



## BLOOMFOSS – EQ series

### ELECTRIC Actuator

*Bloomfoss EQ series Electric Actuator is specifically designed for marine and offshore applications.*

*Focused on compact, simple, rugged and long lasting scotch-yolk design philosophy.*

*Material made from anodized aluminum coated with high resistance coating.*

*Wide Range from 25NM to 6000 NM,*



*Bloomfoss Electric Actuator EQ range*



## Overview

- Years of development from our former series has allowed us to develop the new EQ series electric actuators. It is more robust and durable and extremely suitable for the Oil and Gas, Marine and Offshore industries.
- EQ actuators are specially designed for quarter turn operating applications. From butterfly valves to Ball valves and dampers.
- Variation in the range of output torques fit many different requirements
- Highly reliable feedback and local control system, make our actuator even more adaptable than before.
- INTERNATIONAL recognition from the UKAS Quality systems approval.



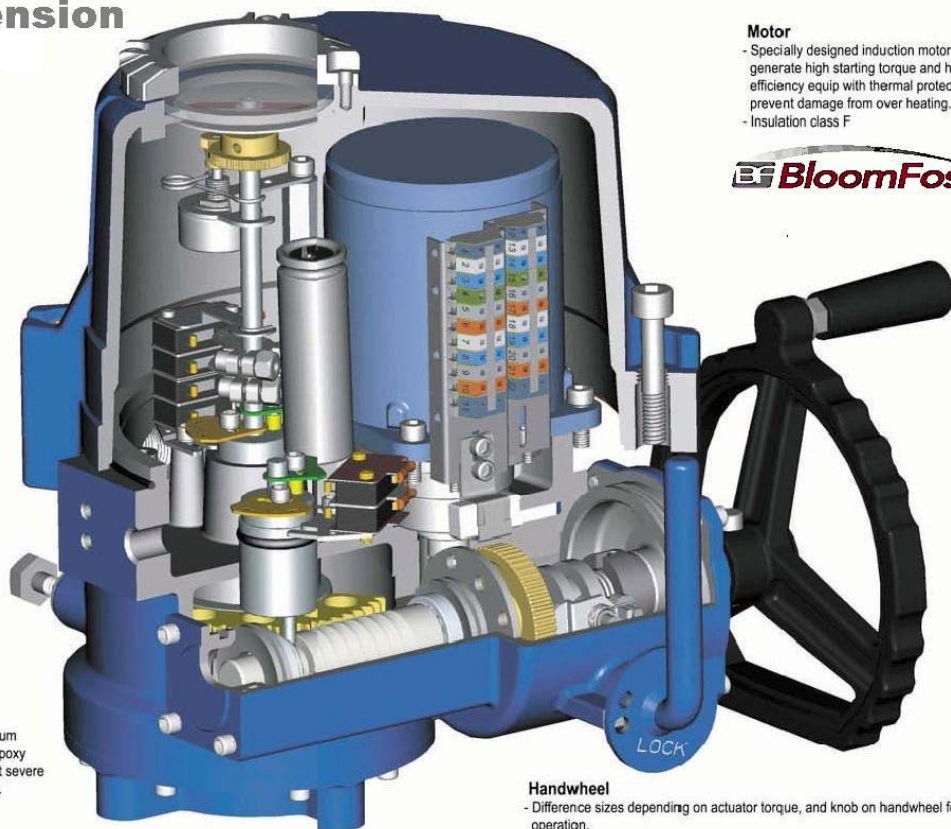
## Strong Features

- High-grade hard anodized aluminum alloy housing with tough epoxy coating for harsh environments.
- Output torque from 50Nm to 6000Nm and higher
- Wide range of voltages from single phase 110 V ,220 V, 230 V to three phase 380 V and 440 V.
- Worm Gear Self locking design with minimum backlash.
- Rugged construction standard IP 66 / 67 with options for submerged IP68 and ex-proof housings (EXD)
- Hand wheel for manual over-ride with optional Electric local control.
- Mounting base standard to ISO 5211
- Standard of 4 limit switches (2 for operation, 2 optional )
- Standard Torque switches (except EQ 6) for over torque protection.
- Clear and visible local position with arrow indication.
- Heater with thermostat for condensation prevention



## 3-D Dissected View

### 3-Dimension View



#### Motor

- Specially designed induction motor to generate high starting torque and high efficiency equip with thermal protector to prevent damage from over heating.
- Insulation class F



#### Housing

- Hard anodized Aluminum casting and external epoxy powder coated against severe industrial environment.

#### Sealing

- Sealed by O-ring in all interfaces, and double o-ring sealing for IP68 (option)

#### Lubrication

- EP type grease, maintenance free service for a long period of time.

#### Handwheel

- Different sizes depending on actuator torque, and knob on handwheel for easy operation.

#### Gear

- Precisely machined double worm gear c/w minimum back-lash, low noise, high output torque.

#### Self locking

- Provided by double worm gearing to keep position of valve unchanged against reverse torque from valve.

## Layout and Description

### 1. Manual Operation ( Declutching system)

A hand wheel is provided for manual operation which is engaged by a pad-lockable Hand/auto selection lever arranged for power preference. The hand wheel drives the second stage worm shaft.

### 2. Limit Switch & Auxiliary switch set

Cam disks in the cam block(□) can be set independent of each other as described below. The pairs of screws are assigned in their height to the respective cam ring



### 3. Terminal Strips

Clear visible indication of terminal strips with colour for easy identification.

### 4. Heater and Thermostat

Installed to maintain a dry actuator interior, recommended usages include all outdoor applications, any high humidity areas and all installations at or below

### 5. Position Indicator

Option : illuminated red (close), green(open), yellow(over torque), white(power)

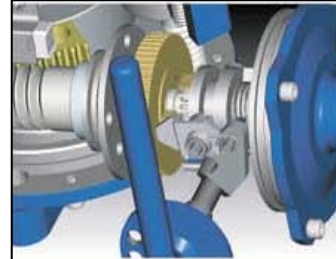
### 6. Torque switches system

These mechanical switches eliminate potential driven device damage due to over torque conditions in either direction of operation.

## Configuration

### Manual Override

- Manual / Auto Lever and handwheel engagement for emergency manual operation
- Power drive automatically. Unless lever padlock it.



### Limit Switches

- 4 limit switches in block form
- 2 travel limit switches for operation
- 2 for customer usage
- Easy setting and tightening using 2 screws.
- Each cam can be set independently
- Once setting is done, cams are locked permanently.



### Terminal Block

- Max of 22 points for convenience
- Proven reliability with tight wiring connection
- Strip length of 8-9mm
- Terminal dimensions 10 X 22 X 32 mm



### Space Heater

- Ceramic housing with thermostat to prevent over heating. (7 –10W)
- Continuous comparison to set temperature
- No electrical leakage





### Torque Switches

- Torque switches provided to prevent damage to actuator caused by overload of valve.



### Visual Indication

- Standard visual indication for easy understanding of valve position
- **Optional** LED lights for easy night vision



## Other Configuration

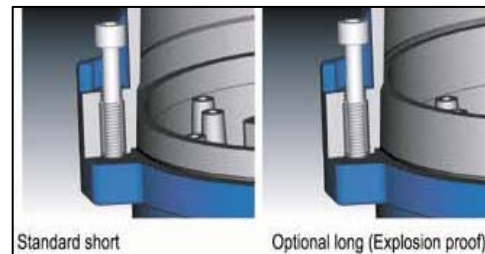
### Potentiometer Assembly

- Continuous position indication of the valve is provided thru direct gearing system and a well designed controller card for high accuracy.
- Functions together with a Proportional Controller card for 4-20mA input and 4-20mA feedbacks.



### Ex Proof and Submerged Housing

- Ex- Proof housing to meet EexdIII B T4 and Eexd II C T4 (135 deg Celsius)
- Submerged housing for IP 68 applications available.





## Performance

Type (Model)	Max Torque Nm	Operating time 50/60Hz 90°	Max Bore Size mm	Power consumption Watts	Motor insulation class	Rated Current (A) 50 / 60 Hz				No of handle turns 90°	Weight Kg
						1 Phase		3 Phase			
						110V	220V	380V	440V		
EQ 6	60	22/18	14	15	F	0.5	0.3	NA	NA	9	3
EQ10	100	21/18	23	15	F	0.95/1.05	0.50/0.55	NA	NA	10	7
EQ16	160	26/22	27	40	F	1.60/1.70	0.85/0.90	0.30/0.30	0.30/0.32	12	15
EQ24	240	31/26	27	40	F	1.62/1.72	0.87/0.92	0.32/0.32	0.32/0.34	12	15
EQ35	350	31/26	42	40	F	1.72/1.80	0.92/0.95	0.32/0.32	0.32/0.35	14	20
EQ50	500	31/26	42	90	F	3.60/3.90	1.50/1.60	0.52/0.56	0.55/0.58	14	20
EQ80	800	39/32	52	180	F	3.80/4.20	2.05/2.20	0.82/0.88	0.82/0.85	17	25
EQ110	1100	39/32	52	180	F	3.90/4.30	2.15/2.30	0.84/0.90	0.84/0.88	17	25
<b>EQ 150 &amp; Above complete with Gear Box System</b>											
EQ150	1500	93/78	78	180	F	3.60/3.90	1.50/1.60	0.52/0.56	0.55/0.58	42	65
EQ200	2000	117/97	78	180	F	3.80/4.20	2.05/2.20	0.82/0.88	0.82/0.85	52	70
EQ300	3000	117/97	78	180	F	3.90/4.30	2.15/2.30	0.84/0.90	0.84/0.88	52	70

## Standard Specifications

<b>Enclosure</b>	Weather Proof IP 67, NEMA 4 & 4X, O-ring sealed (EQ 6 IP6)
<b>Main Power Supply</b>	110 / 220V AC /1Ph/ 50/ 60Hz, 380 /440V AC /3Ph /50 /60 Hz ±10%
<b>Control Power Supply</b>	110 /220 V AC /1Ph/ 50 /60 Hz ±10%
<b>Duty Cycle ( On – Off )</b>	S2, 20~50% Max 10Min ~ 30Min
<b>Duty Cycle ( Modulating)</b>	S4, 30~50%, 300~1200 start /Hour
<b>Motor</b>	Squirrel Caged induction motor
<b>Limit Switches</b>	2 each for Open / Close (SPDT 250 VAC /10A rating except for EQ 6)
<b>Torque Switches</b>	1 each for Open / Close (SPDT 250 VAC /10A rating except for EQ 6, 10)
<b>Stall Protection / Set Temperature</b>	Built in Thermal protection, High 150°C±5°C, Low 97°C±15°C
<b>Travel Angle</b>	90° ±5°(0° ~ 100°)
<b>Position Indicator</b>	Plate with indication Arrow
<b>Manual Override</b>	De-clutchable (except for EQ 6)
<b>Self locking</b>	Provided by double worm gearing (no brake) (except for EQ 6)
<b>Mechanical Stopper</b>	1 each for each travel end (Open and Close), external & adjustable (except for EQ 6)
<b>Heater</b>	5 W (110 / 220 VAC ) for anti-condensation
<b>Cable Entries</b>	2 X PF ¾ “ Tap (except for EQ 6 2 X PT ½ TAP)
<b>Lubrication</b>	EP type grease
<b>Terminal Block</b>	Screw and Lever Push type (spring loaded)
<b>Ambient Temperature</b>	- 20 °C - 70 °C
<b>Ambient Humidity</b>	90 % RH Max (Non – Condensing)
<b>Anti – Vibration</b>	XYZ 10g, 0.2 - 34 Hz, 30 minutes
<b>External Coating</b>	Dry Powder (Polyester)

## Mechanical

Symbol	Description	Remark
EX	Explosion Proof (Ex d II B(C) T4)	Except for EQ 6
WT	Watertight (IP68)	Except for EQ 6
ALS	Auxiliary limit switches (Max 4 for each travel end)	Except for EQ 6, 10 c/w option
ATS	Auxiliary torque switches (Max 4 for each travel end)	Except for EQ 6, 10
EXT	Extended travel angle (upto 120°, 135°, 180°,270°)	Except for EQ with Gear box
SV	Variation in torque and operating speed	Please consult before order

## Remote monitoring and control

PK	Potentiometer kit (1 Kohm)	
CT	Current transmitter (output : 4-20mA DC)	
RPC	Remote position controller (by input and output signal)	Refer to below signal configuration
RPD	Remote position controller (by input and output signal) with display (LCD)	
Signal configuration	Input : 4-20mA, 0-10VDC, 2~10VDC, 1~5VDC, 0~5VDC	
	Output : 4-20mA, 0-10VDC, 2~10VDC, 1~5VDC, 0~5VDC	

## Local monitoring control

LP2	Local position control (Remote / Local, Open / Stop / Close with lamps)
LM1	Integrated motor starter without local control switches (On-Off only)
LM2	Local position control (Remote / Local, Open / Stop / Close with lamps) with integrated motor starter (Mechanical)
LD	Local position control (Remote / Local / Open / Stop / Close with lamps) with integrated motor starter, monitoring relays

### Local Position controller LP2

- 1) Type : Rotary switches with position lamps
- 2) Operating
  - Selector switch : Remote (with Yellow lamp), Local (with Red Lamps)
  - Control switch : Open / Stop / Close
  - Local display : Green lamp at open position, Red Lamp at close position



LP2

### LM1 for 3 phase actuator

- Integrated 2 magnetic contactors for open and close without control device.

### LM2 for 3 phase actuator

- 1) Type : Rotary switches with position lamps
- 2) Operating
  - Selector switch : Remote (with Yellow lamp), Local (with Red Lamps)
  - Control switch : Open / Stop / Close
  - Integrated 2 magnetic contactors for Open/Close, Power source for control
- 3) Options for remote monitoring and control
  - PK (0~1Kohm), CT (4-20mA output signal), RPC (or RPD) for 4-20mA input/output signal



LM2

## RPC

- A combination of electronic positioner (4-20mA input, proportional control) and transmitter(4-20mA continuous output signal)
- Auto-calibration provides the most convenient to user without complicated set in field

## LD

- 1) Type : 2 Magnetic sensors (Rotary type) with status monitoring lamps
  - Operating : Selector switch – Off, Local, Remote (Off: Stop or turn off)  
Control switch – Local open, Close
- 2) Local display : Remote / Local, open, close, over torque
- 3) Remote control : Type : 5000V Opto-Isolated, DC24V, AC110 both
  - Command : Open/Close/Stop/ESD (Emergency shut down)
  - Output : Relay and direct from switch (Full open/full Close)
- 4) Options
  - CT (Current transmitter) : Both sink/Source type, output 4-20mA
  - RPC (or RPD) for 4-20mA input and output signal
  - Profibus communication : 1.5 Mbps, 1 channel, SPC-3





## EQ Electric Actuator Standard selection guide for valves

VALVE ACTUATOR	BUTTERFLY VALVE 10K ANSI 150#	BUTTERFLY VALVE 20k ANSI 300#	2-WAY BALL VALVE 10K ANSI 150#	2-WAY BALL VALVE 20K ANSI 300#	3-WAY BALL VALVE 10K ANSI 150#
EQ 6	80A(3")	65A(2 1/2")	32A(1 1/4")	25A(1")	25A(1")
EQ10	100A(4")	80A(3")	50A(2")	40A(1 1/2")	40A(1 1/2")
EQ16	125A(5")	100A(4")	65/80A (1/2" / 3")	50A(2")	50A(2")
EQ24	150A(6")	125A(5")	100A(4")	65 / 80A (2 1/2" / 3")	65 / 80A (2 1/2" / 3")
EQ35	200A(8")	150A(6")	150A(6")		
EQ50	250A(12")				100A(4")
EQ80	350A(14")	250A(10")	200A(8")	125A(5")	125A(5")
EQ110	400A(16")	300A(12")		150A(6")	150A(6")
EQ150	450A(18")	350A(14")	250A(10")		
EQ200	500A(20")	400A(16")	300 / 350A (12" / 14")	200A(8")	200A(8")
EQ300	600A(24")	450 / 500A (18" / 20")		250 / 300A (10" / 12")	250 / 300A (10" / 12")

\* Above table is for reference only