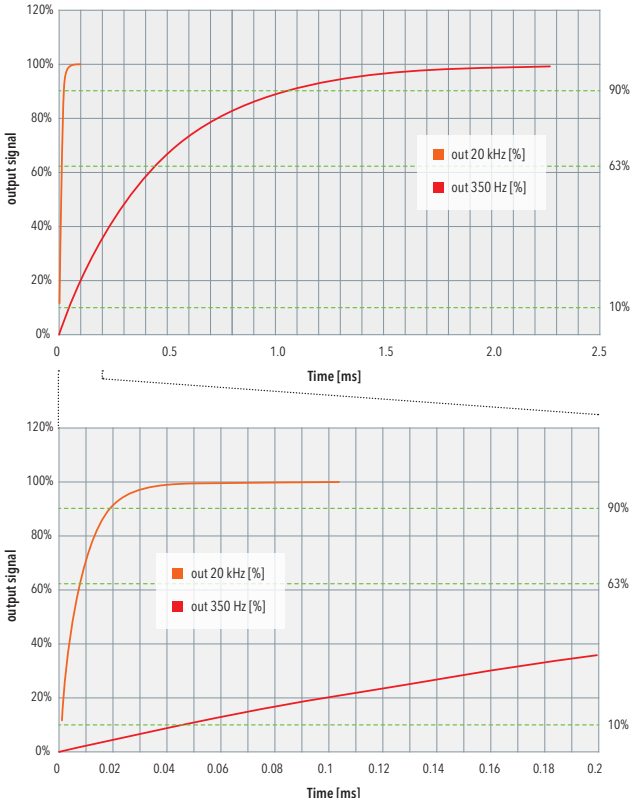
Trafag revolutionises the measuring of highly dynamic pressure curves

The robust pressure transmitter NAH 8254 with 20 kHz cutoff frequency was developed from the optimum combination of thin-film-on-steel sensor element and proprietary ASIC for measuring high dynamic pressure profiles.

Bubikon, April 2018 - If you wanted to correctly record high-frequency pressure curves, you had the choice between a very expensive high-end laboratory instrument and an expensive but drift-prone special transmitter. The new Trafag NAH 8254 20kHz pressure transmitter takes a new path: Based on the proven, extremely robust mobile hydraulic transmitter, the innovative combination of thin-film-on-steel sensor and self-developed ASIC formed the perfect transmitter for highly dynamic pressure measurements.

In many applications, but mainly in the test environment, highly dynamic pressure profiles are measured in order to optimize systems and machines. For example, unfavorable closing behavior of valves can produce extremely short but very high-pressure peaks in pipes which cause considerable damage. There is also a need to analyze explosions and explosive events. For commercially available transmitters such high-frequency signals are usually undetectable. Trafag has developed the extremely robust, high-speed pressure transmitter NAH 8254 by smartly combining its own thin-film-on-steel sensor element with the proprietary Trafag ASIC TX

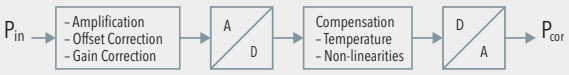


Response behavior of the pressure transmitter NAH 20 kHz compared with a standard transmitter.

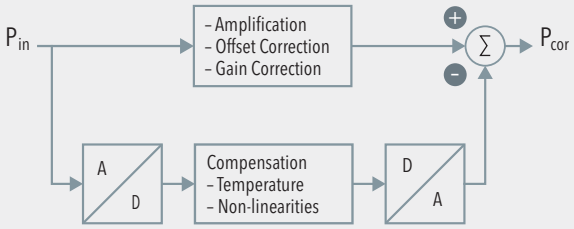
Schematic design of the ASIC TX

The conventional design (diagram above) with fully digital signal processing is limited by the speed of the A/D or D/A converter. The Trafag design (diagram below) consists of two signal components, provided that the main path (about 98 % of the signal) is purely analogue in amplification and zero point and span correction and therefore very fast. Only the correction signal (temperature and non-linearities) is comparatively slow. This part is not time-sensitive since temperature changes also exhibit response times in the minute range. Only the non-linearities correction is relevant in this part, which in the case of Trafag sensors makes up only about 1 % of the signal. Therefore only about 1 % of the signal depends on the speed of the converter.

Conventional signal chain consisting of a single path



Trafag parallel mixed signal ASIC signal chain comprising separate pathes for amplification and compensation



Superior sensor technology and proprietary microchip

Today, highly dynamic pressure profiles are often measured with piezoelectric or piezoresistive sensors. Piezoelectric sensors are very expensive and difficult to manufacture, while the piezoresistive sensors are susceptible to drift at elevated temperatures. Although the thin-film-on-steel sensor technology used by Trafag has a less favorable signal-to-noise ratio than the other two, it is significantly more resistant to signal drift, even under the harshest conditions. Trafag combines this sensor technology with the dedicated, proprietary ASIC TX (Application Specific Integrated Circuit), which enables thin-film

on steel sensors, with their robustness and long-term stability benefits, to be used where competitive solutions reach their limits.

Fast pressure transmitters for rough applications: Pressure transmitter NAH 8254

On the basis of the proven miniature industrial transmitter NAH 8254 with wrench size 19, Trafag offers versions with cutoff frequency of a maximum of 20 kHz can be selected in different levels. Both the thin-film-on-steel sensor element and the basic structure of the transmitter have proven themselves under extreme conditions in harsh environments, such as those found in mobile hydraulics, and guarantee a reliability that is second to none.

The key to using thin-film-on-steel sensors for highly dynamic measurements lies in the special design concept of the Trafag ASIC TX, which combines several hundred thousand transistors on a surface area of only 2 x 2 mm and consists of a powerful analogue amplifier and a matching digital part .

Pressure transmitter NAH 8254 with cut-off frequency 20 kHz for measuring highly dynamic pressure gradients: It combines the robust design of a mobile hydraulic transmitter with refined, extraordinarily fast electronics.

Data sheet: www.trafag.com/H72304

Trafag AG sensors & controls

Trafag is a leading global provider of high-quality sensors and monitoring devices for pressure, temperature and gas density. In addition to a wide range of standardised, configurable products, Trafag also develops customized solutions for OEM customers. Founded in 1942, Trafag is based out of Switzerland and has a wide distribution and service network in over 40 countries worldwide. This enables us to provide personal and professional customer service and ensures that all of their services are of the highest quality. Powerful development and production departments guarantee that Trafag products are of the highest quality and precision, product delivery is fast and reliable and customer requests are implemented quickly.