TEST & MEASUREMENT

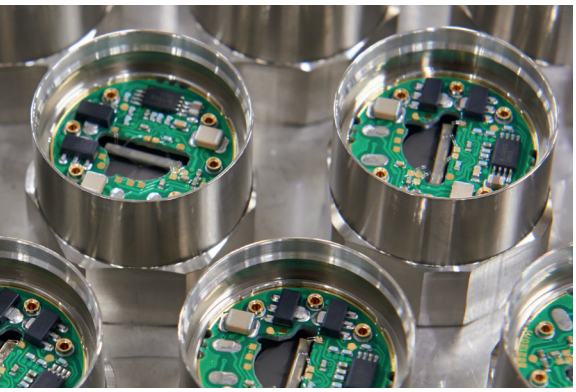
Pressure and temperature monitoring solutions

trafag
sensors controls

Sensor technology

Key components of Trafag pressure transmitters are pressure sensors based on thin-film-on-steel technology (welded design without O-ring) or thick-film-on-ceramic technology. Both sensor technologies come from Trafag's own production and were developed in-house together with the ASIC (application-specific microchip).

As a result, pressure sensors and electronics work in perfect partnership and achieve a unique level of long-term stability and reliability, even under the most adverse environmental conditions.



Trafag pressure transmitters with cutting-edge technologies are produced in Switzerland with high-end production equipment to achieve constantly flawless quality.

Trafag's thin-film-on-steel sensors are geared towards maximum long-term stability and to maintain their accuracy over years in service.

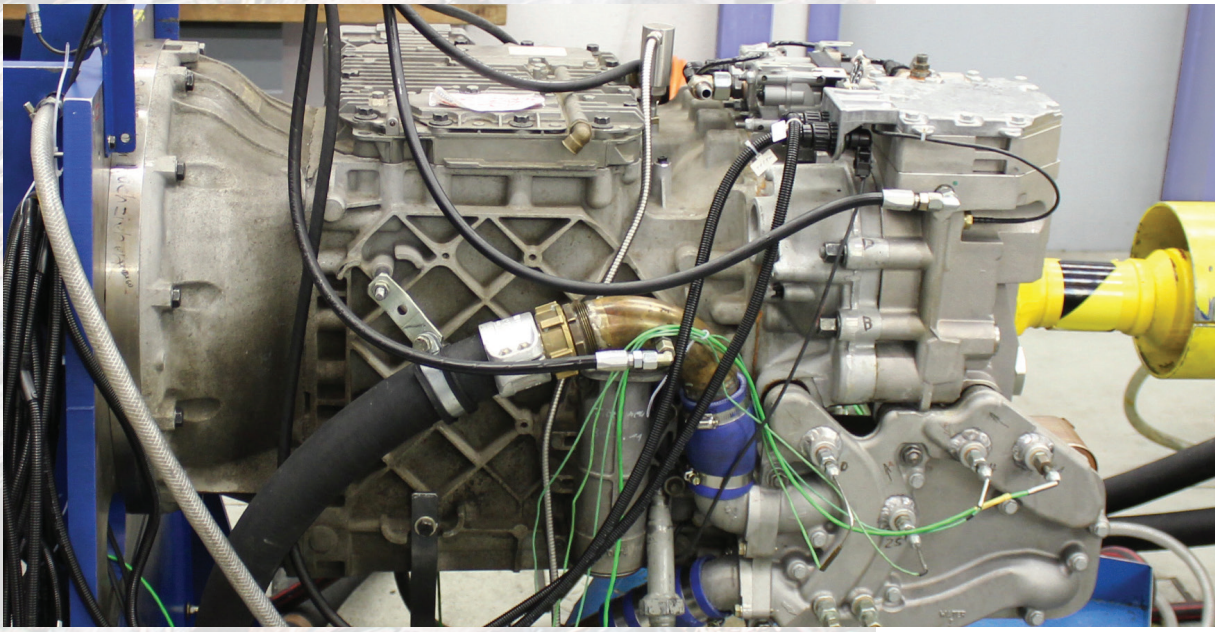
Trafag's ASIC is perfectly tailored to the proprietary sensor elements. The innovative mixed-signal chip with high-performance amplifiers allow best-in-class measuring performance.

Trafag pressure transmitters with thin-film-on-steel sensors and the ASIC electronics are designed for maximum robustness and high accuracy even under heavy vibrations or adverse environmental conditions.

The ceramic sensors are compatible with literally any media and therefore a handy solution for measurements with corrosive liquids and gases.

The ceramic sensor based pressure transmitters with high-grade steel or titanium housing are suitable for measurement in aggressive media.

Durability and performance tests depend on robust and accurate sensors to provide reliable results.



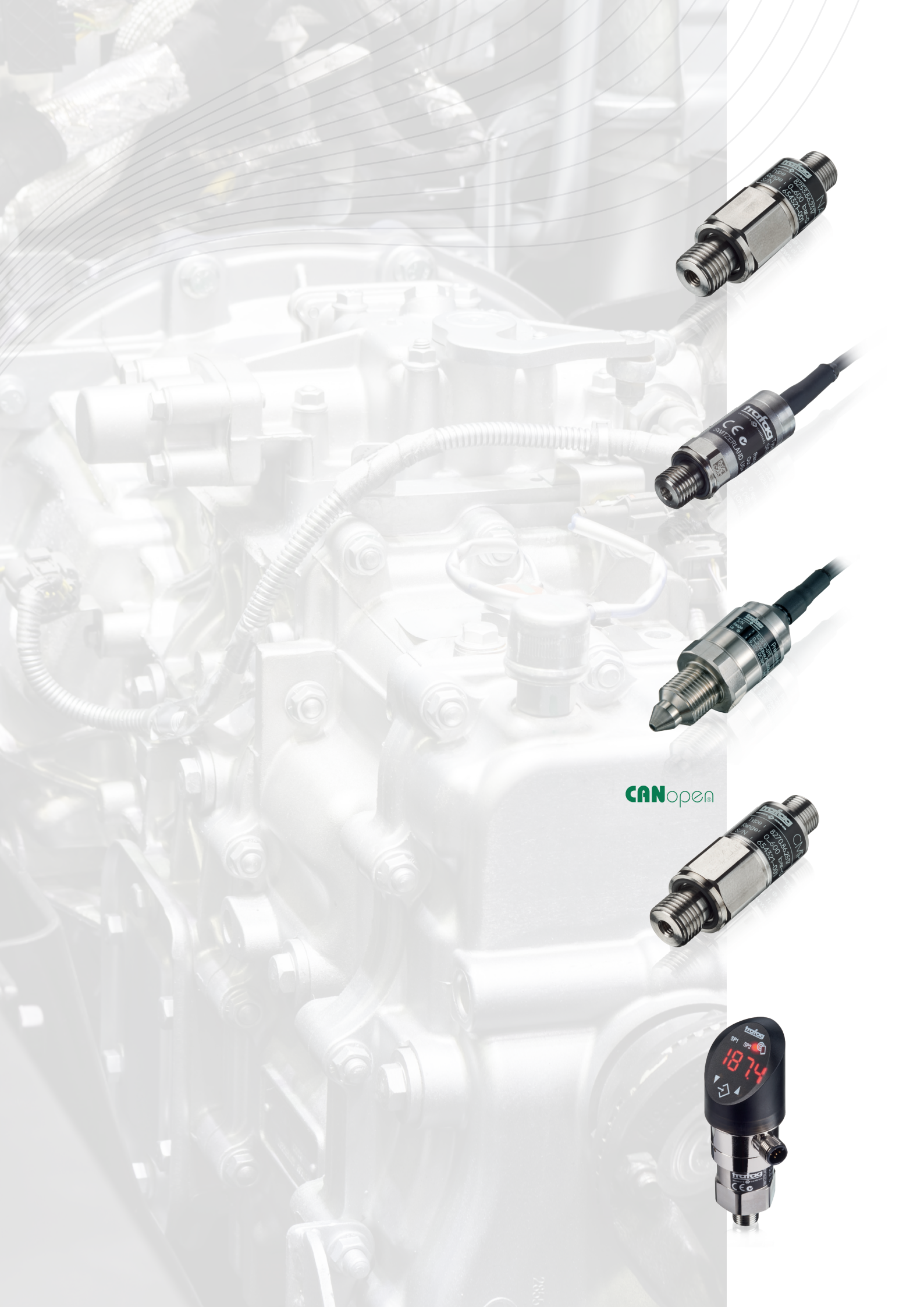
Unparalleled reliability and quality

Test benches and mobile testing installations are built to take devices under test to their limits and beyond. On-road tests for passenger cars, carried out in extremely harsh environments from the dusty heat of deserts to the icy cold of sub-arctic forests, are often also putting the measurement equipment to its limits. Whereas failure of vehicle sensors is expected to a certain degree, the testing equipment must not fail at all – an undetected signal drift could put the entire test cycle results into question. Therefore, only the most robust and reliable sensors should be used for test and measurement instrumentation.

Trafag test and measurement pressure transmitters are based on sensors and mechanical design concepts which have been proving their robustness and reliability under extreme conditions in mobile hydraulics applications over decades. A thin film on steel sensor technology geared towards maximum longterm stability, advanced production processes and highest quality standards provide the basis for Trafag's pressure measurement instruments – built to last where others fail.

Applications

- Engine dynamometer
- Brake test stands
- Under hood on road tests of engine parameters
- Mobile power train test equipment
- On board pneumatic and hydraulic brake testing
- Test benches for hydraulic components such as valves, power packs and cylinders
- Monitoring of cooling systems for stationary and mobile lifetime and endurance testing


CANopen

Your measurement task – Our product range

High accuracy page 8

Precise measurement with accuracy of up to 0.1%, absolute and relative pressure measurement

High speed page 9

Measurement of highly dynamic pressure cycles with cut-off frequency of up to 20 kHz

High pressure page 10

Measuring ranges of up to 2'500 bar, proven use in large engines of up to 10'000 kW

High performance CANopen page 11

CiA Certified CANopen high precision pressure transmitter with accuracy of up to 0.1 %

CANopen

High flexibility page 12

Easy adjustable pressure and temperature transmitters with display and integrated logger, all configurable with Smartphone

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trafag sensors controls

NAH 8253

Precision pressure transmitter

The accuracy class of 0.1 % makes the NAH 8253 pressure transmitter the first choice for all measuring tasks requiring high accuracy in combination with reliability and robustness. Thanks to the superior long-term stability of the thin-film-on-steel sensor and the overall design, which the series has successfully demonstrated in construction and forestry machines for more than 10 years, NAH 8253 pressure transmitters work practically drift-free even under harsh conditions and therefore – unlike conventional precision transmitters – do not have to be recalibrated and readjusted.

Features

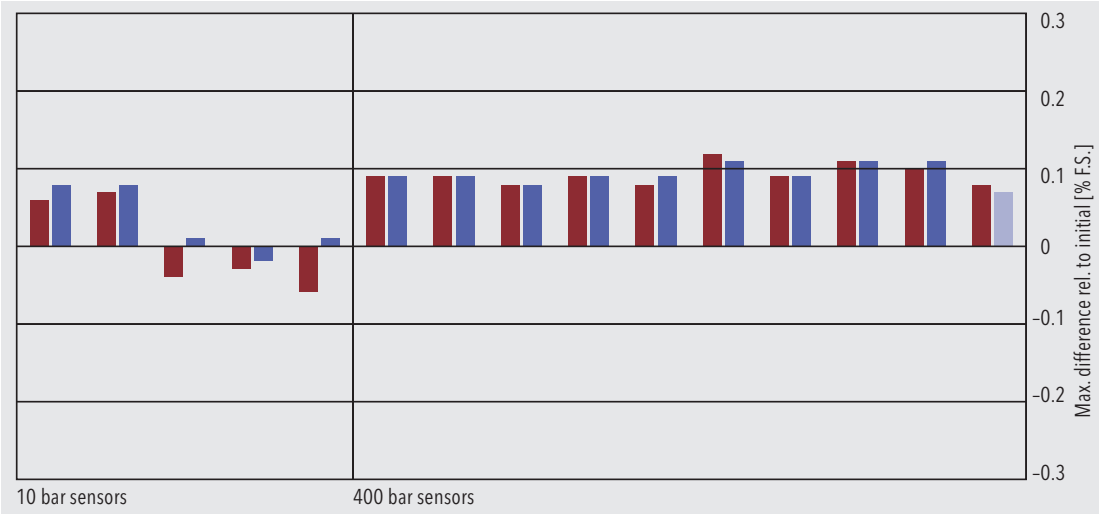
- Accuracy classes 0.1 %, 0.15 %, 0.3 %
- Relative and absolute pressure measurement
- Optional: 500 VAC dielectrical strength

Technical Data

Measuring principle	Thin-film-on-steel
Measuring range	0 ... 2.5 to 0 ... 600 bar 0 ... 30 to 0 ... 7500 psi
Output signal	4 ... 20 mA, 0 ... 5 VDC, 1 ... 6 VDC, 0 ... 10 VDC, 0.5 ... 4.5 VDC ratiometric
Accuracy @ 25°C typ.	± 0.3 % FS typ. ± 0.15 % FS typ. ± 0.1 % FS typ.
Media temperature	–40°C ... +125°C
Ambient temperature	–40°C ... +125°C

Data sheet www.trafag.com/H72300

Sensor Communicator SC
see page 15



Extreme tests with load changes show that the sensors from Trafag are still stable and usually deviate by less than 0.1 % from the initial value after 10 or 20 million cycles and twice the rated pressure.

NAH 8254

High performance pressure transmitter

Based on the proven industrial and mobile hydraulics transmitter NAH 8254 in the miniature size HEX19, Trafag offers special versions for which the desired cut-off frequency can be selected from various levels of over 20 kHz (this corresponds to 18 µs rise time, 10…90 % nominal pressure) for highly dynamic pressure measurements down to 11 Hz for a maximum signal smoothing. The fast electronics based on Trafag's own mixed-signal chip can reproduce even high-frequency pressure gradients without distortion, regardless of sampling rates. Both, the thin-film-on-steel sensor element and the basic design of the transmitter have been proven under extreme conditions (vibration, shock, temperature change, high pressure peaks, etc) in the harsh environment of construction and forestry machinery and guarantee a robustness and reliability that is unsurpassed in the measuring and testing field.

Features

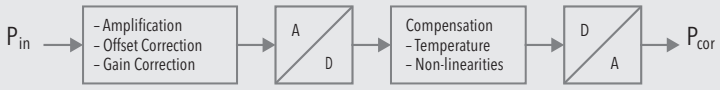
- Cut-off frequency 20 kHz
- For highly dynamic pressure curves
- Analogue signal processing
- Measuring accuracy 0.3 %
- Excellent long-term stability

Technical Data

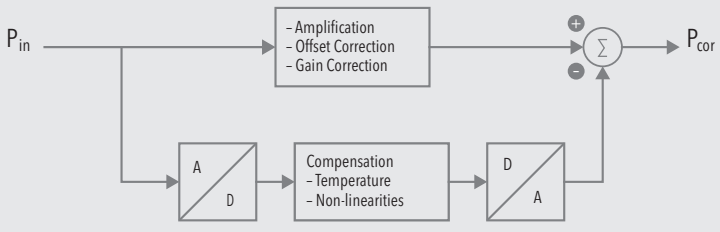
Measuring principle	Thin-film-on-steel
Measuring range	0 ... 0.2 to 0 ... 700 bar 0 ... 3 to 0 ... 10000 psi
Output signal	4 ... 20 mA, 0.5 ... 4.5 VDC ratiometric
Rise time	18 µs / 10 ... 90 % nominal pressure
Cut-off frequency	20 kHz (rise time 18 µs)
Accuracy @ 25°C typ.	± 0.3 % FS typ.
Media temperature	max –40°C ... +125°C
Ambient temperature	max –40°C ... +125°C

Data sheet www.trafag.com/H72304

Non Trafag conventional single path signal chain



Trafag Mixed Signal
ASIC signal chain comprising separate pathes for amplification and compensation



Schematic design of Trafag ASIC TX

The conventional (non Trafag) 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, whereas 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 signals (temperature and non-linearities) are digitally processed and comparatively slow. This is not time-sensitive since temperature changes also exhibit response times in the minute range. Only the non-linearities correction is time relevant, 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 A/D or D/A converter.

trafag sensors controls

EPN/EPNCR 8298

Engine Pressure Transmitter

The EPN 8298 offers extreme robustness and maximum performance. It was developed in close collaboration with manufacturers of large combustion engines to provide reliable and accurate measurement in marine applications, generator sets, fracking pump power units, just to name a few. In standard versions and customer specific variants, it is used for monitoring a wide range of parameters from crank case pressure at a few hundred millibar, fuel and cooling liquids pressure up to common rail or injector pressure at 2500 bar.

Features

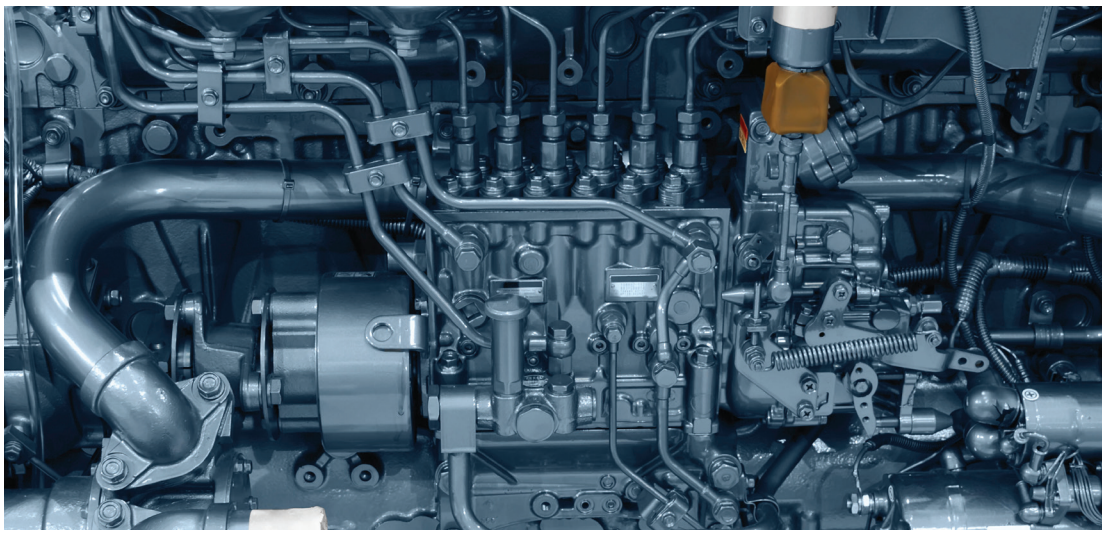
- Nominal pressure up to 2500 bar (Common Rail) with high pressure threaded connection
- High vibration resistance

Technical Data

Measuring principle	Thin-film-on-steel
Measuring range	0 ... 2.5 to 0 ... 2500 bar
Output signal	4 ... 20 mA 0.5 ... 4.5 VDC ratiometric
Accuracy @ 25°C typ.	± 0.5 % FS typ. ± 0.3 % FS typ.
Media temperature	–40°C ... +125°C
Ambient temperature	–40°C ... +125°C
Approval / conformity	ABS, BV, CCS, DNV, KRS, LRS, NKK, RINA, RMRS

Data sheet www.trafag.com/H72312

Sensor Communicator SC
see page 15



Higher injection pressure saves fuel and also increases performance and torque. Trafag's engine pressure transmitter EPNCR 8298 with measuring ranges up to 2'500 bar is ready to face the challenges for next generation engines.

CMP 8270

CANopen miniature pressure transmitter

The miniature CANopen CMP 8270 pressure transmitter has proven its value in many stationary and mobile test facilities with its accuracy of 0.1 %, extremely compact design and extensive CANopen functionality. Well-known automobile manufacturers rely on the CMP 8270 for testing their prototypes, which even works reliably and precisely when the vehicles are pushed to their limits. Trafag's CMP 8270 features comprehensive CANopen functionality which can be customized and parametrized to the specific installation thus making the data acquisition easy, accurate and tailored to the application's test and measurement targets.

CANopen

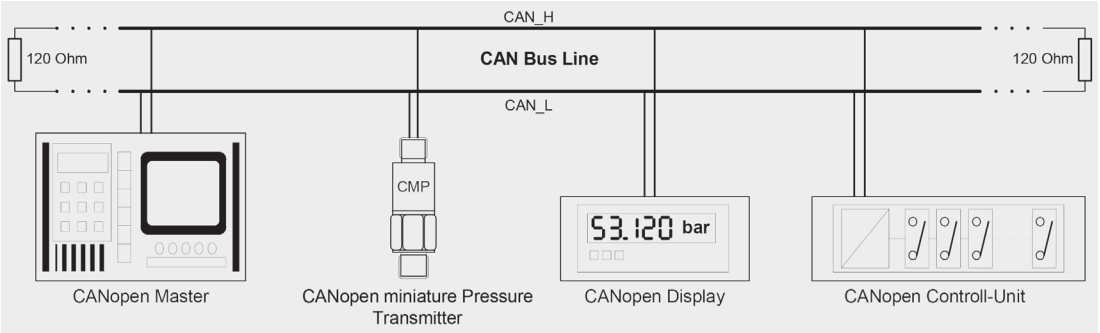
Features

- Different accuracy classes up to 0.1 %
- Measurement of pressure and temperature
- CANopen bus protocol DS301/DS404
- Optional: 500 VAC dielectrical strength

Technical Data	
Measuring principle	Thin-film-on-steel
Measuring range	0 ... 0.2 to 0 ... 600 bar 0 ... 3 to 0 ... 7500 psi
Output signal	Bus protocol CANopen DS404
Accuracy @ 25°C typ.	± 0.5 % FS typ. ± 0.15 % FS typ. ± 0.1 % FS typ.
Media temperature	–50°C ... +135°C
Ambient temperature	–40°C ... +125°C

Data sheet www.trafag.com/H72614

Sensor Communicator SC
see page 15



The use of CANopen bus protocol for pressure transmitters allows easier cabling, configuration via bus software, regular condition monitoring of the sensor itself and measurement of pressure and temperature with the same instrument. The versatility of CANopen, its high robustness and availability make it a preferred protocol for demanding test and measurement applications.

trafag sensors controls

Electronic switches with display

The integrated logger function and the versatile and easy parameterization via Android app make the electronic transmitter for pressure (DPC and DPS) and temperature (DTP) indispensable instruments to set up measurement tasks quickly and flexibly. With the "Trafag Sensor Master" smartphone app, the parameters can be configured easily. In addition, the measurement data can be downloaded to the smartphone as freely readable tables via NFC and further processed or sent by e-mail.

Features

- Parameterization also via NFC-smartphone app (Android)
- Display and electrical connection are independently rotatable 335°/343°
- Analogue output switchable mA or V
- Integrated datalogger
- Measuring range adjustable

DPS 8381

Display pressure switch and transmitter

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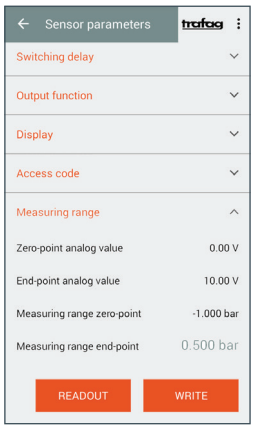
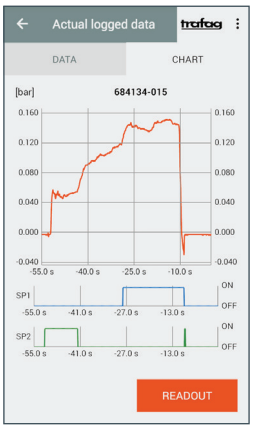
NFC

Technical Data	
Measuring principle	Thin-film-on-steel
Measuring range	0 ... 2.5 to 0 ... 600 bar 0 ... 30 to 0 ... 7500 psi adjustable
Output signal	4 ... 20 mA, 0 ... 5 VDC, 1 ... 6 VDC, 0 ... 10 VDC, switchable mA or V
Switching output	2 transistors PNP
Accuracy @ 25°C typ.	± 0.5 % FS typ.
Media temperature	–25°C ... +85°C
Pressure unit for display	bar, psi, MPa, kPa, m WC, mm WC, %, user scale
Logger	Ring buffer: 3518 data points Sampling time: 0.1 ... 999.9 s, Off (0)
Data sheet	www.trafag.com/H72321





Configuration App Trafag Sensor Master

With the free Android app "Trafag Sensor Master", available in the Google Play Store, the parameters of the Trafag display pressure transmitter / switch DPS 8381, DPC 8380 and the temperature transmitter / switch DTP 8180 can be set very simply through a smartphone. In addition to a variety of parameters for the switchpoints, the measurement range can be scaled. Communication is conducted via the NFC interface on the display. Through this interface, the measurement values of the internal data logger can also be read out and then processed further via smartphone.

DPC 8380

Display pressure switch and transmitter

GET IT ON Google Play

NFC

Technical Data	
Measuring principle	Thick-film-on-ceramic
Measuring range	0 ... 0.2 to 0 ... 100 bar 0 ... 2.5 to 0 ... 1500 psi adjustable
Output signal	4 ... 20 mA, 0 ... 5 VDC, 1 ... 6 VDC, 0 ... 10 VDC, switchable mA or V
Switching output	2 transistors PNP
Accuracy @ 25°C typ.	± 0.5 % FS typ.
Media temperature	–25°C ... +85°C
Pressure unit for display	bar, psi, MPa, kPa, m WC, mm WC, %, user scale
Logger	Ring buffer: 3518 data points Sampling time: 0.1 ... 999.9 s, Off (0)

Data sheet www.trafag.com/H72320

DTP 8180

Display temperature switch and transmitter

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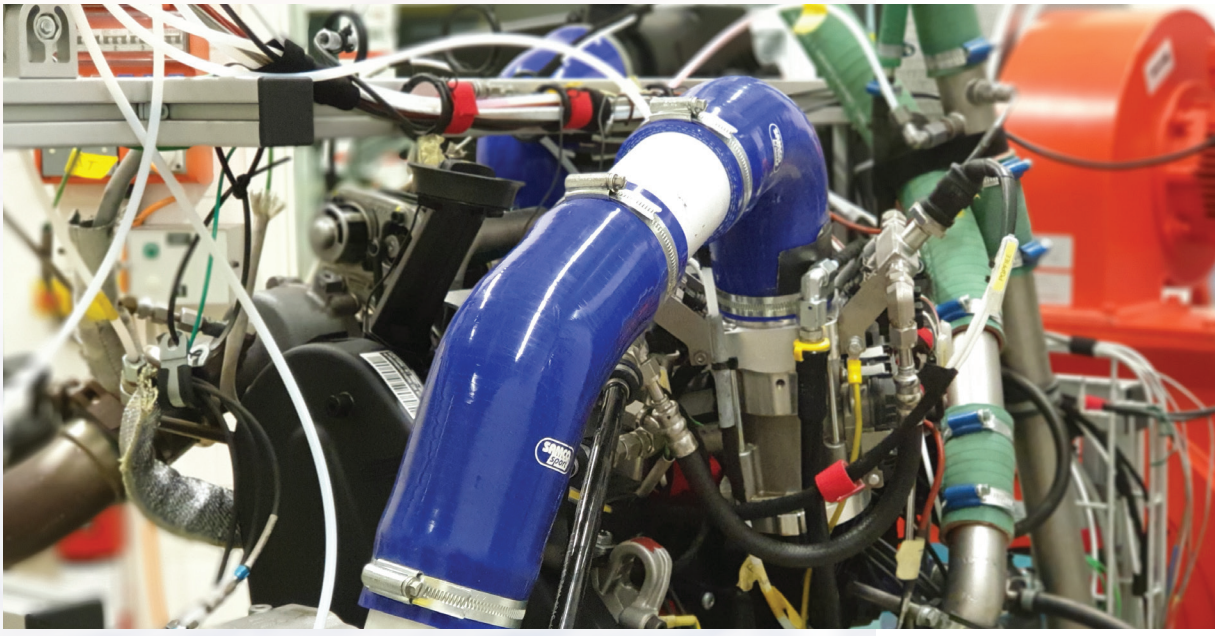
NFC

Technical Data	
Measuring principle	PT 1000, DIN EN 60751 class A, 2 conductors
Temperature measuring range	–50°C ... +150°C adjustable 50 ... 100 % FS
Output signal	4 ... 20 mA, 0 ... 5 VDC, 1 ... 6 VDC, 0 ... 10 VDC, switchable mA or V
Switching output	2 transistors PNP
Accuracy @ 25°C typ.	± 0.5 % FS typ.+ temperature sensor error
Temperature unit for display	°C, °F, K, user scale
Logger	Ring buffer: 3518 data points Sampling time: 0.1 ... 999.9 s, Off (0)

Data sheet www.trafag.com/H72352

trafag sensors controls

Endurance tests for combustion engines under extreme conditions are also a challenge for the measuring equipment. Test engineers need instrumentation they can rely on: Accurate, stable sensors and robust accessories for maximum flexibility in the dyno lab and on the road.



Accessories

Trafag offers a wide range of original accessories which are ideally matched to our products. They include devices for monitoring or configuring transmitters such as the Sensor Communicator, a handheld device which provides direct access to the calibration values of the transmitter in the Trafag ASIC. Other accessories which make installations easier are the stop valves. They allow the replacement of pressure transmitters without interrupting the process.

SC

Sensor Communicator

Features

- Read out of sensor data
- Adjustment of zero point and span
- Real time pressure measuring
- Software update and battery charge with USB-interface

Instruction www.trafag.com/H73699

V6/V7

Stop valve

V6

V7

Features

- Allows replacement of instruments without interruption of process (max. 40 bar)
- Pressure max. 600 bar / 8,700 psi

Data sheet www.trafag.com/H72258

Reliable quality

Worldwide represented, globally trusted, Swiss based

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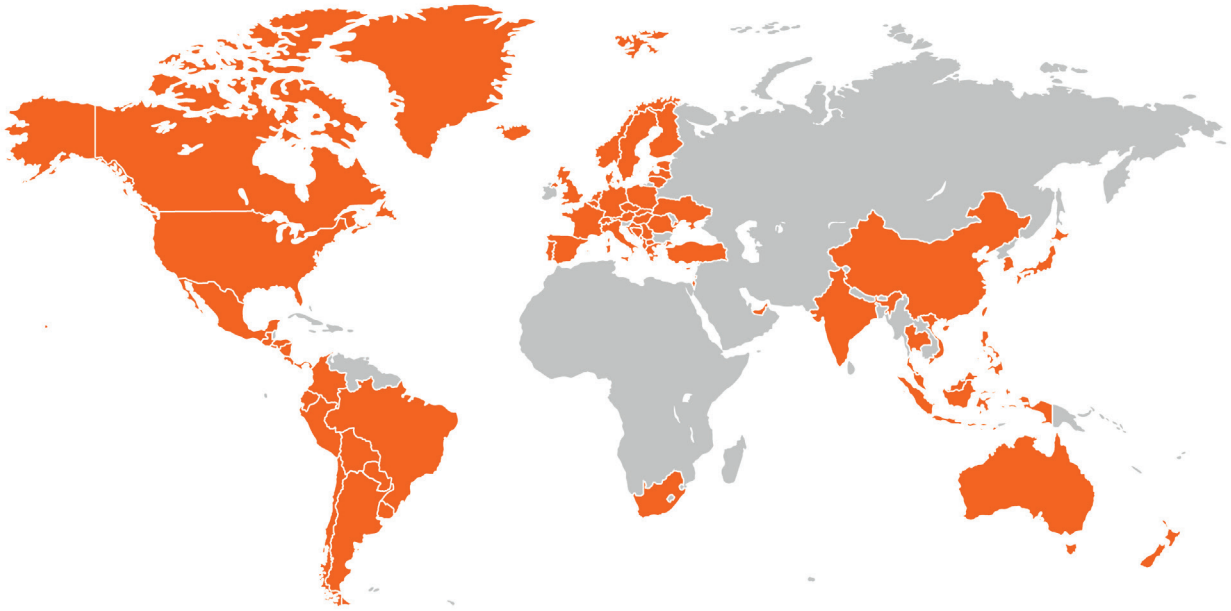
Subject to change 02/2024 H70660d



Coordinates of representatives can be found at www.trafag.com/trafag-worldwide

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