

Example of application

Level indicator for cooling lubricant in a machine tool (CNC machining centre)

GENERAL SITUATION

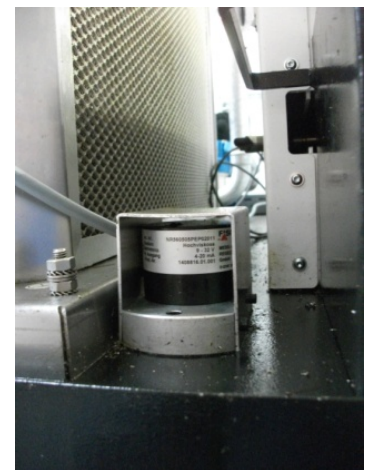
The supply quantity of cooling lubricant in the coolant tank shall be within a certain range. The current filling level is read via a gauge glass on the back of the plant. Since the gauge glass is located on the back it is very difficult to see. Moreover, the tank must not be filled with cooling lubricant completely since the chip conveyor of the machine contains cooling lubricant as well which in the process is transferred by pumping.



SOLUTION APPROACH

An electronic filling level monitoring system was integrated. The storing tank was provided with a suitable drilling and the probe NR56 (filling level probe with float magnet) was installed using a customized mounting flange. A sheet metal cover protects the probe head against potential damage.

As an indicator, a level gauge EA14 with LCD display and colour changer was applied. Power is supplied by conventional wall power supply with 24V DC output voltage. The EA14 was adjusted on a bargraph with percentage of the entire measuring range of the probe.



The following sequential arrangement was chosen as the colour change sequence:

- Red area: 0% to 65% = filling level is too low; refill cooling lubricant
- Green area is larger 65% to 85% = tank is full
- Yellow area larger 85% = tank is overfilled; stop refilling cooling lubricant



ADVANTAGES

Due to the colour change the operator is informed in time whether cooling lubricant requires re-fill until the display changes to green again. If the colour changes from green to yellow during filling, the filling process can be stopped. If the display turns to red, too much cooling lubricant was discharged in the process via the chips or also evaporation. However, there is still enough cooling lubricant in the tank for the process continuing safely.

Due to the contact gap in the probe rod (approx. 11mm) minor fluctuations and turbulences of the filling level caused by the start-up of the high pressure pump or return through the woven filter medium do not have an impact on the level indicator. Using a NR probe instead of a NC probe a potential foam formation does not involve any deviation in the displayed filling level.

FURTHER OPTIONS

Determining the filling level by means of a gauge glass in areas difficult, to see, here inside the housing: instead of the colour change indicator a LED bargraph indicator is used, the filling level is determined also using a NR56 probe. Power supply is taken from the control cabinet of the plant.



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