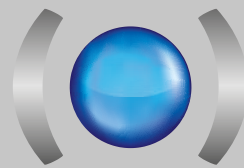




LABEL

The complete solution



**BERNARD[®]
CONTROLS**

//////////////////// Invest in Confidence //////////////////////



Fail-safe Electric Actuators

FQ RANGE



.....
LABEL



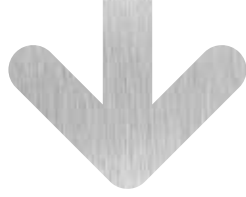
The complete solution

The BC PREMIUM label guarantees “The complete solution”, with many options and possible configurations to fit at best very specific needs. Decades of return on experience from very demanding applications such as nuclear qualified valves actuation have shaped our technical orientations and our commitment to quality and safety.

The BC PREMIUM label reflects this long-lasting experience and in-depth expertise, working with the most demanding markets, where the ability to design customized solutions has always been decisive. It is the guarantee of quality and security for installations’ actuation in the case of **severe environment, demanding operational constraints and critical applications.**

Contents

Failsafe electric actuators	>	4	Technical data	>	8	ISO 5211 mounting	>	18
Main features	>	6	Performances	>	12	Wiring diagram	>	19
			Dimensional drawings	>	16			



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. 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
Tunnel ventilation

 **BERNARD CONTROLS**

TYPE TYP **FC12**

Motor - Motor

0.03 KW **230** V **1** Ph

30 % **0.5** A **50** Hz

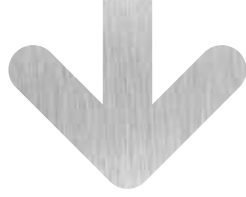
Actionneur - Antrieb - Actuator

120 Nm ⁰/₀ **120** Nm ^F/_S

0.16 tr/min ⁰/₀ **0.25** tours ^F/_S
rpm umdr. turns

N° **03L08363 001**

MADE IN FRANCE 



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 operation (complying with EN15714-2 Class A) and Inching/Positioning (complying with EN15714-2 Class B): 30% motor duty rating. Up to 360 starts per hour at peak of operation.
- BC Modulating Class III (complying with EN15714-2 Class C) : 50% motor duty rating. Up to 1 200 starts per hour at peak of operation.



What is Failsafe?

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/Nema 4 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
- EN15714-2 DUTY CLASSIFICATION
 - On-Off : Class A
 - Inching/Positioning : Class B
 - Modulating : Class C
- Advanced controls with local buttons
 - MINIGAM+
 - INTEGRAL+ (On-Off)
 - POSIGAM+ (Inching/Positioning & Modulating)
- Extra limit switches
- Anticondensation heater resistor
- Position transmitters : 4-20mA or potentiometer
- Specific voltage for solenoid brake supply
 - 115V AC
 - 230V AC
 - 24V DC (other DC voltages on request)
- Fast spring return
- Clockwise or counterclockwise spring action
- Manual override for FQ04 & FQ08 (standard on other models)





Technical data

> Product specifications

General spec.	Torque range	Quarter-turn, direct mounting from 354 to 4425 lbs.in
	Actuator Duty Class	On-Off (Class A), Inching/Positioning (Class B), Modulating (Class C)
Enclosure	Enclosure	Cast aluminium
	Waterproofness	IP67/Nema 4
	Programming	FQ range is generally proposed with switch control (camblock + end-of-travel switches). MINIGAM+, INTEGRAL+ & POSIGAM+ advanced controls are also possible with separated control box. Maximum distance between control box and actuator: 164ft
	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 6209
	Ambient temperature operating range	Weatherproof models: -4°F to 158°F (-40°F as an option) EEx d IIC T4 : -4°F to 140°F (-40°F as an option) EEx d IIC T5 : -4°F to 140°F (-40°F as an option) EEx d IIC T6 : -4°F to 122°F (-40°F as an 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	<ul style="list-style-type: none"> • Paint system : - Polyurethane paint Ra15002 complying with ISO 12944 (C3) - Protection for highly corrosive conditions as an option • All cover fasteners captive and stainless.
Motor	Motor technology	TENV type (Totally Enclosed Non Ventilated). Class F insulation. Integrated thermal overload protection.
	Motor duty rating	S4 motor service (Intermittent periodic duty with startings) acc. to IEC 34-1 <ul style="list-style-type: none"> • S4 - 30% for On-Off Class A - up to 360 starts per hour. • S4 - 30% for Inching/Positioning Class B - 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	As a standard on FQ12, FQ18, FQ30 and FQ50. Optional on FQ04/FQ08. 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 (with optional socket/flange for FQ04 to FQ18)
	Output drive	Direct output drive on FQ04 to FQ18 (Removable socket as an option). Removable socket on FQ30 and FQ50.
	Vibration Resistance	1g (32.2 ft/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: <ul style="list-style-type: none"> • Single-phase, three-phase or DC voltages • 50 or 60 Hz • Specific voltages on request
Cable entries	Weatherproof design : <ul style="list-style-type: none"> - 2x M20 - 3x M20 (as an option) - 3x 3/4" NPT (as a standard) Explosionproof design : <ul style="list-style-type: none"> - 2x 3/4" NPT - 3x 3/4" NPT (as a standard)
Solenoid brake	The solenoid rated power is 21 W. This solenoid is normally under permanent power supply. Need separated power supply. Nominal voltage: <ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • Movement read directly on the main shaft (direct mechanical link) • Adjustable camblock with 2 SPDT end-of-travel switches • 2 extra position switches as an option • Independent position transmitter (TAM or potentiometer) as an option



Advanced controls (option)	Models	<p>Two versions according to operating modes:</p> <p>INTEGRAL+ for On-Off which includes :</p> <ul style="list-style-type: none"> • Terminal compartment • Power contactors • Logic control • Configuration panel • Signalling relays • Local control selectors <p>POSIGAM+ for Class III positioning :</p> <ul style="list-style-type: none"> • All INTEGRAL+ features • Positioner board • Position feedback
	Enclosure protection	<p>Separated FPI box (weatherproof design)</p> <ul style="list-style-type: none"> • Standard: IP67 / NEMA 4 <p>Separated FPx box (explosionproof design)</p> <ul style="list-style-type: none"> • Standard: IP67 / EEx d IIC T6 - NEMA 7 / 9
	On-off control	<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • 4 relays: 4 datas can be freely selected among a total of 16 available datas (250VAC-5A max.) • 1 fault relay
	Cable entries	<p>Weatherproof design (with separated FPI control box option)</p> <ul style="list-style-type: none"> - 3xM20 - 2xM20 + 2xM25 (en option) - 3xM20 + 4xM16(With single or redundant fieldbus option) <p>Explosionproof design (with separated FPx control box option)</p> <ul style="list-style-type: none"> - 2x 3/4" NPT + 1x1" NPT
	EU conformity	<p>INTEGRAL+ / POSIGAM+ controls complying with:</p> <ul style="list-style-type: none"> • 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 <p>Generic immunity standard - Industrial environment EN 61000-6-2.</p> <p>Degrees of protection provided by enclosures (IP code) EN 60529</p>
	Vibration resistance	1g (9.8 m/s ²) at 10-500 Hz
ADDITIONAL OPTIONS	Fieldbus interface (option)	<p>Profibus DP (single or redundant)</p> <ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • LED indication board (closed, open, power on) • Additional 3 relays board • Additional position transmitter isolated from the other output signals





Performances

3 PH 460V 60 Hz

Type	Torque		Available for			Operating time 90°/sec			Flange ISO	Motor : S4 service - D.R. : 30%					
	Max lbs.in	Perm lbs.in	On-Off	Inching/ Positioning	Mod. Class III	Motor Sec	Spring*			Power kW	Speed rpm	Current rated A	Current start A	Cos Φ	Efficiency %
							Fast	Std							
FQ04	354	177	yes	---	---	12	3	7	F07	0,07	3600	0,4	0,9	0,8	30
FQ04	354	177	yes	---	---	28	3	7	F07	0,07	3600	0,4	0,9	0,8	30
FQ04	354	177	yes	yes	yes	22	3	7	F07	0,03	1800	0,2	0,3	0,9	14
FQ04	354	177	yes	yes	yes	51	3	7	F07	0,03	1800	0,2	0,3	0,9	14
FQ08	708	354	yes	---	---	28	2	6	F07	0,07	3600	0,4	0,9	0,8	30
FQ08	708	354	yes	yes	yes	51	2	6	F07	0,03	1800	0,2	0,3	0,9	14
FQ12	1062	531	yes	---	---	33	2	10	F10	0,07	3600	0,4	0,9	0,8	30
FQ12	1062	531	yes	yes	---	78	2	10	F10	0,07	3600	0,4	0,9	0,8	30
FQ12	1062	531	yes	yes	yes	65	2	10	F10	0,03	1800	0,2	0,3	0,9	14
FQ12	1062	531	yes	yes	yes	154	2	10	F10	0,03	1800	0,2	0,3	0,9	14
FQ18	1593	797	yes	yes	---	78	3	15	F10	0,07	3600	0,4	0,9	0,8	30
FQ18	1593	797	yes	yes	yes	154	3	15	F10	0,03	1800	0,2	0,3	0,9	14
FQ30	2655	1328	yes	yes	---	98	7	18	F14	0,07	3600	0,4	0,9	0,8	30
FQ30	2655	1328	yes	yes	yes	194	7	18	F14	0,03	1800	0,2	0,3	0,9	14
FQ50	4425	2213	yes	yes	---	98	9	27	F14	0,07	3600	0,4	0,9	0,8	30
FQ50	4425	2213	yes	yes	yes	194	9	27	F14	0,03	1800	0,2	0,3	0,9	14





1 PH 115V 60 Hz

Type	Torque		Available for			Operating time 90°/sec			Flange	Motor : S4 service - D.R. : 30%					
	Max lbs.in	Perm lbs.in	On-Off	Inching/ Positioning	Mod. Class III	Motor Sec	Spring*			Power kW	Speed rpm	Current rated A	Current start A	Cos Φ	Efficiency %
							Fast	Std							
FQ04	354	177	yes	---	---	28	3	7	F07	0,07	3600	0,4	0,9	0,8	30
FQ04	354	177	yes	yes	yes	55	3	7	F07	0,03	1800	0,2	0,3	0,9	14
FQ08	708	354	yes	---	---	28	2	6	F07	0,07	3600	0,4	0,9	0,8	30
FQ08	708	354	yes	yes	yes	55	2	6	F07	0,03	1800	0,2	0,3	0,9	14
FQ12	1062	531	yes	yes	---	78	2	10	F10	0,07	3600	0,4	0,9	0,8	30
FQ12	1062	531	yes	yes	yes	154	2	10	F10	0,03	1800	0,2	0,3	0,9	14
FQ18	1593	797	yes	yes	---	78	3	15	F10	0,07	3600	0,4	0,9	0,8	30
FQ18	1593	797	yes	yes	yes	154	3	15	F10	0,03	1800	0,2	0,3	0,9	14
FQ30	2655	1328	yes	yes	---	98	7	18	F14	0,07	3600	0,4	0,9	0,8	30
FQ30	2655	1328	yes	yes	yes	194	7	18	F14	0,03	1800	0,2	0,3	0,9	14

24V DC

Type	Max Torque lbs.in	Available for			Operating time 90°/sec			Flange	Motor : S4 service - D.R. : 30%					
		On-Off	Inching/ Positioning	Mod. Class III	Motor Sec	Spring*			Power kW	Speed rpm	Current rated A	Current start A	Cos Φ	Efficiency %
						Fast	Std							
FQ04	354	yes	---	---	50	3	7	F07	0,027	3000	2,4	7	---	48
FQ08	708	yes	---	---	50	2	6	F07	0,027	3000	2,4	7	---	48
FQ12	1062	yes	---	---	140	2	10	F10	0,027	3000	2,4	7	---	48
FQ18	1593	yes	---	---	140	3	15	F10	0,027	3000	2,4	7	---	48
FQ30	2655	yes	---	---	176	7	18	F14	0,027	3000	2,4	7	---	48

***Please note:** The operating times of the spring actions are average values. Those may vary according to the resistive torque and temperature
NB: S4 - 30% for On-Off Class A and for Inching/Positioning Class B, S4 - 50% for Modulating Class III

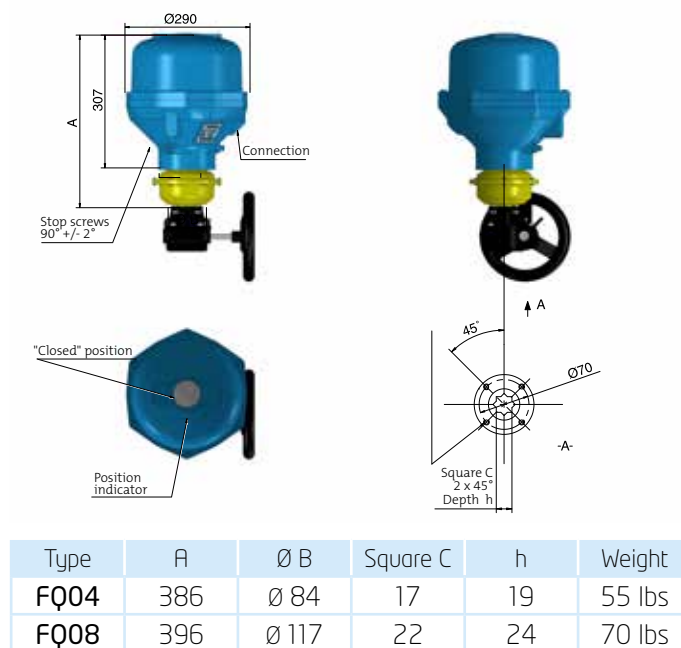






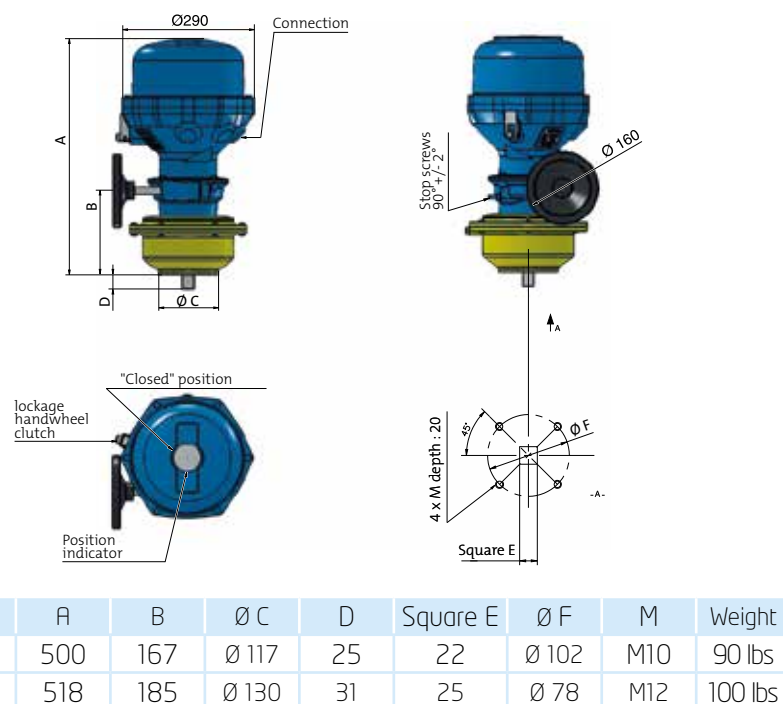
Dimensional drawings

> FQ04 & FQ08



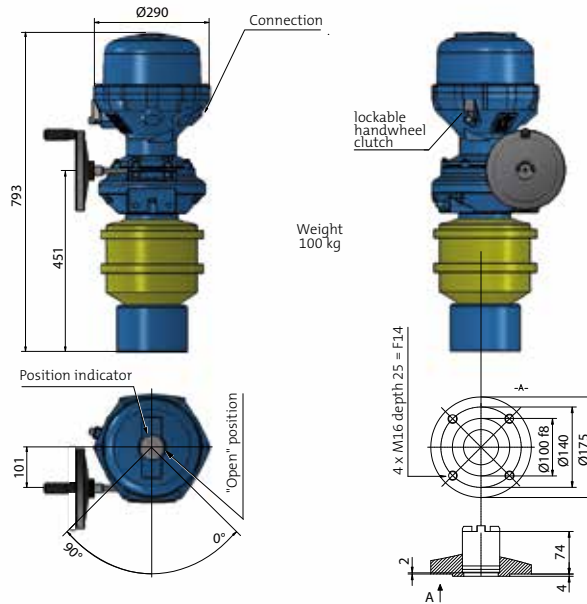
Please note: optional manual override on FQ04 / FQ08
 * All dimensions are in millimeters

> FQ12 & FQ18



Please note: FQ04 to FQ18, ISO5211 mounting with optionnal socket. FQ04 to FQ50, plain socket in standard and machined socket on request
 * All dimensions are in millimeters

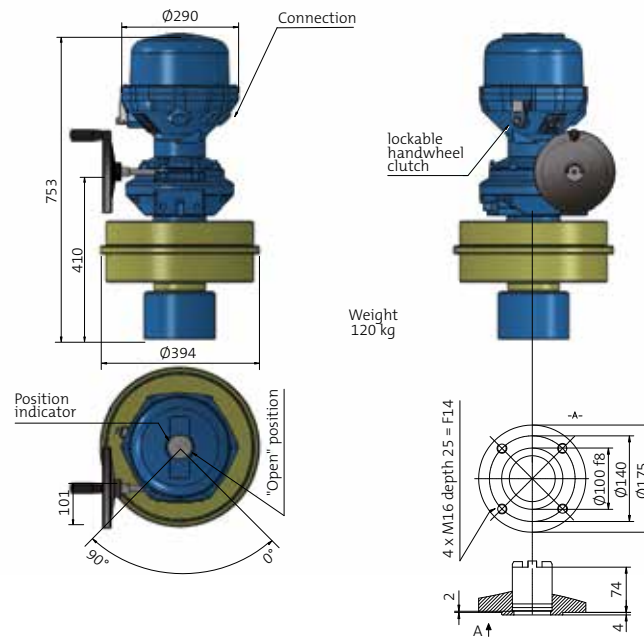
> FQ30



* All dimensions are in millimeters

Type	Weight
FQ30	220 lbs

> FQ50



* All dimensions are in millimeters

Type	Weight
FQ50	265 lbs



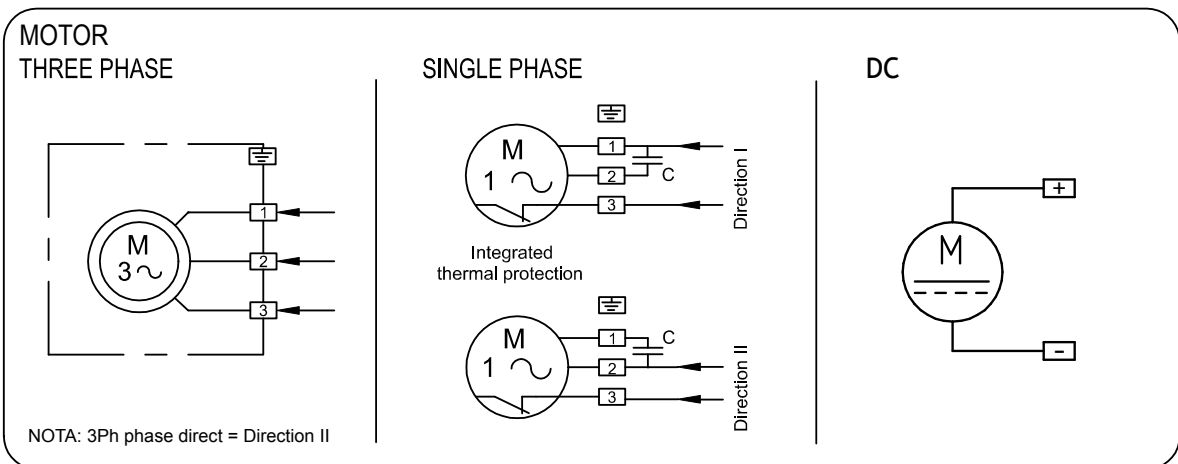
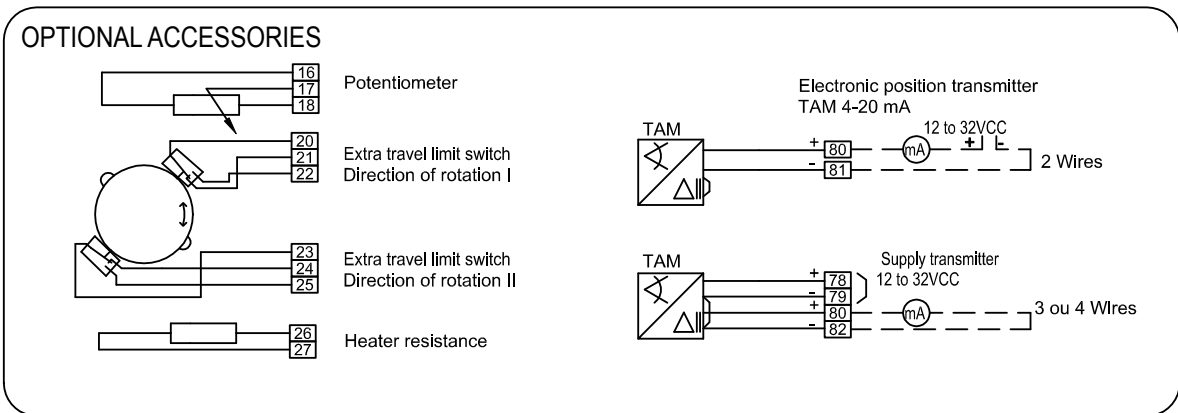
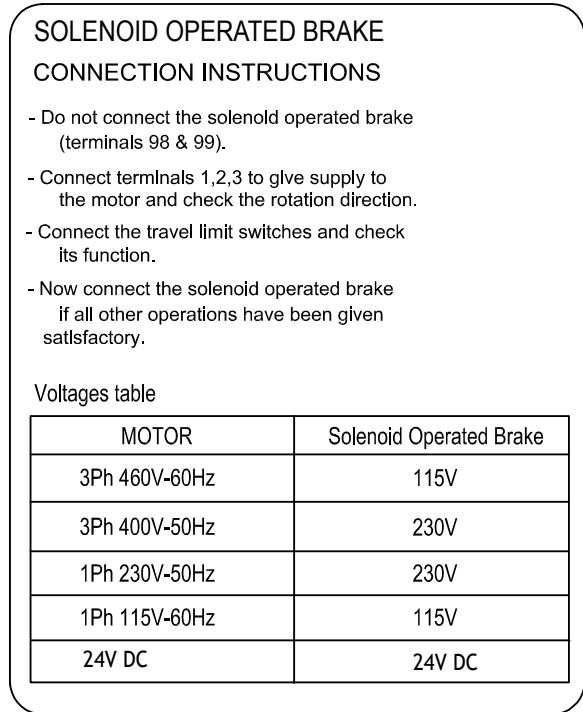
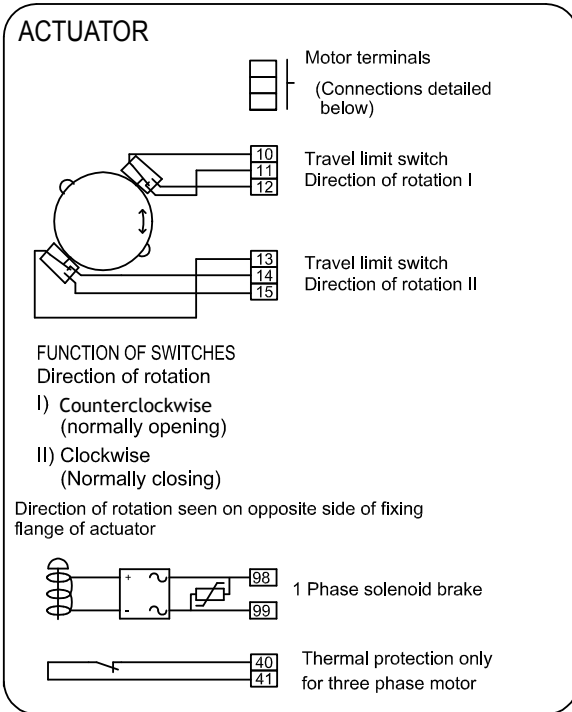
ISO 5211 Mounting

		PARALLEL SQUARE	KEY	DOUBLE D
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

Please note: FQ04 to FQ18, ISO5211 mounting with optional socket. FQ04 to FQ50, plain socket in standard and machined socket on request
 * All dimensions are in millimeters

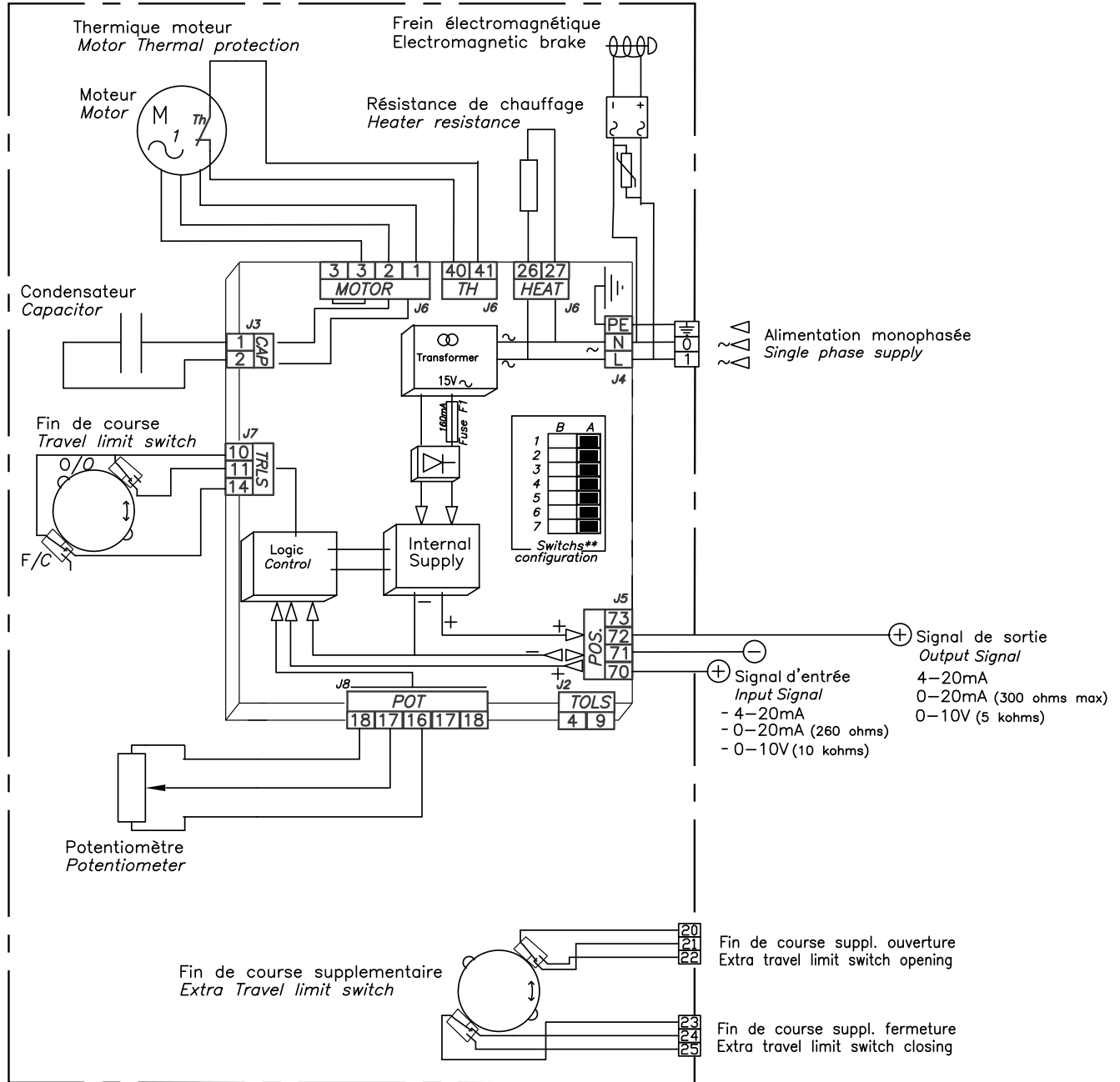


Standard wiring diagram





Minigam wiring diagram



Signal d'entrée Input signal	Signale de sortie Output signal	Position des interrupteurs Switches position					
		1	2	3	4	5	6
0-10a	0-10a	I	I	I	I	B	B
2-10a	2-10a	I	I	I	B	B	B
4-20nB	4-20nB	B	B	B	B	B	B
0-20nB	0-20nB	B	B	B	I	B	B

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