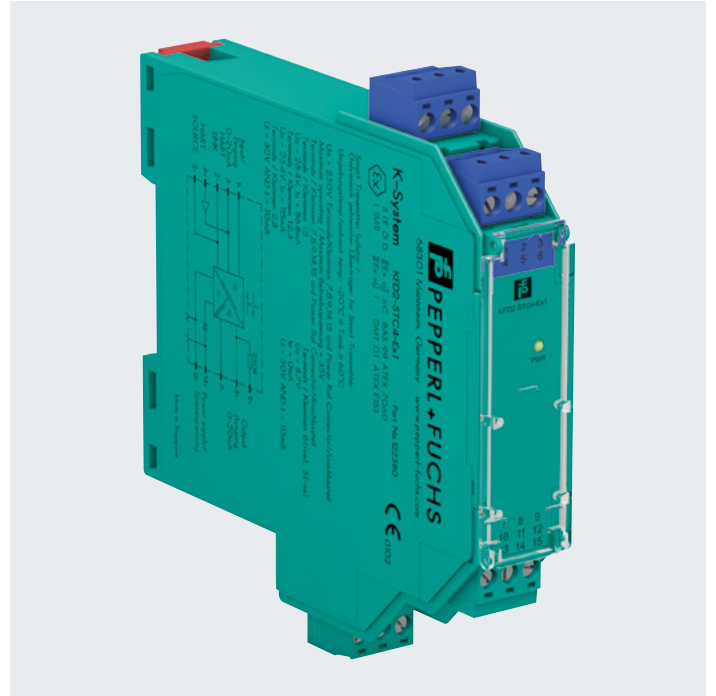


# Screening Systems in Sewage Treatment Plants

Monitoring and controlling the initial  
cleaning stage with the K-System

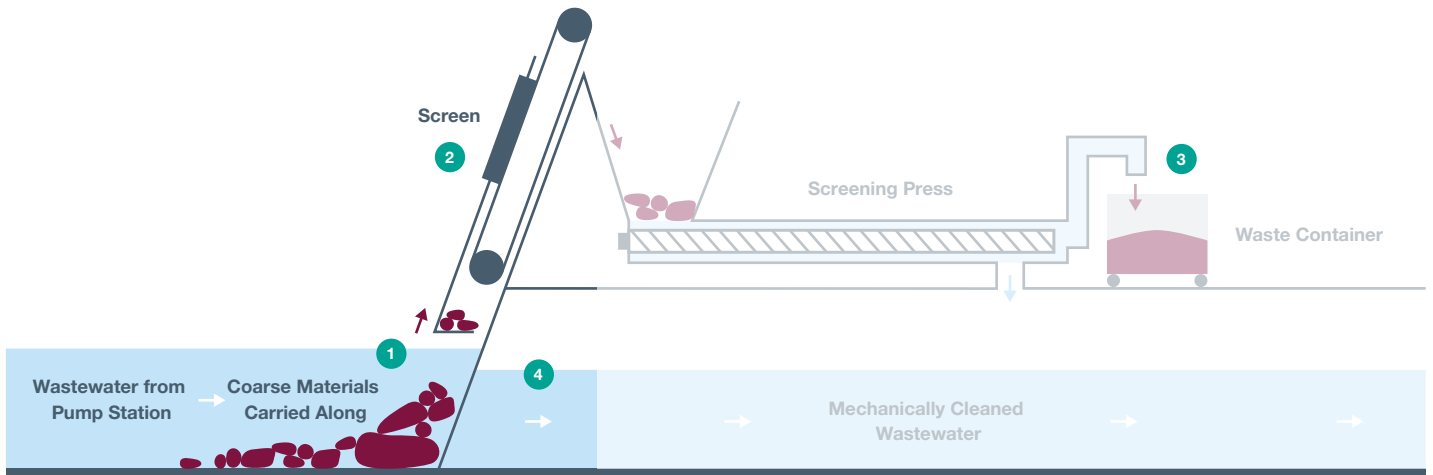


## Application

The first mechanical cleaning stage in a sewage treatment plant is screening. In this process, a rotating comb removes solids such as toilet paper and branches from the wastewater entering the plant. The materials are transported via a conveyor to a screening press where they are dewatered. The materials are then transported via conveyors into waste containers.

Screening systems are located in enclosed spaces. The wastewater in this stage may contain flammable liquids that have been introduced or created as a product of chemical reactions involving substances in the wastewater. As a result, the atmosphere carries a risk of explosion.

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### Schematic Diagram of the Screening System

- 1** Measured value: level

**2** Monitoring the Screen Motor  
Measured value: motor function
- 3** Regular Discharge into the Screening Press  
Measured value: level control

**4** Measured value: level

### Goal

The following functions are carried out in the screening area: The performance of the screening drive is continuously monitored to ensure that the screening comb rotates without disruption. This allows foreign objects to be detected and prevents damage to the conveyors.

The water level is measured before and after the screening process to protect the cleaning system. This makes it possible to detect overflow resulting from insufficient cleaning and prevent operation disruptions.

The fill level of the waste container is also measured after the screening press. This prevents overflow, which results in costly cleaning processes.

### Solution

K-System isolated barriers safely transfer and convert the signals from hazardous areas to the control room. The rotational speed of the screening drive is monitored by reading out discrete sensor signals using a frequency converter.

The water level measurement before and after the screening process is transmitted and monitored using level sensors whose signals are provided to the control panel via transmitter power supplies. The limit values for the water level can be monitored via limit value outputs from suitable transmitter power supplies. If the limit values are to be monitored independently of the transmitter power supply, a vibrating fork is used in conjunction with a switch amplifier.

Transmitter power supplies are used for measuring the fill level of the waste container to prevent it from overflowing. Frequency converters are provided for transmitting fault messages from the screening motors.

### Benefits

The K-System portfolio offers interface modules for all signals and applications, ranging from simple isolators to highly functional modules. The Power Rail provides the devices with supply voltage and offers the option of a collective error message. The Power Rail consists of a DIN rail with an insert. The DIN rail installation makes it easy to plug in the modules, reducing wiring costs. The K-System has received numerous international approvals, including up to SIL 3 for all signal types.

### At a Glance

- The screening system is part of the initial cleaning stage in the mechanical wastewater cleaning process.
- The performance of the screening drive is monitored by frequency converters.
- Transmitter power supplies transmit the value of the wastewater level measured before and after the screening process to the control room.
- Limit values can be issued via the limit value outputs of the transmitter power supplies or—in the case of liquids—using a vibrating fork and a switch amplifier.
- The fill level measurement at the waste container is transmitted via transmitter power supplies.