

Electromotive actuators for valves

SAV..P..



Actuators with 40 mm stroke and 1100 N force

- SAV31P00: Operating voltage AC 230 V, positioning signal 3-position
- SAV61P00: Operating voltage AC/DC 24 V, positioning signal 0...10 V, 4...20 mA, with position feedback, override control, characteristic changeover
- SAV61P00/MO: Operating voltage AC/DC 24 V, RS-485 for Modbus RTU communication
- SAV81P00: Operating voltage AC/DC 24 V, positioning signal 3-position
- For direct mounting on valves; no adjustments required
- Manual adjuster, position and status indication (LED)
- Optional functions with auxiliary switches, potentiometer

Use

Electromotive actuators to operate Siemens PICV (= pressure independent control valve) of the type series VPF43..., VPF44..., VPF53... and VPF54... with 40 mm stroke, as control valves on ventilation, air conditioning, district heating and refrigeration plants.

Functions

Function	Description	Type
3-position control	A 3-position signal controls the actuator via connection terminals Y1 or Y2. The desired position is transmitted to the valve.	SAV31P00 SAV81P00
Modulating control	The positioning signal range (DC 0...10 V / DC 4...20 mA / 0...1000 Ω) corresponds to the positioning range (closed...open, or 0...100 % stroke) in a linear manner.	SAV61P00
Positioning signal and characteristic changeover	Setting with DIL switch. Factory setting: - Characteristic curve: log = equal percentage (switch set to "OFF") - Positioning signal: DC 0...10 V (switch set to "OFF")	
Position feedback U	Signal returned to acquire the position via input.	
Calibration	Carry out during initial commissioning. The actuator drives to the top or bottom end position; the measured values are saved.	SAV61P00 SAV61P00/MO
Valve seat detection	The actuators have power-dependent seat detection. After calibration, the exact valve stroke is stored in the actuator's memory.	
Foreign body detection	After jamming is detected, three attempts are made to get past the jam. If unsuccessful, the actuator continues to follow the positioning signal only within a limited range, and the LED flashes red.	
Override control (Z-mode)	Override control bypasses automatic mode and is implemented via higher control.	
Modbus RTU (RS-485), not galvanically isolated	Setpoint 0...100 % valve position Actual value 0...100 % for valve position Override control Open / Closed / Min / Max / Stop Setpoint monitoring and backup mode	SAV61P00/MO

Type summary

Type	Stock no.	Stroke	Operating voltage	Positioning			Spring return function	LED	Manual adjustment	
				force	signal	time				
SAV31P00 ¹⁾	S55150-A121	40 mm	AC 230 V	1100 N	3-position	120 s	-	-	Push and fix	3)
SAV61P00 ²⁾	S55150-A119		AC 24 V / DC 24 V		DC ...10 V DC 4...20 mA 0...1000 Ω			yes		4), 6)
SAV61P00/MO ²⁾	S55150-A144				Modbus RTU					5)
SAV81P00 ²⁾	S55150-A120				3-position			-		3)

¹⁾ Approval: CE

²⁾ Approval: CE, UL

³⁾ Optional accessories: Auxiliary switch, potentiometer

⁴⁾ Position feedback, override control, characteristic changeover

⁵⁾ Position feedback, override control

⁶⁾ Optional accessories: Auxiliary switch, sequence control, control action changeover

Scope of delivery

Actuators, valves and accessories are supplied in individual packs.

Ordering example

Type	Stock no.	Designation	Quantity
SAV81P00	S55150-A120	Actuator	1
ASZ7.5	S55845-Z106	Potentiometer	1

Accessories / spare parts

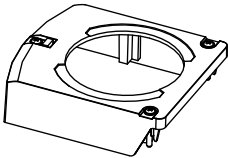
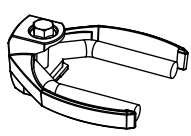
Electrical accessories

Type	Auxiliary switch ASC10.51	Potentiometer ASZ7.5/1000	Function module AZX61.1
Stock no.	S55845-Z103	S55845-Z106	S55845-Z107
	Max. 2 total		
SAV31P00	Max. 2	Max. 1	-
SAV61P00		-	Max. 1
SAV61P00/MO		-	
SAV81P00		Max. 1	-

Mechanical accessory

Type	Weather shield ASK39.1
Stock no.	S55845-Z109

Spare parts set

Type / Stock no.		
8000060843	Housing cover 	Screw (valve stem coupling) 
		U-bracket 

Equipment combinations

Valve type			DN	H ₁₀₀	Ṃ _{min}	Ṃ ₁₀₀	Δp _{min}	Data sheet
				[mm]	[m ³ /h]		[kPa]	
Standard flow	VPF44.100F70	S55266-V106	100	40	12.2	69.6	33	A6V14362310
	VPF54.100F70	S55266-V118						
	VPF44.125F110	S55266-V108	125	40	15	112	30	
	VPF54.125F110	S55266-V120						
	VPF44.150F160	S55266-V110	150	43	19	150		
	VPF54.150F160	S55266-V122						
	VPF43.200F210	S55266-V148	200	43	95	210	32	
	VPF53.200F210	S55266-V150						
High flow rate	VPF44.100F90	S55266-V107	100	40	14.8	90.9	45	A6V14362310
	VPF54.100F90	S55266-V119						
	VPF44.125F135	S55266-V109	125	40	18	132		
	VPF54.125F135	S55266-V121						
	VPF44.150F200	S55266-V111	150	43	26	208	50	
	VPF54.150F200	S55266-V123						
	VPF43.200F280	S55266-V149	200	43	130	280	78	
	VPF53.200F280	S55266-V151						

Title	Content	Document ID
Actuators SAX..., SAY..., SAV..., SAL... for valves	Basic documentation: Detailed information on valve actuators, including Modbus types Stroke actuators for valves with 15/20/40 mm stroke and rotary actuators for butterfly valves	CE1P4040en
Electromotive actuators for valves SA..., Modbus RTU	Datasheet: Modbus communication profiles	A6V101037195
Mounting instructions G..161../MO and S..6/MO	Mounting instructions: Mounting and installation instructions for Modbus actuators	A5W00027551
Valve Actuator DIL Switch Characteristic Overview	Commissioning / configuration: Illustration/description of the characteristics of the valve and actuator combination, depending on the DIL switch setting	A6V12050595
PICV PN16/PN25 with flanged connections	Data sheet: Product description of the PICVs VPF43../VPF44.. (PN16) and VPF53../VPF54.. (PN25)	A6V14362310

Related documents such as the environmental declarations, declarations of conformity, etc., can be downloaded from the following Internet address:

www.siemens.com/bt/download

Notes

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.

WARNING



Risk of burns from hot actuator brackets

The actuator brackets on heating plants can also become hot from the contact with the hot valve during operation. The temperature of the actuator bracket can reach 100 °C.

When servicing the actuator:

- Switch off both pump and operating voltage.
- Close the main shutoff valve in the piping.
- Allow the piping to cool off.

SAV31P00 / SAV81P00

3-position actuators must be controlled by a controller, see "Internal diagrams [► 15]".

SAV61P00

Up to 10 actuators can drive in parallel on a controller output with a rating of 1 mA. Modulating actuators have an input impedance of 100 kΩ.

SAV61P00/MO

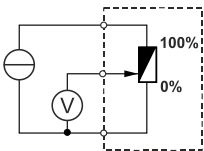
The Modbus converter is designed for analog control at 0...10 V.



Keep the analog signal setting on the Modbus actuator as is (switch 1 to "OFF"). Adjustment is not permitted.

ASZ7.5

Actuators with a DC 0...9.8 V feedback signal are recommended for the combination SIMATIC S5/S7 and position feedback.



Signal peaks in potentiometer ASZ7.5 may result in error messages on Siemens SIMATIC. This is not the cause, however, when combined with Siemens HVAC controllers. The reason is the higher resolution and faster reaction time on SIMATIC.

Use the potentiometer as voltage divider on the 3-wire connection. Powering the potentiometer over the wiper may shorten the life cycle of the potentiometer. Signal peaks increase in frequency and scope over the lifespan in this operating mode.

Mounting

Mounting positions	
Indoor application	Outdoor application ^{1) 2)}

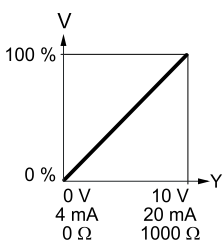
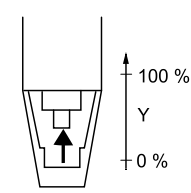
¹⁾ Requires weather shield ASK39.1. Housing protection class remains IP 54.

²⁾ SAV61P00/MO is not intended for outdoor use.

Operation

Direction of control action

On valves where the stem fully retracts to the closed position, "direct acting" means that the actuator stem is fully extended at positioning signal $Y = 0\text{ V}$ or $Z = 0\ \Omega$ (i.e. 0 %).

		Direct acting	
			
		Pos. signal Y	DC 0...10 V, 4...20 mA
		Pos. signal Z	0...1000 Ω
Y, Z	Positioning signal		
V	Volume flow		
	Control action: direct acting		

Maintenance

The actuators are maintenance-free.

Disposal

	This symbol or any other national label indicate that the product, its packaging, and, where applicable, any batteries may not be disposed of as domestic waste. Delete all personal data and dispose of the item(s) at separate collection and recycling facilities in accordance with local and national legislation. For additional details, refer to Siemens information on disposal.
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Warranty service

The application-specific technical data is guaranteed only in combination with the Siemens products listed in the 'Device combinations' section. If third-party products are used, any guarantee provided by Siemens will be invalidated.

Power supply			
Operating voltage		SAV31P00	AC 230 V (±15 %)
		SAV61P00..	AC 24 V (±20 %) / DC 24 V (+20 % / -15 %) (SELV / PELV)
		SAV81P00	
Frequency			45...65 Hz
External supply line fusing (EU)			• Slow-blow fuse 6...10 A • Circuit breaker max. 13 A, tripping characteristic B, C, D as per EN 60898 • Power source with current limitation of max. 10 A
Power consumption at 50 Hz	SAV31P00	Running	7.1 VA / 4.0 W
		Holding	2.3 VA / 1.3 W
	SAV61P00	Running	8.4 VA / 3.5 W
		Holding	4.5 VA / 1.3 W
	SAV61P00/MO	Running	9.1 VA / 4.0 W
		Holding	5.9 VA / 2.2 W
	SAV81P00	Running	5.9 VA / 3.4 W
		Holding	2.7 VA / 1.5 W
Typical in-rush current ¹⁾ (3-position actuators)		SAV31P00	2,3 A
		SAV81P00	4,5 A

Functional Data		
Positioning time for nominal stroke		120 s
Positioning force		1100 N
Nominal stroke	on VPF..., DN100...125	40 mm
	on VPF..., DN150...200	43 mm
Permissible medium temperature (valve fitted)		1...120 °C

Signal inputs			
Positioning signal Y			
	SAV31P00, SAV81P00		3-position
	SAV31P00	Voltage	AC 230 V (±15 %)
	SAV81P00		AC 24 V (±20 %) / DC 24 V (+20 % / -15 %)
	SAV61P00		
	DC 0...10 V	Power consumption	≤ 0.1 mA
		Input impedance	≥ 100 kΩ
	DC 4...20 mA	Power consumption	DC 4...20 mA (±1 %)
		Input impedance	≤ 500 Ω

Parallel connection	
SAV61P00	≤ 10 (depending on controller output)

Override control SAV61P00		
Positioning signal Z		R = 0...1000 Ω, G, G0
	R = 0...1000 Ω	Stroke proportional to R
	Z connected to G	Max. stroke 100 % ²⁾
	Z connected to G0	Min. stroke 0 % ²⁾
	Voltage	Max. AC 24 V (±20 %)
		Max. DC 24 V (+20 % / -15 %)
	Power consumption	≤ 0.1 mA

Position feedback SAV61P00		
Position feedback U	Voltage range	DC 0...10 V
	Load impedance	> 10 kΩ resistive
	Load	Max. 1 mA

Communication SAV61P00/MO		
Communication protocol	Modbus RTU	RS-485, not galvanically isolated
	Number of nodes	Max. 32
	Address range	1...245 / 255
	Factory setting	255
	Transmission formats	1-8-E-1 / 1-8-O-1 / 1-8-N-1 / 1-8-N-2
	Factory setting	1-8-E-1
	Baud rates (kbaud)	Auto / 9.6 / 19.2 / 38.4 / 57.6 / 76.8 / 115.2
	Factory setting	Auto
	Bus termination	120 Ω electronically switchable
	Factory setting	Off

Connection cables		
Wire cross-sectional area		0.75...1.5 mm ² , AWG 20...16 ³⁾
Cable entries	SAV..P..	2 entries Ø 20.5 mm (for M20) 1 entry Ø 25.5 mm (for M25)
	SAV61P00/MO	Fixed connection cable 0.9 m
		Number of wires 5 x 0.75 mm ²

Degree and class of protection		
Housing protection, upright to horizontal		IP 54 as per EN 60529 ⁴⁾
Protection class		As per EN 60730
	SAV31P00, AC 230 V	II
	SAV61P00..., AC/DC 24 V	III
	SAV81P00, AC/DC 24 V	

Environmental conditions		
Operation		As per IEC 60721-3-3 (1994)
	Climatic conditions	Class 3K5
	Mounting location	Indoors, weather-protected ⁴⁾
	Temperature general	-5...55 °C
	Humidity (non-condensing)	5...95 % r.h.
Transport		As per IEC 60721-3-2 (1994)
	Climatic conditions	Class 2K3
	Temperature	-25...70 °C
	Humidity	< 95 % r.h.
Storage		IEC 60721-3-1 (1994)
	Climatic conditions	Class 1K3
	Temperature	-15...55 °C
	Humidity	5...95 % r.h.
Max. medium temperature at fitted valve		120 °C

Directives and Standards		
Product standard		EN 60730-x
Electromagnetic compatibility (field of use)		For residential, commercial and industrial environments
EU conformity (CE)		8000078918 (CE1T4503xx) ⁵⁾
UK conformity (UKCA)		A5W00197822A ⁵⁾
RCM conformity	AC 230 V	8000078495 ⁵⁾
EAC compliance		Eurasian compliance for all SAV..P..
UL, cUL	AC 230 V	-
	AC/DC 24 V	UL 873 http://ul.com/database ; File no. E35198

Environmental compatibility
The product environmental declarations 7173310522 (actuators) ⁵⁾ and A5W00030126 (Modbus adapter) ⁵⁾ contain data on environmentally compatible product design and assessments (RoHS compliance, materials composition, packaging, environmental benefit, disposal).

Dimensions

See "Dimensions [► 17]"

Accessories ⁶⁾

Potentiometer ASZ7.5/1000		0...1000 $\Omega \pm 5\%$
	Voltage	DC 10 V
	Current rating	<4 mA
Auxiliary switch ASC10.51	Switching capacity	AC 24...230 V, 6 (2) A, potential free
External supply line fusing		• Slow-blow fuse 6...10 A • Circuit breaker max. 13 A, tripping characteristic B, C, D as per EN 60898 • Power source with current limitation of max. 10 A
US installation, UL & cUL		AC 24 V class 2, 5 A general purpose

¹⁾ Switching time for RMS value of the sine wave at nominal voltage

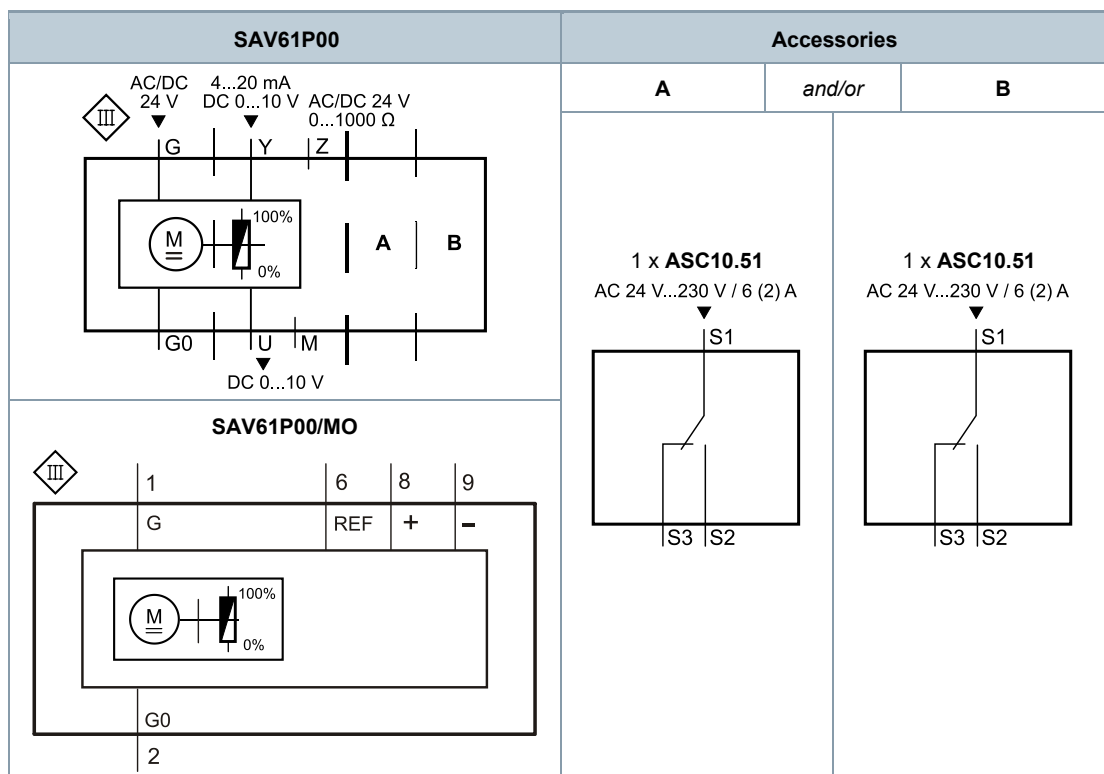
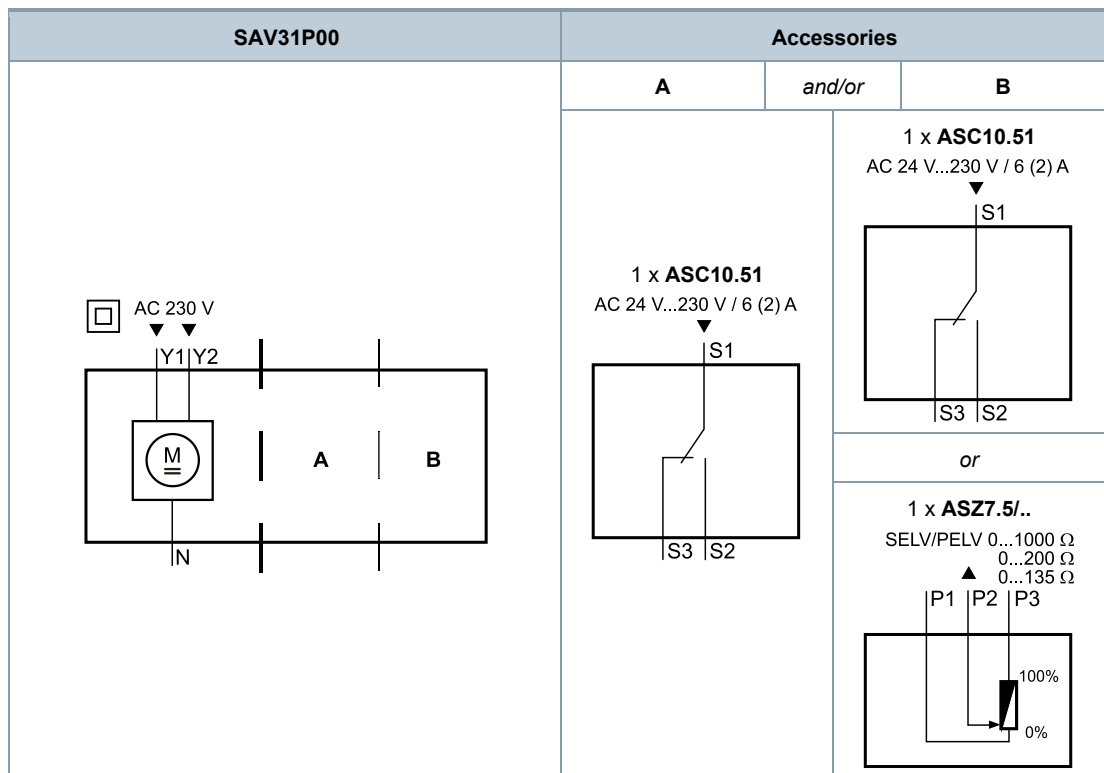
²⁾ Observe acting direction of DIL switches

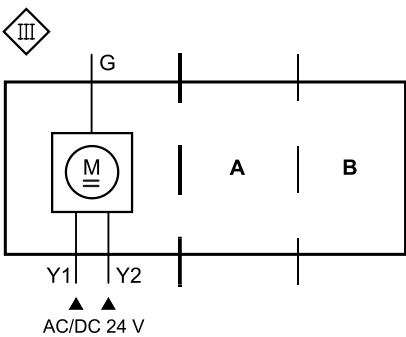
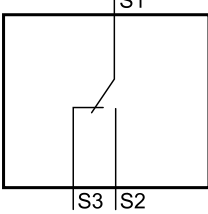
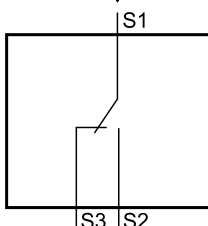
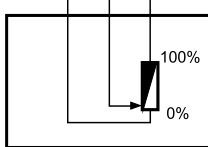
³⁾ AWG = American wire gauge

⁴⁾ For outdoor use, always use weather shield ASK39.1, housing protection IP 54 remains as is. SAV61P00/MO is not intended for outdoor use.
See also "Mounting [► 6]".

⁵⁾ Documents can be downloaded at <https://www.siemens.com/bt/download>.

⁶⁾ UL-approved component 



SAV81P00		Accessories		
		A	and/or	B
		1 x ASC10.51 AC 24 V...230 V / 6 (2) A 		
		1 x ASC10.51 AC 24 V...230 V / 6 (2) A 		
		or 1 x ASZ7.5/.. SELV/PELV 0...1000 Ω 0...200 Ω 0...135 Ω 		

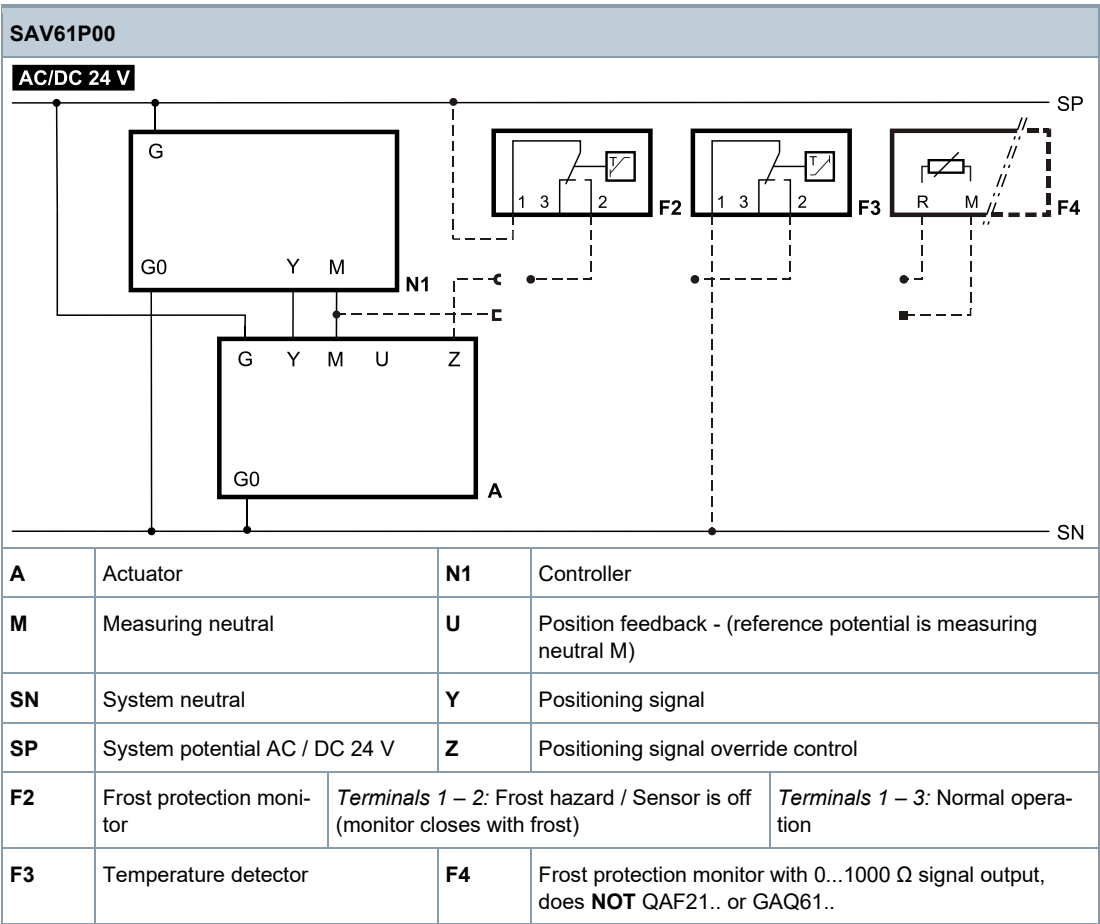
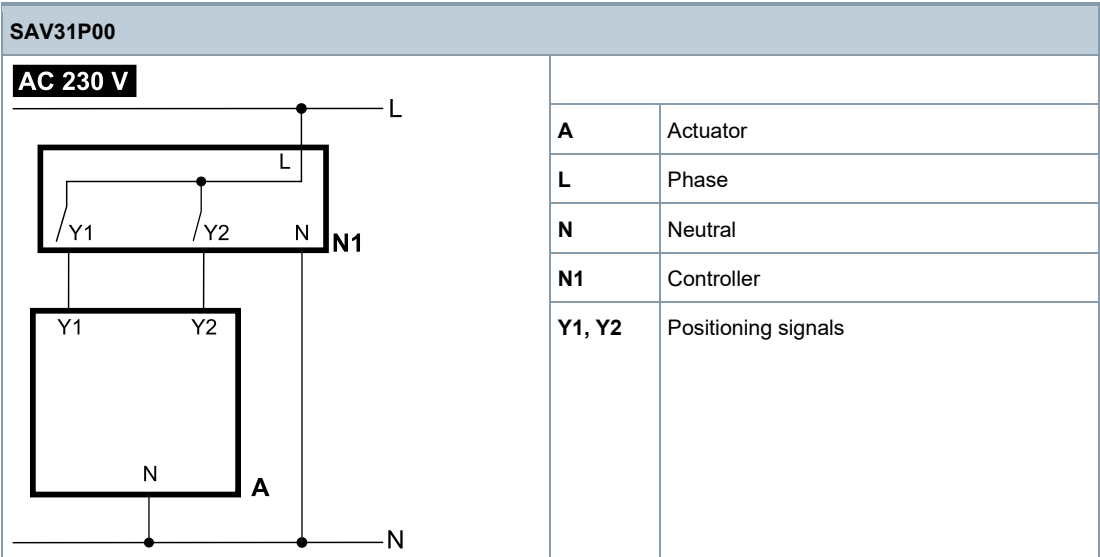
Connection terminals

SAV31P00	AC 230 V	3-position
N	System neutral (SN)	
Y1	Positioning signal (actuator stem extends)	
Y2	Positioning signal (actuator stem retracts)	

SAV61P00	AC / DC 24 V	DC 0...10 V / 4...20 mA / 0...1000 Ω
G0	System neutral (SN)	
G	System potential (SP)	
Y	Positioning signal for DC 0...10 V / 4...20 mA	
M	Measuring neutral	
U	Position feedback DC 0...10 V - (reference potential is measuring neutral M)	
Z	Control signal override control	

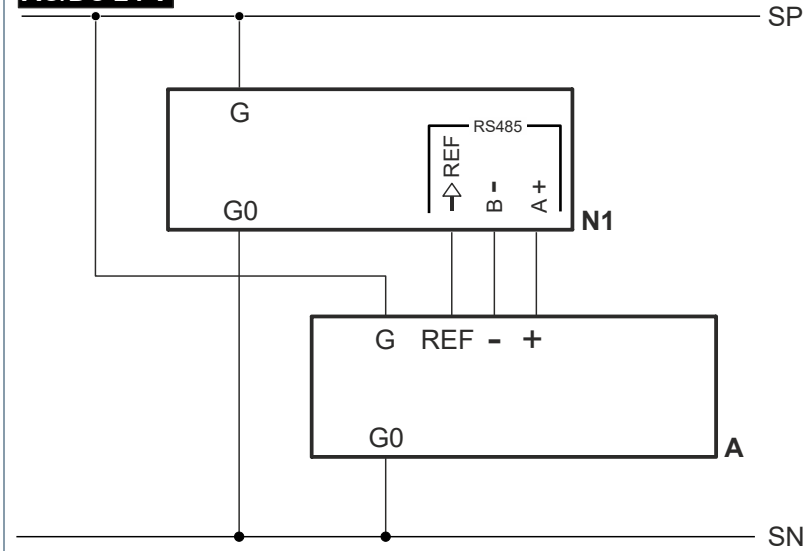
SAV61P00/MO	AC / DC 24 V	Modbus RTU connection cable
G0	System neutral (SN)	black
G	System potential (SP) AC 24 V / DC 24 V	red
REF	Reference line (Modbus RTU)	purple
+	Bus + (Modbus RTU)	gray
-	Bus - (Modbus RTU)	pink

SAV81P00	AC / DC 24 V	3-position
G	System potential (SP)	
Y1	Positioning signal (actuator stem extends)	
Y2	Positioning signal (actuator stem retracts)	



SAV61P00/MO

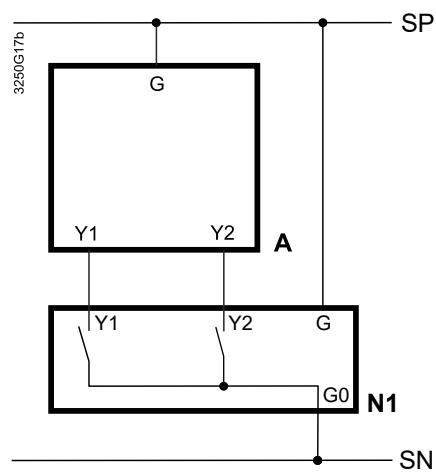
AC/DC 24 V



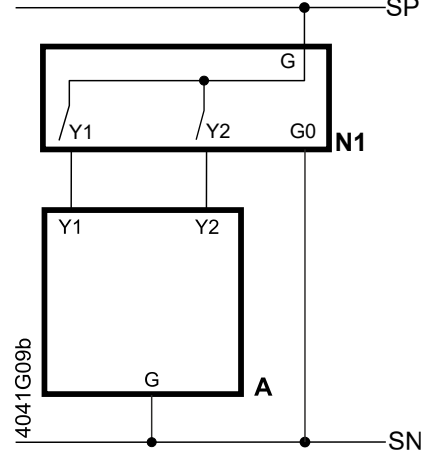
A	Actuator	REF	Reference line (Modbus RTU)
N1	Controller	+	Bus + (Modbus RTU)
SP / G	System potential AC / DC 24 V	-	Bus - (Modbus RTU)
SN / G0	System neutral		

SAV81P00

AC 24 V

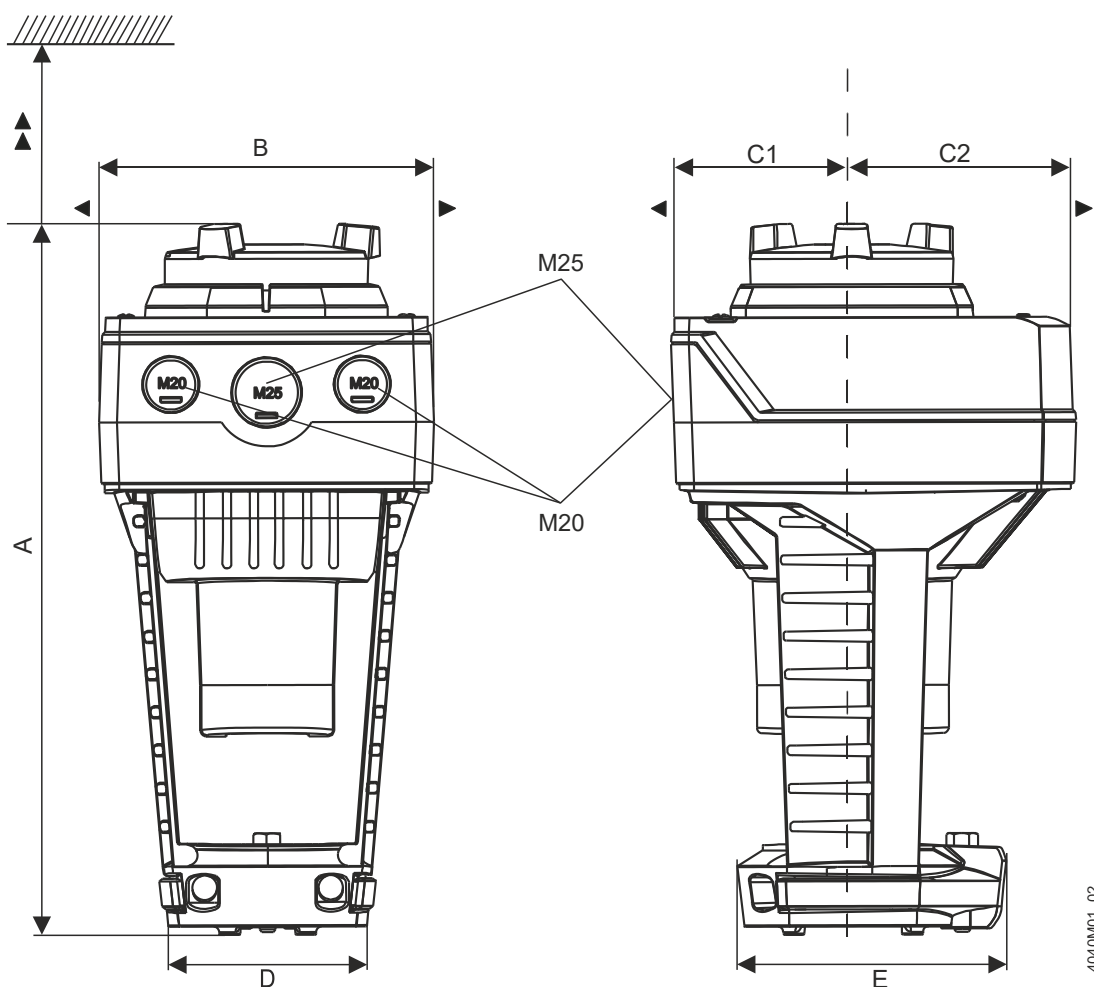


AC/DC 24 V



A	Actuator	SN	System neutral
N1	Controller	SP	System potential
Y1, Y2	Positioning signals		

Actuator

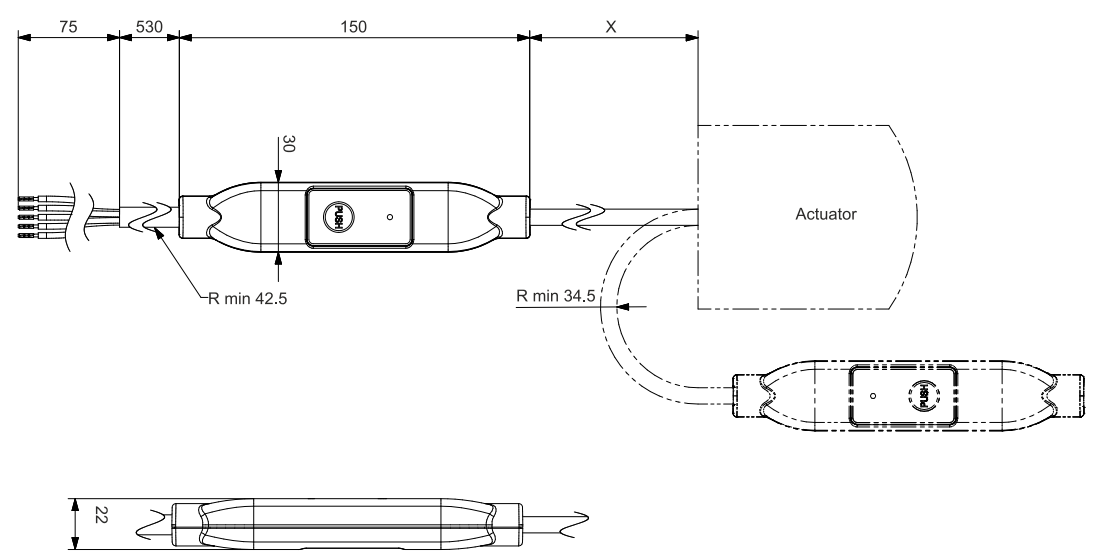


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Type	A	B	C	C1	C2	D	E	▶	▶▶	
	[mm]									[kg]
SAV..P..	265	124	150	68	82	80	100	100	200	1.92
SAV61P00/MO ¹⁾										2.07
With ASK39.1	590	154	300	200	100	-				+ 0.23

¹⁾ Device has fixed connection cable – left cable entry occupied

External Modbus converter



Dimensions in mm

Type	X	
	[mm]	[kg]
SAV61P00/MO	250	0.15 ¹⁾

¹⁾ Included in total weight.

Revision numbers

Type	Valid from rev. no.
SAV31P00	..B
SAV61P00	..C
SAV61P00/MO	..B
SAV81P00	..C

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