

KRUSMAN Emergency Showers • Västerås, Sweden

**KRUSMAN EMERGENCY SHOWERS – safety first**

*A paper mill, one of many hazardous industries where emergency showers add to the safety.*



*A drench shower.*

**Krusman  
Emergency Showers**

In many factories and plants, hazardous-substance handling presents a serious problem in the working environment. Both acids and basic substances can cause severe burns, most notably perhaps to the eyes. Emergency showers and eyewashes can dramatically reduce the consequences of contact with many hazardous substances.

**Decisive factors – summary:**

- Low pressure drop
- Robust and reliable
- Position-independent mounting
- Compact and small in size

### Line of Argument & Solution

In order to ensure that an alarm is sent if the emergency shower is actually in use, Eletta flow switches (types SP-G and SP-GA) are used in Krusman emergency showers.

Eletta has produced flow monitors and flow switches since the late 1940s. Later, in the 1960s, a unique design of the mechanical lever that activated the switch enabled Eletta to obtain a patent for its products. To this day, this design is the foundation of the Eletta product line. Eletta Flow's strong reputation is based on robust design, reliability and longevity. The flow monitors are extremely well suited for rugged industrial environments.

The SP-G and SP-GA flow switches are designed to give an alarm at a very low flow, while still allowing a high full flow. This is due to the design with a variable flow passage area that widens as the flow rate increases. The SP-G and SP-GA differ basically in size. The SP-G is smaller and better suited to the smaller pipes and lower flows of the eyewashes.

The design also allows horizontal or vertical mounting of the switch, as the spring-loaded disc works independently of position. The flow switches have an internally calibrated disc that activates the micro switch at the chosen flow

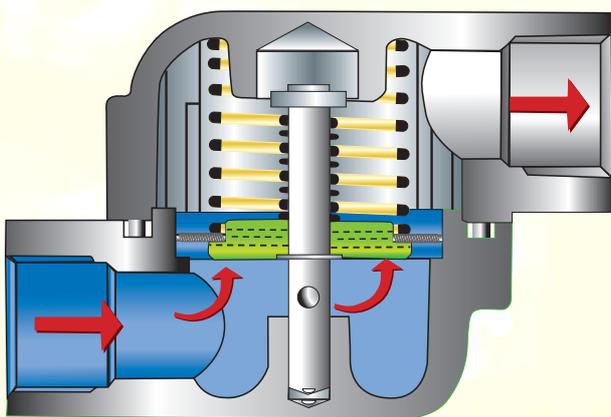
rate and this disc is adjusted before delivery. In all, these features offer advantages over other types of flow switches such as Rotameters or Target or Paddle flow switches.

Another feature is that the outlet can be rotated 90° or 180° with respect to the inlet, depending on the application. Therefore, the Eletta SP-G can be installed in places where space is very limited.

The characteristics of this product made it well suited for use in the Krusman's emergency showers. Also Eletta's overall strengths, such as longevity and reliability, play an important part in the decision to use these switches.

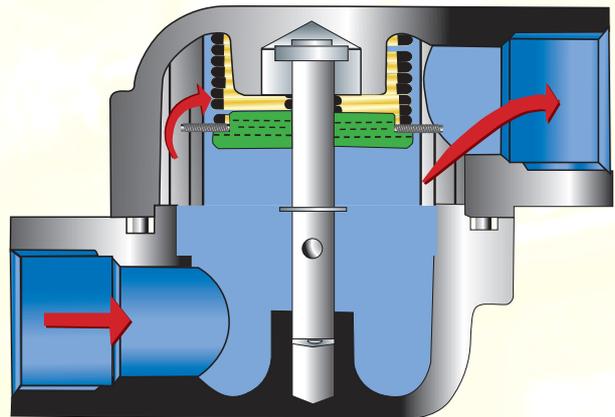
To guarantee the function of the showers, an extensive maintenance programme is carried out according to a specified routine. This includes flushing the showers at least every second week and cleansing the filters. The filters eliminate the risk of residues clogging the flow switch. Also, all paths approaching the showers must be clear, signs must be readable and, not least of all, the flow switch alarm must trip as designed. The importance of this work cannot be overemphasized because a fault could delay the arrival of help to a person in distress at the emergency shower.

### Working Principle



**Closed**

Inside the Flow Switch there is a spring loaded calibrated disc, which will be lifted by the fluid passing. The shaft holding the disc is mechanically connected to a lever, which will influence the micro switch to trip at a preset flow value.



**Open**

As soon as the micro switch has tripped a pump to start or open a valve, the flow increases and the possible flow area increases. The increasing flow volume will push the disc to open fully. Max flow passage is only limited by the pump capacity and the applications accepted pressure drop.

## Background

In order to improve safety standards, the use of emergency showers is on the increase in the industry. The showers are specially designed to be extremely easy to handle for a person in distress. Also, the shower must send an alarm of some kind to facilitate the rescue of the person needing help.

Sweden's leading company in this area is Krusman Nödduschar, or Emergency Showers. Krusman's philosophy is to supply a complete unit that the customer assembles on site.

Two kinds of showers are available:

**Eyewashes:** Made for flushing the eyes and face, requiring a limited amount of water.

**Drench showers:** Able to cover a larger surface of the body.

Both kinds of emergency showers have the overall design in common. They are made from three components:

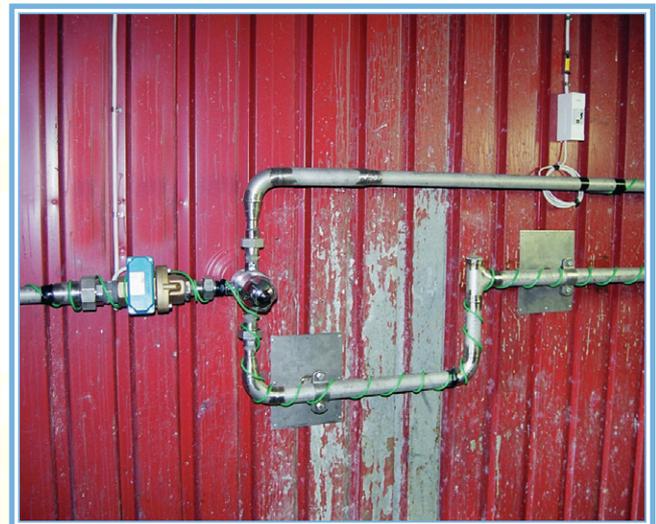
1) **The shower**

2) **The tempering valve.** Makes sure the temperature of the water is correct. To be effective, the affected area must be flushed for quite some time. According to the Swedish Work Environment Authority, a minimum of 15 to 30 minutes is required. However, this is not possible or likely if the water is too cold or too hot. Therefore a tempering valve is needed to give the water a comfortable temperature.

3) **The flow switch.** It gives an alarm when there is flow to the shower. This serves two purposes: It informs everybody that the shower is in use and that somebody is probably in need. It also shows that there is flow in the system, indicating a possible failure if no one is using the shower.



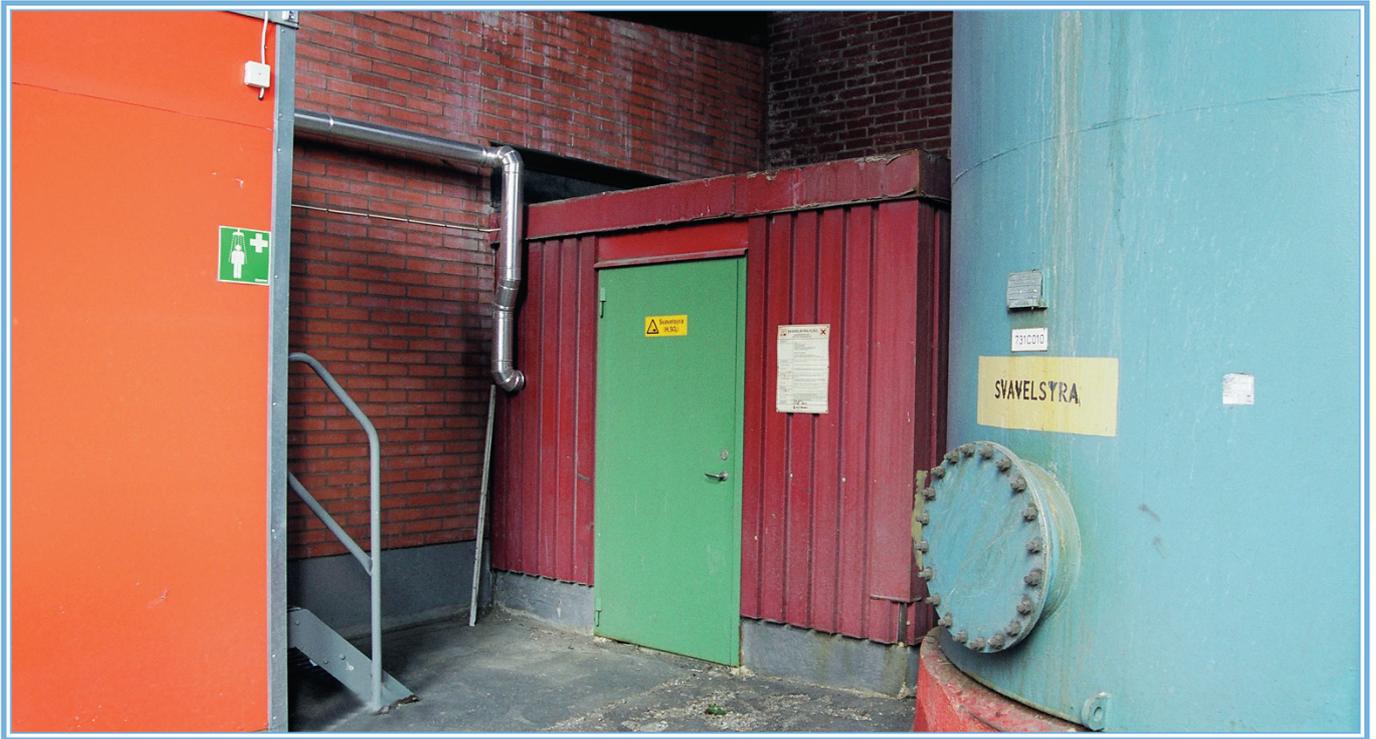
*An eye-wash.*



*An SP-GA flow switch mounted horizontally. Eletta flow switches work independently of their position which is one of their advantages.*

## Problem

In many industries there are dangerous work places in remote areas. Among the customers of Krusman one will find, for example, paper mills, steel works and water works. The pictures and details in this report are from a paper mill in central Sweden. A general decision was made at the paper mill to improve the safety situation. Sulphuric acid and white liquor are used widely and present a great danger. No less than 108 showers were placed throughout the plant at a cost of approximately 350 000 Euros. For the safe accurate function of the emergency showers, it is very important that the showers send a centrally monitored alarm. This system shows not only that a shower has been activated, but also where it is located.



*A large out-door tank containing sulphuric acid ("svavelsyra" in Swedish) and an indoor drench shower close at hand.*



## Conclusion

It is of the utmost importance that the showers work and that an alarm signal be sent out to a central control room to indicate not only that a shower has been activated, but also which one. This allows help to be directed quickly to the person in distress.

The Eletta flow switches are used in many tough and hazardous industrial environments and its unique patented design has proved to be very reliable in such circumstances. These properties are needed in the case of the emergency showers since they are often in use in such industries, in this case a paper mill with a very aggressive and hostile environment.



FLOW MONITORS

Eletta Flow AB

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