



***Oden Control AB***  
**Electric Actuators**



### Some Oden® Electrical Actuator features:

- 24 V DC motor - safe and easy to install
- 100% duty cycle
- An ATEX version of Oden P30 (Oden P30EX) for potentially explosive areas is available with either turning and linear modules
- Sealed housing according to IP67/68
- Backlash free 100:1 gear reduction ratio (model P30 = 63:1) provides accuracy of +/- 0.10°
- No use of electromechanical limit switches and/or potentiometers means high reliability in demanding industrial applications
- High gear efficiency >90 % - gives a low total running cost
- Very silent - < 60 dB(A)
- Customised parameter settings and automatic calibration during installation – all parameters are easily controlled by the OVP and a standard PC
- Analogue (normally 4 - 20 mA) or digital control signal
- Analogue (normally 4-20 mA) return signal
- Extensive choice of adapter system for all kinds of valves
- Valve jam protection – no over-sizing of actuator needed
- Quick and easy functional check only every three years. The gear system is lifetime greased and needs no maintenance.
- Can be mounted in all directions
- All parameters are permanently stored in a non-volatile memory and will not be lost in the case of a power failure
- HART or other field bus systems are optional

By using **Oden® Electrical Actuators** you are getting the most reliable and accurate actuators in the world with exceptionally short pay-back time. The design allows easy mounting without the need to align the actuators to the valve, thus eliminating the dangerous radial loads reaching the bushings of the valve spindle. This improves the maintenance cycle of the valve itself.

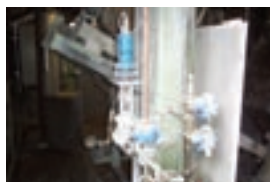


## New and advanced technology



**Oden P220R**, Grammage control at Stora Enso Skutskär Pulp Mill, Sweden

- **forget pneumatic systems with compressors, pressure tanks, air filters, air dryers and expensive stainless steel piping**
- **forget hydraulic systems with oil leakage, pumps, oil tanks and expensive hoses**
- **forget electro-mechanical systems based on low efficiency gears such as worm, helical or planetary gears**



**Oden P30L1**, "Combustion burner controller" Paper industry application

### 24V DC power and 4-20 mA Control Signal

Existing cabling can be used. Easy to use a battery backup. Easy to integrate in a computer environment. Very small footprint. Low weight. Low power consumption < 100 W

### Simplicity and Reliability

Only three components: Oden eccentric gears, an electric motor and electronics. Easy to install in any direction. Needs very little maintenance and yet is easy to service, lifetime greased gears.

### Strength and Precision

Up to 2 500 Nm torque or 100 kN linear force with an extremely high accuracy and repeatability. No backlash in the gear –100:1 (Oden P50/P220/P500) or 63:1 (Oden P30) gear ratio in one step is used. Very silent operation.



**Oden P30R1** - "Steam Control"  
District heating plant, Mälarenergi AB, Västerås, Sweden

### Oden Valve Program – OVP

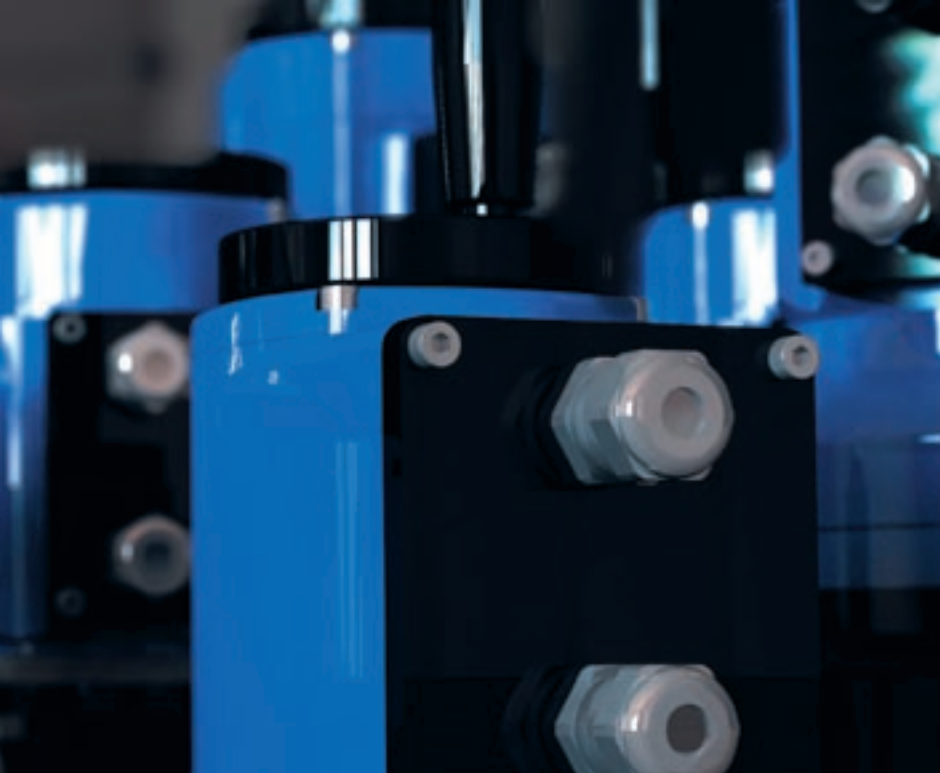
Actuator is fully configured when delivered and calibration is automatic on installation. All parameters can be changed at any time using the cable and the software on the Oden CD - Oden Valve Programme (OVP) – which are both included in the delivery – and a standard PC at the customer site.



**Oden P50R** - "Hot water control"  
District heating plant, Tekniska verken, Linköping, Sweden

### Lowest Cost of Ownership

In the Oden case 80-90% of the energy supplied is used to actuate the valve. Other technologies using 230V/380V AC are not able to utilize more than 40-50% of the energy, the rest of the energy dissipates by heat. In addition to low maintenance costs and gentleness on the valve mechanics, the Oden technology gives the lowest cost of ownership available on the market today.



## The advantages of Oden Actuators

Oden® is the name of the modular system of compact electric actuators for both turning and linear valves.

The actuators, with their highly compact designs and low weight, are based on the unique, patented Oden Gear Systems™ and a 24V DC electric motor with integrated electronic control.

The actuators are sealed according to IP67/68. Recently the Oden P30EX has been made compliant and certified to ATEX standards for the most demanding environments in the shipping and offshore industry. The Oden P30EX has the most demanding ATEX certification available for electric devices to industry standard 94/9/EC, ATEX certification according to EN 50018. An evaluation of all mechanical modules according to Directive 94/9/EC ATEX for non-electrical equipment in potentially explosive atmospheres is made according to EN134 63-1 and EN134 63-5. The Ignition Hazard Assessment is compliant with EN 1127-1 standards. All relevant documents are stored and kept by the notifying body: Det Norske Veritas in Norway.

Oden® actuators do not use backup accumulators or sensitive electromechanical components, such as limit switches or potentiometers.

Torque, velocity and various other parameters are set prior to delivery and can easily be modified at any time using the provided OVP software, Oden® Valve Program.

Mechanical installation to the valve is easy and can be performed in any direction. Adapters are available for all common valves.

The electrical installation requires only one shielded cable carrying the 24V DC power supply, the analogue (4-20 mA) or digital control signal and the analogue (4-20 mA) position (return) signal.

The automatic calibration ensures a tightly closed valve at the desired signal level, mostly at 4 mA, with very high accuracy. Due to the built-in logics the actuator retains its position and parameters during a power break. However, by using 24V DC it is normally very easy to provide a UPS unit/battery backup system for non-stop operation. The duty cycle is 100%.

By using Oden® Electric Actuators you are getting the most reliable and accurate actuator in the world with exceptionally short pay-back time.

### Oden P30EX

*ATEX certified electric actuator for the most demanding applications in the shipping and offshore business*

- The most advanced ATEX certification of electric actuators available today on the market
- The only electric actuator certified for hydrogen and acetylene gases
- 24V DC servomotor with integrated electronics and thermo control circuits
- Sealed according to IP68
- Turning actuator – 30 Nm up to 2 500 Nm
- Linear actuator – up to 15 kN force
- Low weight – the basic unit weighs only 3 kg – and small size Ø 100 mm and length 204 mm
- Automatic calibration with the Oden Valve Program (OVP)
- All mechanical modules are ATEX notified
- The same technical specification as the Oden P30 standard range of actuators

### Oden P30R1

*Oden high speed turning actuator delivering:*

- 30 Nm torque
- 24V DC servomotor with integrated electronics
- All electronics and mechanics in a IP68 sealed housing
- Available with either analogue or digital connection board
- High speed – 250°/sec
- High precision – +/- 0.5° with analogue connection board or with a digital connection board – +/- 0.1° position accuracy
- Weight 3 kg
- Small size – Ø 104 mm and length 270 mm
- Automatic calibration with the Oden Valve Program (OVP)

### Oden P30H

*High torque actuator for quarter turn valves*

- High torque 2 500 Nm
- 24V DC servomotor with integrated electronics
- Sealed according to IP67
- The ball screw module is flush tight
- High precision +/- 0.5°
- Closing time is 45 seconds for a quarter turn
- Low weight 22 kg
- Automatic calibration with the Oden Valve Program (OVP)

### Oden P30L1

*High speed linear actuator delivering:*

- 15 kN control force in either 40 or 100 mm stroke
- 24V DC servomotor with integrated electronics
- Sealed according to IP67
- Available with either analogue or digital connection board
- High speed – 250 mm/min
- High precision – 1/600 position accuracy with analogue connection board or with a digital connection board 1/1 700
- Weight 5 kg
- Small size – Ø 104 mm and length 350 mm (depending on the stroke)
- Automatic calibration with the Oden Valve Program (OVP)

### Oden P30L2

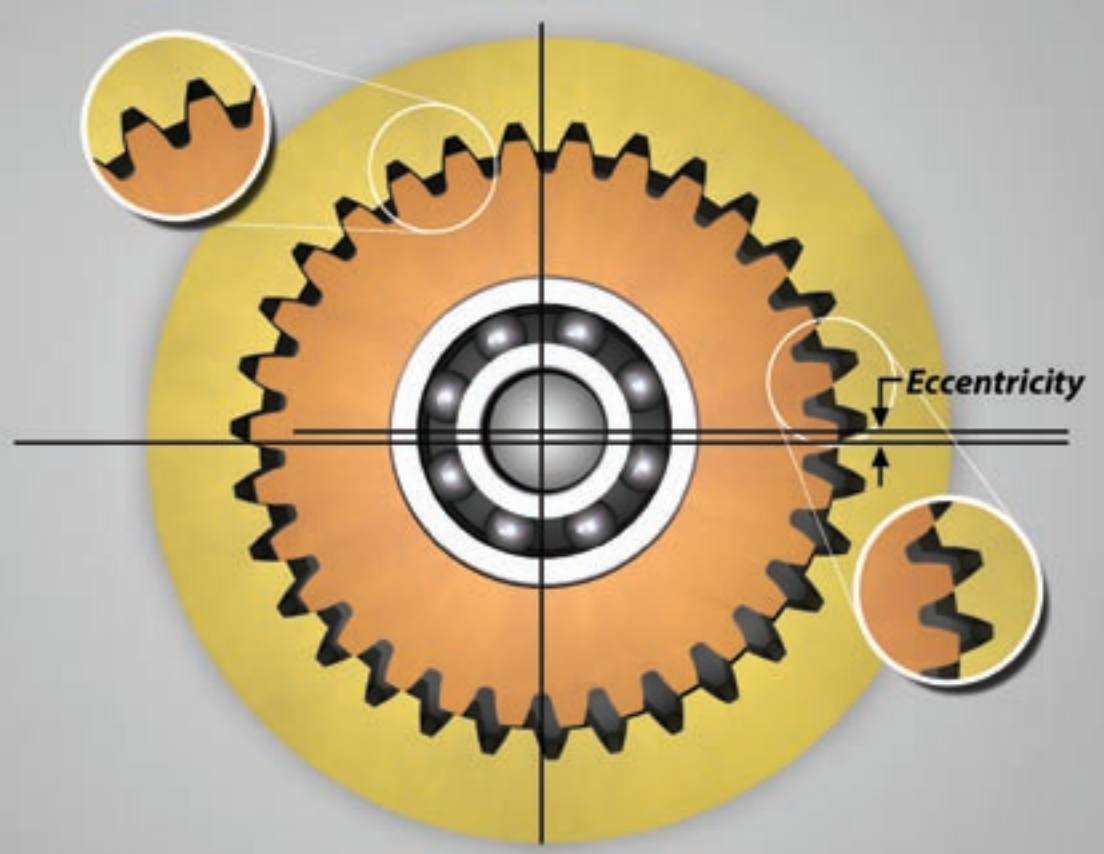
*Electric actuator for needle valves with threaded (turning/rising) spindles such as diaphragm valves.*

- Oden high speed linear actuator delivering high force / speed (depending on the valve spindle pitch)
- 24V DC servomotor with integrated electronics
- Sealed according to IP67
- Available with either analogue or digital connection board
- High speed and high precision (depending on the valve spindle pitch)
- Weight – about 5-6 kg
- Small size – Ø 104 mm and length 250 mm
- Automatic calibration with the Oden Valve Program (OVP)

### Oden P50R – Oden P220R – Oden P500R

*Compact electric turning actuators*

- Control torque 50, 190 or 400 Nm
- 24V DC step motor with integrated electronics
- Sealed according to IP68
- Very high accuracy +/- 0.1°
- Quarter turn closing time movement 6 seconds
- Weight – 5 - 13 kg depending on model
- Small and compact models
- Can be mounted in all directions
- Easy and fast installation
- Automatic calibration with the Oden Valve Program (OVP)



## The Oden Gear Systems™

This unique patented gear system, which comprises just two gears and an eccentric, has been designed using advanced CAD modelling.

The input motor shaft has an eccentric tap with a ball bearing and an inner gear meshing a stationary internal gear. When the input shaft is rotated one turn, the inner gear rotates one tooth pitch in the opposite direction if the difference in amount of teeth is one. This gives an exceptionally high gear ratio in one step with as much as 5 to 10 teeth in meshing depending on ratio, material and load. 100 teeth at the inner gear and 101 teeth at the stationary internal gear results in a ratio of 100:1 in one step.

To transmit the slow eccentric rotation of the inner gear to a centric rotation on the output shaft, some kind of coupling must be used. The Oden Systems™ gear utilizes a simple and reliable solution:

The inner gear consists of a cylindrical "pipe" with a slightly conical gear placed at one end, and in the other end an internal coupling.

The inner gear thus makes a conical movement around the centre point of the coupling. With very few parts you get a high reduction ratio, stiffness and silent running.

This simple design creates a compact, lightweight and reliable speed reduction system with extremely high accuracy and low maintenance.

The total gear efficiency is higher than 90% and the one-step gear up to 250:1 gives a very compact design. The Oden Gear Systems™ is protected by patents worldwide.

The Oden Gear Systems™ is used in applications which require high reduction ratios with perfect accuracy and reliability as in turning/linear actuators, robotics, high performance electronic instruments and high torque industrial applications.

## Oden Control

Oden Control AB (publ) was established in 1996 by Gustav Rennerfelt, a Swedish inventor, who has been designing and engineering special application gearboxes since 1980.

The company was founded on the principle of providing a long-term solution to customers' special needs based on the innovative Oden Gear Systems™ (protected by several patents). Early in 2001 the company went public, and the shares are traded on the official trading market Aktietorget in Sweden with some 300 private shareholders.

The products, based on the Oden Gear Systems™, provide new solutions to machinery builders in many industries and thousands of solutions have been sold to industry in Europe and overseas for a number of different applications. These include heavy duty industrial applications, servo applications and micro-actuators for electronic instruments.

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