...10 V = 8 V).	Влажность	< 85% rh без конденсации
Общая ошибка	2.5% (нелинейность, гистерезис, офсет, усиление; по отношению к рабочему диапазону)		
Влияние температуры	< 0.04 %/K		
Активный дрейф	< 20 mV / при включении питания		
Выход аларма DO	I _{sink} макс: 2 mA Выход открытого коллектора 100 mV при I _{sink} 2 mA		
		Интерфейсы, связь	
		RS-485 электрически изолированы	не 115 kBaud
		Протокол	SAUTER Local Communication (SLC)
		Метод доступа	Master/slave
		Топология	Линейная
		Количество абонентов	31/32 ⁴⁾
		Длина кабеля без шинного окончания	до 200 м, Ø 0.5 mm
		Тип кабеля	витая пара ⁵⁾
		SLC-RS485/D+ (A)	5V, 5 mA макс
		SLC-RS485/D- (B)	5V, 5 mA макс



T11063

V_{in} макс: 24 V= +20% при $I_{sink} = 0$ mA

Техническая информация (продолжение)
Стандарты, директивы

Степень защиты	IP 10 (EN 60529)
Класс защиты	III (EN 60730)

Дополнительная информация

Размерный чертёж	M11457
Схема подключения	A10650
Инструкция по монтажу	MV 505452
Декларация материалов	MD 37.100

- 1) Заводская настройка: бипер включен
- 2) Защита от короткого замыкания и перенапряжения до 24 V~
- 3) Постоянная времени фильтра может быть добавлена
- 4) Один абонент, всегда параметризирующий инструмент, следовательно, максимальное количество подключаемых устройств 31
- 5) Рекомендуемый: Belden 3106A

Аксессуары

Тип	Описание
0520450010	PC – USB набор соединителей, включая программу CASE Tools

General functional description

The travel distance (i.e. the opening of the sash) creates a force on a spring converter. The resultant spring movement is converted into an electrical signal by an inductive distance sensor. The signal from the opening of the sash is fed as a command variable via the monitoring unit to the return-air volume controller for fume cupboards. Within seconds, the air volume is regulated in proportion to the opening of the sash. This helps to prevent toxic gases from escaping from the fume cupboards. The output signal is adjustable over the range and linear with respect to the path. The correct direction of travel is assigned automatically through the teach-in function.

Pin assignment

Connection	Colour coding	Function
LV	Brown	24 V~/=
MM	Blue	GND
DO	Black	Sash excess travel alarm Open collector signal
D+	Orange	SLC-RS485/D+ (A)
D-	Yellow	SLC-RS485/D- (B)
DI	Red	DI, external button
AO	Green	0/2...10 V voltage output

RS485-SLC interface function

SGU100 is equipped with an RS485 interface that is not electrically isolated. The baud rate is 115.2 kbps; this is a fixed setting. The SAUTER Local Communication (SLC) protocol specifies the master-slave bus access procedure, with a maximum of 31 devices permitted in one network segment.

Note

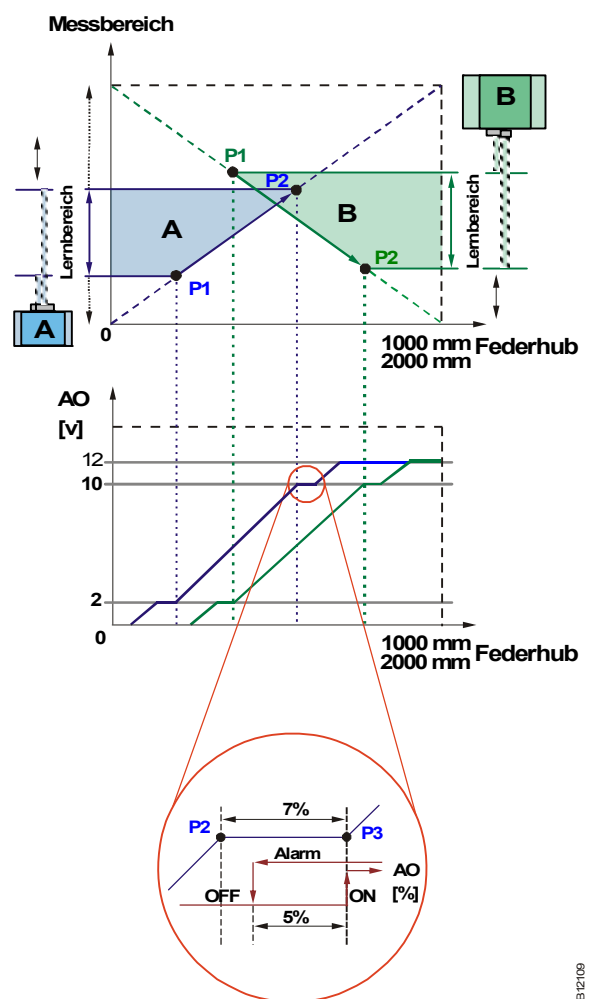
All bus subscribers must be on the same potential.

The SAUTER Tools software is used to parameterise each individual device and to configure the devices within the network segment. Physical access to the bus system is gained via separate leads at the end of the cable.

For further information, consult the fitting instructions P100006869.

CE conformity

EMC Directive 2004/108/EC
EN 61000-6-1
EN 61000-6-2
EN 61000-6-3
EN 61000-6-4

Functional diagram

Key

Pos.	Description
P1	Start position
P2	Nominal position
P3	Triggering position for excess travel alarm
A	Direction of travel of measuring spring: increase in length of spring corresponds to opening of sash
B	Direction of travel of measuring spring: increase in length of spring corresponds to closing of sash

Indication: flashing and acoustic patterns

The various operating states are indicated by visual and acoustic signals. Acoustic signals can be deactivated using SAUTER CASE Sensors.

Function		LED			Buzzer		
		Colour	Duration (s)	Interval ON/OFF (s)/(s)		Duration ¹⁾ (s)	Interval ON/OFF (s)/(s)
1.	Power supply over minimum value; SGU status: ready	Green	–	0.1/1.9	OFF	–	0.1/1.9
2.	Power supply present but below minimum value (factory adjustment)	Orange	–	0.1/1.9	OFF	–	0.1/1.9
4.	Teach-in phase, sash closed. Measurement of start position, P1	Orange	10	0.5/0.5	ON	10	0.5/0.5
5.	Teach-in phase, change of position	Orange	< 60	ON	ON	< 60	ON
6.	Teach-in phase, sash open; measurement of nominal position, P2	Orange	10	0.25/0.25	ON	10	0.25/0.25
7.	Teach-in phase, completed successfully	Green	3	ON	ON	3	ON
8.	Teach-in phase not completed correctly	Red	3	0.1/0.1	ON	3	ON
9.	No valid teach-in values available	Orange	–	ON	ON	4 per 60	0.5/0.5
10.	Measuring error	Red	–	ON	ON	10 per 300	0.1/0.1
11.	Temporary SLC operating mode (SAUTER CASE Sensors; temporary manual operation)	Alternating red - green	20 ²⁾	0.5/0.5	ON	20	0.1/1.9

1) Can be disabled via SAUTER CASE Sensors

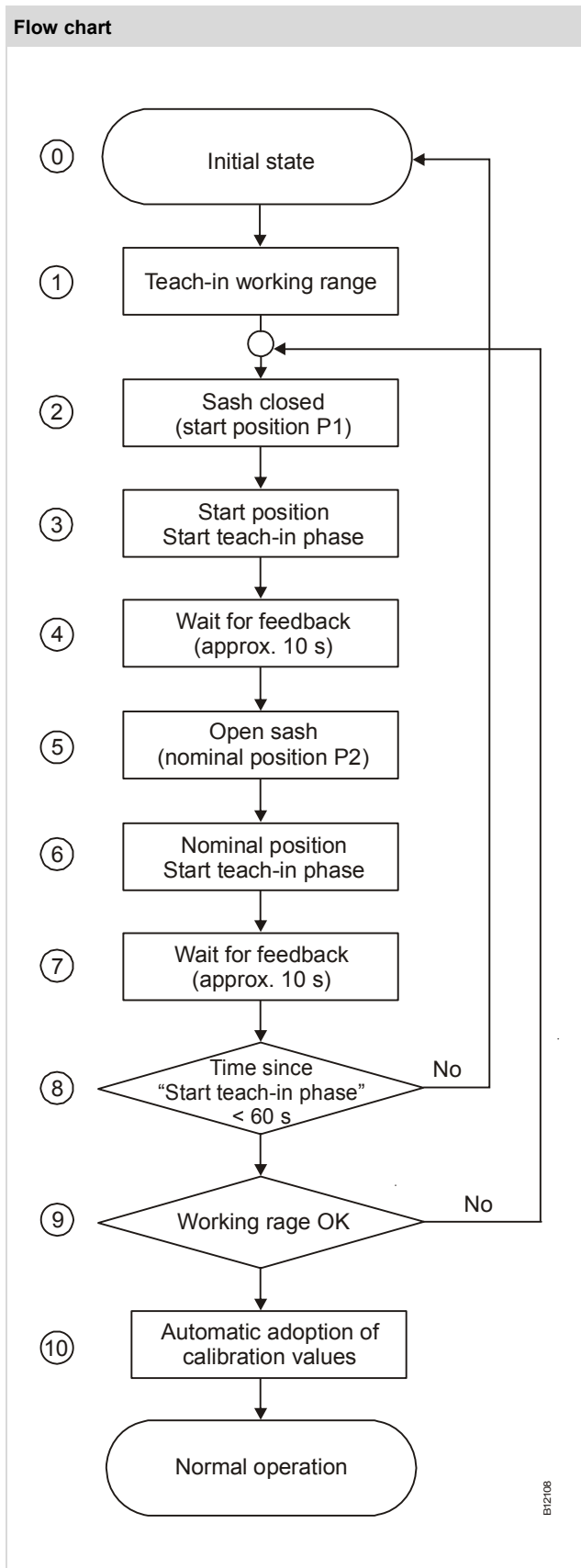
2) Switches automatically to normal mode after 20 s.

Adjusting the working range (teach-in)

Note

Do not operate the sash during the adjustment of start and nominal position.

Flow chart



Explanation of process steps

Pos.	Activities, points to note	Indication ¹⁾	
		LED ²⁾	Buzzer ³⁾
0	First adjustment	Orange	pro min 4 s: 0.5/0.5 s ON/OFF
	Adjustment/Service	Green 0.1/2 s ON/OFF	
1	Start	cf. position "0"	cf. pos. "0"
2	Check position of sash		
3	Operate internal or external button, or start <i>teach-in position</i> via SAUTER CASE Sensors	Orange, 0.5/0.5 s ON/OFF	0.5/0.5 s ON/OFF
4	Wait for signal to change	Orange, ON	ON
5	Move sash to desired/specified nominal position	Orange, ON	ON
6	Operate internal or external button, or start <i>teach-in position</i> via SAUTER CASE Sensors	Orange, 0.25/0.25 s ON/OFF	0.25/0.25 s ON/OFF
7	Wait for signal to change	If OK: green 3 s ON	If OK: 3 s ON
8	Test is performed automatically; if the test criterion is not met, the initial state is restored automatically. The teach-in phase must be started again.	Not OK: red 0.1/0.1 s ON/OFF followed by orange state (no valid teach-in values)	Not OK: 3 s long 0.1/0.1 s ON/OFF
9	Test is performed automatically; if data are not transferred, check the spring installation and working range.	Not OK: red 0.1/0.1 s ON/OFF followed by orange state (no valid teach-in values)	Not OK: for 3 s 0.1/0.1 s ON/OFF
10	Ready to operate	Green 0.1/2 s ON/OFF	

1) A measuring error is signalled as follows: LED red (permanent), buzzer every 300 s for 10 s 0.5/0.5 s ON/OFF

2) Condition: power supply in the permissible range, LED flashes every 2 s for 0.1 s.

3) Buzzer is active as the default; can be disabled via SLC.

Engineering and fitting notes

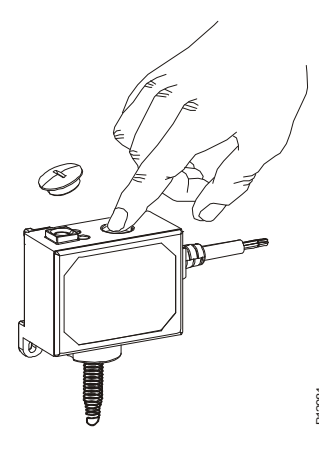
The sash sensor can be fitted in any position (including upside-down). For reasons of personnel safety, the condition of the sensor ex works is 2...10 V. This ensures safe operation of the ASV115CF152 using the standard configuration when the sash is closed (minimum air volume V_{min}).

If the travel sensor is configured with 0...10 V and if the "logical state" LOW Voltage in the ASV115 is assigned to the Damper CLOSED function, the damper will close and the air volume will fall to zero. The fume cupboard is, therefore, in an unsafe state.

If the minimum volume flow V_{min} is greater than 20%, it is recommendable to set the output to "freely configurable" and to parameterise the output voltage in accordance with air volume specifications.

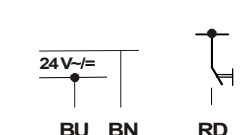
Teaching-in options

Internal manual teach-in button



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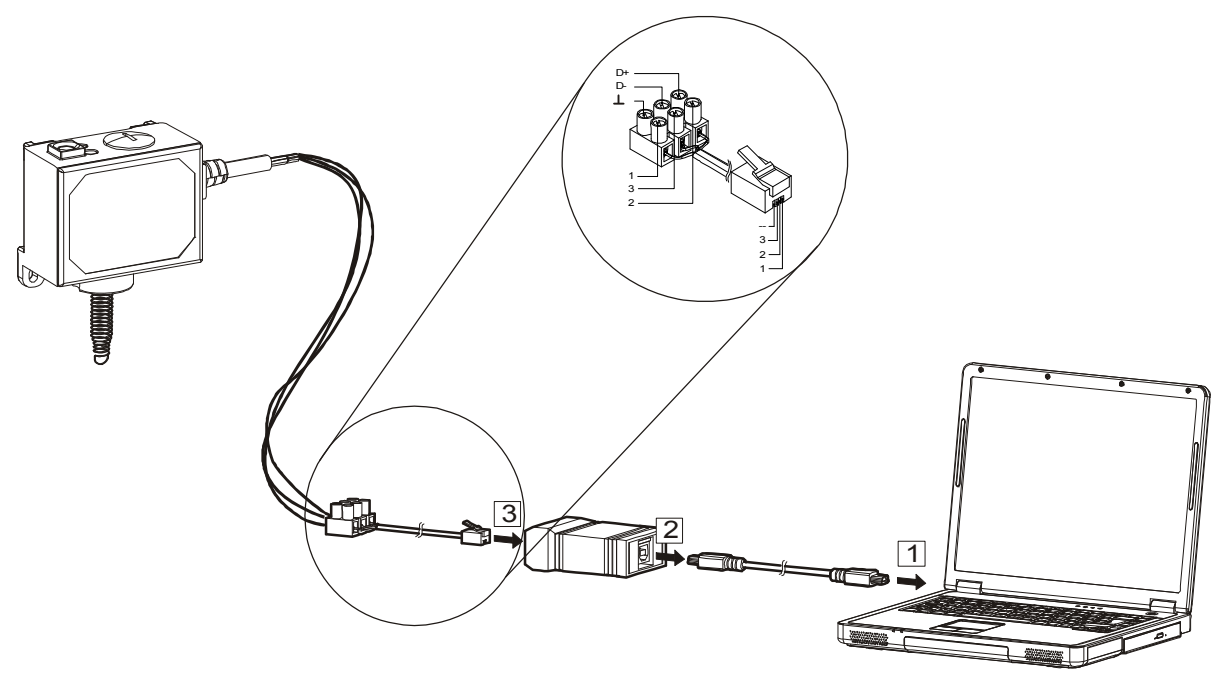
External button



	24 V	AO	DI	D-	D+	DO
MM	LS	01	02	03	04	05
SGU100				RS-485		

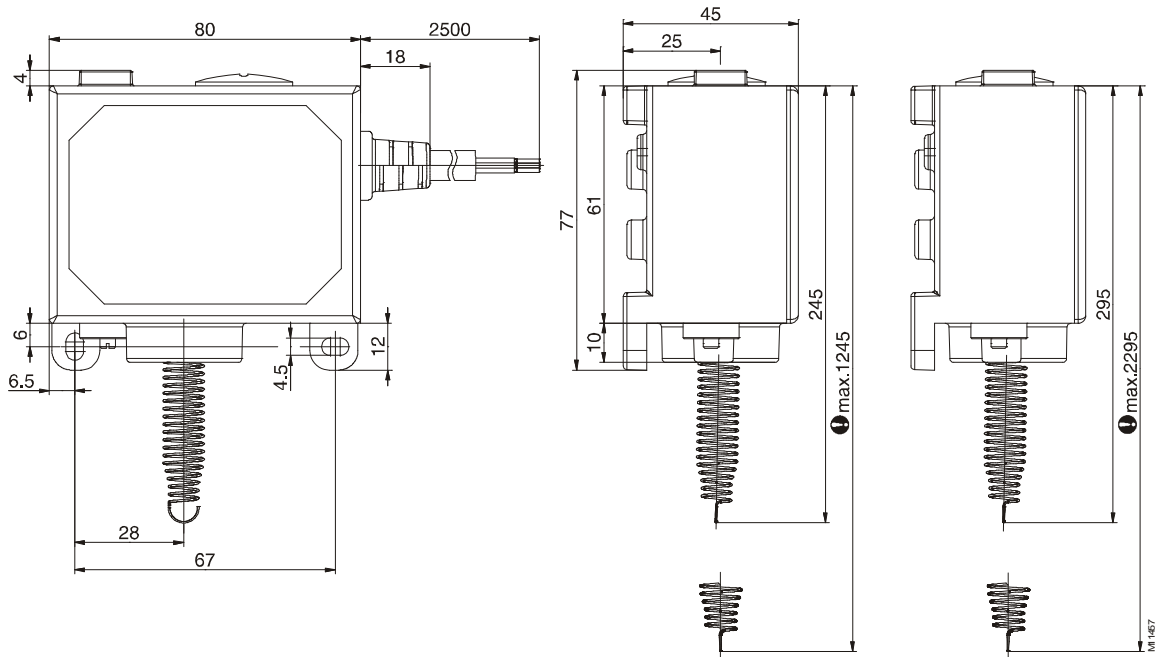
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SAUTER CASE Sensors

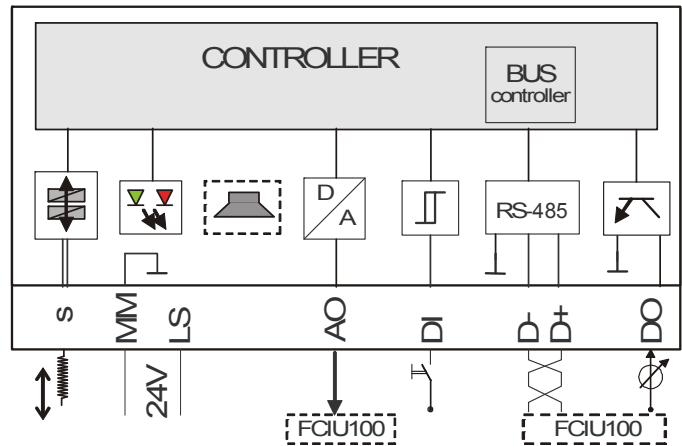


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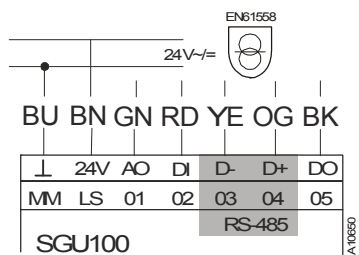
Dimension drawing



Block diagram



Wiring diagram



BU	BN	GN	RD	YE	floor	BK
Blue	Brown	Green	Red	Yellow	Orange	Black
Blue	Brown	Green	Red	Yellow	Orange	Black
Bleu	Brun	Vert	Rouge	Jaune	Orange	Noir

Example of application

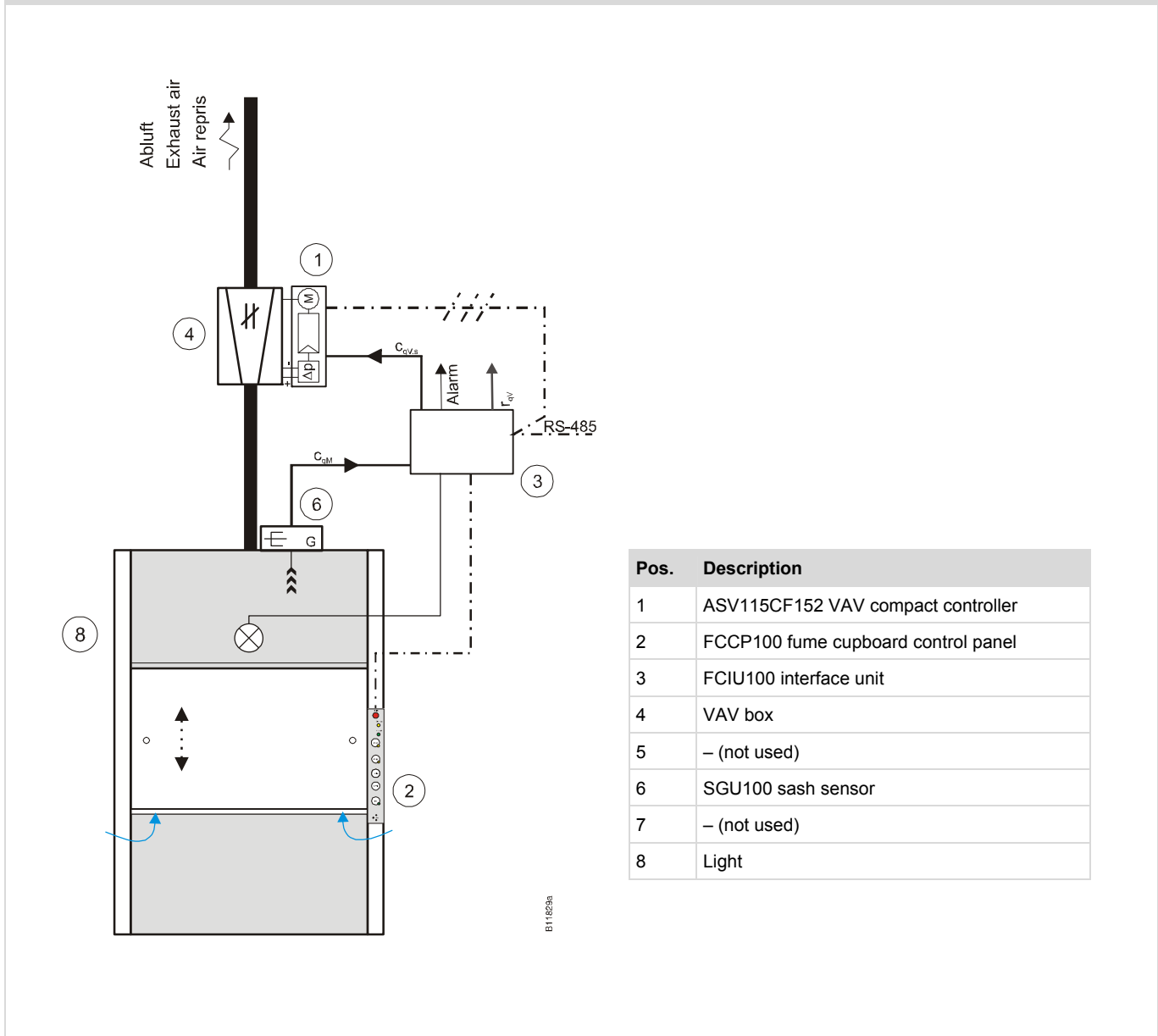
Exhaust-air volume control in proportion to the opening of the sash to the fume cupboard with an SGU100 sash sensor as a setpoint controller.

The capacity of fume cupboards to retain harmful substances in accordance with EN 14175 can be ensured by proportionally adjusting the air volume to the opening of the sash within seconds, i.e. the transient time of the air-volume controller must be very low. The SGU100 sash sensor detects the opening of the sash quickly and reliably and transmits the value as a $cqV.s$ command signal for the air-volume control loop to the ASV115 via the FCIU100 fume cupboard interface. The running time of the ASV115CF152 must be parameterised in the range from 3...5 s.

In accordance with the specified setpoint, the air volume is adjusted between the parameterised \dot{V}_{min} and \dot{V}_{max} values. The reaction times of the entire control loop during the opening and closing of the sash must comply with EN 14175. With a setpoint/actual-value deviation of $> 10\% V$ (adjustable on FCIU), a visual and acoustic alarm is triggered on the fume cupboard's control panel to indicate an unsafe state to the operator.

If the sash is opened beyond the nominal position (lock off), it will be detected by the SGU100 and an excess travel alarm (DO, Open Collector) will be triggered. A separate switch is no longer necessary. The neutral zone and switching hysteresis are shown in the functional diagram (see above) and relate to the working range.

Example of application



Pos.	Description
1	ASV115CF152 VAV compact controller
2	FCCP100 fume cupboard control panel
3	FCIU100 interface unit
4	VAV box
5	– (not used)
6	SGU100 sash sensor
7	– (not used)
8	Light