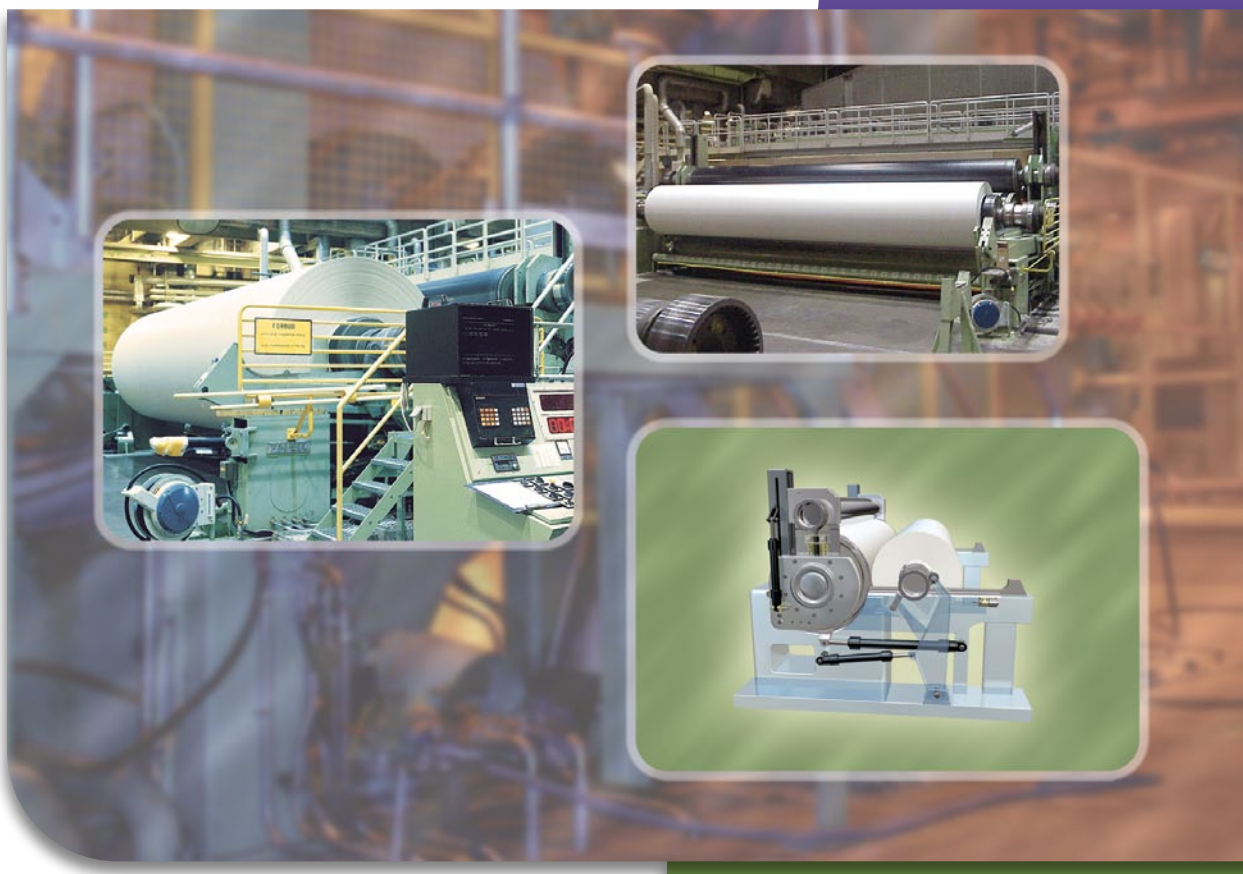
VISHAY PRECISION GROUP



Product Overview

Reel Optimizing System

BLH • Nobel Weighing Systems

Brands of VPG Process Weighing

BLH Nobel Elektronik

www.weighingsolutions.com

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Control System

BLH • Nobel Weighing Systems

Reel Optimizing System (ROS)

Development of the ROS is based on decades of experience in the production of measurement and control systems. The system provides controlled density and reel quality during the winding process. It also minimizes wrinkles and cracks during the critical shifting phase when shifting from primary to secondary arms. ROS reduces bottom breaks by 40% to 90%.

Benefits to the User

- Reduce paper scrap almost to 0%
- Short return on investment (ROI)—less than a year.
- Field proven—more than 23 installed systems in Europe and North America
- Optimized performance based on machine analysis

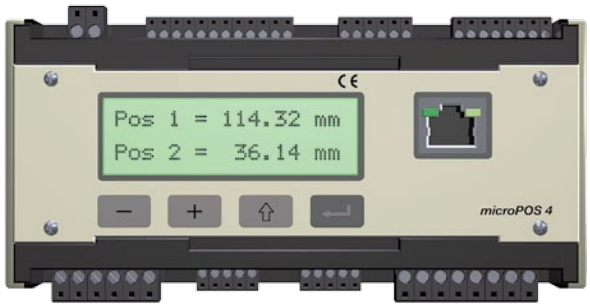
System Highlights

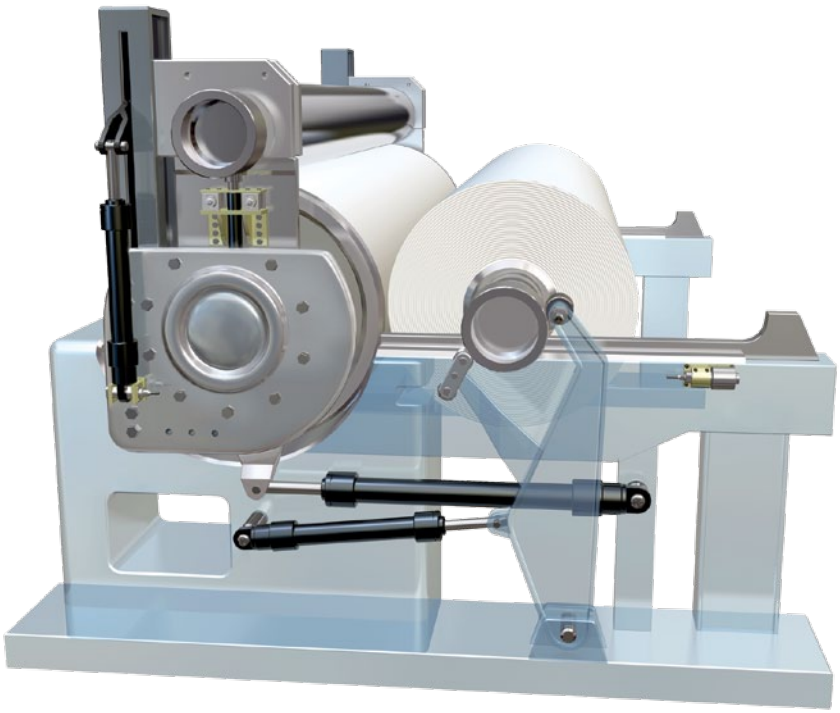
- Minimize paper loss due to bottom breaks
- Improved paper density, roll diameter and length
- Minimizes turn-up breaks during reel replacement
- Real-time closed loop control of the nip force during reel replacement

System Features

The system provides online measurement and control, on each side of the machine, of all force and movement. This method eliminates all problems caused by friction, non-parallelism, and general wear and tear. Automatic weighing and dead weight are carried out to compensate for different weights when changing reel spools in the primary arms.

The system controls the nip force during shifting phases and corrects for angle changes when lowering reels. Parallelism, acceleration, and speed are all controlled during the lowering process. This process minimizes pope speed and any variations in web tension. When shifting, the forces between the primary and secondary arms are added to ensure that the required linear force is maintained.





Linear Force, Measuring, and Control

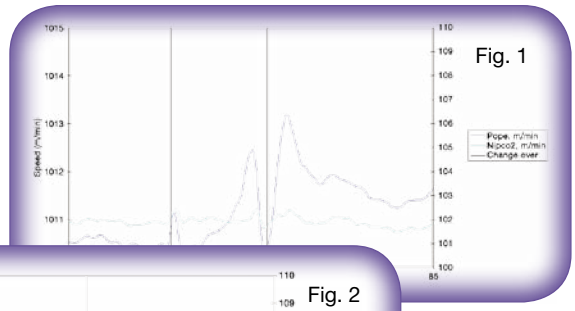
ROS Functions

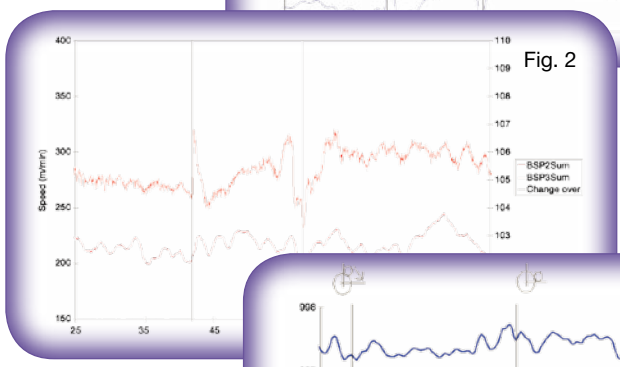
Linear force in the primary arm on the pope depends entirely on the weight of the reel spool, the cylinder force from the over clamp, and the relief force. Uncontrolled movement and linear force can cause disturbances in pope speed and web tension.

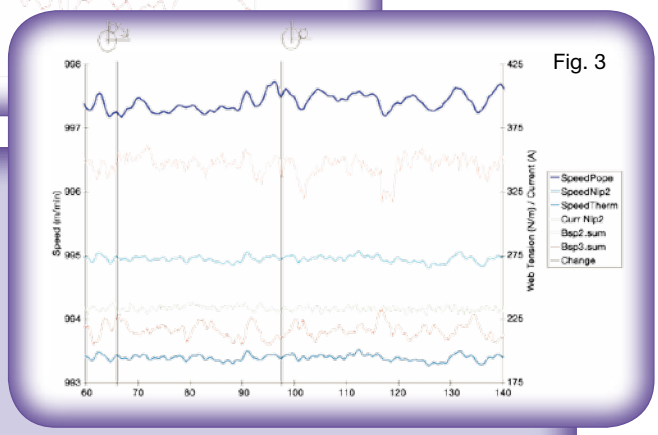
Fig. 1. Speed variations in a traditional pope

Fig. 2. Web tension variations in a traditional pope

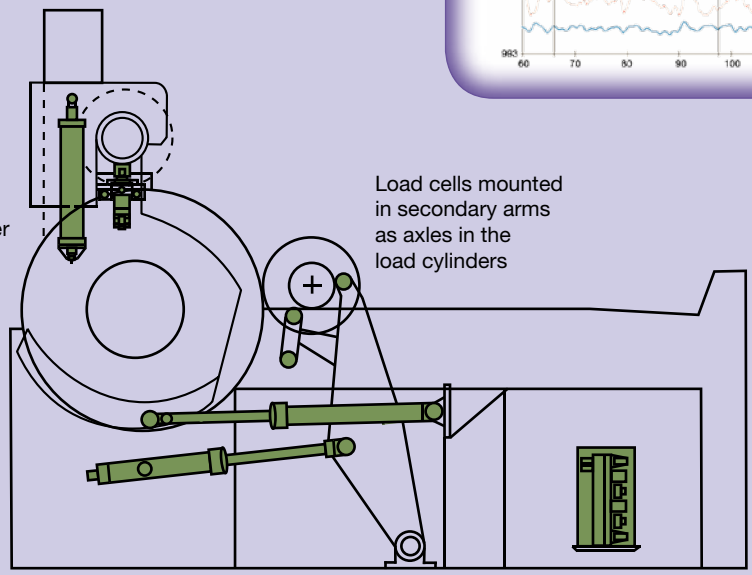
Fig. 3. Lowering of the primary arm using relief and online control techniques reduces pope speed and variations in web tension when shifting to the secondary arms







Optimum Placing of Measuring Unit = Optimum Measurement Results

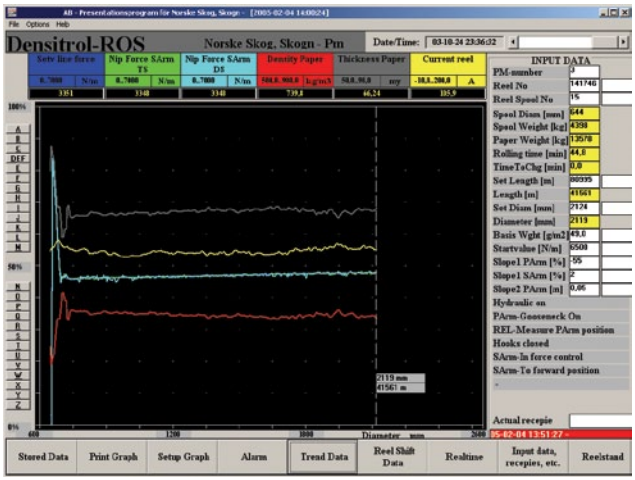


Quality Equipment

ROS with Densitrol is a tool for optimizing and storing measurement data from the systems.

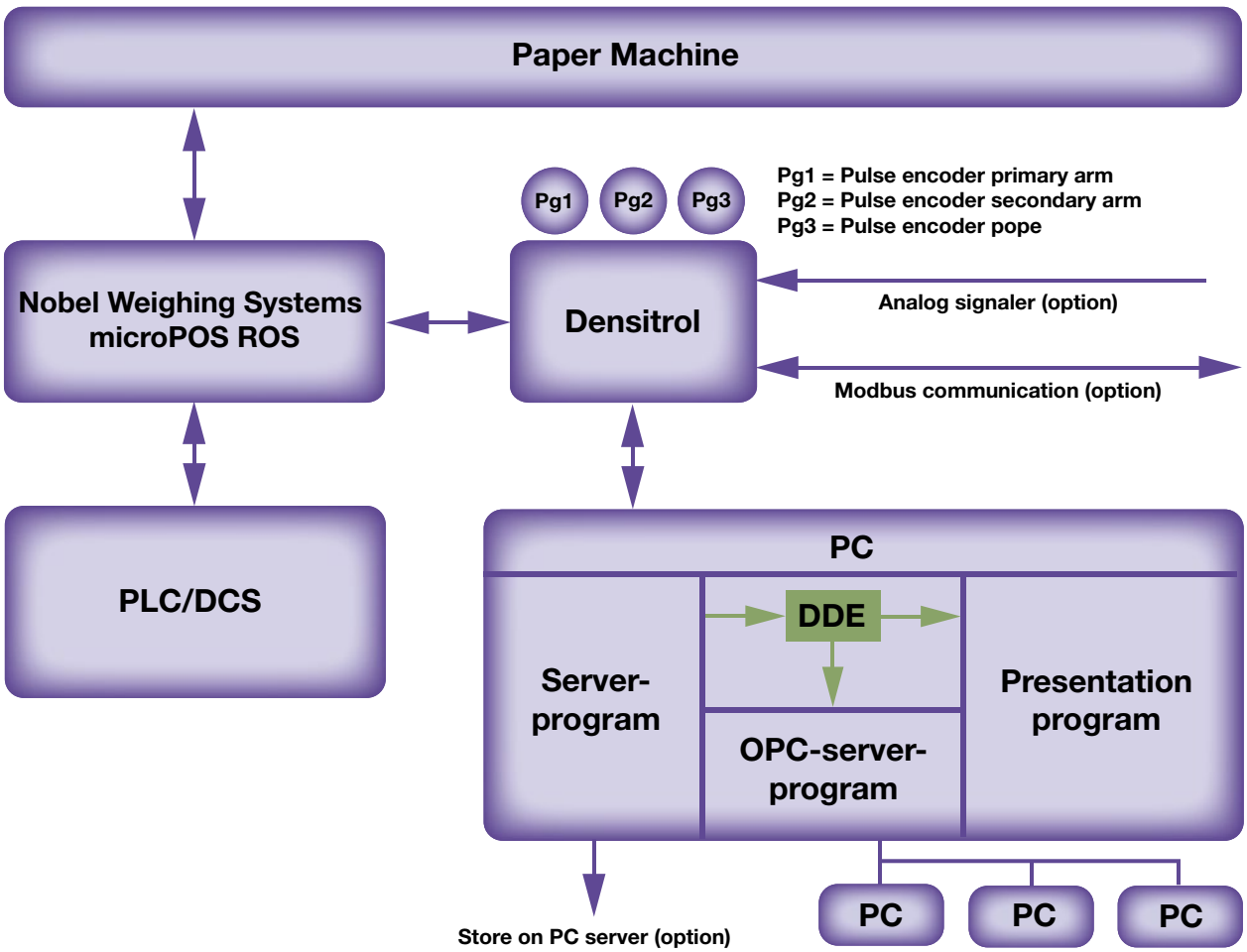
Measurement data is presented online as current data. The system's optimizing logger stores the data for later analysis in servicing as well as quality and product research. Lists of set values for different qualities can be pre-programmed and even adjusted within selected areas by an operator.

Paper thickness and density is calculated by measuring the revolutions of the pope roller and the reel spool. At the same time, a very accurate measurement of length and diameter is also recorded.



Information Display

Examples of information that are presented: paper thickness, density, linear force, and machine speed.



Operator and Service Tools

ROS with Densitrol is also an interface for optimizing thickness/density, length, and diameter.

Density. A quick update of density gives the operator the ability to adjust the calender's linear pressure, e.g., after a line shut-down or quality change. Fine adjustments in roll density are carried out in the ROS system by making corrections in the set values of the linear force.

Length or diameter. Operators can calculate optimum length and diameter for roll machines (see Fig. 1).

There is also a function for automatic changes when specific lengths and diameters are required, as well as a countdown feature for the change being displayed (see Fig. 2).

The operator can see any potential disturbances in paper quality. An alarm is triggered in the event of any disturbances in the measurement or control systems.

Service Tools

ROS is an excellent application for examining production data, maintenance records, etc.

Production data. All measurement data for all run phases are saved in a computer or via a network. Graphs of current trends can be quickly created when analyzing quality problems.

Service. Information such as valve signals, load cells, position data, hydraulic pressure etc., is saved to disc.

Set values. Set values for differences in quality can be easily adjusted by using the program's menu.

System parameters. All parameters are easily configured and modified and saved using the service PC. All parameters and data are clearly displayed in a user-friendly format.

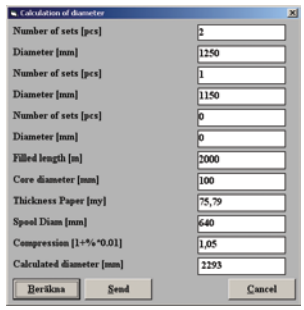


Fig. 1

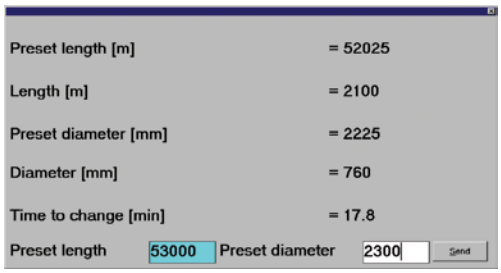
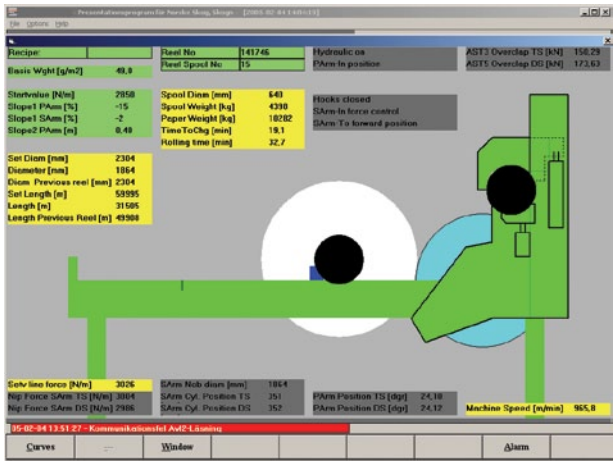


Fig. 2



Installation and System Components

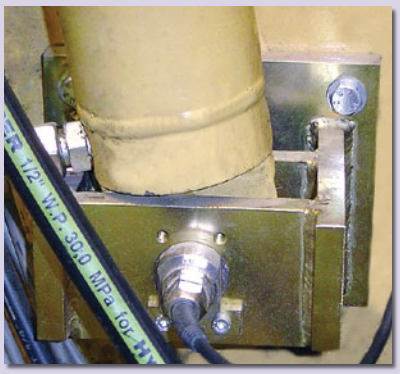
We deliver turn-key systems that can be easily integrated into new or existing machines. In most cases, installation can be completed during standard maintenance sessions, resulting in minimum interruption to production.

Primary arm relief unit with cylinder and load cell

Control System ROS

Secondary arm load cell is mounted directly onto the spool reel

Hydraulic valves mounted in separate cabinet by the machine



Over-clamp load cell

Cylinders with built-in position transducer

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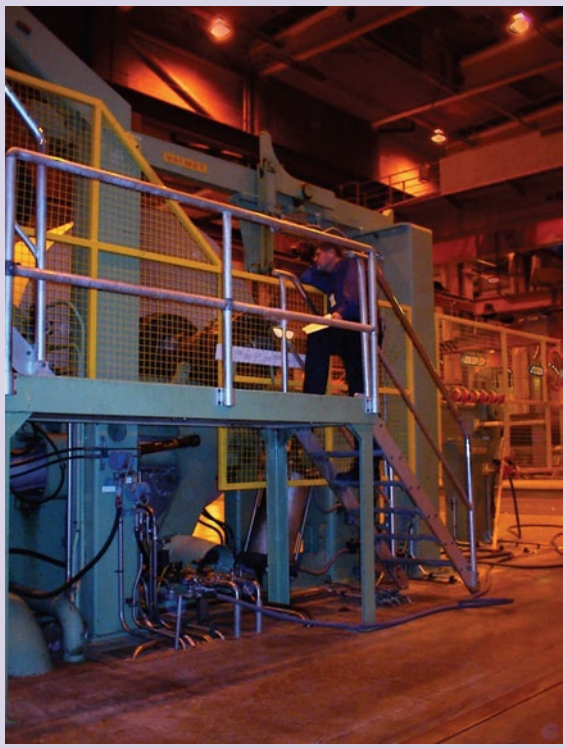
Construction and Performance

System and Cell Construction

An important factor in our system design is the mechanical construction and dimensioning of the load cells, relief units, and cylinders so that the system can be adapted to existing machinery with a minimum of reconstruction.

Dimensioning and construction of hydraulic systems and the selection of control system components is one of our additional areas of expertise.

The digital control system is of our own construction. It is designed to manage dynamic processes and contains features such as control loops for force, positioning, speed, and acceleration.



Example of a Custom-Designed Control System

System Performance	
Force Control	
Secondary arms	±2%
Primary arms	±3%
Parallelism	
Primary and secondary arms	±2 mm
Measurement Data Densitrol	
Length	1 m
Diameter	0.2 mm
Density/thickness	0.05%
Paper thickness	0.05%

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