

# APPLICATION NOTE: Cylinder and feeder control for log splitter Precise position control using Magnetostrictive transducers WRP-A and WPP-A

## Overview

- **Application:** Accurate control of the cylinders and feeder in log splitting machine
- **Product:** Magnetostrictive transducer WRP-A 300 mm stroke and WPP-A 2000 mm stroke
- **Result:** WRP-A controls the cylinders position and WPP-A the feeding frame with  $\leq \pm 0.02\%$ /FS linearity error

## The process

The splitting log machinery includes equipment used for splitting firewood from softwood or hardwood logs. Many log splitters consist of a hydraulic or electrical rod and piston assembly and these are often rated by the tons of force.

In the hydraulic machinery, a log splitter either uses a hydraulic piston to drive the log through a stationary blade or a rotating cone shaped screw mandrel that pulls the log up over the edge. The higher the force rating, the greater the thickness or length of the log that can be split.

The hydraulic log splitter consists of three hydraulic actuators that move all the process phases.

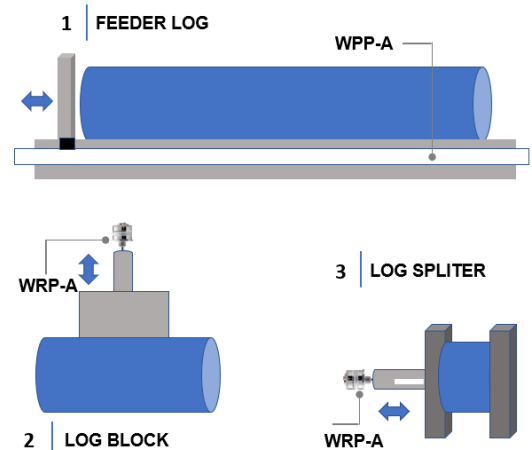


Fig.1 – Installation diagram

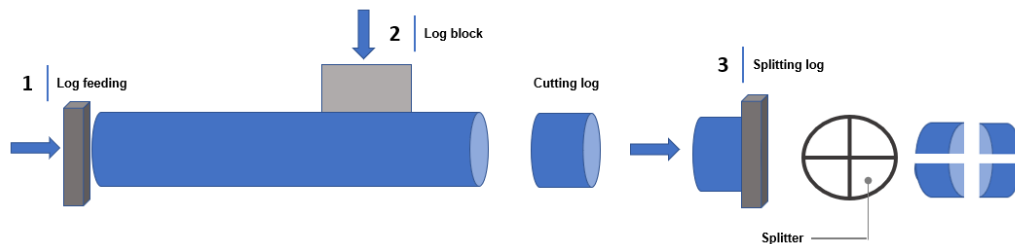


Fig.2 – Process diagram

## The challenge

All the machine movements described in the process diagram (fig.2) – feeding, blocking, splitting-, should be accurately controlled in terms of positioning. All the phases are driven by the PLC that receives the exact position of the hydraulic actuators and feeding frame through the linear position sensors installed on the machine.

Particularly the feeding frame, installed with profile design sensor WPP-A (fig.1), carries out the feeding of the log. The block of the log and the subsequent splitting are realized by actuators (hydraulic cylinders) which presses the log vertically to stop it during the cutting and push it horizontally into the splitter in order to obtain wooden logs. Each cylinder one for blocking and one for splitting are installed with WRP-A position sensors (fig.1).

Working process from the log to the splitted log:

- Log feeding
- Log block-Cutting log
- Splitting log

## Product benefits

### WRP-A and WPP-A transducers

- Absolute and accurate signal:  $\leq \pm 0.02\%$ /FS linearity error
- High reliability
- IP67
- High vibration resistance: 15g / 10...2000Hz (DIN IEC68T2-6)

## Solution

The position transducers HYPERWAVE WRP-A and WPP-A (Analog interface) using Magnetostrictive technology with  $\leq \pm 0.02\%/FS$  linearity error and high signal stability (see vibrations) offers an accurate position measurement.

High reliability for the sensors is a must due to high level of vibration generated by the machine during the production phases. 15g / 10...2000Hz (DIN IEC68T2-6) vibration resistance and contactless technology enables the desired reliability level.

Moreover, the IP67 protection degree ensures that the sensor is fully suited for such an application. The fine wood dust could affect the performance of the sensors if the housing is not duly sealed.



Fig. 3 – Product: WRP-A rod design magnetostrictive linear position sensor



Fig. 4 – Product: WPP-A profile design magnetostrictive linear position sensor

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