

# **Non-invasive Ultrasonic Level Measurement and Control**

**Application notes for  
SONOMETER and SONOCONTROL instrumentation**

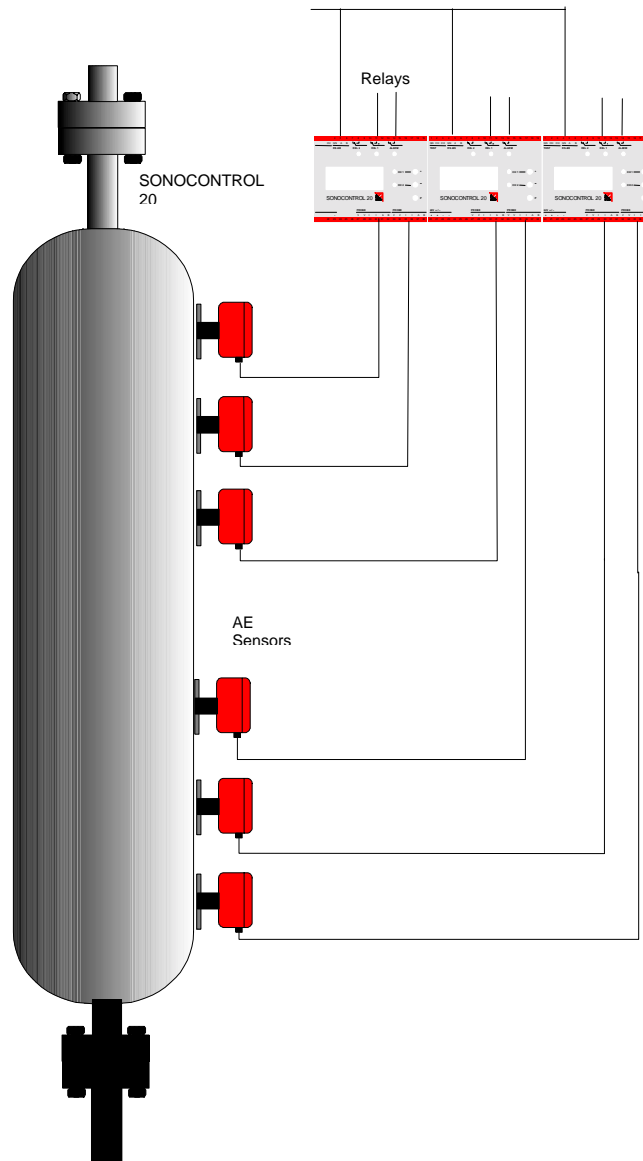
**Coal and steel industry**

**Mining industry**

**Power generation**

**Oil and gas exploration**

## Level limit control for pressurised storage containers Coal and steel industry

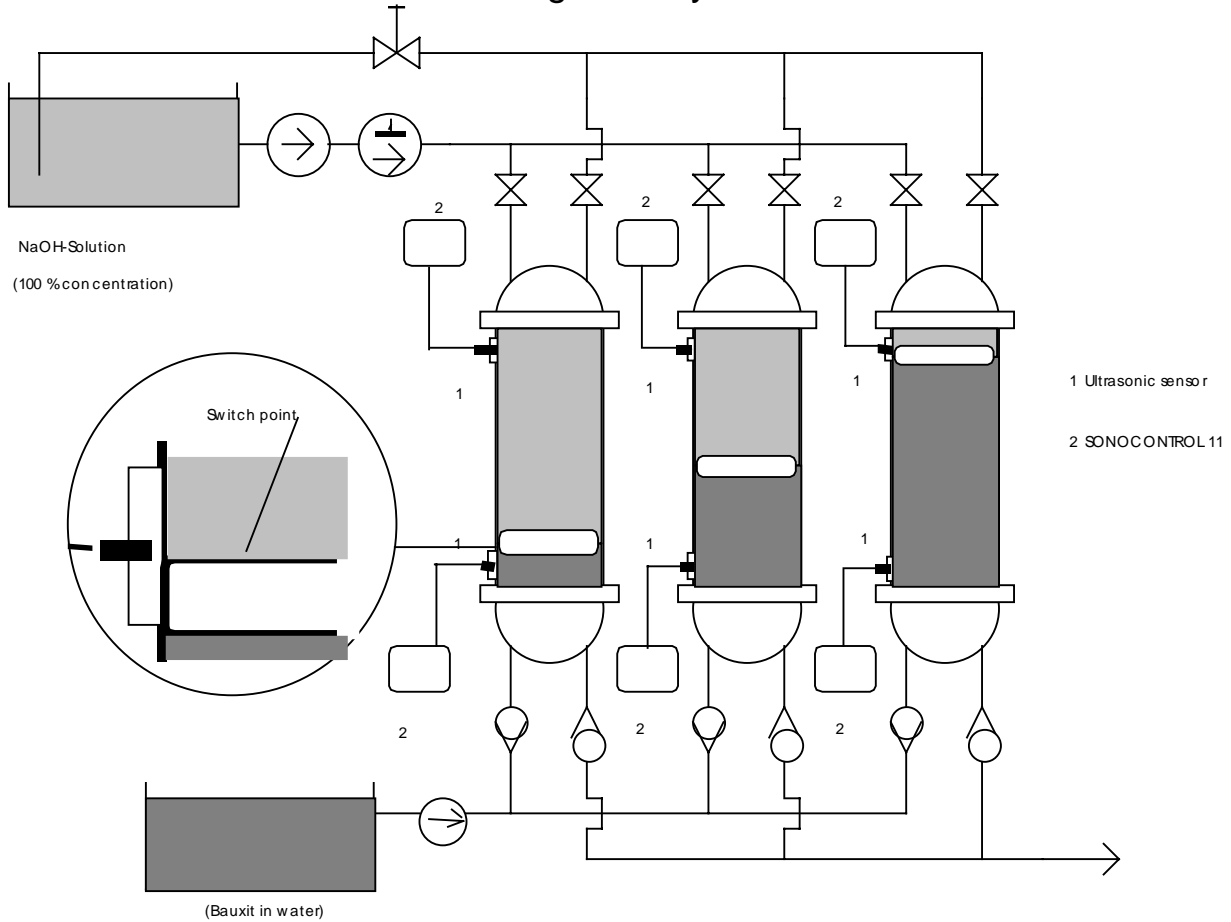


### Advantages of SONOCONTROL 20 solution

- ✓ No medium contact
- ✓ No flanges on pressure container necessary
- ✓ Measurements are independent of pressure inside vessel
- ✓ Easy transmitter mounting on DIN rail in control panel
- ✓ Long cable distances from sensor to transmitter (up to 300 m) possible

## Control of separators in vertical cylinders for the hydraulic transport of solids

Mining industry

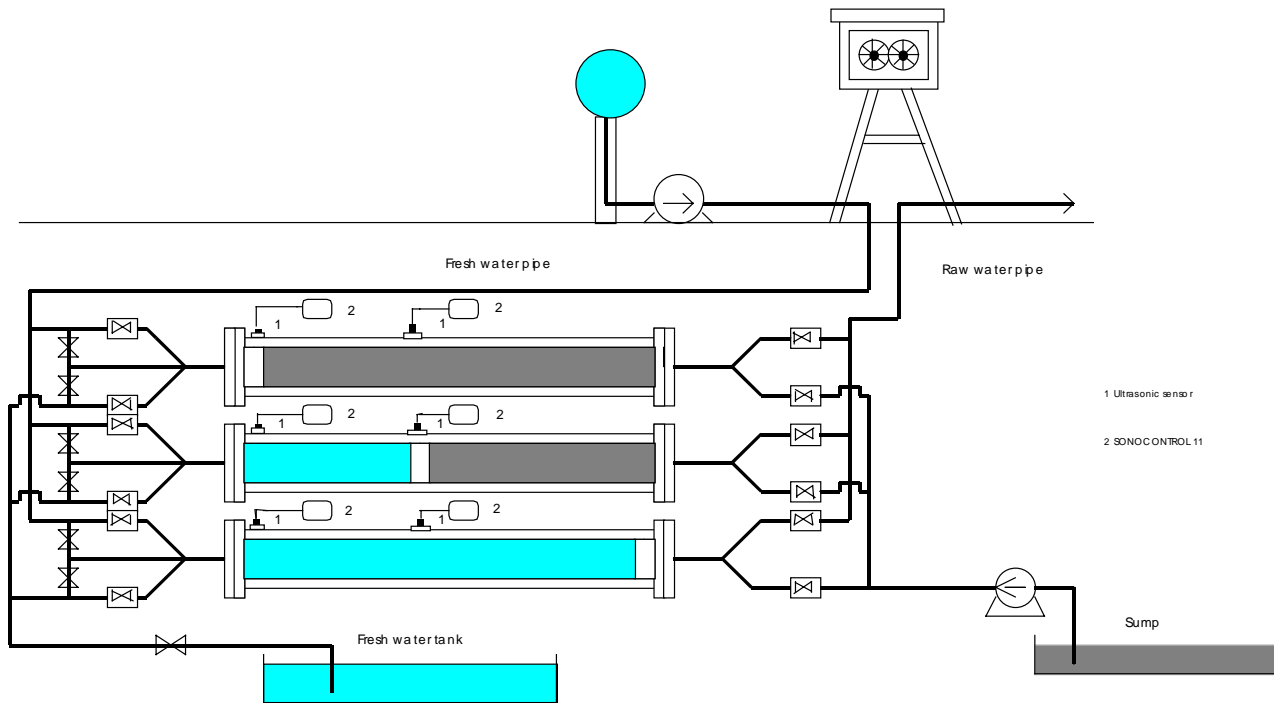


Vertical cylinder (wall thickness 52 mm) for the hydraulic transport of solid mixtures in an aluminium smelter

### Advantages of SONOCONTROL 11 solution

- ✓ No mechanical parts in system
- ✓ No limitation of operating pressure
- ✓ Abrasion or aggressive media are not a problem, no wear and tear
- ✓ No safety measures necessary as for solutions with nucleonic measuring devices
- ✓ Self-checking system

## Separator detection in horizontal pump cylinders Mining industry

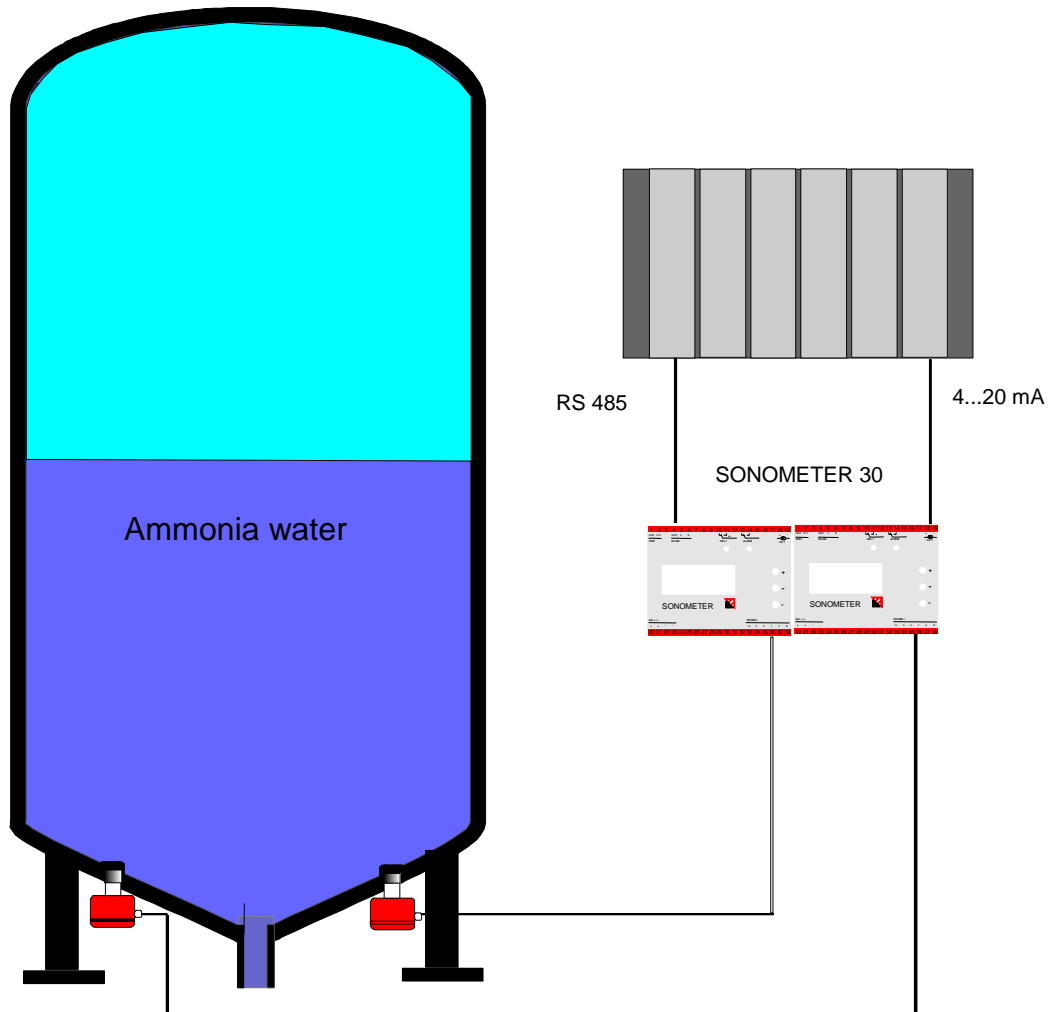


Horizontal cylinder to pump raw water in a coal mine (wall thickness 25 mm)

### Advantages of SONOCONTROL 11 solution

- ✓ No mechanical parts in system
- ✓ No limitation of operating pressure
- ✓ Abrasion or aggressive media are not a problem, no wear and tear
- ✓ No safety measures necessary as for solutions with nucleonic measuring devices
- ✓ Self-checking system

## Level measurement on an ammonia – water vessel Nuclear power



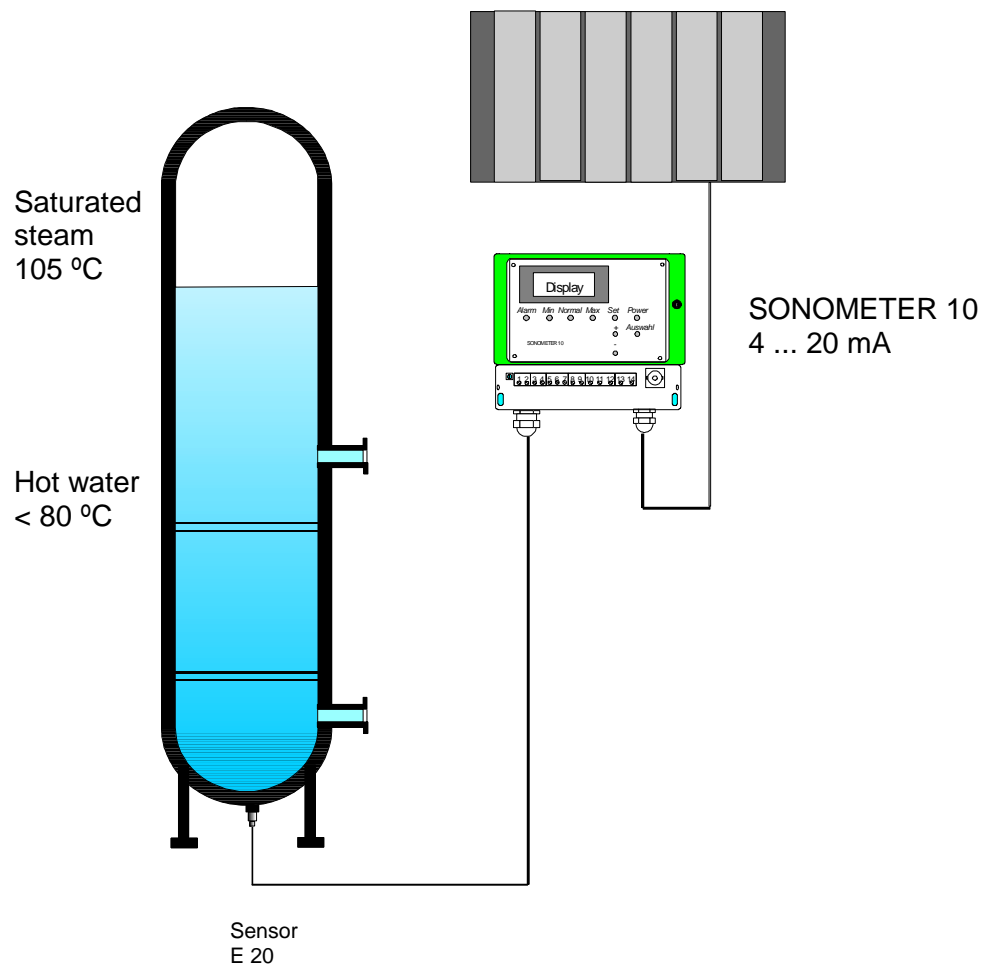
### Advantages of SONOMETER 30 solution

- ✓ Fixing of sensors from the outside, sensor mounting fixtures are glued to the tank
- ✓ 0/4 ... 20 mA signals are connected to PLC control system
- ✓ System redundancy through 2 independent SONOMETER 30 units

## Level measurement with bottom-up ultrasound on a network medium expansion tank

### Power generation

- Continuous level measurement at temperatures up to 85 °C
- Tank content changes continuously through warm water circuit (4 ... 500 m<sup>3</sup>/h)
- Sensors are attached to the tank by means of a weld-on ring
- Tank has wall thickness of 21 mm

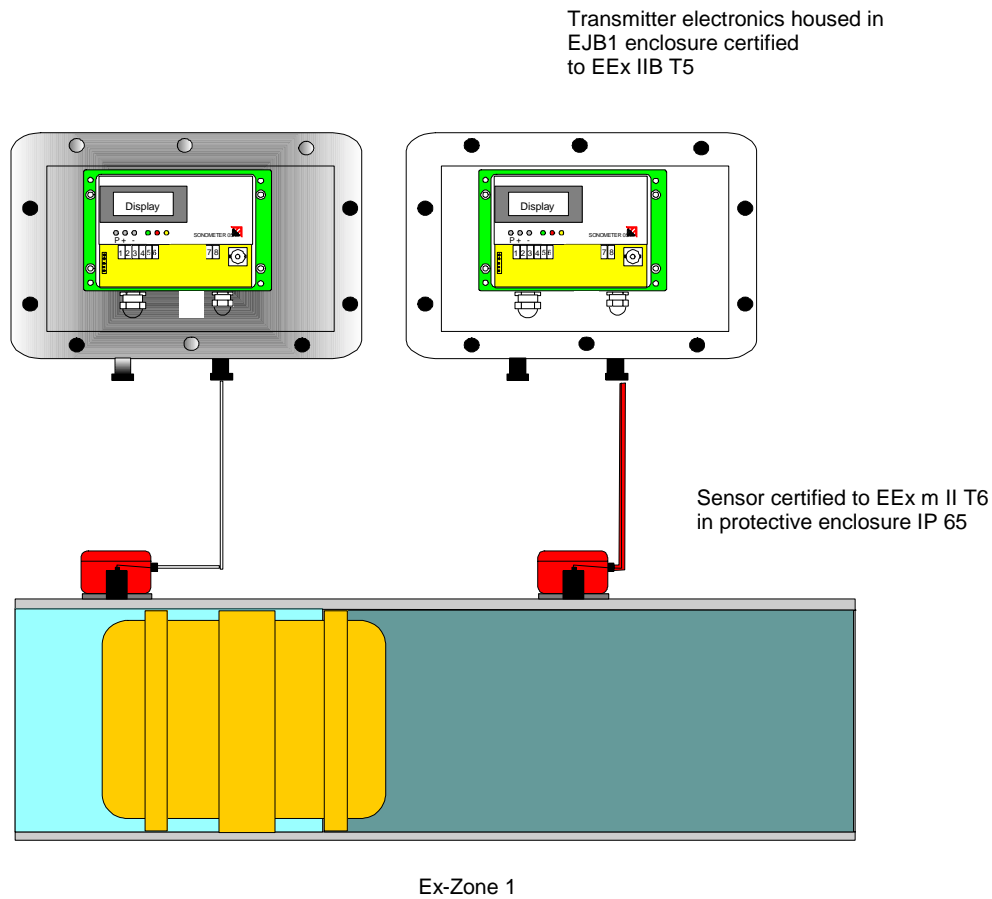


### Advantages of non-invasive measurement through tank wall

- ✓ No holes to drill to mount insertion device
- ✓ System can be installed without interrupting process
- ✓ No influence of system pressure changes

## Pig detection with ultrasound at crude oil pipeline with SONOCONTROL 11 in hazardous area Zone 1

### Oil and gas exploration

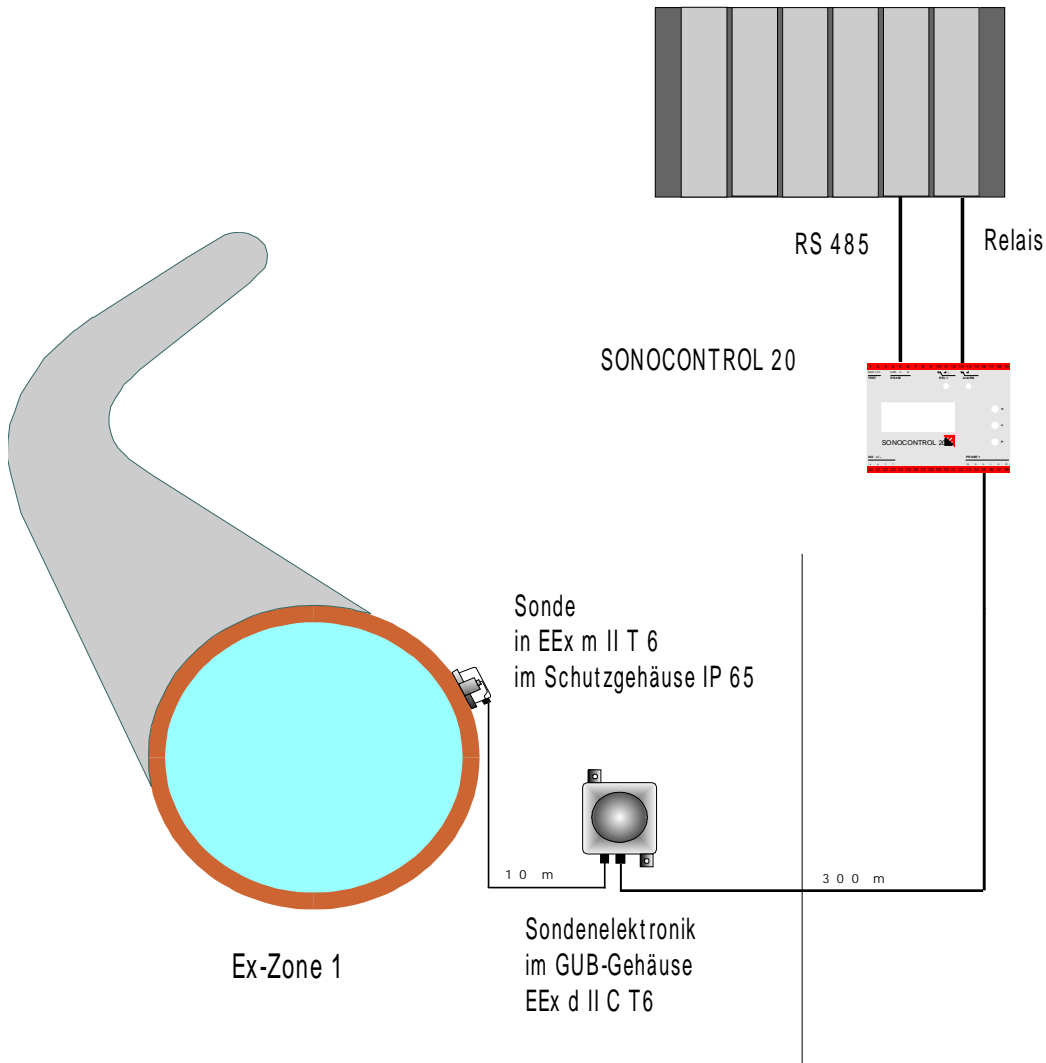


### Advantages of solution with SONOCONTROL 11

- ✓ Retrospective installation on pipeline without shut-down
- ✓ No drilling or welding necessary
- ✓ Easy mounting method by means of a tension strap
- ✓ Cyclical checking of sensor and acoustic coupling

## Pig detection with ultrasound on crude oil pipeline with SONOCONTROL 20

Oil and gas exploration



### Advantages of solution with SONOCONTROL 20

- ✓ Retrospective installation on pipeline without shut-down
- ✓ No drilling or welding necessary
- ✓ Easy mounting method by means of a tension strap
- ✓ Cyclical checking of sensor and acoustic coupling
- ✓ Data transfer and remote set-up via RS 485 possible
- ✓ No permit for use in hazardous area required