

**BERNARD<sup>®</sup>  
CONTROLS**

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# **Weatherproof Quarter-Turn Actuators**

OA, AS & BS Ranges

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# Product range overview

*Quarter-turn actuators are used to operate ball, plug or butterfly valves, dampers, lowers and any equipment with quarter-turn or part turn travel.*

## > Industrial grade actuators

BERNARD CONTROLS has achieved an excellent reputation over the years in this market thanks to a range of actuators providing the following features:

- > Compact construction with a high output torque
- > Self-locking gear train to maintain the position of the valve when the actuator is de-energized
- > Very good resistance to vibrations
- > Very simple settings - no specific tool required
- > Adjustable mechanical travel limit stops to prevent overtravel
- > Removable drive socket for easy machining
- > Emergency handwheel and mechanical position indicator provided on all actuators as a standard

BERNARD CONTROLS actuators have been operated in different fields such as power plants, industry, building automation, ship building and water treatment.

Our range of weatherproof quarter-turn actuators is composed of the following models:

### > Models OA3 to OA15

- Small direct quarter turn actuators for torques lower than 150 N.m



### > Models AS18 to AS80&BS100

- Compact direct quarter turn actuators for the torque range 150 to 800 N.m



### > Models AS100 to AS1000

- Combination quarter turn actuators for torques exceeding 800 N.m



## > For on-off or positioning operations

### • ON - OFF:

The ON-OFF quarter-turn actuators are designed to fully open or close on the valve an average of 20 to 30 times per day (up to 360 starts per hour in peak).

### • CLASS III MODULATING:

With Class III modulating actuators, it is possible to drive the valve to intermediate positions, on an average of 360 times per day (up to 1200 starts per hour in peak), with a precision better than 2%. For higher duty and precision modulating actuators, please refer to our modulating range catalogue.

## > Protection adapted to your environment

### • WEATHERPROOF DESIGN:

As a standard, our actuators have a weatherproof enclosure protection rated IP67 (NEMA 4) as per CEI 144 recommendations. Higher levels of protection are available on request (please consult us).

### • CORROSION RESISTANT DESIGN:

Our actuators can also be configured for operation in harsh environmental conditions such as:

- > industrial corrosive atmosphere (chemical, alumina plants i.e)
- > marine corrosive atmosphere (on-shore and off-shore)

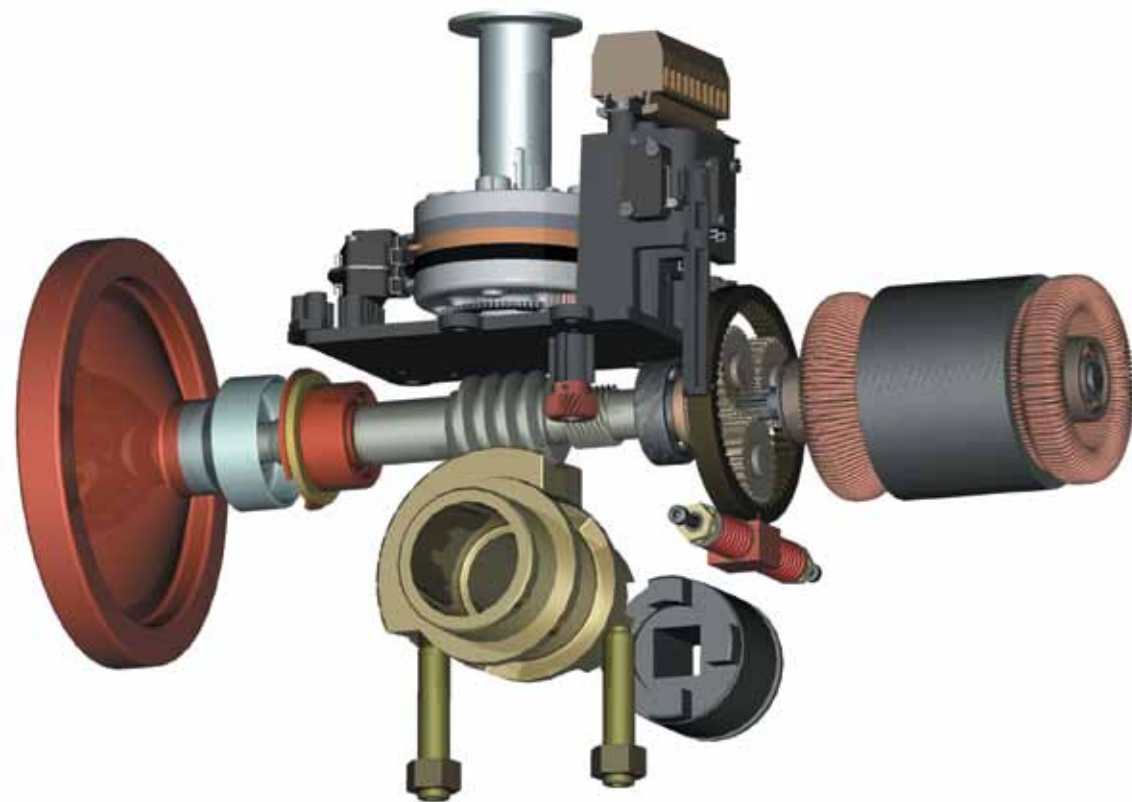




# Main features

## > Transmission gears

- The gear drive system is composed of 2 reduction stages:
  - > The first stage, driven directly by a pinion on the motor drive shaft, is a planetary system.
  - > The second stage, driven by the satellite wheels of the planetary gear consists of a worm and wheel gear type.
- Since the planetary system permits a high speed reduction with an excellent efficiency, the subsequent gear is driven at a relatively low speed which ensures a better overall efficiency than normal standard gear designs.



## > Emergency handwheel

- In case of a loss of power supply or a faulty control system, the presence of a handwheel enables the operator to easily manually drive the valve to any required position.

## > Mechanical end stops

- BERNARD CONTROLS actuators are equipped with adjustable mechanical end stops to prevent overtravel, which may occur during manual operation.

## > Position indicator

- A visual position indicator allows a clear indication of the current valve position. In fact, this indicator is mechanically linked to the valve shaft.

## > Travel limit switches

- Thanks to the BERNARD CONTROLS camblock system, the adjustment of travel limit switches is simply accomplished with a standard screwdriver. No special tool is required.
- Each single cam can be set independently from the others.
- The cams are automatically locked in their respective positions, once adjusted, and unaffected by vibrations.



## > Torque sensors

- On the AS & BS models, the output torque for valve operation is permanently measured by the lever deflection of the planetary gear external crown. This crown gear is maintained in position by two calibrated linear springs which can be set independently for each rotational direction to a desired torque value.
- In the event the torque setting is reached, the crown lever compresses the spring to a point where a switch is tripped.
- As this unique system is mechanically friction-free, exceptional precision and repeatability are obtained, which is highly appreciated when the device has to «close on torque».

## > Asynchronous motors

- The asynchronous motor technology offers the highest ratio of starting torque versus nominal torque. Thus, the actuator maximum torque capacity is available from the beginning of travel to unseat the valve.

## > Detachable drive bush

- The output drive socket can be easily removed from the actuator, without the use of any special tool, for adaptation to the valve shaft.

## > Motor thermal protection

- A built-in motor thermal switch protects the motor from overheating.

## > Lubrication

- The gear design ensures lifetime lubrication by grease, thus reducing periodic maintenance requirements considerably.

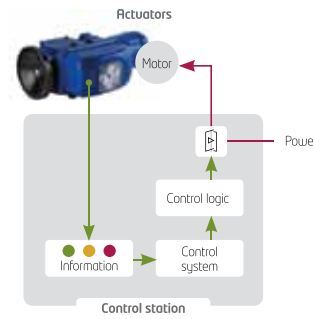


# Wide choice of controls

*You can opt for integrated control or remote control station to meet the requirements of your particular system and the environment in which the actuators are to be used.*

## > Standard control (without integrated controls)

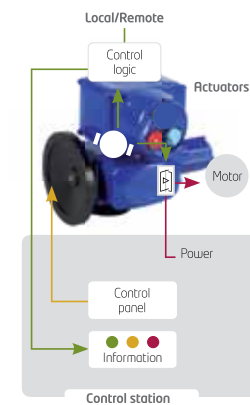
The customer provides the control logic to handle all the data received from the actuator electric contacts. The power reversing starters are housed in the customer's own cabinet.



Standard control

## > INTEGRAL+ control

The INTEGRAL+ control system is fully configurable and can perform all actuator control functions, including production of status reports, fault handling, protection systems and command processing. It offers local controls which can be disabled either locally or from a remote location. The reversing starters are incorporated in the control unit. More information in our INTEGRAL+ catalogue (A115)



Integrated controls INTEGRAL+ / POSIGAM+



## Benefits of integrated control systems

- **Simple:** ready-to-use turnkey solution.
- **Safe:** proven system incorporating many safety features.
- **Economical:** saves time and money at the design and installation stages.

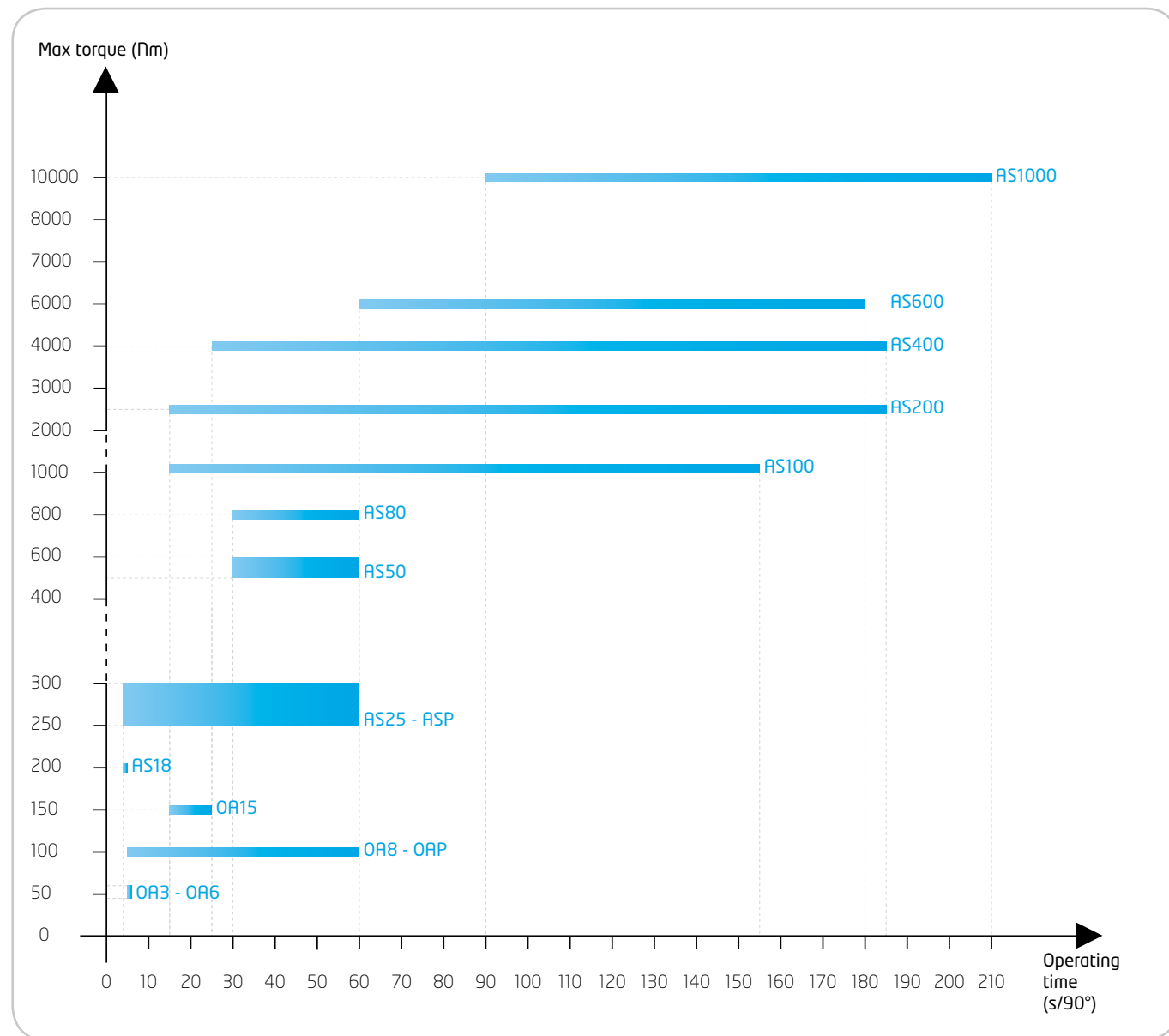
		INTEGRAL+
MODULATING CLASS	ON/OFF	INTEGRAL+
	Modulating class III	POSIGAM+
REMOTE CONTROL	Pulse command	•
	Maintained signal	•
	Analogue proportional control	on POSIGAM+ only
	Auxiliary	Local control inhibition (ESD Emergency command)
	Timer	Option
LOCAL COMMANDS	Lockable selector knobs	•
	Digital display	
	Indicator lights	Option
INTERNAL PROTECTION	Fuses	•
	Automatic phase monitoring (3-phase)	•
	Motor thermal cut-out	•
	Torque limiter protection	• (*)
SIGNALLING	Number of signalling relays	4 (+ 3 option)
	Number of available data	16
	Fault relay	•
	Number of listed faults	8
	Analogue position feedback	Option (Std on POSIGAM)
CONFIGURATION	Configuration setting	Internal (with DIP switches) & jumpers
	Torque/position setting method	Mechanical
	Travel limit stop	On position - On torque (*)
	Full configuration upload	-
MONITORING	Self-diagnostics	-
	Torque/position curve	-
	Actuator operating log	-
	Partial stroking	-
FIELDBUS	Profibus DP (single or redundant)	Option
	Foundation fieldbus	-
	Modbus RTU	-

(\*) except models OA - See INTEGRAL+ (A115) catalogue for further information on controls.

Please also check our INTELLI+ weatherproof actuation solutions catalogue.



# Performances

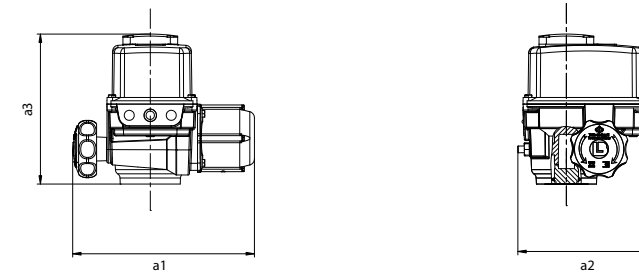


For higher torque values, please refer to documentation on ST range actuators and on quarter-turn gearboxes combinations

# Dimensions

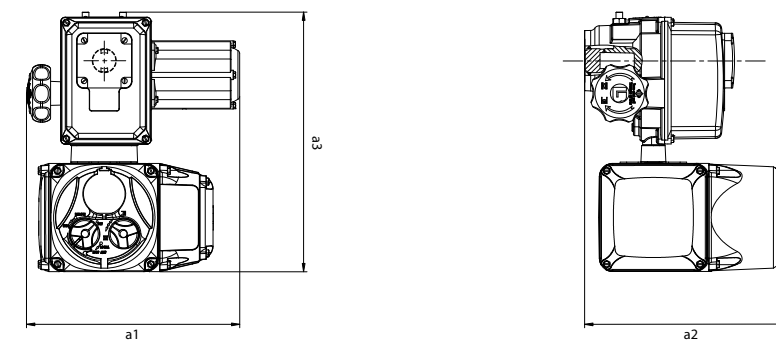
## OA3 to OA15 Models

Standard version



	Flange	Stem size (mm)		a1 max.	a2	a3	Approx. Weight (kg)
		Bore (max.)	Square (max.)				
<b>OR3</b>	F05/F07	22	19	273	200	225	6
<b>OR6</b>	F05/F07	22	19	319	200	225	7
<b>OR8</b>	F05/F07	22	19	319	200	225	7
<b>ORP</b>	F05/F07	22	19	362	200	225	7
<b>OR15</b>	F05/F07	22	19	362	200	225	7

With integrated controls (INTEGRAL+ / POSIGAM)

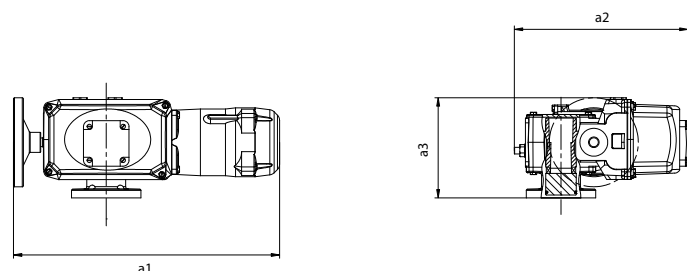


	Flange	Stem size (mm)		a1 max.	a2	a3	Approx. Weight (kg)
		Bore (max.)	Square (max.)				
<b>OR6</b>	F05/F07	22	19	319	305	389	14
<b>OR8</b>	F05/F07	22	19	319	305	389	14
<b>ORP</b>	F05/F07	22	19	362	305	389	14
<b>OR15</b>	F05/F07	22	19	362	305	389	14

# Dimensions

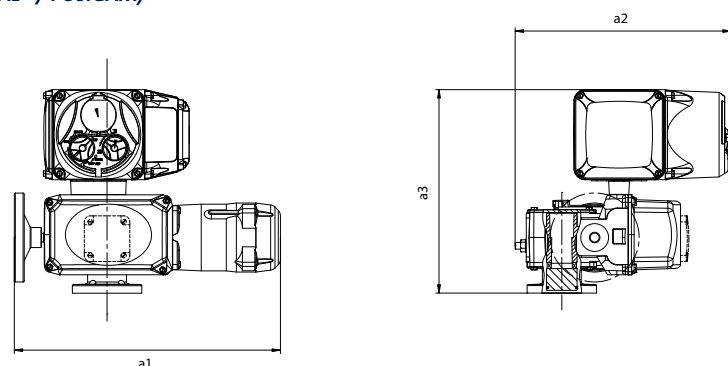
## AS18 to AS80 and BS Models

Standard version



	Flange	Stem size (mm)		a1 max.	a2	a3	Approx. Weight (kg)
		Bore (max.)	Square (max.)				
<b>AS18</b>	F07/F10	30	22	538	313	180	18
<b>AS25</b>	F07/F10	30	22	538	313	180	18
<b>ASP</b>	F07/F10	30	22	518	313	180	15
<b>AS50</b>	F07/F10	32	27	587	313	180	20
<b>AS80</b>	F12	40	36	587	313	211	21
<b>BS100</b>	F12	40	36	643	424	167	30

With integrated controls (INTEGRAL+ / POSIGAM)

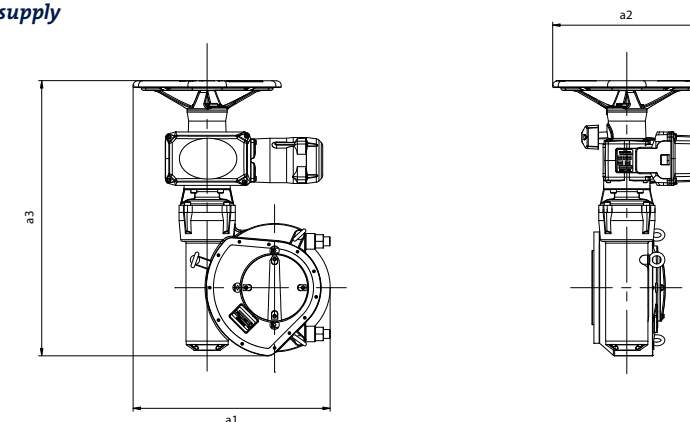


	Flange	Stem size (mm)		a1 max.	a2	a3	Approx. Weight (kg)
		Bore (max.)	Square (max.)				
<b>AS18</b>	F07/F10	30	22	538	389	366	25
<b>AS25</b>	F07/F10	30	22	538	389	366	25
<b>ASP</b>	F07/F10	30	22	518	389	366	22
<b>AS50</b>	F07/F10	32	27	587	389	366	27
<b>AS80</b>	F12	40	36	587	389	397	28
<b>BS100</b>	F12	40	36	643	525	356	37

# Dimensions

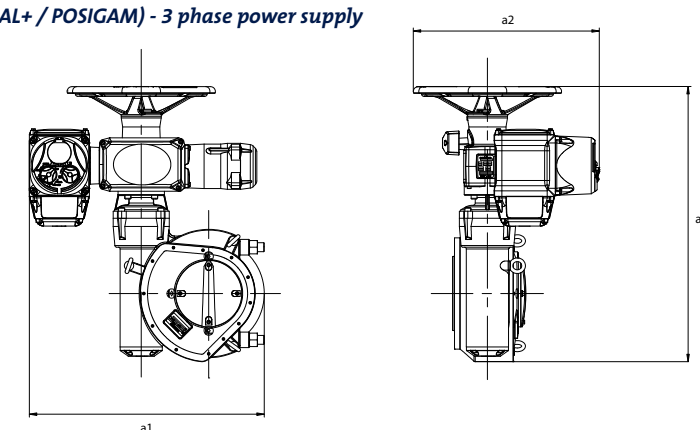
## AS100 to AS1000 Models

Standard version - 3 phase power supply



	Flange	Stem size (mm)		a1 max.	a2	a3	Approx. Weight (kg)
		Bore (max.)	Square (max.)				
<b>AS100</b>	F12 (F10) (F14)	60	36	426	442	521	47
<b>AS200</b>	F14 (F16)	80	46	462	442	664	64
<b>AS400</b>	F16	80	50	462	442	664	67
<b>AS600</b>	F25	100	55	532	414	742	84
<b>AS1000</b>	F25	100	55	482	442	780	92

With integrated controls (INTEGRAL+ / POSIGAM) - 3 phase power supply



	Flange	Stem size (mm)		a1 max.	a2	a3	Approx. Weight (kg)
		Bore (max.)	Square (max.)				
<b>AS100</b>	F12 (F10) (F14)	60	36	615	488	521	54
<b>AS200</b>	F14 (F16)	80	46	615	488	664	71
<b>AS400</b>	F16	80	50	615	488	664	74
<b>AS600</b>	F25	100	55	634	502	742	91
<b>AS1000</b>	F25	100	55	635	488	780	99



# Technical specifications

<b>General</b>	Basic actuators include motor with thermal protection, gear case, emergency handwheel, connection box, travel limit switches, torque switches (except for OA) and output drive with removable socket.
<b>Gear design</b>	<ul style="list-style-type: none"> <li>Reduction stages:                     <ul style="list-style-type: none"> <li>Planetary system with high speed reduction and excellent efficiency (AS)</li> <li>Largely sized worm &amp; quadrant gear type</li> </ul> </li> <li>The gears are mechanically self-locking.</li> </ul>
<b>Torque and operating time</b>	<ul style="list-style-type: none"> <li>Easy overview of torques on page 10 of this catalog</li> <li>Detailed data in Technical Handbook AFTEC101</li> </ul>
<b>Type of service</b>	ON/OFF - Modulating class III
<b>Enclosures</b>	<ul style="list-style-type: none"> <li>Actuator housing in aluminium die casting</li> <li>IP67 (IP68, please consult us)</li> <li>NEMA 4, 4X, 6 and 6P CSA C &amp; US</li> </ul>
<b>Motor technology</b>	Totally-enclosed, squirrel cage 3-phase or 1-phase motor, class F insulation with integral thermal overload protection. Motors easy to remove with sealed ball bearings fitted at front and rear.
<b>Motor duty rating</b>	<ul style="list-style-type: none"> <li>S4 motor service (intermittent service on start-up) to IEC 34-1.</li> <li>S4 - 30% for ON/OFF operation - up to 360 starts per hour in peak.</li> <li>S4 - 50% for Modulating class III - up to 1,200 starts per hour in peak.</li> </ul>
<b>Power supply</b>	<p>Wide variety of power supplies:</p> <ul style="list-style-type: none"> <li>single-phase or 3-phase, DC,</li> <li>up to 690 V (depending on version),</li> <li>50 or 60 Hz, etc.</li> </ul>
<b>Ambient temperature range</b>	<p>IP67 standard :    -20 ... +70°C    -4 ... +158°F</p> <p>IP67 low temp. :   -40 ... +70°C    -40 ... +158°F</p> <p>IP67 high temp. :   +0 ... +90°C    +32 ... +194°F (standard version only)</p>
<b>External corrosion protection</b>	<ul style="list-style-type: none"> <li>Paint system :                     <ul style="list-style-type: none"> <li>Cataphoresis + RAL5002 blue epoxy paint</li> <li>Optional polyurethane finish</li> <li>Protection for highly corrosive conditions on request</li> </ul> </li> <li>All cover fasteners captive and stainless.</li> </ul>
<b>Vibration resistance</b>	1g (9.8 m/s <sup>2</sup> ) at 10-500 Hz. (Contact our marketing dept. for higher vibration levels).
<b>Lubrication</b>	Actuators are lubricated for the product lifetime and do not require any special service.
<b>Manual emergency operation</b>	Actuators are fitted with a handwheel for manual emergency operation. On models with torque higher than 800 Nm (1,400 in.lbs), a declutchable handwheel is used with electric operation priority.
<b>Output flange</b>	Actuator flanges comply with ISO 5211. Detailed data in Technical Handbook AFTEC101.
<b>Visual position indication</b>	A dial type window provides continuous position indication even in the event of power supply loss.
<b>Travel limit systems</b>	<ul style="list-style-type: none"> <li>Position: movement reading on output shaft.</li> <li>2 contacts as standard ; SPDT ; 250VAC-16A / 48VDC-2,5Amax. (resistive load)</li> <li>Optional auxiliary SPDT contacts. (Models OA: 2 ; Models AS/BS: 2 or 4)</li> </ul>
<b>Torque limiting systems</b>	<ul style="list-style-type: none"> <li>Torque: dynamometer measuring torque transmitted (not available for OA models).</li> <li>The torque limit switch gives a short duration contact.</li> <li>The torque limiting system is calibrated at the factory to the torque setting selected by the customer.</li> <li>2 contacts as standard ; SPDT ; 250VAC-16A / 48VDC-2,5Amax. (resistive load)</li> </ul>

<b>Remote position signal (option)</b>	<ul style="list-style-type: none"> <li>1000 Ohm potentiometer, 0.3W - wiper current = max. 1 mA.</li> <li>«TAM» position transmitter: 4-20mA (12, 24 or 32V power supply for maximum permissible load of 150, 750 or 1,050 Ohms).</li> <li>Others on request.</li> </ul>
<b>Terminal compartment</b>	<ul style="list-style-type: none"> <li>Screw-type terminals size 4 mm<sup>2</sup> for controls and power supply.</li> <li>Internal earth grounding post.</li> </ul>
<b>Cable entries</b>	<ul style="list-style-type: none"> <li>Standard: 2 x M 20 (maxi: 4 x M20) sealed by caps</li> </ul>
<b>Compliance with EC Directives</b>	<p>Actuators comply with:</p> <ul style="list-style-type: none"> <li>directive 2004/108/EC Electromagnetic compatibility</li> <li>directive 2006/95/EC Low voltage</li> <li>the following harmonised standards: EN 61000-6-4: Generic emissions standard for industrial environments; EN 61000-6-2: Generic immunity standard for industrial environments; EN 60034-1: Rotating electrical machines; EN 60529: Degrees of protection provided by enclosures (IP ratings code)</li> </ul>
<b>Controls</b>	<ul style="list-style-type: none"> <li><b>STANDARD:</b> all control elements are directly connected to screw type terminals according to wiring diagram S50000.</li> <li><b>INTEGRAL+</b> (option): advanced integrated controls of on-off single and three phase actuators (for details refer to INTEGRAL+ catalog n°A115)</li> <li><b>POSIGAM+</b> (option): advanced integrated controls of Class III modulating single and three phase actuators (for details refer to POSIGAM+ catalog n°A115)</li> </ul>

Please refer to the Technical handbooks AFTEC 101 for detailed:

- Performance and electrical data
- Dimensional drawings
- Wiring diagrams

Please also check our INTELLI+ weatherproof actuation solutions catalogue.





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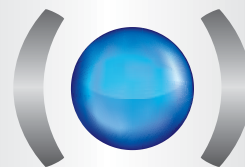
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