



SERVO DRIVES

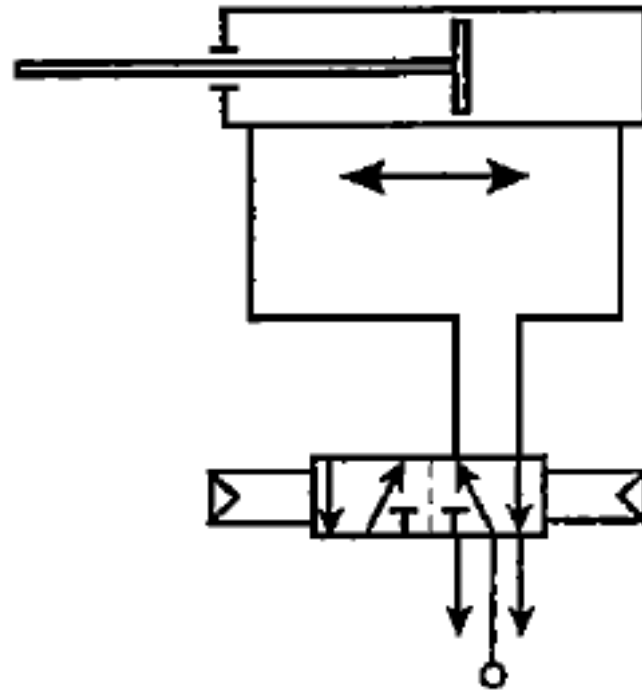
DRIVE PRINCIPLE	SCOPE	BENEFITS	DISADVANTAGES
Pneumatic	Passive Elements, Auxiliary devices	<ul style="list-style-type: none"> • Cheap • Low weight 	<ul style="list-style-type: none"> • Compressibility of the air
Hydraulics	Manipulators with very high load capacity and very large working space	<ul style="list-style-type: none"> • High Dynamics • High-power • Weight ratio 	<ul style="list-style-type: none"> • Necessary Directions: Pump, hoses, Servo Valves "Dirty" Maintenance Low efficiency Warming
Electric	Standard for Industrial robot	<ul style="list-style-type: none"> • High Dynamics • Very generally favorable opportunity • High performance Relationship • High Speed Ratio 	<ul style="list-style-type: none"> • Necessary gear transmission • Warming



Pneumatic drives

- Cheap
- Simple construction
- Low weight
- Clamp movement
- Point-to-point movement (stop)
- Control ► scheme difficult
- Low Positioning (Compressibility of the air)
- Expensive energy

Pneumatic working cylinder



Pneumatic valve
19EET303 EMRA

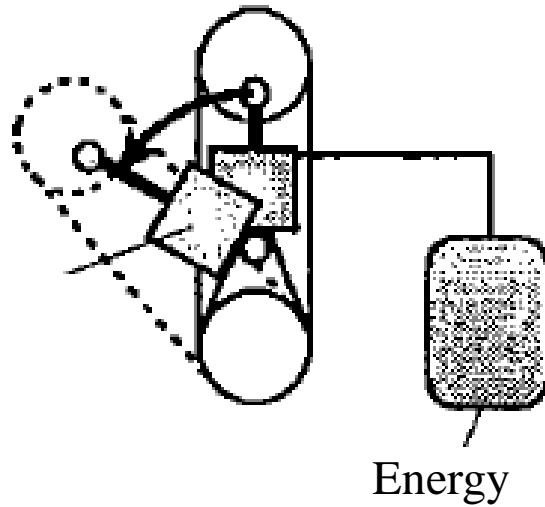


Pneumatic Actuators - usage



A pneumatic cylinder is used as a counterbalance to the individual robot axes.

Pneumatic
Cylinder



Example, an IR



Hydraulic drives



- High energy concentration
- Small size
- Low weight
- No gear needed
- Leaks are detrimental
- Costs (+ power unit oil reservoir 100-150 liters)
- Friction
- Heat
- Difficult interpretation of the regulator
- Long ranges (over 3m)
- Large payload masses (over 150 kg)
- Typical oil pressure ≈ 60 bar
- Seal