

EMA

PRODUCT
BROCHURE

ELECTRO MECHANICAL ACTUATORS



INTERMITTENT

CONTINUOUS

HIGH SPEED
CONTINUOUS



POWER JACKS

manufacturers of precision screw jacks, actuators and gearboxes

Group

www.powerjacks.com

The EMA Range

2

What is an EMA ?

EMA is an abbreviation for Electro Mechanical Actuator, which consists of either a trapezoidal or ball leadscrew, driven by an electric motor through spiroid gearing. The screw converts the rotary motion into linear movement. As the screw rotates, the nut extends and retracts the ram, which is attached to the load.

The EMA Range

There are 3 standard EMA models, all available in a right-angle drive configuration.

Intermittent model, incorporating a trapezoidal screw.

Continuous and High Speed Continuous models, both incorporating a ball screw.

Where the standard range does not meet the application specification, special actuators can be designed to meet customers' specific requirements.

Dynamic Load Capacity and Speed

The dynamic load capacity range is up to 10 kN. A defined range of linear speeds from 135 mm/minute to 5510 mm/minute is available. The speed range is achieved by using a combination of gearbox ratios, screw leads and standard motor speeds.

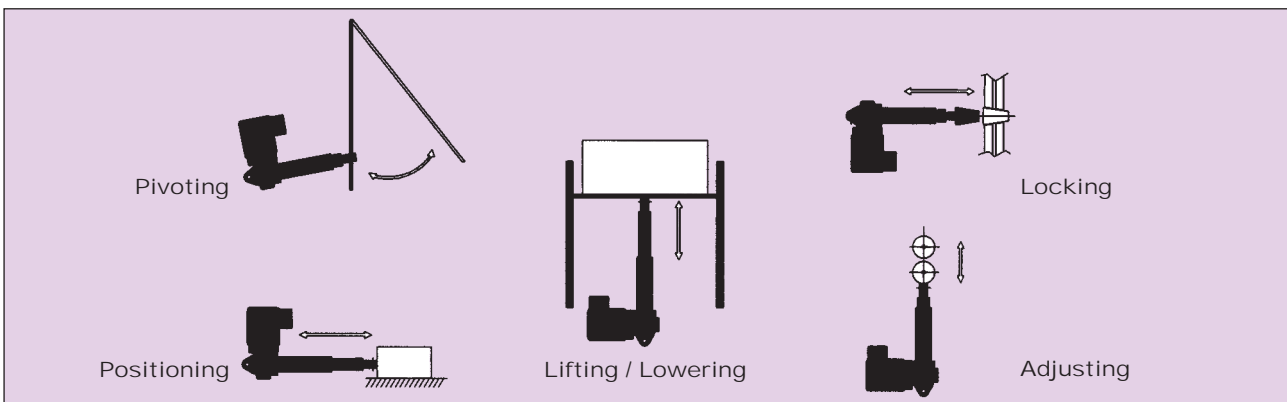
Drives

As standard, the units are available with 240v/415v AC or 24v DC motors, with or without a brake. The type of motors required is dependent on the customer's application. The motors are mounted to the actuator on a 63C Face Flange Mounting.

Stroke

Each model can be provided with a stroke length up to the maximum, in compression, shown in the Technical Charts. The stroke is defined by the customer. For a tensile load, greater maximum strokes can be accommodated, depending on the linear speed. Where the stroke required exceeds the maximum shown, or there is a high static load, please contact our Technical Sales Department.

EMA Applications



Standard Features

- Choice of AC or DC motor drives.
- Choice of end fittings - clevis, fork clevis, top plate or screwed end.
- Trunnion Mounting.
- Limit Switches.

Emergency Overload Clutch

The emergency overload clutch is a device which is mounted on the actuator ram, which will slip when the torque to drive the load exceeds the limit set. If the load is axially locked, or if a torque greater than the clutch setting is required to move the load, the clutch will disengage the load from the ram and prevent the motor from overloading the actuator components. Please note that the clutch is an emergency device and should not be used for reversing the actuator direction.

Limit Switches

Limit switches are fitted to provide end of stroke or ultimate overtravel safety. They are mounted on the outer tube of the actuator and are tripped by a collar on the ram. They are set at a fixed length defined by the customer (see dimensional page for details).

Guiding the Load

Side loads on the actuator ram should be avoided by ensuring that the load is guided. The load guide mechanism should resist the torque developed at the ram by the screw mechanism. A guided ram can be supplied on request, which utilises a keyway in the inner ram, eliminates the need for torsional restraint and therefore allows flexibility in the choice of end fitting.

Operating Environment

All units are constructed and finished to suit industrial operating conditions. The actuator gearbox and outer tube are either aluminium or plated for protection and the ram is zinc plated steel. The actuator is sealed at the ram and including a standard motor, is protected to IP54 enclosure. Normal operating temperatures are from -10°C to +50°C. Please contact our Technical Sales Department to discuss hostile or hazardous operating environments.

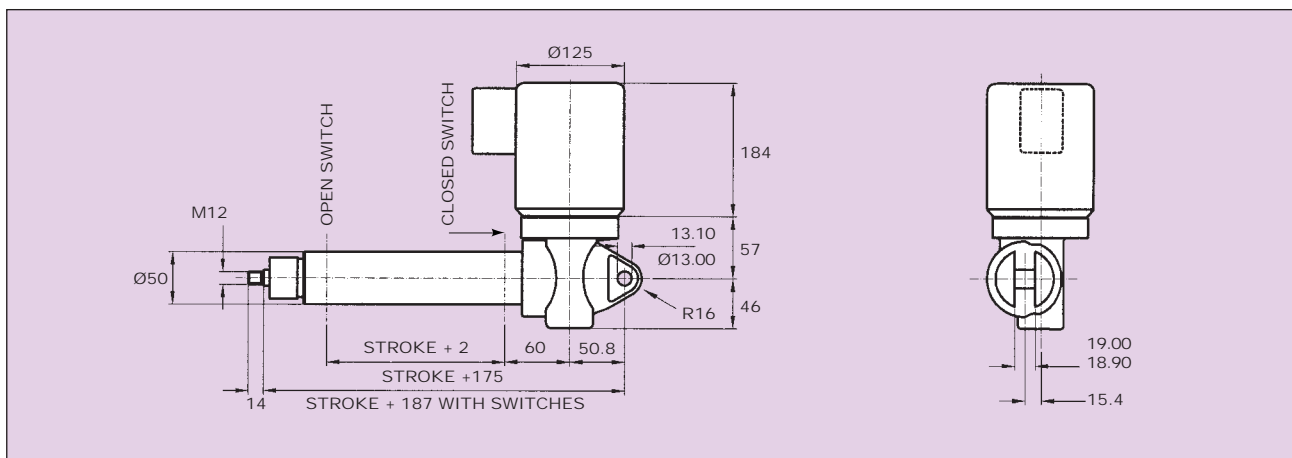
TECHNICAL CHARTS & DIMENSIONS

3

The Technical Charts below give the available dynamic loads, linear speeds, motor details and maximum compressive strokes for each model of actuator. The charts and dimensions refer to an actuator fitted with a non brake 415v or 240v AC motor. All dimensions are in millimetres. For other operating requirements or motor types which are not satisfied by these tables, please contact our Technical Sales Department.

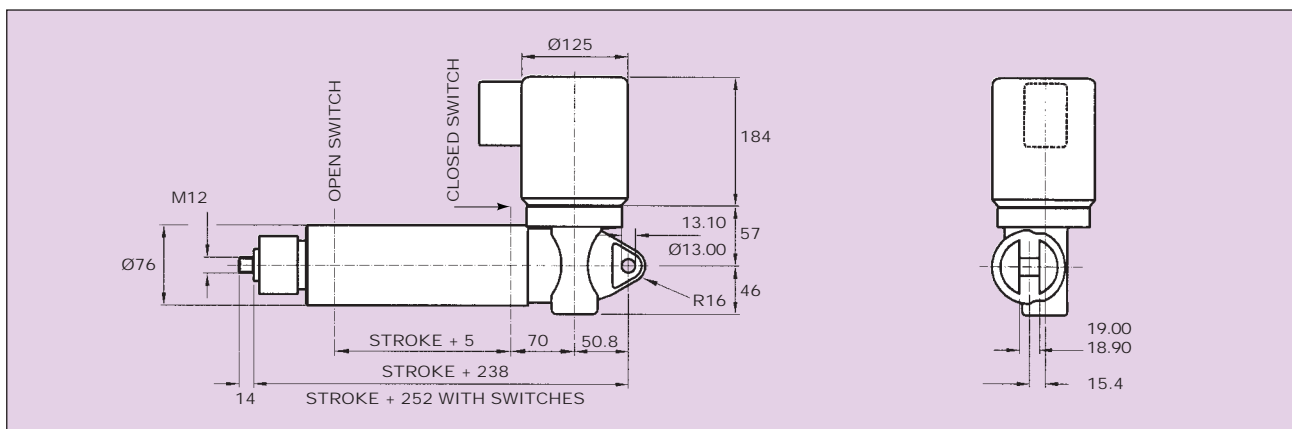
MODEL I - INTERMITTENT

DYNAMIC LOAD CAPACITY (kN)	LINEAR SPEED (mm/min)	MOTOR (kW) / FRAME SIZE	MAX. STROKE (mm) (IN COMPRESSION)
10	135	0.18 / D63	750
5	200	0.18 / D63	750
5	270	0.18 / D63	750
5	410	0.18 / D63	750
2.5	820	0.18 / D63	750



MODEL C - CONTINUOUS

DYNAMIC LOAD CAPACITY (kN)	LINEAR SPEED (mm/min)	MOTOR (kW) / FRAME SIZE	MAX. STROKE (mm) (IN COMPRESSION)
10	225	0.18 / D63	900
10	335	0.18 / D63	900
10	685	0.18 / D63	900
5	1370	0.18 / D63	1250
2.5	2740	0.18 / D63	1500



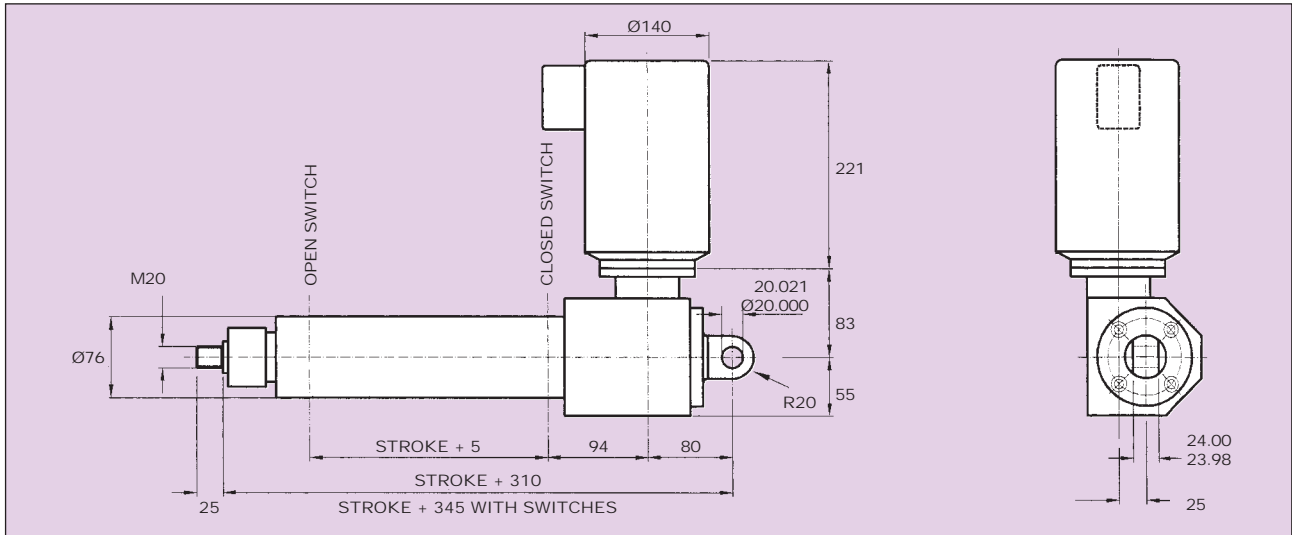
Note : Calculate the total unit weight as follows :
 Model I = Basic weight of 9 kg + 0.69 kg per 100 mm stroke.
 Model C = Basic weight of 10 kg + 1.3 kg per 100 mm stroke.
 Model H = Basic weight of 12 kg + 1.3 kg per 100 mm stroke.

TECHNICAL CHARTS & DIMENSIONS

4

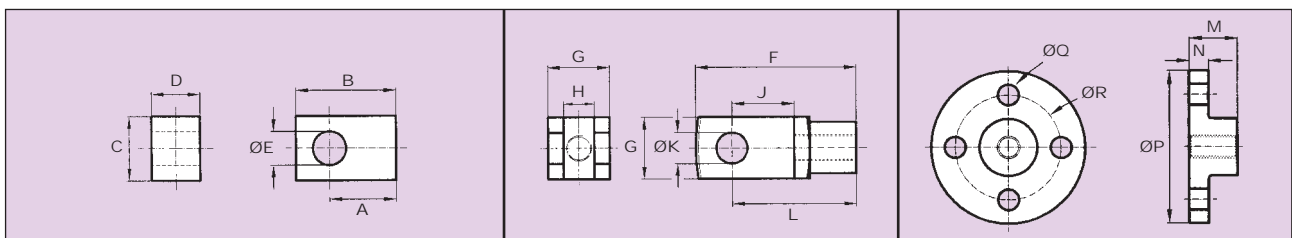
MODEL H - HIGH SPEED CONTINUOUS

DYNAMIC LOAD CAPACITY (kN)	LINEAR SPEED (mm/min)	MOTOR (kW) / FRAME SIZE	MAX. STROKE (mm) (IN COMPRESSION)
10	900	0.25 / D71	900
10	1375	0.37 / D71	900
10	2755	0.55 / D71	900
5	1805	0.18 / D71	1250
5	5510	0.37 / D71	1250



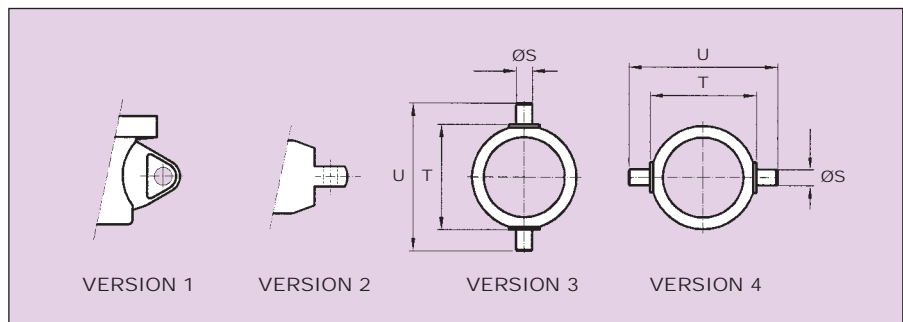
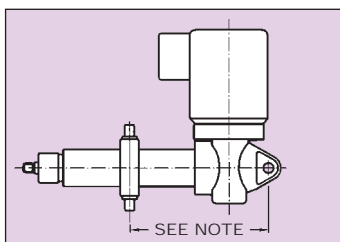
END FITTINGS

MODEL	CLEVIS END					FORK CLEVIS						TOP PLATE				
	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R
I / C	26	39	25	19	13.027 13.000	62	24	12.15 12.33	24	12.000 12.043	48	25	10	80	11	55
H	41	65	35	30	20.033 20.000	105	40	20.16 20.37	40	20.000 20.052	80	30	12	100	13.5	70



MOUNTINGS

MODEL	S	T	U
I	11.99 11.96	70	110
C / H	14.99 14.96	100	140



Note:
The position of mounting versions 3 and 4 is variable and should be specified by the customer at the time of ordering.

Working Applications for EMAs

5

Application

Actuation of the rear door of the British Army armoured personnel vehicle. The door weighs 240 kg, but at compound angles of 30°, can weigh up to 2.6 tonnes.

Product

One Continuous, 5 kN, 24v DC actuator, which is suppressed to avoid radio interference. The actuator can be submersed in water and has to be able to operate immediately whilst the vehicle is out of the water.



Application

To lower the cradle and raise the feed hopper on a granulator. The granulator is used in the plastics, rubber and security disintegration industries.

Product

Two Intermittent, 5 kN, 240v AC actuators on each granulator. One at 280 mm stroke lowers the cradle and the other at 520 mm stroke raises the hopper.

Application

To displace via tilt and slew motions, the slave arm relative to the master arm, on manipulators for handling radioactive material. The actuators also act as load bearing struts, carrying the full reaction loads.

Product

Two Continuous, 2.5 kN and 5 kN, 24v DC actuators on each manipulator.



Application

Conveyor belt tracking, mainly for the food industry. The actuator moves when adjustment is required, to centralize the conveyor belt, ensuring longer life of the belt and reducing production downtime.

Product

One Continuous, 5 kN, 240v AC actuator is fitted onto each tracker unit.

Application

Pay off and take up cable/wire machine. The actuators operate continuously, providing adjustment to ensure even winding onto the drums.

Product

Two Intermittent, 2.5 kN, 415v AC actuators are fitted onto each machine.



HOW TO ORDER OUR EMA RANGE

The product code for Electro Mechanical Actuators (EMAs) is of the following form :

(1) (2) (3) (4) (5) (6) (7) (8) (9) (10) (11)
 □ - □□ - □□□□ - □ - □ - □□□□ - □ - □□□□ - □ - □□ - □

(1) Actuator Model

I - Intermittent
 C - Continuous
 H - High Speed Continuous

(6) Motor Type

240 - 240v AC
 415 - 415v AC
 024 - 24v DC

(2) Dynamic Load Capacity

02 - 250 kg
 05 - 500 kg
 10 - 1000 kg

(7) End Fitting

C - Clevis End
 F - Fork Clevis
 T - Top Plate
 S - Screwed End

(3) Linear Speed

This is shown as a 4 figure code in the Technical Charts on page 6.

(8) Stroke

A 4 figure code to represent the required stroke in mm.

(4) Mountings

1 - Version 1
 2 - Version 2
 3 - Version 3
 4 - Version 4

The position of mounting versions 3 and 4 is variable and should be specified by the customer at the time of ordering.

(9) Emergency Overload Clutch

1 - Clutch
 2 - No Clutch

(5) Brake

B - Brake Motor
 N - Non Brake Motor

(10) Limit Switches

L - Limit Switches
 N - No Limit Switches

(11) Special Feature(s)

N - No Special Feature
 S - Customer to advise feature(s)

EXAMPLE PART NUMBER

(1) (2) (3) (4) (5) (6) (7) (8) (9) (10) (11)
 I - 05 - 0685 - 1 - B - 415 - C - 0300 - 1 - L - N

(1) Intermittent Actuator.

(2) 500 kg Capacity.

(3) Linear Speed of 685 mm/minute.

(4) Mounting Version 1.

(5) Brake Motor.

(6) 415v AC Motor.

(7) Clevis End Fitting.

(8) 300 mm Stroke.

(9) With Clutch.

(10) With Limit Switches.

(11) Without Special Features.

Notes:

- Where a special feature is required, the customer should please provide a description and/or drawing of the special feature.
- All goods are sold subject to our Standard Conditions of Sale, a copy of which is available upon request.

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