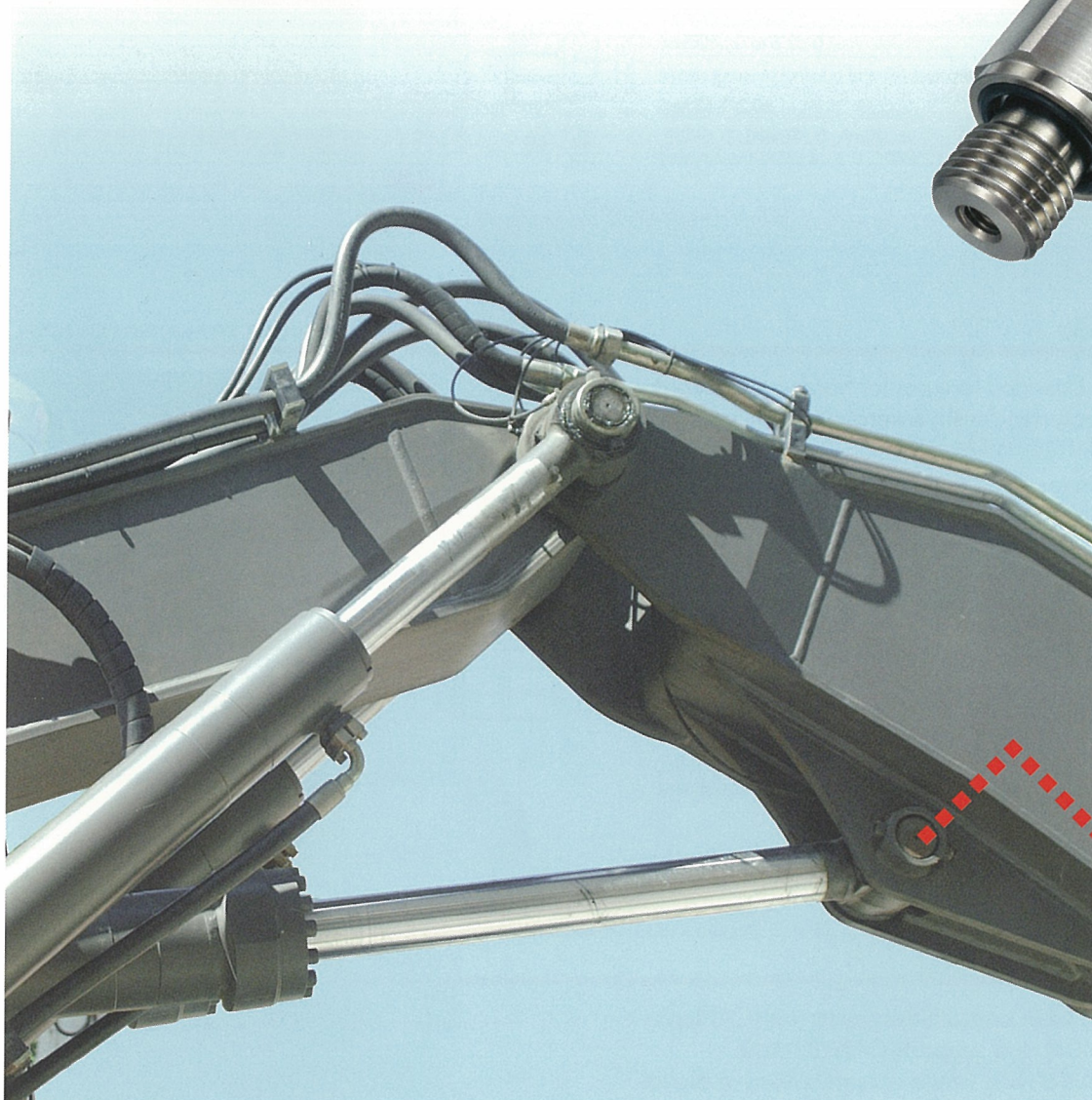


HYDRAULICS

INDUSTRIAL & MOBILE

PRESSURE & TEMPERATURE MONITORING SOLUTIONS



I.C.S. (PTY) LTD. (EST 1988)
INSTRUMENTATION & CONTROL SYSTEMS

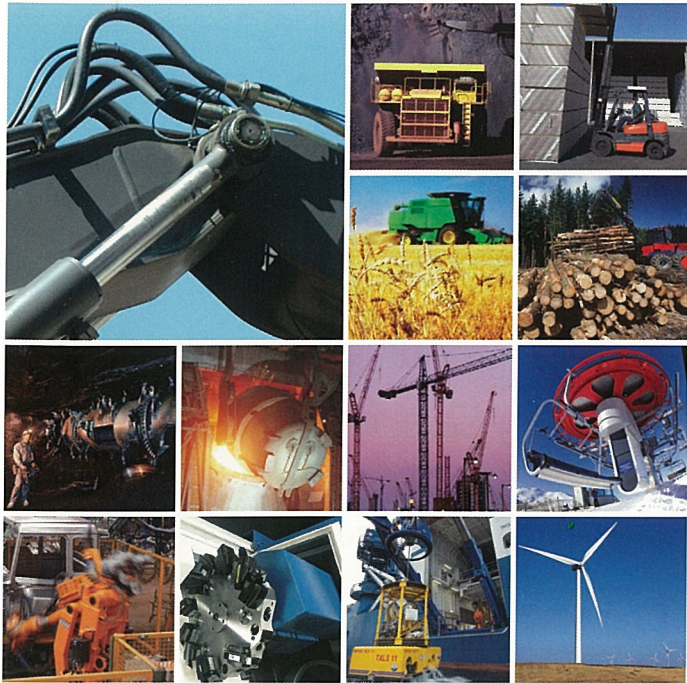
OFFICIAL AGENTS IN
SOUTHERN AFRICA FOR:

- JAQUET
- TRAFAG
- MAGTROL

(LOAD - FORCE - WEIGHT - DISPLACEMENT)

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FAX 086 649 7129
E-mail: info@instcon.co.za
Web: www.instcon.co.za

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sensors  controls



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Hydraulics: PRESSURE & TEMPERATURE MONITORING SOLUTIONS

GENERAL:

Pressure & temperature monitoring solutions for hydraulics have to consider following demands:

- ◆ space-saving dimensions
- ◆ long-term stability and maintenance free over a long life time
- ◆ pressure: resistant to a high No. of load cycles and damaging pressure peaks

INDUSTRIAL HYDRAULICS:

The requirements for industrial applications have the following additional characteristics:

- ◆ EMC: level for industrial applications
- ◆ possibility for integrated solutions (OEM's)

MOBILE HYDRAULICS:

Additional requirements in mobile hydraulics dictate the design of modern instruments:

- ◆ small oil volumes with high temperatures
- ◆ harsh conditions in ambient temperatures, humidity, dust and mechanical impacts
- ◆ accuracy at high operating temperature range
- ◆ extended IP-ratings
- ◆ EMC: level for mobile applications
- ◆ functional safety at decreasing battery power supply
- ◆ wide range of electrical connectors



TRAFAG – ESTABLISHED FOR RELIABLE PRESSURE & TEMPERATURE MONITORING SOLUTIONS

Trafag instruments are satisfying the increasing demands of hydraulics equipment manufacturers. For more than 40 years, Trafag has continued to develop and produce pressure and temperature devices. In addition to products for hydraulics Trafag also supplies other markets with high demands:

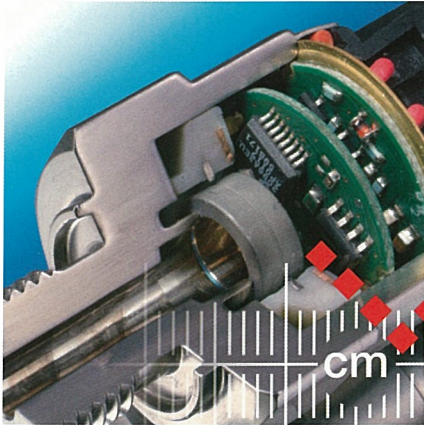
- ◆ ship builders
- ◆ diesel & gas engine manufacturers
- ◆ railways
- ◆ ...
- ◆ Ex

VERSATILE SENSOR TECHNOLOGIES

The technologies described below are perfectly adapted for demands in hydraulic applications.

We produce and integrate other different sensor technologies into our products and are able to offer the ideal solution for each application – please contact our worldwide sales organisation or visit one of our Trafag websites.

PRESSURE TRANSMITTER: THIN-FILM-ON-STEEL SENSORS

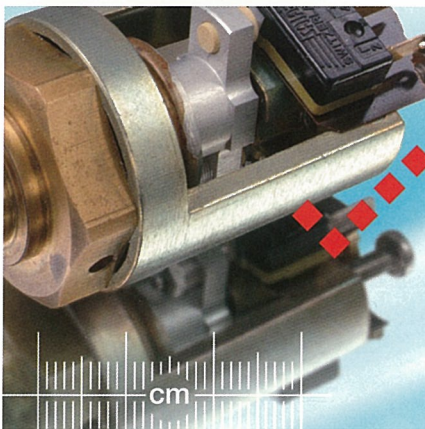


Highest over-pressure safety

MAIN FEATURES

- ◆ no additional materials (e.g. O-rings) which could limit compatibility with certain sample media
- ◆ withstands very high overpressures
- ◆ for gauge pressure ranges of 0....200 mbar up to 0....2600 bar
- ◆ optional pressure peak damping element against liquid hammers & pressure peaks
- ◆ excellent long-term stability
- ◆ high temperature-resistance
- ◆ fast response time

PRESSURE SWITCHES: PISTON SENSOR & MICRO MECHANICS

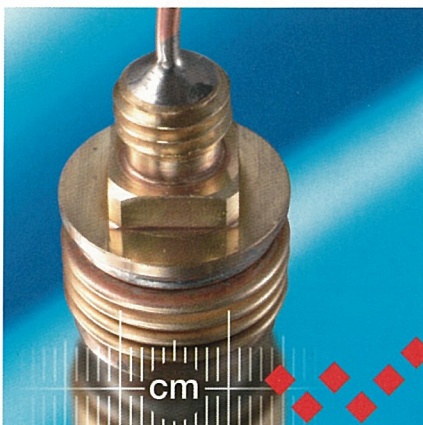


40 years experience in manufacturing durable, high precision mechanics.

MAIN FEATURES

- ◆ piston sensor for hydraulics
- ◆ endure a very large number of switching cycles
- ◆ optional pressure peak damping element against liquid hammers & pressure peaks
- ◆ ideal for high vibrations and for long serviceable life

THERMOSTATS: CAPILLARY TUBES & MICRO MECHANICS



Thermal expansion of the capillary fill moves the bellows in order to activate an ON/OFF micro-switch.

COMPENSATED

Trafag thermostats are designed in such a way that changing ambient temperatures do not cause measuring errors. This means that contrary to non-compensated capillary sensor thermostats, the switching accuracy is guaranteed even with extreme ambient temperatures.

SERIES^{19MM}: MODULAR OPTIONS FOR CONFINED SPACES

With the compact pressure transmitters having a wrench size of 19mm, Trafag offer a modular series allowing you to select the pressure transmitter optimally suited for your application meeting your requirements for media temperature, EMC, vibration resistance and accuracy. All products have reliable electronics with the Trafag ASIC chip.

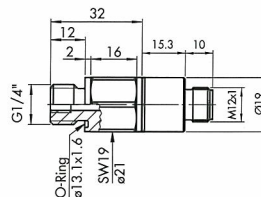
The Series^{19mm} is designed without unnecessary and price-relevant features. You can select a unit at its best price/performance ratio and, owing to its compact dimensions, lends itself for installation in a restricted space.

INDUSTRIAL VERSION FOR GENERAL DEMANDS

The NAT is designed for a wide range of industrial applications with general demands.

MAIN CHARACTERISTICS & SPECIFICATIONS

◆ smallest design	
◆ excellent temperature durability:	-25...85°C (media: -25...125°C)
◆ improved vibration resistance:	25g (20...2000Hz)
◆ pressure ranges:	0...2.5 to 0...600bar
◆ high overpressure safety:	minimum twice of nominal pressure range
◆ NLH (BSL through 0):	±0.3 % FS typ.
◆ signal outputs:	4...20mA, 0...10VDC, 0...5VDC, 1...6VDC, 0.5...4.5VDC (ratiometric)



PRESSURE TRANSMITTER NAT



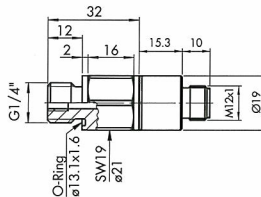
DATA SHEET NO: **H72250**
www.trafag.com/H72250

FOR HIGH DEMANDS

The NAH is designed with extended features for harsh applications. You can select one of two accuracy levels, several signal outputs and electrical connectors.

MAIN CHARACTERISTICS & SPECIFICATIONS

◆ smallest design	
◆ excellent temperature durability:	-40...125°C (media & operating)
◆ improved vibration resistance:	40g (20...2000Hz)
◆ pressure ranges:	0...2.5 to 0...600bar
◆ high overpressure safety:	minimum twice of nominal pressure range
◆ NLH (BSL through 0):	±0.2 or ±0.1 % FS typ. (2 accuracies)
◆ signal outputs:	4...20mA, 0...10VDC, 0...5VDC, 1...6VDC, 0.5...4.5VDC (ratiometric)



PRESSURE TRANSMITTER NAH



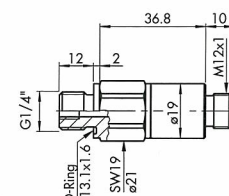
DATA SHEET NO: **H72300**
www.trafag.com/H72300

WITH CANopen BUS PROTOCOL

The CMP is the smallest available pressure transmitter with CANopen bus protocol (DS301/DS404) and supports CAN 2.0A/B. It is CiA certified and allows a wide range of applications in digital signal processing.

MAIN CHARACTERISTICS & SPECIFICATIONS

◆ smallest design	
◆ excellent temperature durability:	-40...125°C (media & operating)
◆ improved vibration resistance:	50g (20...2000Hz)
◆ pressure ranges:	0...4.0 to 0...600bar
◆ high overpressure safety:	minimum twice of nominal pressure range
◆ NLH (BSL through 0):	±0.25 or ±0.15 % FS typ. (2 accuracies)
◆ signal output:	CANopen



PRESSURE TRANSMITTER CMP



DATA SHEET NO: **H72614**
www.trafag.com/H72614

SERIES^{27MM}: VERSATILE OPTIONS

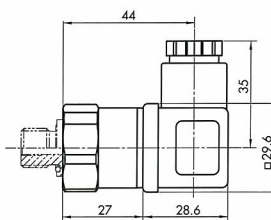
This series is based on a wrench size of 27mm. Electrical connectors with larger dimensions can be easily adapted with Series^{27mm}. In addition to the EPN model (similar to its Series19mm) the DCS is an electronic pressure switch with back-lit LCD and free programmable switchpoint available.

WITH MODULAR OPTIONS

The EPN/EPNCR is designed for a wide range of hydraulic applications and contains a reliable electronics with the Trafag ASIC chip and good price performance ratio. Electrical connectors with big dimensions as EN175301-803-A (DIN43650) or DIN72585 can be adapted.

MAIN CHARACTERISTICS & SPECIFICATIONS

◆ compact design	
◆ excellent temperature durability:	-40...125°C (media & operating)
◆ improved vibration resistance:	20g (20...2000Hz)
◆ pressure ranges:	0...2.5 to 0...2500bar
◆ high overpressure safety:	minimum twice of nominal pressure range
◆ NLH (BSL through 0):	±0.3 or ±0.1 % FS typ. (2 accuracies)
◆ signal outputs:	4...20mA, 0.5...4.5VDC (ratiometric)



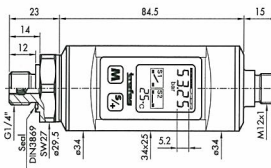
DATA SHEET NO: **H72312**
www.trafag.com/H72312

FREE ADJUSTABLE SWITCHPOINTS WITH I- OR U-OUTPUT

The DCS is an electronic control switch with back-lit display and direct switchpoint adjustment of 2 relays and analogue output.

MAIN CHARACTERISTICS & SPECIFICATIONS

◆ simple switching-point adjustment	
◆ temperature durability:	-25...80°C (media: -25...125)
◆ vibration resistance:	10g (20...2000Hz)
◆ pressure ranges:	0...1.0 to 0...600bar
◆ high overpressure safety:	minimum twice of nominal pressure range
◆ NLH (BSL through 0):	±0.25 % FS typ.
◆ signal outputs:	2 relays (electrically isolated) and 4...20mA or 0...10VDC



DATA SHEET NO: **H72605**
www.trafag.com/H72605

NEW

SC: SENSOR COMMUNICATOR



The SC is a handheld device (PDA like) with access to sensor data and calibration. Compatible with devices containing the Trafag-ASIC. Independently battery operated (including power supply of pressure sensor).

Access to types:
NAT, NAH, CMP, EPN, NPN

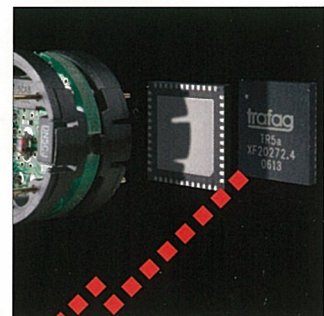
FLYER NO.: **H70185**
www.trafag.com/productfinder (Productname: "SC")

TRAFAG ASIC

Our ASIC (Application Specific Integrated Circuit) chip is a significant part in most of our transmitters. Years of experience in designing electronic pressure transmitters are integrated. Many new features allow to create customer specific products for most demands in a short time.

Key benefits of our ASIC:

- ◆ optimized accuracy
- ◆ more compact design
- ◆ improved resistance to mechanical influence
- ◆ user access with SC (Sensor Communicator)



SERIES PICO BLOCK: PRESSURE TRANSMITTERS & SWITCHES AND THERMOSTATS

Our PICO family is a series of products for pressure and temperature measuring. The compact block design offers new application possibilities. The instruments can be installed in a space-saving way and are easy to service at a central point. The flange version allows a front panel mounting while the pressure connection is positioned at the back.

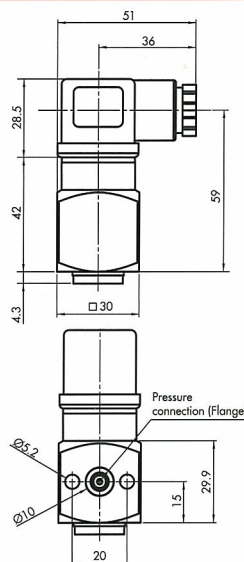
These models can be installed on common test valves (e.g. Diagnostic Valve Block DVB from Trafag) for device testing through a separate test connection without interruption of running process.

WITH FLANGE CONNECTION FOR BLOCK MOUNTING

The NPN is based on the EPN model with different pressure connection. Its compact 30mm block design with flange connection allows for front panel mounting without rotation of a thread.

MAIN CHARACTERISTICS & SPECIFICATIONS

◆ compact design	
◆ excellent temperature durability:	-40...100°C (media & operating)
◆ vibration resistance:	15g (20...2000Hz)
◆ pressure ranges:	0...2.5 to 0...400bar
◆ high overpressure safety:	minimum twice of nominal pressure range
◆ NLH (BSL through 0):	±0.1 or ±0.3 % FS typ. (2 accuracies)
◆ signal outputs:	4...20mA



PRESSURE TRANSMITTER NPN



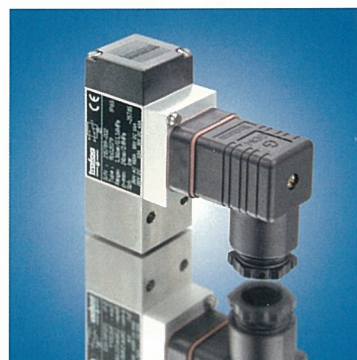
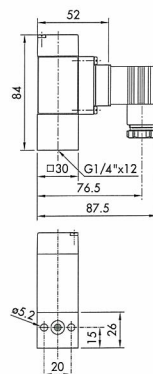
DATA SHEET NO: **H72313**
www.trafag.com/H72313

WITH RUGGED PISTON SENSOR SYSTEM

The PSTK is a pressure switch with piston sensor for a failsafe function in hydraulics with resistance to high pressure peaks and overpressures.

MAIN CHARACTERISTICS & SPECIFICATIONS

◆ compact design	
◆ high temperature durability:	-25...85°C (media -25...125°C)
◆ vibration resistance:	4g (25...100 Hz)
◆ pressure ranges:	1...10 to 40...400bar
◆ high overpressure safety:	twice of nominal pressure range
◆ switching differential:	min. 8...2.4/ max. 15...50 bar
◆ signal outputs:	On/Off micro-switch



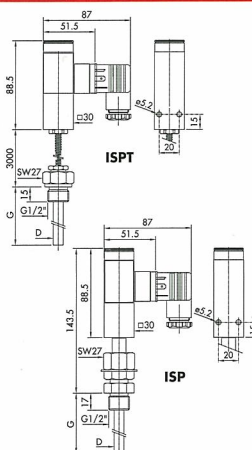
DATA SHEET NO: **H72202**
www.trafag.com/H72202

CAPILLARY TUBE THERMOSTAT WITH TWO MOUNTING OPTIONS

The ISP/ISPT is the thermostat model of the block design Pico family. You can choose one of two sensor mounting positions: sensor is directly mounted on to the unit housing or the sensor is remote.

MAIN CHARACTERISTICS & SPECIFICATIONS

◆ smallest design	
◆ vibration resistance:	4g (25...100Hz)
◆ temperature ranges:	5...95 to 40...300°C
◆ switching differential:	min. 4.0/max. 10°C
◆ signal outputs:	On/Off micro-switch



THERMOSTAT ISP/ISPT



DATA SHEET NO: **H72113**
www.trafag.com/H72113



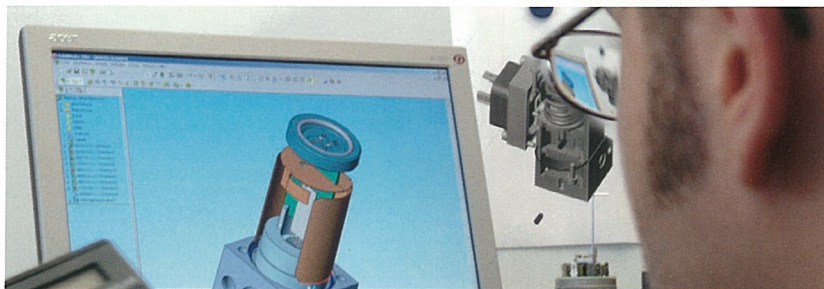
PRESSURE TRANSMITTERS

Outputs:	4...20mA, 0.5...4.5 ratiometric, 0...10 VDC, CANopen, ...
Electrical plugs:	M12x1, DIN43650, DIN72585, Cable, AMP/MQS, Packard, ...
Pressures:	0...2.5 up to 0...2500 bar
Accuracies:	± 0.1 , ± 0.2 , ± 0.5 [NLH (BSL) % FS]

Trafag Pressure Transmitter are well established. High quality sensors with thin-film-on-steel technology form the basis for reliable function of each transmitter.

Main characteristics:

- ◆ versatile pressure ports, electrical connectors and signal outputs
- ◆ excellent long-term stability
- ◆ resistant to high temperatures, overpressures, influence of humidity and dust, adjusted CEM
- ◆ rugged and compact design with resistance to mechanical influences



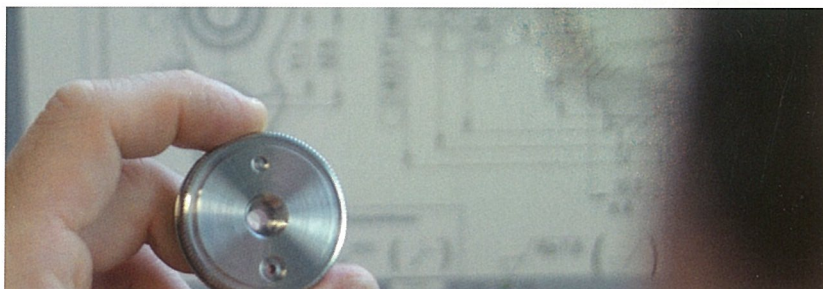
PRESSURE SWITCHES

Outputs:	On/Off micro-switch
Electrical plugs:	EN175301-803-A (DIN43650)
Pressures:	1...10 up to 40...400 bar
Switching differential:	min. 0.8...2.4 / max. 15...50 bar

Trafag Pressure Switches are outstanding for their compact design and high-precision micro-mechanics. Thanks to its On/Off switch no power supply is required.

Main characteristics:

- ◆ with piston sensor technology for frequent switching and abrupt pressure changes
- ◆ On/Off micro-switch with high ratings
- ◆ rugged, Trafag developed block design for space saving installation
- ◆ withstands high oil temperatures



THERMOSTATS

Outputs:	On/Off micro-switch
Electrical plugs:	EN175301-803-A (DIN43650)
Temperatures:	5...95 up to 40...300 °C
Switching differential:	min. 4 / max. 10 °C

Trafag Thermostats with capillary tube technology and a simple On/Off switching signal our thermostats operate failsafe for many years.

Main characteristics:

- ◆ with capillary tube technology: sensor direct mounted on the housing or remote for free mounting
- ◆ On/Off micro-switch with high ratings
- ◆ for harsh operating conditions e.g. extreme fluctuation of ambient temperature
- ◆ rugged, Trafag developed block design for space saving installation



OEM & INTEGRATED SOLUTIONS

We are experts in design and production of pressure sensor solutions for general and high demands. The following field proven sensor technologies are available:

- ◆ Thin-film-on-steel
- ◆ Thick-film-on-ceramics

...for detailed information see next page of this brochure...

Trafag specializes in designing and manufacturing highly integrated pressure sensors and transmitters such as valves and other hydraulic units. We support you with ideas for integrated solutions – perfectly adapted to suit your application.

Modules designed with our established knowledge helps you to reduce the component variety due to higher function integration in a product. Please contact your Trafag distributor in your country.



TRAFAG – EXPERIENCED AND CUSTOMER-ORIENTED

Technological and manufacturing expertise as well as customer-orientation forms the cornerstones of the fully independent Trafag company with corporate headquarters near Zurich (Switzerland).

About one fifth of its employees in Switzerland are involved in the fields of research and development, production technology or applications engineering.

SWISS BASED QUALITY – WORLDWIDE REPRESENTED

SUBSIDIARIES

Austria
Czech Republic
France
Germany
Great Britain
India
Italy
Japan

TRAFAG JOINT VENTURES

Poland

REPRESENTATIONS

Australia
Belgium
Canada
China
Cyprus
Denmark
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Greece
Iceland
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Turkey
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USA

REFERENCES

Aalborg Industries
ABB
AIT
AKG
Alstom
Areva T&D
AVL
Behr
Benninghoven
Bharat Heavy Electrical
Blohm & Voss
Bombardier
Bosch Rexroth
BMW Rolls-Royce
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KOMA
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TRAFAG AG
SENSORS & CONTROLS
EMIL-STAUSTRASSE 1
CH-8708 MÄNNEDORF
TEL +41 44 922 32 32
FAX +41 44 922 32 33
WEB WWW.TRAFAG.COM
MAIL TRAFAG@TRAFAG.COM

trafag
sensors  controls