Reliability,
Security,
User Friendly.

BC PREMIUM

by

BERNARD CONTROLS

LABEL BC PREMIUM

BERNARD® CONTROLS

Invest in Confidence

FAIL SAFE ELECTRIC ACTUATORS

FQ RANGE

LABEL

BC PREMIUM

Reliability
Security
User Friendly

BERNARD CONTROLS introduces the BC Premium label.
The BC Premium label is the guarantee of high performance, reliable and innovative actuator solutions designed to sustain severe environmental and operational conditions.
Decades of return of experience from very demanding applications such as nuclear qualified valves actuation have shaped our technical orientations and our commitment to quality and safety.
Moreover, BC Premium labeled products offer user-friendliness and extremely low level of maintenance requirements.

Contents

Failsafe electric actuators

For all quarter turn applications, spring return FQ range actuators ensure automatic opening or closing even without any power supply.

Operating principle

When energized, the actuator operates the valve normally and at the same time compresses the spring which is held in the loaded position by a solenoid brake.
In case of power failure to the solenoid, the spring will drive the actuator and valve to the safety position either open or closed. The associated dashpot speed controls the spring action and allows a safe and shockfree operation of the valve.
When the power supply is restored (no resetting of the spring is required), the actuator is immediately available for normal operation.
In standard, the spring operates clockwise when viewed from the top. The electric part is equipped with an asynchronous three-phase motor of squirrel cage type. Other versions are available in single phase and direct current supply.

Application fields

All applications where the loss of power supply requires automatically to put the driven device in a safety position.
All applications where the risks are such, that driving the device to its safety position must be possible at any time even in the absence of power supply.

For example :

Storage and distribution of gas and dangerous fluids
Refineries trucks loading arms
Fire protection systems
Chemical installation safety
Climate control and ventilation on hazardous areas
Ventilation of hazardous areas


BERNARD CONTROLS
TYPE TYP
FQ12
Moteur - Motor
0.03 KW 230 V 1 Ph
30 % 0.5 A 50 Hz
Actionneur - Antrieb - Actuator
120 Nm/90° 120 Nm/360°
0.16 tr/min u/min rpm 0.25 tours umdr. turns
N° 03L08363 001
MADE IN FRANCE
CE

Main features

For all quarter turn applications, spring return FQ range actuators ensure automatic opening or closing even without any power supply.

Easy to use, maintenance free

- No periodic maintenance required.
- Trouble free operation for years (the FQ system is not battery technology based).
- Spring efficiency guaranteed over the full 90° travel.
- Fast and shock-free operation of the valve during emergency closing / opening.
- Travel limit switches easy to set with a simple screw driver and unaffected by mechanical vibrations effects.
- Easy access to electrical connections via a terminal strip.

FQ actuator is supplied complete with:

- Mechanical position indicator
- Adjustable quarter-turn mechanical stops
- 2 Travel limit switches setting easy, with a simple screw driver
- Electrical connection to a terminal strip
- Emergency handwheel on all models (excepted the FQ04 and the FQ08)

FQ actuators are available as:

- On-Off: Maximum recommended 20-30 full stroke travels per day. 30% motor service duty.
- Class III: Modulating intermediate positioning with a precision better than 2%. Maximum recommended: 360 movements per day. 50% motor service duty.

What is Fail Safe ?

The activation of an emergency signal triggers the immediate opening or closing of the backup device, without the need of any external power source and using a full mechanical spring return.

This signal can be activated following:

- An abnormal event (fire, overflow ...)
- An automatic control
- An operator's action
- A lack of power supply

Enclosures

FQ actuators are weather-proof to IP67 and are also available as explosion-proof according to international standards

Possible options

- MOTOR :
  - 3PH 50 or 60 Hz
  - 1PH 50 or 60 Hz
  - DC – versions

- On/Off or Positioning
- Advanced controls with local buttons
  - INTEGRAL+ (On/Off)
  - POSIGAM+ (Positioning)
- Extra limit switches
- Anticondensation heater resistor
- Position transmitters : 4-20mA or Potentiometer

- Solenoid brake
  - 115V AC
  - 230V AC
  - DC version
- Fast spring return
- Clockwise or Counterclockwise spring action

Technical data

General specifications

General specifications	Torque range	Quarter turn, direct mounting from 40 to 500Nm
	Modulating class	On-off or class III
Enclosure	Enclosure	Cast aluminium
	Waterproofness	IP67
	Programming	FQ range is generally proposed with standard control (camblock + end-of-travel switches). INTEGRAL+ & POSIGAM+ (See INTEGRAL+ catalogue) advanced controls are also possible with separated control box. Maximum distance between control box and actuator: 50m
	Explosion proof ATEX (option)	ATEX Directive 94/9/EC - CENELEC EN 50014, EN 50018 As standard: EEx d IIC T4 (option T5 or T6) - Ex II 2 G Certificate : LCIE 02 ATEX 6902
	Ambient temperature operating range	EEx d IIC T4 : -20°C to 70°C (-40°C in option) EEx d IIC T5 : -20°C to 65°C (-40°C in option) EEx d IIC T6 : -20°C to 50°C (-40°C in option)
	Explosion proof C.S.A. (Canada & USA) (option)	NEMA 7 - NEMA 9 certified C22-2, FM3600, FM3611 and FM3615 standards Class I Group C, D div 1&2 (option Group B) Class II Group E, F, G div 1&2 Certificate : 1061444
	External corrosion protection	Standard paint system: Zinc rich primer, epoxy undercoat and RAL5002 blue protection polyurethane top coat. Optional special anti-corrosion protection for marine, aggressive or abrasive atmospheres. All cover fasteners captive and stainless
Motor	Motor technology	TENV type (Totally Enclosed Non Ventilated). Class F insulation class. Integrated thermal overload protection.
	Motor duty rating	S4 motor service (Intermittent periodic duty with startings) to IEC 34-1 • S4 - 30% for ON/OFF operation - up to 360 starts per hour. • S4 - 50% for Modulating class III - up to 1,200 starts per hour.
Mechanical specifications	Gearing	Self-locking
	Manual override	Function available on FQ12, FQ18, FQ30 and FQ50. Handwheel does not rotate during motor operation. Padlockable clutch lever
	Spring return	CW as standard, CCW on request (non reversible device) Fast spring return in option
	Output flange	Flange comply with ISO 5211 (Optionnal standard flange on FQ04 to FQ18)
	Output drive	Direct output drive on FQ04 to FQ18 (Removable socket in option) Removable socket on FQ30 and FQ50
	Vibration Resistance	1g (9.8 m/s²) at 10-500 Hz For higher vibration resistance, please contact us.
	Lubrication	Actuators are lubricated for product lifetime and do not require any specific periodic maintenance

Electrical specifications	Power supply	Actuators are available for a wide range of power supplies : • Single-phase, three-phase or DC voltages • 50 ou 60 Hz • Specific voltages on request
	Cable entries	Standard configuration (other on request): 3xM20 • 2 for signalling, • 1 for power supply
	Solenoid brake	The solenoid rated power is 21 W. This solenoid is normally under permanent power supply. Need separated power supply. Nominal voltage : • 230V AC for 230V or 400V AC actuators • 115V AC for 115V or 460V AC actuators • 24V DC for 24V DC actuators Other possible voltages on request
	Position sensors	• Movement read directly on the main shaft (direct mechanical link) • Adjustable camblock with 2 SPDT end-of-travel switches • 2 extra position switches in option • Independent position transmitter (TAM or potentiometer) in option

Advanced controls (option)	Models	Two versions according to operating modes: INTEGRAL+ for ON/OFF which includes : • Terminal compartment • Power contactors • Logic control • Configuration panel • Signalling relays • Local control selectors POSIGAM+ for Class III positioning : • All INTEGRAL+ features • Positioner board • Position feedback
	Enclosure protection	Separated FPi box (weatherproof design) • Standard: IP67 / NEMA 4 Separated FPx box (Explosionproof design) • Standard: IP67 / EEx d IIC T6 - NEMA 7 / 9
	On-off control	• Isolated by opto-couplers • Voltage: 10 to 250 V DC/AC • Current: 10 mA at 24V • Dry contacts (uses INTEGRAL+ auxiliary DC supply) • Minimum pulse duration: 100ms • Time of rotational direction change: 50ms or 200ms
	Positioning control	• Standard : Input signal 4-20 mA - Output signal 4-20 mA • On request :Input signal 0-20 mA - Output signal 0-20 mA • On request : Input signal 0-10 V - Output signal 0-20 mA
	Signaling relays	• 4 relays: 4 datas can be freely selected among a total of 16 available datas (250VAC-5A max.) • 1 fault relay
	Cable entries	Standard configuration (other on request): 3xM20 (2 for signalling, 1 for power supply)
	EU conformity	INTEGRAL+ / POSIGAM+ controls complying with: • The 2004/108/EC electromagnetic compatibility • The 2006/95/EC low voltage • The following harmonized standards: Generic emission standard-Industrial environment EN 61000-6-4 Generic immunity standard - Industrial environment EN 61000-6-2. Degrees of protection provided by enclosures (IP code) EN 60529
	Vibration resistance	1g (9.8 m/s²) at 10-500 Hz
ADDITIONAL OPTIONS	Fieldbus interface (option)	Profibus DP (single or redundant) • PROFIBUS-DP slave - RS 485 • Baudrate: autodetection • Total number of master and slave modules on the same line: 31 max. up to 99 with repeaters • PROFIBUS operability approved by PNO (Profibus Nutzer Organisation) • External power supply backup
	Additional options	• LED indication board (closed, open, power on) • Additional 3 relays board • Additional position transmitter isolated from the other output signals

Performances

ON/OFF

3 PH 400V 50 Hz ON/OFF

Max	Type	Operating time 90°/sec			Flange	S4 service - D.R. : 30%					
Torque		Motor	Spring			Power	Speed	Current	Current	Cos	Efficiency
Nm		Sec	Fast	Std	ISO	kW	rpm	rated A	start A	Φ	%
40	FQ04	14	3	7	F07	0,06	3000	0,3	0,9	0,8	43
40	FQ04	33	3	7	F07	0,06	3000	0,3	0,9	0,8	43
80	FQ08	33	2	6	F07	0,06	3000	0,3	0,9	0,8	43
120	FQ12	39	2	10	F10	0,06	3000	0,3	0,9	0,8	43
120	FQ12	93	2	10	F10	0,06	3000	0,3	0,9	0,8	43
180	FQ18	93	3	15	F10	0,06	3000	0,3	0,9	0,8	43
300	FQ30	117	7	18	F14	0,06	3000	0,3	0,9	0,8	43
500	FQ50	117	9	27	F14	0,06	3000	0,3	0,9	0,8	43

3 PH 460V 60 Hz ON/OFF

Max	Type	Operating time 90°/sec			Flange	S4 service - D.R. : 30%					
Torque		Motor	Spring			Power	Speed	Current	Current	Cos	Efficiency
Nm		Sec	Fast	Std	ISO	kW	rpm	rated A	start A	Φ	%
40	FQ04	12	3	7	F07	0,07	3600	0,3	0,9	0,8	43
40	FQ04	28	3	7	F07	0,07	3600	0,3	0,9	0,8	43
80	FQ08	28	2	6	F07	0,07	3600	0,3	0,9	0,8	43
120	FQ12	33	2	10	F10	0,07	3600	0,3	0,9	0,8	43
120	FQ12	78	2	10	F10	0,07	3600	0,3	0,9	0,8	43
180	FQ18	78	3	15	F10	0,07	3600	0,3	0,9	0,8	43
300	FQ30	98	7	18	F14	0,07	3600	0,3	0,9	0,8	43
500	FQ50	98	9	27	F14	0,07	3600	0,3	0,9	0,8	43

1 PH 230V 50 Hz ON/OFF

Max	Type	Operating time 90°/sec			Flange	S4 service - D.R. : 30%					
Torque		Motor	Spring			Power	Speed	Current	Current	Cos	Efficiency
Nm		Sec	Fast	Std	ISO	kW	rpm	rated A	start A	Φ	%
40	FQ04	33	3	7	F07	0,03	3000	0,5	1,1	0,9	25
40	FQ04	33	2	6	F07	0,03	3000	0,5	1,1	0,9	25
80	FQ08	93	2	10	F07	0,03	3000	0,5	1,1	0,9	25
120	FQ12	93	3	15	F10	0,03	3000	0,5	1,1	0,9	25
120	FQ12	117	7	18	F10	0,03	3000	0,5	1,1	0,9	25

Please note : *The operating time of the spring can increase according to the load.*
The mentioned operating times refer to the max output torque.

1 PH 115V 60 Hz ON/OFF

Max	Type	Operating time 90°/sec			Flange	S4 service - D.R. : 30%					
Torque		Motor	Spring			Power	Speed	Current	Current	Cos	Efficiency
Nm		Sec	Fast	Std	ISO	kW	rpm	rated A	start A	Φ	%
40	FQ04	28	3	7	F07	0,03	3600	0,7	2,6	0,9	40
80	FQ08	28	2	6	F07	0,03	3600	0,7	2,6	0,9	40
120	FQ12	78	2	10	F10	0,03	3600	0,7	2,6	0,9	40
180	FQ18	78	3	15	F10	0,03	3600	0,7	2,6	0,9	40
300	FQ30	98	7	18	F14	0,03	3600	0,7	2,6	0,9	40

24V DC ON/OFF

Max	Type	Operating time 90°/sec			Flange	S4 service - D.R. : 30%					
Torque		Motor	Spring			Power	Speed	Current	Current	Cos	Efficiency
Nm		Sec	Fast	Std	ISO	kW	rpm	rated A	start A	Φ	%
40	FQ04	30	3	7	F07	0,027	3000	2	7		66
80	FQ08	40	2	6	F07	0,027	3000	3	7		66
120	FQ12	100	2	10	F10	0,027	3000	2	7		66
180	FQ18	110	3	15	F10	0,027	3000	2	7		66
300	FQ30	150	7	18	F14	0,027	3000	3	7		66

CLASS III

3 PH 400V 50 Hz Class III

Max	Permanent	Type	Operating time 90°/sec			Flange	S4 service - D.R. : 50%					
Torque	Torque		Motor	Spring			Power	Speed	Current	Current	Cos	Efficiency
Nm	Nm		Sec	Fast	Std	ISO	kW	rpm	rated A	start A	Φ	%
40	20	FQ04	26	3	7	F07	0,03	1500	0,3	0,4	0,8	14
40	20	FQ04	61	3	7	F07	0,03	1500	0,3	0,4	0,8	14
80	40	FQ08	61	2	6	F07	0,03	1500	0,3	0,4	0,8	14
120	60	FQ12	78	2	10	F10	0,03	1500	0,3	0,4	0,8	14
120	60	FQ12	184	2	10	F10	0,03	1500	0,3	0,4	0,8	14
180	90	FQ18	184	3	15	F10	0,03	1500	0,3	0,4	0,8	14
300	150	FQ30	233	7	18	F14	0,03	1500	0,3	0,4	0,8	14
500	250	FQ50	233	9	27	F14	0,03	1500	0,3	0,4	0,8	14

Please note : *The operating time of the spring can increase according to the load.*
The mentioned operating times refer to the max output torque.

CLASS III

3 PH 460V 60 Hz Class III

Max	Permanent	Type	Operating time 90°/sec			Flange	S4 service - D.R. : 50%					
Torque	Torque		Motor	Spring			Power	Speed	Current	Current	Cos	Efficiency
Nm	Nm		Sec	Fast	Std	ISO	kW	rpm	rated A	start A	Φ	%
40	20	FQ04	22	3	7	F07	0,04	1800	0,3	0,4	0,9	14
40	20	FQ04	51	3	7	F07	0,04	1800	0,3	0,4	0,9	14
80	40	FQ08	51	2	6	F07	0,04	1800	0,3	0,4	0,9	14
120	60	FQ12	65	2	10	F10	0,04	1800	0,3	0,4	0,9	14
120	60	FQ12	154	2	10	F10	0,04	1800	0,3	0,4	0,9	14
180	90	FQ18	154	3	15	F10	0,04	1800	0,3	0,4	0,9	14
300	150	FQ30	194	7	18	F14	0,04	1800	0,3	0,4	0,9	14
500	250	FQ50	194	9	27	F14	0,04	1800	0,3	0,4	0,9	14

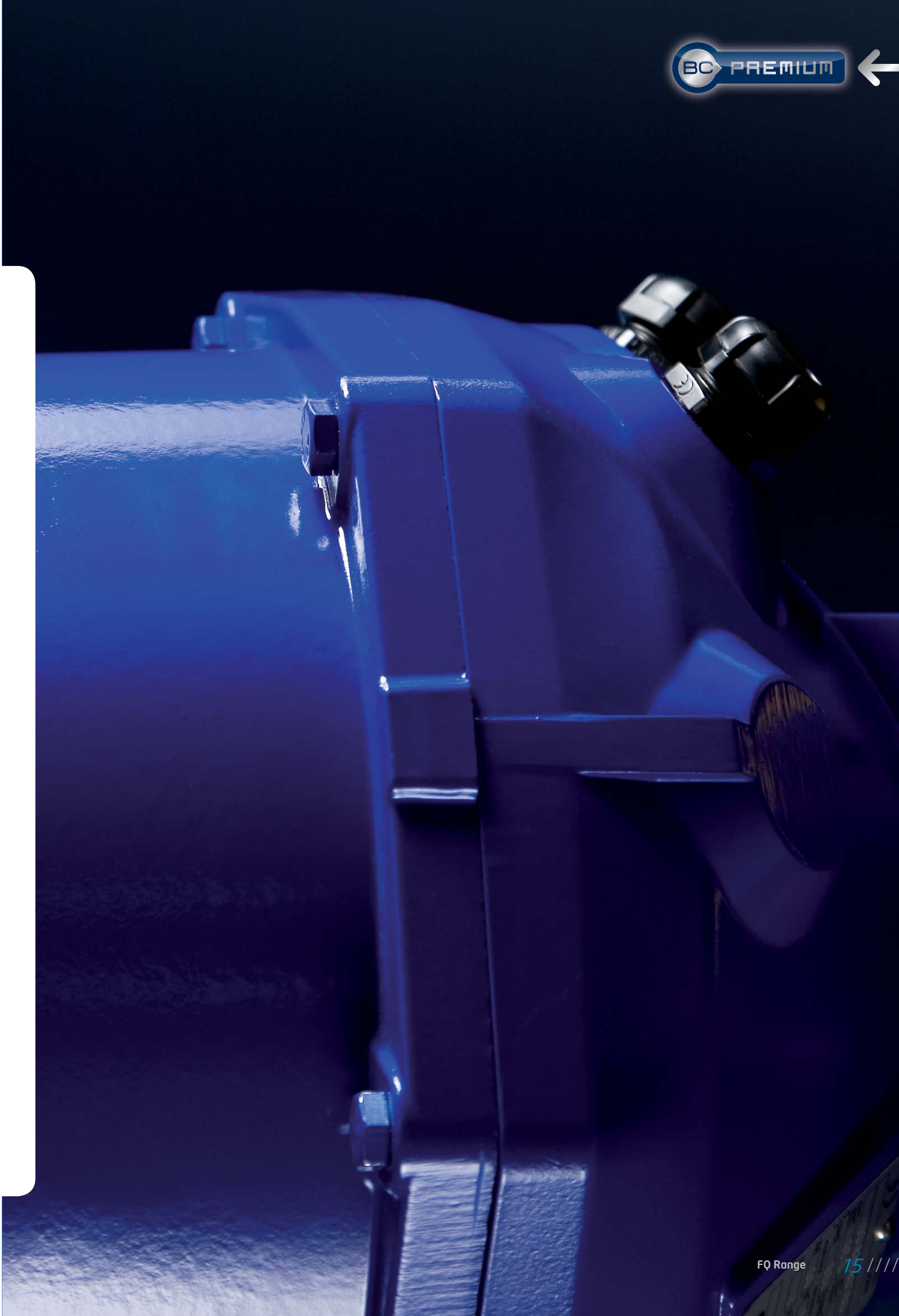
1 PH 230V 50 Hz Class III

Max	Permanent	Type	Operating time 90°/sec			Flange	S4 service - D.R. : 50%					
Torque	Torque		Motor	Spring			Power	Speed	Current	Current	Cos	Efficiency
Nm	Nm		Sec	Fast	Std	ISO	kW	rpm	rated A	start A	Φ	%
40	20	FQ04	66	3	7	F07	0,02	1500	0,5	0,7	0,9	13
80	40	FQ08	66	2	6	F07	0,02	1500	0,5	0,7	0,9	13
120	60	FQ12	184	2	10	F10	0,02	1500	0,5	0,7	0,9	13
180	90	FQ18	184	3	15	F10	0,02	1500	0,5	0,7	0,9	13
300	150	FQ30	233	7	18	F14	0,02	1500	0,5	0,7	0,9	13

1 PH 115V 60 Hz Class III

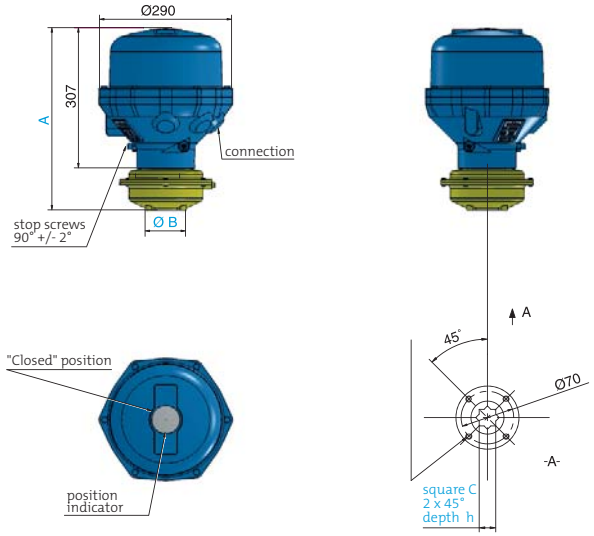
Max	Permanent	Type	Operating time 90°/sec			Flange	S4 service - D.R. : 50%					
Torque	Torque		Motor	Spring			Power	Speed	Current	Current	Cos	Efficiency
Nm	Nm		Sec	Fast	Std	ISO	kW	rpm	rated A	start A	Φ	%
40	20	FQ04	55	3	7	F07	0,03	1800	1	1,2	0,9	20
80	40	FQ08	55	2	6	F07	0,03	1800	1	1,2	0,9	20
120	60	FQ12	154	2	10	F10	0,03	1800	1	1,2	0,9	20
180	90	FQ18	154	3	15	F10	0,03	1800	1	1,2	0,9	20
300	150	FQ30	194	7	18	F14	0,03	1800	1	1,2	0,9	20

Please note : The operating time of the spring can increase according to the load.
The mentioned operating times refer to the max output torque.



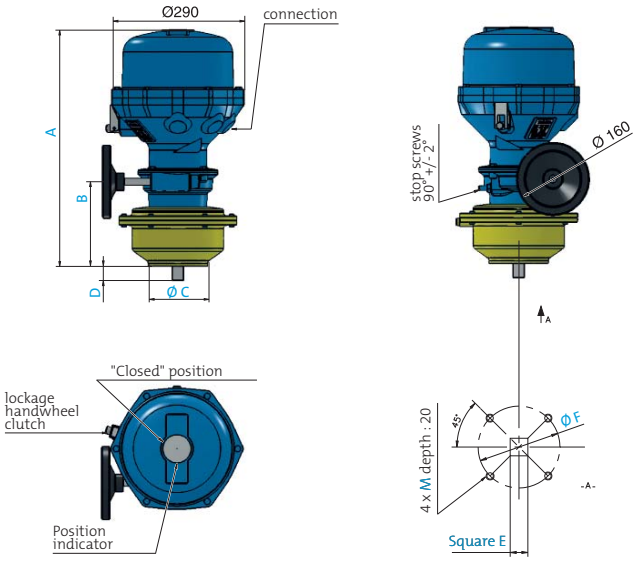
Dimensional drawings

FQ04 & FQ08



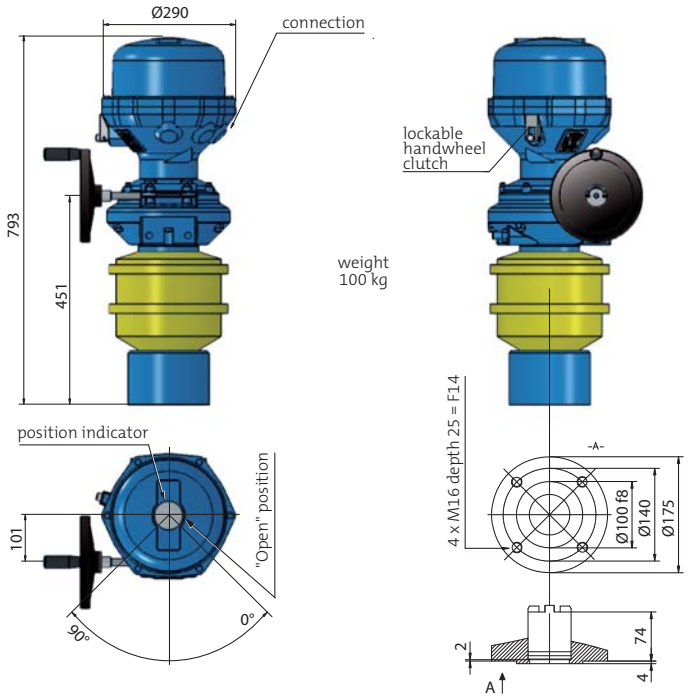
Type	A	Ø B	Square C	h	Weight
FQ04	386	Ø 84	17	19	25 kg
FQ08	396	Ø 117	22	24	30 kg

FQ12 & FQ18

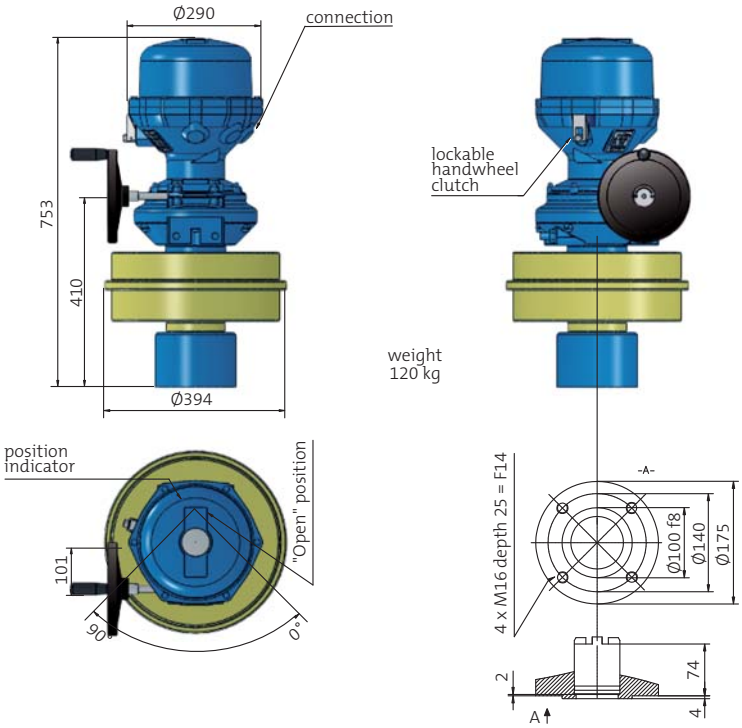


Type	A	B	Ø C	D	Square E	Ø F	M	Weight
FQ12	500	167	Ø 117	25	22	Ø 102	M10	40 kg
FQ18	5	185	Ø 130	31	25	Ø 78	M12	45 kg

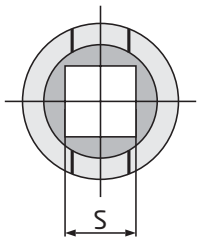
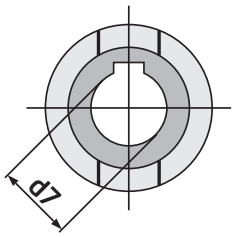
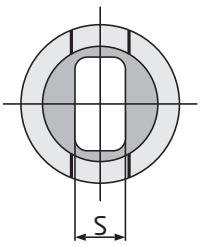
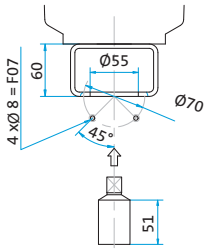
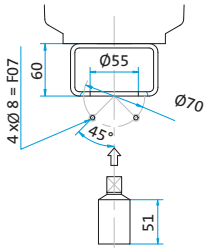
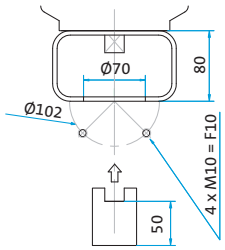
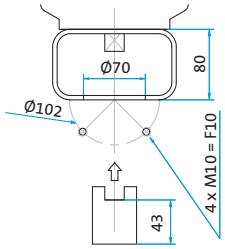
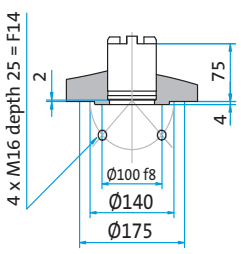
FQ30


Ø290
connection
793
451
position indicator
101
"Open" position
90°
0°
lockable handwheel clutch
weight 100 kg
4 x M16 depth 25 = F14
-A-
Ø100 f8
Ø140
Ø175
2
74
4
A

FQ50

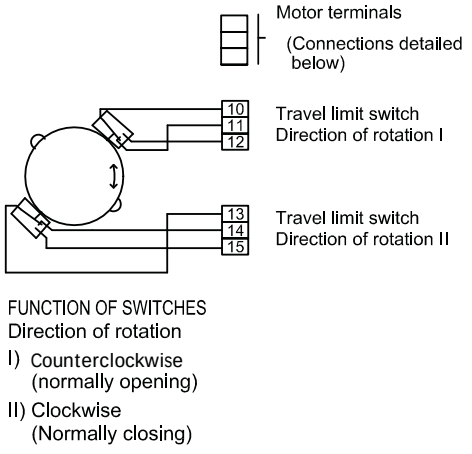

Ø290
connection
753
410
Ø394
position indicator
101
"Open" position
90°
0°
lockable handwheel clutch
weight 120 kg
4 x M16 depth 25 = F14
-A-
Ø100 f8
Ø140
Ø175
2
74
4
A

Standard mounting

		PARALLEL SQUARE	KEY	FLAT
				
FQ04		S 11 / 14 / 17	Ød7 14 / 18 / 22 / 28	S 11 / 14 / 17
FQ08		S 11 / 14 / 17	Ød7 14 / 18 / 22 / 28	S 11 / 14 / 17
FQ12		S 14 / 17 / 19 / 22	Ød7 18 / 22 / 28 / 36	S 14 / 17 / 19 / 22
FQ18		S 14 / 17 / 19 / 22	Ød7 18 / 22 / 28 / 36	S 14 / 17 / 19 / 22
FQ30 & FQ50		S 19 / 22 / 36	Ød7 22 / 28 / 30 / 40	S 19 / 22 / 36

Standard wiring diagram

ACTUATOR

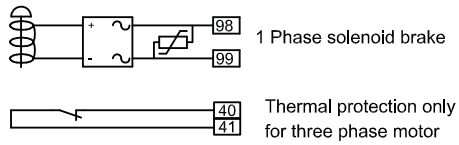


FUNCTION OF SWITCHES
Direction of rotation

I) Counterclockwise (normally opening)

II) Clockwise (Normally closing)

Direction of rotation seen on opposite side of fixing flange of actuator



SOLENOID OPERATED BRAKE

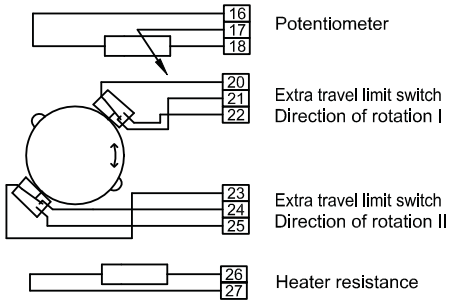
CONNECTION INSTRUCTIONS

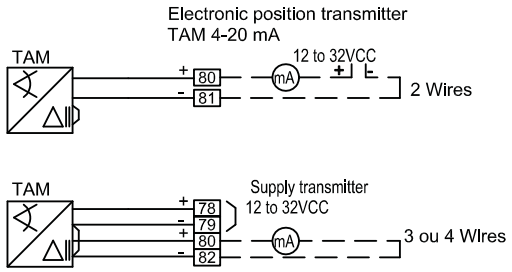
- Do not connect the solenoid operated brake (terminals 98 & 99).
- Connect terminals 1,2,3 to give supply to the motor and check the rotation direction.
- Connect the travel limit switches and check its function.
- Now connect the solenoid operated brake if all other operations have been given satisfactory.

Voltages table

MOTOR	Solenoid Operated Brake
3Ph 460V-60Hz	115V
3Ph 400V-50Hz	230V
1Ph 230V-50Hz	230V
1Ph 115V-60Hz	115V
24V DC	24V DC

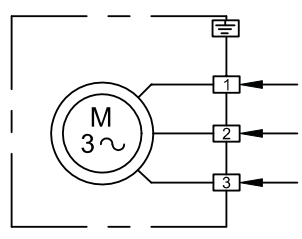
OPTIONAL ACCESSORIES





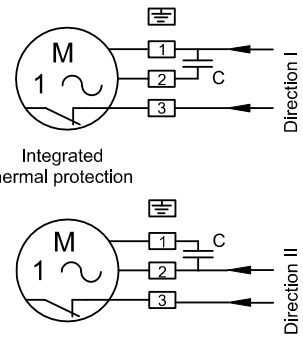
MOTOR

THREE PHASE

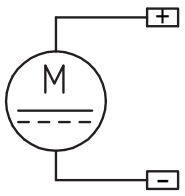


NOTA: 3Ph phase direct = Direction II

SINGLE PHASE



DC



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