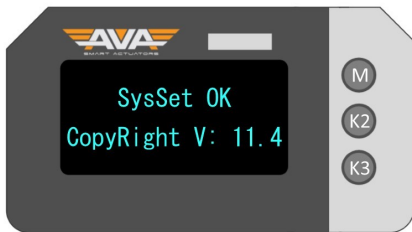


**The AVA Basic** is an entry level electric actuator designed where only minimal features are required for on-off applications. The basic version is constructed traditionally with internal cams striking micro-switches to stop the reversible motor in the required positions. The lower torque models are available failsafe using capacitors.

- Fully weatherproof to IP67
- Dome style local visual indicator
- Hand operation
- End of travel confirmation switches
- Female octagon drive output
- Multiple ISO5211 mountings
- Anti-condensation heater



## The AVA Smart

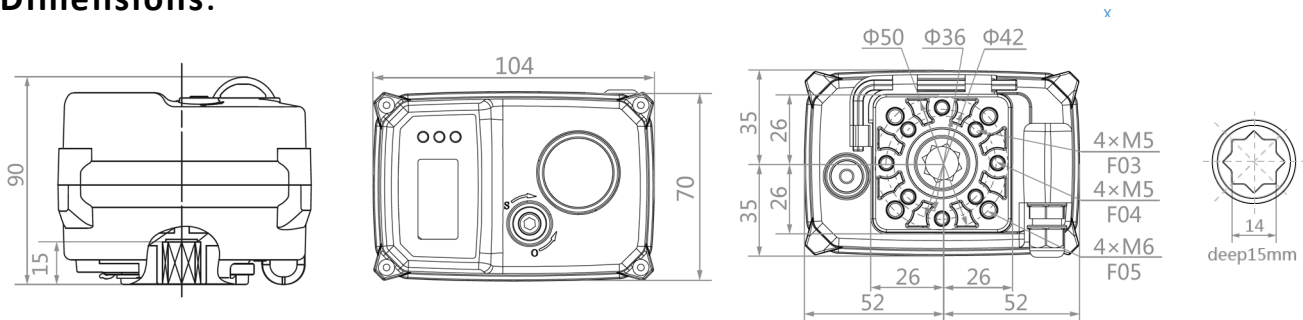
is a truly smart electric actuator designed to cover a wide range of functional applications, is fully electronic using digital magnetic positioning and entirely run by firmware. The smart version is recognisable by the introduction of a bright OLED screen and external push buttons that are used to set and adjust the AVA Smart actuator. Available in ON OFF, Modulating, Failsafe, Failsafe Modulating, Timer, Wireless and BUS. Standard features include:

- OLED Screen
- User friendly local button controls
- Brushless motors
- Anti-condensation heater
- Electronic torque limiter
- Many functional options



Standard Specifications 20Nm	B20 Basic	S20 Smart
Max Rated torque Nm output (in.lbs)	Run 20Nm (178) / 25Nm Break (221)	Run 20Nm (178) / 25Nm Break (221)
Voltage range	12VDC, 24VAC/DC, 95-265VAC	12VDC, 24VAC/DC, 95-265VAC
Mounting (ISO5211) x drive (female octagon)	F03/04/05 x 14mm	F03/04/05 x 14mm
Ingress Protection	IP67	IP67
Electrical connection	Pre Wired 0.8m Flying Lead	Pre Wired 0.8m Flying Lead
End of travel confirmation (dry contact/volt-free)	2 x Mechanical micro-switches	2 x Electronic relays
Local visual position indicator	Dome style	Dome style
LED Status light - Coming Q3 2020	LED open/close/fault	LED open/close/fault
Housing material	ABS (Aluminium Option)	ABS (Aluminium Option)
Weight ABS (Aluminium)	0.8Kg (1.2Kg)	0.8Kg (1.2Kg)

## Dimensions:



Note that our smart and basic actuators, regardless of function, are all the same size per series.

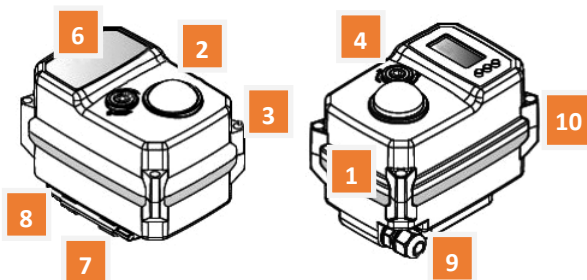
## POWER CONSUMPTION FOR SERIES 20 ACTUATORS

Rated Voltage	95-265VAC/DC (50/60Hz)	24VAC/DC (50/60Hz)	DC 24V	DC 12V
Voltage Range	AC: 95-265V DC: 100-300V	AC: 18-26V DC: 22-28V	DC: 22-28V	10-15V
20 Series Torque Nm (Break)	20 (25)	20 (25)	20 (25)	20 (25)
20 Series Power (W) All Series	15W	15W	15W	15W
20 Series Power (W) Failsafe	36W	36W	36W	36W
20 Series Power (W) Hi Speed	85W	85W	85W	85W
20 Series Peak Current	0.94A	0.94A	0.94A	0.94A
20 Series On Off Fuse	2A	1A	2A	2A
20 Series Failsafe/HiSpeed Fuse	2A	4A/10A	4A/10A	4A/10A
20 Series Run time	10 Seconds Open - Close	10 Seconds Open - Close	10 Seconds Open - Close	15 Seconds Open - Close
20 Series Hi Speed Run time	3-5 Seconds Open - Close	3-5 Seconds Open - Close	1 Second Open - Close	N/A
20 Series Heater Power (W)	0.6W	0.6W	0.6W	0.6W

## STANDARD FEATURES:

Operating frequency	Not continuous, allow $\geq 1$ minute between cycles
Position confirmation	Mechanically driven dome style visual 2 colour indicator
Mounting restriction	Do not install underslung/upside down. Can install upright horizontally or vertically.
End Position indication	Micro-switches operated by adjustable internal cams , set slightly ahead of the final motor stop position.
ISO:5211	F03/04/05 - Note F04 is at 45 degree
Working Angle	Factory set at $90^\circ \pm 2^\circ$ , maximum angle of rotation $360^\circ$ unless multi turn series.
Manual operation	Yes, by hexagonal wrench (supplied in clip) when no power is being applied.
Female drive	14mm x 15mm deep
Ingress protection	IP67
Max media temp	$\leq 80C$
LED Light - Coming Q3 2020	Green shows actuator <b>OPEN</b> - Red shows actuator is <b>CLOSED</b> - Blue shows actuator has an <b>ALERT</b> , see wiring diagram
Ambient temp	-20 to +60C (ABS) Non-operating temp ; $\leq -40C$ to $\geq 80C$
Wiring Connectivity	2 x M10 weatherproof gland with flying lead.
Ambient humidity	5-95% RH non-condensing
Explosion proof	No, prohibited. Do not use in hazardous areas
Housing	Plastic (ABS) - option available for aluminium housing.
Weight	With standard ABS housing 1.2Kg.
Warranty Basic Series	Basic series carries standard 1 year 20,000 operations warranty. Terms and conditions apply.
Warranty Smart Series	Smart series carries upgraded 2 year 60,000 operations warranty. Terms and conditions apply.

## Main parts



Item	Parts	Material
1	Actuator	ABS
2	Indicator	Transparent AS
3	Screw x 4	304
4	Manual Shaft	304
5	Oil Seat	NBR
6	Label	PVC
7	Wrench Fixed	ABS
8	Hexagon Wrench	Steel
9	Weatherproof Cable connector	Nylon
10	Cover Seal	NBR

**SERIES**
**SERIES OVERVIEW OF OUR 20NM ELECTRIC ACTUATORS**
**SALES**

**ON OFF QUARTER TURN ACTUATORS**

B205	95-265VAC	BASIC SERIES ON OFF MULTI VOLTAGE
B206	24VAC/DC	BASIC SERIES ON OFF MULTI VOLTAGE
S2010-5	95-265VAC	SMART SERIES ON OFF MULTI VOLTAGE
S2010-6	24VAC/DC	SMART SERIES ON OFF MULTI VOLTAGE

**i** Note: Basic 20 series available as 220VAC, 110VAC, 24VAC and 24VDC single voltage options.


**FAILSAFE QUARTER TURN ACTUATORS**

B245	95-265VAC	BASIC SERIES FAILSAFE MULTI VOLTAGE
B246	24VAC/DC	BASIC SERIES FAILSAFE MULTI VOLTAGE
S2014-5	95-265VAC	SMART SERIES FAILSAFE MULTI VOLTAGE
S2014-6	24VAC/DC	SMART SERIES FAILSAFE MULTI VOLTAGE


**MODULATING QUARTER TURN ACTUATORS - 4-20mA/ 0-10V + other inputs**

S2025-5	95-265VAC	SMART SERIES MODULATING MULTI VOLTAGE
S2025-6	24VAC/DC	SMART SERIES MODULATING MULTI VOLTAGE
S2026-5	95-265VAC	SMART MODULATING FAILSAFE MULTI VOLTAGE
S2026-6	24VAC/DC	SMART MODULATING FAILSAFE MULTI VOLTAGE

**i** Note: Modulating Hi Speed versions also available.


**HI SPEED QUARTER TURN ACTUATORS -**

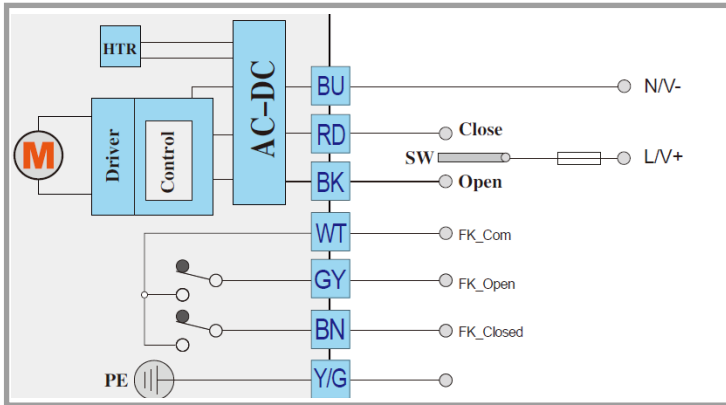
S2019-5	95-265VAC	SMART SERIES HI SPEED MULTI VOLTAGE
S2019-6	24VAC/DC	SMART SERIES HI SPEED MULTI VOLTAGE
S2029-5	95-265VAC	SMART MODULATING HI SPEED MULTI VOLTAGE
S2029-6	24VAC/DC	SMART MODULATING HI SPEED MULTI VOLTAGE

**i** Note other functionality available includes Timer Modbus and Wireless options. Contact Reseller for details

## WIRING

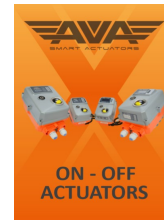
## BASIC ON OFF / HI SPEED / FAILSAFE

TYPE: B3S



### BASIC ACTUATORS:-

Standard wiring for Basic actuators used for all series. Failsafe achieved using internal Super Capacitor option. *Different wiring options available.*

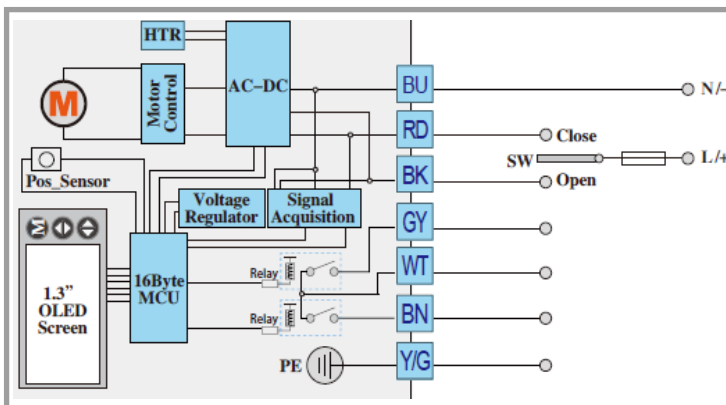


Note that we currently cannot offer Hi Speed Failsafe functionality due to limitations in Capacitor technology used.

## WIRING

## SMART ON OFF / HI SPEED / FAILSAFE

TYPE: B3J



### SMART ACTUATORS:-

Smart actuators utilised Digital Encoder and electronic relays. Feedback digitally set using firmware. *Different wiring options available.*

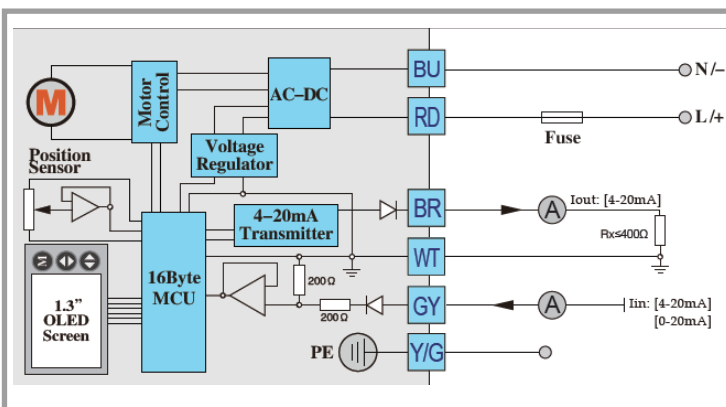


Note that we currently cannot offer Hi Speed Failsafe functionality due to limitations in Capacitor technology used.

## WIRING

## SMART MODULATING / HI SPEED / FAILSAFE

TYPE: 4-20/0-10



### SMART MODULATING ACTUATORS:-

Smart actuators require resistor fitting as shown in diagram. Feedback must be connected for actuator to work correctly.



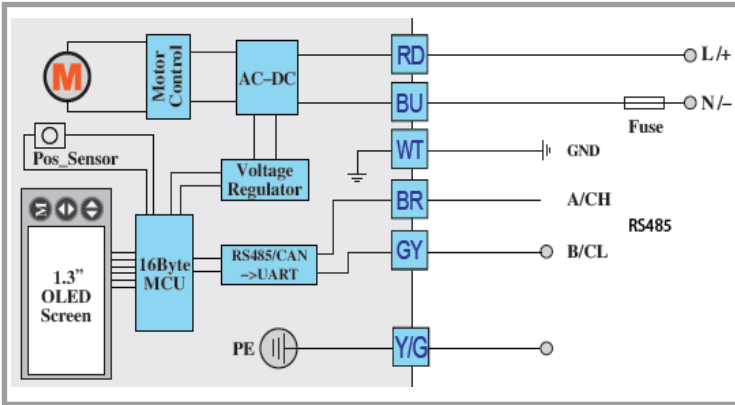
Note that we currently cannot offer Hi Speed Failsafe functionality due to limitations in Capacitor technology used.

**i** Note that all of the following options are typically 'Specials' and not available from stock. Contact your reseller for details.

## WIRING

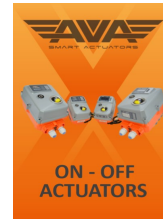
### SMART MODBUS RS485 ON OFF / FAILSAFE

TYPE: RS485



#### SMART MODBUS ACTUATORS:-

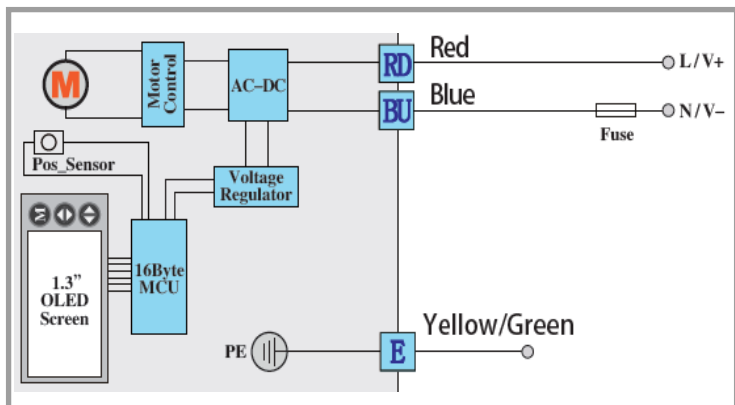
Available as on off, failsafe and modulating using Modbus RS485 or CANBUS. See website for additional information and user guides.



## WIRING

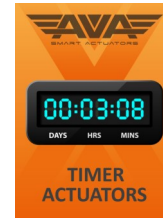
### SMART TIMER SERIES ON OFF / FAILSAFE

TYPE: TIMER



#### SMART TIMER ACTUATORS:-

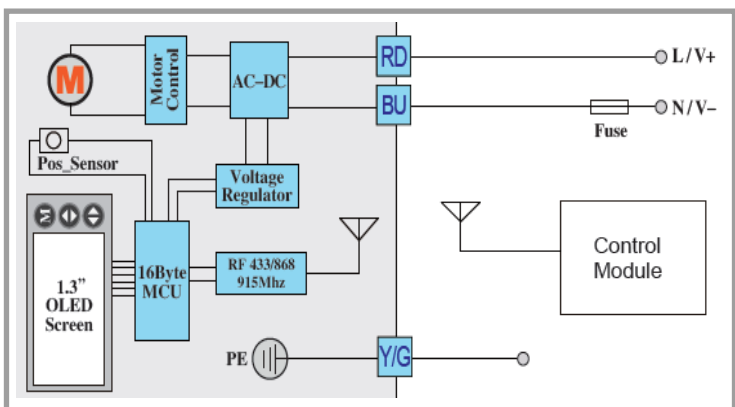
You only need power, the actuators opening and closing schedule is set via onboard firmware. 24/7 x 365 timer upto 60 operations per day.



## WIRING

### SMART WIRELESS ON OFF / FAILSAFE LORA RF433/868/915MHZ

TYPE: LORA



#### SMART RF/ WIRELESS ACTUATORS:-

Power local to actuator and control via RF Fob. For installations where power is available, but wired control is not.



## WIRING

### SERIES 10, 20 AND 50 PRE WIRED ACTUATORS

## WIRING

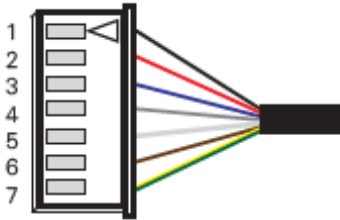


Figure 1 (7wiring diagram)

#### PRE WIRED ACTUATORS:-

Due to the compact design of our actuators, our Series 10, 20 and 50 have pre wired, typically 0.8m long cables that contain your power, feedback and earthing cores. Unless fitted with a special option, such as Alarm Relays, the actuators are supplied with a 7 pin connector. This can be removed if not required or to be utilised. This does NOT invalidate the warranty or effect the actuator. Flying lead can be from 1m to 20m. Speak to our team about your requirement.



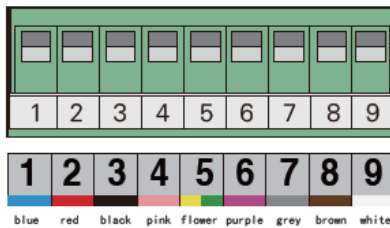
Note that the 20 Series 7 core cables are 16 wire Gauge as standard and our 50 series is 12 wire Gauge as standard.

## WIRING

### SERIES 80-110 AND 200 –400 WIRING BOX ACTUATORS

## WIRING

#### 9P-5.08 Terminal diagram



#### WIRING BOX - TERMINAL STRIP ACTUATORS:-

Our larger actuators have 2 x M20 Conduit Glands on the back of the actuator. The wiring box is removed from the actuator base which will expose the terminal strip for you to terminate your cables. This will be typically a 9 pin terminal design to allow for additional cores for Alarm Relays. Refer to manual for Fuse requirements. Feedback signal contact load capacity 0.1A/250VAC 0.5A/30VDC.

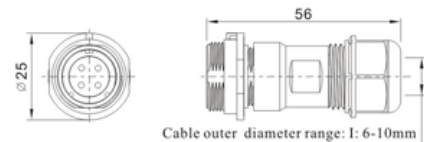
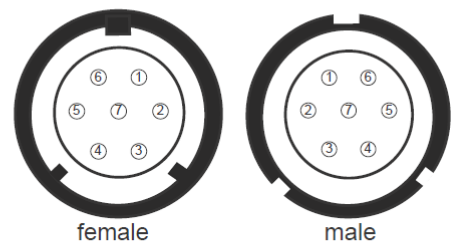
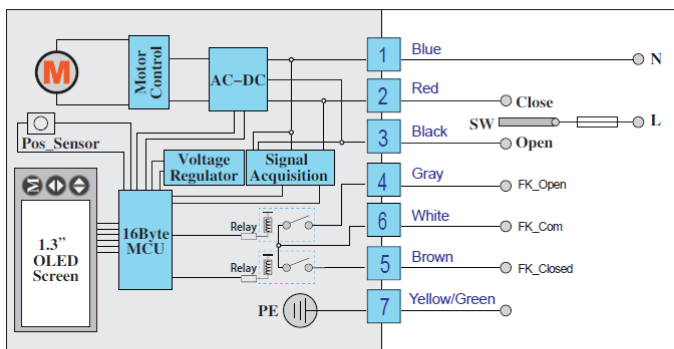


Note that the 80-110 and 200-400 terminal strip is designed to accept 12 wire Gauge cables. We can supply prewired if required.

## WIRING

### SERIES 20-400 AVIATION PLUG IP68 CONNECTOR OPTION

## WIRING



#### WIRING BOX - 'AVIATION PLUG' IP68 OPTION:-

Our inline connectors offer a plug and play weather proof connector. This is becoming more popular for customers looking to remove the need to install a junction box between the actuator and panel. This IP68 weatherproof connector is an ideal choice for external applications. Speak to our sales team today about options on this connector type.



Note the 'Aviation Plug' is a special execution on request at this time. Speak to your reseller for more information.

## Adjusting valve location instructions

Note you should only remove the cover on instruction from your AVA reseller or AVA technical support agent as it may invalidate warranty.

### 1. ADJUSTING FULL CLOSE POSITION

Rotate the valve to full close position with handle.

- Since the valve has gone through "factory default setting", this step can be omitted if the adjustment is slight.
- Detach cambered indicating dial, loosen fixing screw L3 of indicating dial support, turn reinforcing rib as shown in diagram 5, perpendicular to the flow direction of valve, then screw up L3 and buckle up cambered indicating dial.
- Loosen fixing screw L1 of cam 1, drive cam 1 to rotate clockwise and trigger micro switches K2, K1 to move in turn and make sound. When K1 moves and makes sound, stop adjustment. Then screw up fixing screw L1.
- Notice 1: The default is that rotating in clockwise direction means closing, and rotating in anticlockwise direction means opening.
- Notice 2: B3P does not have K2, K4 micro switch.

**Caution:** When screwing up L3, the torque  $\leq 0.5$  NM, otherwise it will damage locating driving gear.

In the process of adjustment, do not over tighten screws, otherwise it will damage screw threads or other parts.

### 2. ADJUSTING FULL OPEN POSITION

- Rotate the valve to full open position with handle.
- Loosen fixing screw L2 of cam2, drive cam 2 to rotate anticlockwise and trigger micro switches K4, K3 to move in turn and make sound. When K3 moves and makes sound, stop adjustment. Then screw up fixing screw L2.

### 3. WIRING

- After modifying, connect the circuit according to the wiring label on the box cover. After confirmation, you can do power test.

### 4. ELECTRICAL TEST

- Mainly check the consistence of on and off between the actuator and the valve body. At the same time, please check whether the valve is full close or not. Special testing device is recommended

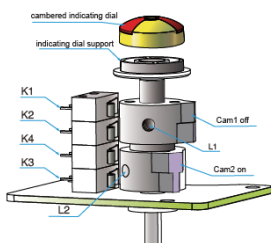


Diagram 1

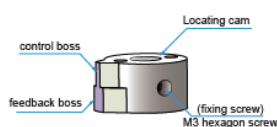


Diagram 2

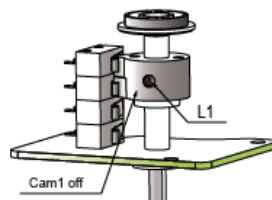


Diagram 3

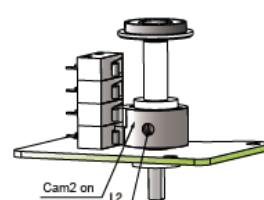


Diagram 4

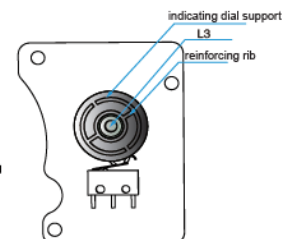
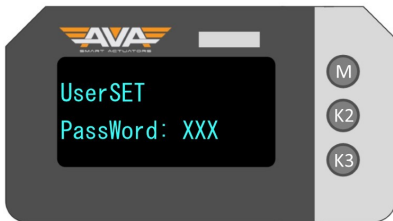


Diagram 5

**NOTE - Smart actuators do not have internal cams and micro switches, therefore position adjustment is via firmware. See actuator Firmware User Guide for detailed screen by screen guide including how to change working angle and feedback.**

Our Smart series actuators utilise our smart screen and menu system using a colour OLED screen. Not only does the screen display the actuator status, set position from PLC/Controller and actual position. The screen also can display any ALERTS such as an over torque situation. You can use the touch buttons to enter the Menu mode, customising working angle, speed, accuracy to name just a few of the customisable options. You can also use the Local Control mode or Manual Mode to use the buttons to open and close the actuator locally via the touch buttons. Full screen by screen Firmware guide available on request.

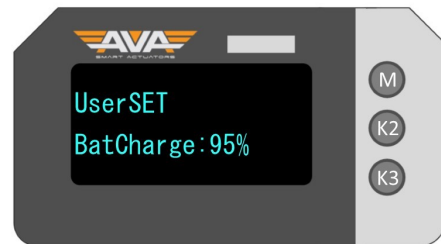
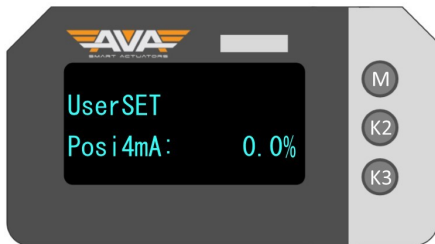


M	Hold for 3 seconds to enter MENU Mode. <b>Enter 333 Password</b>
K2	
K3	Hold for 3 seconds to enter LOCAL CONTROL. <b>Enter 111 Password</b>
ALLMK	Hold all 3 buttons and enter RESET MODE. Enter <b>6666 Password</b>

You can use the M button once into the Menu Mode to move through the different screens.

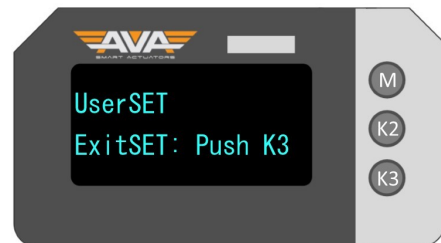
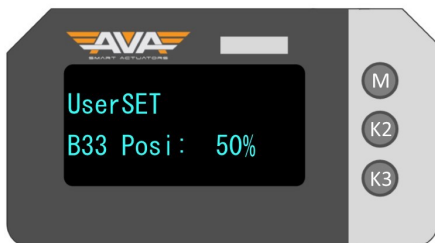
You can use K2 to move up and down through the options

You can use K3 to move left and right through the options.



For ALL actuators, you can electronically set the Open and Close position via the firmware. This example shows a Modulating Actuator screen, the user can set the 4mA position or the closed position.

For our Failsafe actuators, on initially powering, you will see the screen display the Capacitor Charge %. You can also set the % of charge needed as a minimum, the failsafe position to fail OPEN or CLOSED.



You can set the B33 position. This is used for setting a 3rd Position. Either on a 3 way valve or simply as a 3 point control valve. For example 0-90-180 degrees or 0-45-90 degrees. For Failsafe actuators you can also use the 3ed position as the failsafe position.

Once all the settings and adjustments have changed, you can exit via the screen above and press the K3 button (bottom button) this will show the message 'Saved' which means the changes made are now live and will reflect in



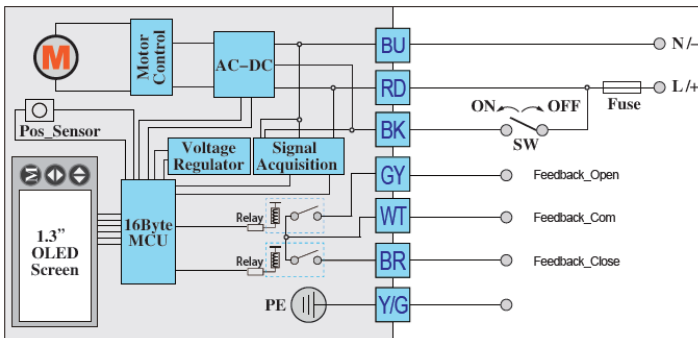
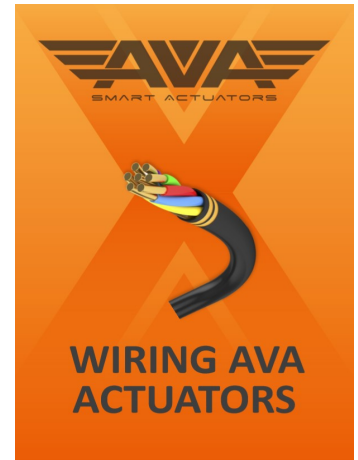
Note the above are just some of the Firmware options available to customise the actuator function. This will vary on series and function.



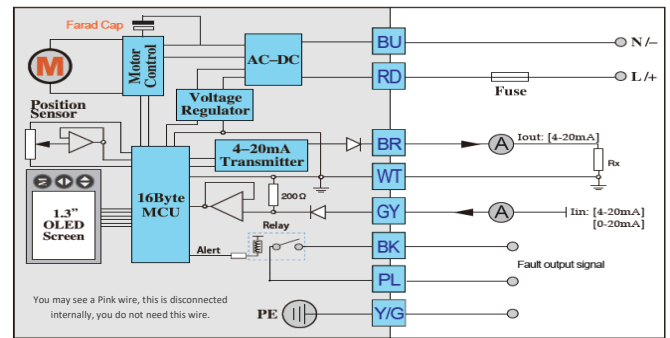
## AVA Wiring Options

As you will see from the previous page, our AVA electric actuators are capable of various wiring configurations based on what your application requires. As detailed, our standard for our Basic actuators is what we call B - B3S which is a SPDT with volt free position confirmation. Our Smart actuators use E - B3J which is SPDT Relay position confirmation. Remember that all of our Smart units don't use mechanical cams and micro switches. A digital encoder and relays are used. The following are some of the additional wiring diagrams that you might find of interest, that are available for our Smart actuators including 3 and 4 position wiring configurations.

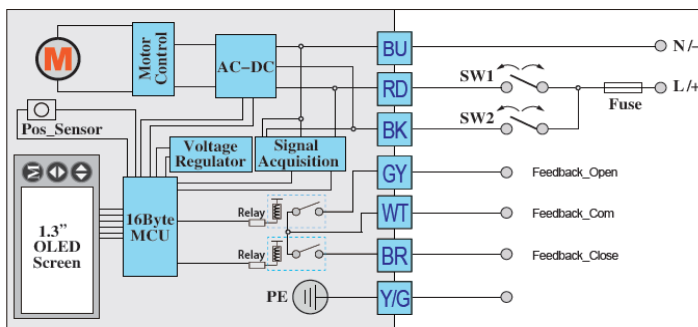
Check with your AVA reseller for lead time on non stock wiring configurations.



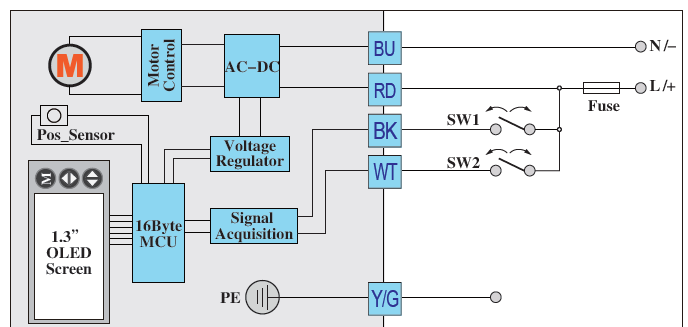
Wiring G: BD3J - SPST / Relay Position Confirmation



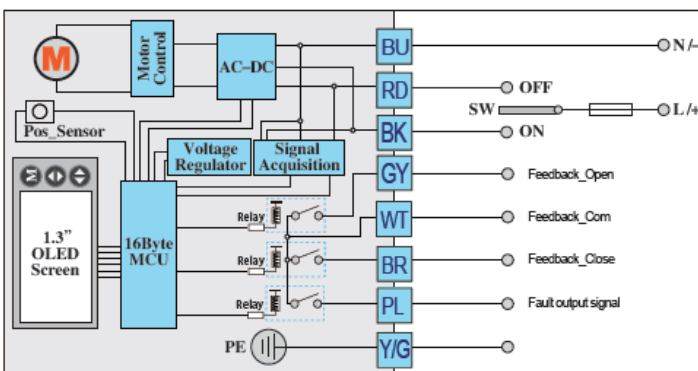
Wiring P2: 4-20ma Failsafe with alarm output



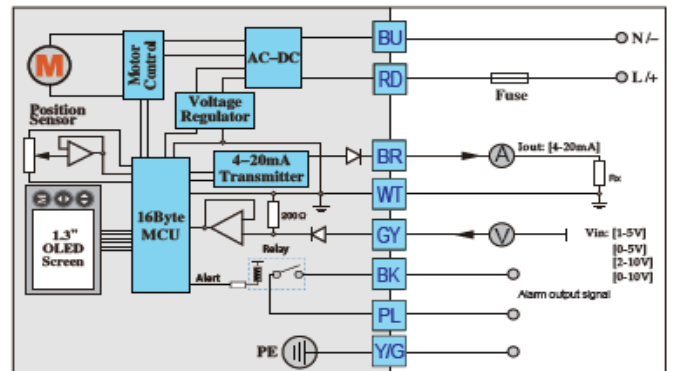
Wiring J: B33J 2 x SPST / Relay Position Confirm (3 position)



Wiring M: B44 SPST / No position confirmation (4 position)



Wiring F: B3JA 2 x SPDT/Relay Position Confirm + Alarm Output



Wiring U5: 0-10V Control/ Feedback with Alarm Output

## AVA Actuator IOM's

Here are some general instructions relating to the Installation, Operation and Maintenance of our electric actuators.

We also cover some of the Frequently Asked Questions by our customers over the years from around the world.

Check out our website for all the latest Technical Support documents including product videos and for our Smart Actuators, our screen by screen user guides.

[www.avactuators.co.uk](http://www.avactuators.co.uk)



SUPPORT	INSTALLATION, OPERATION & MAINTENANCE
Cover	No need to remove cover, doing so can invalidate your warranty
Heater	The heater option is prewired. When the actuator is powered, the heater is working
Orientation	Install vertically or horizontally upright, not to be installed underslung/upside down
Explosion Proof	All series are suitable for SAFE AREA use only. Series 20 available as EX Rated
IP Rating	IP67 weather proof, we advise against jetting/pressure washing actuators
Connector	If your actuator is received with the white connector, you can remove it and terminate cable
Warranty	Basic Series is 12 months 20,000 operations. Smart Series is 24 months 60,000 operations
End of Travel	All actuators have end of travel limit switches except Modulating actuators, see below
4-20mA Output	Smart Modulating actuators have position feedback only, they don't have end of travel feedback
Wiring Box	Series 80-400Nm utilise a wiring box at the rear of the actuator. Remove to wire actuator
Maintenance	All series of the actuators maintenance free. We recommend actuators are operated daily.
Keep Powered	Yes, we recommend the actuators are powered at all times to ensure the heater and feedback operate

SUPPORT	FREQUENLTLY ASKED QUESTIONS AND COMMON FAULT DIAGNOSIS
Capacitor Charge	When initially using Failsafe actuators, allow short period of time for the actuator to charge capacitor.
Alert on Screen	Smart actuators show ALERT when actuator has 'Excessive Valve Torque' or Motor Failure
No Control	If your Modulating Actuator shows 'NoCtrl' check wiring, your actuator cannot see the modulating input
Feedback Error	Ensure you are using resistors for Modulating actuators as per wiring diagram.
3rd Position	To put actuator into B33 or 3rd position, apply power to both Red and Black at same time.
Adjust Angle Basic	You can adjust the working angle of the actuator through adjusting the cams in the Basic series
Adjust Angle Smart	You can use the firmware to set the working angle and this will also set the end of travel limit switches
LED Modulating	Series 20-110 where LED fitted will only show the LED on alarm. 200-400 series will also show open/close
Actuator Spins 360	If a Basic actuator and actuator rotates 360 degrees, internal micro switches are likely damaged
Screen isn't on	For Smart actuators, check wiring and ensure excess voltage not applied. If ok, contact our support team