

# EXPLOSION PROTECTION EQUIPMENT

# Automation is our world. A perfect application solution is

A willingness to take entrepreneurial risks, a pioneering spirit, and a firm belief in their own inventive powers – these were the assets that Walter Pepperl and Ludwig Fuchs started out with when they opened their Mannheim radio repair shop in 1945. Their invention of the proximity switch a few years later proved their strength. It was also the starting point in a successful history defined by close customer relationships as well as innovative automation technologies and procedures.

Then as now, our focus is squarely on the individual requirements of each customer. Whether as a pioneer in electrical explosion protection, or as a leading innovator of highly efficient sensors – the intensive communication with our customers is what allowed us to become the leader in automation technology. Our main objective is combining state-of-the-art technologies and comprehensive services to optimize our customers' processes and applications.

For more information, please visit our website: [www.pepperl-fuchs.com](http://www.pepperl-fuchs.com)



our goal.

# CONTENT

<b>Ex d IIB Terminal Boxes, Control Stations and Control Panels</b>	<b>4</b>
<b>Ex d IIB Power Switching</b>	<b>7</b>
<b>Ex d IIC Terminal Boxes, Control Panels and Instrument Housings</b>	<b>8</b>
<b>Ex d IIB / IIC Applications</b>	<b>10</b>
<b>Ex d IIB / IIC Control Units</b>	<b>12</b>
<b>Ex de Panel Solutions</b>	<b>14</b>
<b>Ex e Junction and Terminal Boxes and Enclosures</b>	<b>16</b>
<b>Ex e Control Units and Control Stations</b>	<b>20</b>
<b>Ex d / Ex e Signaling Equipment</b>	<b>24</b>



# EJB - Ex d IIB

## aluminum and stainless steel

The EJB series of flameproof enclosures and a large variety of flameproof operators, such as switches, pushbuttons and indicator lights, provides a reliable and versatile base to design comprehensive control stations and panels.

The enclosure materials provide the high corrosion resistance required in many industries including offshore and marine applications.



## SPECIFICATION

- Certified Ex d and Ex tb as well as for installation of intrinsically safe circuits (Gas group IIB; Zones 1, 2, 21, 22)
- Ambient temperature range: -20 °C ... +60 °C, ingress protection IP66 (IP67 on request)
- 40 sizes, material: copper-free aluminum alloy, epoxy painted RAL7005 (grey) or stainless steel 316L (AISI 304 on request), shot peened
- Optional circular or rectangular windows in various sizes
- Customizable configuration of operators, cable entry quantities and gland types as per specification



More info is available at: [www.pepperl-fuchs.com/enclosures-IIB](http://www.pepperl-fuchs.com/enclosures-IIB)

# ASM - Ex d IIB

## cast-iron

The ASM series consists of three flame-proof, cast iron enclosures with hinged covers. In conjunction with a comprehensive range of flameproof operators, such as switches, pushbuttons and indicator lights, it provides a cost-efficient base to design control stations and panels.

### SPECIFICATION

- Certified Ex d and Ex tb as well as for installation of intrinsically safe circuits (Gas group IIB; Zones 1, 2, 21, 22)
- Ambient temperature range: -40 °C ... +55 °C, ingress protection IP66
- 3 sizes, material: cast iron, epoxy powder coated black
- Optional windows in various sizes
- Customizable configuration of operators, cable entry quantities and gland types as per specification
- Various international certifications including ATEX, IECEx, GOST-R



More info is available at: [www.pepperl-fuchs.com/enclosures-IIB](http://www.pepperl-fuchs.com/enclosures-IIB)

# SD, SF, DOL, SDS - Ex d IIB switch disconnectors and motor starters

The SD switch disconnectors and SF fused disconnectors are used to ensure the safe disconnection of the electrical supply. The DOL direct online and SDS star-delta motor starters provide ready-to-connect solutions complete with precalculated overload protection necessary for field use. The series cover both single- and three-phase applications in a wide load range.

## SPECIFICATION

- DOL starters from 1.1 kW up to 75 kW.  
Star-delta starters from 11 kW to 30 kW
- Certified Ex d and Ex tb (Gas group IIB; Zones 1, 2, 21, 22)
- Ambient temperature range: -40 °C ... +55 °C, ingress protection IP66
- Various sizes according to function, material: cast iron, cast aluminum and cast stainless steel all epoxy powder coated in black
- Various international certifications including ATEX, IECEx, GOST-R



More info is available at: [www.pepperl-fuchs.com/switching-IIB](http://www.pepperl-fuchs.com/switching-IIB)

# GUB - Ex d IIC

## aluminum and stainless steel

The GUB series is designed for flame-proof control solutions in IIC environments. The diverse range of enclosures is manufactured from copper-free aluminum or stainless steel, providing effective corrosion resistance commonly required for offshore and marine applications. A choice of windows and lid extensions allow a very flexible adaptation for any application.

### SPECIFICATION

- Certified Ex d and Ex tb as well as for installation of intrinsically safe circuits (Gas group IIC; Zones 1, 2, 21, 22)
- Ambient temperature range: -50 °C ... +60 °C, ingress protection IP66 (IP67 on request)
- 50 sizes, material: copper-free aluminum alloy, epoxy painted RAL7005 (grey) or stainless steel 316L (AISI 304 on request), shot peened
- Aluminum versions available with circular windows as well as front extensions
- Customizable cable entry quantities and gland types as per specification



More info is available at: [www.pepperl-fuchs.com/enclosures-IIC](http://www.pepperl-fuchs.com/enclosures-IIC)

# SEB, SO, SK, SMH - Ex d IIC instrument housings

These series of enclosures are ideal for housing terminals, electronic transmitters, monitoring instruments such as ammeters, as well as electronic devices for processing signals of sensors such as thermocouples and RTDs. The compact enclosures are manufactured from either cast aluminum or stainless steel. A safe IIC flamepath is provided by a circular threaded lid.

## SPECIFICATION

- Certified Ex d and Ex tD (Gas group IIC; Zones 1, 2, 21, 22)
- Ambient temperature range: -50 °C ... +60 °C, ingress protection IP66 (IP67 on request)
- Various sizes, materials: copper-free aluminum alloy, epoxy painted RAL7005 (grey), fabricated stainless steel 316L or SS 304, shot peened
- Versions with viewing windows and extensions for increased internal volume



More info is available at: [www.pepperl-fuchs.com/insthousings-IIC](http://www.pepperl-fuchs.com/insthousings-IIC)

# DMT - Ex d

## hazardous area grounding

The DMT electronic grounding devices are designed to monitor the capacitance and resistance of equipment where a build-up of static charges can occur within hazardous locations. They feature a clamp fitted to 8 meters of cable in order to measure and monitor the continuity to earth, aiming to eliminate the electrostatic charges while delivery vehicles transfer combustible products in tank farms, storage areas, or mixing stations.

### DMT 2B GROUNDING DEVICE

- Certified Ex d and Ex tb (Gas group IIB; Zones 1, 2, 21, 22)
- Ambient temperature range: -20 °C ... +40 °C, ingress protection IP66 (IP67 on request)
- Size: 375 x 270 x 200 mm, materials: copper-free aluminum alloy, epoxy painted RAL7005 (grey), fabricated stainless steel 316L or SS 304, shot peened

### DMT 2C GROUNDING DEVICE

- Certified Ex d and Ex tb (Gas group IIC; Zones 1, 2, 21, 22)
- Ambient temperature range: -20 °C ... +40 °C, ingress protection IP66 (IP67 on request)
- Size: 360 x 360 x 245 mm, materials: copper-free aluminum alloy, epoxy painted RAL7005 (grey), fabricated stainless steel 316L or SS 304, shot peened



More info is available at: [www.pepperl-fuchs.com/flameproofapplications](http://www.pepperl-fuchs.com/flameproofapplications)

# TVCC - Ex d IIC camera enclosures

The GUB/WE-TVCC series is designed to contain compact CCTV cameras. Various camera types can be integrated in a GUB enclosure to facilitate remote monitoring in hazardous areas. The camera is mounted on an internal rail allowing the regulation of the distance to the window.

## SPECIFICATION

- Certified Ex d and Ex tb (Gas group IIC; Zones 1, 2, 21, 22)
- Including anti-condensation resistor (115/230 VAC 50/60 Hz), external rain canopy, sun shade, and wall mounting bracket
- Ambient temperature range: -50 °C ... +60 °C, ingress protection IP67
- 3 sizes, materials: enclosure copper-free aluminum alloy, epoxy painted RAL7005 (grey), canopy and wall bracket aluminum epoxy painted RAL9001 (white)



More info is available at: [www.pepperl-fuchs.com/flameproofapplications](http://www.pepperl-fuchs.com/flameproofapplications)

# EFDC - Ex d IIB+H<sub>2</sub> aluminum control units

The EFDC series of flameproof local control units is certified for the use in IIB hazardous gas atmospheres including hydrogen. The versatile range provides customized solutions with up to eleven function positions for different types of pushbuttons, LEDs, switches and manual call points.

## SPECIFICATION

- Certified Ex d and Ex tb (Gas group IIB+H<sub>2</sub>; Zones 1, 2, 21, 22)
- Ambient temperature range:  
-20 °C ... +60 °C,  
ingress protection IP65  
(IP67 on request)
- 6 sizes, material: copper-free aluminum alloy, epoxy painted RAL7005 (grey)



More info is available at: [www.pepperl-fuchs.com/localcontrol-IIB](http://www.pepperl-fuchs.com/localcontrol-IIB)

# EFD21 - Ex d IIC aluminum control units

The EFD21 control units are a comprehensive range of one- and two-function units manufactured from cast aluminum, covering a wide choice of operating elements. Each unit offers two cable-entry points to access the internal connection points. The circular body and lid facilitates easy access and termination of cables.

## SPECIFICATION

- Certified Ex d and Ex tb (Gas group IIC; Zones 1, 2, 21, 22)
- Ambient temperature range: -20 °C ... +60 °C, ingress protection IP65 (IP67 on request)
- Size: 125 x 80 x 115 mm, material: copper-free aluminum alloy, epoxy painted RAL7005 (grey)



More info is available at: [www.pepperl-fuchs.com/localcontrol-IIC](http://www.pepperl-fuchs.com/localcontrol-IIC)

# Customized solutions utilizing Ex

As a manufacturer of Ex e increased safety applications and Ex d flameproof panels, Pepperl+Fuchs is ideally positioned to offer a complete solution combining both protection methods. These Ex de “bushed” solutions, which utilize the wide range of enclosure types and operator elements, can provide an optimized and cost-effective option for any specific plant requirements.

A typical example would be an EJB stainless steel Ex d enclosure used to house industrial equipment such as intrinsic safety isolators, PLCs, contactors and MCBs, coupled with an FXL stainless steel Ex e enclosure where controls such as pushbuttons and LEDs are located. Cable glands are available for field connections to terminals which are mounted inside the Ex e enclosure. Combining these different protection methods saves cost and weight and eliminates the need for opening the Ex d enclosure during installation and commissioning.

#### Plan for success

Close cooperation and continuous support are the foundation of any successful project. Pepperl+Fuchs is the perfect partner to provide a specific engineered solution fully planned and executed from start to finish.

#### Right from the start

Whether it's a large, complex suite of Ex d control panels or a single Ex e control station, a tried and trusted format to ensure that the design meets the project's time and specification criteria will be delivered.

#### AT EVERY STEP

In close collaboration with the customer the Pepperl+Fuchs Solution Engineering Centers will provide:

- Evaluation of application requirements
- Proposals of technical solutions
- Final engineering design specification
- Manufacturing of the control solution
- Customer inspection support and final acceptance test
- Comprehensive documentation



More info is available at: [www.pepperl-fuchs.com/solution-engineering](http://www.pepperl-fuchs.com/solution-engineering)

# e and Ex d technologies



Customer's personnel can concentrate fully on other project tasks while Pepperl+Fuchs engineers take care of the control solution details. For the duration of the project a highly-skilled project engineer will be dedicated to coordinate all necessary activities. As a single-point of contact for all project needs, the project manager can provide up-to-date status and essential information at any time.

### With quality and expertise

Pepperl+Fuchs products are world renowned for their high standard of ISO9000 certified quality and reliability in conjunction with exceptional service in providing expert application analysis and technical expertise with each and every solution that is manufactured.



# GL and GVU – Ex e glass fiber reinforced polyester (GRP)

The GL terminal boxes and GVU junction boxes are manufactured using glass fiber reinforced polyester which provides a high strength, impact resistant solution. They are ideally suitable for use in rough operating conditions.

## SPECIFICATION

- Certified Ex e and Ex tb, GL also Ex ia (Zones 0, 1, 2, 21, 22)
- Ambient temperature range: -50 °C ... +60 °C, ingress protection IP66 / 67
- 17 enclosures sizes, material: carbon loaded, anti-static, glass fiber reinforced polyester, black, UV stabilized
- Customizable terminal and entry quantities and configuration, with cable glands or plugs, as per specification
- Various international certifications including ATEX, IECEx, GOST-R, INMETRO, CCOE



More info is available at: [www.pepperl-fuchs.com/tjb](http://www.pepperl-fuchs.com/tjb)

# SL – Ex e stainless steel

The SL series is a range of six compact junction and terminal boxes which provide the ideal solution for small applications. The cost-saving terminal arrangement speeds up the total installation time.

The robust design provides a high degree of safety for offshore applications and in other hazardous areas where adverse chemical, mechanical, and climatic operating conditions exist.

## SPECIFICATION

- Certified Ex e, Ex tb and Ex ia (Zones 0, 1, 2, 21, 22)
- Ambient temperature range: -50 °C ... +120 °C, ingress protection IP67
- 6 sizes, material: 316L & 304 stainless steel, surface electro-polished
- Customizable terminal and entry quantities and configuration, with cable glands or plugs, as per specification
- Various international certifications including ATEX, IECEx, GOST-R, INMETRO

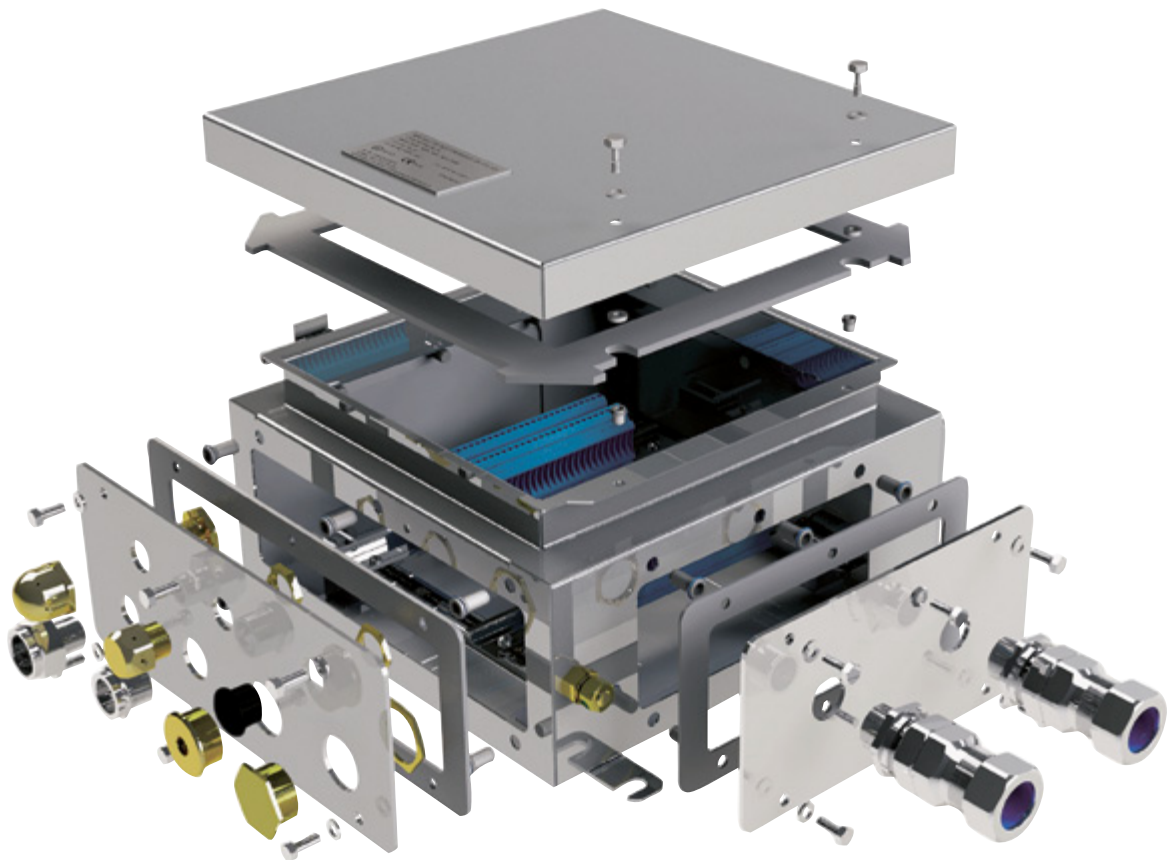


More info is available at: [www.pepperl-fuchs.com/tjb](http://www.pepperl-fuchs.com/tjb)

# FXL, XL, HVB – Ex e stainless steel

The FXL and XL series of stainless steel terminal boxes meet the sterilization requirements in food processing and pharmaceutical industries. The FXL series features a return flange sealing method which prevents dirt, dust and moisture from entering

the enclosure when opening. The HVB high voltage box is a XL variant especially designed for installation of power distribution networks.



## SPECIFICATION

- Certified Ex e, Ex tb and Ex ia (Zones 0, 1, 2, 21, 22)
- Ambient temperature range:  
-50 °C ... +120 °C,  
ingress protection IP66
- 21 sizes, material: 316L or 304 stainless steel, surface electro-polished to prevent tarnish and corrosion
- Customizable terminal and entry quantities and configuration, with cable glands or plugs, as per specification
- HVB equipped with insulated connection bars rated 6.6 kV / 650 A, for cable cross sections up to 70 mm<sup>2</sup>
- Various international certifications including ATEX, IECEx, GOST-R, INMETRO



More info is available at: [www.pepperl-fuchs.com/tjb](http://www.pepperl-fuchs.com/tjb)

# LCP - Ex e GRP control units

The LCP series is a family of flexible glass fiber reinforced polyester local control units with options for adjustments to specific application requirements.

## SPECIFICATION

- Certified Ex de and Ex tb (Zones 1, 2, 21, 22)
- Ambient temperature range: -40 °C ... +55 °C, ingress protection IP66
- Up to 3 operators including pushbuttons, LED indicators, emergency-stop buttons, rotary switches with many different switching configurations, potentiometers, ammeters
- 3 sizes, material: glass fiber reinforced polyester, black, anti-static and UV stabilized
- Cable entries: standard with M20 stopping plug in top face and M20 plastic cable gland in bottom face, other configurations on request
- Various international certifications including ATEX, IECEx, GOST-R, INMETRO



More info is available at: [www.pepperl-fuchs.com/localcontrol](http://www.pepperl-fuchs.com/localcontrol)

# LCS - Ex e stainless steel control units

The LCS series features stainless steel enclosures and has a modular design to fit the majority of small control applications.

## SPECIFICATION

- Certified Ex de and Ex tb (Zones 1, 2, 21, 22)
- Ambient temperature range: -40 °C ... +55 °C, ingress protection IP66
- Up to 3 operators including pushbuttons, LED indicators, emergency-stop buttons, rotary switches with many different switching configurations, potentiometers, ammeters
- 3 sizes, material: 316L stainless steel, surface electro-polished for sterilization requirements
- Cable entries: standard with M20 stopping plug in top face and M20 plastic cable gland in bottom face, others on request
- Various international certifications including ATEX, IECEx, GOST-R, INMETRO



More info is available at: [www.pepperl-fuchs.com/localcontrol](http://www.pepperl-fuchs.com/localcontrol)

# GLCP - Ex e GRP control stations

The GLCP control stations are manufactured from glass fiber reinforced polyester supplied with a smooth surface finish to provide increased corrosion protection. To ensure a reliable solution for any control application, up to 35 operators with a wide range of labeling, contact blocks, and enclosure options are available.



## SPECIFICATION

- Certified Ex de and Ex tb (Zones 1, 2, 21, 22)
- Ambient temperature range: -40 °C ... +55 °C, ingress protection IP66
- Up to 35 operators including pushbuttons, LED indicators, emergency-stop buttons, rotary switches with many different switching configurations, potentiometers, ammeters
- 7 sizes, material: carbon loaded, anti-static, glass fiber reinforced polyester, black, UV stabilized
- Customizable configuration of operators, cable entry quantities and gland types as per specification
- Various international certifications including ATEX, IECEx, GOST-R, INMETRO



More info is available at: [www.pepperl-fuchs.com/controlstations](http://www.pepperl-fuchs.com/controlstations)

# FXLSCP - Ex e stainless steel control stations



The FXLSCP control stations are manufactured from stainless steel. They are ideally suited for sterilized environments common in food processing or pharmaceutical industries. Up to 56 operators with various contact block configurations and labeling options allow the perfect adjustment of the control station to the required switching and monitoring functions.

## SPECIFICATION

- Certified Ex de and Ex tb (Zones 1, 2, 21, 22)
- Ambient temperature range: -40 °C ... +55 °C, ingress protection IP66
- Up to 56 operators including pushbuttons, LED indicators, emergency-stop buttons, rotary switches with many different switching configurations, potentiometers, ammeters
- 5 sizes, material: 316L stainless steel, surface electro-polished to provide tarnish and corrosion resistance
- Customizable configuration of operators, cable entry quantities and gland types as per specification
- Various international certifications including ATEX, IECEx, GOST-R, INMETRO



More info is available at: [www.pepperl-fuchs.com/controlstations](http://www.pepperl-fuchs.com/controlstations)

# FFCM - Ex d IIC limit switches

The FFCM series of compact limit switch bodies is manufactured from cast aluminum alloy and can be fitted with five interchangeable designs of plastic actuator heads. With this diverse range of accessories, the presence or absence of moving equipment can be safely detected in every application.

## SPECIFICATION

- Certified Ex d and Ex tD (Gas group IIC; Zones 1, 2, 21, 22)
- Ambient temperature range: -20 °C ... +60 °C, ingress protection IP65
- Size: 97 x 68 x 57 mm, without external actuator, material: copper-free aluminum alloy, epoxy painted RAL7005 (grey)



More info is available at: [www.pepperl-fuchs.com/limitswitch-IIC](http://www.pepperl-fuchs.com/limitswitch-IIC)

# Call points, visual, and audible signaling devices

## E0301 AND E0302 MANUAL CALL POINTS WITH BREAK GLASS

- Certified Ex de IIC and Ex tb IIIC (E0301); Ex ed IIC and Ex tbIIIC(E0302) (Zones 1, 2, 21, 22)
- Ambient temperature range: -40 °C ... +50 °C, ingress protection IP66
- Material: cast iron (E0301); GRP (E0302)
- Optionally with series or end-of-line resistors



## E501 STATUS LIGHT

- Certified Ex d IIB and Ex tb IIIC (Zones 1, 2, 21, 22)
- Ambient temperature range: -40 °C ... +85 °C, ingress protection IP66
- Lamp type: 15 W incandescent
- 5 glass colors: white, red, green, blue, amber
- Material: cast iron



## ETH12MD MULTIPLE TONE WARNING DEVICE

- Certified Ex d IIC (Zones 1, 2)
- Ambient temperature range: -20 °C ... +40 °C, ingress protection IP55
- Voltages: 12, 24, 48, 115, 230VAC; 12, 24, 48 VDC
- Sound output: up to 106 dB, 440-1600Hz, 32 different warning sounds
- Material: body of copper-free aluminum alloy, plastic acoustic diffuser with conductive coating



## LPA AERIAL OBSTACLE SIGNAL DEVICE

- Certified Ex d IIC and Ex tD (Zones 1, 2, 21, 22)
- Ambient temperature range: -20 °C ... +40 °C, ingress protection IP66/IP67
- 4 colors: orange, blue, red, green
- 4 types of lamps: xenon, fluorescent, halogen, incandescent
- 3 mounting methods: suspension, arm, ceiling
- Material: body of copper-free aluminum alloy, globe of borosilicate glass with Fresnel lens of colored thermo-plastic



## EVC100 FLASHING BEACON

- Certified Ex d IIC and Ex tD (Zones 1, 2, 21, 22)
- Ambient temperature range: -20 °C ... +40 °C, ingress protection IP66/IP67
- Lamp type: 4.5 W 6 Joule miniflash xenon, 5 colors: blue, yellow, white, red, green
- Voltages: 12/24, 48, 110, 220/240 VAC; 12/24, 48 VDC
- 3 mounting methods: suspension, arm, ceiling
- Material: body of copper-free aluminum alloy, globe of borosilicate glass



More info is available at: [www.pepperl-fuchs.com/lighting](http://www.pepperl-fuchs.com/lighting)

# Staying in touch. The world over.

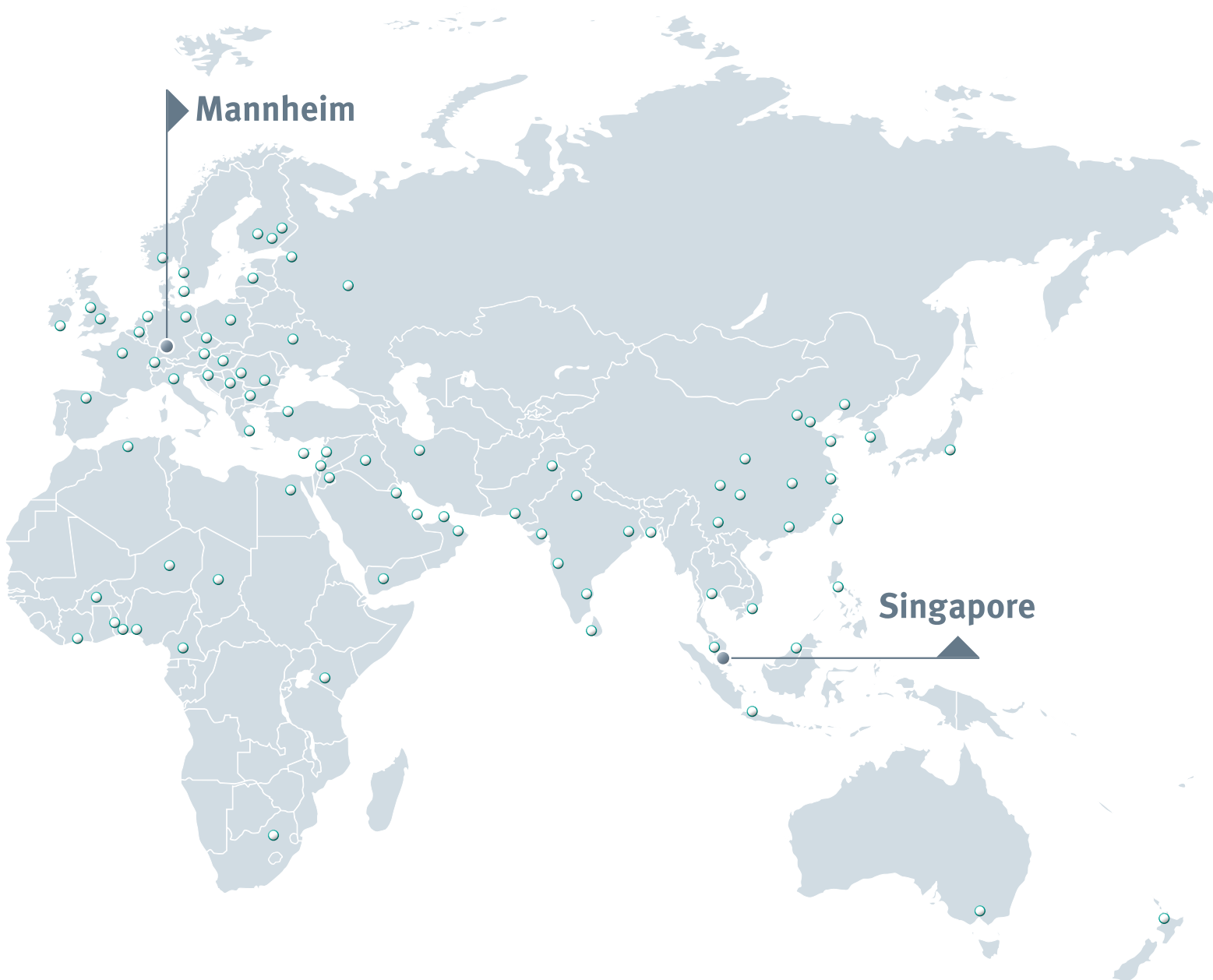
Good customer relationships need care and attention. They are an indication of genuine interest, trust, and a cooperative spirit: the foundation of Pepperl+Fuchs' strengths. No matter where you might be, we are always nearby. And we speak your language – in more than 140 countries the world over.



## At home on all continents

Our customers are at the center of all our activities. Our worldwide network ensures that we provide them with the best possible service and support. Our world headquarters in Mannheim services Europe through a network of more than 40 affiliates. Asia is handled by our office in Singapore, with more than 1000 employees in manufacturing, service, and sales. And our North American headquarters in Twinsburg, Ohio, is responsible for a comprehensive network of offices and sales partners in the USA, Canada, and Mexico.

No matter where in the world you may be, Pepperl+Fuchs is right nearby – and always there for you.



**Mannheim**

**Singapore**

# YOUR APPLICATION. OUR CHALLENGE.

## PROCESS INTERFACES

- Intrinsically safe barriers
- Signal conditioners
- Fieldbus infrastructure
- Remote I/O systems
- HART interface solutions
- Wireless solutions
- Level measurement
- Purge and pressurization systems
- Industrial monitors and HMI solutions
- Explosion protection equipment
- Solutions with process interfaces

## INDUSTRIAL SENSORS

- Proximity sensors
- Photoelectric sensors
- Industrial vision
- Ultrasonic sensors
- Rotary encoders
- Positioning systems
- Inclination and acceleration sensors
- AS-Interface
- Identification systems
- Logic control units



[www.pepperl-fuchs.com](http://www.pepperl-fuchs.com)

 **PEPPERL+FUCHS**