

COMPACT SMART MODBUS ELECTRIC ACTUATOR

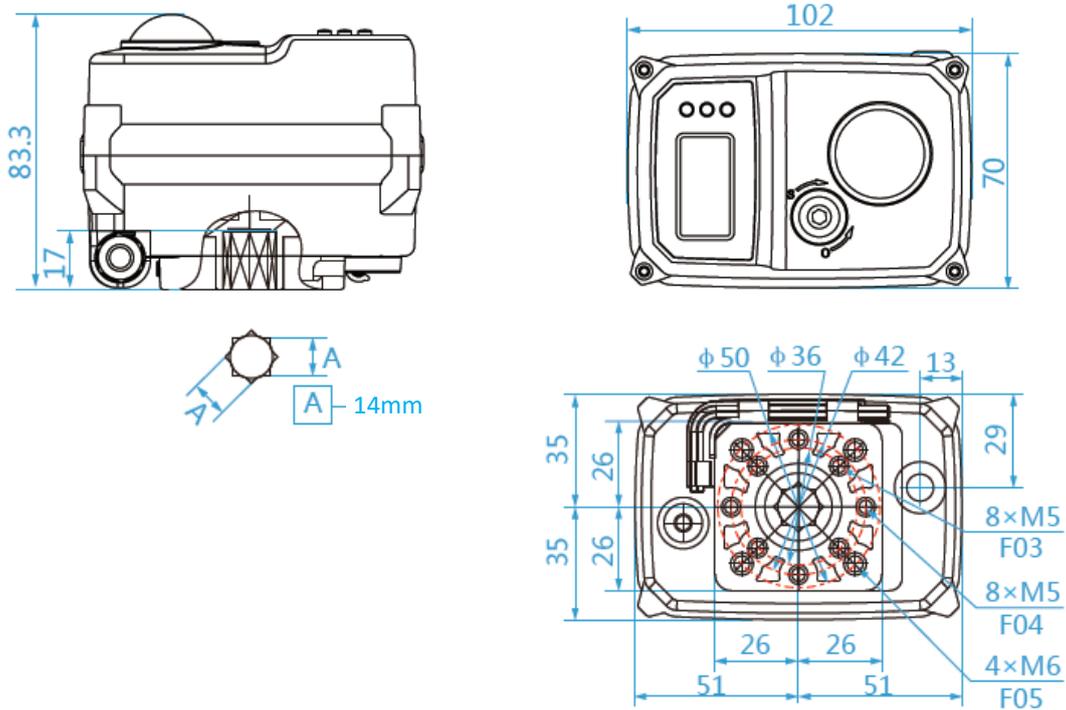
AVS-S20.31 SMART MODBUS ACTUATOR 20Nm



Model	AVS-S20.31 20Nm 24VAC/DC SMART MODBUS ACTUATOR	
Rated Voltage		Low voltage 24V AC/DC
Voltage Range		AC 15-24V 50/60Hz, DC18-30V
Consumption		15W run, 0.5W hold
Peak current		900mA (DC 24V) for 5ms
Fuse		5A
Control		RS485 MODBUS
Position feedback		Via bus
Maximum Break Torque Nm		20
Run & Reseat Torque Nm		15
Manual operation	Yes, by hexagonal wrench (supplied in clip) when no power is being applied	
Run time (90°)		~ 10 secs
STANDARD FEATURES:		
Operating frequency	Brushless motor with thermal override, continuous rated.	
Position sensing	Magnetic with digital sensing. No mechanical cams fitted. ($\pm 1\%$ Accuracy)	
Maximum angle of rotation	330° $\pm 5^\circ$ (Factory set 90° $\pm 2^\circ$)	
Position indication (visual)	2 colour (red/ yellow) dome for local visual confirmation	
End Position indication	2 x Electronic relay	
Mounting restriction	None, can be mounted at any angle. Leave room for space to operate manually, and for electrical connection	
ISO:5211	F03 & F05 (+ F04 which mounts at 45 degrees)	
Female drive	11mm octagon x 17mm deep	
Ingress protection	IP67, recommend cover provided if exposed to direct rain or sun	
Max media temp	$\leq 80C$	
Ambient temp	-20 to +60C (ABS) -20 to +80C (Aluminium)	
Non-operating temp	$\leq -40C$ to $\geq 80C$	
Ambient humidity	5-95% RH non-condensing	
Explosion proof	No, absolutely prohibited. Do not use in hazardous areas	
Shock Resistance	$\geq 300m/S^2$	
Vibration	10 to 55Hz, 1.5mm double amplitude (product damage most likely if exceeded)	
Noise level	Maximum around 50dB	
Flame Retardant Level	V0 using the UL94 Test method	
Certification	CE	
Maintenance	Maintenance free	
Cable Entry	Cable gland provides, actuator pre-wired with approx. 0.5m flying lead	
Housing	Plastic (ABS)	
Weight	With standard ABS housing 0.62kg (With optional aluminium housing 0.82kg)	

Dimensions

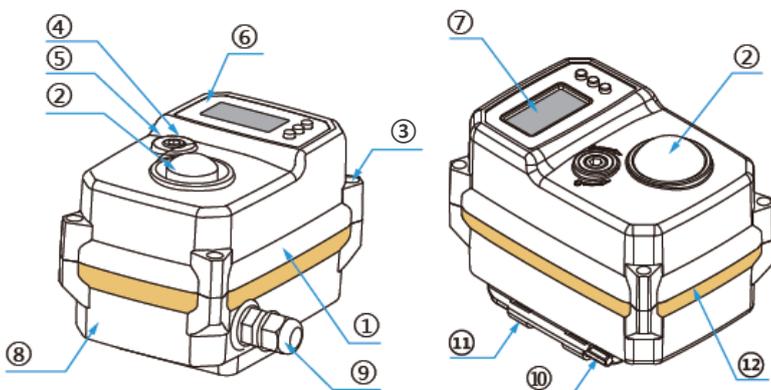
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Model	Voltage	Housing	Heater	Communication signal	Baud rate
AVS-S20.31-	1 AC 24V or	P Plastic (ABS)	O None	A RS485 - MODBUS	D Default 9600
	1 DC 24V	A Aluminium	H 5W/24kΩ		R Client request specify (range 1200-19200)
	Multi-voltage				

MATERIALS

AVS-S20.31 20Nm 24VAC/DC SMART MODBUS ACTUATOR



No	PART	MATERIAL
1	Housing	Aluminium base, ABS cover
2	Indicator	Clear plastic
3	Cover screws	304SS
4	Override drive	304SS
5	Seal	NBR
6	Screen cover	Rubber
7	Screen	OLED
8	ID Label	PVC
9	Connector	Plastic
10	Allen key	Tool steel
11	Allen key clip	ABS
12	Cover seal	NBR

RS485**AVA-S20.31 20Nm 24VAC/DC SMART MODBUS ACTUATOR**

RS-485 allows multiple devices (up to a maximum of 31) to communicate at half-duplex on a single pair of wires, plus a ground wire (more on that later), at distances up to 1200 meters (4000 feet). However, both the length of the network and the number of nodes can easily be extended using a variety of repeater products on the market.

Data is transmitted differentially on two wires twisted together, referred to as a "twisted pair." The properties of differential signals provide high noise immunity and long distance capabilities. In a "two-wire" network the transmitter and receiver of each device are connected to a twisted pair.

Devices are addressable, allowing each node/ receiver to be communicated to independently. Only one device can drive the line (bus) at a time, so drivers must be put into a high-impedance mode (tri-state) when they are not in use.

A consequence of tri-stating the drivers is a delay between the end of a transmission and when the driver is tri-stated. This turn-around delay is an important part of a two-wire network because during that time no other transmissions can occur. An ideal delay is the length of one character at the current baud rate (i.e. 1 ms at 9600 baud). The AVA factory default communication rate (baud) is 9600. If a specific setting in the RS485 range of 1200-19200 is required, it should be specified in any enquiry or order.

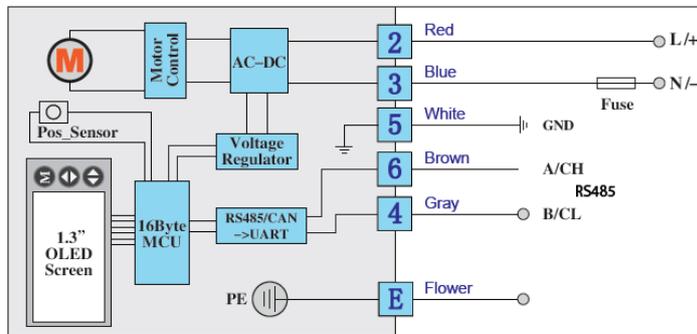
Two-wire 485 networks have the advantage of lower wiring costs and the ability for nodes to talk amongst themselves. Cables should be shielded. On the downside, two-wire mode is limited to half-duplex and requires attention to turn-around delay.

Protocols: Overview of Modbus

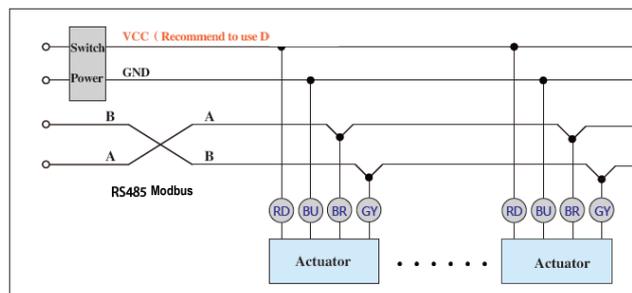
Modbus communication protocol defines a structure and message format transmitted between a master and a slave. The master can address individual slaves using their unique address, or 'broadcast' to them all. Slaves will only transmit to the network when asked to do so by the master, they will never transmit unsolicited messages. AVA actuators are slaves in a Modbus application.

The message format is a query-response. It has 4 fields, an address field, function field, data field and error check field. If a slave can't carry out the required action then an exception response (error message) will be returned by the slave to the master, confirming its address, the action requested and an indication of why it couldn't carry out the command.

AVA actuators are configured to be used on linear (or multi-drop) networks so a maximum of 31 actuators can be connected to a single master.

WIRING DIAGRAMS

RS485 Modbus

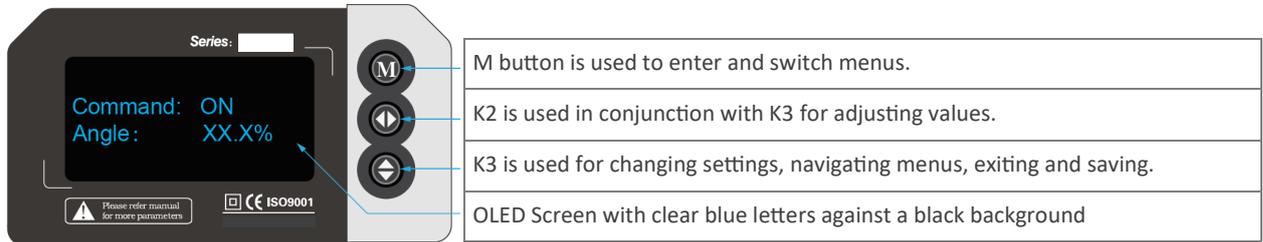


Recommended wiring of multiple AVA actuators on a bus/ network



Overview: All AVS smart electric actuators have local controls as standard which combine an OLED screen and 3 positive feel push buttons to create local control and a variety of user friendly adjustments. The bright screen with blue letters on a black background are easy to read, and the use of the push buttons to adjust settings is intuitive. The local controls require power to be applied to the actuator to operate.

Local controls:



Standard local control function options:

- MANUAL CONTROL** The AVS smart actuator can be opened and closed using the K2 and K3 buttons
- DEAD BAND** Adjusts the accuracy and sensitivity
- SPEED CONTROL** The working time can be increased either by setting a step timer (run/stop/run/stop), or continuous running adjusting the PWM
- CLOSED POSITION** Small adjustments can easily and quickly be made to the final close position angle (zero adjustment).
- REVERSE ACTING** Receiving an open command signal sends the AVAS smart actuator to the closed position and vice versa
- EXTEND ANGLE** Adjust the open position by adjusting the span. Typically used to set 0-180 degree operation

Example of screen display

Dead Zone Setting (DEADBAND)

The main function of the dead zone setting (in °degrees) is to adjust the accuracy and sensitivity.
 The smaller the setting, the more accurate and sensitive the response is, but too low a setting can cause system oscillation (hunting).

