Control Systems for Position, Pressure, and Force
Solutions for Electro-Hydraulic Applications

BLH • Nobel Weighing Systems
Brands of VPG Process Weighing

www.weighingsolutions.com
History

VPG Process Weighing is a division of Vishay Precision Group, which produces load cells based on resistive foil technology, load-cell-based systems, and vertically integrated products and solutions for multiple markets in the areas of force measurement, industrial weighing, and process control.

VPG Process Weighing includes products from BLH and Nobel Weighing Systems, providers of process weighing and force measurement systems for decades. We use our advanced Micro-Measurements strain gage technology and foil resistor products and know-how in all our transducers and instruments. Our experience and design capabilities make it possible to provide a wide range of standard and custom-made products and solutions.

For decades we have designed, produced, installed, and serviced advanced systems for positioning and control in various industries. Starting with systems for artillery guns, we have extensive experience using electro-hydraulic components as tools for complex positioning applications.

Control Systems for Position, Pressure, Force, Rotational Speed, and Angle Position

Electro-hydraulic control systems from BLH and Nobel Weighing Systems provide extremely accurate control and high repeatability. These make possible consistent product quality and optimal use of raw materials.

Our electro-hydraulic control systems:

• Provide high production capacity through rapid machine settings
• Withstand great set forces and have wide operating ranges

Complete System Concept

We work closely with our customers to analyze tasks; propose system solutions; select components; install systems and participate during start-ups; provide follow-up operating assistance, and deliver equipment for serial production.

Our technical and customer service resources enable us to provide high-quality servo assemblies to customers worldwide.

System Solutions

Our CPU-based electronic systems can communicate with host PC/PLC systems via fieldbus. Control parameters and calibration values are set up through terminal programs in a PC-based environment.

Our control system for sawmill machinery can be found in most countries with a lumber industries. Over the years, we have shipped control systems for thousands of axes.

BLH and Nobel Weighing Systems products for controlling web tension, roll pressure, reeling, and disc gaps in pulp and paper operations and cellulose operations are known worldwide.

Our systems are ideal for use with industrial machines with high set speeds and wide operating ranges that require high set forces.

All systems are factory calibrated and ready to be put into operation immediately after installation.

Experience in Electro-Hydraulics

The development of electro-hydraulic systems started in the 1940s. Initially they were used to control artillery guns (Bofors).

Subsequent development involved systems for sawmill applications.

<table>
<thead>
<tr>
<th>Year</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1974</td>
<td>First system for sawmills</td>
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<tr>
<td>1977</td>
<td>Development of H-2 modules for servo control</td>
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<tr>
<td>1983</td>
<td>First single board system (SBS)</td>
</tr>
<tr>
<td>1986</td>
<td>Servo actuator (POS) for hydraulic systems</td>
</tr>
<tr>
<td>1989</td>
<td>SBS 30</td>
</tr>
<tr>
<td>1992</td>
<td>SBS 40</td>
</tr>
<tr>
<td>1996</td>
<td>Digital servo controller, microPOS</td>
</tr>
<tr>
<td>2004</td>
<td>New generation of servo controller, microPOS4</td>
</tr>
</tbody>
</table>
### Sawmill Applications

Our control systems for sawmill machinery can be found in most countries with lumber industries. The systems are found in machines such as:

- Profilers
- Block turners
- Circular saws
- Band saws
- Chipping canters

### Industrial Applications

Our control systems are suitable for machine operations that require high set forces with high speed and accuracy. Applications include:

- Hydraulic presses
- Turbines
- Saw mill machines
- Manipulators
- Fatigue testing
- Plastic extruder
- Wind turbines

### Pulp and Paper Applications

Our control systems are used in critical processes in the pulp and paper industry. Applications include:

- Disc Gap Control (DGC)
- Reel Optimizing System (ROS)
- Rider Roll System (RRS)
Positioning Systems

SCS – Servo Control System

Modular servo control system for hydraulic applications. The system can control between 2 and 16 servo axes. Communication to the main control unit is done with Modbus or fieldbus.

**Typical applications:**
- Position control
- Rotational control
- Pressure control
- Force control

SPU – Servo Positioning Unit

Programmable unit for customer applications including PLC functionality and integrated servo control system.

**Typical applications:**
- Dimension and sequence functions in sawmill machines

DGC II – Disc Gap Control

For production of mechanical pulp in disc refiners, accurate control of the disc gap is required to achieve a satisfying production quality.

- Control of the disc gap, manually or by computer
- Disc position measuring
- Display of the disc gap and the disc wear
- Setting of limits for the working range
- Fast opening of the disc gap in case of emergency
# Positioning Systems

**Control Instruments**
- microPOS4 – Digital servo controller
- GATE-3 – Gateway to fieldbus
- LVD-3 – Signal conditioner

**Servo Actuators**

**POS Series Hydraulic Servo Actuators**
Servo actuators specially designed for rough environments. They can be mounted with front flanges, mid-trunnions, or swivel-eyes. The servo actuator is available with built-in potentiometers or magnetostrictive transducers.

**Control Valves**
- Servo valves
- DDV valves
- Proportional valves
- Tracer valves

**Transducers**
- RAG – Position transducer
- LVDT – Position transducer
- MTS – Position transducer
- IDA – Pressure transducer
- KOS/KIS – Force transducer
Force Nip Load

Winders, Slitters, Rewinders, Calenders, and Press Section Force and Position Control

We have been delivering systems for controlling nip loads for decades. Our experienced engineers design system components such as force measurement blocks, cylinders, valves, and control units. This guarantees optimized performance that is independent of the type of machine on which the system is installed. The control unit is a digital, multi-channel, servo controller that is specially designed for fast force- and position-control loops.

The Rider Roll System (RRS) for winders and slitters is a force- and position-control system with separate controls for each side. The system features soft contact with the core, high nip-load accuracy, and dynamic force detection to prevent roll kickouts.

For rewinders, we can supply a system with correction for variable web width. This system is also available with single-channel pressure control.

The system for calenders is similar to the RRS, but includes correction for the changing angles of the arms. The press-control system provides pressure and position control of the nip load in the press section or calenders.
Reel Optimizing

Nip Load and Position Control

Measure, Control, and Optimize Your Reel

The patented Reel Optimizing System (ROS) is a hydraulic force and position control system developed to eliminate wrinkles and cracks during the critical shifting phase, and improve roll density. With load cells in the primary and secondary arms installed close to the spool, the system provides extremely accurate measurement of nip force.

The ROS gives your reel smooth and synchronized movement of the arm, and a correct nip load from the first meters in turn-up position to the complete roll length. This is accomplished by measuring and controlling the nip load forces and cylinder positions in both the primary and secondary arms.

Roll Density, Diameter, and Length

Roll density is measured and optimized by controlling the nip load. Online density measurement provides very fast feedback for optimizing the calander after line shut-downs, or when changing grades.

The system provides very accurate length and diameter measurement, and includes a feature for calculating the required tambour diameter for the scheduled winder sets.

Optimizing Logger

The system’s optimizing logger stores data on a PC for analysis.
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