

## Electro-hydraulic Quarter-turn Valve Actuator for Hazardous Areas

The SB-Q are compact and robust electrically operated fail safe spring-return, quarter-turn actuators for two-position and ESD applications. They feature the Rotork double-seal system with separate termination and cable gland compartments, are suitable for all types of quarter-turn valves and are supplied with a mounting flange to ISO 5211. The range is divided into two groups: SB-1Q with end torque ranging from 65 to 480 Nm (575 to 4,248 lbf-in), and SB-2Q with end torque ranging from 380 to 4,400 Nm (3,360 to 39,000 lbf-in).

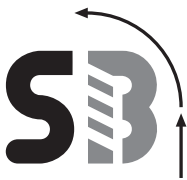
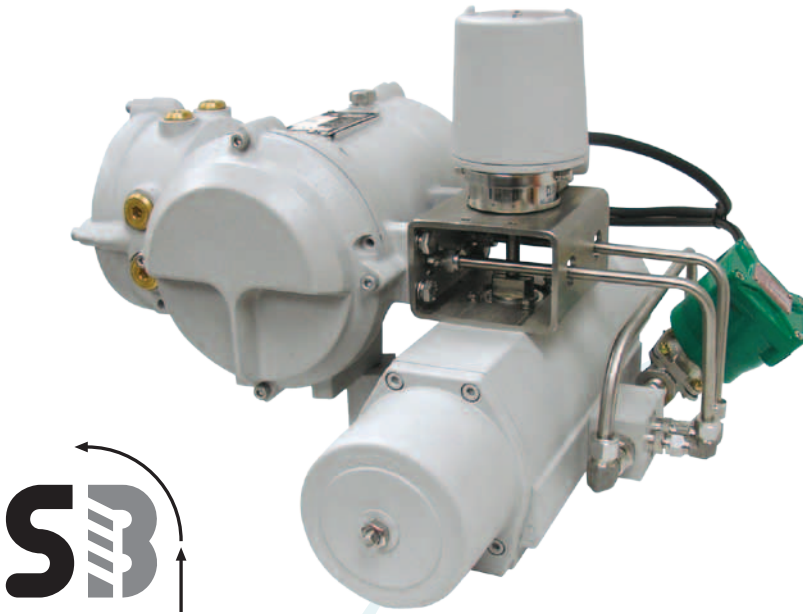
SB-Q actuators are specifically designed for hazardous areas, explosionproof EExdm IIB T4, but are also available watertight and dusttight to IP67 / NEMA 6 with the option of IP68.

Consisting of a self-contained electro-hydraulic control module and scotch yoke spring-return drive, the actuators combine the simplicity of electrical operation with the precision of hydraulic control and the reliability of spring-powered fail-safe action. The spring-return mechanism provides the most reliable means of positioning a valve to the safe condition and can be provided as fail safe close, open, or last position on loss of power or signal failure. They are available with either a clockwise or anticlockwise spring stroke.

SB-Q actuators are designed specifically for on/off duty, particularly where failsafe ESD is required. They provide an electrical torque limiting facility by utilising an internal pressure switch to isolate the hydraulic pump should over-pressure be detected. Adjustable electro-mechanical volt-free end-of-stroke limit switches are provided.

A manual override gearbox is available on all sizes.

See SI range specifications for applications where more advanced control functions are required.



The **SKILMATIC**<sup>®</sup>  
Range

### Features

- Self-contained electrically operated with internal low-pressure electro-hydraulic control module.
- Spring-return for fail safe open or close.
- Dual redundant hydraulic oscillating pumps.
- Single or dual fail safe solenoids.
- Single-phase 115 or 230 VAC power supply.
- Two-position control with torque / pump protection.
- Watertight and explosionproof.
- Double-sealed control module with separate terminal and cable gland compartments.
- Adjustable electro-mechanical volt-free limit switches.

# SB-1Q Specification

## Ordering Information and Model Code

ACTUATOR SELECTION		SB-1-Q51	0	0	2	1	0	0	0	A	A
Table 1	Actuator Size										
Table 2	Failure Mode										
Table 3	Return Speed Options										
Table 4	Supply Voltage										
Table 5	Control Option										
Table 6	Certification										
Table 7	Cable Entries										
Table 8	Hydraulic Fluid / Operating Temperature										
Table 9	Mounting										
Table 10	Accessories										

**Table 1 – Actuator Size**

Code		Torque Nm (lbs-in)						Stroke Speed (Seconds)			
Spring-Return Direction		Hydraulic Stroke			Spring-Return			Hydraulic	Spring-Return (See table 3 & note 2)		
Clockwise	Anti-Clockwise	Start	Mid	End	Start	Mid	End		A	B	C
SB-1-Q31	SB-1-QA31	95 (840)	42 (372)	60 (530)	93 (823)	40 (354)	65 (575)	15	5.5	3	1.5
SB-1-Q41	SB-1-QA41	190 (1680)	95 (840)	120 (1060)	180 (1590)	100 (885)	140 (1239)	30	10	6	2
SB-1-Q51	SB-1-QA51	290 (2565)	140 (1240)	170 (1505)	325 (2875)	170 (1504)	240 (2124)	50	15	10	4
SB-1-Q60	SB-1-QA60	720 (6370)	360 (3185)	500 (4425)	500 (4425)	260 (2300)	380 (3363)	95	29	19	6
SB-1-Q61	SB-1-QA61	620 (5487)	300 (2655)	350 (3095)	630 (5575)	340 (3009)	480 (4248)	95	29	19	6

**Table 2 – Failure Mode**

Code	Description
0	Fail safe on loss of power supply (in direction of spring).
1	Fail in position on loss of power supply.

**Table 6 – Certification**

Code	Description
0	Watertight IP67.
1	ATEX: Hazardous area Gas group IIB (IP67).

**Table 3 – Spring-Return Speed & ESD Options**

Code	Description
0	Speed A – Single internal solenoid
1	Speed B – Dual internal solenoid
2	Speed C – Single internal & external solenoid (note 4).
3	Speed D – Slow acting internal solenoid, consult sales office.

**Table 7 – Cable Entries**

Code	Description
0	M25 x 1.5P
1	M20 x 1.5P
2	1/2" NPT
3	3/4" NPT
4	1" NPT

**Table 4 - Supply Voltage**

Code	Description
0	1-phase 115 VAC ± 10% 50/60 Hz.
1	1-phase 230 VAC ± 10% 50/60 Hz.

**Table 5 - Control**

Code	Description
0	Two wire – two position control
1	Three wire for remote controls

**GENERAL NOTES:**

1. Select one option from each table except table 10 which has multiple options.
2. Stroke speed is typical for all actuators with no load at 20 °C ±10%
3. External solenoid options available waterproof to IP67, not IP68.  
FM certified actuators available to -20 °C only.



**Table 8 – Hydraulic Fluid/Operating Temperature**

Code	Description
0	Mineral fluid -20 to +60 °C.
3	Food grade fluid -10 to +60 °C.
4	Silicone fluid -30 to +60 °C (note 4 & 6).
5	Silicone fluid / low temperature seals -35 to +60 °C (note 4 & 6).

**Table 9 – Mounting**

Code	Description
A	Vertical stem above valve.
B	Vertical stem below valve.
C1	Valve stem & pipeline horizontal.
C2	Valve stem horizontal, pipeline vertical.
D	Vertical stem above valve with valve mounting kit.
E	Vertical stem below valve with valve mounting kit.
F1	Valve stem & pipeline horizontal with valve mounting kit.
F2	Valve stem horizontal, pipeline vertical with valve mounting kit.

**Table 10 – Accessories**

Code	Description
A	None.
B	Manual override hydraulic hand pump.
C	Manual override (gearbox standard IP65).
D	Watertight IP68 (7m for 72 hours).
F	Two additional volt-free SPDT limit switches (four total).
H	All cable entries plugged.
J	Viton seals.



## Certification

**ATEX - II 2G EEx dme\* IIB T4 (T<sub>amb</sub> -35 to +60 °C)**  
EN60079-0, EN60079-1, EN60079-7,  
EN60079-18, EN13463-1.

**FM - Class I, Zone1 AEx dme\* IIC T4 (Ta -20 to +60 °C)  
(Pending)** Class3600, ANSI/ISA-12.00.01,  
ANSI/ISA-12.22.01, ANSI/ISA-12.16.01  
ANSI/ISA-12.23.01, Class3810 & ANSI/NEMA-250.  
\*‘e’ increased safety available on single phase & DC  
supply voltage only.

**INMETRO: BR-Ex dme IIB T4 (T<sub>amb</sub> -35 to +60 °C)**

Note: Certification temperatures are not operating temperatures.

**Enclosure:** Watertight to IP67 / NEMA 6, double-sealed  
protection with separate cable gland and  
termination compartment. Optional to IP68  
(7 meters /72 hours). Consult factory for alternative  
depths / pressures consult factory. External ESD  
solenoid option is only available to IP67.

## Materials

**Control  
Module:** Aluminium.

**Actuator  
Body:** Anodised aluminium.

**Actuator  
Springs:** Corrosion protected spring steel.

**Switchbox:** Aluminium.

**Mounting  
Bracket:** Steel.

**Piping:** 316 Stainless steel (hard piped).

**Paint Finish:** 2-pack epoxy silver grey (150 microns thick).

## Mechanical

**Operating  
Temperature:** See table 8.

**Torque/  
Speed:** See table 1.

**Stroke Q31  
& Q41:** 0 to 90° ± 3° in the end of spring direction.

**Stroke Q51  
to Q61:** 0° ± 3° to 90° ± 3° in the end of spring direction.

**Weight:** See dimensional detail opposite.

**Failure Mode:** Fail safe in the direction of the spring or fail in  
last position.

**Action:** Spring-return clockwise or anti-clockwise.

**Hydraulic  
Fluid:** See table 8.

**Max. Working  
Pressure:** 12 bar (175 psi).

**Manual  
Override:** Optional gearbox or hydraulic hand pump.

**Mounting:** Valve stem vertical or horizontal (see table 9).

## Electrical

**Electrical  
Supply:** 1-phase 115 or 230 VAC.

**Supply  
Tolerance:** Supply voltage ± 10 %. Frequency 50/60 Hz ± 5 %.

**Power  
Consumption:** 400 VA max.

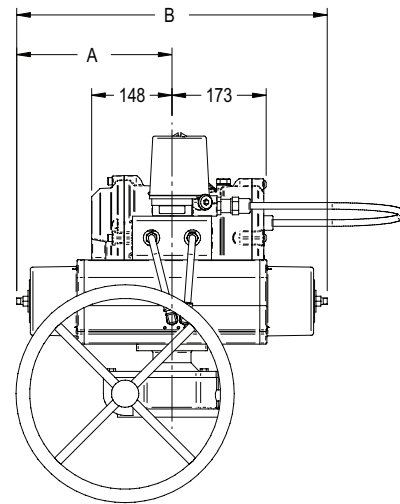
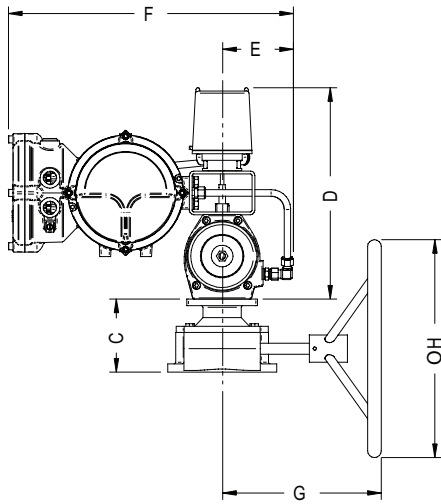
**Pump Coil  
Protection:** Thermal cutouts and thermal fuse.

**Cable  
Entries:** Power module has a minimum of two spare entries.  
(see table 7) plus two plugged M20 cable entries.  
See drawing No SMW-SI-010 for options.  
Switchbox spare entry will be plugged:  
ATEX = M20, FM/ CSA = 1/2" NPT.

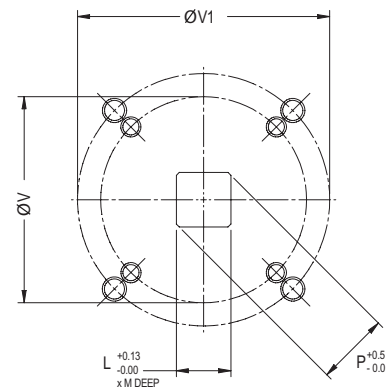
**Limit  
Switches:** Three spare adjustable electro-mechanical  
SPDT volt-free switches.  
Rating 5 A minimum at 230 VAC (See Table 10.)

# SB-1Q specification

## SB-1Q Dimension & Mounting Details



DIMENSIONS (mm)	ACTUATOR CODE				
	SB-1-Q31 SB-1-QA31	SB-1-Q41 SB-1-QA41	SB-1-Q51 SB-1-QA51	SB-1-Q60 SB-1-QA60	SB-1-Q61 SB-1-QA61
A	65	200	90	285	285
B	265	400	375	570	570
C	119	119	131	131	131
D	331	331	354	354	354
E	107	107	133	133	133
F	500	500	525	525	525
F*	584	584	609	609	609
G	272	272	292	312	312
H	400	400	400	600	600
L	17	22	22	27	27
M	30	30	30	37	37
P	22.2	28.2	28.2	36.2	36.2
∅V	70	70	102	102	102
∅V1	102	102	125	125	125
W	M8 x 14	M8 x 14	M10 x 17	M10 x 17	M10 x 17
W1	M10 x 17	M10 x 17	M12 x 21	M12 x 21	M12 x 21
Weight (kg)	27	30	38	42	42
Weight (kg) with gearbox	39	42	56	60	60



Flange & Square Drive Details to ISO 5211

**NOTE:** Manual override gearbox is optional.

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