Servo-hydraulic control for CNC press brakes

Product characteristics

The patented electro-hydraulic drive ePrAX® modular is tailored to the special requirements of drives for CNC press brakes. All required components are composable based on a modular concept and allow an optimal use of the mounting space through a flexible arrangement.

For each actuator a servo motor takes over the control of power stroke and fast stroke as well as bending force. The return stroke partly takes place using temporarily stored hydraulic energy. In this way a high dynamic with significant energy savings and shorter cycle periods is possible. At the same time the operating noise of the press brake is drastically reduced by each adapted speed.

The hydraulic system with its optimized oil circulation system leads to a very high system stiffness and thus to a high control accuracy. The pre-finished and fully tested press drive involves only minimal installation and maintenance effort. A standardized cylinder interface allows different cylinder sizes and therefore variable lifting speeds. Further options, such as modules for tool clamping, are available for the press drive.

The ePrAX® modular complies with valid accident prevention regulations and is certified with proof of concept number 18003.

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Structure

- Cylinder module (including Slow Up module)
- 2x Servo Power module (left and right)
- 2x tank (left and right)
- Drive controller

Options

- Module for tool clamping with pressure control
  - HB55370-002A (<80 bar)
  - Clamp system for tool holder at the upper beam, which enables change and movement of tools. Pressure can be adjusted as required.

- Module for tool clamping without pressure control
  - HB55369-002A
  - Clamp system for tool holder at the upper beam, which enables change and movement of tools.
## Technical data

### General

<table>
<thead>
<tr>
<th>weight [kg]</th>
<th>ambient temperature [°C]</th>
<th>mounting position</th>
<th>volume [L]</th>
</tr>
</thead>
<tbody>
<tr>
<td>cylinder module: ~150 (including Slow Up Module) Servo Power Module: ~100 tank module: ~35</td>
<td>0 to +40</td>
<td>horizontal (cylinder module, tank module) or arbitrary (Servo Power Module)</td>
<td>tank module: ~70</td>
</tr>
</tbody>
</table>

### Hydraulic parameters

Hydraulic fluid: mineral oil according to DIN 51524, other media on request

<table>
<thead>
<tr>
<th>operating pressure (initial pressure) (bar)</th>
<th>volume flow Q_{max} [L/min]</th>
<th>hydraulic fluid temperature [°C]</th>
<th>viscosity [mm²/s]</th>
<th>permissible degree of pollution</th>
<th>volume flow Q_{max,suction valve} [L/min]</th>
</tr>
</thead>
<tbody>
<tr>
<td>max. 320</td>
<td>50</td>
<td>-10 to +70</td>
<td>10-600; recommended range for continuous operation: 20-100</td>
<td>max. 19/16/13 according ISO4406</td>
<td>600</td>
</tr>
</tbody>
</table>

### Electrical parameters

<table>
<thead>
<tr>
<th>rated power [kW]</th>
<th>rated voltage</th>
<th>rated current [A]</th>
<th>operating mode / duty cycle</th>
<th>ingress protection class (DIN40050)</th>
</tr>
</thead>
<tbody>
<tr>
<td>24.3 (per actuator)</td>
<td>3x400 VAC 50/60 Hz</td>
<td>35 (per actuator)</td>
<td>S1</td>
<td>IP20</td>
</tr>
</tbody>
</table>
Functional diagram

With Slow Up function

1. IDLE
2. PRECLOSING
3. FAST DOWN
4. MUTE
5. WORKING SPEED
6. DECOMPRESSION
7. SLOW UP
8. WAIT
9. FAST SPEED UP
10. PREOPENING

Servo-hydraulic control for CNC press brakes
Hydraulic schematic

Options

5-A1 module for tool clamping with pressure control

6-A1 module for tool clamping without pressure control
Dimensions

Servo Power Module

*Pump and motor are size-dependent on tonnage and speed.
Tank module
# Request form

I wish to receive an offer of a press brake system for the following machine:

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Press force</td>
<td>______________________ kN</td>
</tr>
<tr>
<td>Piston diameter press cylinder</td>
<td>______________________ mm</td>
</tr>
<tr>
<td>Rod diameter press cylinder</td>
<td>______________________ mm</td>
</tr>
<tr>
<td>Rapid speed down</td>
<td>______________________ mm/s</td>
</tr>
<tr>
<td>Working speed</td>
<td>______________________ mm/s</td>
</tr>
<tr>
<td>Rapid speed return</td>
<td>______________________ mm/s</td>
</tr>
<tr>
<td>Beam weight including tools</td>
<td>______________________ kg</td>
</tr>
<tr>
<td>Valves position monitored (safety)</td>
<td>□ yes □ no</td>
</tr>
<tr>
<td>Options</td>
<td></td>
</tr>
<tr>
<td>Upper tool clamping</td>
<td>□ yes □ no</td>
</tr>
<tr>
<td>Lower tool clamping</td>
<td>□ yes □ no</td>
</tr>
<tr>
<td>Proportional hydraulic crowning</td>
<td>□ yes □ no</td>
</tr>
<tr>
<td>Used CNC control</td>
<td>Product: __________________ model: __________________</td>
</tr>
<tr>
<td>Demand</td>
<td>_______ systems/ year</td>
</tr>
</tbody>
</table>
Order information

Type code - Servo Power Module

<table>
<thead>
<tr>
<th>ordering example</th>
<th>SERVO MOD_</th>
<th>SPM</th>
<th>2</th>
<th>019</th>
<th>PHS</th>
<th>0001</th>
<th>A001</th>
<th>42</th>
<th>S...</th>
<th>A1</th>
</tr>
</thead>
</table>

- **designation**: SERVO MOD\_
- **System**: SPM Servo Power Modul
- **size**: 2 size 2 (HQI2)
- **volume flow [ccm/U]**
  - size 2
    - 008  008 ccm
    - 011  011 ccm
    - 013  013 ccm
    - 016  016 ccm
    - 019  019 ccm
    - 022  022 ccm
- **servo motor**: PHS phase
  - XXX without motor

- **serial identification**: A1 (A) letter interchangeability ensured
- **(1) number interchangeability partially ensured**
- **special design**: S.... ....
- **shaft diameter motor**: 42 42 mm
- **variety counter motor adapter**: A001
- **variety counter servo motor**: 0001
Type code - cylinder block

ordering example

<table>
<thead>
<tr>
<th>CYLINDER BLOCK\</th>
<th>S</th>
<th>CM</th>
<th>063</th>
<th>H</th>
<th>X</th>
<th>A</th>
<th>S....</th>
<th>A1</th>
</tr>
</thead>
</table>

**Designation**

CYLINDER BLOCK

**Monitoring of valves**

- S: monitored are two 2/2-way poppet valves and two 4/2-way valves
- valves are not monitored

**System**

CM: press brake control
VM: valve module

**Size of prefill valve**

063 NG 63 (100 L/min; Qmax = 680 L/min)

**Interface Servo Power module**

- 2: size 2 SPM
- 3: size 3 SPM
- 6: size 6 SPM

**Interface tank module**

H: 2 1/2"

---

Type code - Slow Up Module

ordering example

<table>
<thead>
<tr>
<th>SLOW UP MODULE\</th>
<th>1.4</th>
<th>-</th>
<th>210</th>
<th>-</th>
<th>X</th>
<th>S....</th>
<th>A1</th>
</tr>
</thead>
</table>

**Designation**

SLOW UP MODULE

**Nominal volume accumulator**

- 1.4: 1.4 L
- 2.0: 2.0 L

**Accumulator pressure (p2)**

- 210: 210 bar
- 250: 250 bar

**Precharge pressure (p0)**

- X: unfilled
- __: __ bar

---

**Serial identification**

A1: (A) letter interchangeability ensured

(1) number interchangeability partially ensured

**Special design**

S.... ....
# Type code - tank module

<table>
<thead>
<tr>
<th>ordering example</th>
<th>TANKMODULE</th>
<th>TM</th>
<th>070</th>
<th>H</th>
<th>0001</th>
<th>A</th>
<th>0001</th>
<th>S....</th>
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<td>TANKMODULE</td>
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<tr>
<td>interface cylinder module</td>
<td>H 2 1/2&quot;</td>
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