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WHITEPAPER

MOUNTING SOLUTIONS AND ACCESSORIES FOR RELIABLE SENSOR MOUNTING

Author: Dipl.-Ing. Christian Fiebach
Chief Executive Manager ipf electronic gmbh

IPF ELECTRONIC

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1 INTRODUCTION

When searching for a suitable sensor, the focus is primarily on the specific task that a device solution is to fulfill in an application. In this context, the prevailing environmental conditions at the place of use may also be relevant, as the technical device properties and the appropriate connection technology depend on this to a large extent. In the early project phase, however, little or no attention is often paid to the self-test sensor installation. Nevertheless, a sensor mounting that is optimally matched to an application is just as important as the device solution itself.

The motto „Fits, fits, wobbles and has air“ should therefore never apply to sensor installation. This is because an incorrectly mounted sensor can lead to malfunctions and thus significantly impair the smooth operation of machines or systems and the smooth running of processes. In the worst case scenario, longer downtimes with costly production losses are the unavoidable consequences.

ipf electronic offers a comprehensive range of very different sensor solutions for a broad spectrum of applications and can draw on decades of practical experience from a wide variety of industries. In view of the large number of potential areas of use for sensor technology, for which new fields of application are also constantly being developed, it is impossible to know the requirements of each individual application in detail.
Nevertheless, when developing mounting accessories, ipf electronic has set itself the goal of offering optimum solutions for as many different installation situations and operating conditions as possible.

This white paper describes the essential requirements for modern mounting solutions and provides an overview of the wide range of mounting solutions from ipf electronic. In addition, a selection of accessories for device protection, connection components and tools is presented at the end of the white paper.

2 REQUIREMENTS FOR MODERN ASSEMBLY SOLUTIONS

Fastening systems must be able to solve a wide range of different tasks. The systems should therefore be versatile, always reliable and, if required, also very resistant and robust. There are a number of „low-cost“ solutions on the market, most of which do not have the aforementioned properties, especially as the requirements for practical mounting systems are far more diverse and complex than just the desire for a solid fastening system.

2.1 FLEXIBLE ALIGNMENT, STABLE POSITIONING OR MOBILE USE

Modern mounting solutions must allow flexible alignment of the devices when mounting the sensor and at the same time ensure stable positioning of the sensor at all times once the installation position has been reached. In industrial practice, shocks, strong impacts or vibrations are the order of the day. On the other hand, there are applications in which the mounting material must not allow any leeway because the installation position of a sensor must be exactly reproduced at all times. When a device is replaced, a new sensor can be installed without the need for a new and sometimes time-consuming adjustment. Sometimes, however, there may also be a desire to use a sensor and its mounting more flexibly and therefore in a different location. In this case, mounting solutions are required that can be quickly and easily detached and reattached in the same way at a different location.

2.2 SPECIAL PROTECTION EVEN AGAINST ADVERSE ENVIRONMENTAL INFLUENCES

In areas of application with particularly demanding environmental conditions, special mounting accessories are sometimes required for the sensors to protect the devices in a special way, e.g. from the effects of welding spatter. Other adverse environmental

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influences, such as very low or increased ambient temperatures, increased humidity, chemicals, oils or the use of cleaning agents, which not only affect the sensor technology itself but also the respective mounting system and can shorten its service life, can pose further challenges.

The examples could be continued almost endlessly at this point due to the complex and, moreover, very different operating conditions and tasks. Basically, an extremely wide-ranging catalog of very different requirements that can ultimately only be covered by a comprehensive range of solutions, as the following pages will show.

3 TRIED AND TESTED STANDARD FASTENINGS

ipf electronic's range of standard fasteners already includes many different solutions that cover a wide range of applications for various sensor technologies. Below is a brief overview.

Hexagon nuts are required for connection technology (built-in plugs and couplings) and for mounting various sensors (e.g. optical, inductive or capacitive sensors, magnetic field sensors, laser sensors, transmitters and receivers of high-performance light barriers, magnetic field sensors, etc.). The hexagon nuts made of different materials (e.g. **AY000025** made of brass) are available with various metric thread sizes (from M5 to M50) and spans (of the jaw).

Aluminum clamps with two fixing screws were originally developed for mounting fibre optic cables (e.g. **AY000010** with a diameter of 8mm). Along with fiber optic sensors, the robust mounting clips are suitable for a wide range of other devices, e.g. inductive, capacitive or optical sensors, magnetic field sensors, ultrasonic sensors, magnetic displacement and angle measurement systems, and, and, and. To change the sensor, only one of the two hexagon socket screws on the mounting clip needs to be loosened so that it retains its original mounting position.

Examples of how some standard mountings work: Aluminum clip with a fiber optics (top right) and a quick clip with the receiver of a high-performance light barrier (bottom).

Quick clips without limit stop made of plastic (e.g. **AY000049** for sensors with a diameter of 12 mm) have also been designed for mounting sensors with a cylindrical design and are therefore suitable for a wide range of devices, e.g. optical, inductive or capacitive sensors, laser sensors, temperature sensors, transmitters and receivers of high-power light barriers, etc. The mounting clips have two oblong holes for mounting and fine adjustment of the distance between the sensor and holder. The sensor itself is fixed in place with another locking screw. As with the aluminum clamps described above, only one screw needs to be loosened to replace the sensor.

Encoder accessories: These accessories serve as a combination solution for mounting encoders and measuring wheels. The mounting solutions consist of a spring arm (e.g. **AV000146)** for use with a wide variety of measuring wheels in conjunction with

an encoder to record position or rotational speed. The spring arm provides a certain amount of pressure on a material. If the material now moves under the measuring wheel, the slippage that otherwise occurs, especially on smooth materials, can be avoided to a certain extent by selecting a suitable measuring wheel.

The mounting accessories include these spring-loaded holders for encoders in order to always obtain the optimum pressure on a material (fabric, metal, etc.) depending on the choice of measuring wheel.

The range of standard fasteners is rounded off by a comprehensive selection of strap retainers, adapters, adapter flanges and coverage and screw plugs, to name just a few examples.

4 FASTENING PLUS ADJUSTMENT: MORE FREEDOM DURING INSTALLATION

In many applications, sensors must first be adjusted after mounting so that they are optimally aligned for reliable detection at all times. In such cases, flexible solutions such as mounting brackets, precision flanges and brackets, ball joints, universal mounting brackets and, last but not least, the universal mounting system from ipf electronic offer an extremely wide range of mounting options.

4.1 FROM MOUNTING BRACKETS TO UNIVERSAL MOUNTINGS

Mounting bracket in various versions (e.g. **AO000389**), e.g. for camera systems for process monitoring, usually integrate the oblong holes that are characteristic of such solutions. They provide sufficient clearance for adjusting the device attached to the bracket. The mounting surface of the device is usually defined both by the hole pattern on the bracket and on the device. Mounting on the wrong side of the bracket is therefore largely impossible. Along with the device, the bracket itself can also be easily adjusted during installation.

Mounting brackets such as **AO000389**, shown here with a camera sensor, offer more freedom during installation.

Precision flanges and brackets (e.g. **AP000015/AP000020**) made of aluminum were developed for mounting laser light barriers in order to be able to precisely align transmitters and receivers with each other, even at greater distances. The mounting solutions consist of a base plate that is screw-fitted to the mounting surface, while the second mounting plate above it is used to attach the sensor. This mounting plate has spring-loaded screws to enable high-precision adjustment of the sensor in all directional axes.

Precision flange in the basic version (left). The **PS13** series laser sensor is attached to the spring-loaded mounting plate with an additional bracket (right).

Ball and socket joints are always useful when maximum flexibility is required for high-precision sensor adjustment. Solutions such as **AO000618** offer complete freedom in all directions. The sensors can be mounted with different mounting angles on an adapter plate for the ball-and-socket joints.

Example of mounting a laser sensor attached to a bracket on an adapter plate located on a ball joint.

Universal mounting for mounting sensors in any position and orientation offer the same advantages as ball-and-socket joints and are versatile alternatives to complex and cost-

intensive custom-made products. The universal mounts consist of a multifunctional base module with ball joint and M6 setscrew, which can be easily attached to the slot nut of an industrial profile. Various plates in different versions can be flanged onto the lateral side of the base module to attach a variety of sensors to the universal mounting. The mounting plate for the sensor can also be mounted on the base module in two axes (laterally or from above).

Universal mounting with multifunctional base module plus ball joint for fastening in a groove block of an industrial profile make complex and cost-intensive custom-made products superfluous.

4.2 UNIVERSAL MOUNTING SYSTEM

In the introduction to this white paper, it was emphasized that ipf electronic's goal in developing mounting accessories is to provide optimal mounting solutions for as many different installation situations and operating conditions as possible. The **universal mounting system**, which consists of a comprehensive range of tried-and-tested components for the flexible, simple, precise and individual mounting of sensors, was developed to meet this requirement. The modular system is supplied according to customer requirements and is optionally available in a robust case set (**AY000173**).

The universal mounting system in the handy case set **AY000173** offers a reliable mounting solution for sensors in almost any situation.

Two aluminum tubes with a diameter of 12mm (length 200mm and 500mm) form the basis for a wide range of mounting solutions, which can be individually shortened as required and then securely fastened using a variety of clamp holders.

For example, the holding magnet **AY000162** for the foot clamp holder **AY000161** makes it easy to attach the mounting structure to a magnetic machine part, for example. The mounting tubes have the features that their surfaces are not roughened but ground to achieve an exactly round shape for an absolutely positive connection with maximum locking power.

As is well known, the fastening stops close to the sensor and therefore at the point of interrogation. The universal mounting system offers a reliable solution for almost any situation.

The universal mounting system is supplemented by surface-mounted, parallel and cross-clamp brackets, including adjustable versions, as well as a mounting bracket without bores (**AY000172**) for individual adaptation. The mounting bracket **AY000164** also integrates an M6 inside thread, which can be used to attach various stainless steel mounting brackets for sensors in sizes M8, M12, M18 and M30 as well as the universal mounting brackets with ball head.

Examples of accessories for the universal mounting system: Mounting bracket **AY000172** without bore (left) and mounting clamp bracket **AY000164** with lateral M6 inside thread.

5 FASTENING WITH POSITIONING: ALWAYS CLEAR, WITHOUT IFS AND BUTS

Fasteners with positioning already specify the mounting position for a sensor through the respective accessories, e.g. through a defined positive stop. The mounting material thus always enables the desired device positioning so that the new device does not have to be repositioned when the sensor is replaced. Here are some examples of such solutions.

Quick clips (e.g. **AY000050**) made of plastic with positive stop are used for wall mounting with screw-on mounting via two oblong holes. A sensor is pushed from one side into the bore of the mounting clip up to the specified limit stop and is thus in the intended position. Here too, the sensor can be replaced quickly and easily by loosening just one locking screw. The new sensor does not need to be aligned again, as its correct position is already determined by the limit stop.

Clamping sleeves (e.g. **AY000155** made of brass, 8mm internal hole) with positive stop and internal holes have been developed for easy installation and mounting of sensors with threaded or round housings. The solutions are available in various diameters from 8mm to 30mm. The clamping sleeve can be fixed in a fitting panel, for example, using the two nuts supplied. The appropriate sensor is then pushed into the clamping sleeve up to the limit stop. Energizing the fixing nut ensures that the sensor is securely clamped. If the sensor needs to be replaced, this type of fastening saves the need for readjustment.

Quick clips (above) and clamping sleeves enable reliable mounting of sensors, as they always provide a clear device position.

Screw-in sleeves in stainless steel V4A with compression fitting have been specially developed for mounting PT100 thermocouples (resistance thermometers) from ipf electronic. The clamping sleeve is screwed into a container or pipe wall, for example, and thus reliably seals the system. The thermocouple can then be inserted into the sleeve and fixed in place with a locking screw. To replace the thermocouple, simply loosen the PT100 and pull it out of the sleeve. The screw-in sleeves are pressure-proof up to 100 bar and are suitable for media temperatures from -40°C to +350°C.

Screw-in sleeves in stainless steel V4A are particularly pressure-proof up to 100 bar and designed for media temperatures from -40 °C to +350 °C.

6 MORE FLEXIBILITY IN ANY POSITION - SPECIAL HOLDERS

The mounting solutions presented so far offer a wide range of installation options and are primarily aimed at the diverse mounting requirements of a wide variety of sensors in very different applications. Special holders for very specific areas of application also offer a high degree of flexibility in daily practice. These include, for example, holding magnets, table clamps, stands, mounting systems for camera sensors and illumination, as well as solutions that have been specially adapted to ipf electronic's magnetic field sensors for pneumatic cylinders and pressure sensors for liquid media and technical gases (more on this in chapters 7 and 8).

6.1 PORTABLE MOUNTING WITHOUT INSTALLATION EFFORT

Holding magnets (e.g. **AY000129**) often prove to be extremely practical for the mobile attachment of sensors, camera systems and LED articulated arm and gooseneck lights, for example. The holding magnets, e.g. with an M6 threaded sleeve, enable the simple and variable and therefore always flexible attachment of universal mounts to any magnetic surface with high adhesive force. The universal holders are in turn compatible with various adapter plates from ipf electronic, to which different devices can be attached.

LED lights, for example, can be attached quickly and easily to a wide variety of magnetic surfaces using magnetic clamps. Removal is just as easy.

Table clamps such as the **AE000022** made of robust steel were developed for the flexible mounting of articulated arm and gooseneck lights from ipf electronic. This ensures that the light is always exactly where it is needed after positioning, even if the light is relocated.

Secure holder for LED articulated arm and gooseneck lights on any table or workbench.

Stands such as the aluminum **AO000579** were specially developed for the OC29 high-speed cameras from ipf electronic for monitoring high-speed industrial processes. In addition to the camera, illuminations with different light colors, e.g. a light spot with green LEDs for quality assurance during laser welding, can be mounted on the stand.

Stands for the OC29 high-speed cameras enable the quick setup of a process control system with optional illumination.

6.2 ALWAYS PERFECTLY ILLUMINATED - ACCESSORIES FOR ADDITIONAL CAMERA LIGHTS

Both special and universal holders are available for the wide range of additional camera lights from ipf electronic.

Mounting brackets such as **AO000653** and **AO000654** made of aluminum enable the reliable mounting of ring lights (diameter 130mm) and **EF750xxx** dark field lights from ipf electronic.

Flexible mounting solutions for the **ES46xx** spotlights can be realized with the universal mounting system already presented in chapter 4.2 (as a case set: **AY000173**).

Mounting systems made of aluminum consisting of the holders **AE000007**/**AE000008**

and the adapter **AE000009** offer a simple and variable solution for mounting and alignment of camera sensors and illumination.

Special mounting brackets for ring lights with 130mm diameter (illustration) and **EF750xxx** dark field lights

The spotlights in the **ES46xx** series can be mounted very flexibly using components from the universal mounting system from ipf electronic.

The three-part mounting system consisting of two holders and an adapter enables variable mounting of the camera sensor and illumination.

7 SPECIAL SOLUTIONS FOR CYLINDER SENSORS

Magnetic field sensors or so-called cylinder sensors are used for the inquiry of the piston rod position in pneumatic cylinders. The fully electronic solutions with metal housing from ipf electronic prove to be very resistant and durable in many applications, especially under very demanding environmental conditions. What is expected of the cylinder sensors must also be fulfilled by the mountings. This is why ipf electronic has developed a range of very robust and therefore reliable mounting accessories for round, profile and tie rod cylinders as well as pneumatic cylinders with T-slots.

Steel mounting straps (e.g. **AM000061**) with different clamping widths are one of the simplest solutions for attaching cylinder sensors from the **MZ13** series to a wide range of pneumatic cylinders. The housing of the sensors has a correspondingly adapted design for this purpose.

Simple and tried and tested: Mounting straps for the cylinder sensors of the **MZ13** series.

Round cylinder fastenings
such as the **AM000012** or **AM000038** mounting clips and e.g. the **AM000030** mounting straps enable easy mounting of cylinder sensors from ipf electronic to round cylinders with different diameters.

Profile cylinder fixings
such as the mounting clips **AM000005** made of zinc or **AM000073** made of aluminum are used to easily attach cylinder sensors to various profile cylinders using grub screws.

Whether round or profile cylinders, the right accessories make sensor installation much easier.

Pull-rod fasteners were designed for fastening the cylinder sensors of the **MZ07** and **MZA7** series to pneumatic cylinders with pull-rods (e.g. **AM000071** fasteners made of aluminum).

Perfectly adapted to pneumatic cylinders with pull-rod: the mounting accessories for cylinder sensors from the **MZ07** and **MZA7** series.

Other mounting solutions complement the portfolio of mounting accessories for cylinder sensors, e.g. **adapters** such as the **AM000081** for mounting a sensor designed for a round groove (C-slot) in a 6.2 mm T-slot or the **AM000036** for mounting the sensor in a 3.75 mm round groove of pneumatic cylinders. **Clamps** (e.g. **AM000076**), on the other hand, serve as a mechanical limit stop in a T-slot, whereby the cylinder sensor is then pushed into the slot up to the clamp. When the sensor is replaced, its sensing position is already predetermined as a result.

Further examples of solutions for the reliable mounting of cylinder sensors: Adapters (e.g. for the 6.2 mm T-slot and 3.75 mm round slot) and clamps.

8 RELIABLE FASTENINGS FOR PRESSURE SENSORS

The robust and precise pressure sensors from ipf electronic measure various media in all conceivable pneumatic and hydraulic applications. To accompany these devices, several fasteners have been developed, some of which have been specially adapted to the specific sensor designs.

Adapter (e.g. **AD000018** or **AD000017** made of stainless steel) are designed for the process connection of the **DW35** series pressure sensors for liquid and gaseous media with a G1/4“ outside thread. The solutions make it possible to adapt the sensor for connection to a G1/2“ connection, for example, or to convert the outside thread into an inside thread. The adapters are designed for maximum pressures of up to 350 bar or 630 bar.

Mounting brackets such as the **AD000015** with adapter flange are ideal for screw-on mounting of the **DW16** series pressure switches and **DT16** series pressure transmitters for the measurement of technical gases and compressed air in the pressure range from-1bar to +10bar. The brackets enable, among other things, the attachment of a push-in adapter for easy attachment of the sensors to a compressed air hose.

Quick clips such as the **AD000014** made of plastic are also used for easy mounting of the **DW16** and **DT16** pressure sensor series mentioned above. The devices are simply pressed into the appropriate mounting clip for screw-on mounting to ensure a secure holdert.

Mounting accessories for pressure sensors: from adapters for the process connection of the DW35 pressure sensor series (above) to mounting brackets and quick clips (below) for the DW16 and DT16 pressure sensor series.

9 COMPREHENSIVE CONTACTOR IN EVERY SITUATION

Adverse or particularly harsh environmental conditions, e.g. dust, dirt, moisture or very high or low temperatures, are often extremely hard on sensors and connection components. Solutions for comprehensive contactor protection, some of which specialize in certain sensor technologies such as optical or inductive sensors, ensure long-lasting operation and are therefore an integral part of the ipf electronic portfolio.

Installation and surface-mounted housing (e.g. **AV000018**) are not only suitable as connection accessories for the amplifiers of ipf electronic's high-performance photoelectric sensors, but also for many other applications in harsh industrial environments due to their material properties. The housings with integrated cable entries are via IP66 shock-resistant plastic housing (protection against strong water jets and ingress of dust) and can be used in a wide temperature range from-40 °C to +120 °C.

Built-in/wall-mounted housing in extremely robust industrial design (**IP66**).

Teflon caps (e.g. **AY98A607**) with inside thread for screw fitting onto a sensor protect the

active surface of inductive sensors and magnetic field sensors from potentially damaging effects such as welding spatter.

Cleaning air nozzles (e.g. **AO000095**) with an integrated compressed air connection are recommended as accessories for optical sensors in applications with high levels of contamination. The air flow is directed so that it always flows away from the sensor optics, keeping them free of dust and similar dirt deposits. The compressed air can also be used to create a cooling effect in order to compensate to a certain extent for heat radiation acting on the sensor optics.

Teflon caps (bottom) protect the active surfaces of optical and inductive sensors as well as magnetic field sensors from potentially harmful influences, while cleaning air nozzles (top) prevent dust and similar dirt deposits from forming on the optics of sensors.

Top panels with glass insert (e.g. **AO000297** with M8 inside thread) are simply screwed onto the sensor optics of through-beam sensors, retro-reflective sensors or optical diffuse reflection sensors to protect them from heat. In addition, aperture diaphragms, for example, can also be integrated into the attachments to influence or focus the light exit of a light barrier.

Top covers with glass inserts primarily protect the optics of sensors from potentially damaging heat or thermal influences.

Mechanical limit stops (e.g. **AY000064**) are metal top adapters in the designs M8 and M12, which were specially developed for inductive sensors of the **IB06, IB09** and **IB12** series in order to be able to implement robust small interrogations easily and reliably. The stop tappet itself contains an axially movable steel bolt with a spring return mechanism, the end face of which is also hardened for increased wear resistance. The limited stroke of the steel bolt prevents the active sensor surface from being „hit“ and the detector coil from being damaged. The limit stops are characterized by a very high repeatability and switching point accuracy of ±0.01mm.

Specially developed for inductive sensors. Robust small sensors can be realized with the mechanical limit stops.

Sheaths are one of the simplest and most effective means of protecting connection cables of many different sensors from potentially problematic environmental influences. The sheaths (e.g. **AY000141**) with an inner diameter of 10 mm are made of glass fiber reinforced silicone rubber and cover a very wide operating temperature range from -40 °C to +250 °C. The **AY000141** sheath is resistant to welding spatter at temperatures up to +1200 °C in the short term and has a tensile strength of up to 400N.

Simple and highly effective: Particularly robust sheaths are suitable for many sensor solutions and are designed for ambient temperatures from -40 °C to +250 °C (up to +1200 °C for short periods).

10 SIMPLE INSTEAD OF HEAVY AND COMPLICATED: PROFESSIONAL TOOLS

If you don‘t have the right tools to hand when installing sensors and accessories, you can lose a lot of time and sometimes even patience. That‘s why ipf electronic offers special tools for professional installation and mounting to complement its wide range of mounting solutions.

Torque wrenches enable the defined energizing of hexagonal screw connections or the secure fastening of connection cables on field distributors. An optimum tightening torque ensures permanently tight connections, e.g. for connectors with O-ring seals, so that the specified or required IP protection classes are achieved. This also prevents unintentional material damage and therefore possible „overloading“ of the sealing concept due to excessive force and expensive reworking. The **AV000140** tool set from ipf electronic consists of a torque wrench with scale (adjustment range: 0.4 to 1Nm, resolution: 0.05Nm), an adjustment tool and wrench sets with 9mm span (of the jaw) for M8 cable connectors/sockets and 13mm span (of the jaw) for M12 cable connectors/sockets.

Always the right tightening torque: The tool set consists of a torque wrench, an adjustment tool and two sets of wrenches.

Multi-tools combine many tools in one handy solution and are therefore particularly practical for everyday use. The **AY000154** multi-tool from ipf electronic with a total of eight tools for optical sensors and cylinder sensors, among other things, is particularly compact and therefore fits in virtually any trouser pocket. The **AY000154** consists of six Allen keys e.g. for mounting the cylinder sensors from ipf electronic. If the potentiometer of an optical sensor needs setting, you don‘t have to search long for a suitable mini screwdriver, as the multitool also contains two suitable solutions. The 2.5 mm and 0.7 mm Allen keys are also not usually available in comparable tool sets.

Small, handy, practical: the multi-tool from ipf electronic integrates a total of eight tools, including mini screwdrivers for setting potentiometers.

Stripping pliers (**AV000132**) from ipf electronic are designed for particularly robust and durable connection cables, e.g. made of PUR or silicone, whose sheaths cannot always be easily removed with conventional tools.

The stripping pliers for sheath thicknesses between 3.2 mm and 4.4 mm or 4.4 mm to 7 mm make this possible with just one movement, even for longer sheath lengths that need to be removed: Insert the line for the desired section length into the pliers, set the sheath down and pull it off the line, done.

Stripping pliers such as the **AV000132** can also handle cable materials that are generally not easy to strip.

The range is supplemented by other tools that are useful for everyday assembly and installation work. These include, for example, the **mini-slotted screwdriver AY000070** with a blade width of 1.6 mm and a blade thickness of 0.4 mm for the exact setting of the potentiometers of various sensors or the **fiber cutter AL000007** for the precise, clean cutting of plastic light guides. Care should be taken here to make only one cut with each fiber hole, as the blade becomes blunter with each additional fiber cut, which can increase the optical damping of the fiber optics interface.

Fiber cutter **AL000007** for precise cutting of plastic light guides (top) and a mini-slotted screwdriver **AY000070** for setting the potentiometer on a wide variety of sensors.

11 SUMMARY AND CONCLUSION

If you select the mounting material that is optimally matched to a device solution for an application, there is no need for time-consuming and sometimes costly probes or in-house designs. The right mounting accessories also ensure that the fastening always has exactly the properties that are expected of it in an application. Incorrect installation using components that may not be suitable, however, can lead to sensor malfunctions and, in some circumstances, to system downtimes and therefore production losses.

The large selection of mounting accessories that ipf electronic offers in this area alone shows how important this topic is in practice with regard to the safe and reliable functioning of sensors. The aim of providing the best possible mounting components for almost all sensor technologies from ipf electronic has also resulted in the universal mounting system, which already covers a wide range of sensor mounting tasks.

Against this background, this white paper can serve as an initial guide in the search for a suitable mounting or fastening solution for a specific sensor or illumination.

These solutions are complemented by a wide range of connection accessories, including those designed to protect the sensor technology from harmful environmental influences. Finally, these developments are rounded off with professional tools for everyday installation and mounting practice.

ipf electronic gmbh
info@ipf-electronic.com • **www.ipf-electronic.com**

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