

# PQ Systems Ltd - MOTION CONTROL -

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## Self Contained – Electric Driven Hydraulic Actuator



M-MAC **Hydraulic Linear Actuators** are completely **stand alone** units. Simply install, then hook up to the appropriate electric power source.

No separate power unit!  
No hydraulic installation required!

Motors available in all common AC & DC voltages for AC-Inverter or DC-SCR motor controllers.

Actuators have variable acceleration and deceleration, through motor control and hydraulic valving, to provide smooth load raising and lowering characteristics.

**Power only consumed when the electric actuator is operating.**

Totally integrated circuitry, **no external plumbing**, pre-filled with standard hydraulic Mineral oil or Bio Degradable or Water Glycol fluids and sealed exclusively with zero leak O-ring plugs.

Operates in any orientation, with the shaft extending up or down or horizontal.

Available with **TEMPOSONIC** Feedback Probe

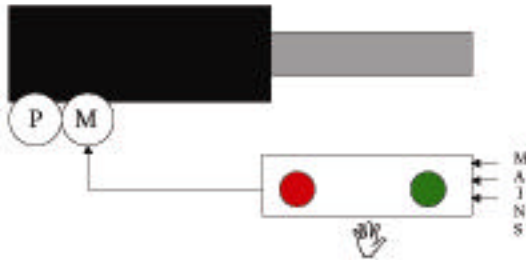
Mountings include standard Clevis Type with Spherical Bearings, Trunnion, Base or Head Mount, according to application requirement.

Available with **Explosion Proof** Electric Motor

See attached literature for application and control options.

# MODES OF OPERATION

1



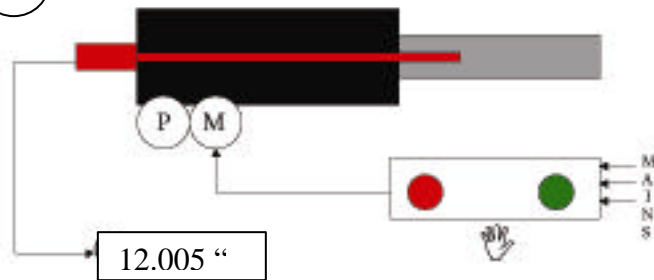
## MANUAL FIXED SPEED

FIXED SPEED IN BOTH DIRECTIONS ,

EG MANUAL PUSH BUTTON CONTROL

Or by PLC I / O to RELAYS

2



## MANUAL FIXED SPEED WITH FEEDBACK

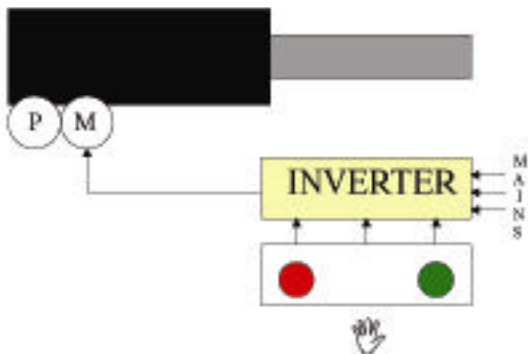
FIXED SPEED IN BOTH DIRECTIONS ,

INDICATION OF ACTUAL POSITION WITH **TEMPOSONIC** FEEDBACK TO DISPLAY.

EG MANUAL PUSH BUTTON CONTROL

Or by PLC I / O to RELAYS

3



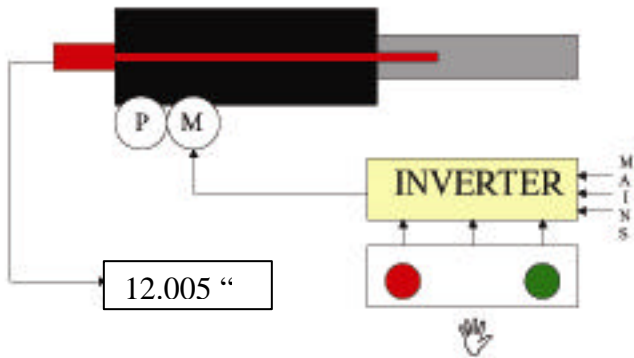
## MANUAL VARIABLE SPEED

VARIABLE SPEED IN BOTH DIRECTIONS

USING PRESETS OR MANUALLY ADJUSTABLE

Or by PLC I / O to RELAYS

4



**MANUAL VARIABLE SPEED WITH FEEDBACK**

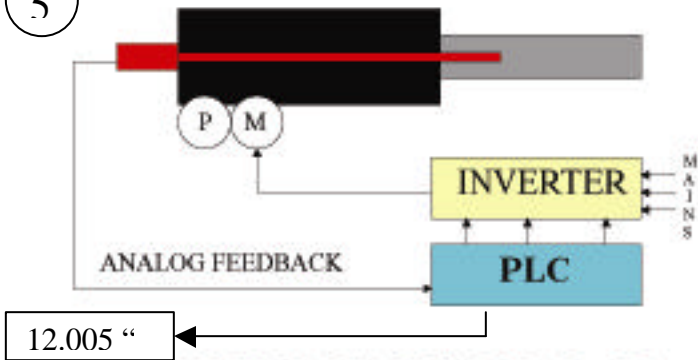
VARIABLE SPEED IN BOTH DIRECTIONS

INDICATION OF ACTUAL POSITION WITH **TEMPOSONIC** FEEDBACK TO DISPLAY.

USING PRESETS OR MANUALLY ADJUSTABLE

Or by PLC I / O to RELAYS

5



**FULLY CLOSED LOOP POSITION AND SPEED**

VARIABLE SPEED IN BOTH DIRECTIONS

WITH **TEMPOSONIC** FEEDBACK TO PLC CLOSES LOOP

EG PROGRAMMABLE POSITION AND SPEED

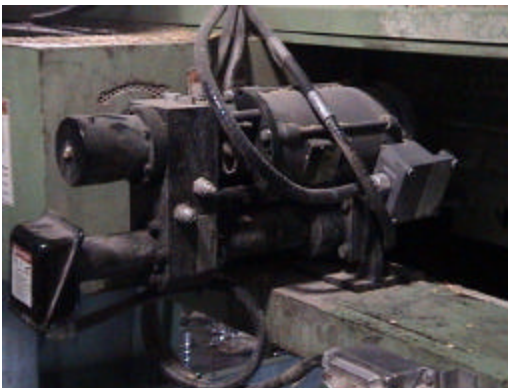
NOTE: The actuator is supplied standard with counterbalance valves , once the unit is turned off load hold can be achieved , ( this does depend on external forces ). This makes the unit exceptionally viable for not only dynamic applications but also for intermittent operation , such as gate valves.

The following charts provide a guide to the components that are needed to use the control options on pages 1 and 2. The Actuator is not limited to these options they merely provide usage ideas.

The feedback options apply to Temposonic Probes and the wide variety of options available to suit your requirements.

OPERATION MODE	DESCRIPTION	OPTION	INITIATION		TRAVEL DIRECTION	VARAIBLEVARIABLE				
			either BUTTONS	or PLC		FEEDBACK	SPEED	POSITION	INVERTER	STARTER
	MANUAL FIXED SPEED	1	✓	✓	BOTH			✓		✓
	MANUAL FIXED SPEED WITH FEEDBACK	2	✓	✓	BOTH	✓		✓		✓
	MANUAL VARIABLE SPEED	3	✓	✓	BOTH		✓	✓	✓	
	MANUAL VARIABLE SPEED c/w FEEDBACK	4	✓	✓	BOTH	✓	✓	✓	✓	
	FULLY CLOSED LOOP POSITION AND SPEED AUTOMATIC CONTROL BY PLC or PC	5		✓	BOTH	✓	✓	✓	✓	

FEEDBACK OPTIONS	ANALOG		DIGITAL		PROTOCOL			
	VOLTAGE	CURRENT	PWM	START/STOP	SSI	CNABUS	PROFIBUS	DEVICENET
	✓	✓	✓	✓	✓	✓	✓	✓



Typical installation for a Sliding Gate Application. This replaces manual adjustment no feedback with closed control , analog feedback , PLC driven.

Cost savings are , repeatable position of feed gate , Constant and controlled flow of product, No manual input so time saved. System can automatically be put through a purge cycle and be adjusted to suit different materials.



Old system required a manual adjustment of the gate and a separate pneumatic cylinder for purging. No feedback . No guarantee of repeatability. No continuous control of gate.