E-T-A®
Circuit Protection & Control

E-T-A Automation

Safety for man and machine.

E-T-A:
Safety first.

For over five decades the E-T-A registered mark has been recognised as a symbol of safety and reliability throughout the field of equipment protection. With headquarters in Altdorf, Germany, E-T-A is an international group of companies and a world leader in the design, development and manufacture of circuit breakers for the protection of components, equipment and systems against the potentially catastrophic effects of electrical overload and short circuits. Today the E-T-A product range is one of the widest available with a solution for almost every application.

Research and development.

As a privately owned group, we are committed to maintaining a high level of research and development investment to ensure we remain at the forefront of circuit protection technology. E-T-A has over 1300 highly qualified personnel worldwide with 150 in research and development alone. Our products combine innovative, leading-edge designs with proven low cost of ownership, and exceptional safety and reliability. They are fully approved by internationally respected authorities including VDE, UL and CSA.

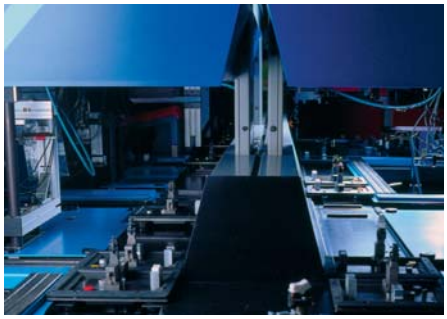
In addition to our own R & D activity we work closely with universities and are funding several advanced technology programmes addressing industry's needs for tomorrow.

Advanced manufacturing.

Our modern, award-winning manufacturing plants in Germany are highly automated and accredited to ISO 9001:2001. Quality is assured from design through development and every production process by advanced methodologies such as FMEA (Failure Mode Effect Analysis) and SPC (Statistical Process Control).

Our commitment to environmental protection and conservation of natural resources has been widely acclaimed and is a high priority throughout the E-T-A organisation, including our other manufacturing sites in the USA, Tunisia and Indonesia.

E-T-A's network of subsidiary companies and representatives provides sales and support in over 50 countries around the world. Product specialists will assist in the selection of the correct solution for your application. Whether you require individual circuit breakers, a complete system solution, sensors or control devices you will be able to specify E-T-A products confident in the knowledge you will not be disappointed.



Strategic Business Field Automation.

E-T-A specialises in circuit breakers for equipment protection and electronic protection solutions across many different sectors of industry. Our business is structured around our core competencies. Operating globally our business field managers and their teams, who are experts in their individual fields, are available to provide specialised applications advice to our customers wherever they are.

In the Business Field of Automation E-T-A offers products for an entire range of applications, from an individual machine-tool to the complete automatic production lines of industries such as chemical, food processing, and steel as well as power plants and water treatment processes.

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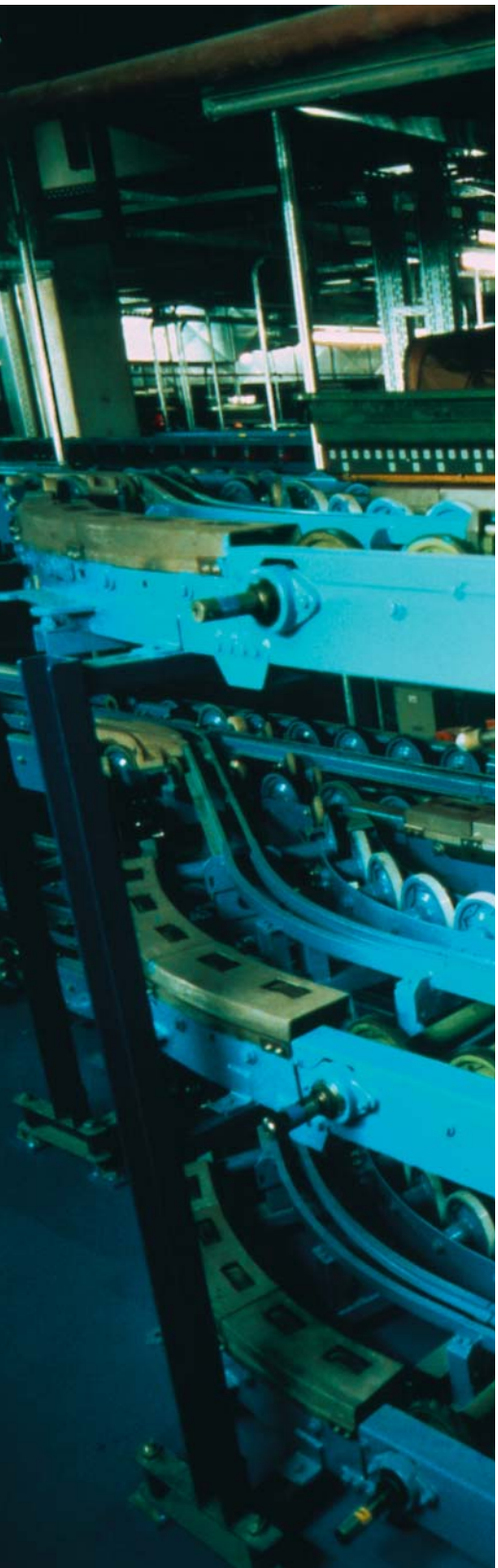
WACKER

Safety and reliability in Automation.



E-T-A's range of circuit breakers offers a choice of effective products and solutions for overload and short circuit protection, and for electronic monitoring and protection of control, auxiliary and supply circuits.

As today's machinery and systems for industrial production are highly automated, protective elements are needed not only to protect the actual loads, but also the complete systems. Reduction of factory downtime and stoppages in modern manufacturing is of the essence in increasing profitability. With ease of trouble-shooting and failure remedy as basic requirements, the integral signal contacts, visual status indication and signal outputs of E-T-A products are valuable benefits.

Moreover, a shared design feature of all E-T-A circuit breakers is their compact size – a significant advantage for applications where space is at a premium. In control cabinets the small physical size of E-T-A circuit breakers helps to reduce the space required by up to 50%. Type 2210, for example, with integral auxiliary contacts, requires only half the space of competitive products.

For some time E-T-A has also been manufacturing electronic circuit breakers with active current limitation to extend still further the range of applications possibilities. Furthermore, by combining its circuit breakers together with E-T-A terminal blocks such as Module 17plus, a complete system solution can be offered to significantly reduce wiring time.

Complete systems are available from E-T-A, either in standardised versions or tailor-made to customers' needs. Pre-wired 19" racks may be supplied with or without circuit breakers.

E-T-A electronic products in Automation.

Current and voltage monitors are also part of the E-T-A product range, designed to prevent problems caused by a breach of or a failure to attain limit values. E-T-A's **Solid State Remote Power Controllers** provide reliable switching of loads such as magnetic valves, at the same time as protecting load circuits against overcurrent and short circuit. They provide visual status indication as well as fault signals which can be processed by the main control system.

E-T-A also offers an extensive range of electronic sensors which are widely specified within the Automation market. They are used for monitoring and measuring liquids (water, oil), air and gases, and granules (powder). Products for use in EX zones are available.

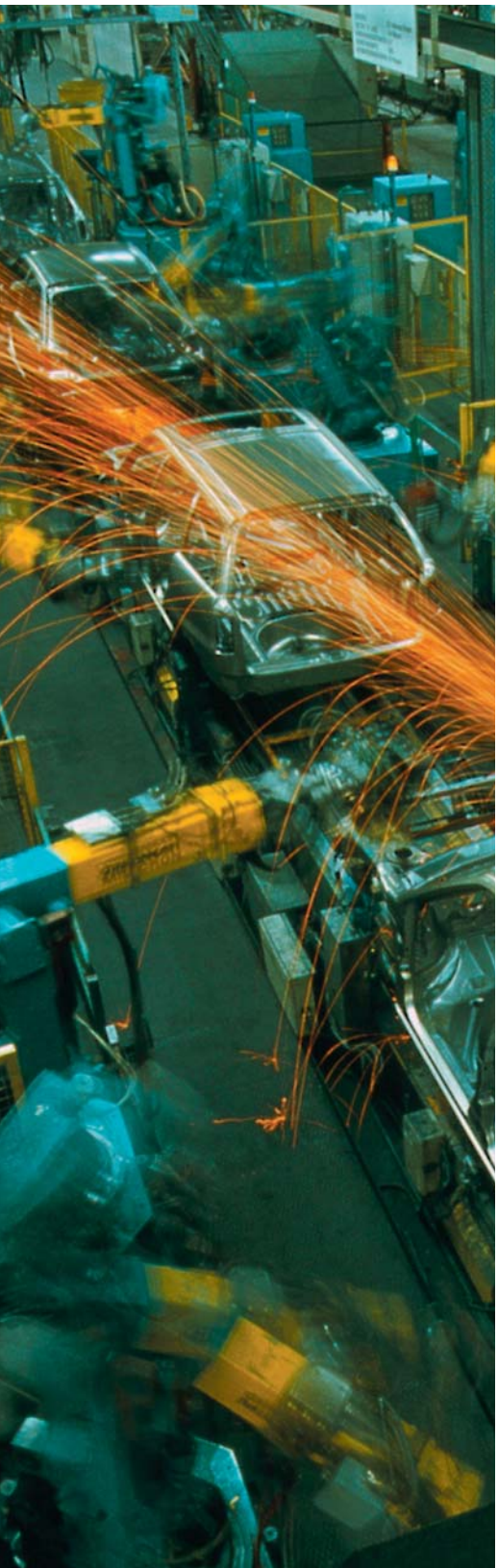
Unlike other methods of operation, the calorimetric principle of E-T-A **flow monitoring systems,** which relies on heat dissipation measured between two sensors, can be used to monitor the rate of flow of almost all media capable of moving through a pipeline. Once a flow monitor has been adjusted to a desired flow value an output signal will indicate any deviation below (MIN monitor) or above (MAX monitor) this value. The FS10 flow switch for instance, is ideal for monitoring the water supply in cooling circuits and will help to ensure that the pump does not run dry or sustain damage through a blocked filter.

Flow measuring systems like the FM1 offer the possibility of measuring the actual flow speed of the medium. This is achieved either by a direct read-out from the instrument itself on site or by processing output signals centrally. Different types of monitoring heads are available for various pipe diameters.

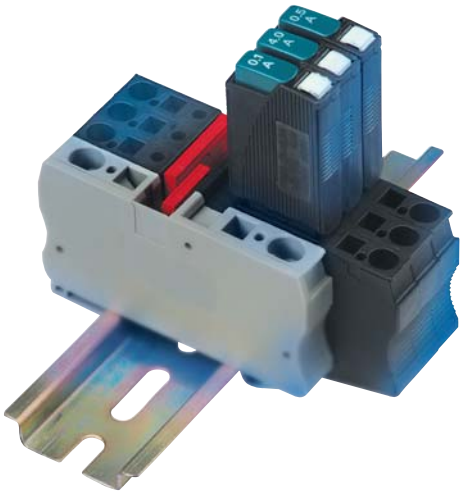
The FM1-CA has been designed to monitor the consumption of compressed air in individual production areas. It is easy to install and will immediately detect leakages thereby ensuring a significant cost saving opportunity within the shortest possible time scale.

E-T-A **level sensors** respond to contact with a medium and may also be used for MIN or MAX functions.

E-T-A products
for applications in Automation.



Thermal circuit breaker type 1180
For trouble-free system protection.



Thermal circuit breaker type 1180, suitable for plug-in terminal block mounting, reduces stoppages and downtime. In combination with a modular style terminal block the circuit breaker can offer individual protection for every circuit. Fuse replacement, with all its associated difficulties, is obviated as the circuit breaker can be immediately reset after operation. The terminal block is available as an option with screw or spring-loaded terminals and, if required, an LED can be fitted to illuminate when the circuit breaker is in the tripped/off position.

Voltage rating:
Up to AC 250 V; DC 65 V

Current rating range:
0.1 ... 10 A

Rupture capacity I_{CN} (EN 60934)

0.1 ... 5 A	6 x IN
6 ... 10 A	8 x IN

Rupture capacity (UL1077)
up to 2000 A

Typical applications:
- overcurrent protection of load circuits in power distribution systems
- protection of long, small diameter cables (e.g. sensor cables)

Thermal-magnetic circuit breakers types 2210 and 201

Plug-in design or suitable for rail mounting – width only 12.5mm.

Whether for use in power supply systems, control rooms, or plant switchboards, thermal-magnetic circuit breaker type 2210-S offers a wide range of important features, such as a positively trip-free mechanism and all-pole trip for multipole versions. It is also available with integral signal contacts with a housing width of only 12.5mm.

Voltage rating:
Up to AC 250 V; 3 AC 433 V (50/60 Hz); DC 65 V (higher ratings upon request)

Current rating range:
0.1 ... 25 A

Rupture capacity I_{CN} (EN 60934)
up to 800 A

Rupture capacity (UL1077)
up to 3500 A

Typical applications:
- telecommunications systems
- power supplies
- industrial switchgear and control systems

Thermal-magnetic circuit breaker type 201 is the ideal choice when DIN rail mounting is required A low-resistance version is also available, ideally suited to very low voltage applications.

Voltage rating:
Up to AC 240 V (50/60 Hz); DC 65 V

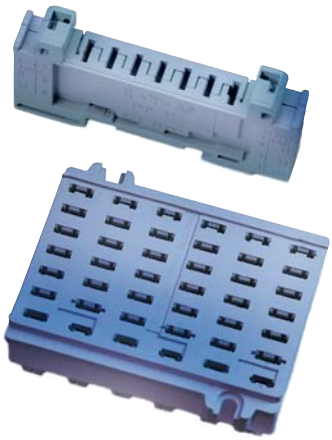
Current rating range:
0.1 ... 16 A

Rupture capacity $I_{C\,N}$ (EN 60934)
up to 400 A

Rupture capacity (UL1077)
up to 1000 A

Typical applications:
- telecommunications systems
- power supplies
- industrial switchgear and control systems

Socket 17-P10-Si/63-P10-Si
Ease of mounting.



An easy installation option! E-T-A circuit breakers types 2210-S, 3600 and 3900 as well as SSRPC E-1048-600 are designed to plug into sockets type 17-P10-Si or 63-P10-Si for quick and easy mounting. These products can be grouped together to form small, modular power distribution systems for cost-effective installation.

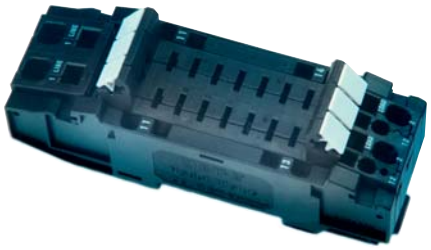
Terminals:
Blade terminals 6.3 mm

Voltage rating:
Up to AC 250 V; DC 65 V

Current rating:
16 A per pole

Typical applications:
- power distribution systems for process control, control cabinets and mechanical engineering
- individual load circuit protection

Module 17plus
Innovative power distribution.



E-T-A's Module 17plus is a new power distribution system which offers safety, flexibility and time saving benefits both during initial installation and routine maintenance. All cable connections are via spring-loaded terminals. Connection of the feed is by means of plug-in distribution busbars. Module 17plus is suitable for use with E-T-A circuit breaker types 2210 and 3600/3900, electronic circuit breaker ESS20, and SSRPC E-1048-7xx.

Terminals:
spring-loaded terminals

Voltage rating:
AC 433 V / DC 65 V

Current rating:
Line 50 A; load 25 A; signals 1 A

Typical applications:
- power distribution systems in process control and control cabinets
- power distribution for the chemical and food processing industries and logistics

Power distribution systems with 19” racks 19BGT
Systematic protection and wiring.

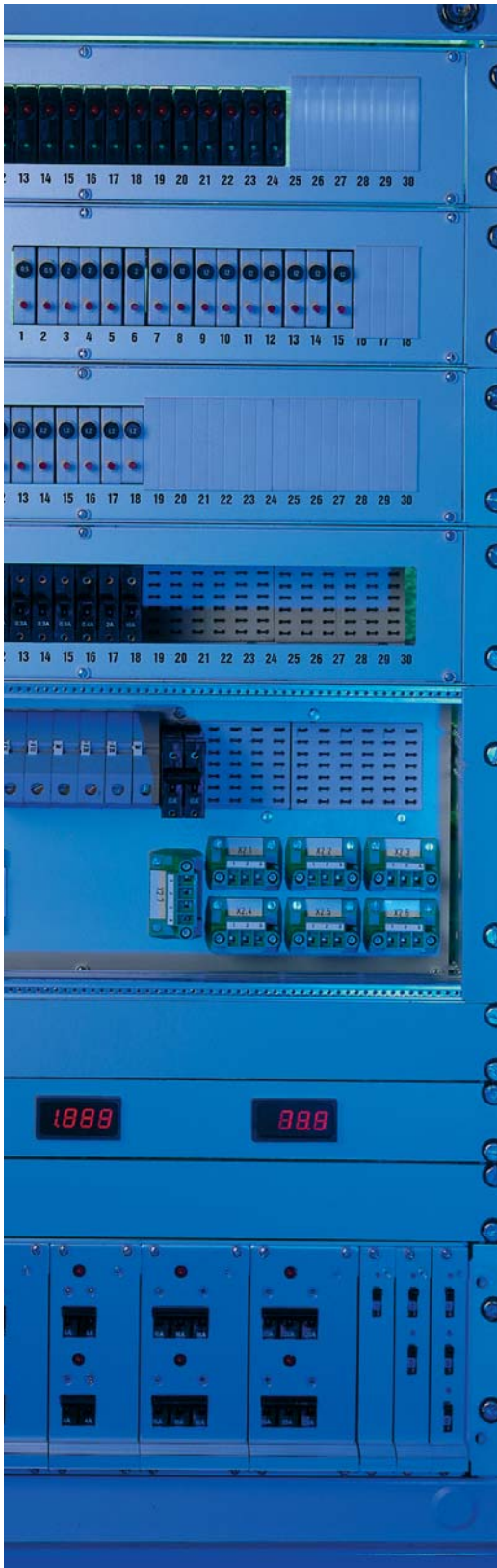
The 19” rack 19BGT is an ideal solution with real cost saving benefits for protection and wiring. The compact 2-U rack featuring 84 modular spacing units is made of aluminium and has an anodised front plate. The front cut-out offers the possibility for up to 30 component positions, with covers available for those which are not used. Plug-in circuit breaker types 3600/3900 and 2210 as well as the SSRPC E-1048-600 can be installed in the 19BGT rack utilising E-T-A type 63-P10-Si sockets (6 positions each). Other space-saving solutions include a 3-U 19” rack for up to 60 circuit breakers or a 1-U version for up to 12 circuit breakers.

Current rating range:

busbar	max. 63 A
feed per socket	max. 20 A
feed per position	max. 16 A

Typical applications:

- telecommunications
- process control
- power supplies and distribution
- 19” control cabinet sector



Electronic circuit breaker ESS20
Optimum protection, minimum size.

Switch-mode power supplies will shut down the output in the event of an overload with the result that one faulty load in the system can lead to complete disconnection of all loads. The ESS20 helps to overcome this problem. At a width of only 12.5mm it selectively protects all DC24V circuits through a combination of active electronic current limitation and well-proven circuit breaker technology including physical isolation. Thus it is possible to switch on capacitive loads, but they are disconnected only in the event of an overload or short circuit. Ease of installation is ensured through plug-in mounting utilising power distribution system Module 17plus.

Operating voltage:
DC 24 V (18 ... 32 V)

Rated current:
3 A or 6 A (selectable)

Typical applications:
- selective protection of automation components such as
  – sensors
  – actuators
  – bus couplers
  – PLCs
  – user panels
  powered by DC 24 V switch-mode power supplies

Solid State Remote Power Controller E-1048
Amplification, protection and signalling.

Use of the E-T-A electronic SSRPC E-1048 will enhance the flexibility of PLCs. It provides amplification of PLC outputs, protects loads and lines against overloads and short circuits, and monitors all circuits for wire breakage.

Operating voltage:
DC 24 V (18 ... 36 V)

Current rating:
0.5 A / 1 A / 2 A / 4 A
(other ratings upon request)

Typical applications:
- automation engineering
- protection and activation of fast switching operations with
  – motors
  – magnetic valves
  – resistive loads
  – signalling and monitoring lamps

Solid State Remote Power Controller E-1072
Safety for man and machine.

The electronic SSRPC E-1072 is a double pole magnetic switching amplifier suitable for resistive and inductive loads (magnetic valves, solenoids etc.). It reliably eliminates the hazard of inadvertent start-up or dangerous machine movements thereby significantly increasing safety in accordance with the European Machinery Directive.

Operating voltage:
DC 24 V (18 ... 36 V)

Current rating:
1 A / 2 A / 3 A

Typical applications:
- double pole protection, switching and monitoring of solenoids and magnetic brakes
- for ungrounded DC24V systems (IT systems) in steel plants, rolling mills and paper industry

Flow Meter FM1-CA
Measure, detect and save.

The micro-controller operated Flow Meter FM1-CA is the professional solution for consumption measurement and leakage detection of compressed air systems. Changes of pressure or temperature of the medium do not affect the performance of the FM1-CA, but are automatically allowed for. The FM1-CA is easily configurable and with a measuring range extending from close to zero, even the smallest flow volumes can accommodated. Adapters, ideally suited to main pipes and outputs of circular cross section, are available for installation of the sensor heads.

Supply voltage:
DC 24 V (19 ... 32 V)
AC 24 V ± 10% (50/60 Hz)

Measuring range:
with CSP monitoring head in DN 15 ... DN 50:
0–50 Nm_/h...0–480 Nm_/h

with CSF monitoring head in DN 65...DN 500:
0-750 Nm_/h...0-50,000 Nm_/h

Typical applications:
- measurement of compressed air in main pipes and outputs of compressed air pipe systems
- flow measurement of oxygen and nitrogen

Electronic Flow Monitor FM3
Miniaturised size.

The FM3, featuring a sensor head and integral electronic control unit, is designed for compressed air systems. Indication of measuring values is by means of an analogue current or frequency output, or as a flow limit signal to facilitate processing in primary systems. Ease of installation in pipes with a diameter of DN15...50 is ensured through the use of E-T-A sensor adapters..

Supply voltage:
DC 24 V (18 ... 32 V)

Measuring range:
in DN 150...6 Nm_/h
in DN 500...500 Nm_/h

Typical applications:
- flow measurement of compressed air in branch lines or directly at the machine
- monitoring of compressed air in pneumatic conveyor systems
- process control in chemical industry and process engineering by monitoring mixers or valve movements

Flow Monitor FS10
Flow control made easy!

Though small and compact the FS10 can handle flow media temperatures from –25 °C up to +100 °C. It is suitable too for all kinds of flow media: oil, gases and even aggressive media, thus it is simply indispensable for any cooling or lubrication circuit. The probe and fitting are made of stainless steel, ensuring a long life span with fit-and-forget reliability. Thanks to the innovative plug-in connection technology the FS10 is easy-to-fit allowing installation to be completed in a matter of seconds.

Supply voltage:
DC 24 V (18 ... 32 V)

Flow response adjustment:

air	0.5 ... 50m/sec
water, oil	0.01 ... 4.5 m/s

Typical applications:
- monitoring of pumps
- monitoring of cooling and lubrication circuits

Miniature Flow Monitor SW 112
For air and inert gases.

The SW112 calorimetric flow monitor is designed to cost-effectively monitor air flow. The switching point is steplessly adjustable by means of a potentiometer. If the flow speed falls below a pre-adjusted value, this is indicated by a relay output and the integral green LED will extinguish. The SW 112 is extremely versatile and suitable for a temperature range of –20 °C up to +60 °C.

Supply voltage:
AC 24 V +10%/-15% / DC 19 ... 32 V

Flow response adjustment:

air	0.5 ... 20 m/s

Typical applications:
- flow monitoring in ventilation systems, fans, cooling blowers, filter contamination
- gas and exhaust control in heating systems, power plants, furnaces, gas supply networks and welding equipment

Level Sensor NR 160
Maintenance-free.

Capacitive level sensor type NR 160 is a quick and easy solution for monitoring the levels of liquids and powders. A MIN/MAX selector switch allows the possibility for both minimum and maximum level indication to further enhance the flexibility of this product.

Operating voltage:
DC 9 ... 36 V or with power supply NG03

Power consumption:
typically 17 mA

Typical applications:
- level sensing of all kinds of media in plant construction and engineering
- level monitoring in containers for automatically opening and closing valves or switching on pumps

Tube Sensor TLS100
Simply snap it on!

The TLS 100 works on the capacitive principle and detects the presence of a liquid in a plastic tube. These plastic tubes may also be mounted as a by-pass on a compensator in order to signal the required medium level in containers. The sensor is simply snapped onto the tube at the ideal level of the medium and provides versatile usage for a wide range of applications.

Operating voltage:
DC 12/24 V (DC 9 ... 36 V)

Media:
liquids (water etc.)

Typical applications:
- medical equipment (e.g. infusion bags)
- water containers in sterilisers

E-T-A®
Circuit Protection & Control

E-T-A Elektrotechnische Apparate GmbH: Worldwide Service Network.

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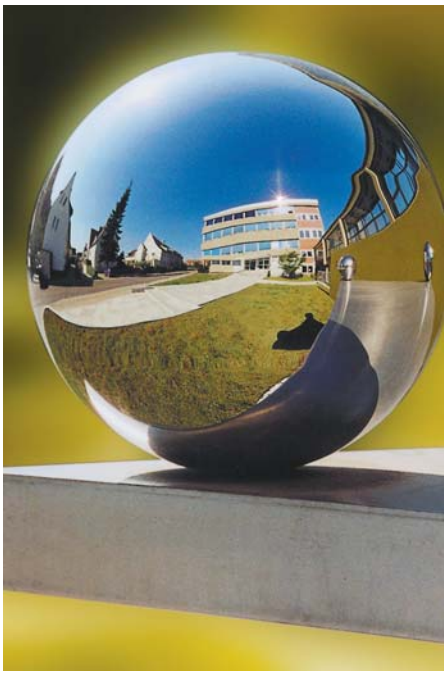

Photos:
Adam Opel, E-T-A, Flughafen Frankfurt/Main,
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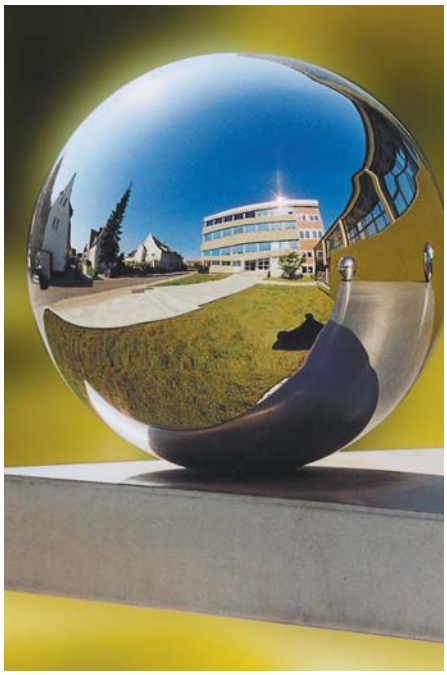

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