



## Electro-hydraulic Quarter-turn Valve Actuator for General Purpose Modulating

The SB-405/406 are compact and robust electrically operated fail safe spring-return, quarter-turn actuators for modulating applications. They are suitable for all types of quarter-turn valves and provide end torque ranging from 24 to 480 Nm (212 to 4,248 lbf-in). Environmental protection is to IP65 / NEMA 4.

These electro-hydraulic actuators combine the simplicity of electrical operation with the precision of hydraulic control and the reliability of spring-powered fail-safe action thereby offering the most reliable means of positioning a valve or damper to a safe condition upon loss of power. They can be provided as fail safe close, open, or last position and are available with either a clockwise or anticlockwise spring stroke.

The actuators are available with an internal positioner for modulating applications. The positioner accepts an analogue input signal, provides an output of actual valve position and accurately positions the actuator. With a resolution better than 0.2°, they offer control superior to conventional electric or pneumatic solutions.

All models are supplied with end-of-stroke limit switches or a pressure switch for fail open applications. Optional quick-release hydraulic valves are available for fail safe emergency shutdown applications.

A manual override gearbox is available on all sizes as is biodegradable oil for food and water applications.



The **SKILMATIC**<sup>®</sup>  
Range

### Features

- Electrically operated spring-return for fail safe open, close or lock-in-last position.
- 110/120 or 230 VAC, 50/60 Hz power supply options.
- Low power consumption.

# SB405/406 Specification

## Ordering Information and Model Code

KEY MODEL CODE	SB405	A	2	A	3	A	MO
Table 1	Actuator Type						
Table 2	Supply Voltage						
Table 3	Failure Mode						
Table 4	Actuator Size						
Table 5	Control Options						
Table 6	Input Signal						
Table 7	Accessories						

**Table 1 – Actuator Type**

Code	Description
SB405	Quarter-turn electro-hydraulic power unit directly mounted to type A, or B actuators. See table 4 and note 1.
SB406	Quarter-turn electro-hydraulic power unit directly mounted to type C, D, E, F or G actuators. See table 4 and note 1.

**Table 2 – Supply Voltage**

Code	Description
A	230 VAC ± 10% 50 Hz.
B	110 VAC ± 10% 50 Hz.
C	120 VAC ± 10% 60 Hz.

**Table 3 – Failure Mode**

Code	Description
1	Fail in position (hold pressure) 1.6 mm. See table 4 for stroke speeds.
2	Fail safe (release pressure) standard 1.6 mm. See table 4 for stroke speeds.
5	Internal quick release fail in position 2.4 mm. See table 4 for stroke speeds.
6	Internal quick release fail safe 2.4 mm. See table 4 for stroke speeds.

**Table 4 – Actuator Size**

Code		Torque Nm (see note 2)						Stroke speed (Seconds)			
Spring Return		Hydraulic Stroke			Spring Return			Hydraulic Direction	Spring Direction (See table 2 & 6)		
Clockwise	Anti-clockwise	Start	Mid	End	Start	Mid	End		1.6 mm	2.4 mm	ESD
A	AA	34	-	17	38	-	24	16	8	3	-
B	BA	50	-	23	60	-	38	22	10	4	-
C	CA	95	42	60	93	40	65	30	10	5.5	1.5
D	DA	190	95	120	180	100	140	30	18	10	2
E	EA	290	140	170	325	170	240	50	30	15	4
F	FA	720	360	500	500	260	380	95	60	29	6
G	GA	620	300	350	630	340	480	95	60	29	6

**GENERAL NOTES:**

1. Power units complete with all mounting kits to suit specified actuators.
2. All torques are in Nm (lbf-in x 8.85).
3. Stroke speeds are typical for actuators with no load at 20 °C, tolerance ± 10%.

**Table 5 – Control Options**

Code	Description
1	On/off control.
3	Modulating control, internal electronic interface.
5	Valve position feedback potentiometer for use with external electronic interface model 452 or remote valve position indicator.

**Table 6 – Input/Output Signal**

Code	Description
A	4-20 mA (table 5 code 3).
B	20-4 mA (table 5 code 3).
C	0-10 VDC (table 5 code 3).
D	10-0 VDC (table 5 code 3).
E	On/off control (table 5 code 1 and 5).

**Table 7 – Accessories**

Code	Description
M0	Geared manual override.
ESD1	External emergency shutdown. See table 3 stroke speeds.
PS	Pressure switch (torque switch) for model
NPT	1/2" NPT cable entries.
BIO	Bio-degradable oil (for water and food industries).
SI	20 cSt Silicone oil (for low temperature applications -35 °C).
CH	Anti-condensation heater.
A/M	Local auto/manual switch unit.
BR	Valve mounting kit to suit specific valve.



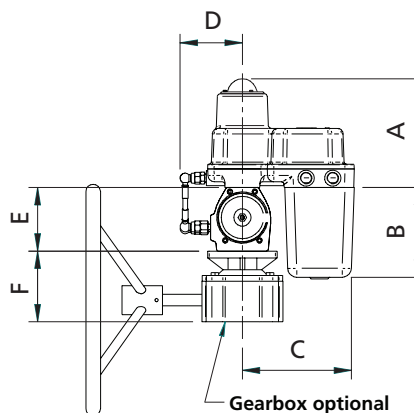
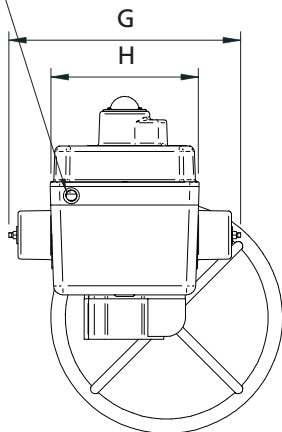
## Specification

<b>Enclosure:</b>	Weatherproof to IP65 / NEMA 4. Cast aluminium BS 1490 Grade LM 27 (equivalent ASTM B179 Grade 328.1).	<b>Electrical Supply:</b>	230 VAC, 110 VAC 50 Hz or 120 VAC 60 Hz $\pm$ 10%.
<b>Actuator Body:</b>	Anodised aluminium.	<b>Input Signal:</b>	4-20 mA, 20-4 mA, 0-10 VDC or switched main supply for two position.
<b>Piston:</b>	Aluminium	<b>Output Signal:</b>	4-20 mA or 0-10 VDC.
<b>Drive shaft:</b>	Zinc-plated stainless steel.	<b>Deadband Adjustment:</b>	0-2.5% of range.
<b>Springs:</b>	Corrosion protected spring steel.	<b>Duty Rating:</b>	95%.
<b>Paint Finish:</b>	Textured 2-pack epoxy (150 microns thick).	<b>Resolution:</b>	<0.2°.
<b>Weight:</b>	See dimensional detail on last page.	<b>Repeatability:</b>	<0.25%.
<b>Operating Temperature:</b>	Two-position: -25 to 75 °C (-13 to 167 °F). Modulating: -25 to 60 °C (-13 to 140 °F). Optional: -35 to 60 °C (-31 to 140 °F). See "SI" table 7.	<b>Power Consumption:</b>	Model SB405: @ 230 VAC - 207 VA (106 Watts) nominal, @ 110 VAC - 264 VA (135 Watts) nominal, reducing to 15 VA (6 Watts) in balanced state.  Model SB406: 374 VA (190 Watts) nominal, reducing to 15 VA (6 Watts) in balanced state.
<b>Mounting:</b>	Vertical or horizontal (See Instruction Manual)	<b>Limit Switches:</b>	Two spare volt-free switches rated at 5 A at 230 VAC.
<b>Action:</b>	Spring return clockwise or anti-clockwise.	<b>Cable Entries:</b>	Three entries threaded M20 or 1/2" NPT (SB405 has two cable entries).
<b>Failure Mode:</b>	Fail safe in the direction of the spring or fail in last position.		
<b>Torque/ Stroke Speed:</b>	See table 4.		
<b>Hydraulic Fluid:</b>	10 cSt hydraulic fluid or optional 15 cSt bio-degradable fluid.		

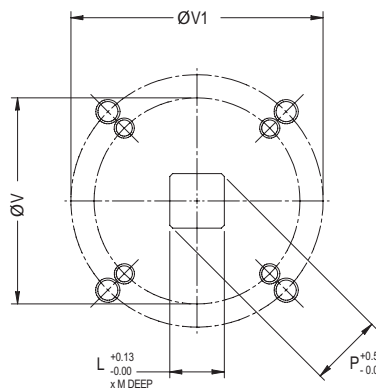
*For on/off control applications see product specification for SB301/2.*

## SB405/406 Dimension & Mounting Details

Conduit Cable Entries:  
M20 x 1.5 pitch as standard  
1/2" NPT available to order



DIMENSIONS (mm)	ACTUATOR CODE						
	Model SB405		Model SB406				
	A	B	C	D	E	F	G
A	185	185	187	187	187	187	187
B	133	133	155	155	155	155	155
C	157	157	188	188	188	188	188
D	95	100	107	107	127	127	127
E	93	105	113	113	158	158	158
F	70	70	119	119	131	131	131
G	204	49	265	400	375	570	570
H	220	220	257	257	257	257	257
L	14	14	17	22	22	27	27
M	27	30	30	30	30	37	37
P	18.1	18.1	22.2	28.2	28.2	36.2	36.2
∅V	50	50	70	70	102	102	102
∅V1	70	70	102	102	125	125	125
W	M6 x 10 M6 x 10		M8 x 14	M8 x 14	M10 x 17	M10 x 17	M10 x 17
W1	M8 x 10 M8 x 10		M10 x 17	M10 x 17	M12 x 21	M12 x 21	M12 x 21
Weight (kg)	20	21	22	24	37	47	47
Weight (kg) with gearbox	23.5	24.5	32	34	52	62	62



Flange & Square Drive Details  
to ISO 5211