Advantages

+ High energy efficiency
+ High dynamics
+ Oil free – power pack and piping are not necessary
+ Sensors used provide the basis for a complete integration in automated production plants
+ Overload safety
CLDP (Closed Loop Differential Pump) is a hydraulic linear axis suitable for all applications with high density and high dynamics. Consisting of a servo motor, internal gear pump and a directly linked hydraulic cylinder, CLDP is a compact and closed system.

The integrated servo pump is matched to the surface area ratio of the cylinder. Speed and direction of movement is controlled without any directional or proportional valves. Because of the closed loop system, CLDP does not need a tank or external power pack. The necessary volume compensator is integrated.

Position control and pressure/force control is possible. The pressure transducer is integrated into the system (option). An integrated position feedback sensor is available. Key features of CLDP are very high energy efficiency and virtually wearless operation. Hydraulic’s intrinsically good overload protection is combined with long life time.

**Technical data**
- Ambient temperature: 0°C to +40°C
- Mounting position: any
- Working force: up to 500 kN
- Stroke length: 50, 100, 200, 300, 400 mm
- Linear feedback system (option): absolute encoder SSI
- Position accuracy: 0.01 mm
- Pressure accuracy: 0.5% FS (full scale)
- Repeatability: 0.01 mm
- IP rating: IP54 / IP64
- Control: position and/or pressure control
- Service interval: 3 years or 20,000 operating hours

**Scope of delivery**
- **Basic version:**
  - Complete drive unit
  - Motor, pump, cylinder, compensation tank, valves, pressure switch
  - Oil filling with high performance fluid PF-700
  - Drift protection (not a safety component)
- **Options:**
  - Pressure transducer
  - Servo converter with safety relay and interface cards (e.g., analog, CANopen, Ethernet, ...)
  - Line filter, mains line choke, brake resistor
  - Motor cable, encoder cable
  - Parameterization software
  - Start-up on-site
  - Integrated position feedback sensor (absolute)

**Applications**
- Bending machines
- Cutting machines
- Forming machines
- Presses
- Special machines
- General replacement of spindle drives with servo motor
- Material handling
- Testing machines (laboratory)
- Food industry
Performance fluid PF-700 for servo drive CLDP

Performance Fluid PF-700 was developed especially for all power transmission systems with special requirements on tribology, temperature, oxidation and shearing stability. The result is a very high application period at minimum degradation.

• Very low frictional losses, therefore significantly enhanced efficiency of power transmission
• Energy saving
• High viscosity index
• Outstanding wear protection characteristics
• Compatible with commonly used sealing materials

For the servo drive CLDP, exclusive use of PF-700 is mandatory.

Data standard sizes

<table>
<thead>
<tr>
<th>Force F [kN]</th>
<th>CLDP 10</th>
<th>CLDP 20</th>
<th>CLDP 40</th>
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additional data on request
Movement direction of the piston rod

The special split design has been developed for use in very cramped installation situations. The pump group and the servomotor form a unit and the cylinder forms its own unit. All advantages of the CLDP are preserved.

The units are hydraulically connected by pipes or hoses. The split version offers extended design options compared to the standard series.
<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Advantages</th>
<th>Benefits</th>
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</thead>
</table>
| Servo drive with hydraulic power transmission                                | The drive is wear-resistant and absolutely overload-safe                                         | + Your drive components and moving parts have a long lifetime  
+ After an overload occurs, your machine or equipment can be quickly and easily restarted |
|                                                                               | The drive has only a few electrical interfaces                                                 | + This keeps your startup effort and costs low  
+ No staff with knowledge of hydraulics is required                                        |
| Closed-loop hydraulic system with no directional control valves or servo valves | The integrated hydraulic system is a stand-alone system (self-contained)                       | + You save the procurement and maintenance costs required for an external hydraulic power pack with all of its piping and tubing  
+ The linear drive is easy and cost-effective to install in machines and equipment        |
| The hydraulic cylinder is controlled with a servo pump whose flow rate is matched to the cylinder surfaces | Simple and compact design with no classic valve and control technology                         | + The linear drive requires up to 50% less energy, reducing your operational costs  
+ The costs for commissioning, training, and maintenance are low                           |
|                                                                               | Hydraulic system throttle losses are kept to a minimum                                         | + The drive is energy-efficient and has low cooling requirements                              |
| Standardized linear drive with very few components and modular design        | • This keeps planning costs associated with system integration low  
• A large number of designs and sizes are available                                            | + This reduces development times and development costs associated with your machinery or equipment |


Control principle: speed and pressure control integrated in the servo converter

Control principle: speed, position and pressure controller integrated in the servo converter

*only with pressure control
Control principle: motion block control integrated in the servo converter

- **Servo Converter**
  - RPM set
  - RPM actual
  - Pressure actual*
  - Position actual
  - Safety clearance
- **CLDP**
- **Machine Control**
  - Parameter setting / implementation
  - Data line: field bus, Dig I/O
  - Parameter setting (field bus only)
  - Operating type (start, stop, auto...)
  - Monitoring
- **PCA/HMI**
- **Safety Controller**
  - Parameter setting / implementation
  - Monitoring
  - *only with pressure control

*only with pressure control
## Dimensional drawing basic design CLDP 10

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All dimensions in mm, all dimensions for reference only

* depending on version

** plug position may be rotated in 90° steps
Dimensional drawing basic design CLDP 20

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All dimensions in mm, all dimensions for reference only
* depending on version
** plug position may be rotated in 90° steps
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All dimensions in mm, all dimensions for reference only
* depending on version
** plug position may be rotated in 90° steps
*** Piston
Type code

CLDP L 20 100M U 2 - 100/070-010 B U 10

00 = without drift protection, without pressure transducer
01 = without drift protection, with pressure transducer
11 = with drift protection, with pressure transducer
10 = with drift protection, without pressure transducer

Position of electrical connection
(as seen viewing motor front, tank on top)
R = right; L = left; U = down
Outlet motor connection box
L = left *; R = right *; P = pump side *
M = motor side *
*only with motor connection box

Electrical connection
A = motor connection box; B = connector

Cylinder
Piston diameter; rod diameter; stroke

Motor rotation speed
2 = 2 000 min⁻¹; 3 = 3 000 min⁻¹

Motor cooling
O = surface forced cooling; U = without forced cooling

Motor
070M; 070L; 100M; 100L

Size
10; 20; 40

Design
L = linear; P = parallel; O = orthogonal (right angle)

Servo drive CLDP

Material number