Baumer, Минск +375447584780 viber email minsk17@tut.by
www.fotorele.net www.tiristor.by радиодетали, электронные компоненты
tel.+375 29 758 47 80 мтс

каталог, описание, технические, характеристики, datasheet, параметры, маркировка, габариты, фото, модуль, **Baumer**

КАТАЛОГ 2019г.

Baumer в Беларуси

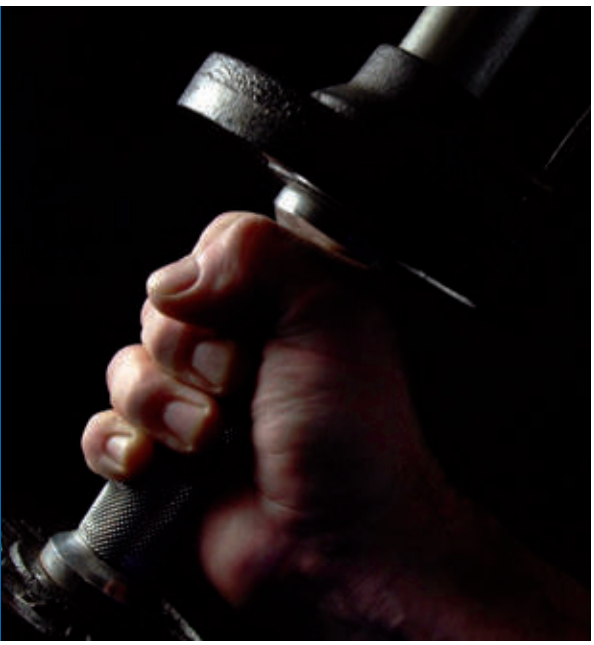
купить, продажа в **Минске, Беларусь**

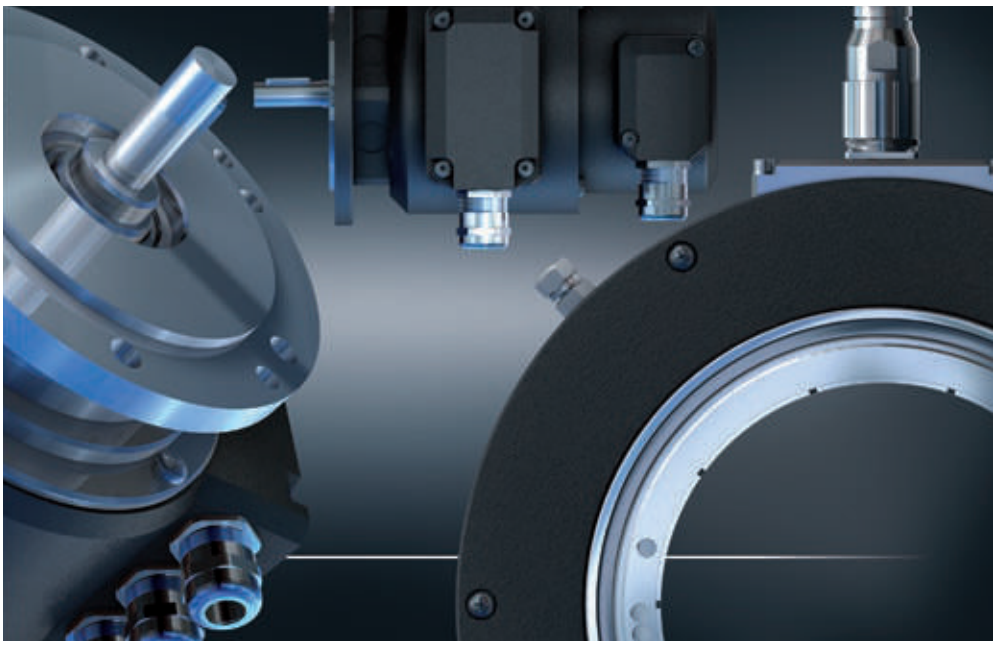
электронные компоненты

где и как купить в Минске?

BaumerHübner

Датчики HeavyDuty для приводной техники
HeavyDuty Sensors for Drive Technology





Motion Control

№1 в области HeavyDuty

Энкодеры из Берлина? Специалисты сразу же вспоминают о технике HeavyDuty, о датчиках, обеспечивающих надежные сигналы измерения при тяжелых условиях эксплуатации – и при этом с высокой точностью. Однако HeavyDuty это не просто уникальное торговое предложение продукции Baumer Hübner. Термин уже давно стал частью корпоративной философии, и мы нисколько не преувеличиваем, когда утверждаем, что в своем рыночном сегменте мы являемся лидерами. Благодаря постоянному развитию наших технологий на протяжении более чем 70 лет мы готовы к технологическим требованиям будущего.

Содержание

Датчики индивидуального исполнения

Для нас очень важен каждый клиент. Поэтому, помимо стандартных энкодеров, Baumer Hübner предлагает специфические варианты для пользователей. Тем самым мы демонстрируем одну из наших сильных сторон: мы можем гибко подойти к Вашим индивидуальным требованиям и в кратчайшие сроки предложить изготовленную на заказ измерительную технику для самых различных вариантов применения в электрической приводной технике. Не в последнюю очередь это объясняется тем, что наша штаб-квартира в Берлине объединяет все подразделения под одной крышей – от разработки продукта до его производства и сбыта. Практическое сотрудничество с пользователями из различных отраслей является одной из причин того, что продукция Baumer Hübner в течение десятилетий доказывает свое преимущество при эксплуатации по всему миру.

Пионер и инициатор

Воплощение блестящей идеи для получения реального продукта – это процесс, требующий обширных фундаментальных исследований, высочайшей компетенции в области технологий, таланта, преданности делу и железной дисциплины. Такое сочетание умственных и профессиональных достоинств, отличающее нашу команду, в значительной степени способствует тому, что мы постоянно определяем уровень развития техники благодаря нашим разработкам. Многочисленные патенты демонстрируют инновационные возможности нашей компании, которая завоевала свою репутацию в области обработки сигналов и электронных преобразователей.
На следующих страницах Вам в кратком виде будут представлены основные особенности техники Baumer Hübner, а также производственная программа. Мы с радостью проконсультируем Вас по вопросам, связанным с Вашими проектами систем приводов. Мы открыты для диалога с клиентами!

No. 1 in HeavyDuty

Rotary encoders from Berlin? Specialists immediately think of HeavyDuty sensors that are both capable of supplying measurement signals even in the toughest environmental conditions and have a high level of precision.

However, HeavyDuty is more than just a unique selling proposition for products from Baumer Hübner. The term has long become part of our corporate philosophy, and we do not exaggerate when we claim to hold the top ranking in this market segment. During the more than 70 years of our success story, we have systematically continued to develop our knowledge base and we are well equipped for any technological challenges we may meet in the future.

Partner for Customized Sensor Solutions

Who is the most important person for an enterprise? You, the user. Besides standard encoders, Baumer Hübner manufactures customized variants. At the same time, this demonstrates one of our strengths: We are flexible and adaptable to meet your individual requirements. We are capable of supplying tailor-made measuring technology for a wide range of electric drive-system applications with fast turnaround times. One of the reasons for this is the fact that our headquarters accommodate all the necessary divisions under a single roof - from product development through to production and sales. Our practical cooperation with users from a wide variety of industries is one of the reasons why products from Baumer Hübner have proved their worth in applications all around the world for many decades.

Pioneer and Initiator

The process of transforming a brilliant idea into the physical reality of a product is one that demands far-reaching basic research, sustained technological competence, talent, commitment, and iron-willed discipline. This combination of mental and specialist strengths is what makes our team different and is the key contributory factor why our developments redefine the state of the art time and again. Numerous patents demonstrate the innovativeness of our company. In the meantime, we have also earned a reputation for ourselves in complex signal processing and evaluation electronics.

Contents

The following pages present the key features of Baumer Hübner technology and a short version of the product portfolio. We will be glad to advice you on your drive system projects. Let the dialog begin.

Особенности техники Baumer Hübner

Датчики Baumer Hübner отличаются рядом особенностей, которые делают их идеальным решением для работы в тяжелых условиях эксплуатации:

Прочная конструкция

- Цельный корпус из алюминия или высококачественной стали
- Высокая вибро- и ударостойкость
- Специальная защита поверхности для особо агрессивного окружения
- Степень защиты до IP 69K
- Максимально широкий диапазон температур эксплуатации
- Исполнение с цилиндрическим выступающим валом и EURO-фланцем
  -или с полым (сквозным) валом
- Электрическое подсоединение для любого применения: клеммные коробки, внутренние соединительные зажимы, металлические штекеры или неотсоединяемый кабель.

Оптимизированные подшипники

- Усиленные шариковые подшипники
- Высокая радиальная и осевая предельная нагрузка вала, обеспечиваемая за счет установки подшипников на двух концах вала, если это конструктивно возможно. Это обеспечивает дополнительные преимущества: есть возможность создавать законченную комбинации из нескольких скрученных вместе энкодеров, реле скорости и т.д. Помимо этого, можно использовать второй конец вала для установки дополнительных внешних устройств.
- Подшипник на одной стороне энкодера с полым валом большого диаметра, установленный в том случае, если преимущества одностороннего расположения подшипника перевешивают.
- Для отдельных случаев применения возможны версии без подшипников.

Защита от паразитных токов

В энкодерах с пустотелым валом можно предотвратить появление паразитных токов, генерируемых электродвигателем и текущих с оси через корпус энкодера на землю, если использовать подшипники с изолирующими керамическими шариками, при этом паразитный ток должен сниматься с оси при помощи заземляющего контактного кольца. Для энкодеров с цельным выступающим валом для защиты от паразитного пульсирующего тока применяют диэлектрическую пружинную муфту с изолированной ступицей.

Патентованные клеммные коробки

Начиная с определенного размера, устройства Baumer Hübner стандартно комплектуются большой и удобной для подключения проводов клеммной коробкой. Крышка клеммной коробки поворачивается на 180°, что обеспечивает оптимальную адаптацию к условиям монтажа на месте.

Еврофланец B10

Еврофланец B10, применяемый на энкодерах с выступающим валом Baumer Hübner, является промышленным стандартом в области машиностроения и производства оборудования.

Магнитное считывание

Наряду с классическими энкодерами, работающими на основе оптоэлектронного метода считывания, Baumer Hübner также изготавливает магнитные инкрементальные и абсолютные энкодеры для специфических вариантов применения. В них магнитная дорожка, обычно нанесенная на наружную сторону ротора, установленного непосредственно на рабочий вал, считывается магниторезистивными датчиками, встроенными в считывающую головку. Благодаря механической конструкции и комплексной обрабатывающей электронике данные магнитные энкодеры одновременно обеспечивают чрезвычайную прочность и точность – с технической точки зрения это часто взаимоисключающие требования. Они отличаются следующими особенностями:

Многооборотные абсолютные энкодеры последнего поколения со встроенным микрогенератором, без батарей

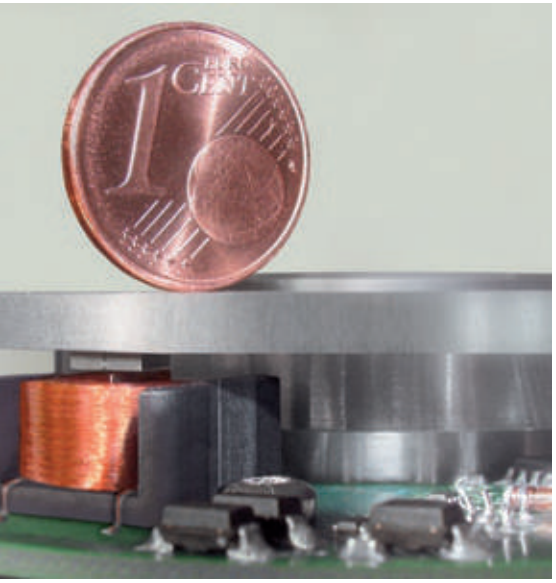
Multiturn absolute encoders of the latest generation with integrated micro-generator

- Очень высокая прочность и износостойкость, поскольку отсутствуют собственные подшипники, вся считывающая электроника герметично изолирована
- Высокая вибро- и ударостойкость
- Высокая предельная скорость вращения
- Широкий диапазон рабочих температур и высокая степень защиты
- Большой допустимый осевой зазор между ротором и статором
- Чрезвычайно малые размеры, малая толщина вдоль оси
- Простой и быстрый монтаж, легкая адаптация к имеющимся компонентам
- Пригодность для использования с валами, имеющими большой диаметр
- Инкрементальные энкодеры: очень большое количество счетных штрихов и одновременно высокая выходная частота

Одобрение UL

Все энкодеры Baumer Hübner, за небольшим исключением, имеют одобрение UL

Features of Baumer Hübner Technology



Baumer Hübner sensors are characterized by the many excellent features that make them ideal for operation in rough environments:

Robust Design

- Solid housing made of aluminum or stainless steel
- High vibration and shock resistance
- Special surface protection for hostile environments
- Protection class up to IP 69K
- Temperature range to match the class of application
- Versions with solid shaft and EURO flange – or with (through-hole) hollow shaft
- Cable connection according to application: terminal box, internal terminal clamps, metal connector, or permanently attached cable

Optimized Bearings

- Ball bearings are generously dimensioned.
- High radial and axial load-bearing capability of the shaft is ensured by bearings mounted at both ends of the shaft, as far as mechanically feasible. This provides additional advantages: Additional functions can be incorporated to produce combinations. Alternatively, a second (free) shaft end can be used as an option to attach further units.
- Single bearings on large hollow-shaft encoders where the benefits of fitting a bearing at only one end are overriding.
- Versions without bearings for applications with special requirements

Protection from Shaft Currents

Induced shaft currents are prevented in many hollow-shaft encoders by building in insulated or ceramic ball bearings. Capacitive shaft currents can be diverted to ground by a slip-ring grounding contact. On solid-shaft devices, spring-disk couplings with an insulated hub provide protection from parasitic shaft currents.

Patented Terminal Box

From an appropriate size, Baumer Hübner sensors are equipped as standard with a large, installation-friendly terminal box. The terminal box cover can be turned through 180° for optimized adaptation to the installation conditions on site.

EURO Flange B10

Over the years the EURO flange B10 on solid-shaft encoders from Baumer Hübner has become accepted as the industry standard in mechanical engineering and plant construction.

Magnetic Sensing

Besides classic encoders that operate on the basis of optoelectronic sensing methods, Baumer Hübner produces magnetic incremental and absolute encoders for special applications. Here, a track with a magnetic scale – normally fixed to the outside of a rotor mounted directly on the drive shaft – is evaluated by magneto-resistive sensors integrated in the sensor head. Due to the mechanical construction and using complex evaluation electronics, these magnetic encoders combine extreme robustness and high precision - two requirements that are often diametrically opposed from a technical viewpoint. Their main features are:

- Extremely robust and free from wear since they have no bearings and the sensing electronics are fully encapsulated.
- Highest vibration and shock resistance
- High maximum speed
- Wide operating temperature range and high protection class
- Large permissible axial tolerance between rotor and stator
- Compact dimensions, very short axial fitted length
- Simple and fast installation, easy adaptation to existing fittings
- Suitable for very large shaft diameters
- Incremental encoders: very high number of line counts and high output frequency at the same time

UL Approval

Baumer Hübner rotary encoders are UL approved with very few exceptions.

Обзор групп продуктов

Инкрементальные энкодеры с прямоугольными импульсами (датчики угловых перемещений)

Классические инкрементальные энкодеры с выходными импульсами прямоугольной формы ещё часто применяются для определения количества оборотов или положения приводов. Энкодеры Baumer Hübner могут иметь следующие типы TTL или HTL выходного сигнала: TTL логика с RS-422 с рабочим напряжением +5 В ± 5% - или TTL (R) с рабочим напряжением +9…36 В и внутренним регулятором напряжения для 5 В. HTL логика в версии HTL (C) с драйвером IC – от энкодеров, имеющих достаточный конструктивный размер, в том числе с усилителем мощности для пиковых токов до 300 мА.

Инкрементальные энкодеры с синусоидальными импульсами (синусоидальные энкодеры)

Стандартные синусоидальные энкодеры с синусоидальными импульсами имеют, как правило, мощный спектр гармоник, достигающий гармоник 10 порядка. Чаще всего наиболее выражены 2 и 3 гармоники. Baumer Hübner благодаря технологии LowHarmonics устанавливает новый стандарт для синусоидальных импульсов с ничтожно малым содержанием гармоник. Основой запатентованного метода является оптоэлектронная технология считывания, которая практически полностью подавляет гармоники с помощью интерференции. Высокоточные синусоидальные импульсы отличаются малым содержанием гармоник, небольшой разницей между синус- /косинус-амплитудами и минимальным смещением постоянной составляющей – важные условия для точной обработки и интерполяции.

Новое поколение абсолютных энкодеров

Абсолютные энкодеры, соответствующие современному уровню техники, сохраняют количество оборотов механически с помощью редуктора или электронным способом, с помощью аккумулятора. Однако оба способа имеют свои недостатки. Запатентованный Baumer Hübner многооборотный процесс устраняет необходимость в редукторе или батарее, поскольку он использует необходимую энергию встроенного микрогенератора, получаемую даже при малых оборотах. Данный способ отличается простотой конструкции, прочностью и отсутствием износа – и тем самым открывает для абсолютных энкодеров новые, до сих пор недоступные области применения.

Датчики ускорения на эффекте Феррариса

К регулируемым приводам предъявляются все более жесткие требования относительно динамики, равномерности работы и отказоустойчивости. Для этого, а также для предотвращения износа и нежелательных эффектов, таких как образование тепла и шума, необходимо максимально уменьшить вибрации. Датчики относительного ускорения, работающие на эффекте Феррариса, оказывают важную услугу, когда речь идет об анализе приводной системы для повышения качества её работы вцелом. При встраивании таких датчиков в петлю управления качество обратной связи существенно улучшается.

Аналоговые тахогенераторы

Аналоговые тахогенераторы Baumer Hübner отличаются высокой точностью преобразования напряжения тахогенератора во всем диапазоне оборотов. Основной причиной этого является система передачи, состоящая из ротора и щеток. Для этого на поверхности запатентованных роторов LongLife нанесена непрерывная серебряная дорожка, которая даже при тяжелых условиях окружающей среды обеспечивает постоянно низкое переходное сопротивление. В сочетании со специально подобранными щетками обеспечивается чрезвычайно длительный срок службы без технического обслуживания.

Комбинации

Характерной особенностью комбинаций является то, что они всегда состоят из основного устройства с валом, установленным на двух подшипниках, имеющего минимум одну систему датчиков между подшипниками, и дополнительного устройства на том же валу за подшипником на свободной (B) стороне вала. Наличие двух подшипников гарантирует, что вал может воспринимать высокие радиальные и осевые усилия. Кроме того, жесткое соединение, обеспечиваемое общим валом, способствует дополнительной прочности, а высокая прочность на скручивание обеспечивает основу для оптимальных характеристик управления.

Ограничители скорости вращения

Ограничители скорости вращения поставляются как в виде чисто механических устройств (центробежные переключатели), так и в виде электронных переключателей. Существуют варианты в отдельном исполнении и в комбинации с энкодерами и аналоговыми тахогенераторами.

Взрывобезопасное исполнение

Baumer Hübner производит взрывобезопасные энкодеры и аналоговые тахогенераторы в герметичных корпусах согласно ATEX 95 (Группа приборов II, категория приборов 2G).

Обработка сигналов

Электроника для обработки и оценки сигналов завершает семейство продуктов Baumer Hübner. Точные блоки интерполяции обрабатывают выходные синусоидальные импульсы энкодеров таким образом, что внешние воздействия устраняются, и становится возможной высокоточная интерполяция. Интерполяторы конвертируют аналоговые синус/косинус сигналы в серии прямоугольных импульсов с частотой выше или ниже исходного сигнала или в синусоидальный сигнал с более высокой частотой. Коэффициенты интерполяции для различных выходов могут выбираться независимо друг от друга. Возможна реализация недвоичных промежуточных значений. Помимо этого, продукция включает преобразователи уровня сигналов, оптоволоконные передатчики и приёмники для передачи сигналов энкодеров.

Принадлежности

Прочный монтаж, надежная передача сигналов и защита от паразитных токов через ось с помощью механических и электронных принадлежностей.

Product Groups Overview

Incremental Encoders with Square-Wave Signals

Classic incremental encoders with square-wave signals are still often used on drives for speed and position acquisition. Encoders from Baumer Hübner are available with TTL or HTL logic level at the output:

- TTL technology to RS-422 with operating voltage of + 5 V ± 5% or as TTL (R) version with operating voltage of + 9 to 26 V and internal voltage regulator for 5 V
- HTL technology in HTL (C) version with driver IC – from a sufficient encoder size, also with power drivers for peak currents up to 300 mA

Incremental Encoders with Sine-Wave Signals (Sine Encoders)

Standard sine-wave encoders with signals approaching a true sine wave have harmonics up to the 10th order superimposed on the sine waveform. In particular the 2nd and 3rd harmonics are often prominent. Baumer Hübner has set a new standard with LowHarmonics technology that produces sine-wave signals with negligible harmonic content. The basis of the patented method is an optoelectronic sensing technology which almost totally suppresses the harmonics by interference. The high precision sine-wave signals are characterized by their purity of harmonics, low difference between sine/cosine amplitudes, and by a minimum DC offset - key requirements for precise evaluation and interpolation.

A New Generation of Absolute Encoders

Multiturn absolute encoders incorporating the present state of the art record the number of turns mechanically by means of a gearbox, or electronically with the aid of a backup battery. Both methods have inherent disadvantages, however. A patented Baumer Hübner process now does not require a gearbox or battery any more, using instead the energy derived by a microgenerator from even the smallest rotary movements. This method is distinguished by simple construction, robustness and freedom from wear, and opens up areas of application previously excluded for absolute encoders.

Ferraris Acceleration Sensors

Speed-controlled drives are subject to ever increasing demands with regard to dynamics, smooth running and disturbance resistance. To achieve this, vibration must be reduced as far as possible - also to prevent wear or undesirable side-effects such as the generation of noise and heat. Relative acceleration sensors on the Ferraris principle perform valuable service when it is necessary to analyze drive systems in order to improve the quality of the system as a whole. Furthermore, if the sensors are integrated into the control loop, then the control-loop performance can be considerably improved.

Tachogenerators

Baumer Hübner tachogenerators are characterized by high precision of the tachogenerator voltage across the entire speed range. The main reason for this unique capability is the commutator-brush transmission system: A solid silver track is embedded into the surface of the patented LongLife commutator. This insures constant low contact resistance even in rough environmental conditions. Together with the specially matched brushes, the result is a very long, maintenance-free operating life.

Combinations

The characteristic feature of combinations is that they all consist of a basic device with a common shaft mounted on two bearings, with at least one sensor system fitted between the bearings and an additional device behind the bearing at the free (»B«) end of the shaft. Bearings at both ends mean that the system can withstand high radial and axial forces on the shaft. The rigid connection between the devices produces a high degree of torsional rigidity and results in optimum control characteristics.

Speed Switches

Speed switches are either available as purely mechanical devices (centrifugal force switches) or as electronic switches. They come in standalone versions or in combination with encoders and tachogenerators.

Explosion-Proof Devices

Baumer Hübner produces explosion-proof encoders and tachogenerators with pressure-tight encapsulation as per ATEX 95 (Device Group II, Device Category 2 G).

Signal Processing

Signal processing and evaluation electronics round off the Baumer Hübner product portfolio. Precision interpolators process sine encoder output signals so that the effects of external interference are eliminated and multiple evaluation becomes possible. The interpolators convert analog sin/cos signals into a series of square-wave signals at a higher or lower frequency - and into sin/cos signals at a higher frequency. The interpolation factors for different outputs can be set up independently of one another. Non-binary intermediate values can also be achieved. In addition, the product range includes converters for signal level shifting, fiber-optic transmitters and an analyzer for encoders.

Accessories

Safe installation, reliable signal transmission and protection against shaft currents by means of mechanical and electronic accessories.

Инкрементальные энкодеры с прямоугольными импульсами
Incremental Encoders with Square-Wave Signals

Датчики угловых перемещений HeavyDuty

Датчики угловых перемещений (инкрементальные энкодеры с прямоугольными импульсами) служат для определения количества оборотов или положения в приводной технике. Энкодеры Baumer Hübner имеют следующие особенности:

- Прочный корпус из легкого сплава
- Специальная защита поверхности (опционально)
- Поставляются с цельным или полым (сквозным) валом
- Широкая программа со стандартным Еврофланцем B10
- Возможно исполнение с очень большим диаметром полого вала
- Исполнение без подшипника для особых случаев применения
- Выходной уровень: TTL согласно RS-422 или HTL
- Защита от паразитных токов (опционально)
- Возможно использование в комбинации с ограничителями скорости вращения, тахогенераторами или в качестве сдвоенного датчика
- Оптический и магнитный способ считывания

Рабочее напряжение U_B:

TTL: U_B = + 5 В ± 5 %
TTL (R): U_B = + 9...26 В
HTL: U_B = + 9...30 В
HTL (C): U_B = + 9...26 В

OG 6

Число импульсов на оборот:	Counts per turn:	100 → 512
Макс. частота выходного сигнала:	Max. output frequency:	120 кГц (kHz)
Уровень логического сигнала:	Logic level:	HTL (C), TTL, TTL (R)
Диапазон температур:	Temperature range:	-20 °C → +70 °C
Масса:	Weight:	Около (approx.) 200 г (g)
Ударная прочность (6 мс):	Shock resistance (6 ms):	1000 м/с² (m/s²)
Класс защиты:	Protection class:	IP 54

OG 60 · HOG 60

Число импульсов на оборот:	Counts per turn:	200 → 10 000
Макс. частота выходного сигнала:	Max. output frequency:	250 кГц (kHz)
Уровень логического сигнала:	Logic level:	HTL (C), TTL, TTL (R)
Диапазон температур:	Temperature range:	-30 °C → +85 °C
Масса:	Weight:	Около (approx.) 260 г (g) / 250 г (g)
Ударная прочность (6 мс):	Shock resistance (6 ms):	1000 м/с² (m/s²)
Класс защиты:	Protection class:	IP 65

OG 70/71 · HOG 70/71

Число импульсов на оборот:	Counts per turn:	50 → 10 000
Макс. частота выходного сигнала:	Max. output frequency:	250 кГц (kHz) / 120 кГц (kHz)
Уровень логического сигнала:	Logic level:	HTL (C), TTL, TTL (R)
Диапазон температур:	Temperature range:	-30 °C → +85 °C
Масса:	Weight:	Около (approx.) 360 г (g) / 240 г (g)
Ударная прочность (6 мс):	Shock resistance (6 ms):	1000 м/с² (m/s²)
Класс защиты:	Protection class:	IP 66

HOG 75

Число импульсов на оборот:	Counts per turn:	250 → 2 500
Макс. частота выходного сигнала:	Max. output frequency:	120 кГц (kHz)
Уровень логического сигнала:	Logic level:	HTL (C), TTL, TTL (R)
Диапазон температур:	Temperature range:	-30 °C → +85 °C
Масса:	Weight:	Около (approx.) 320 г (g)
Ударная прочность (6 мс):	Shock resistance (6 ms):	2 000 м/с² (m/s²)
Класс защиты:	Protection class:	IP 56

OG 8 · HOG 8

Число импульсов на оборот:	Counts per turn:	1 → 2 500
Макс. частота выходного сигнала:	Max. output frequency:	120 кГц (kHz)
Уровень логического сигнала:	Logic level:	HTL (C), TTL, TTL (R)
Диапазон температур:	Temperature range:	-30 °C → +85 °C
Масса:	Weight:	Около (approx.) 700 г (g) / 550 г (g)
Ударная прочность (6 мс):	Shock resistance (6 ms):	1000 м/с² (m/s²)
Класс защиты:	Protection class:	IP 54

OG 9

Число импульсов на оборот:	Counts per turn:	1 → 1 250
Макс. частота выходного сигнала:	Max. output frequency:	120 кГц (kHz)
Уровень логического сигнала:	Logic level:	HTL, TTL, TTL (R)
Диапазон температур:	Temperature range:	-30 °C → +100 °C
Масса:	Weight:	Около (approx.) 900 г (g)
Ударная прочность (6 мс):	Shock resistance (6 ms):	1000 м/с² (m/s²)
Класс защиты:	Protection class:	IP 55

OG 90

Число импульсов на оборот:	Counts per turn:	1 024 → 10 000
Макс. частота выходного сигнала:	Max. output frequency:	250 кГц (kHz)
Уровень логического сигнала:	Logic level:	HTL (C), TTL, TTL (R)
Диапазон температур:	Temperature range:	-30 °C → +85 °C
Масса:	Weight:	Около (approx.) 1,5 кг (kg)
Ударная прочность (6 мс):	Shock resistance (6 ms):	1000 м/с² (m/s²)
Класс защиты:	Protection class:	IP 55

HOG 9 · FOG 9 (HOG 9 G → стр./page 27)

Число импульсов на оборот:	Counts per turn:	1 → 2 500
Макс. частота выходного сигнала:	Max. output frequency:	120 кГц (kHz)
Уровень логического сигнала:	Logic level:	HTL, TTL, TTL (R)
Диапазон температур:	Temperature range:	-30 °C (опция/Option: -40 °C) → +100 °C
Масса:	Weight:	Около (approx.) 700 г (g) / 860 г (g)
Ударная прочность (6 мс):	Shock resistance (6 ms):	1000 м/с² (m/s²)
Класс защиты:	Protection class:	IP 56

POG 9 (POG 9 G → стр./page 27)

Число импульсов на оборот:	Counts per turn:	1 → 2 500
Макс. частота выходного сигнала:	Max. output frequency:	120 кГц (kHz)
Уровень логического сигнала:	Logic level:	HTL, TTL, TTL (R)
Диапазон температур:	Temperature range:	-30 °C (опция/Option: -40 °C) → +100 °C
Масса:	Weight:	Около (approx.) 1,3 г (kg)
Ударная прочность (6 мс):	Shock resistance (6 ms):	1000 м/с² (m/s²)
Класс защиты:	Protection class:	IP 56

POG 90

Число импульсов на оборот:	Counts per turn:	1 024 → 10 000
Макс. частота выходного сигнала:	Max. output frequency:	250 кГц (kHz)
Уровень логического сигнала:	Logic level:	HTL, TTL, TTL (R)
Диапазон температур:	Temperature range:	-30 °C (опция/Option: -40 °C) → +85 °C
Масса:	Weight:	Около (approx.) 1,5 г (kg)
Ударная прочность (6 мс):	Shock resistance (6 ms):	1000 м/с² (m/s²)
Класс защиты:	Protection class:	IP 56

HOG 10 (HOG 10 G → стр./page 27)

Число импульсов на оборот:	Counts per turn:	1 → 2 500
Макс. частота выходного сигнала:	Max. output frequency:	120 кГц (kHz)
Уровень логического сигнала:	Logic level:	HTL, TTL, TTL (R)
Диапазон температур:	Temperature range:	-30 °C (опция/Option: -40 °C) → +100 °C
Масса:	Weight:	Около (approx.) 1,6 г (kg)
Ударная прочность (6 мс):	Shock resistance (6 ms):	2000 м/с² (m/s²)
Класс защиты:	Protection class:	IP 66

HOG 100

Число импульсов на оборот:	Counts per turn:	1 024 → 10 000
Макс. частота выходного сигнала:	Max. output frequency:	250 кГц (kHz)
Уровень логического сигнала:	Logic level:	HTL, TTL, TTL (R)
Диапазон температур:	Temperature range:	-30 °C (опция/Option: -40 °C) → +85 °C
Масса:	Weight:	Около (approx.) 1,5 г (kg)
Ударная прочность (6 мс):	Shock resistance (6 ms):	1000 м/с² (m/s²)
Класс защиты:	Protection class:	IP 66

HeavyDuty Incremental Encoders

Incremental encoders with square-wave signals measure speed and position in drive systems. The encoders from Baumer Hübner are characterized by the following features:

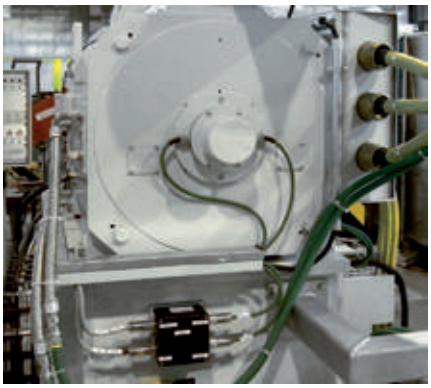
- Solid housing made of light alloy
- Special surface protection (option)
- Available with solid or (through-hole) hollow shaft
- Many versions offer standard EURO flange B10
- Also available with very large hollow-shaft diameters
- Versions without bearings for special applications
- Output logic level: TTL as per RS-422 or HTL
- Protection against parasitic shaft currents (option)
- Also available as combination with speed switches, tachogenerators, or as twin encoder
- Optical and magnetic sensing methods

Operating voltage U_B:

TTL: $U_B = + 5\ V \pm 5\ \%$
TTL (R): $U_B = + 9...26\ V$
HTL: $U_B = + 9...30\ V$
HTL (C): $U_B = + 9...26\ V$

Инкрементальные энкодеры с синусоидальными импульсами
Incremental Encoders with Square-Wave Signals

Испытательный стенд для проверки коробок передач с магнитными инкрементальными энкодерами, обеспечивающими высокоточное динамическое управление количеством оборотов. Широкий измеряемый диапазон – в зависимости от режима испытаний – охватывает как минимальную скорость, так и скорость до 10 000 об/мин. При этом синхронный двигатель, имитирующий автомобильный привод, ускоряется до 50 000 об/мин за секунду.



A gearbox test-bed with magnetic incremental encoders for high-precision dynamic speed control. The wide measuring range – depending on the test mode – extends from the lowest speeds through to 10,000 rpm. The synchronous motor emulating the car engine accelerates up to 50,000 rpm per second.

POG 10 (POG 10 G → стр./page 27)

Число импульсов на оборот:	Counts per turn:	1 → 2 500
Макс. частота выходного сигнала:	Max. output frequency:	120 кГц (kHz)
Уровень логического сигнала:	Logic level:	HTL, TTL, TTL (R)
Диапазон температур:	Temperature range:	-30 °C (опция/Option: -40 °C) → +100 °C
Масса:	Weight:	Около (approx.) 1,8 кг (kg)
Ударная прочность (6 мс):	Shock resistance (6 ms):	2 000 м/с² (m/s²)
Класс защиты:	Protection class:	IP 66

HOG 11 (HOG 11 G → стр./page 28)

Число импульсов на оборот:	Counts per turn:	1 → 2 500
Макс. частота выходного сигнала:	Max. output frequency:	120 кГц (kHz)
Уровень логического сигнала:	Logic level:	HTL, TTL, TTL (R)
Диапазон температур:	Temperature range:	-30 °C (опция/Option: -40 °C) → +100 °C
Масса:	Weight:	Около (approx.) 1,6 кг (kg)
Ударная прочность (6 мс):	Shock resistance (6 ms):	2 500 м/с² (m/s²)
Класс защиты:	Protection class:	IP 67

POG 11 (POG 11 G → стр./page 28)

Число импульсов на оборот:	Counts per turn:	1 → 2 500
Макс. частота выходного сигнала:	Max. output frequency:	120 кГц (kHz)
Уровень логического сигнала:	Logic level:	HTL, TTL, TTL (R)
Диапазон температур:	Temperature range:	-30 °C (опция/Option: -40 °C) → +100 °C
Масса:	Weight:	Около (approx.) 1,8 кг (kg)
Ударная прочность (6 мс):	Shock resistance (6 ms):	3 000 м/с² (m/s²)
Класс защиты:	Protection class:	IP 67

HOG 12

Число импульсов на оборот:	Counts per turn:	600 → 1 024
Макс. частота выходного сигнала:	Max. output frequency:	120 кГц (kHz)
Уровень логического сигнала:	Logic level:	HTL (C), TTL, TTL (R)
Диапазон температур:	Temperature range:	-30 °C → +85 °C
Масса:	Weight:	Около (approx.) 1 кг (kg)
Ударная прочность (6 мс):	Shock resistance (6 ms):	1 000 м/с² (m/s²)
Класс защиты:	Protection class:	IP 54

HOG 131

Число импульсов на оборот:	Counts per turn:	1 024 → 3 072
Макс. частота выходного сигнала:	Max. output frequency:	120 кГц (kHz)
Уровень логического сигнала:	Logic level:	HTL, TTL, TTL (R)
Диапазон температур:	Temperature range:	-30 °C → +100 °C
Масса:	Weight:	Около (approx.) 4 кг (kg)
Ударная прочность (6 мс):	Shock resistance (6 ms):	2 000 м/с² (m/s²)
Класс защиты:	Protection class:	IP 56

EGZ 14 · AG 14

Число импульсов на оборот:	Counts per turn:	250 → 2 500
Макс. частота выходного сигнала:	Max. output frequency:	120 кГц (kHz)
Уровень логического сигнала:	Logic level:	HTL (C), TTL, TTL (R)
Диапазон температур:	Temperature range:	-30 °C → +70 °C
Масса:	Weight:	Около (approx.) 1,2 кг (kg)
Ударная прочность (6 мс):	Shock resistance (6 ms):	1 000 м/с² (m/s²)
Класс защиты:	Protection class:	IP 20 / IP 54

HOG 16

Число импульсов на оборот:	Counts per turn:	250 → 2 500
Макс. частота выходного сигнала:	Max. output frequency:	120 кГц (kHz)
Уровень логического сигнала:	Logic level:	HTL, TTL, TTL (R)
Диапазон температур:	Temperature range:	-30 °C (опция/Option: -40 °C) → +100 °C
Масса:	Weight:	Около (approx.) 4 кг (kg)
Ударная прочность (6 мс):	Shock resistance (6 ms):	3 000 м/с² (m/s²)
Класс защиты:	Protection class:	IP 66

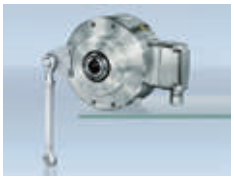
HOG 161

Число импульсов на оборот:	Counts per turn:	250 → 2 500
Макс. частота выходного сигнала:	Max. output frequency:	120 кГц (kHz)
Уровень логического сигнала:	Logic level:	HTL (C), TTL, TTL (R)
Диапазон температур:	Temperature range:	-30 °C (опция/Option: -40 °C) → +100 °C
Масса:	Weight:	Около (approx.) 2,1 кг (kg)
Ударная прочность (6 мс):	Shock resistance (6 ms):	1 000 м/с² (m/s²)
Класс защиты:	Protection class:	IP 54

HOG 163

Число импульсов на оборот:	Counts per turn:	250 → 5 000
Макс. частота выходного сигнала:	Max. output frequency:	120 кГц (kHz)
Уровень логического сигнала:	Logic level:	HTL, TTL, TTL (R)
Диапазон температур:	Temperature range:	-30 °C (опция/Option: -40 °C) → +100 °C
Масса:	Weight:	Около (approx.) 3 кг (kg)
Ударная прочность (6 мс):	Shock resistance (6 ms):	1 000 м/с² (m/s²)
Класс защиты:	Protection class:	IP 56

HOG 165



Число импульсов на оборот:	Counts per turn:	250 → 5 000
Макс. частота выходного сигнала:	Max. output frequency:	120 кГц (kHz)
Уровень логического сигнала:	Logic level:	HTL, TTL, TTL (R)
Диапазон температур:	Temperature range:	-30 °C → +100 °C
Масса:	Weight:	Около (approx.) 4 кг (kg)
Ударная прочность (6 мс):	Shock resistance (6 ms):	3 000 м/с² (m/s²)
Класс защиты:	Protection class:	IP 67

HOG 22 · HOG 220

Число импульсов на оборот:	Counts per turn:	720 → 4 000
Макс. частота выходного сигнала:	Max. output frequency:	120 кГц (kHz)
Уровень логического сигнала:	Logic level:	HTL (C), TTL, TTL (R)
Диапазон температур:	Temperature range:	-30 °C → +85 °C
Масса:	Weight:	Около (approx.) 8,6 кг (kg)
Ударная прочность (6 мс):	Shock resistance (6 ms):	2 000 м/с² (m/s²)
Класс защиты:	Protection class:	IP 54 / IP 56

HOG 28

Число импульсов на оборот:	Counts per turn:	1 024 → 2 048
Макс. частота выходного сигнала:	Max. output frequency:	120 кГц (kHz)
Уровень логического сигнала:	Logic level:	HTL (C), TTL, TTL (R)
Диапазон температур:	Temperature range:	-30 °C → +85 °C
Масса:	Weight:	Около (approx.) 20 кг (kg)
Ударная прочность (6 мс):	Shock resistance (6 ms):	2 000 м/с² (m/s²)
Класс защиты:	Protection class:	IP 54

В тесном сотрудничестве с производителями и пользователями установок появляются решения в области датчиков, характеристики которых идеально соответствуют жестким требованиям области применения. Чрезвычайно прочные энкодеры с полым валом для генераторов мегаватт-класса, используемых в ветровых генераторах - лишь один из множества примеров.

In close cooperation with system manufacturers and operators, Baumer Hübner produces sensor solutions whose features meet the tough requirements of the application precisely. One of many examples: extremely robust hollow-shaft encoders for generators in the megawatt class, as used in offshore wind power turbines.

Инкрементальные энкодеры с прямоугольными импульсами (без подшипников)

Incremental Encoders with Square-Wave Signals (without bearings)

Скоростные петли и «пикирования» со скоростью 90 км/ч заставляют пассажиров американских горок в крупнейшем парке отдыха Швеции почувствовать пятикратные перегрузки. Перед этим приводы мощностью 315 кВт доставляют тележки на «стартовую платформу». Количество оборотов при этом определяется энкодерами HeavyDuty производства Baumer Hübner.

High-speed loops and nose dives at speeds of 90 km/h (around 56 mph) subject visitors to the roller coaster at Sweden's largest leisure park to g-forces that are five times their body weight. Regulated asynchronous 315 kW drives lift the trains to the »launching ramp«. HeavyDuty encoders from Baumer Hübner detect the motor speed.

HG 6

Число импульсов на оборот:	Counts per turn:	100 → 512
Макс. частота выходного сигнала:	Max. output frequency:	120 кГц (kHz)
Уровень логического сигнала:	Logic level:	HTL (C), TTL, TTL (R)
Диапазон температур:	Temperature range:	-20 °C → +85 °C
Масса:	Weight:	Около (approx.) 180 г (g)
Ударная прочность (6 мс):	Shock resistance (6 ms):	1 000 м/с² (m/s²)
Класс защиты:	Protection class:	IP 55

HG 16

Число импульсов на оборот:	Counts per turn:	250 → 2 048
Макс. частота выходного сигнала:	Max. output frequency:	120 кГц (kHz)
Уровень логического сигнала:	Logic level:	HTL, TTL, TTL (R)
Диапазон температур:	Temperature range:	-30 °C (опция/Option: -40 °C) → +100 °C
Масса:	Weight:	Около (approx.) 2,4 кг (kg)
Ударная прочность (6 мс):	Shock resistance (6 ms):	1 000 м/с² (m/s²)
Класс защиты:	Protection class:	IP 56

HG 18 · HG 22

Число импульсов на оборот:	Counts per turn:	250 → 4 000
Макс. частота выходного сигнала:	Max. output frequency:	120 кГц (kHz)
Уровень логического сигнала:	Logic level:	HTL (C), TTL, TTL (R)
Диапазон температур:	Temperature range:	-30 °C → +70 °C
Масса:	Weight:	Около (approx.) 4,2 кг (kg) / 5,8 кг (kg)
Ударная прочность (6 мс):	Shock resistance (6 ms):	1 000 м/с² (m/s²)
Класс защиты:	Protection class:	IP 54 / IP 44

HG 21 · HG 211

Число импульсов на оборот:	Counts per turn:	2 500
Макс. частота выходного сигнала:	Max. output frequency:	120 кГц (kHz) · опция/Option: 160 кГц (kHz)
Уровень логического сигнала:	Logic level:	HTL (C), TTL, TTL (R)
Диапазон температур:	Temperature range:	-30 °C → +70 °C
Масса:	Weight:	Около (approx.) 5,8 кг (kg)
Ударная прочность (6 мс):	Shock resistance (6 ms):	1 000 м/с² (m/s²)
Класс защиты:	Protection class:	IP 44

HMC 16 (M) + HEAG 158 V (M) – магнитный способ считывания / magnetic sensing

Число импульсов на оборот:	Counts per turn:	128 → 8 192
Макс. частота выходного сигнала:	Max. output frequency:	2 000 кГц (kHz)
Уровень логического сигнала:	Logic level:	HTL, TTL
Диапазон температур HMC 16:	Temperature range HMC 16:	-40 °C → +100 °C
Диапазон температур HEAG 158 V:	Temperature range HEAG 158 V:	0 °C → +50 °C
Масса:	Weight:	Около (approx.) 2,4 кг (kg)
Ударная прочность (6 мс):	Shock resistance (6 ms):	3 000 м/с² (m/s²) , 100 м/с² (m/s²)
Класс защиты (ротор/статор):	Protection class (rotor / stator):	IP 68 / IP 68
Класс защиты HEAG 158 V:	Protection class HEAG 158 V:	IP 65
Опция:	Option:	
версия с резервированием	redundant version	Версия M / Version M

MHG 150 – магнитный способ считывания / magnetic sensing

Число импульсов на оборот:	Counts per turn:	94 → 1 504
Макс. скорость вращения (об/мин)	Max. speed (rpm):	4 000 (опция/Option: 12 000)
Уровень логического сигнала:	Logic level:	TTL
Диапазон температур:	Temperature range:	-40 °C → +85 °C
Ударная прочность (12 мс):	Shock resistance (12 ms):	2 000 м/с² (m/s²)
Класс защиты (ротор/статор):	Protection class (rotor / stator):	IP 68 / IP 68

MHG 400 – магнитный способ считывания / magnetic sensing

Число импульсов на оборот:	Counts per turn:	256 → 32 768
Макс. скорость вращения (об/мин)	Max. speed (rpm):	4 000
Уровень логического сигнала:	Logic level:	HTL, TTL
Диапазон температур:	Temperature range:	-20 °C → +85 °C
Ударная прочность (12 мс):	Shock resistance (12 ms):	2 000 м/с² (m/s²)
Класс защиты (ротор/статор):	Protection class (rotor / stator):	IP 68 / IP 67

Ни одна из отраслей промышленности не подняла гибкое производство на такой высокий уровень, как автомобильная промышленность. Скорость и точность приводной техники являются обязательным условием эффективности и качества. В течение многих лет датчики Baumer Hübner придают промышленности импульс, обеспечивая постоянную инновационную динамику.

No other industry has raised flexible manufacturing to such high levels of efficiency and quality as the auto industry. This places high demands on the speed and precision of drive systems. For many years sensors from Baumer Hübner have provided the industry with the driving pulse required for sustained dynamic innovations.

Инкрементальные энкодеры с синусоидальными импульсами
Incremental Encoders with Sine-Wave Signals

Синусоидальные сигналы высочайшего качества – критерий точности

Синусоидальные энкодеры (инкрементальные энкодеры с синусоидальными импульсами) служат для определения количества оборотов или положения в приводной технике. Энкодеры Baumer Hübner имеют следующие особенности:

- Прочный корпус из легкого сплава
- Оптические датчики обеспечивают импульсы с ничтожно малой составляющей гармоник благодаря использованию патентованной технологии LowHarmonics
- Высокое качество импульсов на магнитных датчиках обеспечивает возможность использования точных блоков интерполяции
- Специальная защита поверхности (опционально)
- Поставляются с цельным или полым (сквозным) валом
- Возможно исполнение с очень большим диаметром полого вала
- Исполнение без подшипника для особых случаев применения
- Защита от паразитных токов (опционально)
- Возможно использование в комбинации с ограничителями скорости вращения

OGS 60 · HOGS 60

Число импульсов на оборот:	Counts per turn:	1 024 → 2 048
Полоса пропускания:	Bandwidth:	250 кГц (kHz)
Диапазон температур:	Temperature range:	-20 °C → +85 °C
Масса:	Weight:	Около (approx.) 350 г (g)
Ударная прочность (6 мс):	Shock resistance (6 ms):	1 000 м/с² (m/s²)
Класс защиты:	Protection class:	IP 65

OGS 71 · HOGS 71

Число импульсов на оборот:	Counts per turn:	1 024 → 2 048
Полоса пропускания:	Bandwidth:	200 кГц (kHz)
Диапазон температур:	Temperature range:	-20 °C → +85 °C
Масса:	Weight:	Около (approx.) 350 г (g)
Ударная прочность (6 мс):	Shock resistance (6 ms):	3 000 м/с² (m/s²)
Класс защиты:	Protection class:	IP 66

HOGS 75

Число импульсов на оборот:	Counts per turn:	1 024 → 2 048
Полоса пропускания:	Bandwidth:	200 кГц (kHz)
Диапазон температур:	Temperature range:	-20 °C → +70 °C
Масса:	Weight:	Около (approx.) 320 г (g)
Ударная прочность (6 мс):	Shock resistance (6 ms):	2 000 м/с² (m/s²)
Класс защиты:	Protection class:	IP 56

POGS 90

Число импульсов на оборот:	Counts per turn:	5 000
Полоса пропускания:	Bandwidth:	200 кГц (kHz)
Диапазон температур:	Temperature range:	-30 °C → +85 °C
Масса:	Weight:	Около (approx.) 1,5 кг (kg)
Ударная прочность (6 мс):	Shock resistance (6 ms):	1 000 м/с² (m/s²)
Класс защиты:	Protection class:	IP 56

HOGS 100

Число импульсов на оборот:	Counts per turn:	5 000
Полоса пропускания:	Bandwidth:	200 кГц (kHz)
Диапазон температур:	Temperature range:	-30 °C → +85 °C
Масса:	Weight:	Около (approx.) 1,5 кг (kg)
Ударная прочность (6 мс):	Shock resistance (6 ms):	1 000 м/с² (m/s²)
Класс защиты:	Protection class:	IP 66

HOGS 14

Число импульсов на оборот:	Counts per turn:	1 024 / 5 000
Полоса пропускания:	Bandwidth:	200 кГц (kHz)
Диапазон температур:	Temperature range:	-20 °C → +85 °C
Масса:	Weight:	Около (approx.) 1,9 кг (kg)
Ударная прочность (6 мс):	Shock resistance (6 ms):	1 000 м/с² (m/s²)
Класс защиты:	Protection class:	IP 54

MHGS 150 – магнитный способ считывания / magnetic sensing – без опоры / without bearings

Число импульсов на оборот:	Counts per turn:	94
Макс. скорость вращения (об/мин)	Max. speed (rpm):	4 000 (опция/Option: 12 000)
Диапазон температур:	Temperature range:	-40 °C → +85 °C
Ударная прочность (12 мс):	Shock resistance (12 ms):	2 000 м/с² (m/s²)
Класс защиты (ротор/статор):	Protection class (rotor / stator):	IP 68 / IP 68

MHGS 400 – магнитный способ считывания / magnetic sensing – без опоры / without bearings

Число импульсов на оборот:	Counts per turn:	8 192
Макс. скорость вращения (об/мин)	Max. speed (rpm):	4 000
Диапазон температур:	Temperature range:	-20 °C → +85 °C
Ударная прочность (12 мс):	Shock resistance (12 ms):	2 000 м/с² (m/s²)
Класс защиты (ротор/статор):	Protection class (rotor / stator):	IP 68 / IP 67

Лишь немногие области применения предъявляют столь высокие требования к техническим компонентам, как судоходство. Мощные приводы автономно борются с ветром и волнами. Синусоидальные энкодеры Baumer Hübner являются полноправными «членами команды».

Few applications place so many demands on technical components as shipping. Powerful drive systems battle autonomously with wind and waves. Sine encoders from Baumer Hübner are »members of the crew«.

High-Quality Sine-Wave Signals – The Standard of Precision

Incremental encoders with sine-wave signals measure speed and position in drive systems. The encoders from Baumer Hübner are characterized by the following features:

- Solid housing made of light alloy
- Optical encoders with the patented LowHarmonics technology produce sine-wave signals with negligible harmonic content
- The high quality of magnetic encoder signals is achieved by use of precision interpolators
- Special surface protection (option)
- Available with solid or (through-hole) hollow shaft
- Also available with very large hollow-shaft diameters
- Versions without bearings for special applications
- Protection from parasitic shaft currents (option)
- Also available as combination with speed switches

Абсолютные энкодеры
Absolute Encoders

Абсолютные энкодеры обеспечивают возможность контроля положения вала в приводных системах. Энкодеры, кодирующие положение в пределах одного оборота, называются однооборотными. Энкодеры со счётчиком оборотов называются многооборотными. Энкодеры Baumer Hübner имеют следующие характеристики:

- Прочный корпус из легкого сплава
- Поставляются с цельным или полым (сквозным) валом
- Возможно исполнение с очень большим диаметром полого вала
- Модификации без подшипников для особых областей применения
- Оптическое или магнитное считывание
- Новейшее поколение оптических энкодеров с запатентованной функцией многооборотного режима без использования редуктора или батареи. В качестве источника энергии используется встроенный микрогенератор.
- Интерфейсы: Profibus DP, SSI, CANopen и др.
- Дублируемый абсолютный сигнал (опционально)
- Дополнительные инкрементальные сигналы (опционально)
- Особая защита поверхности (опционально)
- Защита от паразитных токов (опционально)
- Модификации с ограничителями скорости вращения.

AMG 71 – без привода и батареи / no gearbox, no battery

Однооборотный:	Singleturn:	13 бит (Bit)
Многооборотный:	Multiturn:	12 бит (Bit)
Интерфейс:	Interface:	SSI
Инкрементный выходной сигнал:	Incremental output:	sin/cos
Число импульсов на оборот:	Counts per turn:	2 048
Диапазон температур:	Temperature range:	-20 °C → +85 °C
Соединительная клемма	Connecting terminal	
Масса:	Weight:	Около (approx.) 0,35 кг (kg)
Класс защиты:	Protection class:	IP 66

HMG 71 – без привода и батареи / no gearbox, no battery

Однооборотный:	Singleturn:	13 бит (Bit)
Многооборотный:	Multiturn:	12 бит (Bit)
Интерфейс:	Interface:	SSI
Инкрементный выходной сигнал:	Incremental output:	sin/cos
Число импульсов на оборот:	Counts per turn:	2 048
Диапазон температур:	Temperature range:	-30 °C → +100 °C
Клеммная коробка	Terminal box	
Масса:	Weight:	Около (approx.) 0,4 кг (kg)
Класс защиты:	Protection class:	IP 66

AMG 81

Однооборотный:	Singleturn:	13 бит (Bit)
Многооборотный:	Multiturn:	12; 16 бит (Bit)
Интерфейс:	Interface:	Profibus DP; SSI; CANopen
параметризируемый	parameterizable	
Инкрементный выходной сигнал:	Incremental output:	HTL (C); TTL (R)
Число импульсов на оборот:	Counts per turn:	2 048
Диапазон температур:	Temperature range:	-20 °C → +85 °C
Интерфейс Profibus DP:	Profibus DP:	Коробка шины / Bus cover
Интерфейс SSI:	SSI:	Круглый штекер / Mating connector
Масса:	Weight:	Около (approx.) 1,7 кг (kg)
Класс защиты:	Protection class:	IP 55
Еврофланец:	EURO flange:	B 10

AMG 10

Однооборотный:	Singleturn:	13 бит (Bit)
Многооборотный:	Multiturn:	12 бит (Bit)
Интерфейс:	Interface:	SSI; EnDat
Инкрементный выходной сигнал:	Incremental output:	sin/cos
Число импульсов на оборот:	Counts per turn:	512
Диапазон температур:	Temperature range:	-30 °C → +100 °C
Клеммная коробка	Terminal box	
Масса:	Weight:	Около (approx.) 2 кг (kg)
Класс защиты:	Protection class:	IP 66
Еврофланец:	EURO flange:	B 10

AMG 11 – без привода и батареи / no gearbox, no battery

Однооборотный:	Singleturn:	13 бит (Bit)
Многооборотный:	Multiturn:	12; 16 бит (Bit)
Интерфейс:	Interface:	CANopen; Profibus DP; SSI
параметризируемый	parameterizable	
Инкрементный выходной сигнал:	Incremental output:	HTL (C); TTL (R)
Число импульсов на оборот:	Counts per turn:	1024, 2048
Диапазон температур:	Temperature range:	-20 °C → +85 °C
Интерфейс CANopen:	CANopen:	Клеммная коробка / Terminal box
Интерфейс Profibus DP:	Profibus DP:	Клеммная коробка / Terminal box
Интерфейс SSI:	SSI:	Круглый штекер / Mating connector
Масса:	Weight:	Около (approx.) 3 кг (kg)
Класс защиты:	Protection class:	IP 67
Еврофланец:	EURO flange:	B 10

HMG 11 – без привода и батареи / no gearbox, no battery

Однооборотный:	Singleturn:	13 бит (Bit)
Многооборотный:	Multiturn:	12; 16 бит (Bit)
Интерфейс:	Interface:	CANopen; Profibus DP; SSI
параметризируемый	parameterizable	
Инкрементный выходной сигнал:	Incremental output:	HTL (C); TTL (R)
Число импульсов на оборот:	Counts per turn:	1024, 2048
Диапазон температур:	Temperature range:	-20 °C → +85 °C
Интерфейс CANopen:	CANopen:	Клеммная коробка / Terminal box
Интерфейс Profibus DP:	Profibus DP:	Клеммная коробка / Terminal box
Интерфейс SSI:	SSI:	Круглый штекер / Mating connector
Масса:	Weight:	Около (approx.) 3 кг (kg)
Класс защиты:	Protection class:	IP 67
Пустотелый вал:	Hollow shaft:	∅ ≤ 20 mm

HMG 161 – без привода и батареи / no gearbox, no battery

Однооборотный:	Singleturn:	13 бит (Bit)
Многооборотный:	Multiturn:	12; 16 бит (Bit)
Интерфейс:	Interface:	CANopen; Profibus DP; SSI
параметризируемый	parameterizable	
Инкрементный выходной сигнал:	Incremental output:	HTL (C); TTL (R)
Число импульсов на оборот:	Counts per turn:	2 048
Класс защиты:	Protection class:	IP 56
Диапазон температур:	Temperature range:	-20 °C → +85 °C
Интерфейс CANopen:	CANopen:	Коробка шины / Bus cover
Интерфейс Profibus DP:	Profibus DP:	Коробка шины / Bus cover
Интерфейс SSI:	SSI:	Клеммная коробка / Terminal box
Масса:	Weight:	Около (approx.) 2 → 3 кг (kg)
Пустотелый вал со сквозным отверстием:	Through-hole hollow shaft:	∅ ≤ 70 mm

Absolute encoders measure position in drive systems. Single-turn encoders are used to measure the position within a turn. Multiturn encoders also record the number of completed turns. The encoders from Baumer Hübner are characterized by the following features:

- Solid housing made of light alloy
- Available with solid or (through-hole) hollow shaft
- Also available with very large hollow-shaft diameters
- Versions without bearings for special applications
- Optical and magnetic sensing methods
- The latest generation of optical encoders with a new, patented multiturn process that does not require a gearbox or battery, using instead the energy derived by an integrated micro-generator
- Interfaces: Profibus DP, SSI, CANopen and others
- Redundant absolute signals (option)
- Additional incremental signals (option)
- Special surface protection (option)
- Protection from parasitic shaft currents (option)
- Also available as combination with speed switches

Абсолютные энкодеры (без подшипников)
Absolute Encoders (without bearings)

Специальные высокомоментные двигатели (крутящий момент до 15 000 Нм) предназначены для установки в высокопроизводительные измельчительные машины. Данные позиционирования, необходимые двигателю для переключения, и sin/cos сигналы, необходимые для регулировки частоты вращения, поступают с энкодеров модели MHGA 400.

Specially designed torque motors (torque up to 15000 Nm) are installed in this high-performance shredder plant. Both the position data required by the motor for commutation and the sin/cos signals required for speed control are supplied by magnetic encoders of type MHGA 400.

HMCA 100 – магнитный способ считывания / magnetic sensing

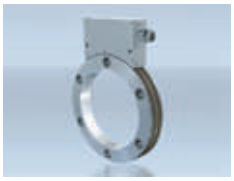
Однооборотный:	Singleturn:	до / up to 16 бит (Bit)
Интерфейс:	Interface:	SSI
Инкрементный выходной сигнал:	Incremental output:	TTL · HTL · sin/cos
Число импульсов на оборот:	Counts per turn:	
sin/cos	sin/cos	до / up to 2048
TTL · HTL	TTL · HTL	до / up to 131072
Класс защиты (ротор/статор):	Protection class (rotor / stator):	IP 68 / IP 67
Диапазон температур:	Temperature range:	-20 °C → +85 °C
Интерфейс SSI:	SSI:	Патрубок с фланцем / Flange socket

MHGA 100 – магнитный способ считывания / magnetic sensing

Однооборотный:	Singleturn:	до / up to 16 бит (Bit)
Интерфейс:	Interface:	SSI
Инкрементный выходной сигнал:	Incremental output:	TTL · HTL · sin/cos
Число импульсов на оборот:	Counts per turn:	
sin/cos	sin/cos	до / up to 2048
TTL · HTL	TTL · HTL	до / up to 131072
Класс защиты (ротор/статор):	Protection class (rotor / stator):	IP 68 / IP 67
Диапазон температур:	Temperature range:	-20 °C → +85 °C
Интерфейс SSI:	SSI:	Патрубок с фланцем / Flange socket

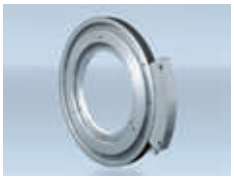
MHGA 200 – магнитный способ считывания / magnetic sensing

Однооборотный:	Singleturn:	до / up to 16 бит (Bit)
Интерфейс:	Interface:	SSI
Инкрементный выходной сигнал:	Incremental output:	TTL · HTL · sin/cos
Число импульсов на оборот:	Counts per turn:	
sin/cos	sin/cos	до / up to 4096
TTL · HTL	TTL · HTL	до / up to 131072
Класс защиты (ротор/статор):	Protection class (rotor / stator):	IP 68 / IP 67
Диапазон температур:	Temperature range:	-20 °C → +85 °C
Интерфейс SSI:	SSI:	Патрубок с фланцем / Flange socket



MHGA 400 – магнитный способ считывания / magnetic sensing

Однооборотный:	Singleturn:	10 бит (Bit)
Интерфейс:	Interface:	SSI
Инкрементный выходной сигнал:	Incremental output:	sin/cos
Число импульсов на оборот:	Counts per turn:	256
Класс защиты (ротор/статор):	Protection class (rotor / stator):	IP 68 / IP 67
Диапазон температур:	Temperature range:	-20 °C → +85 °C
Интерфейс SSI:	SSI:	Патрубок с фланцем / Flange socket



Датчики ускорения на эффекте Феррариса
Ferraris Acceleration Sensors

ACC 70 · ACC 74

Для роторный приводов / for rotary drives		
Полоса пропускания:	Bandwidth:	600 Гц / Hz → 1,2 кГц / kHz (ACC 74)
Эксплуатация с усилителем:	Operating with Amplifier:	HEAG 163 · HEAG 164-15 · HEAG 165
Чувствительность в зависимости от усиления:	Sensitivity depending on amplification:	5 → 50 000 rad s^{-2}/V
Масса:	Weight:	Около (approx.) 1 кг (kg)

ACC 93 · ACC 94

Для линейных и роторных приводов / for linear and rotary drives		
Полоса пропускания: в зависимости от материала диска:	Bandwidth depending on disk material:	1 → 2 кГц / kHz (ACC 94)
Эксплуатация с усилителем:	Operating with Amplifier:	HEAG 163 · HEAG 164-15 · HEAG 165
Чувствительность в зависимости от усиления:	Sensitivity depending on amplification:	0,05 → 50 g/V

1. Датчики ускорения для систем анализа

Ускорение это важный параметр для точного вычисления динамических характеристик приводной системы, так как оно является непосредственной реакцией груза, перемещаемого под воздействием всех приложенных к нему сил. Датчики, в основу работы которых положен эффект Феррариса, позволяют измерять относительное ускорение, которое возникает между специальным металлическим диском (привод вращения) или металлической лентой (линейный привод) и неподвижным сенсором.

Данные датчики значительно эффективнее устройств, работающих на основе пружинно-массового принципа действия.

2. Датчики на эффекте Феррариса для лучшей обратной связи

Надежность и стабильность работы привода могут быть значительно улучшены с помощью встроенного в цепь его обратной связи датчика на эффекте Феррариса. Малое трение в системе позволяет снизить износ механических элементов, уменьшить уровень шума и увеличить КПД двигателя.

1. Ferraris Sensors for Analyzing Systems

The acceleration is indispensable as a state-variable for precise analysis of the dynamic response of a drive system. This is because it represents the direct, undelayed response of a mass being moved in reaction to all the forces acting on it. Sensors based on the Ferraris principle measure the relative acceleration between a special metal disk (rotary drive) or a special metal strip (linear drive) and a fixed detector unit. They are significantly superior to conventional sensors based on the spring-mass principle.

2. Ferraris Sensors for better Control-Loop Performance

Dynamics, disturbance resistance and smoothness of a drive can be significantly improved by integrating the Ferraris sensor in the control loop. The smoothness of the system also reduces the wear on mechanical components, prevents the generation of unwanted noise, and reduces the power loss in the motor.

Датчики на эффекте Феррариса в цепи обратной связи флексографической машины позволяют увеличить производительность и качество продукции

Ferraris Sensors in the control loop of flexo printing machines increase productivity and ensure quality

Аналоговые тахогенера
Tachogenerators

Высокоточное измерение значений скорости

Тахогенераторы позволяют измерять скорость и направление вращения посредством сигнала выходного напряжения. Величина этого напряжения пропорциональна скорости вращения вала. Тахогенераторы Baumer Hübner имеют следующие характеристики:

- Прочный корпус из легкого сплава
- Высокая точность сигнала и долгий срок службы благодаря запатентованной технологии LongLife
- Измерение скорости и направления вращения в реальном времени
- Высокая точность измерений при малых оборотах
- Дополнительный источник питания не требуется
- Поставляются с цельным или полым (сквозным) валом
- Еврофланец B10, подходит для большинства модификаций устройств
- Стандартный рабочий диапазон температур от -30 °C до +130 °C
- Модификации без подшипников для особых областей применения
- Особая защита поверхности (опционально)
- Возможность эксплуатации в условиях влажного и тропического климата (опционально)
- Модификации с ограничителями скорости вращения, инкрементальными энкодерами или возможность использования со сдвоенным тахогенератором.

TDP 0,03

Напряжение:	Voltage:	7; 20 мВ / мин$^{-1}$ (mV / min^{-1})
Температурный коэффициент:	Temperature coefficient:	± 0,02 %/ K
Гармоника:	Ripple:	≤ 1,8 % соотношение пиков (peak-peak)
Постоянная времени:	Time constant:	≤ 20 µs
Мощность:	Power:	0,14; 0,32 Вт (W)
Диапазон температур:	Temperature range:	-30 °C → +130 °C
Фланец:	Flange:	∅ 44 mm ≙ 1 $^{3}/_{4}$"
Вал:	Shaft:	∅ 4,73 mm ≙ $^{3}/_{16}$"
Момент инерции:	Moment of inertia:	0,012; 0,021 кг*см² (kgcm²)
Масса:	Weight:	Около (approx.) 150; 230 г (g)
Класс защиты:	Protection class:	IP 44

TDP 0,09 (TDPZ 0,09 → стр./page 28)

Напряжение:	Voltage:	10 → 60 мВ / мин$^{-1}$ (mV / min^{-1})
Температурный коэффициент:	Temperature coefficient:	± 0,05 %/ K
Гармоника:	Ripple:	≤ 0,55 % соотношение пиков (peak-peak)
Постоянная времени:	Time constant:	≤ 25 µs
Мощность:	Power:	1,2 Вт (W)
Диапазон температур:	Temperature range:	-30 °C → +130 °C
Фланец:	Flange:	∅ 85 mm
Вал:	Shaft:	∅ 6 mm
Момент инерции:	Moment of inertia:	0,25 кг*см² (kgcm²)
Масса:	Weight:	Около (approx.) 1,2 кг (kg)
Класс защиты:	Protection class:	IP 56
Опция:	Option:	С ножками (Foot)

TDP 0,2 LT (TDPZ 0,2 → стр./page 28)

Напряжение:	Voltage:	10 → 150 мВ / мин$^{-1}$ (mV / min^{-1})
Температурный коэффициент:	Temperature coefficient:	± 0,05 %/ K
Гармоника:	Ripple:	≤ 0,5 % соотношение пиков (peak-peak)
Постоянная времени:	Time constant:	75 µs
Мощность:	Power:	12 Вт (W)
Диапазон температур:	Temperature range:	-30 °C → +130 °C
Еврофланец B10 или ножки B3	EURO flange B 10 or Foot B 3	
Вал:	Shaft:	∅ 11 mm
Момент инерции:	Moment of inertia:	1,1 кг*см² (kgcm²)
Масса:	Weight:	Около (approx.) 2,5 кг (kg)
Класс защиты:	Protection class:	IP 55
Опции:	Options:	Вал (Shaft): ∅ 7; 14 mm 2. задний вал вала (Rear shaft)

GMP 1,0 (GMPZ 1,0 → стр./page 29)

Напряжение:	Voltage:	40 → 175 мВ / мин$^{-1}$ (mV / min^{-1})
Температурный коэффициент:	Temperature coefficient:	± 0,05 %/ K
Гармоника:	Ripple:	≤ 1 % соотношение пиков (peak-peak)
Постоянная времени:	Time constant:	≤ 0,55 ms
Мощность:	Power:	30 Вт (W)
Диапазон температур:	Temperature range:	-30 °C → +130 °C
Фланец:	Flange:	B5; B5n; B5s; B5k
Вал:	Shaft:	∅ 12; 14 mm
Момент инерции:	Moment of inertia:	4,5 кг*см^2 (kgcm^2)
Масса:	Weight:	Около (approx.) 4,5 кг (kg)
Класс защиты:	Protection class:	IP 55
Опции:	Options:	2. задний вал (Rear shaft)
		С ножками (Foot) B3

TDP 13 (TDPZ 13 → стр./page 29)

Напряжение:	Voltage:	20 → 200 мВ / мин$^{-1}$ (mV / min^{-1})
Температурный коэффициент:	Temperature coefficient:	± 0,05 %/ K
Гармоника:	Ripple:	≤ 0,5 % соотношение пиков (peak-peak)
Постоянная времени:	Time constant:	≤ 0,4 ms
Мощность:	Power:	40 Вт (W)
Диапазон температур:	Temperature range:	-30 °C → +130 °C
Фланец:	Flange:	B5; B5s; B5k; B10; B10w
Вал:	Shaft:	∅ 14; 20; 32 mm
Момент инерции:	Moment of inertia:	0,4 кг*см^2 (kgcm^2)
Масса:	Weight:	Около (approx.) 8,5 кг (kg)
Класс защиты:	Protection class:	IP 55
Опции:	Options:	2. задний вал (Rear shaft)
		С ножками (Foot) B3; B5kd; B5km

GT 3

Напряжение:	Voltage:	5 мВ / мин$^{-1}$ (mV / min^{-1})
Температурный коэффициент:	Temperature coefficient:	± 0,035 %/ K
Гармоника:	Ripple:	≤ 1,2 % соотношение пиков (peak-peak)
Постоянная времени:	Time constant:	≤ 2 µs
Мощность:	Power:	0,025 Вт (W)
Диапазон температур:	Temperature range:	-30 °C → +130 °C
Пустотелый вал:	Hollow shaft:	∅ 6 mm
Момент инерции:	Moment of inertia:	0,0090 кг*см^2 (kgcm^2)
Вес (ротор):	Weight (rotor):	Около (approx.) 20 г (g)
Корпус:	Housing:	∅ 34 mm
Класс защиты:	Protection class:	IP 00; 54
Опция:	Option:	Фланец (Flange) ∅ 45 mm

GT 5 · GTL 5

Напряжение:	Voltage:	7; 9,5; 10 мВ / мин$^{-1}$ (mV / min^{-1})
Температурный коэффициент:	Temperature coefficient:	± 0,05 %/ K
Гармоника:	Ripple:	≤ 0,7 % соотношение пиков (peak-peak)
Постоянная времени:	Time constant:	≤ 4,5 µs
Мощность:	Power:	0,075 Вт (W)
Диапазон температур:	Temperature range:	-30 °C → +130 °C
Пустотелый вал:	Hollow shaft:	∅ 8; 12 mm; $^1/_2$ "
Момент инерции:	Moment of inertia:	0,050 кг*см^2 (kgcm^2)
Вес (ротор):	Weight (rotor):	Около (approx.) 50 г (g)
Корпус:	Housing:	∅ 52 mm
Класс защиты:	Protection class:	IP 00; 44
	GTL 5:	Собственная опора (own bearings)

Precise Actual Speed Values

Tachogenerators measure speed and direction of rotation via an output voltage signal that is directly proportional to the speed. Tachogenerators from Baumer Hübner are characterized by the following features:

- Solid housing made of light alloy
- High signal quality and long operating life due to patented LongLife technology
- Speed and direction of rotation measured in real-time
- Precise measurement also at low speeds
- Auxiliary power (power supply) not necessary
- Available with solid or (through-hole) hollow shaft
- Many versions offer standard EURO flange B10
- Temperature range from -30 °C to +130 °C as standard
- Versions without bearings for special applications
- Special surface protection (option)
- Protection against maritime climates and tropicalization (option)
- Also available as combination with speed switches, incremental encoders, or as twin tachogenerator

Аналоговые тахогенераторы
Tachogenerators

Плавное включение, бесшумная работа, оптимальная скорость работы при любой температуре, силе ветра, плохих погодных условиях. Аналоговый тахогенератор TDP 0,2 LT с нанесенной на медные пластины ротора серебряной дорожкой управляет скоростью двигателя фуникулера Zugspitz в Альпах.

Soft start, quiet running, travel speed as required, at any temperature, in wind, or in bad weather, the analog tacho-generator TDP 0,2 LT, with the silver track embedded in the commutator, controls the motor speed of the Zugspitz cable car in the Alps.

GT 7 · GTF 7

Напряжение:	Voltage:	10 → 60 мВ / мин$^{-1}$ (mV / min^{-1})
Температурный коэффициент:	Temperature coefficient:	± 0,05 %/ K
Гармоника:	Ripple:	≤ 0,6 % соотношение пиков (peak-peak)
Постоянная времени:	Time constant:	≤ 4 µs
Мощность:	Power:	0,3; 0,6 Вт (W)
Диапазон температур:	Temperature range:	-30 °C → +130 °C
Пустотелый вал:	Hollow shaft:	∅ 12; 14; 15; 16 mm
Момент инерции:	Moment of inertia:	0,4; 0,6 кг*см^2 (kgcm^2)
Вес (ротор):	Weight (rotor):	Около (approx.) 110; 160 г (g)
Корпус:	Housing:	∅ 70 mm
Класс защиты:	Protection class:	IP 55

GTF 7: Евро-фланец B 10 **(EURO flange B 10)**

GT 9

Напряжение:	Voltage:	10; 20 мВ / мин$^{-1}$ (mV / min^{-1})
Температурный коэффициент:	Temperature coefficient:	± 0,05 %/ K
Гармоника:	Ripple:	≤ 0,5 % соотношение пиков (peak-peak)
Постоянная времени:	Time constant:	≤ 9 µs
Мощность:	Power:	0,3 Вт (W)
Диапазон температур:	Temperature range:	-30 °C → +130 °C
Пустотелый вал:	Hollow shaft:	∅ 12; 16 mm
Момент инерции:	Moment of inertia:	0,95 кг*см^2 (kgcm^2)
Вес (ротор):	Weight (rotor):	Около (approx.) 155 г (g)
Корпус:	Housing:	∅ 90 mm
Класс защиты:	Protection class:	IP 00; 44

Встроенный тахогенератор (Built-in tachogenerator)

GTB 9

Напряжение:	Voltage:	10; 20 мВ / мин$^{-1}$ (mV / min^{-1})
Температурный коэффициент:	Temperature coefficient:	± 0,05 %/ K
Гармоника:	Ripple:	≤ 0,5 % соотношение пиков (peak-peak)
Постоянная времени:	Time constant:	≤ 9 µs
Мощность:	Power:	0,3 Вт (W)
Диапазон температур:	Temperature range:	-30 °C → +130 °C
Пустотелый вал:	Hollow shaft:	∅ 12; 16 mm
Момент инерции:	Moment of inertia:	0,95 кг*см^2 (kgcm^2)
Вес (ротор):	Weight (rotor):	Около (approx.) 155 г (g)
Корпус:	Housing:	∅ 95 mm
Класс защиты:	Protection class:	IP 68

Внешняя установка тахогенератора / External mounting

GTR 9

Напряжение:	Voltage:	10 → 60 мВ / мин$^{-1}$ (mV / min^{-1})
Температурный коэффициент:	Temperature coefficient:	± 0,05 %/ K
Гармоника:	Ripple:	≤ 0,4 % соотношение пиков (peak-peak)
Постоянная времени:	Time constant:	≤ 5 µs
Мощность:	Power:	0,9 Вт (W)
Диапазон температур:	Temperature range:	-30 °C → +130 °C
Пустотелый вал:	Hollow shaft:	∅ 16 mm
Момент инерции:	Moment of inertia:	1,95 кг*см^2 (kgcm^2)
Вес (ротор):	Weight (rotor):	Около (approx.) 490 г (g)
Корпус:	Housing:	∅ 95 mm
Класс защиты:	Protection class:	IP 56

Новая версия TDP 0,5 / Successor type for **TDP 0,5**

Комбинированные устройства и ограничители скорости вращения
Combinations & Speed Switches

OG 60 + GT 5

Инкрементальный энкодер + аналоговый тахогенератор / Incremental Encoder + Tachogenerator

OG 60:		
Число импульсов на оборот:	Counts per turn:	200 → 10000
Уровень логического сигнала:	Logic level:	HTL (C), TTL, TTL (R)
Диапазон температур:	Temperature range:	-20 °C → +85 °C
Euro-фланец	Servo-flange	

GT 5:		
Напряжение:	Voltage:	7; 10 мВ / мин$^{-1}$ (mV / min^{-1})
Гармоника:	Ripple:	≤ 0,7 % соотношение пиков (peak-peak)
Мощность:	Power:	0,075 Вт (W)
Класс защиты:	Protection class:	IP 54

FOG 9 + GT 7

Инкрементальный энкодер + аналоговый тахогенератор / Incremental Encoder + Tachogenerator

FOG 9:		
Число импульсов на оборот:	Counts per turn:	1 → 2500
Уровень логического сигнала:	Logic level:	HTL, TTL, TTL (R)
Диапазон температур:	Temperature range:	-20 °C → +100 °C
Еврофланец:	EURO flange:	B 10

GT 7:		
Напряжение:	Voltage:	10 → 60 мВ / мин$^{-1}$ (mV / min^{-1})
Гармоника:	Ripple:	≤ 0,6 % соотношение пиков (peak-peak)
Мощность:	Power:	0,3 Вт (W)
Класс защиты:	Protection class:	IP 55

POG 9 + FSL/ESL

Инкрементальный энкодер + ограничитель оборотов / Incremental Encoder + Speed Switch

POG 9:		
Число импульсов на оборот:	Counts per turn:	1 → 2500
Уровень логического сигнала:	Logic level:	HTL, TTL, TTL (R)
Диапазон температур:	Temperature range:	-20 °C → +100 °C (FSL)
Диапазон температур:	Temperature range:	-20 °C → +85 °C (ESL)
Еврофланец:	EURO flange:	B 10

FSL / ESL Диапазон ограничения скорости вращения / Range of switching speed:	
FSL 90:	850 → 4900 мин$^{-1}$ (min^{-1})
ESL 90:	650 → 6000 мин$^{-1}$ (min^{-1})
ESL 93:	3 x 200 → 5000 мин$^{-1}$ (min^{-1})
Класс защиты:	IP 55

POG 90 + FSL/ESL

Инкрементальный энкодер + ограничитель скорости / Incremental Encoder + Speed Switch

POG 90:		
Число импульсов на оборот:	Counts per turn:	1024 → 10000
Уровень логического сигнала:	Logic level:	HTL, TTL, TTL (R)
Диапазон температур:	Temperature range:	-20 °C → +85 °C
Еврофланец:	EURO flange:	B 10

FSL / ESL Диапазон ограничения скорости вращения / Range of switching speed:	
FSL 90:	850 → 4900 мин$^{-1}$ (min^{-1})
ESL 90:	650 → 6000 мин$^{-1}$ (min^{-1})
ESL 93:	3 x 200 → 5000 мин$^{-1}$ (min^{-1})
Класс защиты:	IP 55

Параллельное измерение нескольких параметров

Основной задачей при контроле приводных систем является измерение скорости, но все чаще необходимо одновременное измерение нескольких физических величин или определение параметра за одно измерение, а также стоит задача дублирования измерения. Характерной особенностью комбинаций является то, что они всегда состоят из основного устройства с валом, установленным на двух подшипниках, имеющего минимум одну систему датчиков между подшипниками, и дополнительного устройства на том же валу за подшипником на свободной (B) стороне вала. Существует большое количество модификаций в зависимости от требований клиента. Также поставляются системы, объединяющие в себе три устройства.

Parallel Measurement of Multiple Parameters

In many speed-controlled drive systems, there is the task of acquiring different measurement values simultaneously or a single measurement value redundantly. A characteristic feature of the combinations designed for these purposes is that they always consist of a basic device with a common shaft mounted on two bearings, with at least one sensor system fitted between the bearings and an additional device behind the bearing at the free (»B«) end of the shaft. Depending on customer requirements, there is a wide variety of versions through to triple combinations.

Рабочее напряжение U_B:

Operating voltage U_B:

TTL: U_B = + 5 V ± 5 %
TTL (R): U_B = + 9...26 В (V)
HTL: U_B = + 9...30 В (V)
HTL (C): U_B = + 9...26 В (V)

Комбинированные устройства и ограничители скорости вращения
Combinations & Speed Switches

Системы с тремя измерительными устройствами - энкодер HOG 22 + тахогенератор HTA 11 + ограничитель скорости ES 100 - предназначены для установки в стан горячей прокатки. Электронный ограничитель скорости ES 100 идеально подходит для низкоскоростных приводных систем.

The triple combination, comprising encoder HOG 22 + tachogenerator HTA 11 + speed switch ES 100, is installed in a hot-rolling mill. The electronic speed switch ES 100 is ideally suited for this slow-running drive system as it is adjustable to very low switching speeds.

HOG 10 + DSL

Инкрементальный энкодер + ограничитель скорости / Incremental Encoder + Speed Switch

HOG 10:		
Число импульсов на оборот:	Counts per turn:	512 → 2500
Уровень логического сигнала:	Logic level:	HTL, TTL (R)
Диапазон температур:	Temperature range:	-20 °C → +85 °C
Пустотелый вал:	Hollow shaft:	∅ ≤ 16 mm

DSL Диапазон ограничения скорости вращения / Range of switching speed:	
3 → 2900 мин$^{-1}$/min^{-1} (2500 пер/об counts/turn)	
4 → 3500 мин$^{-1}$/min^{-1} (2048 пер/об counts/turn)	
8 → 6000 мин$^{-1}$/min^{-1} (1024 пер/об counts/turn)	
16 → 6000 мин$^{-1}$/min^{-1} (512 пер/об counts/turn)	
Защита от паразитных токов через ось	Protection against shaft currents
Класс защиты:	Protection class: IP 66

POG 10 + DSL

Инкрементальный энкодер + ограничитель скорости / Incremental Encoder + Speed Switch

POG 10:		
Число импульсов на оборот:	Counts per turn:	512 → 2500
Уровень логического сигнала:	Logic level:	HTL, TTL (R)
Диапазон температур:	Temperature range:	-20 °C → +85 °C
Еврофланец:	EURO flange:	B 10

DSL Диапазон ограничения скорости вращения / Range of switching speed:	
3 → 2900 мин$^{-1}$/min^{-1} (2500 пер/об counts/turn)	
4 → 3500 мин$^{-1}$/min^{-1} (2048 пер/об counts/turn)	
8 → 6000 мин$^{-1}$/min^{-1} (1024 пер/об counts/turn)	
16 → 6000 мин$^{-1}$/min^{-1} (512 пер/об counts/turn)	
Класс защиты:	Protection class: IP 66

HOG 10 + FSL/ESL

Инкрементальный энкодер + ограничитель скорости / Incremental Encoder + Speed Switch

HOG 10:		
Число импульсов на оборот:	Counts per turn:	1 → 2 500
Уровень логического сигнала:	Logic level:	HTL, TTL, TTL (R)
Рабочий диапазон температур (FSL):	Temperature range (FSL):	-30 °C → +100 °C
Рабочий диапазон температур (ESL):	Temperature range (ESL):	-20 °C → +85 °C
Пустотелый вал:	Hollow shaft:	∅ ≤ 16 mm

FSL / ESL Диапазон ограничения скорости вращения / Range of switching speed:	
FSL 90:	850 → 4900 мин$^{-1}$ (min^{-1})
ESL 90:	650 → 6000 мин$^{-1}$ (min^{-1})
ESL 93:	3 x 200 → 5000 мин$^{-1}$ (min^{-1})
Защита от паразитных токов через ось	Protection against shaft currents
Класс защиты:	Protection class: IP 66

POG 10 + FSL/ESL

Инкрементальный энкодер + ограничитель скорости / Incremental Encoder + Speed Switch		
POG 10:		
Число импульсов на оборот:	Counts per turn:	1 → 2 500
Уровень логического сигнала:	Logic level:	HTL, TTL, TTL (R)
Диапазон температур:	Temperature range:	-30 °C → +100 °C (FSL)
Диапазон температур:	Temperature range:	-20 °C → +85 °C (ESL)
Еврофланец:	EURO flange:	B 10
FSL / ESL Диапазон ограничения скорости вращения / Range of switching speed:		
FSL 90:		850 → 4 900 мин$^{-1}$ (min^{-1})
ESL 90:		650 → 6 000 мин$^{-1}$ (min^{-1})
ESL 93:		3 x 200 → 5 000 мин$^{-1}$ (min^{-1})
Класс защиты:	Protection class:	IP 66

HOG 11 + FSL/ESL

Инкрементальный энкодер + ограничитель скорости / Incremental Encoder + Speed Switch		
HOG 11:		
Число импульсов на оборот:	Counts per turn:	1 → 2500
Уровень логического сигнала:	Logic level:	HTL, TTL, TTL (R)
Диапазон температур:	Temperature range:	-30 °C → +100 °C (FSL)
Диапазон температур:	Temperature range:	-20 °C → +85 °C (ESL)
Пустотелый вал:	Hollow shaft:	∅ ≤ 16 mm
FSL / ESL Диапазон ограничения скорости вращения / Range of switching speed:		
FSL 90:		850 → 4900 мин$^{-1}$ (min^{-1})
ESL 90:		650 → 6000 мин$^{-1}$ (min^{-1})
ESL 93:		3 x 200 → 5000 мин$^{-1}$ (min^{-1})
Защита от паразитных токов через ось		Protection against shaft currents
Класс защиты:	Protection class:	IP 67

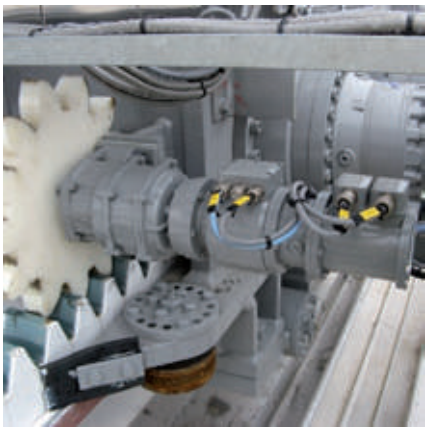
POG 11 + FSL/ESL

Инкрементальный энкодер + ограничитель скорости / Incremental Encoder + Speed Switch		
POG 11:		
Число импульсов на оборот:	Counts per turn:	1 → 2500
Уровень логического сигнала:	Logic level:	HTL, TTL, TTL (R)
Диапазон температур:	Temperature range:	-30 °C → +100 °C (FSL)
Диапазон температур:	Temperature range:	-20 °C → +85 °C (ESL)
Еврофланец:	EURO flange:	B 10
FSL / ESL Диапазон ограничения скорости вращения / Range of switching speed:		
FSL 90:		850 → 4900 мин$^{-1}$ (min^{-1})
ESL 90:		650 → 6000 мин$^{-1}$ (min^{-1})
ESL 93:		3 x 200 → 5000 мин$^{-1}$ (min^{-1})
Класс защиты:	Protection class:	IP 67

HOG 16 (M) + DSL

Инкрементальный энкодер + ограничитель скорости / Incremental Encoder + Speed Switch		
HOG 16 (M):		
Число импульсов на оборот:	Counts per turn:	512 → 2500
Уровень логического сигнала:	Logic level:	HTL, TTL (R)
Диапазон температур:	Temperature range:	-20 °C → +85 °C
Пустотелый вал:	Hollow shaft:	∅ ≤ 50 mm
Спец. модификация	Option: redundant version	модификация (Version M)
DSL Диапазон ограничения скорости вращения / Range of switching speed:		
3 → 2900 мин$^{-1}$/min^{-1} (2500 пер/об counts/turn)		
4 → 3500 мин$^{-1}$/min^{-1} (2048 пер/об counts/turn)		
8 → 6000 мин$^{-1}$/min^{-1} (1024 пер/об counts/turn)		
16 → 6 000 мин$^{-1}$/min^{-1} (512 пер/об counts/turn)		
Защита от паразитных токов через ось		Protection against shaft currents
Класс защиты:	Protection class:	IP 66

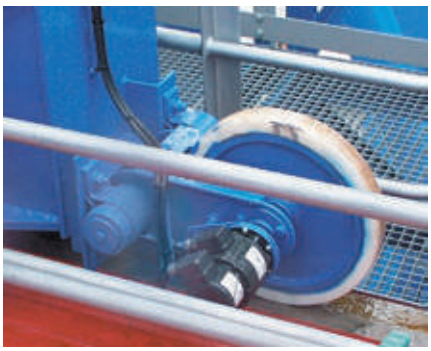
Стадион Уэмбли (Лондон) является самым большим стадионом в мире с подвижной крышей. Каждая из семи секций крыши приводится в движение планетарным мотор- редуктором. Система управления двигателем была специально разработана для использования вне помещений. Данная система включает в себя энкодер и два независимых механических ограничителя скорости, которые функционируют благодаря центробежной силе.



The London Wembley Stadium is the largest stadium in the world with a movable roof. Each of the seven roof sections is moved by several planetary-geared motors. The motor control loops use robust combinations specially designed for outdoor use. They combine an absolute encoder and two independently operating, purely mechanical safety switches triggered by centrifugal force.

Комбинированные устройства и ограничители скорости вращения
Combinations & Speed Switches

Для высокоточного позиционирования при перемещении многотонных грузов могут быть использованы высокоточные энкодеры Baumer Hübner. Энкодер HOG 220 с валом большого диаметра обеспечивает управление скоростью сдвоенных двигателей подъемных механизмов контейнерного терминала в Гамбурге. Приводы рельсовой колесной пары используются с энкодером HOG 10, а мерные ролики - с установленными на них сдвоенными энкодерами POG 10 G.



To move loads weighing several tons safely and efficiently, encoders from Baumer Hübner supply precise actual-value signals. Type HOG 220 encoders with large hollow shafts measure the speeds of directly coupled hoist drives on the gantries of the Hamburg container terminal. The drive motors for the rail wheel sets are fitted with HOG 10 hollow-shaft encoders, while measuring wheels are equipped with directly flanged twin encoders POG 10 G.

TDP 0,09 + FSL

Аналоговый тахогенератор + ограничитель скорости / Tachogenerator + Speed Switch

TDP 0,09:		
Напряжение:	Voltage:	10 → 60 мВ/мин$^{-1}$ (mV/min^{-1})
Гармоника:	Ripple:	≤ 0,55 % соотношение пиков (peak-peak)
Мощность:	Power:	1,2 Вт (W)
Фланец:	Flange:	∅ 85 mm
Опция:	Option:	С ножками B3 (Foot B3)
FS (L) 90:		
Диапазон ограничения скорости вращения:	Range of switching speed:	850 → 4 900 мин$^{-1}$ (min^{-1})
Диапазон температур:	Temperature range:	-30 °C → +130 °C
Класс защиты:	Protection class:	IP 55

TDP 0,2 + OG 9

Аналоговый тахогенератор + инкрементальный энкодер / Tachogenerator + Incremental Encoder

TDP 0,2:		
Напряжение:	Voltage:	10 → 150 мВ/мин$^{-1}$ (mV/min^{-1})
Гармоника:	Ripple:	≤ 0,5 % соотношение пиков (peak-peak)
Мощность:	Power:	12 Вт (W)
Еврофланец:	EURO flange:	B 10
Опция:	Option:	С ножками B3 (Foot B3)
OG 9:		
Число импульсов на оборот:	Counts per turn:	1 → 1 250
Уровень логического сигнала:	Logic level:	HTL, TTL (R)
Диапазон температур:	Temperature range:	-30 °C → +100 °C
Класс защиты:	Protection class:	IP 55

TDP 0,2 + OG 60

Аналоговый тахогенератор + инкрементальный энкодер / Tachogenerator + Incremental Encoder

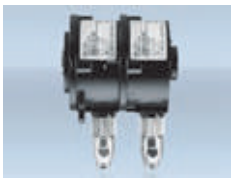
TDP 0,2:		
Напряжение:	Voltage:	10 → 150 мВ/мин$^{-1}$ (mV/min^{-1})
Гармоника:	Ripple:	≤ 0,5 % соотношение пиков (peak-peak)
Мощность:	Power:	12 Вт (W)
Еврофланец:	EURO flange:	B 10
Опция:	Option:	С ножками B3 (Foot B3)
OG 60:		
Число импульсов на оборот:	Counts per turn:	10 → 10 000
Уровень логического сигнала:	Logic level:	HTL (C), TTL, TTL (R)
Диапазон температур:	Temperature range:	-20 °C → +85 °C
Внутреннее сцепление	Internal coupling	
Класс защиты:	Protection class:	IP 55

TDP 0,2 + FSL/ESL

Аналоговый тахогенератор + ограничитель / Tachogenerator + Speed Switch

TDP 0,2:		
Напряжение:	Voltage:	10 → 150 мВ/мин$^{-1}$ (mV/min^{-1})
Гармоника:	Ripple:	≤ 0,5 % соотношение пиков (peak-peak)
Мощность:	Power:	12 Вт (W)
Еврофланец:	EURO flange:	B 10
Опция:	Option:	С ножками B3 (Foot B3)
FSL / ESL Диапазон ограничения скорости вращения / Range of switching speed:		
FSL 90:		850 → 4 900 мин$^{-1}$ (min^{-1})
ESL 90:		650 → 6 000 мин$^{-1}$ (min^{-1})
ESL 93:		3 x 200 → 5 000 мин$^{-1}$ (min^{-1})
Рабочий диапазон температур (FSL):	Temperature range (FSL):	-30 °C → +130 °C
Рабочий диапазон температур (ESL):	Temperature range (ESL):	-20 °C → +85 °C
Класс защиты:	Protection class:	IP 55

HOG 9 G



Сдвоенный энкодер (Инкрементальный энкодер + Инкрементальный энкодер) Twin Encoder (Incremental Encoder + Incremental Encoder)		
Число импульсов на оборот:	Counts per turn:	2 x 1 → 2 500
Уровень логического сигнала:	Logic level:	HTL, TTL, TTL (R)
Диапазон температур:	Temperature range:	-30 °C → +100 °C
Пустотелый вал:	Hollow shaft:	∅ ≤ 16 mm
Защита от паразитных токов через ось		Protection against shaft currents
Класс защиты:	Protection class:	IP 56
Масса:	Weight:	Около (approx.) 1,1 кг (kg)

POG 9 G

Сдвоенный энкодер (Инкрементальный энкодер + Инкрементальный энкодер) Twin Encoder (Incremental Encoder + Incremental Encoder)		
Число импульсов на оборот:	Counts per turn:	2 x 1 → 2 500
Уровень логического сигнала:	Logic level:	HTL, TTL, TTL (R)
Диапазон температур:	Temperature range:	-30 °C → +100 °C (FSL)
Еврофланец:	EURO flange:	B 10
Класс защиты:	Protection class:	IP 56
Масса:	Weight:	Около (approx.) 1,7 кг (kg)

POG 90 + OG 9

Сдвоенный энкодер (Инкрементальный энкодер + Инкрементальный энкодер) Twin Encoder (Incremental Encoder + Incremental Encoder)		
POG 90:		
Число импульсов на оборот:	Counts per turn:	1 024 → 10 000
Уровень логического сигнала:	Logic level:	HTL, TTL, TTL (R)
Диапазон температур:	Temperature range:	-20 °C → +85 °C
Еврофланец:	EURO flange:	B 10
OG 9:		
Число импульсов на оборот:	Counts per turn:	1 → 1 250
Уровень логического сигнала:	Logic level:	HTL, TTL, TTL (R)
Класс защиты:	Protection class:	IP 56

HOG 10 G

Сдвоенный энкодер (Инкрементальный энкодер + Инкрементальный энкодер) Twin Encoder (Incremental Encoder + Incremental Encoder)		
Число импульсов на оборот:	Counts per turn:	2 x 1 → 2 500
Уровень логического сигнала:	Logic level:	HTL, TTL, TTL (R)
Диапазон температур:	Temperature range:	-30 °C → +100 °C
Пустотелый вал:	Hollow shaft:	∅ ≤ 16 mm
Защита от паразитных токов через ось		Protection against shaft currents
Класс защиты:	Protection class:	IP 66
Масса:	Weight:	Около (approx.) 3,5 кг (kg)

POG 10 G

Сдвоенный энкодер (Инкрементальный энкодер + Инкрементальный энкодер) Twin Encoder (Incremental Encoder + Incremental Encoder)		
Число импульсов на оборот:	Counts per turn:	2 x 1 → 2 500
Уровень логического сигнала:	Logic level:	HTL, TTL, TTL (R)
Диапазон температур:	Temperature range:	-30 °C → +100 °C
Еврофланец:	EURO flange:	B 10
Класс защиты:	Protection class:	IP 66
Масса:	Weight:	Около (approx.) 3,2 кг (kg)

Данная система находится в отличном состоянии после нескольких десятков лет эксплуатации. Она включает в себя сдвоенный тахогенератор и два блока сердечников якоря, установленных последовательно друг за другом за корпусом подшипника двигателя (8,7 мВт).

In operation for decades and still in top form: a twin tachogenerator with two armature stacks mounted one behind the other, behind the bearing block of an 8,7 MW drive.

Комбинированные устройства и ограничители скорости вращения
Combinations & Speed Switches

Стандартная модификация, включающая в себя энкодер и тахогенератор, установленные на гидропривод.

Standard combination comprising an encoder and a tachogenerator mounted on a hydraulic drive.

HOG 11 G

Сдвоенный энкодер (Инкрементальный энкодер + Инкрементальный энкодер) Twin Encoder (Incremental Encoder + Incremental Encoder)		
Число импульсов на оборот:	Counts per turn:	2 x 1 → 2 500
Уровень логического сигнала:	Logic level:	HTL, TTL, TTL (R)
Диапазон температур:	Temperature range:	-30 °C → +100 °C
Пустотелый вал:	Hollow shaft:	∅ ≤ 16 mm
Защита от паразитных токов через ось		Protection against shaft currents
Класс защиты:	Protection class:	IP 67
Масса:	Weight:	Около (approx.) 3,5 кг (kg)

POG 11 G

Сдвоенный энкодер (Инкрементальный энкодер + Инкрементальный энкодер) Twin Encoder (Incremental Encoder + Incremental Encoder)		
Число импульсов на оборот:	Counts per turn:	2 x 1 → 2500
Уровень логического сигнала:	Logic level:	HTL, TTL, TTL (R)
Диапазон температур:	Temperature range:	-30 °C → +100 °C
Еврофланец:	EURO flange:	B 10
Класс защиты:	Protection class:	IP 67
Масса:	Weight:	Около (approx.) 3,2 кг (kg)

TDPZ 0,09

Сдвоенный тахогенератор (Аналоговый тахогенератор + аналоговый тахогенератор) Twin Tachogenerator (Tachogenerator + Tachogenerator)		
Напряжение:	Voltage:	2 x10 → 40 мВ/мин$^{-1}$ (mV/min^{-1})
Гармоника:	Ripple:	≤ 0,55 % соотношение пиков (peak-peak)
Мощность:	Power:	2 x 0,3 Вт (W)
Диапазон температур:	Temperature range:	-30 °C → +130 °C
Фланец:	Flange:	∅ 85 mm
Класс защиты:	Protection class:	IP 56
Масса:	Weight:	Около (approx.) 1,3 кг (kg)

TDPZ 0,2

Сдвоенный тахогенератор (Аналоговый тахогенератор + аналоговый тахогенератор) Twin Tachogenerator (Tachogenerator + Tachogenerator)		
Напряжение:	Voltage:	2 x 20 → 100 мВ/мин$^{-1}$ (mV/min^{-1})
Гармоника:	Ripple:	≤ 0,5 % соотношение пиков (peak-peak)
Мощность:	Power:	2 x 3 Вт (W)
Диапазон температур:	Temperature range:	-30 °C → +130 °C
Еврофланец:	EURO flange:	B 10
Опция:	Option:	С ножками B3 (Foot B3)
Класс защиты:	Protection class:	IP 55
Масса:	Weight:	Около (approx.) 3 кг (kg)

TDPZ 13

Сдвоенный тахогенератор (Аналоговый тахогенератор + аналоговый тахогенератор) Twin Tachogenerator (Tachogenerator + Tachogenerator)		
Напряжение:	Voltage:	2 x 20 → 200 мВ/мин$^{-1}$ (mV/min^{-1})
Гармоника:	Ripple:	≤ 0,5 % соотношение пиков (peak-peak)
Мощность:	Power:	2 x 20 Вт (W)
Диапазон температур:	Temperature range:	-30 °C → +130 °C
Фланец:	Flange:	B5, B5k, B5s, B10, B10w
Опция:	Option:	С ножками B3 (Foot B3)
Класс защиты:	Protection class:	IP 55
Масса:	Weight:	Около (approx.) 10 кг (kg)

GMPZ 1,0

Сдвоенный тахогенератор (Аналоговый тахогенератор + аналоговый тахогенератор) Twin Tachogenerator (Tachogenerator + Tachogenerator)		
Напряжение:	Voltage:	2 x 40 → 175 мВ/мин$^{-1}$ (mV/min^{-1})
Гармоника:	Ripple:	≤ 1,0 % соотношение пиков (peak-peak)
Мощность:	Power:	2 x 30 Вт (W)
Диапазон температур:	Temperature range:	-30 °C → +130 °C
Фланец:	Flange:	B5, B5k, B5n, B5s
Опция:	Option:	С ножками B3 (Foot B3)
Класс защиты:	Protection class:	IP 55
Масса:	Weight:	Около (approx.) 7 кг (kg)

Комбинированные устройства, установленные на данной нефтяной платформе, имеют специальное защитное покрытие корпуса для эксплуатации в агрессивных средах.

Combinations installed offshore – here on an oil rig – are provided with special surface protection to withstand highly corrosive atmospheres.

Ограничители скорости вращения
Speed Switches

Пусковое состояние ограничителя скорости изменяется при возникновении минимум одного сигнала предельного параметра скорости. Устройства данного типа выполняют защитную функцию, но также используются для общих задач управления. Компания Baumer Hübner предлагает три категории ограничителей:

- Механические ограничители скорости (центробежные): серия FS.
- Электронные аналоговые ограничители скорости: серия ES;
- Цифровые, программируемые ограничители скорости: серия DSL.

Ограничители скорости могут функционировать как самостоятельно, так и в комбинации с энкодерами и тахогенераторами.

Speed switches trigger state changes at minimum one switch output when preset switching speeds are overshot or undershot. They often perform a safety function, but are also used for general control tasks. Baumer Hübner offers:

- Mechanical speed switches (centrifugal force switches): FS model series
- Electronic analog speed switches: ES model series
- Digital, programmable speed switches: DSL model series

Speed switches are available as standalone devices or in combination with encoders and tachogenerators.

*counts/turn

** Диапазон ограничения скорости вращения

FS 90 · FS 162

FS 90: Ограничение скорости:	Switching speed:	850 → 4900 об/мин (rpm)
FS 162: Ограничение скорости:	Switching speed:	1000 → 6000 об/мин (rpm)
Точность переключения:	Switching accuracy:	± 4 %
Принцип действия:	Principle:	Центробежная сила (Centrifugal force)
Диапазон температур:	Temperature range:	-30 °C → +130 °C
Класс защиты:	Protection class:	IP 55

DSL (HOG 10 + DSL)

Диапазон ограничения скорости вращения:	Range of switching speeds:	3 → 2900 об/мин (rpm) (2 500 имп/об *) 4 → 3500 об/мин (rpm) (2 048 имп/об *) 8 → 6000 об/мин (rpm) (1 024 имп/об *) 16 → 6000 об/мин (rpm) (512 имп/об *)
Принцип действия:	Principle:	Цифровой (digital)
Диапазон температур:	Temperature range:	-20 °C → +85 °C
Класс защиты:	Protection class:	IP 66

DSL (POG 10 + DSL)

Диапазон ограничения скорости вращения:	Range of switching speeds:	3 → 2900 об/мин (rpm) (2 500 имп/об *) 4 → 3500 об/мин (rpm) (2 048 имп/об *) 8 → 6000 об/мин (rpm) (1 024 имп/об *) 16 → 6000 об/мин (rpm) (512 имп/об *)
Принцип действия:	Principle:	Цифровой (digital)
Диапазон температур:	Temperature range:	-20 °C → +85 °C
Класс защиты:	Protection class:	IP 66

DSL (HOG 16 + DSL)

Диапазон ограничения скорости вращения:	Range of switching speeds:	3 → 2900 об/мин (rpm) (2 500 имп/об *) 4 → 3500 об/мин (rpm) (2 048 имп/об *) 8 → 6000 об/мин (rpm) (1 024 имп/об *) 16 → 6000 об/мин (rpm) (512 имп/об *)
Принцип действия:	Principle:	Цифровой (digital)
Диапазон температур:	Temperature range:	-20 °C → +85 °C
Класс защиты:	Protection class:	IP 66

ES 90 · ES 93 · ESH 93

ES 90: Диапазон ... **:	Range of switching speed:	1 x 650 → 6000 об/мин (rpm)
ES 93: Диапазон ... **:	Range of switching speed:	3 x 200 → 5000 об/мин (rpm)
ESH 93: как и у ES 93 с полым валом:	as ES 93 with hollow shaft:	∅ 20 mm
Точность переключения:	Switching accuracy:	± (2-4) %
Принцип действия:	Principle:	Аналоговый (analog)
Диапазон температур:	Temperature range:	-20 °C → +85 °C
Класс защиты:	Protection class:	IP 55

ES 100

Диапазон ... **:	Range of switching speed:	110 → 500 об/мин (rpm)
Макс. скорость:	Max. speed:	550 об/мин (rpm)
Точность переключения:	Switching accuracy:	± 4 %
Переключающая способность:	Switch capacity:	6 A/250 VAC, 1 A/125 VDC
Принцип действия:	Principle:	Аналоговый (analog)
Диапазон температур:	Temperature range:	-20 °C → +85 °C
Класс защиты:	Protection class:	IP 55

DS 93

3 скорости вращения, при которых осуществляется переключение		3 switching speeds
Диапазон ограничения скорости вращения:	Range of switching speeds:	25 → 4096 об/мин (rpm) (2500 имп/об *) 30 → 5000 об/мин (rpm) (2048 имп/об *) 60 → 10000 об/мин (rpm) (1024 имп/об *) 120 → 20000 об/мин (rpm) (512 имп/об *)
Принцип действия:	Principle:	Цифровой (digital)
Диапазон температур:	Temperature range:	-20 °C → +70 °C
Класс защиты:	Protection class:	IP 65

Взрывобезопасное исполнение
Explosion-Proof Devices

EEx OG 9

Число импульсов на оборот:	Counts per turn:	1 → 5000
Макс. частота выходного сигнала:	Max. output frequency:	120 (250) кГц (kHz)
Уровень логического сигнала:	Logic level:	HTL, TTL, TTL (R)
Диапазон температур:	Temperature range:	-20 °C → +55 °C
Масса:	Weight:	Около (approx.) 3,5 кг (kg)
Ударная прочность (6 мс):	Shock resistance (6 ms):	1 000 м/с² (m/s²)
Класс защиты:	Protection class:	IP 56
Еврофланец:	EURO flange:	B 10
Вал:	Shaft:	∅ 11 mm
Клеммная коробка / Terminal box		
Синусоидальный сигнал (опционально) / Sine signals as option		

EEx HOG 161

Число импульсов на оборот:	Counts per turn:	250 → 2500
Макс. частота выходного сигнала:	Max. output frequency:	120 кГц (kHz)
Уровень логического сигнала:	Logic level:	HTL (C), TTL, TTL (R)
Масса:	Weight:	Около (approx.) 6,2 → 8,8 кг (kg)
Ударная прочность (6 мс):	Shock resistance (6 ms):	1 000 м/с² (m/s²)
Класс защиты:	Protection class:	IP 56 (T5) / IP 54 (T6)
Диапазон температур:	Temperature range:	-20 °C → +65 °C (T5)
		-20 °C → +70 °C (T6)
Пустотелый сквозной вал / Through-hole hollow shaft		
Клеммная коробка / Terminal box		

EEx GP 0,2 · TG 74d

Напряжение:	Voltage:	20 → 150 мВ/мин⁻¹ (mV/min⁻¹)
Макс. скорость:	Max. speed:	8000 → 2800 мин⁻¹ (min⁻¹)
Диапазон температур:	Temperature range:	-20 °C → +55 °C
Температурный коэффициент:	Temp. coefficient:	± 0,006 %/K
Гармоника:	Ripple:	≤ 0,6 % соотношение пиков (peak-peak)
Постоянная времени:	Time constant:	≤ 150 µs
Мощность:	Power:	12 Вт (W)
Момент инерции:	Moment of inertia:	1,15 кгсм² (kgcm²)
Масса:	Weight:	Около (approx.) 3,8 кг (kg)
Класс защиты:	Protection class:	IP 54
Еврофланец:	EURO flange:	B 10
Вал:	Shaft:	∅ 11 mm
Еврофланец:	EURO flange:	B 10
Вал:	Shaft:	∅ 14 mm (TG 74d)

EEx ME 12

Блок заземления двигателя / Motor Earthing Unit		
Макс. скорость:	Max. speed:	8500 мин⁻¹ (min⁻¹)
Макс. Токовая нагрузка:	Max. current:	1 A
Момент инерции:	Moment of inertia:	3,7 кгсм² (kgcm²)
Вращающий момент привода:	Driving torque:	15 H*см (Ncm)
Макс. нагрузка на вал:	Max. shaft load:	axial 150 N, radial 200 N
Вибростойкость:	Vibration resistance:	(50 Hz → 2 кГц (kHz)): ≤ 100 м/с² (m/s²)
Ударная прочность (6 мс):	Shock resistance (6 ms):	≤ 1000 м/с² (m/s²)
Диапазон температур:	Temperature range:	-20 °C → +50 °C
Масса:	Weight:	Около (approx.) 3,5 кг (kg)
Класс защиты:	Protection class:	IP 56
Пустотелый сквозной вал / Through-hole hollow shaft		

Взрывозащита по стандарту ATEX 95

Директива Евросоюза 94/9/EC также известная, как ATEX 95, призвана синхронизировать европейские стандарты взрывозащиты и установить нормативы соответствия для оборудования, применяемого во взрывоопасных условиях и отраслях. С 1 июля 2003 года Германия и другие члены Евросоюза допускают к эксплуатации во взрывоопасных зонах только взрывозащищенные устройства, прошедшие соответствующую сертификацию.

Компания Baumer Hübner предлагает энкодеры и тахогенераторы, которые соответствуют директиве ATEX.

Explosion Protection to ATEX 95

EU Directive 94/9/EC, often referred to as the ATEX 95 Directive, was introduced to harmonize explosion-protection standards throughout Europe. It regulates the requirements for the design of explosion-proof devices and protection systems. Since July 1, 2003, Germany and the other member states of the EU only allow the putting into circulation of explosion-proof electrical and mechanical devices if they are certified according to the new directive.

Baumer Hübner offers encoders and tachogenerators that comply with the ATEX Directive.

Рабочее напряжение U_B:

Operating voltage U_B:

TTL: U_B = + 5 V ± 5 %
TTL (R): U_B = + 9...26 В (V)
HTL: U_B = + 9...30 В (V)
HTL (C): U_B = + 9...26 В (V)

Signal Обработка сигналов
Signal Processing

Устройства обработки сигналов для точного управления приводом

Устройства обработки сигнала Baumer Hübner обеспечивают надежную передачу сигналов датчиков и оптимизируют их работу в соответствии с характеристиками привода:

- Цифровые преобразователи необходимы для контроля уровня смещения сигнала, гальванической развязки и восстановления сигнала.
- Волоконно-оптический канал связи обеспечивает отсутствие помех при передаче сигнала даже при работе в неблагоприятных условиях.
- Интерполяторы преобразуют угловые (sin/cos) сигналы в импульсные высоко- или низкочастотные сигналы, или в sin/cos сигналы более высокой частоты.

Анализатор HENQ 1100, предназначенный для энкодеров, позволяет осуществлять всесторонний анализ на наличие ошибок и контроль качества.

HENQ 1100

Анализатор для энкодеров. Функции устройства:

Длительный мониторинг и отображение значений скорости вращения, угла, позиции и начальной позиции относительно предельного параметра, частоты выходных сигналов, напряжения, тока и ошибок

Analyzer for Encoders, Device functionality:

Continuous monitoring and display of speed, angular, position, zero pulse position relative to the switching on position, frequency of the output signals, voltage, current and occurrence of errors

HEAG 151 · 152 · 153 · 154

Цифровой преобразователь смещения уровня сигнала, гальванической развязки, и восстановлением сигнала
Digital Converter for signal level shifting, galvanical isolation, regeneration of signals

TTL → TTL (HEAG 151)	
HTL → TTL (HEAG 152)	
TTL → HTL (HEAG 153)	
HTL → HTL (HEAG 154)	
Оптическая изоляция входов	Opto coupler inputs
Установка на DIN-рейку	Standard rail installation

HEAG 156

Интерполятор / Interpolator

Входы:	Inputs:	sin/cos
Выходы:	Outputs:	TTL
Выходная частота:	Output frequency:	макс. (max.) 1 мГц (MHz)
Коэффициент интерполяции:	Interpolation factor:	2 → 16
Установка на DIN-рейку	Standard rail installation	

HEAG 158

Высокоточный Блок интерполяции (демультипликатор) / Precision Interpolator/Splitter

Входы:	Inputs:	sin/cos
Выходы:	Outputs:	HTL/TTL
Частота сигнала:	Signal frequency:	5 мГц (MHz)
Коэффициент интерполяции:	Interpolation factor:	1 → 16 384
Класс защиты:	Protection class:	IP 65

HEAG 159

Высокоточный синусоидальный мультиплексор / Precision Sine Multiplier

Входы:	Inputs:	sin/cos
Выходы:	Outputs:	sin/cos
Разрешение:	Resolution:	12 бит (Bit)
Частота сигнала:	Signal frequency:	макс. (max.) 600 кГц (kHz)
Коэффициент умножения:	Multiplying factor:	1 → 128
Класс защиты:	Protection class:	IP 65

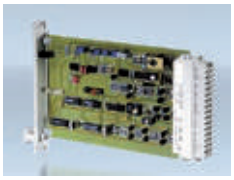
HEAG 160

Высокоточный интерполятор / демультипликатор / синусоидальный умножитель Precision Interpolator/Splitter / Precision Sine Multiplier		
Входы:	Inputs:	sin/cos
Выходы:	Outputs:	sin/cos · TTL · HTL
Коэффициент умножения (sin/cos):	Multiplying factor (sin/cos):	1 → 128
Разрешение:	Resolution:	12 бит (Bit)
Частота сигнала:	Signal frequency:	макс. (max.) 600 кГц (kHz)
Коэффициент интерполяции:	Interpolation factor (TTL · HTL):	1 → 16 384
Частота сигнала:	Signal frequency:	5 мГц (MHz)
Класс защиты:	Protection class:	IP 65

HEAG 171 · 172 · 173 · 174 · 175 · 176

Волоконно-оптический канал связи (ВОКС) для инкрементального энкодера Fiber Optic Links for Incremental Encoders		
4 x TTL → ВОЛС / fiber link (HEAG 171)		
4 x HTL → ВОЛС / fiber link (HEAG 172)		
3 x ВОЛС / fiber link → TTL (HEAG 173)		
3 x ВОЛС / fiber link → HTL (HEAG 174)		
3 x TTL → ВОЛС / fiber link (HEAG 175)		
3 x HTL → ВОЛС / fiber link (HEAG 176)		
Волоконно-оптические разъёмы:	Fiber optic connectors:	VL; ST; SMA
Неразъемный корпус:	Sealed housing (HEAG 171, 172)	
Установка на DIN-рейку	Standard rail installation (HEAG 173 → 176)	

HEAG 121 P



Биполярный преобразователь частота-ток для аналогового преобразования частоты Bipolar f/A-Converter for frequency analogue conversion		
Входы:	Inputs:	HTL, TTL
Выходы:	Outputs:	-10 В (V) → +10 В (V) / -20 mA → +20 mA
Входы оптрона	Opto coupler inputs	
Нелинейность выхода:	Linearity:	≤ 0,02 %
Кварцевый резонатор	Quartz controlled	
Плата в компьютер	PC board:	100 x 160 mm

DS 93

Цифровой ограничитель скорости с 3-мя уставками скорости Digital Speed Switch with 3 adjustable switching speeds		
Диапазон установки реле скорости (3 выхода):	Range of switching speeds:	25 → 4 096 об/мин (rpm) (2 500 пер/об counts/turn) 30 → 5 000 об/мин (rpm) (2 048 пер/об counts/turn) 60 → 10 000 об/мин (rpm) (1 024 пер/об counts/turn) 120 → 20 000 об/мин (rpm) (512 пер/об counts/turn)
Диапазон температур:	Temperature range:	-20 °C → +70 °C
Класс защиты:	Protection class:	IP 65

Signal Processing for Optimized Drive Control

Signal processing and evaluation electronics from Baumer Hübner condition sensor signals and optimize them to the requirements of the drive control system:

- Digital converters are used for level shifting, galvanic isolation, and signal regeneration.
- Fiber optic links guarantee an interference-free signal transmission even in tough environments.
- Interpolators convert sin/cos signals into square-wave signals at a higher or lower frequency - and into sin/cos signals at a higher frequency.

The analyzer for encoders HENQ 1100 provides comprehensive test and evaluation features. It is an ideal instrument for error analysis and quality assurance.

Принадлежности
Accessories

Безопасная установка, надежная передача сигнала, защита от паразитных токов

Качество управления зависит не только от качества датчиков. Передача сигнала может быть нарушена из-за неверной установки или внешних воздействий. Механические и электронные аксессуары, разработанные специально для энкодеров Baumer Hübner, обеспечивают безопасную эксплуатацию и надежную передачу данных.

Safe Installation, Reliable Signal Transmission, Protection from Shaft Currents

The quality of a control loop not only depends on the quality of the actual-value sensor. It also depends on whether the sensor output signal is deteriorated by installation errors or external interferences. Mechanical and electronic accessories are specially matched to Baumer Hübner encoders and support the safe, uncorrupted acquisition and transmission of actual values.

K 35 · K 50 · K 60

Соединительные муфты с тарельчатой пружиной для установки высокоточных датчиков вращения
Spring-Disk Couplings for connecting precision rotary sensors

	K 35	K 50	K 60
T_{KN} (Nm)	2	8	18
T_K max. (Nm)	3	10	34
n max. (min^{-1})	15 000	13 000	12 000
ΔK_a (mm)	± 0,7	± 0,7	± 0,7
ΔK_r (mm)	± 0,2	± 0,15	± 0,1
ΔK_w (°)	± 2	± 2	± 2
$C_{T\,dyn}$ (Nm/ rad)	900	1 400	3 600
J ($kgcm^2$)	$89 \cdot 10^{-3}$	$258 \cdot 10^{-3}$	$685 \cdot 10^{-3}$
m (g)	50	95	165

Реактивные штанги (Torque Arms)

для предотвращения радиального движения и осевого смещения
for the compensation of radial displacement and axial shift

Размер / size K...6		
1	L min. = 67	L max. = 70
2	L min. = 70	L max. = 130
3	L min. = 130	L max. = 460
Шарнирное соединение, не требует технического обслуживания / Ball joints, maintenance-free		

Размер / size K...12		
4	L min. = 145	L max. = 170
4	L min. = 180	L max. = 205
4	L min. = 200	L max. = 540
Шарнирное соединение, требуется смазка / Ball joints, for lubrication		

HEK 8

Кабель для энкодеров / Sensor Cable for Rotary Encoders		
Сигнальные провода:	Signal leads:	4 x 2 x 0,25 mm^2
Провода питания:	Power leads:	2 x 0,5 mm^2
Экран: обычный экран с низкой емкостью	Screen: common low capacity screen	
Межпроводная ёмкость:	Capacitance:	67 pF / m
Напряжение:	Voltage:	max. 300 V
Рабочий диапазон температур:	Operating temperature range:	-30 °C → +90 °C
Внешний диаметр:	Outside diameter:	Около (approx.) 7,5 mm

ME 11

Блок заземления двигателя / Motor Earthing Unit		
Макс. скорость (об/мин):	Max. speed (rpm):	8 500
Макс. ток:	Max. current:	1 A
Момент инерции:	Moment of inertia:	0,72 кгсм² ($kgcm^2$) → 0,38 кгсм² ($kgcm^2$)
Вращающий момент привода:	Driving torque:	15 Н*см (Ncm)
Макс. нагрузка на вал	Max. shaft load:	Осевая (axial) 150 N; Радиальная (radial) 200 H (N)
Виброустойчивость:	Vibration resistance:	(50 Гц (Hz) → 2 кГц (kHz)): ≤ 100 м/с² (m/s^2)
Ударная прочность (6 мс):	Schock resistance (6 ms):	≤ 1 000 м/с² (m/s^2)
Диапазон температур:	Temperature range:	-30 °C → +120 °C
Масса:	Weight:	Около (approx.) 1 кг (kg)
Класс защиты:	Protection class:	IP 55

Рисунки / Picture sources:

Страница / page 3: Baumer Hübner

Страница / page 10: Baumer Hübner

Страница / page 11: NEG Micon A/S

Страница / page 12: Malux Elektro AB

Страница / page 13: SEW-EURODRIVE

Страница / page 15: MEV

Страница / page 18: Baumer Hübner

Страница / page 19: MEV

Страница / page 22: ELIN Seilbahntechnik

Страница / page 24: euroHübner benelux

Страница / page 25: euroHübner benelux

Страница / page 26: Baumer Hübner

Страница / page 27: euroHübner benelux

Страница / page 28: euroHübner benelux

Страница / page 29: MEV

Технические данные были тщательно проверены. Отпечатано в Германии - 08.A1
Technical data has been fully checked, but accuracy of printed matter not guaranteed. Printed in Germany – 08.A1

BaumerHübner

Baumer Hübner GmbH
Planufer 92 b
10967 Berlin, Germany
P.O. Box 61 02 71
10924 Berlin
Phone +49 (0)30/69003-0
Fax +49 (0)30/69003-104
info@baumerhuebner.com

www.baumerhuebner.com

Baumer
Passion for Sensors

Counters, Process Displays, Timers, Tachometers

Product overview

Partnership.
Precision.
Pioneering.

Visibly better: Baumer sensors.

The Baumer Group is an international leading manufacturer and developer of sensors, encoders, measuring instruments and components for automated image-processing. Baumer combines innovative technology and customer-oriented service into intelligent solutions for factory and process automation and offers a uniquely wide range of related products and technologies. With around 2300 employees and 37 subsidiaries and in 19 countries, the family-owned company is always close to the customer. Industrial clients in many sectors gain vital advantages and measurable added value from the worldwide consistency of Baumer's high quality standards and its considerable innovative potential.

Our standards – your benefits.

- Passion coupled with expertise – both have made us a sensor pioneer and technology leader
- Our range of services is hard to beat – we have the right product, developed by our own team, for every task
- Inspired by innovation – Baumer takes on the challenge every day
- Reliability, precision and quality – we are powered by our customers' requirements
- Partnership from the very beginning – we develop the optimal solution in close cooperation with our customers
- Always one step ahead – thanks to our level of vertical production, our flexibility and adherence to delivery dates
- Worldwide presence – Baumer is always close across the globe

Baumer – setting standards with innovations.

The success story of the Baumer Group is characterized by innovations. By hardware and software engineers, designers or process engineers who work day in and day out to make our products and systems even better.

Our particular focus is on further miniaturization, enhanced precision as well as improved measuring speed and sensor robustness. That's what our products are characterized by - and something we are proud of.

The Baumer development teams are organized in an international network and are in close contact with well-known universities, recognized research institutes and highly specialized international engineering companies. As the technological leader, Baumer always endeavors to maintain its lead over the long term and protect its numerous innovations through patents.

Comprehensive product range

- Absolute encoders
- Acceleration sensors
- Actuators and positioning drives
- Cable-pull encoders
- Capacitive proximity sensors
- Conductivity sensors
- Counters and process displays
- Digital cameras
- Encoder combinations
- Force and strain sensors
- Inclination sensors
- Inductive sensors
- Incremental encoders
- Level measurement
- Magnetic sensors
- Network Components
- OCR and code reader systems
- Optical inspection systems
- Photoelectric sensors
- Precision switches My-Com
- Pressure measurement
- Process analysis
- Speed switches
- Spindle positioning systems
- Tachogenerators and resolvers
- Temperature sensors
- Ultrasonic sensors
- Vision sensors

Totalizers & position displays
From page 10

Preset counters
From page 20

The Baumer portfolio of counters and displays: Mechanical, electromechanical, electronic.

Measuring quantity and length are ever-present cycles that repeat a thousand times at production and manufacturing facilities. The principal aid for quantity-relevant process control are counters and process displays.

Deployed together with a measuring wheel or encoder, these compact controllers are capable of processing and indicating distance and speed.

Depending on the product variant, their capabilities are further enhanced by more intelligent functionalities: Comparison of measured values, acquisition of difference, calculation of ratios, output of control variables and communication with higher-level controls via serial interface.

Production facilities are expected to meet the ever-growing requirements on efficiency and reliability. The Baumer counters and process displays provide decentralized automation solutions and hence contribute towards cost-efficient production processes.

Tachometers & process displays
From page 28

Time & hour meters
From page 32

Measuring wheels & mounting accessories
From page36

Process-oriented technologies.

Reliable technologies master most versatile tasks in industrial production processes. From hand-held piece counters on to pulse and preset counters onward to calibrated meter counters – our customers can select among the broadest single-source portfolio available on the European market. Our process displays are designed to capture and display measured values in mechanical engineering and construction.

In interaction with digital or analog sensors, these instruments provide many options for evaluation and display of distance, speed, ratio and many more process parameters while taking over control functions in parallel.

Content

Totalizers & position displays

Every revolution counts

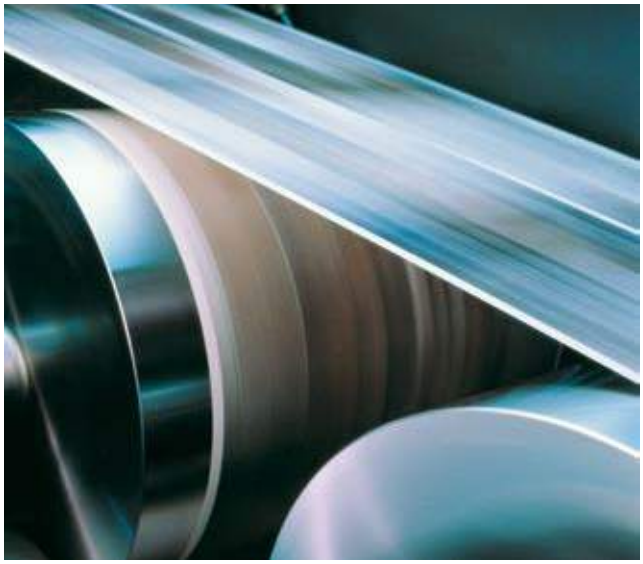
From page 10

Preset counters

Switching operations with pinpoint accuracy

From page 20

Content



Tachometers & process displays

Reliably keeping pace

From page 28

Time & hour meters

Time is money

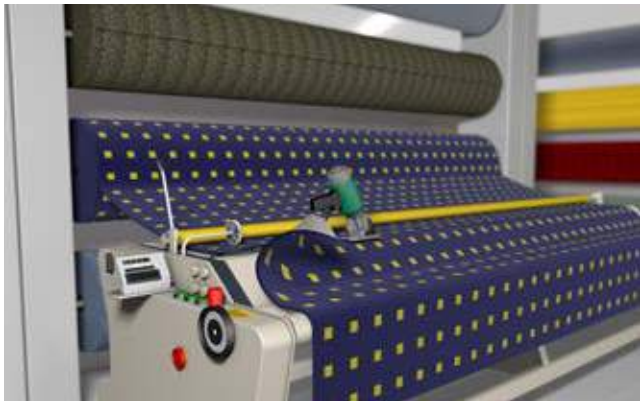
From page 32

Accessories & Index

Applications

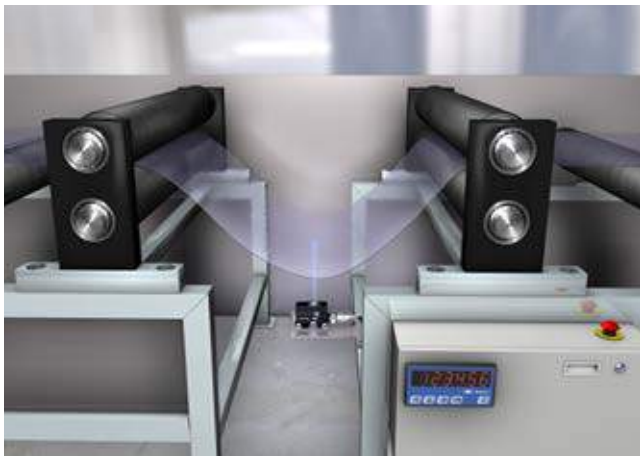
Winding and unwinding webs of textile, cables or ropes
Multifunctional counters deployed together with incremental encoders and measuring wheels acquire the length of a material and initiate the cutting operation as soon as the predefined target has been achieved.

Depending on the product variant, the counters acquire and monitor production parameters such as length with end and precontact for counting up to the preset target quantity of units and lots. Some counters provide additional functions to provide overall total and machine running time. Data transfer to higher-level control systems for further processing is by serial interface.



Mechanical length measurement
Robust and no need for power supply – these are the benefits of mechanical counters put in a nutshell. Carpet cutting facilities which are found at every do-it-yourself store are a good example. Mechanical totalizers and preset counters are used to acquire the length of material webs of carpet or wallpaper – most often together with a measuring wheel.

Mechanical totalizers are frequently found at distance measuring instruments or presses and punches.
Hand-held piece counters have been particularly popular for many decades – used by airlines and sports clubs, in forest management or for traffic surveys.



Analog control and monitoring of distance

The actual processing step requires some material webs (foil, textile) to be partly unrolled in order to prepare a smooth web infeed.
Some examples:
- Metal sheet alignment prior to punching
- Foils at printing machines
- Textile in drying systems

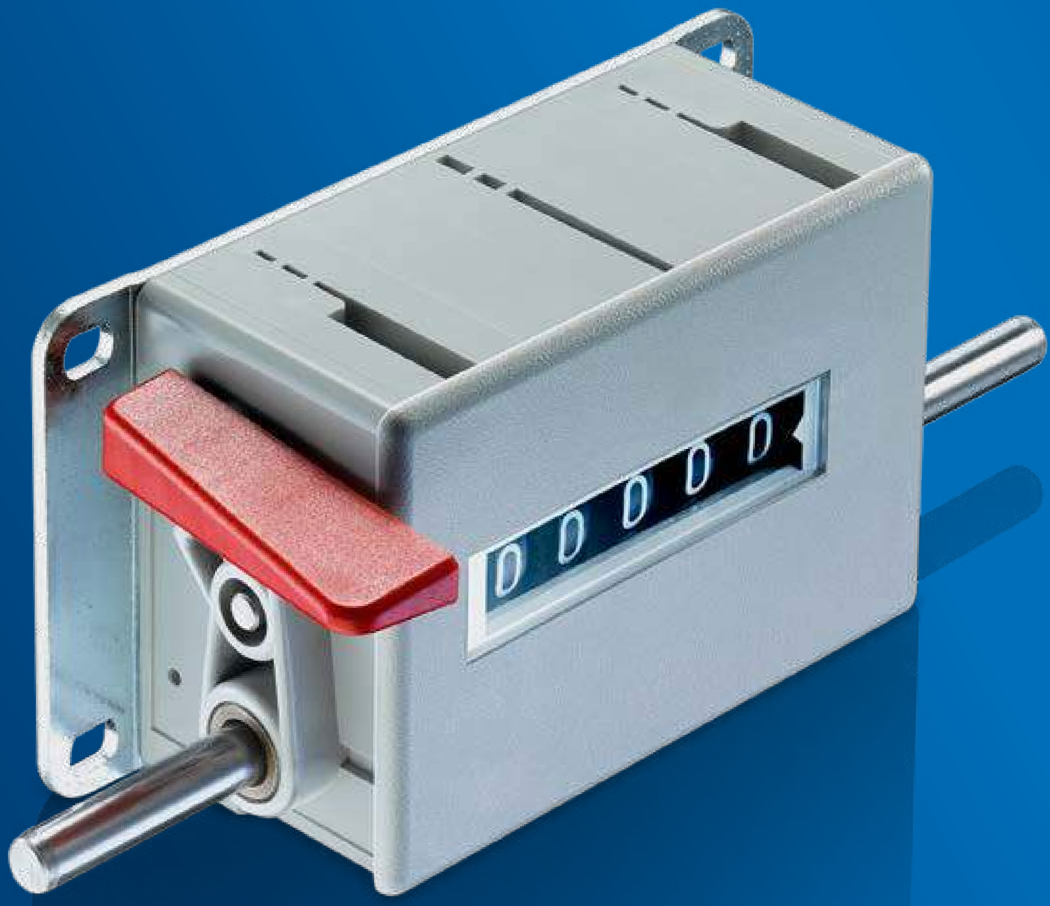
The material must come with slight sag as infeed buffer to ensure a smooth feeding process. A distance sensor is used to monitor the appropriate amount of sagging and to prevent any excess sag or strain.
Process display PCD41 is given the analog output signal and converts it into a digital measured value. Two configurable limits allow for sag monitoring within the allowed tolerance.

Two-speed ratio display

Electronic tachometers acquire several measured values all at once while in parallel controlling the related measuring operation according to their programmed parameters.
A good example is speed synchronization of conveyor belts. The belts' speed is acquired by encoders, the process display acts as a comparator and calculator while monitoring the defined limits at the same time.

With only one frequency input, tachometers allow for decentralized and precise indication of speed, clock cycles or rotational speed.

Every revolution counts.



U 410 – Revolution counter

Totalizers & position displays

How many, how often, how long?

Totalizing is an ever-present cycle that repeats a thousand times at production and manufacturing facilities. Quantity, filling level, operation hours, length and position are process variables of vital significance. The principal aid for quantity-relevant process control is the totalizer. Deployed together with an encoder, it is even capable of supplying the length or position of an object.

Hence, totalizers are found at distance measuring instruments, pasting tables, presses and punches and where cables must be cut to length. Mechanical counters excel by on-spot measurements without needing power supply, while electronic counters with optional serial interface can communicate with master controls.

SSI position displays

NA214 position displays with SSI interface allow for immediate absolute encoder diagnostics. They are also the product to choose when it comes to absolute positioning by interaction with an absolute SSI encoder, for example adjusting machine stop positions or measuring travel distance.

Totalizers & position displays

Size 48 x 24 mm

Totalizers and incremental position displays.
Voltage supply by lithium battery.

- Pulse inputs NPN / PNP or 10...260 VAC/VDC
- Adding or subtracting
- 8-digit LCD display
- Length measurement with up/down counting

Features	■ Pulse counter adding or subtracting ■ 8-digit LCD display	■ Counting processes with direction signal (Up/Down) or differential counting ■ 8-digit LCD display	■ Slow counting processes with direction signal (Up/Down) ■ 8-digit LCD display	■ Position displays ■ Length measurement by incremental encoder A 90° B x1/x2 ■ 8-digit LCD display
Product family	**ISI30**	**ISI31**	**ISI32**	**ISI33**
Voltage supply	Lithium battery (approx. 8 years at 20 °C)	Lithium battery (approx. 8 years at 20 °C)	Lithium battery (approx. 8 years at 20 °C)	Lithium battery (approx. 8 years at 20 °C)
Display	LCD, 7-segment	LCD, 7-segment	LCD, 7-segment	LCD, 7-segment
Number of digits	8	8	8	8
Digit height	8 mm	8 mm	8 mm	8 mm
Control inputs	Pulses 10...260 VAC/VDC Floating contact NPN / PNP	Pulses 10...260 VAC/VDC Floating contact NPN / PNP	Pulses 10...260 VAC/VDC	NPN / PNP
Count mode	Adding or subtracting	Up/Down, differential counting	Up/Down	A 90° B
Count frequency	30 Hz, 7 kHz, 12 kHz	30 Hz, 7 kHz, 12 kHz	30 Hz	3 kHz, 6 kHz
Reset	Button and electric	Button and electric	Button and electric	Button and electric
Keylock	Electric	Electric	Electric	Electric
Programmable parameters	Count mode	Count mode	Count mode	Count mode
Dimensions	48 x 24 mm	48 x 24 mm	48 x 24 mm	48 x 24 mm
Protection (face)	IP 65	IP 65	IP 65	IP 65
Connection	Screw terminals	Screw terminals	Screw terminals	Screw terminals
Mounting	Clip frame or screw mount	Clip frame or screw mount	Clip frame or screw mount	Clip frame or screw mount
Options	Display backlighting 24 VDC, 50 mA	Display backlighting 24 VDC, 50 mA	Display backlighting 24 VDC, 50 mA	Display backlighting 24 VDC, 50 mA

Totalizers & position displays
Size max. 96 x 48 mm

Totalizers and incremental position displays.
Absolute position displays SSI.

- Pulse inputs NPN / PNP
- Adding or subtracting
- 6-digit LED display, 8-digit LCD display
- Length measurement with up/down counting

Features	■ Totalizers ■ Differential counting ■ Position displays ■ 6-digit LED display, 7.6 mm	■ Position displays ■ Programmable ■ Pulse evaluation ■ 6-digit LED display, 14 mm	■ SSI-Position displays ■ Programmable ■ 8-digit LCD display, 10 mm
Product family	N 208	N 214	NA214
Voltage supply	12...24 VDC	24/48 VAC ±10 % 115/230 VAC ±10 % 24 VDC ±10 %	85...265 VAC (50/60 Hz) 24 VDC ±10 %
Display	LED, 7-segment	LED, 7-segment	LCD-TFT, 2-lines alphanumeric
Number of digits	6	6	8
Digit height	7.6 mm	14 mm	10 mm (position value) 5 mm (menu guided)
Control inputs	NPN / PNP	NPN / PNP	NPN / PNP
Count mode	Adding or subtracting Differential counting A-B Total (parallel) A+B Up/Down, A 90° B phase evaluation	Adding or subtracting Differential counting A-B Total (parallel) A+B Up/Down, A 90° B phase evaluation	SSI format 1...31 bits
Count frequency	3 Hz, 25 Hz, 10 kHz	3 Hz, 25 Hz, 10 kHz	3 Hz, 25 Hz, 10 kHz
Reset	Button and electric	Button and electric	Button and electric
Keylock	Electric	Electric	Electric
Programmable parameters	Decimal point, set value Scaling factor, count mode Count frequency	Decimal point, set value Scaling factor, count mode Count frequency	Decimal point, set value Scaling factor, count mode Count frequency
Dimensions	53.2 x 28.2 mm 60 x 37.5 mm 50 x 25 mm	96 x 48 mm	96 x 48 mm
Protection (face)	IP 41	IP 65	IP 65
Connection	Screw terminals	Screw terminals	Screw terminals
Mounting	Spring clips Screw mount Socket box	Clip frame for built-in housing	Clip frame for built-in housing
Interface	–	RS232, RS422, RS485	RS485
Options	–	–	Relay and analog outputs

Totalizers mechanical
Stroke counters

Three designs, optional with 5-, 6- or 7-digit display.
- Adding
- Manual reset
- Surface mount with mounting plate



Features	■ Stroke counter ■ Adding ■ 5-digit		■ Stroke counter ■ Adding ■ 5- or 6-digit		■ Stroke counter ■ Adding ■ 5- or 7-digit	
Product family	H 126	H 127	H 300	H 310	H 400	H 410
Display	White numbers on black		White numbers on black		White numbers on black	
Number of digits	5		6	5	7	5
Measuring range	99999		999999	99999	9999999	99999
Digit height	4.5 mm		4.5 mm		7 mm	
Count mode	1 stroke = 1 count		1 stroke = 1 count		1 stroke = 1 count	
Stroke	>38° to <60°		>38° to <60°		>38° to <60°	
Stroke frequency	≤500 strokes/min		≤500 strokes/min		≤500 strokes/min	
Reset	Knurled knob		Detachable key	Reset lever	Detachable key	Reset lever
Drive shaft	Right or left		Both sides		Both sides	
Shaft diameter	4 mm		4 mm		7 mm	
Lever diameter	3.5 mm		5 mm		6 mm	
Dimensions	48 x 24 x 48 mm		69 x 48 x 28 mm		106 x 64 x 45 mm	
Mounting	Base plate, 4 mounting holes	Base plate, 2 mounting slots	Base plate, 6 mounting slots		Base plate, 4 mounting slots	

Totalizers mechanical
Meter counters

Two designs, optional with 5-, 6- or 7-digit display.

- Adding
- Manual reset
- Surface mount with mounting plate
- Matching measuring wheels as an accessory




Features	■ Meter counter ■ Adding ■ 5- or 6-digit		■ Meter counter, PTB ■ Adding ■ 5-digit	■ Meter counter ■ Adding ■ 5- or 7-digit		■ Meter counter, PTB ■ Adding ■ 5-digit
Product family	M 300	M 310	M 310.A	M 400	M 410	M 410.A
Display	White numbers on black Decimal digits in red		White numbers on black Decimal digits in red	White numbers on black Decimal digits in red		White numbers on black Decimal digit with graduation
Number of digits	6	5	5	7	5	5
Measuring range	99999.9 m	9999.9 m	999.99 m/cm	999999.9 m	9999.9 m	9999.99 m/cm
Digit height	4.5 mm		4.5 mm	7 mm		7 mm
Count mode	5 revolutions = 10 counts		5 revolutions = 100 counts	1 revolution = 10 counts 2 revolutions = 10 counts 5 revolutions = 10 counts		2 revolutions = 10 counts
Measuring speed	<100 m/min (with measuring wheel)		<100 m/min (with measuring wheel)	<100 m/min (with measuring wheel)		<200 m/min (with measuring wheel)
Reset	Detachable key	Reset lever	Reset lever	Detachable key	Reset lever	Reset lever
Drive shaft	Both sides		Both sides	Both sides		Both sides
Shaft diameter	4 mm		4 mm	7 mm		7 mm
Dimensions	69 x 48 x 28 mm		69 x 48 x 28 mm	106 x 64 x 45 mm		106 x 64 x 45 mm
Mounting	Base plate, 6 mounting slots	Base plate, 2 mounting slots	Base plate, 6 mounting slots	Base plate, 4 mounting slots		Base plate, 4 mounting slots
Options	–		–	M 411: Drive shaft from below		–

Totalizers mechanical
Revolution counters

Three designs, optional with 5-, 6- or 7-digit display.
- Surface mount with mounting plate
- Adding
- Manual reset




Features	■ Revolution counter ■ Adding ■ 5-digit		■ Revolution counter ■ Adding ■ 5- or 6-digit		■ Revolution counter ■ Adding ■ 5- or 7-digit		■ Revolution counter ■ Adding ■ Drive shaft at bottom ■ 5- or 7-digit	
Product family	U 126	U 127	U 300	U 310	U 400	U 410	U 401	U 411
Display	White numbers on black		White numbers on black		White numbers on black		White numbers on black	
Number of digits	5		6	5	7	5	7	5
Measuring range	99999		999999	99999	9999999	99999	9999999	99999
Digit height	4.5 mm		4.5 mm		7 mm		7 mm	
Count mode	1 revolution = 1 count		1 revolution = 1 count		1 revolution = 1 count		1 revolution = 1 count	
Operating speed	≤2000 rpm		≤3000 rpm		≤1000 rpm	≤3000 rpm	≤1000 rpm	
Reset	Knurled knob		Detachable key	Reset lever	Detachable key	Reset lever	Detachable key	Reset lever
Drive shaft	Single-sided		Both sides		Both sides		Drive shaft centered below	
Shaft diameter	4 mm		4 mm		7 mm		7 mm	
Dimensions	48 x 24 x 48 mm		69 x 48 x 28 mm		106 x 64 x 45 mm		106 x 64 x 45 mm	
Mounting	Base plate, 4 mounting holes	Base plate, 2 mounting slots	Base plate, 6 mounting slots		Base plate, 4 mounting slots		Base plate, 4 mounting slots	

Totalizers mechanical
Hand-held piece counters

With retaining ring.
For wall or table mount.

- Metal or plastic housing
- Adding
- Manual reset

Mechanical, hand-held piece counters for mobile and stationary applications ease counting persons, parts, events and a lot more.

Features	■ Piece counter with lever ■ Adding ■ 4-digit	■ Hand-held piece counter with retaining ring ■ Adding ■ Metal or plastic housing ■ 4-digit		■ Hand-held piece counter, table mount ■ Adding ■ Metal or plastic housing ■ 4-digit		■ Hand-held piece counter, wall mount ■ Adding ■ Metal or plastic housing ■ 4-digit	
Product family	T 127	T 120	T 130	T 123	T 134	T 124	T 134
Display	White numbers on black	White numbers on black		White numbers on black		White numbers on black	
Number of digits	4	4		4		4	
Measuring range	9999	9999		9999		9999	
Digit height	4.5 mm	4.5 mm		4.5 mm		4.5 mm	
Count mode	1 press = 1 count	1 press = 1 count		1 press = 1 count		1 press = 1 count	
Stroke	>38° to <60°	–		–		–	
Reset	Knurled knob	Knurled knob		Knurled knob		Knurled knob	
Push button	On one side	Top		Top		Top	
Shaft diameter	4 mm	–		–		–	
Dimensions	40 x 29 x 27.5 mm	ø53 mm		ø53 mm		ø53 mm	
Mounting	Base plate, 2 mounting slots	–		Base / mounting plate with 3 holes		Base / mounting plate with 3 holes	
Housing	Surface mount	With retaining ring		For table mount		For wall mount	
Housing colour	Grey	Silver	Yellow, red or grey	Silver	Yellow, red or grey	Silver	Yellow, red or grey
Housing material	Plastic	Metal	Plastic	Metal	Plastic	Metal	Plastic
Options	–	Available with customer logo imprint		Available with customer logo imprint		Available with customer logo imprint	

Totalizers electromechanical

Pulse counters

Pulse counters for AC/DC voltage pulses.

- Adding
- 4- to 8-digit display
- With or without reset button or detachable key
- Built-in housing




Features	■ Pulse counter, adding ■ With/without manual by reset button ■ 4- or 6-digit	■ Pulse counter, adding ■ With/without manual by reset button ■ 6- or 8-digit	■ Pulse counter, adding ■ With/without manual by reset button ■ 5- or 7-digit	■ Pulse counter, adding ■ With/without manual by reset button or detachable key ■ 6- or 8-digit
Product family	F 102, F 112, F 122	F 304, F 314, F 324, F 364	F 503, F 513, F 523	F 504, F 514, F 518, F 524
Voltage supply	24/110 VAC ±10 % 230 VAC +6/-10 % 24 VDC ±10 %	24/110 VAC ±10 % 230 VAC +6/-10 % 24 VDC ±10 %	24/110 VAC ±10 % 230 VAC +6/-10 % 12/24 VDC ±10 %	24/110 VAC ±10 % 230 VAC +6/-10 % 24 VDC ±10 %
Measuring range	9999 or 999999	999999 or 99999999	99999 or 9999999	999999 or 99999999
Number of digits	4 - with reset button 6 - w/o reset button	6 - with reset button 8 - w/o reset button	5 - with reset button 7 - w/o reset button	6 - with reset button 8 - w/o reset button
Digit height	4 mm	4.5 mm	4 mm	4.5 mm
Reset	Manual by reset button	Manual by reset button	Manual by reset button	Manual by reset button or detachable key
Count mode	1 pulse = 1 count	1 pulse = 1 count	1 pulse = 1 count	1 pulse = 1 count
Count frequency	6 pulses (230 VAC) 10 pulses (24 VAC) 20 pulses (24 VDC)	10 pulses (24/230 VAC) 20 pulses (24 VDC)	5 pulses (VAC) 10 pulses (VDC)	10 pulses (VAC) 20 pulses (VDC)
Dimensions	F 102 - 32 x 21.5 x 59 mm F 112 - 39 x 37 x 59 mm F 122 - 37 x 25 x 59 mm	F 304 - 50 x 25 x 85.5 mm F 314 - 60 x 50 x 61 mm F 324 - 53.2 x 28.2 x 61 mm F 364 - 66.5 x 37 x 75 mm	F 503 - 36 x 22 x 45 mm F 513 - 45.7 x 45.7 x 43 mm F 523 - 42 x 28 x 43 mm	F 504 - 50 x 25 x 85.5 mm F 514 - 60 x 37.5 x 61.3 mm F 518 - 66.5 x 37 x 61.3 mm F 524 - 53.2 x 28.2 x 61.3 mm
Protection	IP 41	IP 41	IP 41	IP 41
Connection	Soldering pins	Soldering pins	Stranded wires	Soldering pins
Mounting	F 102 - Screw mount F 112 - Front panel F 122 - Spring clips	F 304 - Socket box F 314 - Screw mount F 324 - Spring clips F 364 - Screw mount	F 503 - Screw mount F 513 - Front panel F 523 - Spring clips	F 504 - Socket box F 514 - Screw mount F 518 - Screw mount F 524 - Spring clips
Options	–	–	–	Front panel with flexible transparent cover or lockable plexiglass lid

Totalizers electromechanical
Pulse counters

Piece counting is a cycle repeating a thousand times at production and manufacturing facilities. The principal aid for quantity-relevant process control is the totalizer.

Switching operations with pinpoint accuracy.

NE212 – Electronic preset counter

Universal deployment.

Cutting and packaging operations as well as positioning require the position, length, quantity and processing time of an object to be acquired, calculated and displayed. But a preset counter can do a lot more: Comparing parameters, determining difference, outputting control variables and communicating with master controls via serial interface. Preset counters can relieve the burden on a higher-level control system. Self-sufficient and compact, they also allow for cost-efficient solutions in basic control applications.

Easy and quick preset entry

Where production parameters require frequent realignment, maybe several times a day, a numeric keypad is recommended.
A single touch on a key will both start and end the new preset operation. Preset entry is in the same way as at a pocket calculator.

Preset counters electronic

Size 48 x 48 mm

Main counter with 1 or 2 presets.
Batch counter, totalizer and time-controlled functions.

- Programmable parameters
- 5-, 6- or 8-digit LCD or LED display
- Soft-touch membrane keypad
- Optional: Interface RS485
- Optional: Analog output for display value (NE214)




Features	■ Preset counter with 1 or 2 presets ■ Pulses 12-260 VAC/VDC ■ Programmable parameters	■ Preset counter with 1 or 2 presets ■ Batch counter with/ without preset ■ Totalizer (parallel)	■ Preset counter with 1 preset ■ Time function ■ Programmable	■ Preset counter with 2 presets ■ Totalizer, hour and batch counter ■ Programmable
Product family	NE131	NE134	NE210	NE216
Voltage supply	10...30 VAC (50/60 Hz) 85...265 VAC (50/60 Hz) 10...30 VDC	24/48 VAC ±10 % (50/60 Hz) 85...265 VAC (50/60 Hz) 12...30 VDC	24/48 VAC ±10 % (50/60 Hz) 85...265 VAC (50/60 Hz) 24 VDC ±10 %	24/48 VAC ±10 % (50/60 Hz) 85...265 VAC (50/60 Hz) 12...30 VDC
Display	LCD, 7-segment, 2-line, backlit	LCD, 7-segment, 2-line, backlit	LED, 7-segment	LED, 7-segment
Number of digits	6	6 8 - totalizer/2 steps	5	5 8 - totalizer/2 steps
Digit height	7 mm (position value) 4 mm (preset)	7 mm (position value) 4 mm (preset)	7.6 mm	7.6 mm
Scaling factor	0.0001...9999.99	0.0001...9999.99	0.001...99.999	0.0001...9999.99
Control inputs	Voltage pulses 12...260 VAC/VDC	NPN / PNP	NPN / PNP	NPN / PNP
Count mode	Adding or subtracting	Adding or subtracting Differential counting A-B Total (parallel) A+B Up/Down, A 90° B x1/x2/x4	Adding or subtracting Differential counting A-B Total (parallel) A+B Up/Down, A 90° B x1/x2/x4	Adding or subtracting Differential counting A-B Total (parallel) A+B Up/Down, A 90° B x1/x2/x4
Count frequency	25 Hz (AC) 1 kHz (DC)	Main counter: max. 10 kHz Batch counter: max. 20 Hz	15 Hz, 10 kHz (adjustable)	3 Hz, 25 Hz, 10 kHz programmable
Reset	Button, electric or automatic	Button, electric or automatic	Button, electric or automatic	Button, electric or automatic
Outputs	Floating relay, change-over contact	Optocoupler Floating relay	NPN/PNP Floating relay	NPN/PNP Floating relay
Programmable parameters	Measuring units, Sensor logic, decimal point, Scaling factor, count mode	Measuring units, Sensor logic, decimal point, Scaling factor, count mode	Measuring units, Sensor logic, decimal point, Scaling factor, count mode, Time function	Operating modes, Sensor logic, scaling factor, Count mode, control inputs
Dimensions	48 x 48 x 100 mm	48 x 48 x 100 mm	48 x 48 x 100 mm	48 x 48 x 100 mm
Connection	Screw terminal connector	Screw terminal connector	Screw terminal connector	Screw terminal connector
Mounting	Clip frame for built-in housing	Clip frame for built-in housing	Clip frame for built-in housing	Clip frame for built-in housing
Interface	–	RS485	RS485	RS485
Options	Programmable as a time and hour counter	Adaptor plate for screw or clip mount	Time relay with delayed pick up and drop out	Programmable as a time and hour counter

Preset counters electronic
Size 72 x 72 mm / 96 x 48 mm

Cutting, positioning and packaging operations require the position, length, quantity and processing time of an object to be acquired, calculated and displayed. But a preset counter can do a lot more: Comparing parameters, determining difference, outputting control variables and communicating with higher-level controls via serial interface.

				
Features	■ Preset counter with 2 presets ■ Totalizer/batch counter ■ 10 figure keypad with 5 function keys	■ Preset counter with 2 presets ■ Totalizer, hour and batch counter	■ Preset counter with 2 presets and PTB approval 1.3 / 93.15 ■ Measurement in mm and cm	■ Preset counter with 2 presets ■ Totalizer and hour counter ■ DIN rail housing
Product family	NE212	NE214	NE215	NE230
Voltage supply	24/48 VAC ±10 % 85...265 VAC 24 VDC ±10 %	24/48 VAC ±10 % 115/230 VAC ±10 % 24 VDC ±10 %	115/230 VAC ±10 % 24 VDC ±10 %	14...28 VAC 85...265 VAC 10...30 VDC
Display	LED, 7-segment	LED, 7-segment	LED, 7-segment	LED, 7-segment
Number of digits	6 - totalizer-/main-/batch counter 8 - totalizer	6	6 - preset counter 8 - totalizer	6
Digit height	7.6 mm	14 mm	7.6 mm	7.6 mm
Scaling factor	0.0001...9999.99	0.0001...9999.99	0.0001...9999.99	0.0001...9999.99
Control inputs	NPN / PNP	NPN / PNP	NPN / PNP	NPN / PNP
Count mode	Adding or subtracting Differential counting A-B Total (parallel) A+B Up/Down, A 90° B x1/x2/x4	Adding or subtracting Differential counting A-B Total (parallel) A+B Up/Down, A 90° B x1/x2/x4	A 90° B	Adding or subtracting Differential counting A-B Total (parallel) A+B Up/Down, A 90° B x1/x2/x4
Count frequency	3 Hz, 25 Hz, 10 kHz programmable	3 Hz, 25 Hz, 10 kHz programmable	10 kHz	3 Hz, 25 Hz, 10 kHz programmable
Reset	Button, electric or automatic	Button, electric or automatic	Button, electric or automatic	Button, electric or automatic
Outputs	NPN/PNP transistor switch Relay change-over contact	Optocoupler Relay change-over contact	Relay change-over contact	Relay (normally open or closed, programmable)
Programmable parameters	Operating modes, Sensor logic, control inputs, Scaling factor, count mode	Operating modes, Sensor logic, control inputs, Scaling factor, count mode	Print output Sensor logic Scaling factor	Print output Sensor logic Scaling factor
Dimensions	72 x 72 x 108 mm	96 x 48 x 124 mm	72 x 72 x 105 mm	70 x 89 x 58 mm
Connection	Screw terminal connector	Screw terminal connector	Screw terminal connector	Screw terminal connector Connector D-SUB, 9-pin
Mounting	Clip frame for built-in housing	Clip frame for built-in housing	Clip frame for built-in housing	DIN rail housing for control cabinet installation
Interface	RS232, RS422, RS485	RS232, RS422, RS485	RS232 oder RS422/RS485	RS232, RS422, RS485
Options	With printer interface (NE213)	Analog output 0(2)...10 V, 0(4)...20 mA	–	–

Preset counters mechanical

Meter counters

Mechanical meter counters with 1 or 2 presets.
Adding or subtracting.

- 4- or 5-digit display
- Manual reset
- Robust top mount
- End contact with switching capacity 100 VA / 30 W




Features	■ Small meter counter with 1 preset ■ Subtracting ■ Reset button ■ 4-digit	■ Large meter counter with 1 preset ■ Subtracting ■ With/without precontact ■ Reset lever ■ 5-digit	■ Large meter counter with 2 presets ■ Adding ■ Reset lever ■ 5-digit	■ Large meter counter with 1 or 2 presets ■ PTB approval ■ Adding ■ Reset lever ■ 5-digit	
Product family	ME102	ME230	ME280	ME280 - PTB	ME282 - PTB
Display	White numbers on black Decimal digits in red	White numbers on black Decimal digits in red	White numbers on black Decimal digits in red	White numbers on black Decimal digits in red	White numbers on black Decimal digit with graduation
Number of digits	4	5	5	5	
Digit height	5.5 mm	7 mm	7 mm	7 mm	
Count mode	Subtracting in a direction to be indicated, adding in reverse direction	Adding in a direction to be indicated, subtracting in reverse direction	Adding in a direction to be indicated, subtracting in reverse direction	Adding in a direction to be indicated, subtracting in reverse direction	
Measuring speed	5 revs. = 1-count ≤2000 m/min 5 revs. = 10-counts ≤200.0 m/min	2 revs. = 1-count ≤2500 m/min 2 revs. = 10-counts ≤250.0 m/min	2 revs. = 1-count ≤3000 m/min 2 revs. = 10-counts ≤300.0 m/min	2 revs. = 100-counts ≤25.00 m/min	2 revs. = 10-counts = <250.0 m/min
Measuring range, max.	9999 m	99999 m	99999 m	99.99 m	9999.95 m
Drive shaft	Both sides, ø4 mm	Both sides, ø7 mm	Both sides, ø7 mm	Both sides, ø7 mm	
Measuring accuracy	1 m, 1 dm, 1 cm	1 m, 1 dm	1 m, 1 dm	1 cm	1 dm
Reset	Manual by reset button	Manual by reset lever	Manual by reset lever	Manual by reset lever	
Preset	1	1	2	1	2
Trigger	Momentary contact at 0000 Permanent contact at 9999	Permanent contact at 00000 Permanent contact at 99999 with precontact	Permanent contact at 00000 Permanent contact at 99999	Permanent contact at 00000 Permanent contact at 99999	
Output contact	Change-over contact	Change-over contact	Change-over contact	Change-over contact	
Switching capacity	100 VA / 30 W	100 VA / 30 W	100 VA / 30 W	100 VA / 30 W	
Dimensions	60 x 62 x 68.5 mm	126 x 88 x 78 mm	120 x 105 x 95 mm	120 x 105 x 95 mm	
Connection	Cable, 0.3 m, 3 pin	Terminal connector	Terminal connector	Terminal connector	
Mounting	Base plate with M4 mounting holes	Base plate, 4 mounting holes	Base plate, 4 mounting holes	Base plate, 4 mounting holes	
Options	With permanent precontact	With permanent precontact as permanent contact	–	–	

Preset counters mechanical
Revolution counters

Mechanical revolution counters with 1 or 2 presets.
Adding or subtracting.

- 4- or 5-digit display
- Manual reset
- Robust top mount
- End contact with switching capacity 100 VA / 30 W

Features	■ Small revolution counter with 1 preset ■ Subtracting ■ Reset button ■ 4-digit	■ Large revolution counter with 1 preset ■ Subtracting ■ With/without precontact ■ Reset lever ■ 5-digit	■ Large revolution counter with 2 presets ■ Adding ■ Reset lever ■ 5-digit
Product family	UE102	UE230	UE280
Display	White numbers on black	White numbers on black	White numbers on black
Number of digits	4	5	5
Digit height	5.5 mm	7 mm	7 mm
Count mode	Subtracting in a direction to be indicated, adding in reverse direction	Adding in a direction to be indicated, subtracting in reverse direction	Adding in a direction to be indicated, subtracting in reverse direction
Measuring speed	≤10000 rpm	≤5000 rpm	≤6000 rpm
Measuring range max.	9999 revs.	99999 revs.	99999 revs.
Drive shaft	Both sides, ø4 mm	Both sides, ø7 mm	Both sides, ø7 mm
Measuring accuracy	1 rev. = 1-digit	1 rev. = 1-digit	1 rev. = 1-digit
Reset	Manual by reset button	Manual by reset lever	Manual by reset lever
Preset	1 preset	1 preset	2 presets
Trigger	Momentary contact at 0000 Permanent contact at 9999	Permanent contact at 00000 Permanent contact at 99999	Permanent contact at 00000 Permanent contact at 99999
Output contact	Change-over contact	Change-over contact	Change-over contact
Switching capacity	100 VA / 30 W	100 VA / 30 W	100 VA / 30 W
Dimensions	60 x 62 x 68.5 mm	126 x 88 x 78 mm	120 x 105 x 95 mm
Connection	Cable, 0.3 m, 3 pin	Terminal connector	Terminal connector
Mounting	Base plate with M4 mounting holes	Base plate, 4 mounting holes	Base plate, 4 mounting holes
Options	With permanent precontact	–	–

Preset counters electromechanical

Pulse counters

Electromechanical pulse counters with 1 preset.
Adding or subtracting.

- 5- or 6-digit display
- Manual and electric reset
- Built-in housing
- End contact with switching capacity 100 VA / 30 W

Features	■ Pulse counter with 1 preset ■ Adding ■ Reset button ■ 5-digit display	■ Pulse counter with 1 preset ■ Subtracting ■ Reset button ■ 5-digit display	■ Pulse counter with 1 preset ■ Subtracting ■ Manual and electric reset ■ 5-digit display	■ Pulse counter with 1 preset ■ Adding ■ Reset button ■ 6-digit display
Product family	**FE304, FE314, FE324**	**FS304, FS314, FS324**	**FS309, FS319, FS329**	**FE504, FE514, FE524**
Voltage supply	24/110 VAC ±10 % (50/60 Hz) 230 VAC +6/-10 % (50/60 Hz) 24 VDC ±10 %	24/110 VAC ±10 % (50/60 Hz) 230 VAC +6/-10 % (50/60 Hz) 24 VDC ±10 %	24/110 VAC ±10 % (50/60 Hz) 230 VAC +6/-10 % (50/60 Hz) 24 VDC ±10 %	24/110 VAC ±10 % (50/60 Hz) 230 VAC +6/-10 % (50/60 Hz) 24 VDC ±10 %
Display	White numbers on black	White numbers on black	White numbers on black	White numbers on black
Number of digits	5	5	5	6
Digit height	4.5 mm	4.5 mm	4.5 mm	4.5 mm
Count mode	1 pulse = 1 count	1 pulse = 1 count	1 pulse = 1 count	1 pulse = 1 count
Count frequency	10 pulses (AC) 20 pulses (DC)	10 pulses (AC) 20 pulses (DC)	10 pulses (AC) 20 pulses (DC)	10 pulses (AC) 20 pulses (DC)
Measuring range	99999	99999	99999	999999
Reset	Manual by reset button	Manual by reset button	Manual by reset button and electric	Manual by reset button
Outputs	Change-over contact by micro-switch, one-pole	Change-over contact by micro-switch, one-pole	Change-over contact by micro-switch, one-pole	Change-over contact by micro-switch, one-pole
Switching capacity	100 VA / 30 W	100 VA / 30 W	100 VA / 30 W	100 VA / 30 W
Dimensions	FE304 - 50 x 50 x 85.9 mm FE314 - 60 x 75 x 61 mm FE324 - 53.2 x 53.2 x 61 mm	FS304 - 50 x 50 x 85.9 mm FS314 - 60 x 75 x 61 mm FS324 - 53.2 x 53.2 x 61 mm	FS309 - 50 x 50 x 85.9 mm FS319 - 60 x 75 x 61 mm FS329 - 53.2 x 53.2 x 61 mm	FE504 - 50 x 50 x 85.9 mm FE514 - 60 x 75 x 61 mm FE524 - 53.2 x 53.2 x 61 mm
Connection	Soldering pins	Soldering pins	Soldering pins	Soldering pins
Mounting	FE304 - Socket box FE314 - Screw mount FE324 - Spring clips	FS304 - Socket box FS314 - Screw mount FS324 - Spring clips	FS309 - Socket box FS319 - Screw mount FS329 - Spring clips	FE504 - Socket box FE514 - Screw mount FE524 - Spring clips
Options	Front panel with flexible transparent cover or lockable plexiglass lid	Front panel with flexible transparent cover or lockable plexiglass lid	With permanent precontact as permanent contact	Front panel with flexible transparent cover or lockable plexiglass lid

Preset counters electromechanical
Pulse counters

Large electromechanical pulse counter with 1 preset.
Subtracting.

- 5-digit display
- Manual and electric reset
- Built-in housing 144 x 72 mm
- End contact with switching capacity 100 VA / 30 W

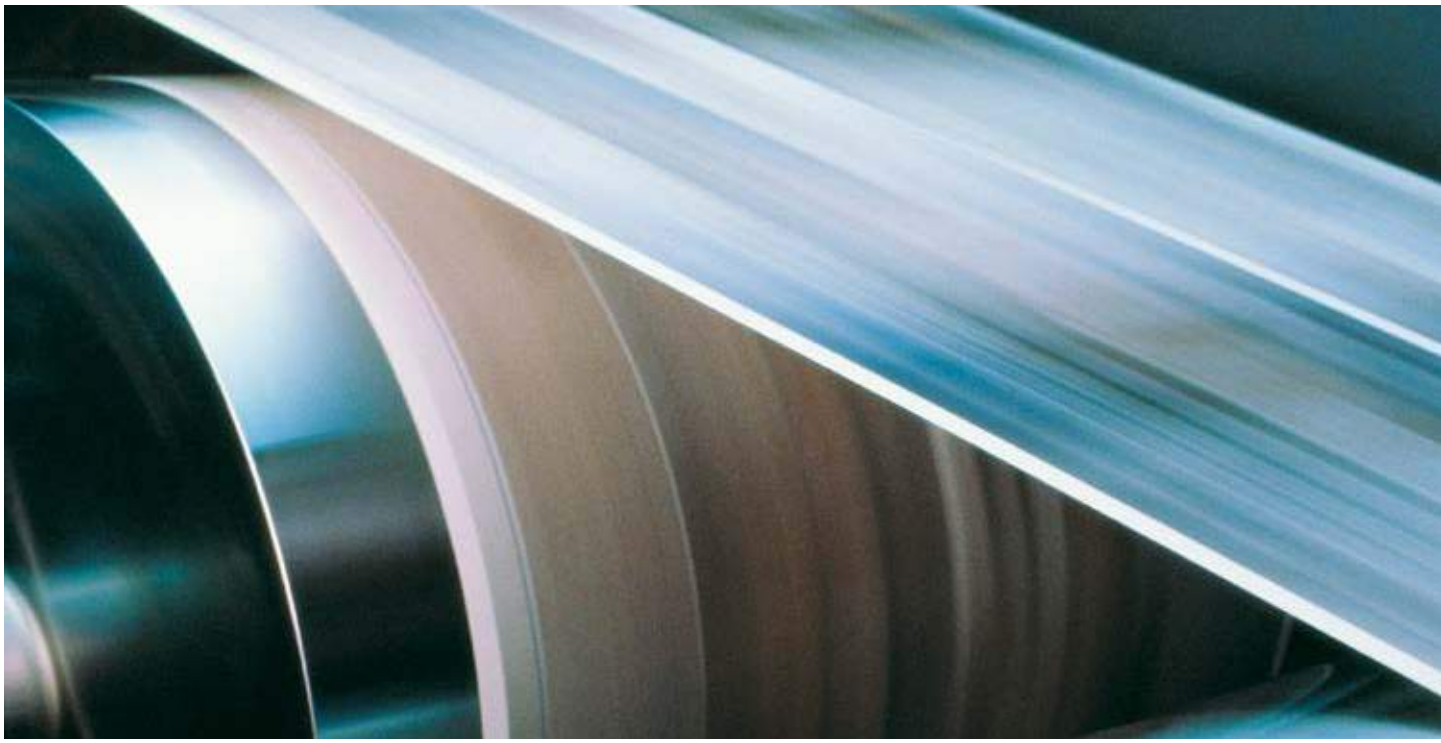
Features	■ Pulse counter with 1 preset ■ Subtracting ■ Manual and electric reset ■ 5-digit display	
Product family	FS218	FS219

Voltage supply	24/110 VAC ±10 % (50/60 Hz) 230 VAC +6/-10 % (50/60 Hz) 24 VDC ±10 %	
Display	White numbers on black	
Number of digits	5	
Digit height	8 mm	
Count mode	1 pulse = 1 count	
Count frequency	10 pulses (AC) 20 pulses (DC)	
Measuring range	99999	
Reset	Manual by reset button	Manual by reset button and electric
Outputs	Change-over contact by micro-switch, one-pole	
Switching capacity	100 VA / 30 W	
Dimensions	144 x 72 x 129 mm	
Connection	Terminal connector, 10-pin	
Mounting	Front panel with 4 screws	
Options	Front plate with flexible transparent cover	

Reliably keeping the pace.

TA202 – Electronic tachometer

Tachometer & process displays



Analog and digital.

At present-day production facilities, significant variables as speed and clock rate must be monitored and displayed. Electronic tachometers and process displays evaluate the analog and digital measured values and, depending on the configuration, will calculate and provide the required information in the display. The measuring principle combining period duration and gate measurement ensures precise results. Pulse evaluation can be configured at will to have the result displayed in the desired measuring unit.

Typical fields of application:
- Speed monitoring and display
- Display of throughput
- Display of clock rate
- Monitoring slippage and torsion
- Monitoring stretching/compression
- Fill level acquisition, distance measurement

Process monitoring

By acquiring two frequencies in parallel, TA202 provides the speed ratio and is also capable of monitoring functions. Optional digital and analog outputs are available for further enhanced process control.

Tachometer electronic

For digital and analog measured values

Rotation speed and velocity display.
Signal inputs for NPN / PNP.

- One or two frequency inputs
- 5- or 6-digit LCD or LED display
- Adjustable limits
- Interface RS485

Features	■ Small tachometer and frequency display ■ Display unit 1/s ■ 5-digit LCD display	■ Tachometers for rotation speed and velocity display ■ Programmable ■ 6-digit LED display, 14 mm	■ Tachometer with 2 limits ■ Programmable ■ 6-digit LCD display	■ Tachometer as speed ratio display ■ 6-digit LED display, 14 mm
Product family	ISI36	TA200	TA134	TA201
Voltage supply	Lithium battery	24/48 VAC ±10 % (50/60 Hz) 115/230 VAC ±10 % (50/60 Hz) 24 VDC ±10 %	24/48 VAC ±10 % (50/60 Hz) 85...265 VAC (50/60 Hz) 12...30 VDC	24/48 VAC ±10 % (50/60 Hz) 115/230 VAC ±10 % (50/60 Hz) 24 VDC ±10 %
Display	LCD, 7-segment, backlit	LED, 7-segment	LCD, 7-segment, 2-line, backlit	LED, 7-segment
Number of digits	5	6	6, programmable	6
Digit height	8 mm	14 mm	7 mm	14 mm
Scaling factor	–	0.0001...9999.99	0.0001...9999.99	0.0001...9999.99
Control inputs	NPN / PNP	NPN / PNP Comparator	NPN / PNP Comparator	NPN / PNP Comparator
Measuring principle	Gate time measurement 1 s	Period duration measure-ment	Period duration measure-ment	Period duration measurement
Count frequency	30 Hz, 7 kHz, 12 kHz	25 Hz, 40 kHz	25 Hz, 40 kHz programmable	F1: 10 kHz / F2: 25 Hz, 40 kHz programmable
Calculating functions	–	–	1/s, 1/min, 1/h program-mable	Differential F1-F2 Ratio F1:F2 Stretch/shrinking (F2-F1):F1 Flow Pulse rate measurement
Outputs	–	–	Relay, optocoupler	Relay, optocoupler
Programmable parameters	–	Measuring units, Sensor logic, scaling factor, Pulse frequency	Measuring units, Sensor logic, scaling factor, Count frequency	Assignment F1, F2 or F3 Calculating functions Count frequency
Dimensions	48 x 24 x 48 mm	96 x 48 x 124 mm	48 x 48 x 100 mm	96 x 48 x 124 mm
Connection	Screw terminals 5 mm pattern	Screw terminal connector	Screw terminal connector	Screw terminal connector
Mounting	Clip frame or screw mount	Clip frame for built-in housing	Clip frame for built-in housing	Clip frame for built-in housing
Interface	–	–	RS485	–

Process displays electronic
For digital and analog measured values

Two-frequency ratio display.
Process display for analog sensors.

- 6-digit LED display
- Soft-touch membrane keypad
- Adjustable limits
- Interface RS232, RS422 or RS485
- Analog output 0(2)...10 V, 0(4)...20 mA


Features	■ Tachometer as speed ratio display ■ Two limits ■ 6-digit LED display, 14 mm	■ Process display with analog measured value input ■ Two limits with relay ■ Programmable ■ 6-digit LED display, 14 mm
Product family	TA202	PCD41
Voltage supply	24/48 VAC ±10 % (50/60 Hz) 115/230 VAC ±10 % (50/60 Hz) 24 VDC ±10 %	24/48 VAC ±10 % (50/60 Hz) 115/230 VAC ±10 % (50/60 Hz) 24 VDC ±10 %
Display	LED, 7-segment	LED, 7-segment
Number of digits	6	6
Digit height	14 mm	14 mm
Scaling factor	0.0001...9999.99	–
Control inputs	NPN / PNP Comparator	Analog 0(2)...10 V, 0(4)...20 mA
Measuring principle	Period duration measure-ment	Analog input , Resolution 12 bit
Count frequency	F1: 10 kHz / F2: 25 Hz, 40 kHz programmable	–
Calculating functions	Differential F1-F2 Ratio F1:F2 Stretch/shrinking (F2-F1):F1 Flow Pulse rate measurement	–
Outputs	Floating relay (change-over contact) Optocoupler Analog output 0(2)...10 V, 0(4)...20 mA Resolution 12 bit	Relay (normally open or closed) programmable
Programmable parameters	Assignment F1, F2 or F3 Calculation functions 2 limits, analog output Slave point	Analog input, limits Control inputs, calculating functions, offset (maximum and minimum analog limit)
Dimensions	96 x 48 x 124 mm	96 x 48 x 124 mm
Connection	Screw terminal connector	Screw terminal connector
Mounting	Clip frame for built-in housing	Clip frame for built-in housing
Interface	RS232, RS422, RS485	RS232, RS422, RS485

Time is money.

BE134 – Electronic hour meter

Time & hour meters

Electronic and electromechanical.

Time and hour meters acquire operating hours of machines, facilities and instruments. Product variants with preset option and control output as well as RS interface master time-controlled processes.

Time and hour counters acquire operating hours and determine maintenance intervals, but also provide throughput and machine operating hours.

Special characteristics

Electronic counters operate with quartz precision and are independent of the prevailing grid frequency. Product variants with configurable measuring ranges offer even more versatility in the application.

Time & hour meters

Time counter / Timer

Trigger NPN / PNP and 10...260 VAC/VDC.
Measuring range programmable.

- With and without preset
- LCD or LED display
- Programmable time slots
- Interface RS485




Features	■ Time/hour meter with count input for NPN-, PNP logic ■ Count input 10...260 VAC/VDC ■ 7-digit / 8-digit LCD display		■ Time/hour meter with 1 or 2 presets ■ Count input 12...260 VAC/VDC ■ 6-digit LCD display	■ Time/hour meter with 2 presets ■ NPN-/PNP input ■ 6-digit / 8-digit LCD display	■ Preset counter with 1 or 2 presets ■ Programmable ■ 5-digit LED display ■ Programmable as a time counter	
Product family	ISI34	ISI35	NE131	BE134	NE210	NE216
Voltage supply	Lithium battery		10...30 VAC (50/60 Hz) 85...265 VAC (50/60 Hz) 10...30 VDC	24/48 VAC ±10 % (50/60 Hz) 85...265 VAC (50/60 Hz) 12...30 VDC	24/48 VAC ±10 % (50/60 Hz) 85...265 VAC (50/60 Hz) 24 VDC ±10 %	12...30 VDC
Display	LCD, 7-segment, backlit		LCD, 7-segment, 2-line, backlit	LCD, 7-segment, 2-line, backlit	LED, 7-segment	
Number of digits	7	8	6 8 - totalizer/2 steps	6 8 - totalizer/2 steps	5	
Digit height	8 mm		7 mm (position value) 4 mm (preset)	7 mm (position value) 4 mm (preset)	7.6 mm	
Measuring range	9999 h 59 min 99999.99 h	9999 h 59 min 59 s 9999999.9 h	999.99 s / 999.59.9 min 9999.59 min / 9999.59 h 999999 h	9999.99 s / 999.59.9 min 9999.59 min / 9999.59 h	999 s 99/100 s 99 min 59 s 9/10 s 999 min 59 s / 999 h 59 min	
Control inputs	NPN / PNP Pulses 10...260 VAC/VDC		Voltage pulses 12...260 VAC/VDC	NPN / PNP	NPN / PNP	
Count mode	Adding		Adding or subtracting	Adding or subtracting	Adding or subtracting	
Preset	–		1 or 2	2	1	2
Reset	Button or electric		Button, electric or automatic	Button, electric or automatic	Button, electric or automatic	
Outputs	–		Floating relay (change-over contact)	Optocoupler Relay (normally open or closed)	Optocoupler Relay (normally open/ closed)	NPN, PNP, Relay (change-over contact)
Programmable parameters	Time slot		Sensor logic, decimal point, Scaling factor, count mode, Time slot	Measuring units, Sensor logic, decimal point, Scaling factor, count mode, Time slot	Operating modes, Sensor logic, scaling factor, Control inputs, count mode, Time slot	
Dimensions	48 x 24 x 48 mm		48 x 48 x 100 mm	48 x 48 x 100 mm	48 x 48 x 108 mm	
Connection	Screw terminals		Screw terminal connector	Screw terminal connector	Screw terminal connector	
Mounting	Clip frame or screw mount		Clip frame for built-in housing	Clip frame for built-in housing	Clip frame for built-in housing	
Interface	–		–	RS485	–	RS485
Options	Keylock		–	–	–	

Hour meters

Trigger 18 to 400 VAC.
DIN housing 48 x 48 mm.

- 7-digit
- Measuring range 99 999.99 h or 999 999.9 h

Cure time
Maintenance cycles
Cooling time
Machine operating time
Mixing time
Set-up times
Throughput

Features	■ Hour meter ■ DIN housing 48 x 48 mm ■ VAC trigger ■ 7-digit	■ Hour meter ■ DIN housing 48 x 48 mm ■ VDC trigger ■ 7-digit
Product family	B 148	B 160
Voltage supply	18...26 VAC / 50 Hz 36...48 VAC / 50 Hz 110...120 VAC / 50 Hz 220...240 VAC / 50 Hz 350...400 VAC / 50 Hz 24...30 VAC / 60 Hz 110...127 VAC / 60 Hz 220...240 VAC / 60 Hz	10...80 VDC
Display	White numbers on black Decimal digits in yellow Red running indicator	White numbers on black Decimal digits in red
Number of digits	7	7
Digit height	4 mm	4 mm
Measuring range	99 999.99 h	999 999.9 h
Control inputs	VAC	VDC
Count mode	Adding	Adding
Running accuracy	Mains synchronization	<1 s / 24 h, stepping motor
Reset	Without	Without
Dimensions	48 x 48 x 43 mm	48 x 48 x 38 mm
Connection	Screw terminals Flat connector outlet	Screw terminals
Mounting	Clip frame for built-in housing Rear screw mount Snap-on base for DIN rail EN 50022	Clip frame for built-in housing DIN rail housing EN 50022

Optimal.
Flexible.
Dependable.

Measuring wheel – MR261 and MR592

Accessories for counters.

Several front and adaptor panels with flexible or lockable transparent cover provide optimum protection against dirt, dust or water in any installation environment.

Measuring wheels

When selecting a measuring wheel, the kind of material to be measured must be considered prior to deciding on the wheel's profile or cover lining. Measuring wheels with 20 cm, 30.48 cm (1 foot) or 50 cm circumference are available with different surface profiles and linings.

Accessories

Small measuring wheels

20 cm circumference.
- For 4...10 mm shaft diameter
- Different surface profiles
- Aluminium or plastic wheel

Features	■ Small measuring wheel with 20 cm circumference ■ Surface: Aluminium knurled	■ Small measuring wheel with 20 cm circumference ■ Surface: Hytrel TPE-E smooth	■ Small measuring wheel with 20 cm circumference ■ Surface: Nitrile NBR knubbed rubber	■ Small measuring wheel with 20 cm circumference ■ Surface: Hytrel TPE-E knurled
Product family	MR211	MR241	MR261	MR291
Circumference	20 cm	20 cm	20 cm	20 cm
Outer diameter	63.33 mm ±0.1 mm	63.33 mm ±0.1 mm	63.33 mm ±0.1 mm	63.33 mm ±0.1 mm
Mounting bore	ø4 mm, ø7 mm	ø4 mm, ø5 mm, ø6 mm, ø7 mm, ø10 mm	ø4 mm, ø5 mm, ø6 mm, ø7 mm, ø10 mm	ø4 mm, ø5 mm, ø6 mm, ø7 mm, ø10 mm
Surface profile	Knurled	Smooth	Knubbed rubber	Knurled
Surface material	Aluminium	Hytrel TPE-E	Nitrile NBR	Hytrel TPE-E
Wheel material	Aluminium	Plastic	Aluminium	Plastic
Surface hardness, approx.	–	90° Shore A	55° ±5° Shore A	90° Shore A
Operating temperature	–30...+180 °C	–10...+70 °C	–10...+50 °C	–10...+70 °C
Fastening torque/pin	1.5 Nm	1.5 Nm	1.5 Nm	1.5 Nm
Suitable material	Cardboard, wood, (textile)	Plastic, painted material, Paper, cardboard, wood, Metal, textile	Textile	Plastic, painted material, Paper, cardboard, wood, Metal, textile

Accessories
Large measuring wheels

50 cm or 1 foot circumference.

- For 6...12 mm shaft diameter
- Different surface profiles
- Aluminium or plastic wheel

■ Large measuring wheel with 50 cm circumference ■ Surface: Aluminium knurled	■ Large measuring wheel with 50 cm circumference ■ Surface: Hytrel TPE-E smooth or knurled	■ Large measuring wheel with 50 cm circumference ■ Surface: Vulkollan PUR smooth	■ Large measuring wheel with 50 cm circumference ■ Surface: Nitrile NBR knubbed rubber	■ Measuring wheel 30.48 cm (1 foot) circumference ■ Surface: Vulkollan PUR smooth
MR512	**MR542** | **MR592**	**MR552**	**MR562**	**MR752**
50 cm	50 cm	50 cm	50 cm	30,48 cm
159.15 mm ±0.2 mm	159.15 mm ±0.2 mm	159.15 mm ±0.2 mm	159.15 mm ±0.2 mm	97.02 ±0.06 mm
ø7 mm, ø10 mm	ø6 mm, ø7 mm, ø10 mm, ø12 mm	ø7 mm, ø10 mm	ø7 mm, ø10 mm	ø4 mm, ø7 mm, ø9.52 mm, ø10 mm
Knurled	Smooth | Knurled	Smooth	Knubbed rubber	Smooth
Aluminium	Hytrel TPE-E	Vulkollan PUR	Nitrile NBR	Vulkollan PUR
Aluminium	Plastic	Aluminium	Aluminium	Aluminium
–	90° Shore A	94° Shore A	55° ±5° Shore A	92° Shore A
–30...+180 °C	–10...+70 °C	–30...+80 °C	–10...+50 °C	–30...+80 °C
3 Nm	3 Nm	3 Nm	3 Nm	1.5 Nm
Cardboard, wood, (textile)	Plastic, painted material, Paper, cardboard, wood, Metal, textile	Plastic, painted material, Paper, cardboard, wood, Metal, wire	Textile	Plastic, painted material, Paper, cardboard, wood, Metal, wire

Measuring wheels

Measuring wheels can be attached to both an encoder and electronic or mechanical counter or process display. Different designs, surface linings and profiles ensure ever-precise measured results on most varied materials.

Accessories

Mounting accessories

Front frame, adaptor and front plates.

- Screw or clip mount
- Front plates with transparent cover
- Front plates and front frames with and without plexiglass lid

Features	■ Adaptor plates ■ For electronic counters in DIN housing	■ Front panel with flexible, transparent cover	■ Frame with transparent lid with knob or cylinder lock	■ Frame and transparent lid with knob lock
Product family	Z 118.033, Z 118.034, Z 118.035	Z 100.01A, Z 100.02A Z 100.03A, Z 100.04A	Z 102.01A, Z 102.02A	Z 102.050
Dimensions	Front 60 x 75 mm Front 53.2 x 53.2 mm Front 60 x 75 mm	50 x 25 mm, 50 x 50 mm 50 x 75 mm, 114 x 61 mm	64.5 x 79.5 mm	64.5 x 79.5 mm
Mounting	Screw mount Clip mount	Screw mount	Screw mount	Screw mount
Cutout dimensions	50.5 x 50.5 mm	–	55 x 55 mm	50.5 x 50.5 mm
Suitable for matching counters	BE134, NE131, NE134, NE210, NE216, TA134	F 304, F 504, FE304, FE504, FS304, FS218, FS219	FE304, FE504, FS304, FS309	

Features	■ Front frame with cylinder lock provided on transparent cover	■ Front frame with different cutouts ■ 50 x 25 mm	■ Front frame with different cutouts ■ 50 x 50 mm	■ Front frame with different cutouts ■ 50 x 75 mm, 100 x 50 mm
Product family	Z 105.02A	Z 107.01A	Z 107.02A	Z 107.03A, Z 107.04A
Dimensions	64.5 x 55 mm	60 x 50 cm	60 x 75 mm	100 x 60 mm, 110 x 75 mm
Mounting	Screw mount	Screw mount	Screw mount	Screw mount
Cutout dimensions		55 x 30 mm	55 x 55 mm	55 x 80 mm, 105 x 55 mm
Suitable for matching counters	F 304, F 504, N 208	F 304, F 504, N 208	FE304, FE504, FS304, FS309	Combination of several electromechanical counters

Worldwide presence.

Africa
Algeria
Cameroon
Côte d'Ivoire
Egypt
Morocco
Reunion
South Africa

America
Brazil
Canada
Colombia
Mexico
United States
Venezuela

Asia
Bahrain
China
India
Indonesia
Israel
Japan
Kuwait
Malaysia
Oman
Philippines
Qatar
Saudi Arabia
Singapore
South Korea
Taiwan
Thailand
UAE

Europe
Austria
Belgium
Bulgaria
Croatia
Czech Republic
Denmark
Finland
France
Germany
Greece
Hungary
Italy
Malta
Martinique
Netherlands
Norway
Poland
Portugal
Romania
Russia
Serbia
Slovakia
Slovenia
Spain
Sweden
Switzerland
Turkey
United Kingdom

Oceania
Australia
New Zealand

For more information about our worldwide locations go to:
www.baumer.com/worldwide

Baumer
Passion for Sensors

Baumer Group
International Sales
P.O. Box · Hummelstrasse 17 · CH-8501 Frauenfeld
Phone +41 (0)52 728 1122 · Fax +41 (0)52 728 1144
sales@baumer.com · www.baumer.com

Represented by:

03/15 No. 11135823

Baumer
Passion for Sensors

Process sensors

Product overview

Partnership.
Precise.
Pioneering.

Visibly better: Baumer sensors.

The Baumer Group is leading at international level in the development and production of sensors, shaft encoders, measuring instruments as well as components for automatic image processing. As an owner-managed family business, we employ about 2400 workers worldwide in 38 subsidiaries and 19 countries. With marked customer orientation, consistently high quality and vast innovation capability, Baumer develops specific solutions for many industries and applications worldwide.

Our standards – your benefits.

- Passion coupled with expertise – both have made us a sensor pioneer and technology leader
- Our range of services is hard to beat – we have the right product, developed by our own team, for every task
- Inspiring through innovation – a challenge Baumer employees take on every day
- Reliability, precision and quality – our customers' requirements are what drives us
- Partnership from the start – together with our customers we develop suitable solutions
- Always a step ahead – thanks to our production depth, our flexibility and our delivery reliability
- Available worldwide – Baumer is Baumer everywhere

Baumer
Passion for Sensors

Process sensors

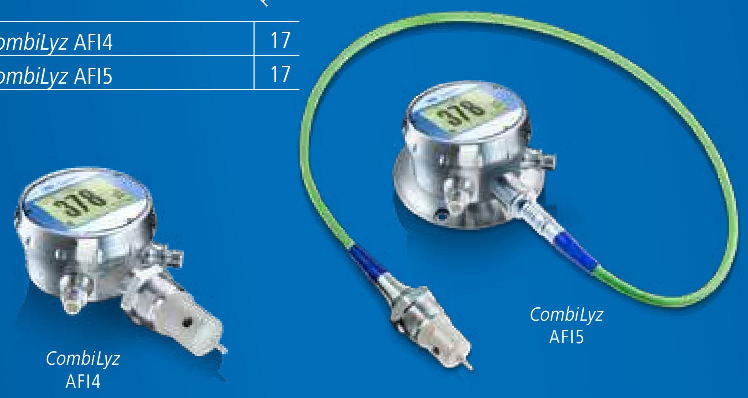
Selection guide

Pressure measurement

	Measuring range (bar)	Min. span (bar)	Accuracy (± % FS)	Absolute pressure	Media temperature ≥ 125 °C	Dry cell (no liquids)	PNP switch	Current Loop 4 … 20 mA	Voltage output	HART	Display	ATEX	Type	Page
Hygienic/front-flush	–1 … 40	0.1	0.1; 0.25	■	■			■	■			■	PBMH hygienic	9
Hygienic/front-flush	–1 … 400	0.1	0.1; 0.25; 0.5	■	■			■	■			■	PBMN flush	8
Hygienic/front-flush	–1 … 68	0.05	0.1; 0.25	■	■		■	■		■	■	■	*CombiPress* PFMH	9
Hygienic/front-flush	–1 … 400	0.05	0.1; 0.25	■	■		■	■		■	■	■	*CombiPress* PFMN	8
Hygienic/front-flush	–1 … 40	0.4	0.1; 0.25	■	■			■	■				PBMH autoclavable	9
General industrial	–1 … 40	0.1	0.1; 0.25; 0.5	■	■			■	■			■	PBMN low pressure	8
General industrial	–1 … 600	1.0	0.5; 0.7	■	■	■		■	■				PBSN	6
General industrial	–1 … 600	1.0	0.5 (BFSL)	■		■	■						CPX	6
General industrial	–1 … 200	1.0	0.5 (BFSL)			■		■	■				CTX/CTL	6
General industrial	0 … 1600	60	0.1; 0.25; 0.5		■	■		■	■			■	PBMN high pressure	8
Hydraulics	0 … 1000	25	0.5		■	■		■	■				PBM4	7
Railway	0 … 250	1.0	0.5		■	■		■	■				EF6	7
Railway	–1 … 40	0.1	0.1; 0.25; 0.5	■	■			■	■				PBMR	7

Conductivity measurement

	Measuring range (mS/cm)	Min. span (mS/cm)	PNP switch	Current Loop 4…20 mA	HART	Type	Page
All-in-one sensor	0 … 1000	0.5	■	■	■	*CombiLyz* AFI4	17
Separated sensor	0 … 1000	0.5	■	■	■	*CombiLyz* AFI5	17



Temperature measurement

Measuring range (°C)	Accuracy class (EN 60751)	Transmitter accuracy (± °C)	Fit for mounting head transmitter	Compact OEM version	RTD resistance output	Wall or pipe mounted	Remote Sensor	PNP switch	Current Loop 4…20 mA	HART	Modbus	Display	ATEX	Type	Page
Hygienic	–50 … +250	1/6 B, AA, A, B		■		■			■	■	■		■	■	*CombiTemp* TFRH	10
Hygienic	–50 … +250	1/6 B, AA, A, B	0.25		■	■				■					TE2	11
Hygienic	–50 … +250	1/6 B, AA, A, B	0.25		■	■				■					TER8	11
Hygienic	–50 … +205	1/6 B, AA, A, B				■		■							Hygienic cable sensor	14
General industrial	–50 … +400	1/6 B, AA, A, B		■		■			■	■	■		■	■	*CombiTemp* TFRN	10
General industrial	–50 … +400	1/6 B, AA, A, B		■		■				■	■			■	TCR6	11
Environmental temperature	–40 … +85	1/6 B, AA, A, B		■			■	■	■	■	■		■	■	*CombiTemp* TFR5	10
HVAC, general industrial	–50 … +205	1/6 B, AA, B				■		■							Universal cable sensor	14

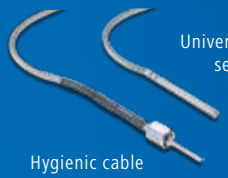

CombiTemp TFRN


CombiTemp TFRH


TE2


TER8


TCR6


Universal cable sensor

Hygienic cable sensor

Temperature transmitter

Measuring range (°C)	Accuracy (± °C)	Pt100	Pt500	Pt1000	T/C	Current Loop 4…20 mA	HART	ATEX	Type	Page
Head transmitter	–200 … +850	0.25 (0.1 % FS)	■				■		■	FlexTop 2202 (Pt100)	12
Head transmitter	–100 … +1820	3.0; 4.0; 5.0				■	■		■	FlexTop 2203 (T/C)	12
Head transmitter	–100 … +160	0.25		■			■		■	FlexTop 2204 (Pt500)	12
Head transmitter	–250 … +2300	0.1 (Pt); 1.0; 2.0 (T/C)	■	■	■	■	■		■	FlexTop 2211 (Universal)	12
Head transmitter	–250 … +2300	0.1 (Pt); 1.0; 2.0 (T/C)	■	■	■	■	■	■	■	FlexTop 2221 (HART)	13
DIN-rail transmitter	–200 … +850	0.25 (0.1 % FS)	■				■			FlexTemp 2301 (Pt100)	13
DIN-rail transmitter	–250 … +2300	0.1 (Pt); 1.0; 2.0 (T/C)	■	■	■	■	■			FlexTemp 2311 (Universal)	13
DIN-rail transmitter	–250 … +2300	0.1 (Pt); 1.0; 2.0 (T/C)	■	■	■	■	■	■		FlexTemp 2321 (HART)	13


FlexTemp


FlexTop

Level measurement

Immersion depth (mm)	Point level	Continuous level	Bulk solids	Hygienic	PC programmable	LED indicator	LED indicator multicolor	Direct teach-in	*qTeach*	Electrode terminal	PNP / NPN switch	IO-Link	Current Loop 4…20 mA	ATEX	Type	Page
Frequency sweep		■		■		■		■		■		■	■		■	*CleverLevel* LBFI	15
Frequency sweep		■		■	■	■		■		■		■	■		■	*CleverLevel* LBFH	15
Frequency sweep	0 … 250	■		■	■	■	■					■			■	*CleverLevel* LBFS	15
Frequency sweep	0 … 250	■		■	■	■	■		■			■			■	*CleverLevel* LFFS	15
Conductive single rod	0 … 2000	■			■						■	■				LSKx2x	16
Conductive multi rod	0 … 2000	■			■						■					LSKx5x	16
Potentiometric	200 … 3000		■		■				■					■		LSP051.x	16


CleverLevel LBFI

CleverLevel LBFH

CleverLevel LBFS


CleverLevel LFFS


LSKx2x


LSKx5x


LSP051.x

Flow measurement

	Measuring range (cm/s)	Immersion depth (mm)	Hygienic	PNP / NPN switch	IO-Link	Current Loop 4…20 mA	Type	Page
	10 … 400	16 … 100		■	■	■	*FlexFlow* PF20S	18
	10 … 400	32 … 50	■	■	■	■	*FlexFlow* PF20H	18

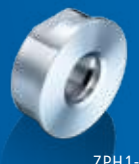
FlexFlow PF20S

FlexFlow PF20H

Process connections & accessories

Hygienic adapters	ZPH1
Weld-in sleeves	ZPW1, ZPW2
Vibronic level switch replacement	ZPH1-32xx
Standard threaded adapters	ZPI1
Blind plugs, welding mandrels	ZPX5, ZPX6
Additional parts, gaskets, o-rings	ZPXx

ZPH1-524E



ZPH1-5236

ZPH1-327

ZPH1-3213

ZPX4-x10

ZPI1-32A

ZPX6-66

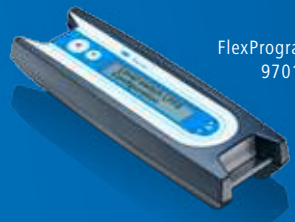
ZPH1-626

ZPH1-327

Interfaces

	ATEX	Type	Page
Graphics display	■	*CombiView* DFON	19
USB programming interface		FlexProgrammer 9701	19
IO-Link programming interface		USB IO-Link Master	
Evaluation unit for LSK		DNGA	
ATEX barrier for LxFS	■	PROFSI3	

CombiView DFON



FlexProgrammer 9701

Compliance and approvals

Baumer products meet international industrial standards. Where appropriate or selected by options, they are FDA compliant, fulfil the requirements of the respective 3-A Sanitary Standards or comply with EU regulations 1935/2004, 10/2011 and 2023/2006. In addition certain products are EHEDG certified. For hazardous environments you have a choice of ATEX approved products. Please refer to the related data sheets for details.

Information on product characteristics may relate to defined product options.
Only the applicable product data sheet is of relevance.

www.baumer.com

Baumer
Passion for Sensors

	Hygienic interfacing																												
Process connection	G 1/8 B male thread hygienic	M12×1.5 hygienic	G 1/2 A hygienic	G1 A hygienic	BHC 3A DN 38	BHC 3A DN 76	Tri-Clamp Ø 24.9	Tri-Clamp Ø 34.0	Tri-Clamp Ø 50.5, ID ≤ 23.7	Tri-Clamp Ø 50.5, ID ≥ 26.0	Tri-Clamp Ø 64.0	DIN 11851 (dairy pipe connection), DN 25	DIN 11851 (dairy pipe connection), DN 32	DIN 11851 (dairy pipe connection), DN 40	DIN 11851 (dairy pipe connection), DN 50	DIN 11851 (dairy pipe connection), DN 65	DIN 11864-1-A (aseptic screwed union), DN 40	DIN 11864-1-A (aseptic screwed union), DN 50	DIN 11864-3-A (Aseptic Clamp), DN25, Ø 50.5	SMS 1145, DN 38	SMS 1145, DN 51	Varivent® DN 25; 1" (Type F), Ø 50	Varivent® DN 32 … 125; 1 1/2" … 6" (Type N), Ø 68	G 1/4 A ISO 228-1	G 1/2 A ISO 228-1	G 1/2 A ISO 228-1 BSC
BCID	A01	A02	A03	A04	B01	B02	C01	C02	C03	C04	C05	D01	D02	D03	D04	D05	H03	H04	H41	S01	S02	V01	V02	G03	G06	G07
CTL/CTX																										
PBSN																										
CPX																										
PBM4																										
EF6																										
PBMR																										
PBMN low pressure																										
PBMN high pressure																										
PBMN flush				■	■	●				●	●	●	●	●	●	●	●				●	●		●					
CombiPress® PFMN				■	■	●				●	●	●	●	●	●	●	●				●	●		●					
PBMH autoclavable								■	■	■	■	■																	
PBMH hygienic						■	■	■	■	■	■	■								■			■	■					
CombiPress® PFMH						■	■				■	■												■					
CombiTemp® TFRN																										
CombiTemp® TFRH				■	●	■				■	■	■	●		●	●						●		■					
CombiTemp® TFR5																										
TE2		■	■	■	●	■		■		■	■	●	●		●	●						●	●	●		■		
TER8				■	●	●				●	●	●	●		●	●		●	●			●	●	●				
TCR6																									■			
Hygienic cable sensor		■																										
Universal cable sensor																										
CleverLevel® LBFS				■	●	●				●	●	●	●		●	●		●	●			●	●	●				■
CleverLevel® LFFS				■	●	■				●	●	●	●		●	●		●	●			●	●	●				
CleverLevel® LBFI				■	●	●				●	●	●	●		●	●		●	●			●	●	●				■
CleverLevel® LBFH				■	●	●				●	●	●	●		●	●		●	●			●	●	●				
LSP05X.X					■						●	●		●	●	●	●				●	●		●					
LSKx2x				■	●	●				●	●	●	●		●	●						●		●					
LSKx5x					■						●	●		●	●	●	●				●	●		●					
AFI4					■						●	●		●	●	●	●				●	●		●					
AFI5					■						●	●		●	●	●	●				●	●		●					
FlexFlow PF20H				■	●	■			■	■	■	■	■		■	■		●	●			●	■	■					
FlexFlow PF20S																									●	●			

■ One-Piece Design
● Adapter available

Industrial interfacing

G08	G09	G10	G11	G12	G13	G14	G16	G20	G21	G23	G24	G30	G31	G32	G44	G50	G51	M05	M07	M08	M11	N01	N02	N03	N04	R01	T03	T04	T06	T07	T10	T44	T52
G 1/2 A ISO 228-1 with cone	G 1/2 A DIN 3852-E with O-ring at the front	G 3/4 A ISO 228-1	G 1 A ISO 228-1	G 1 A DIN 3852-E with O-ring at the front	G 1 1/4 A ISO 228-1	G 1 1/2 A ISO 228-1	G 2 A ISO 228-1	G 1/8 A ISO 228-1 female thread	G 1/4 A ISO 228-1 female thread	G 1/2 A ISO 228-1 female thread	G 3/4 A ISO 228-1 female thread	G 1/4 B EN 837-1	G 1/2 B EN 837-1	G 3/8 B EN 837-1	G 1/2 A DIN 3852-A	G 1/4 A DIN 3852-E	G 1/2 A DIN 3852-E	M14×1.5, cone 60°	M18×1.5 ISO 261 / ISO 965	M20×1.5 ISO 261 / ISO 965	M18×1 ISO 261 / ISO 965	1/4-18 NPT	1/2-14 NPT	3/4-14 NPT	1-11 1/2 NPT	R 1/2 ISO 7/1	G 1 A ISO 228-1 (EH FTL GW2)	G 3/4 A ISO 228-1 (EH FTL GQ2)	G 3/4 A ISO228-1 (VS Ø 21.3)	G 1 A ISO228-1 (VS Ø 21.3)	G 1/2 A ISO 228-1 for reverse assembly (in-shell thread)	Sealing cone M18×1.5	Compression fitting Ø 6
■	■		●	■		●	●					■	■			■	■					■	■				●	●	●	●			
			●			●	●					■	■			■	■					■	■				●	●	●	●			
												■	■			■						■	■										
									■			■	■			■	■																
									■			■	■			■	■					■	■										
									■			■	■			■	■					■	■										
									■			■	■			■	■	■				■	■										
															■		■						■			■							
			●			●	●										●												●	●	●	●			
			●			●	●					●	●	●		■	■					■	■		●				●	●	●	●			
			●			●	●					●	●	●	■				■	■			■			■								
		■	■														■						■	■			■							
		■	■			●	●										■						■	■	●			●	●	●	●	■		
			●			●	●										●							■	●			●	●	●	●			
			●			●	●										●							■	●			●	●	●	●			
			●			●	●										●								●			●	●	●	●			
					●	●																											
			●		●	●											●								●			●	●	●	●			
					●	●																											
					●	●																											
					●	●																											
			●			●	●										●								●			●	●	●	●			
■			●																													■	■

								Weld-in-sleeves																			Pipe ends				
	Sleeve Ø 5.8	Sleeve Ø 6	Sleeve Ø 8	Sleeve Ø 10	7/16-20 UNF with cone (SAE 4)	7/16-20 UNF with o-ring (SAE 4)	9/16-18 UNF with o-ring (SAE 6)	Ø 16 x 12.2 (Thin-walled tanks)	DN 25, Ø 16 (Pipes without collar)	Ø 25 x 17 (Thin-walled tanks)	Ø 30 x 26 (Thick-walled tanks)	Ø 45 x 34 (Thin-walled tanks)	Ø 30 x 34 (Thick-walled tanks)	DN 25 … 50, Ø 29 x 36.5 (Pipes with collar)	DN 65 … 150, Ø 30 x 36.5 (Pipes with collar)	Ø 35 × 34 (Inclined mounting)	Taper Ø 16	Ø 35 × 20 (Thick-walled tanks)	DN 40 … 50, Ø 40 x 28 (Pipes with collar)	DN 65 … 150, Ø 41 x 28 (Pipes with collar)	Ø 50 × 23 (Thick-walled tanks)	Ø 55 × 23 (Thick-walled tanks)	Ø 60 × 20.5 (Thick-walled tanks)	DN 38, Ø 38 x 40 (Pipes with collar)	Ø 55 × 32 (Thick-walled tanks)	Ø 120 × 32 (Thick-walled tanks)	ISO 2037	BS 4825-1	3A ASTM A270	SMS 3008	Dutch Dairy
	T64	T65	T66	T67	U01	U02	U04	W01	W02	W05	W10	W20	W21	W25	W26	W30	W31	W35	W40	W41	W45	W46	W50	W60	W65	W70	P12	P21	P31	P41	P46
					■	■	■																								
												●	●	●	●	●		●	●	●	●	●	●								
												●	●	●	●	●			●	●	●										
																								●	●	●	●	●	●	●	●
																								●	●	●	●	●	●	●	●
		■	■																												
												●	●	●	●	●								●	●		●	●	●	●	●
	■	■																													
		■						●	●	●		●	●	●	●	●								●	●		●	●	●	●	●
												●	●	●	●	●															
		■	■	■																											
	■																														
								●	●																						
											●	●	●	●	●	●															
												●	●	●	●	●								●	●		●	●	●	●	●
											●	●	●	●	●	●															
												●	●	●	●	●															
																			●	●	●	●									
												●	●	●	●	●															
																			●	●	●	●									
																			●	●	●	●									
																			●	●	●	●									
												●	●			●								●	●		●	●	●	●	●
																	●	●													

Baumer – rely on our technological advantage

Sophisticated and proven products, top precision and expert consultancy – Baumer meets all these demands in every respect. Our broad product portfolio provides optimally suited, dependable solutions, which provide a one-stop solution to meet your individual requirements. Our longstanding expertise, practical insights and technological supremacy give you the control you need to maximize production and equipment performance as well to reduce downtime and maintenance to a minimum.

Customization – our understanding of individual needs
Operating worldwide and present across the globe, we are always close to provide you with competent on-site support. The customer is at the very heart of our services, and our level of commitment is characterized by taking swift and effective action to respond to our customers' needs. Furthermore, beside our standard portfolio, we are specialized to produce your individual product in terms of your application demands.

Content.

Electronic pressure

The Baumer in-house cell competence:
Baumer provides the optimum technology
for your specific applications.

	CTX/CTL	PBSN	CPX
Product highlights	■ Compact design ■ Robust ceramic measuring cell ■ Relative pressure and vacuum measurement	■ Standard use ■ Robust ceramic measuring cell ■ Absolute, relative pressure and vacuum measurement	■ Two switching outputs ■ Robust ceramic measuring cell ■ Absolute, relative pressure and vacuum measurement
Application examples	OEM, HVAC, pneumatics, agricultural vehicles	Pneumatics, oxygen applications, hydraulics	OEM, HVAC, pneumatics, hydraulics
Measuring ranges	–1 … 0 bar to 0 … 200 bar	–1 … 0 bar to 0 … 600 bar	–1 … 0 bar to 0 … 600 bar
Process conditions	–40 … +100 °C	–40 … +125 °C	–20 … +100 °C
Technology	Ceramic thick film	Ceramic thick film	Ceramic thick film
Wetted parts material	CTL: brass CTX: AISI 316L (1.4404) Ceramic (96 % Al_2O_3) NBR, EPDM, FKM	AISI 316L (1.4404) Ceramic (96 % Al_2O_3) NBR, EPDM, FKM	AISI 316L (1.4404) Ceramic (96 % Al_2O_3) NBR, EPDM, FKM
Accuracy (max. measuring error)	≤ 0.5% FS (BFSL)	≤ 0.5 % FS ≤ 0.7 % FS	≤ 0.5 % FS (BFSL)
Output signal	4 … 20 mA 0 … 10 V 1 … 5 V 0.5 … 4.5 V ratiometric	4 … 20 mA 0 … 10 V	2× PNP switch
Proof pressure	> 2× NP, max. 360 bar	> 2× NP, max. 600 bar	> 2× NP, max. 500 bar
Versatile options for process connection	G 1/4 B EN 837-1 G 1/2 B EN 837-1 G 1/4 A DIN 3852-E 1/4-18 NPT 1/2-14 NPT	G 1/4 B EN 837-1 G 1/2 B EN 837-1 G 1/4 A DIN 3852-E 1/4-18 NPT 1/2-14 NPT	G 1/4 B EN 837-1 G 1/2 B EN 837-1 G 1/4 A DIN 3852-E 1/4-18 NPT 1/2-14 NPT
Electrical connection	M12, 4 pins DIN 43650 Shielded cable	M12, 4 pins DIN 43650 Shielded cable	M12, 5 pins DIN 43650
Degree of protection	IP 65, IP 67	IP 65, IP 67	IP 65, IP 67
Compliance and approvals			
Additional information		■ External programming of zero point and span with FlexProgram	■ External programming of switching thresholds with FlexProgram

Pressure control with EF6 for:

- Braking
- Slide regulation
- Retarder cooling
- Sanding system
- Pantograph pressure

	PBM4	EF6	PBMR
Product highlights	■ Standard use in hydraulics ■ Fully welded, dry measuring cell ■ Compact and light weight design ■ E1 approval for mobile hydraulics ■ Relative pressure measurement	■ Tested for railway applications ■ Robust ceramic measuring cell ■ Designed for harsh environments ■ Relative pressure measurement	■ Tested for railway applications ■ Fully welded stainless steel membrane ■ Excellent accuracy and stability ■ Absolute, relative pressure and vacuum measurement
Application examples	OEM, hydraulics, overload monitoring, robot arm gripping pressure control	Pneumatic braking systems, railway applications, mobile hydraulics	Railway applications, pneumatic subsystems (e.g. pantograph), cabin pressure monitoring, testing and measuring equipment
Measuring ranges	0 … 10 bar to 0 … 1000 bar	0 … 2.5 bar to 0 … 250 bar	−1 … 0 bar to 0 … 40 bar
Process conditions	−40 … +150 °C	−40 … +125 °C	−40 … +120 °C
Technology	Metal thin film	Ceramic thick film	Piezoresistive silicon
Wetted parts material	AISI 630 (1.4548)	AISI 316L (1.4404) Ceramic (96% Al_2O_3) FVMQ, NBR, EPDM, FKM	AISI 316L (1.4404) AISI 316L (1.4435)
Accuracy (max. measuring error)	≤ 0.5 % FS	≤ 0.5% FS	≤ 0.1 % FS (NP ≥ 400 mbar) ≤ 0.25 % FS ≤ 0.5 % FS
Output signal	4 … 20 mA 1 … 6 V 0 … 5 V 0 … 10 V 0.5 … 4.5 V ratiometric	4 … 20 mA 0 … 10 V	4 … 20 mA 0 … 10 V
Proof pressure	> 2× NP, max. 1200 bar	> 2× NP	> 3× NP
Versatile options for process connection	G 1/4 B EN 837-1 G 1/4 A DIN 3852-E 1/4-18 NPT 7/16-20 UNF with cone (SAE 4) 7/16-20 UNF with o-ring (SAE 4) 9/16-18 UNF with o-ring (SAE 6)	G 1/4 A ISO 228-1 female thread G 1/4 B EN 837-1 G 1/2 B EN 837-1 G 1/4 A DIN 3852-E	G 1/4 A ISO 228-1 female thread G 1/4 B EN 837-1 G 1/2 B EN 837-1 G 1/4 A DIN 3852-E G 1/2 A DIN 3852-E 1/4-18 NPT 1/2-14 NPT
Electrical connection	M12, 5 pins	M12, 4 pins DIN 43650 Shielded cable	M12, 4 pins DIN 43650
Degree of protection	IP 67	IP 65, IP 67	IP 65, IP 67
Compliance and approvals		EN50155 (railway)	EN50155 (railway) EN 61373:1999, 2010 (shock and vibration)

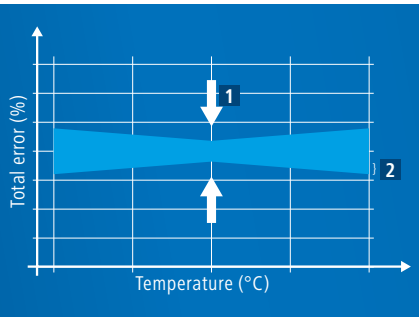
Customization is our passion!
One of our strengths is customizing products to your individual needs.

	PBMN low pressure	PBMN high pressure	PBMN flush	*CombiPress*® PFMN
Product highlights	■ Fully welded membrane ■ High sensitivity from 100 mbar ■ Excellent temperature stability ■ Absolute, relative pressure and vacuum measurement	■ Fully welded membrane ■ Precise up to 1600 bar ■ Excellent temperature stability ■ Relative pressure measurement	■ Cavity-free process connection ■ Compact installation from G 1/2 A ■ Excellent temperature stability ■ CIP capability	■ Cavity-free process connection ■ Compact installation from G 1/2 A ■ High-precision and temperature stable ■ Touch display with tank illustration
Application examples	Vacuum control, level measurement of mineral oil, air-flow meters	Hydraulics, cranes, turbines, overload monitoring, pneumatic springs	Vapor phase control, continuous level measurement, density measurement, pasty or crystallizing media	Filter monitoring, continuous level measurement, density measurement, pasty or crystallizing media
Measuring ranges	–1 … 0 bar to 0 … 40 bar	0 … 60 bar to 0 … 1600 bar	–1 … 0 bar to 0 … 400 bar	–1 … 0 bar to 0 … 400 bar
Process conditions	–40 … +120 °C	–40 … +120 °C	–40 … +125 °C –40 … +200 °C (with cooling neck)	–40 … +125 °C –40 … +200 °C (with cooling neck)
Technology	Piezoresistive silicon	Metal thin film	Piezoresistive silicon	Piezoresistive silicon
Wetted parts material	AISI 316L (1.4404)	AISI 316L (1.4404)	AISI 316L (1.4404) AISI 316L (1.4435)	AISI 316L (1.4404) AISI 316L (1.4435)
Accuracy (max. measuring error)	≤ 0.1 % FS (NP ≥ 400 mbar) ≤ 0.25 % FS ≤ 0.5 % FS	≤ 0.1 % FS ≤ 0.25 % FS ≤ 0.5% FS	≤ 0.1 % FS (NP ≥ 400 mbar) ≤ 0.25 % FS ≤ 0.5 % FS	≤ 0.1 % FS (NP ≥ 400 mbar) ≤ 0.25 % FS
Output signal	4 … 20 mA 0 … 10 V	4 … 20 mA 0 … 10 V	4 … 20 mA 0 … 10 V	4 … 20 mA + HART® 2× PNP switch
Proof pressure	3× NP	> 2× NP	3× NP, max. 690 bar	3× NP, max. 690 bar
Versatile options for process connection	G 1/4 A ISO 228-1 female thread G 1/4 B EN 837-1 G 1/2 B EN 837-1 G 1/4 A DIN 3852-E G 1/2 A DIN 3852-E 1/4-18 NPT 1/2-14 NPT	G 1/4 A ISO 228-1 female thread G 1/4 B EN 837-1 G 1/2 B EN 837-1 G 1/4 A DIN 3852-E G 1/2 A DIN 3852-E M14×1.5, cone 60° 1/4-18 NPT 1/2-14 NPT	G 1/2 A hygienic G1 A hygienic G 1/2 A ISO 228-1 with cone G 1/2 A DIN 3852-E with O-ring at the front G 1 A DIN 3852-E with O-ring at the front G 1/2 A DIN 3852-E 1/2-14 NPT	G 1/2 A hygienic G1 A hygienic G 1/2 A DIN 3852-E 1/2-14 NPT
Electrical connection	M12, 4 pins DIN 43650 Shielded cable	M12, 4 pins DIN 43650 Shielded cable	M12, 4 pins DIN 43650 Shielded cable	M12, 5 pins M12, 8 pins Cable gland, M16
Degree of protection	IP 65 , IP 67	IP 67, IP 69K	IP 65 , IP 67	IP 67, IP 69K
Compliance and approvals	ATEX	ATEX	ATEX	ATEX
Additional information			■ External programming of zero point and span with FlexProgram	■ Internal setting of zero point ■ External programming with FlexProgram

Total error band

(accuracy and thermal drift)

The total error band specifies max. measuring error (zero-point and span error, nonlinearity, hysteresis and non-repeatability acc. EN 61298-2) and the thermal drift over a temperature range.



1 Max. measuring error at ambient temperature

2 Thermal drift

	PBMH autoclavable	PBMH hygienic	*CombiPress*® PFMH
Product highlights	■ Fully autoclavable up to 140 °C ■ High-precision and temperature stable ■ Surface roughness ≤ 0.4 Ra	■ Certified hygienic design ■ SIP / CIP capability ■ Excellent temperature stability	■ Certified hygienic design ■ SIP / CIP capability ■ High-precision and temperature stable ■ Touch display with tank illustration
Application examples	Biotechnology, pharmaceutical, pressure monitoring	Controlling of CIP procedure, vapor phase control, continuous level measurement	Controlling of CIP procedure, filter monitoring, continuous level measurement
Measuring ranges	–1 … 0 bar to 0 … 40 bar	–1 … 0 bar to 0 … 40 bar	–1 … 0 bar to 0 … 60 bar
Process conditions	–10 … +125 °C –10 … +200 °C (with cooling neck)	–40 … +125 °C –40 … +200 °C (with cooling neck)	–40 … +125 °C –40 … +200 °C (with cooling neck)
Technology	Piezoresistive silicon	Piezoresistive silicon	Piezoresistive silicon
Wetted parts material	AISI 316L (1.4435)	AISI 316L (1.4404) AISI 316L (1.4435)	AISI 316L (1.4404) AISI 316L (1.4435)
Accuracy (max. measuring error)	≤ 0.1 % FS ≤ 0.25 % FS	≤ 0.1 % FS (NP ≥ 400 mbar) ≤ 0.25 % FS	≤ 0.1 % FS (NP ≥ 400 mbar) ≤ 0.25 % FS
Output signal	4 … 20 mA 0 … 10 V	4 … 20 mA 0 … 10 V	4 … 20 mA + HART® 2× PNP switch
Proof pressure	> 3× NP	> 3× NP	> 3× NP
Versatile options for process connection	Tri-Clamp Ø 24.9 Tri-Clamp Ø 34.0 Tri-Clamp Ø 50.5 Tri-Clamp Ø 64.0	BHC 3A DN 38 BHC 3A DN 76 Tri-Clamp Ø 24.9 Tri-Clamp Ø 34.0 Tri-Clamp Ø 50.5 Tri-Clamp Ø 64.0 DIN 11864-3-A (Aseptic Clamp), DN25, Ø 50.5 Varivent® DN 25; 1" (Type F), Ø 50 Varivent® DN 32 … 125; 1 1/2" … 6" (Type N), Ø 68	BHC 3A DN 38 BHC 3A DN 76 Tri-Clamp Ø 50.5 Tri-Clamp Ø 64.0 Varivent® DN 32 … 125; 1 1/2" … 6" (Type N), Ø 68
Electrical connection	M12, 4 pins Fischer plug, 4 pins	M12, 4 pins DIN 43650 Shielded cable	M12, 5 pins M12, 8 pins Cable gland, M16
Degree of protection	IP 67	IP 65, IP 67	IP 67, IP 69K
Compliance and approvals	3-A EHEDG	ATEX 3-A EHEDG	ATEX 3-A EHEDG
Additional information	■ External programming with FlexProgram ■ Available with optional electropolished process connection	■ External programming of zero point and span with FlexProgram	■ Internal setting of zero point ■ External programming with FlexProgram

Electronic temperature

Another Baumer INNOVATION

CombiSeries – Safe and convenient process monitoring and control.

	CombiTemp® TFRN	*CombiTemp*® TFRH	*CombiTemp*® TFR5
Product highlights	■ Threaded process connections ■ Immersion depth to 3000 mm ■ Touch display with backlight alert	■ Certified hygienic design ■ SIP / CIP capability ■ Immersion depth to 3000 mm ■ Touch display with backlight alert	■ Wall or tube mounting ■ Indoor and outdoor applications ■ Cable or fixed sensor ■ Touch display with backlight alert
Application examples	Monitoring of cooling circuits, heat exchanger control, laboratory equipment	Controlling of CIP procedure, pasteurizer control, pharmaceutical equipment	Pipe systems, room temperature measurement, fridge monitoring
Measuring ranges	–40 … +160 °C –40 … +400 °C (with cooling neck)	–40 … +160 °C –40 … +250 °C (with cooling neck)	–30 ... +80 °C –200 … +850 °C (with detached sensor)
Sensor element	Pt100	Pt100	Pt100
Accuracy class (EN 60751)	1/6 B, AA, A, B	1/6 B, AA, A, B	1/6 B, AA, A, B
Output signal	4 … 20 mA + HART®, 2× PNP switch	4 … 20 mA + HART®, 2× PNP switch	4 … 20 mA + HART®, 2× PNP switch
Wetted parts material	AISI 316L (1.4404)	AISI 316L (1.4404)	
Versatile options for process connection	G 1/2 A DIN 3852-A G 1/2 A DIN 3852-E 1/2-14 NPT R 1/2 ISO 7/1 Sleeve Ø 6 mm Sleeve Ø 8 mm	G 1/2 A hygienic BHC 3A DN 38 Tri-Clamp Ø 50.5 Tri-Clamp Ø 64.0 Varivent® DN 32 … 125; 1 1/2" … 6" (Type N), Ø 68	Sleeve Ø 5.8 mm Sleeve Ø 6 mm
Degree of protection	IP 67, IP 69K	IP 67, IP 69K	IP 67
Compliance and approvals	ATEX	ATEX 3-A	ATEX

	TE2	TER8	TCR6
Product highlights	■ Compact design ■ Hygienic and industrial process connections ■ SIP / CIP capability ■ Immersion depth to 3000 mm ■ Integrated 4 … 20 mA transmitter or Pt100 output ■ Easy process implementation on tube from DN 25 or on tank	■ Front-flush or immersion depth 20 mm, 50 mm ■ Certified hygienic design ■ SIP / CIP capability ■ Optimum placement even in stirrers and pigging systems ■ Integrated 4 … 20 mA transmitter or Pt100 output ■ Fast response time ■ 3-A-compliant without elastomers	■ Housing DIN form B ■ Immersion depth to 3000 mm ■ 4 … 20 mA + HART®, Pt100 or Pt1000 output
Application examples	Controlling of CIP procedure, temperature monitoring, pasteurizer control	Ice cream and cooking vessels with wipers, pigging systems	Monitoring of cooling circuits, pumps and compressors, marine industries
Measuring ranges	–40 … +115 °C –40 … +175 °C (with cooling neck)	–40 … +115 °C +135 °C max. (t < 1 h)	–50 … +400 °C –50 … +600 °C (with cooling neck)
Sensor element	Pt100	Pt100	Pt100, Pt1000
Accuracy class (EN 60751)	1/6 B, AA, A, B	1/6 B, AA, A, B	1/6 B, AA, A, B
Output signal	4 … 20 mA Pt100	4 … 20 mA Pt100	4 … 20 mA + HART® Pt100 Pt1000
Wetted parts material	AISI 316L (1.4404) (PEEK)	PEEK	AISI 316L (1.4404)
Versatile options for process connection	G 1/8 B male thread hygienic M12×1.5 hygienic G 1/2 A hygienic BHC 3A DN 38 Tri-Clamp Ø 24.9 Tri-Clamp Ø 50.5 G 1/2 A ISO 228-1 G 1/4 A DIN 3852-E G 1/2 A DIN 3852-E 1/4-18 NPT 1/2-14 NPT Sleeve Ø 6 mm	G 1/2 A hygienic	G 1/2 A ISO 228-1 G 3/4 A ISO 228-1 G 1 A ISO 228-1 G 1/2 A ISO 228-1 female thread G 3/4 A ISO 228-1 female thread G 1/2 A DIN 3852-A M18×1.5 ISO 261 / ISO 965 M20×1.5 ISO 261 / ISO 965 1/2-14 NPT R 1/2 ISO 7/1 Sleeve Ø 6 mm Sleeve Ø 8 mm Sleeve Ø 10 mm
Degree of protection	IP 65, IP 67	IP 67, IP 69K	IP 65
Compliance and approvals	3-A	3-A	ATEX

User configurable transmitters for head mounting.

	FlexTop 2202	FlexTop 2203	FlexTop 2204	FlexTop 2211
Product highlights	■ Specifically for Pt100 ■ ATEX explosion protection ■ DIN form B housing installation	■ Specifically for T/C ■ ATEX explosion protection ■ DIN form B housing installation	■ Specifically for Pt500 ■ ATEX explosion protection ■ DIN form B housing installation	■ Programmable input type ■ ATEX explosion protection ■ DIN form B housing installation
Application examples	OEM applications	OEM applications	OEM applications	OEM applications
Accuracy	< 0.25 °C	< 3 … 5 °C	< 0.25 °C	< 0.1 °C (Pt100)
Measuring ranges	Pt100: –200 … +850 °C R: 0 … 500 Ohm	T/C: –100 … +1820 °C U: –10 … 100 mV	Pt500: –100 … +160 °C R: 0 … 1000 Ohm	RTD: –200 … +850 °C T/C: –270 … +2300 °C U: –0,1 … 1,1 V R: 0 … 2200 Ohm
Input	Pt100, R	T/C, U	Pt500, R	Pt100, T/C, U, R
Output	4 … 20 mA	4 … 20 mA	4 … 20 mA	4 … 20 mA
Degree of protection	IP 40	IP 40	IP 40	IP 40
Compliance and approvals	ATEX	ATEX	ATEX	ATEX

Transmitters with your individual logo and in your individual housing color.

	 FlexTop 2221	 FlexTemp 2301	 FlexTemp 2311	 FlexTemp 2321
Product highlights	■ Programmable input type ■ 4 … 20 mA + HART® ■ ATEX explosion protection ■ DIN form B housing installation	■ Specifically for Pt100 ■ DIN rail mounting	■ Programmable input type ■ DIN rail mounting	■ Programmable input type ■ 4 … 20 mA + HART® ■ DIN rail mounting
Application examples	OEM applications	Cabinet installation	Cabinet installation	Cabinet installation
Accuracy	< 0.1 °C (Pt100)	< 0.25 °C	< 0.1 °C (Pt100)	< 0.1 °C (Pt100)
Measuring ranges	RTD: –200 … +850 °C T/C: –270 … +2300 °C U: –0,1 … 1,1 V R: 0 … 2200 Ohm	Pt100: –200 … +850 °C	RTD: –200 … +850 °C T/C: –270 … +2300 °C U: –0,1 … 1,1 V R: 0 … 2200 Ohm	RTD: –200 … +850 °C T/C: –270 … +2300 °C U: –0,1 … 1,1 V R: 0 … 2200 Ohm
Input	Pt100, T/C, U, R	Pt100	Pt100, T/C, U, R	Pt100, T/C, U, R
Output signal	4 … 20 mA + HART®	4 … 20 mA	4 … 20 mA	4 … 20 mA + HART®
Degree of protection	IP 40	IP 10	IP 10	IP 10
Compliance and approvals	ATEX			

	Hygienic cable sensor	Universal cable sensor
Product highlights	■ Compact and light weight ■ Hygienic design ■ Pt100 sensor element	■ Air temperature or thermowell mounted ■ Cable length according to customer specification ■ Pt100 or Pt1000 sensor element
Application examples	Pipe systems, pasteurizer control	Heating systems, HVAC
Measuring ranges	–50 … +205 °C	–50 … +205 °C
Sensor element	Pt100	Pt100 Pt1000
Accuracy class (EN 60751)	B, A, AA, 1/6 B	B, AA, 1/6 B
Wetted parts Material	AISI 316L (1.4404)	AISI 316Ti (1.4571)
Versatile options for process connection	G 1/8 B male thread hygienic	Sleeve Ø 5.8 mm
Degree of protection	IP 65	IP 65

Another Baumer INNOVATION

CleverLevel Switch
The clever alternative to vibrating forks.

IO-Link

IO-Link

	CleverLevel® LBFS	*CleverLevel*® LFFS	*CleverLevel*® LBFI	*CleverLevel*® LBFH
Product highlights	■ Certified hygienic design ■ SIP / CIP capability ■ Minimal insertion length ■ Detects all kinds of media (solid, liquid, viscous, pasty) ■ Compact and light weight ■ LED display	■ Certified hygienic design ■ SIP / CIP capability ■ Detects all kinds of media (solid, liquid, viscous, pasty) ■ Bright, blue light on top when triggered ■ Visible from long distance	■ Compact and robust stainless steel housing ■ On-site setting with *qTeach* ■ Two adjustable switching outputs ■ Multicolor LED display of switching statuses	■ Certified hygienic design ■ SIP / CIP capability ■ Foam detection or suppression ■ Problem solver for adhesions ■ Two adjustable switching outputs ■ 360° visible multicolor LED
Application examples	Point level detection in tanks, empty pipe monitoring, overfill protection, leakage detection, high temperature applications up to 200 °C	Point level detection in tanks, empty pipe monitoring, overfill protection, leakage detection	Point level detection in tanks, empty pipe monitoring, max. / min. level control, separation layer detection	Controlling of CIP procedure, point level detection in tanks, empty pipe monitoring, separation layer detection
Process conditions	–40 … +115 °C –40 … +200 °C (sliding connection)	–40 … +115 °C –40 … +200 °C (sliding connection)	–40 … +115 °C	–40 … +115 °C +135 °C max. (t < 1 h)
Versatile options for process connection	G 1/2 A hygienic G 1/2 A ISO 228-1 BSC G 3/4 A ISO 228-1 G 1 A ISO 228-1 G 1/2 A DIN 3852-E M18×1 ISO 261 / ISO 965 1/2-14 NPT 3/4-14 NPT G 1/2 A ISO 228-1 for reverse assembly (in-shell thread)	G 1/2 A hygienic BHC 3A DN 38	G 1/2 A hygienic G 1/2 A ISO 228-1 BSC 1/2-14 NPT	G 1/2 A hygienic
Output signal	PNP switch NPN switch	PNP switch NPN switch	2× programmable switch IO-Link 1.1	2× programmable switch IO-Link 1.1
Wetted parts material	PEEK AISI 316L (1.4404) AISI 304 (1.4301) (optional)	PEEK	PEEK AISI 316L (1.4404)	PEEK
Degree of protection	IP 67, IP 69K	IP 67	IP 67, IP69K	IP 67, IP 69K
Compliance and approvals	ATEX 3-A EHEDG WHG EN50155 (railway) DNV-GL Lloyd's register CCS	ATEX 3-A EHEDG WHG EN50155 (railway) DNV-GL	ATEX cULus FDA	ATEX cULus 3-A EHEDG
Additional information	■ M18×1 replaces a capacitive sensor directly ■ Available with sliding connection 250 mm ■ Hanging version for silos	■ Available with sliding connection 100 mm and 250 mm		

	LSP051.X	LSP056.X	LSKx2x	LSKx5x
Product highlights	■ Fast response time < 10 ms ■ Insensitive to foam, bubbles and sticky media ■ Top-, bottom- or side mounting	■ Fast response time < 10 ms ■ Insensitive to foam, bubbles and sticky media ■ Remote sensor with cable up to 5 m	■ Top- or side mounted ■ Adjustable rod length ■ PTFE coating for foamy media ■ Robust stainless steel connection head	■ Multipoint level detection ■ Adjustable rod length ■ PTFE coating for foamy media ■ Robust stainless steel connection head
Application examples	Controlling of filling machines, level regulation in deaerator tanks	Controlling of filling machines, level regulation in deaerator tanks	Point level detection in tanks, overfill protection	Multi point level detection in tanks, overfill protection
Process conditions	–20 … +140 °C Media conductivity > 50 µS	–20 … +140 °C Media conductivity > 50 µS	–20 … +140 °C	–20 … +140 °C
Measuring ranges	0 … 200 mm to 0 …. 3000 mm	0 … 200 mm to 0 …. 3000 mm	20 … 2000 mm	20 … 2000 mm
Versatile options for process connection	G1 A hygienic	G1 A hygienic	G 1/2 A hygienic	G1 A hygienic
Technology	Potentiometric	Potentiometric		
Wetted parts material	PEEK AISI 316L (1.4404)	PEEK AISI 316L (1.4404)	PEEK PTFE (with coating) AISI 316L (1.4404)	PEEK PTFE (with coating) AISI 316L (1.4404)
Accuracy (max. measuring error)	≤ 0.5 % FS	≤ 0.5 % FS		
Output signal	4 … 20 mA (galvanically isolated)	4 … 20 mA (galvanically isolated)	Electrode terminal PNP switch (with LKP100)	2× … 4× electrode terminal
Degree of protection	IP 67	IP 67	IP 67	IP 67
Compliance and approvals	3-A	3-A	3-A	3-A
Additional information	■ Adaptors for other hygienic connections available	■ Adaptors for other hygienic connections available	■ Adaptors for other hygienic connections available	■ Adaptors for other hygienic connections available ■ Evaluation unit DNGA-230.100 available as accessory

	CombiLyz® AFI4	*CombiLyz*® AFI5
Product highlights	■ Conductivity or concentration output ■ Fast internal temperature compensation ■ Fast response time ■ High accuracy ≤ 1 % ■ Programmable via touch screen or FlexProgram	■ Remote sensor with cable up to 10 m ■ Conductivity or concentration output ■ Fast internal temperature compensation ■ Fast response time ■ High accuracy ≤ 1 % ■ Programmable via touch screen or FlexProgram
Application examples	Concentration measurement, ingredients monitoring, phase separation	Concentration measurement, ingredients monitoring, phase separation
Process conditions	–20 … +140 °C +150 °C max. (t < 1 h)	–20 … +140 °C +150 °C max. (t < 1 h)
Measuring range	0 … 500 µS/cm to 0 … 1000 mS/cm	0 … 500 µS/cm to 0 … 1000 mS/cm
Versatile options for process connection	G1 A hygienic	G1 A hygienic
Wetted parts material	PEEK	PEEK
Output signal	4 … 20 mA + HART® (galvanically isolated)	4 … 20 mA + HART® (galvanically isolated)
Accuracy	≤ 1 % of selected range	≤ 1 % of selected range
Degree of protection	IP 67, IP 69K	IP 67, IP 69K
Compliance and approvals	3-A EHEDG	3-A EHEDG
Additional information	■ Adaptors for other hygienic connections available	■ Adaptors for other hygienic connections available

Flow measurement

	FlexFlow PF20H	*FlexFlow* PF20S
Product highlights	■ Hygienic design ■ SIP / CIP capability ■ Flow and temperature measurement in a single sensor ■ Compact and robust ■ Two analogue outputs or IO-Link plus programmable output ■ No moving parts	■ Industrial process connections ■ Flow and temperature measurement in a single sensor ■ Compact and robust ■ Two analogue outputs or IO-Link plus programmable output ■ No moving parts
Application examples	Flow control, controlling of CIP procedure	Flow control, controlling of CIP procedure
Applicable media	Water Beverages Cleaning agents	Water Water-glycol mixture (max. 30 % glycol)
Process conditions	–25 … +150 °C 40 bar max.	–25 … +150 °C 100 bar max.
Measuring ranges	10 … 400 cm/s –25 … +125 °C	10 … 400 cm/s –25 … +125 °C
Versatile options for process connection	G 1/2 A hygienic BHC 3A DN 38 Tri-Clamp Ø 34.0 Tri-Clamp Ø 50.5 Tri-Clamp Ø 64.0 DIN 11851 (dairy pipe connection), DN 25 DIN 11851 (dairy pipe connection), DN 40 DIN 11851 (dairy pipe connection), DN 50 Varivent® DN 25; 1" (Type F), Ø 50 Varivent® DN 32 … 125; 1 1/2" … 6" (Type N), Ø 68	G 1/2 A ISO 228-1 with cone Sealing cone M18×1.5 Compression fitting Ø 6 mm
Wetted parts material	AISI 316L (1.4404)	AISI 316L (1.4404)
Output signal	Programmable switch IO-Link 1.1 4 … 20 mA 0 … 10 V	Programmable switch IO-Link 1.1 4 … 20 mA 0 … 10 V
Accuracy (max. measuring error)	≤ 2 % (FS)	≤ 2 % (FS)
Degree of protection	IP 67, IP 68, IP 69K	IP 67, IP 68, IP 69K
Compliance and approvals	cULus FDA	cULus

User interface

Your individual alarm system.

Red = take action

Green = ok

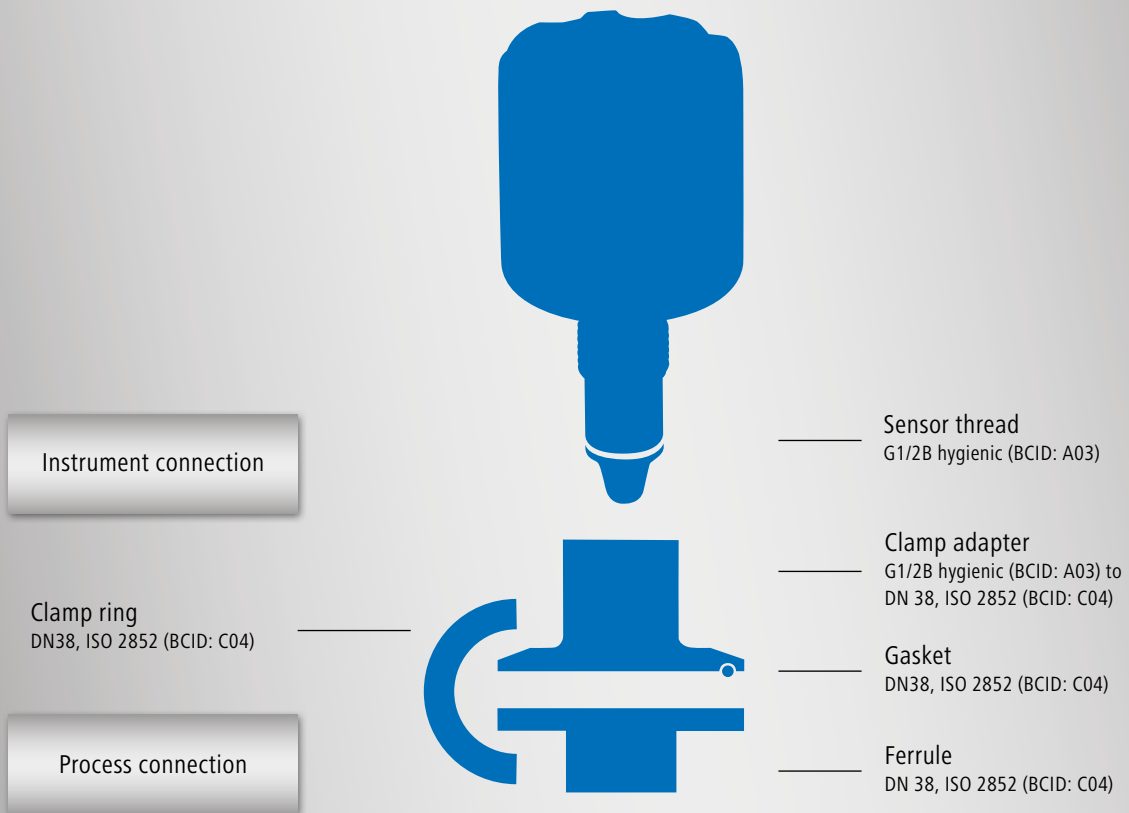
	CombiView® DFON	FlexProgrammer 9701	USB IO-Link Master
Product highlights	■ Large digits and illustration visible from long distance ■ Configurable via touch screen or FlexProgram ■ Backlight color change according to alarm settings ■ 3 configurable backlight colors	■ Easy configuring with menu control function ■ Data transfer from PC to device via USB ■ Configuration of a device on the spot without a PC ■ Robust plastic case with digital display and buttons ■ Rechargeable battery (USB) ■ Free FlexProgram updates from Baumer web site	■ Compatible with IO-Link Device Tool ■ Including power supply and USB cable
Application examples	Remote monitoring, value visualization, alerting	Sensor parameterization, setup duplication, data monitoring and logging	Integration of IO-Link sensors via USB
Supply voltage	Loop-powered	From USB-port	Wall power supply
Accuracy	0.1 % ± 1 digit		
Output signal	2× PNP switch	Sensor interface	IO-Link 1.1
Ambient conditions	–30 … +80 °C	0 … +50 °C, rel. humidity < 90 %	
Degree of protection	IP 67	IP 42	
Software		FlexProgram FDT / DTM based	FlexProgram IO-Link Device Tool
Compliance and approvals	ATEX		

Ready to fit your process: Baumer sensors support off-the-shelf standard and brand compatible process connections.

Baumer instruments fit almost every process connection you have in place. With more than 40 connenction types readily available, you needn't modify your system design in any way. The Baumer Connection Identifier (BCID) provides you a convenient and safe system to identify the right process adapter to get your Baumer sensor mounted to your Application examplesn.

How to select the fitting adaptor to your instrument
In the first place, you should decide which process connection – threaded, clamped or welded. Please refer to the table on next page for more information. Afterwards, the sensor data sheet provides you with the BCID code for the selected connection type. Each adaptor or sleeve comes also with a BCID code. Same BCID codes always mean matching accessories – whether adaptors, ferrules, clamp rings or gaskets.

Example for the Baumer Connection Identifier (BCID) System



Threaded connections		BCID
Hygienic cone connection	G 1/8 B male thread hygienic	A01
	M12×1.5 hygienic	A02
	G 1/2 A hygienic	A03
	G1 A hygienic	A04
Industry standard	G 1/8 A ISO 228-1	G01
	G 1/4 A ISO 228-1	G03
	G 1/2 A ISO 228-1	G06
	G 1/2 A ISO 228-1 BSC	G07
	G 1/2 A ISO 228-1 with cone	G08
	G 1/2 A DIN 3852-E with O-ring at the front	G09
	G 3/4 A ISO 228-1	G10
	G 1 A ISO 228-1	G11
	G 1 A DIN 3852-E with O-ring at the front	G12
	G 1 1/4 A ISO 228-1	G13
	G 1 1/2 A ISO 228-1	G14
	G 2 A ISO 228-1	G16
	G 1/8 A ISO 228-1 female thread	G20
	G 1/4 A ISO 228-1 female thread	G21
	G 1/2 A ISO 228-1 female thread	G23
	G 3/4 A ISO 228-1 female thread	G24
	G 1/4 B EN 837-1	G30
	G 1/2 B EN 837-1	G31
	G 3/8 B EN 837-1	G32
	G 1/2 A DIN 3852-A	G44
	G 1/4 A DIN 3852-E	G50
	G 1/2 A DIN 3852-E	G51
	G 1 A DIN 3852-E	G54
Vibration fork replacement	G 1 A ISO 228-1 (EH FTL GW2)	T03
	G 3/4 A ISO 228-1 (EH FTL GQ2)	T04
	G 3/4 A ISO228-1 (VS Ø 21.3)	T06
	G 1 A ISO228-1 (VS Ø 21.3)	T07
Reverse assembly (in-shell thread)	G 1/2 A ISO 228-1 for reverse assembly (in-shell thread)	T10
Gland nut	Sealing cone M18×1.5	T44
	Compression fitting ø 6	T52
	Sleeve Ø 5.8 mm	T64
	Sleeve Ø 6 mm	T65
	Sleeve Ø 8 mm	T66
	Sleeve Ø 10 mm	T67
Metric	M12×1.5, metric fine thread, DIN 837	M02
	M12×1.5, metric fine thread, DIN 3852-E	M03
	M14×1.5, 60° cone	M05
	M18×1.5 ISO 261 / ISO 965	M07
	M20×1.5 ISO 261 / ISO 965	M08
	M18×1 ISO 261 / ISO 965	M11
UTS (Unified Thread Standard)	7/16-20 UNF with cone (SAE 4)	U01
	7/16-20 UNF with o-ring (SAE 4)	U02
	9/16-18 UNF with o-ring (SAE 6)	U04
NPT (ANSI/ASME B1.20.1)	1/4-18 NPT	N01
	1/2-14 NPT	N02
	3/4-14 NPT	N03
	1-11 1/2 NPT	N04
	1/4-18 NPT female	N20
	1/2-14 NPT female	N21

Clamp and nut connections		BCID
Baumer Hygienic Connection	BHC 3A DN 38 BHC 3A DN 76	B01 B02
ISO 2852 (Tri-Clamp)	DN 21.3, Ø 34.0 DN 25, Ø 50.5 DN 33.7; 38, Ø 50.5 DN 40; 51, Ø 64.0	C02 C03 C04 C05
DIN 32676-A (Tri-Clamp)	DN 20, Ø 34.0 DN 25; 32; 40, Ø 50.5 DN 50, Ø 64.0	C02 C04 C05
DIN 32676-B (Tri-Clamp)	DN 26.9, Ø 50.5 DN 33.7, Ø 50.5 DN 42.4; 48.3, Ø 64.0	C03 C04 C05
DIN 32676-C (Tri-Clamp)	DN 3/4", Ø 24.9 DN 1", Ø 50.5 DN 1 1/2", Ø 50.5 DN 2", Ø 64.0	C01 C03 C04 C05
DIN 11851 (dairy pipe connection)	DN 25 DN 32 DN 40 DN 50 DN 65	D01 D02 D03 D04 D05
DIN 11864-1-A (aseptic screwed union)	DN 25 DN 32 DN 40 DN 50 DN 50, female thread DN 65	H01 H02 H03 H04 H14 H05
DIN 11864-3-A (Aseptic Clamp)	DN25, Ø 50.5 DN25, Ø 50.5, female thread	H41 H51
SMS 1145	SMS 1145, DN 38 SMS 1145, DN 51	S01 S02
VARIVENT®	VARIVENT® DN 25; 1" (Type F), Ø 50 VARIVENT® DN 32 … 125; 1 1/2" … 6" (Type N), Ø 68	V01 V02

Welded connections		BCID
Thin-walled tanks	Ø 16 × 12.2 Ø 25 × 17 Ø 45 × 34	W01 W05 W20
Thick-walled tanks	Ø 26.5 × 15 Ø 26.5 × 25 Ø 30 × 26 Ø 45 × 34 Ø 30 × 34 Ø 35 × 20 Ø 50 × 23 Ø 55 × 23 Ø 60 × 20.5 Ø 55 × 32 Ø 120 × 32	W07 W08 W10 W20 W21 W35 W45 W46 W50 W65 W70
Inclined mounting	Ø 35 × 34	W30
Pipes without collar	DN 25, Ø 16	W02
Pipes with collar	DN 25 … 50, Ø 29 × 36.5 DN 65 … 150, Ø 30 × 36.5 DN 40 … 50, Ø 40 × 28 DN 65 … 150, Ø 41 × 28 DN 38, Ø 38 × 40	W25 W26 W40 W41 W60

Baumer – the strong partner.

We at Baumer are close to our customers, understand their needs and provide the best solution. Worldwide customer service for Baumer starts with on-the-spot personal discussions and qualified consultation. Our application engineers speak your language and strive from the start, through an interactive problem analysis, to offer comprehensive and user-compatible solutions.

We are close to you across the globe.

The worldwide Baumer sales organizations guarantee short delivery times and readiness to supply. Many of our customers are directly linked via our electronic order system with the JIT logistics process.

A worldwide network coupled with the most modern communication techniques enable us to deliver information quickly and transparently to decision makers in all Baumer locations.

Closeness to the customer for Baumer means being available for your needs anywhere and at any time.

Worldwide presence.

Africa
Algeria
Cameroon
Côte d'Ivoire
Egypt
Morocco
Reunion
South Africa

America
Brazil
Canada
Colombia
Mexico
United States
Venezuela

Asia
Bahrain
China
India
Indonesia
Israel
Japan
Kuwait
Malaysia
Oman
Philippines
Qatar
Saudi Arabia
Singapore
South Korea
Taiwan
Thailand
UAE

Europe
Austria
Belgium
Bulgaria
Croatia
Czech Republic
Denmark
Finland
France
Germany
Greece
Hungary
Italy
Malta
Martinique
Netherlands
Norway
Poland
Portugal
Romania
Russia
Serbia
Slovakia
Slovenia
Spain
Sweden
Switzerland
Turkey
United Kingdom

Oceania
Australia
New Zealand

For more information about our worldwide locations go to:
www.baumer.com/worldwide

Baumer
Passion for Sensors

Baumer Group
International Sales
P.O. Box · Hummelstrasse 17 · CH-8501 Frauenfeld
Phone +41 (0)52 728 1122 · Fax +41 (0)52 728 1144
sales@baumer.com · www.baumer.com

Represented by:

11/17 No. 11193794

Baumer
Passion for Sensors

Innovative Sensor Solutions

Product overview

Partnership.
Precise.
Pioneering.

Visibly better: Baumer sensors.

The Baumer Group is leading at international level in the development and production of sensors, shaft encoders, measuring instruments as well as components for automatic image processing. As an owner-managed family business, we employ about 2400 workers worldwide in 38 subsidiaries and 19 countries. With marked customer orientation, consistently high quality and vast innovation capability, Baumer develops specific solutions for many industries and applications worldwide.

Our standards – your benefits.

- Passion coupled with expertise – both have made us a sensor pioneer and technology leader
- Our range of services is hard to beat – we have the right product, developed by our own team, for every task
- Inspiring through innovation – a challenge Baumer employees take on every day
- Reliability, precision and quality – our customers' requirements are what drives us
- Partnership from the start – together with our customers we develop suitable solutions
- Always a step ahead – thanks to our production depth, our flexibility and our delivery reliability
- Available worldwide – Baumer is Baumer everywhere

Object detection

Sensors, proximity switches and light barriers for object and position detection.

Inductive proximity switches

The proven solution for safe, non-contact detection of metal objects

Capacitive sensors

Proximity switch for non-contact detection of liquid as well as solid objects and bulk solids

Light barriers and light sensors

Unique reliable object detection and positioning with Baumer optical sensors

Fiber optic sensors and fiber optic cables

Always close to the action – detecting tiny objects in cramped or inaccessible places

Content

Ultrasonic sensors – the most versatile object detection

Undisturbed by difficult environmental conditions and varying object properties

Magnetic and cylinder sensors

Long-distance detection of magnetic fields

Copy counters – *SCATEC*®

Number 1 in flawless edge detection

Precison mechanical switches *My-Com*®

Micrometer precision – 70 times more accurate than a hair is thick

Distance measurement

Sensors for detecting distances and distance information from the µm range to over 40 m.

Optical distance sensors

Precise distance, spacing and position measurements even on challenging surfaces

Ultrasonic distance sensors

Accurate distance measurement regardless of material, surface, color or transparency

Inductive distance sensors – *AlphaProx*®

Measure distances on metal objects accurate to a micrometer

Linear magnetic encoders

Non-contact length measuring operations, cost-efficient and precise.

Content

Measuring wheel encoders

The efficient and reliable solution to measure length

Cable transducers

Linear travel measurement made easy. Easy installation, reliable results

Accessories

An easy and quick way to optimal functionality

Inductive proximity switches

Cylindrical inductive proximity switches for factory automation

The proven solution for safe, non-contact detection of metal objects

- Very small sensors with all integrated evaluation electronics and large sensing distance
- Sturdy, maintenance-free and durable
- Always the right sensor thanks to a wide variety of variants
- Millions of them in use - highest precision and guaranteed reliability thanks to over 40 years of experience

	IFRM 03 external electronics	IFRM 03	IFRM 04 Thread	IFRM 04	IFRM 05
category	Subminiatur	Subminiatur	Subminiatur	Subminiatur	Subminiatur
dimensions	ø 3 mm	ø 3 mm	M4	ø 4 mm	M5
housing length	12 mm	from 12 mm	from 22 mm	from 15 mm	from 15 mm
nominal sensing distance Sn	0,8 mm	0,8 ... 1 mm	0,8 mm	1 ... 1,6 mm	1 ... 1,6 mm
switching frequency	3 kHz	to 4 kHz	3 kHz	to 5 kHz	to 5 kHz
output signal	PNP NPN	PNP NPN	PNP NPN	PNP NPN	PNP NPN
connection types	flylead connector M8 (electronics in connector)	cable 2 m flylead connector M8 wires	cable 2 m flylead connector M8	connector M5 connector M8 cable 2 m flylead connector M8 wires	connector M5 connector M8 cable 2 m flylead connector M8 wires
housing material	stainless steel	stainless steel	stainless steel	stainless steel	stainless steel
operating temperature	–25 ... +75 °C	–25 ... +75 °C –10 ... +70 °C	–25 ... +75 °C	–25 ... +75 °C	–25 ... +75 °C
protection class	IP 67	IP 67	IP 67	IP 67	IP 67
specific features					

Learn more:
www.baumer.com/inductive





IFRM 06 IR06.PxxS	IFRM 08 IR08.PxxS	IFRM 12 IR12.PxxS	IFRM 18 IR18.PxxS	IFRM 30 IR30.PxxS
Sub-/Miniatur	Sub-/Miniatur	Compact	Compact	Compact
ø 6,5 mm	M8	M12	M18	M30
from 22 mm	from 18 mm	from 30 mm	from 35 mm	from 35 mm
2 ... 6 mm	2 ... 6 mm	4 ... 10 mm	8 ... 15 mm	10 ... 24 mm
to 5 kHz	to 5 kHz	to 2 kHz	to 500 Hz	to 500 Hz
PNP NPN	PNP NPN	PNP NPN	PNP NPN	PNP NPN
connector M8 cable 2 m flylead connector M8	connector M8 connector M12 cable 2 m flylead connector M8	connector M8 connector M12 cable 2 m	connector M8 connector M12 cable 2 m	connector M12 cable 2 m
stainless steel	stainless steel	brass nickel plated	brass nickel plated	brass nickel plated
–25 ... +75 °C	–25 ... +75 °C	–25 ... +75 °C	–25 ... +75 °C 0 ... +65 °C	–25 ... +75 °C
IP 67	IP 67	IP 67	IP 67	IP 67
		■ variants with antivalent output (NO & NC)	■ variants with antivalent output (NO & NC)	■ variants with antivalent output (NO & NC)

Inductive proximity switches

Rectangular inductive proximity switches for factory automation

The proven solution for safe, non-contact detection of metal objects

- Very small sensors with all integrated evaluation electronics and large sensing distance
- Sturdy, maintenance-free and durable
- Millions of them in use - highest precision and guaranteed reliability thanks to over 40 years of experience

	IFFM 08	IFFM 04	IFFM 06	IFFM 08
category	Subminiatur	Subminiatur	Miniatur	Miniatur
dimensions (B × T × L)	8 × 4,7 × 16 mm	4 × 4 × 22 mm	6 × 6 × 20 ... 30 mm	8 × 8 × 20 ... 60 mm
nominal sensing distance Sn	2 mm	0,8 mm	1 mm	2 mm
switching frequency	5 kHz	3 kHz	5 kHz	5 kHz
output signal	PNP NPN	PNP NPN	PNP NPN	PNP NPN
connection types	cable 2 m flylead connector M8	cable 2 m	connector M5 cable 2 m	connector M8 cable 2 m flylead connector M8
housing material	die-cast zinc nickel plated	stainless steel	brass nickel plated	brass nickel plated die-cast zinc nickel plated
operating temperature	–25 ... +75 °C	–25 ... +75 °C	–25 ... +75 °C	–25 ... +75 °C
protection class	IP 67	IP 67	IP 67	IP 67
specific features	■ extra flat design (4.7 mm)			

Learn more:
www.baumer.com/inductive

IFFM 12	IFFM 20
Compact	Compact
12 × 8 × 28 mm	20 × 10 × 41 mm
4 mm	5 ... 8 mm
2 kHz	to 1 kHz
PNP NPN	PNP NPN
connector M5	connector M8
brass nickel plated	brass nickel plated
–25 ... +75 °C	–25 ... +75 °C
IP 67	IP 67

Inductive proximity switches

Application-specific inductive sensors – Outdoor / high temperature

- Rugged Outdoor and Washdown sensors
- High shock and vibration resistance
- Sensors with extended temperature range up to 180 °C

Outdoor / Washdown	**IFRM 12 / 18** **Outdoor**	**IFRR 08 / 12 / 18** **Washdown**
features	■ Rugged stainless steel (V4A) or all-metal housing ■ IP 69K long-term seal – *proTect+* ■ High signal quality in an extended temperature range	
dimensions	M12 / M18	M8 / M12 / M18
nominal sensing distance Sn	6 ... 12 mm	3 ... 12 mm
switching frequency	0,4 ... 2 kHz	0,5 ... 3 kHz
housing material	brass nickel plated	stainless steel 1.4404 (V4A)
operating temperature	–40 ... +80 °C	–40 ... +80 °C
protection class	IP 67	IP 68/69K & *proTect+*
specific features		■ Ecolab-tested ■ FDA-compliant ■ Vibration resistance EN 61373: 2010 (category 3) ■ Shock resistance EN 61373: 2010 (category 3)

High temperature up to +180 °C	**IFRM 06 / 08 / 12** **High temperature up to +100 °C**	**IFRD 06 / 08 / 12 / 18** **High temperature up to +100 °C** **Full metal housing (*DuroProx*)**	**IFRH 06 / 08 / 12** **High temperature up to +180 °C** **with separated electronics**
features	■ Sensors with extended temperature range up to 180 °C ■ Versions with integrated and separate evaluation electronics ■ High switching frequencies		
dimensions	ø 6,5 mm / M8 / M12	ø 6,5 mm / M8 / M12 / M18	M8 / M12 / M18
nominal sensing distance Sn	2 ... 4 mm	2 ... 6 mm	1,5 ... 5 mm
switching frequency	2 ... 5 KHz	100 ... 150 Hz	1 ... 4 kHz
housing material	stainless steel brass nickel plated	stainless steel 1.4404 (V4A)	stainless steel brass nickel plated
operating temperature	–25 ... +100 °C	–25 ... +100 °C	–25 ... +180 °C
protection class	IP 67	IP 68 / IP 69K	IP 67

Application-specific inductive sensors – High pressure / magnetic field

- Pressure resistant up to 500 bar
- Immune to welding and magnetic fields up to 90 mT

Learn more:
www.baumer.com/inductive

High pressure resistant sensors	IFRP 12	IFRP 16	IFRP 18
features	■ Pressure resistant up to 500 bar ■ Sensor surface made of zirconium oxide (ZrO2/ceramics) ■ High switching frequencies		
dimensions	M12	M16	M18
nominal sensing distance Sn	2 mm	2 mm	2 mm
switching frequency	5 kHz	3 kHz	3 kHz
housing material	stainless steel	stainless steel	stainless steel
sensing face	ZrO2 / ceramic	ZrO2 / ceramic	ZrO2 / ceramic
operating temperature	–25 ... +80 °C	–25 ... +80 °C	–25 ... +80 °C
protection class	IP 68/67	IP 68/67	IP 68/67

Sensors immune to welding and magnetic fields	IFRW 12	IFRW 18
features	■ For magnetic fields up to 90 mT ■ PTFE-coated front ■ Chrome-plated brass housing ■ Resistant to welding sparks	
dimensions	M12	M18
nominal sensing distance Sn	2 mm	5 mm
switching frequency	1 kHz	500 Hz
housing material	brass chromium plated	brass chromium plated
sensing face	PTFE-coated	PTFE-coated
operating temperature	–25 ... +75 °C	–25 ... +75 °C
protection class	IP 67	IP 67

Inductive proximity switches

Application-specific inductive sensors - Large sensing distance / Factor 1

- Sensors with extended switching distance up to 24 mm
- Factor 1 sensors with the same switching distance on all metals

Large sensing distance	**IR06.P03S IR06.P06S**	**IR08.P03S IR08.P06S**	**IR12.P06S IR12.P10S**	**IR18.P12S IR18.P15S**	**IR30.P18S IR30.P24S**
category	Miniatur	Miniatur	Compact	Compact	Compact
features	■ Large installation tolerances ■ Enhanced protection against mechanical damage ■ Cylindrical designs from Ø6.5 mm to M30 ■ Flush and non-flush variants				
dimensions	ø 6,5 mm	M8	M12	M18	M30
nominal sensing distance Sn	3 / 6 mm	3 / 6 mm	6 / 10 mm	15 / 18 mm	18 / 24 mm
switching frequency	2 kHz	2 kHz	1 kHz	400 Hz	500 Hz
housing material	stainless steel	stainless steel	brass nickel plated	brass nickel plated	brass nickel plated
operating temperature	–25 ... +75 °C	–25 ... +75 °C	–25 ... +75 °C	–25 ... +75 °C 0 ... +65 °C	–25 ... +75 °C
protection class	IP 67	IP 67	IP 67	IP 67	IP 67

Factor 1	**IR06.P02F**	**IR08.P02F**	**IR12.P04F**	**IR18.P06F IR18.P08F**
category	Miniatur	Miniatur	Compact	Compact
features	■ Detection of stainless steel, aluminum and non-ferrous metals with the same sensing distance ■ High switching frequencies up to 3 kHz			
dimensions	ø 6,5 mm	M8	M12	M18
nominal sensing distance Sn	40 / 46 mm	40 / 46 mm	40 / 50 mm	50 / 60 mm
switching frequency	2 mm	2 mm	4 mm	6 / 8 mm
housing material	3 kHz	3 kHz	2 kHz	500 Hz
operating temperature	stainless steel	stainless steel	brass nickel plated	brass nickel plated
protection class	–25 ... +75 °C	–25 ... +75 °C	–25 ... +75 °C	–25 ... +75 °C
protection class	IP 67	IP 67	IP 67	IP 67

Application-specific inductive sensors - ATEX / Hygienic

- Sensors for the Ex-area (ATEX-certified)
- Stainless steel sensors in hygienic design, EHEDG-certified

Learn more:
www.baumer.com/inductive




ATEX	IFR10.82	IFRM 06X IFRM 08X	IFRM 12	IFRM 12X IFRM 18X
category	Sub-Miniatur Circuit board mountable	Miniatur	Compact	Compact
features	■ For environments with flammable gas or dust ■ ATEX certified ■ High repeat accuracy < 0.01 mm ■ Compact design			
dimensions	10 mm	ø 6,5 mm / M8	M12	M12 / M18
nominal sensing distance Sn	2 mm	1,5 mm	4 mm	2 ... 8 mm
switching frequency	2 kHz	5 kHz	2 kHz	to 2 kHz
output circuit	NAMUR	NAMUR	PNP / NPN	NAMUR
operating temperature	–25 ... +75 °C	–20 ... +60 °C	–25 ... +65 °C	–20 ... +60 °C
protection class	IP 67	IP 67	IP 67	IP 67
approvals/certificates	ATEX 3G	ATEX 1G	ATEX 3D	ATEX 1G



Hygienic design	IFBR 06	IFBR 11	IFBR 17
category	Miniatur	Compact	Compact
features	■ FDA compliant materials – EHEDG certified ■ High chemical resistance – Ecolab tested and LCP front cap ■ IP 68K long-term seal – *proTect+* ■ Flush and non-flush housings		
dimensions	ø 6,5 mm	ø 11 mm	ø 17 mm
nominal sensing distance Sn	3 mm	4 mm (flush) 6 mm (non-flush)	8 mm (flush) 12 mm (non-flush)
switching frequency	3 kHz	1 kHz	500 Hz
housing material	stainless steel 1.4404 (V4A)	stainless steel 1.4404 (V4A)	stainless steel 1.4404 (V4A)
operating temperature	–40 ... +80 °C, cleaning temperature to +100 °C	–40 ... +80 °C, cleaning temperature to +100 °C	–40 ... +80 °C, cleaning temperature to +100 °C
protection class	IP 68/69K & proTect+	IP 68/69K & proTect+	IP 68/69K & proTect+

Capacitive sensors

Capacitive proximity sensors in metal housing

Proximity switch for non-contact detection of liquid as well as solid objects and bulk solids

- High switching distance up to 30 mm even through non-metallic walls
- Absolutely reliable even when interfered by ambient conditions, e.g. ambient light or dirt
- Absolutely reliable detection of objects such as wafers, PCBs, paper stacks or hot adhesives up to 200 °C

	CFAM 12	CFAM 18	CFAM 30	CFBM 20
category	cylindrical	cylindrical	cylindrical	cylindrical
function				
detection of non-conductive media	■	■	■	■
liquids in direct contact				
fill level detection through container	■	■	■	■
object detection / buld goods	■	■	■	■
dimensions / height	M12	M18	M30	M20
housing length	60 mm	64 mm	71 mm	79,5 mm
nominal sensing distance Sn	4 mm	8 mm	15 mm	10 mm
switching frequency	50 Hz	50 Hz	50 Hz	50 Hz
output signal	PNP NPN	PNP NPN	PNP NPN	PNP NPN
connection types	cable 2 m connector M12	cable 2 m connector M12	cable 2 m connector M12	cable 2 m
housing material	brass nickel plated	brass nickel plated	brass nickel plated	brass nickel plated
operating temperature	–25 ... +75 °C	–25 ... +75 °C	–25 ... +75 °C	–25 ... +75 °C
protection class	IP 65	IP 65	IP 65	IP 65
specific features	■ potentiometer	■ potentiometer	■ potentiometer	■ potentiometer

Learn more:
www.baumer.com/capacitive

CFAH 30	CFDM 12
cylindrical high temperature to +200 °C	rectangular
■	■
■	
	■
	■
M30	M12
65 mm	60 mm
15 mm	4 mm
50 Hz	50 Hz
PNP NPN	PNP NPN
cable 2 m connector M12	cable 2 m connector M12
brass nickel plated	brass nickel plated
–40 ... +200 °C	–25 ... +75 °C
IP 65	IP 65
■ potentiometer	■ potentiometer

Capacitive sensors

Capacitive proximity sensors in plastic housings

Proximity switch for non-contact detection of liquid as well as solid objects and bulk solids

- High switching distance up to 30 mm even through non-metallic walls
- Absolutely reliable even when interfered by ambient conditions, e.g. ambient light or dirt
- Absolutely reliable detection of objects such as wafers, PCBs, paper stacks or hot adhesives up to 200 °C

	CFAK 12 with cap	CFAK 12	CFAK 18	CFAK 22 Oil Level Switch
category	cylindrical	cylindrical	cylindrical	cylindrical
function				
detection of non-conducti-ve media			■	
fill level detection through container	■	■	■	■
object detection / buld goods			■	
dimensions	M12	M12	M18	22 mm
housing length	39,5 mm	39 mm	63,5 mm	87 mm
nominal sensing distance Sn	0,1 mm	0,5 mm	5 / 15 mm	
switching frequency	15 Hz	15 Hz	50 Hz	
output signal	PNP NPN	PNP NPN	PNP NPN	voltage output
connection types	cable 2 m connector M8	cable 2 m connector M8	cable 2 m	connector AMPSEAL 16 3-Pol
housing material	POM EPDM50	PBT	PBT	PA 10T/X
operating temperature	0 ... +50 °C	0 ... +70 °C	–25 ... +75 °C	–40 ... +85 °C
protection class	IP 67	IP 67	IP 67/65	IP 67/65
specific features	■ liquid level sensor for wastewater		■ potentiometer	■ liquid level sensor for oil ■ media temperature +100 °C

Learn more:
www.baumer.com/capacitive

	CFAK 30	CFDK 25	CFDK 30
	cylindrical	rectangular extremely flat	rectangular
	■	■	■
	■		
	■	■	■
	M30	25 × 52,4 × 6 mm	30 × 65 × 18,5 mm
	72 mm		
	8 / 30 mm	2 ... 15 mm	4 ... 15 mm
	50 Hz	35 Hz	50 Hz
	PNP NPN	push-pull	PNP NPN
	cable 2 m	cable 2 m flylead connector M12	cable 2 m connector M12
	PBT	PA 12	PBT
	–25 ... +75 °C	–25 ... +75 °C	–25 ... +75 °C
	IP 67/65	IP 65	IP 65
	■ versions with fixed switching point ■ adjustable versions ■ potentiometer	■ fixed sensing distance ■ flexible mounting options thanks to innovative mounting frame	■ potentiometer

Light barriers and light sensors

Subminiature and miniature sensors

Unique reliable object detection and positioning with optical sensors

- Smart & Small – top performance in smallest designs
- Find the optimum solution quickly through large portfolio
- Easy to set up with clever teach-in function
- Laser sensors for detection tasks in the 0.01 mm range

x = function principle y = light source	FHDK 04	FxDK 07 FxCK 07	FxDM 08	FxAM 08
features	■ Mounting in rails ■ Fix sensing distance	■ World's smallest adjustable sensor family	■ Fix sensing distance ■ Robust metal housing	■ Fix sensing distance
dimensions (B × H × T)	4 × 44,8 × 6,2 mm	8 × 16,2 × 10,8 mm	8 × 58 × 12 mm	M8 × 56 mm
function principle (x) / ranges				
diffuse sensors with background suppression	**30 mm / 50 mm** (FHDK 14)	**10 ... 60 mm** (FHDK 07 / FHCK 07)		
diffuse sensor with background suppression		**20 ... 150 mm** (FZDK 07 / FZCK 07)	**40 mm / 80 mm** (FZDM 08)	**40 mm / 80 mm** (FZAM 08)
SmartReflect® light barriers without reflector		**17 ... 45 mm** (FNCK 07)		
SmartReflect® transparent				
retro-reflective sensors		**800 mm** (FPDK 07 / FPCK 07)		
transparent detection without reflector				
through beam sensors		**2,5 m** (FSDK 07 / FSCK 07) (FEDK 07 / FECK 07)	**1 m / 3 m** (FSDM 08 / FEDM 08)	**3 m** (FSAM 08 / FEAM 08)
light source (y)				
standard LED (R)	■	■		
pinPoint LED (P)				
infrarot (I)			■	■
laser (L)				
response time	< 0,5 ms	< 0,5 ms	< 1 ms	< 2,5 ms
output	push-pull	PNP NPN	PNP	PNP
connection types	cable 2 m flylead connector M8	cable 2 m flylead connector M8	cable 2 m connector M8	cable 2 m connector M8
housing material	plastic	plastic	aluminium	brass nickel plated
operating temperature	–10 ... +50 °C	–20 ... +50 °C	–25 ... +65 °C	–25 ... +65 °C
protection class	IP 65	IP 65	IP 65	IP 65

Learn more:
www.baumer.com/opto

FxDK 10 OxDK 10 (Laser)	FxDM 12 OxDM 12 (Laser)	FxAM 12	O300.xy	OHDM 13 (Laser)
■ Different beam cones optimized for the application	■ Sensing distance adjustable ■ Sensors with single lens optics	■ Sensitivity adjustable with potentiometer	■ Setting via wear-free *qTeach*® or IO-Link	■ Sensing distance adjustable
10,4 × 27 × 14 mm	12,4 × 35 × 35 mm	M12 × 70,5 mm	12,9 × 32,3 × 23 mm	13,4 × 48,2 × 40 mm
10 ... 130 mm (FHDK 10 / OHDK 10)	**15 ... 300 mm** (FHDM 12 / OHDM 12)		**30 ... 300 mm** (O300.Gy)	**50 ... 550 mm** (OHDM 13)
3 ... 200 mm (FZDK 10 / OZDK 10)		**30 ... 200 mm** (FZAM 12)	**10 ... 400 mm** (O300.Zy)	
			30 ... 300 mm (O300.Sy)	
			30 ... 300 mm (O300.SP.T)	
4 m (FPDK 10)	**8 m** (FPDM 12 / OPDM 12)		**6 m** (O300.Ry)	
			4 m (O300.RP.T)	
10 m (FSDK 10 / FEDK 10) (OSDK 10 / OEDK 10)	**7,5 m** (FSDM 12 / FEDM 12)		**15 m** (O300.Ty / O300.Ey)	
■	■		■	
			■	
		■	■	
■	■		■	■
< 0,5 ms < 0,05 ms (laser)	< 1 ms < 0,05 ms (laser)	< 1 ms	< 0,25 ms < 0,1 ms (laser)	< 5 ms
push-pull PNP NPN	PNP NPN	PNP	push-pull PNP NPN	PNP NPN
cable 2 m connector M8 flylead connector	cable 2 m connector M8	cable 2 m connector M12	cable 2 m connector M8 flylead connector	connector M8
plastic	die-cast zinc	brass nickel plated	plastic	aluminum
–25 ... +65 °C –10 ... +50 °C (laser)	–25 ... +65 °C –20 ... +50 °C (laser)	–25 ... +65 °C	–25 ... +60 °C –10 ... +60 °C (laser)	0 ... +50 °C
IP 65 / IP 67	IP 67	IP 65	IP 67	IP 67

Light barriers and light sensors

Standard sensors – rectangular and cylindrical

Unique reliable object detection and positioning with optical sensors

- Find the optimum solution quickly through large portfolio
- Easy to set up with clever teach-in function
- Laser sensors for detection tasks in the 0.01 mm range

x = function principle y = light source	FxDK 14 OxDK 14 (laser)	FxDM 16 OxDM 16 (laser)	OR18.xy	OR18.GR.F
features	■ Sensors for transparent objects	■ Laser sensors for wafer detection	■ Setting via potentiometer, teach-in or *qTeach*	■ Fixed Focus
dimensions (B × H × T)	14,8 × 43 × 31 mm	15,4 × 50 × 50 mm	M18	M18 × 48,3 mm
function principle (x) / ranges				
diffuse sensors with background suppression	**20 ... 500 mm** (FHDK 14 / OHDK 14)	**20 ... 600 mm** (FHDM 16 / OHDM 16)	**40 ... 200 mm** (OR18.Gy)	**50 mm** (OR18.GR.F)
diffuse sensors with intensity difference	**5 ... 600 mm** (FZDK 14 / OZDK 14)	**0 ... 400 mm** (FZDM 16 / OZDM 16)	**0 ... 800 mm** (OR18.ZI)	
SmartReflect® light barriers without reflector	**50 ... 800 mm** (FNDK 14)		**55 ... 300 mm** (OR18.SP)	
SmartReflect® transparent				
retro-reflective sensors	**11 m** (FRDK / FPDK / OPDK 14)	**12 m** (FPDM 16 / OPDM 16)	**16 m** (OR18.RR)	
transparent detection without reflector			**800 mm** (OR18.RR.T)	
through beam sensors	**15 m** (FSDK 14 / FEDK 14) (OSDK 14 / OEDK 14)		**60 m** (OR18.TI / OR18.EI)	
light source (y)				
standard LED (R)	■	■	■	■
pinPoint LED (P)			■	
infrarot (I)			■	
laser (L)	■	■	■	
response time	< 0,5 ms < 0,25 ms (laser)	< 1 ms < 0,05 ms (laser)	< 0,5 ms < 0,1 ms (laser)	< 0,5 ms
output	push-pull PNP NPN	PNP NPN 4 ... 20 mA	PNP NPN	PNP NPN
connection types	cable 2 m connector M8 flylead connector M12	cable 2 m connector M12	cable 2 m connector M12 flylead connector M12	cable 2 m connector M12
housing material	plastic	die-cast zinc	plastic brass nickel plated	plastic
operating temperature	–25 ... +65 °C –10 ... +50 °C (laser)	–25 ... +65 °C –10 ... +50 °C (laser)	–25 ... +55 °C –10 ... +55 °C (laser)	–25 ... +55 °C
protection class	IP 67	IP 67	IP 67	IP 65 / IP 67

Learn more:
www.baumer.com/opto

FxAM 18	O500.xy	OHDM 20 (Laser)	OxDK 25 (Laser)
■ Compatible with glass fibre optics	■ Setting via wear-free *qTeach*® or IO-Link	■ Light / dark operate switchable	■ Sensors with 2 output ■ *qTeach*®
M18	18 × 45 × 32 mm	20,6 × 65 × 50 mm	23,4 × 63 × 45 mm
	60 ... 550 mm (O500.Gy)	**210 ... 1500 mm** (OHDM 20)	**100 ... 1750 mm** (OHDK 25)
60 ... 430 mm (FZAM 18)	**20 ... 600 mm** (O500.Zy)		
	60 ... 600 mm (O500.SP)		**1900 mm** (ONDK 25)
	60 ... 1000 mm (O500.Sy.T)		
4 m (FPAM 18)	**8 m** (O500.Ry)		
	6 m (O500.RP.T)		
	40 m (O500.TR / O500.ER)		
■	■		
	■		
■	■		
		■	■
< 1 ms	< 0,25 ms	< 6 ms	10 ms
PNP NPN	push-pull PNP NPN	PNP	push-pull
cable 2 m connector M12	cable 2 m connector M12	connector M12	cable 2 m connector M12
brass nickel plated	plastic	die-cast zinc	plastic
–25 ... +55 °C	–25 ... +60 °C	0 ... +50 °C	0 ... +50 °C
IP 67	IP 67	IP 67	IP 67

Light barriers and light sensors

Standard with extra power – O300/O500

Unique portfolio with extra performance for your application

- Enhanced processor performance for reliable detection
- 2500 variants with seven sensor principles and four light sources
- Easy implementation and operation
- IO-Link – Industry 4.0 and IIoT-ready

IO-Link

IO-Link

IO-Link

O300.xy x = function principle y = light source	O300.xy	O300W.xy	O300H.xy
features	■ Setting via wear-free *qTeach*® or IO-Link	■ Setting via wear-free *qTeach*® or IO-Link	■ Setting via wear-free magnetic *qTeach*® or IO-Link
dimensions (B × H × T)	12,9 × 32,3 × 23 mm	16,5 × 34,7 × 28,2 mm	16,5 × 34,6 × 28,7 mm
function principle (x) / ranges			
diffuse sensors background suppression (G)	**30 ... 300 mm** (O300.Gy)	**30 ... 250 mm** (O300W.Gy)	**30 ... 250 mm** (O300H.Gy)
diffuse sensors with intensity difference (Z)	**10 ... 400 mm** (O300.Zy)		
SmartReflect® light barriers without a reflector (S)	**30 ... 300 mm** (O300.Sy)	**30 ... 300 mm** (O300W.Sy)	**30 ... 300 mm** (O300H.Sy)
SmartReflect® transparent (Sy.T)	**30 ... 300 mm** (O300.SP.T)	**30 ... 300 mm** (O300W.SP.T)	**30 ... 300 mm** (O300H.SP.T)
diffuse sensors (R)	**6 m** (O300.Ry)	**6 m** (O300W.Ry)	**6 m** (O300H.Ry)
retro-reflective sensors (Ry. T)	**4 m** (O300.RP.T)	**4 m** (O300W.RP.T)	**4 m** (O300H.Ry.T)
through beam sensors (T / E)	**15 m** (O300.Ty / O300.Ey)	**15 m** (O300W.Ty / O300W.Ey)	**15 m** (O300H.Ty / O300H.Ey)
light source (y)			
standard LED (R)	■	■	■
pinPoint LED (P)	■	■	■
infrarot (I)	■		
laser (L)	■	■	■
response time	< 0,25 ms < 0,1 ms (laser)	< 0,25 ms < 0,1 ms (laser)	< 0,25 ms < 0,1 ms (laser)
output	push-pull PNP NPN	push-pull	push-pull
connection types	cable 2 m connector M8 flylead connector M8	connector M8	connector 2 m flylead connector M8
housing material	plastic	stainless steel, Ecolab-certified, FDA-compliant	stainless steel, Ecolab-certified, EHEDG-compliant, FDA-compliant
operating temperature	–25 ... +60 °C –10 ... +60 °C (laser)	–25 ... +60 °C –10 ... +60 °C (laser)	–25 ... +60 °C –10 ... +60 °C (laser)
protection class	IP 67	IP 68 / IP 69K *proTect+*	IP 68 / IP 69K *proTect+*

Learn more:
www.baumer.com/opto

O500.xy x = function principle y = light source	O500.xy	O500W.xy	O500H.xy
Features	■ Setting via wear-free *qTeach*® or IO-Link	■ Setting via wear-free *qTeach*® or IO-Link	■ Setting via wear-free magnetic *qTeach*® or IO-Link
dimensions (B × H × T)	18 × 45 × 32 mm	20,2 × 47,2 × 37,2 mm	20,2 × 47,7 × 36,4 mm
function principle (x) / ranges			
diffuse sensors background suppression (G)	**60 ... 550 mm** (O500.Gy)	**60 ... 400 mm** (O500W.Gy)	**60 ... 400 mm** (O500H.Gy)
diffuse sensors with intensity difference (Z)	**20 ... 600 mm** (O500.Zy)		
SmartReflect® light barriers without a reflector (S)	**60 ... 600 mm** (O500.SP)	**60 ... 600 mm** (O500W.SP)	**60 ... 600 mm** (O500H.SP)
SmartReflect® transparent (Sy.T)	**60 ... 1000 mm** (O500.SP.T)	**60 ... 1000 mm** (O500W.SP.T)	**60 ... 1000 mm** (O500H.SP.T)
diffuse sensors (R)	**8 m** (O500.Ry)	**8 m** (O500W.Ry)	**8 m** (O500H.Ry)
retro-reflective sensors (Ry. T)	**6 m** (O500.RP.T)	**6 m** (O500W.RP.T)	**6 m** (O500H.RP.T)
through beam sensors (T / E)	**40 m** (O500.TR / O500.ER)	**40 m** (O500W.TR / O500W.ER)	**40 m** (O500H.TR / O500H.ER)
light source (y)			
standard LED (R)	■	■	■
pinPoint LED (P)	■	■	■
infrarot (I)	■		
laser (L)			
response time	< 0,25 ms	< 0,25 ms	< 0,25 ms
output	push-pull PNP NPN	push-pull	push-pull
connection types	cable 2 m connector M12	connector M12	cable 2 m connector M12
housing material	plastic	stainless steel, Ecolab-certified, FDA-compliant	stainless steel, Ecolab-certified, EHEDG-compliant, FDA-compliant
operating temperature	–25 ... +60 °C	–25 ... +60 °C	–25 ... +60 °C
protection class	IP 67	IP 68 / IP 69K *proTect+*	IP 68 / IP 69K *proTect+*

Light barriers and light sensors

Laser sensors

Precise control of fast processes and detection of very small objects

- Very precise object positioning to within 0.01 mm
- Detection of very small objects thanks to focused 0.1 mm laser spot
- Detection of fast objects thanks to short response times of < 0.1 ms
- The right shapes, sizes and sensor principles for your application

x = function principle	OxDK 10	OxDM 12	OBDM 12 Difference sensors	OHDM 13
features	■ Different application-optimized beam shapes	■ Adjustable ranges ■ Sensors with single lens optics	■ 5 functions (e.g. window teach)	■ Adjustable ranges
dimensions (B × H × T)	10,4 × 27 × 14 mm	12,4 × 35 × 35 mm	12,4 × 37 × 34,5 mm	13,4 × 48,2 × 40 mm
function principle (x) / ranges				
diffuse sensors background suppression	**20 .. 130 mm** (OHDK 10)	**17 ... 120 mm** (OHDM 12)		**50 ... 550 mm** (OHDM 13)
diffuse sensors with intensity difference	**3 ... 150 mm** (OZDK 10)			
SmartReflect® light barriers without a reflector				
retro-reflective sensors		**8 m** (OPDM 12)		
retro-reflective sensors for transparent detection				
through beam sensors	**10 m** (OSDK / OEDK 10)			
differential sensors			**16 ... 120 mm** (OBDM 12)	
laser class	1 & 2	2	2	2
response time up	< 0,05 ms	< 0,05 ms	< 1 ms	< 5 ms
output	PNP NPN	PNP NPN	PNP NPN	PNP NPN
housing material	plastic	die-cast zinc	die-cast zinc	aluminum
operating temperature	–10 ... +50 °C	0 ... +50 °C	0 ... +50 °C	0 ... +50 °C
protection class	IP 65 / IP 67	IP 67	IP 67	IP 67

Learn more:
www.baumer.com/laser

	 IO-Link	 IO-Link	 IO-Link
OxDK 14	**O300.xL**	**O300W.xL**	**O300H.xL**
■ Mechanical sensing distance adjustment	■ Setting via wear-free magnetic *qTeach*® or IO-Link	■ Setting via wear-free *qTeach*® or IO-Link	■ Setting via wear-free magnetic *qTeach*® or IO-Link
14,8 × 43 × 31 mm	12,9 × 32,3 × 23 mm	16,5 × 34,7 × 28,2 mm	16,5 × 34,6 × 28,7 mm
20 ... 350 mm (OHDK 14)	**30 ... 300 mm** (O300.GL)	**30 ... 250 mm** (O300W.GL)	**30 ... 250 mm** (O300H.GL)
	10 ... 400 mm (O300.ZL)		
	30 ... 300 mm (O300.SL)	**30 ... 300 mm** (O300W.SL)	**30 ... 300 mm** (O300H.SL)
11 m (OPDK 14)	**6 m** (O300.RL)	**6 m** (O300W.RL)	**6 m** (O300H.RL)
5,2 m (OPDK 14)			
	75 m (O300.TL / O300.EL)	**75 m** (O300W.TL / O300W.EL)	**75 m** (O300H.TL / O300H.EL)
2	1	1	1
< 0,15 ms	< 0,1 ms	< 0,1 ms	< 0,1 ms
PNP NPN	PNP NPN push-pull	push-pull	push-pull
plastic	plastic	stainless steel	stainless steel
–10 ... +50 °C	–25 ... +60 °C	–25 ... +60 °C	–25 ... +60 °C
IP 67	IP 67 IP 68 / IP 69K *proTect+*	IP 67 IP 68 / IP 69K *proTect+*	IP 67 IP 68 / IP 69K *proTect+*

Light barriers and light sensors

Laser sensors

Precise control of fast processes and detection of very small objects

- Very precise object positioning to within 0.01 mm
- Detection of very small objects thanks to focused 0.1 mm laser spot
- Detection of fast objects thanks to short response times of < 0.1 ms
- The right shapes, sizes and sensor principles for your application

x = function principle	OxDM 16	OHDM 20	OxDK 25	OR18.EL/TL
features	■ Sensors for wafer detection	■ Large range	■ Sensors with two outputs	■ Short response time ■ Large range
dimensions (B × H × T)	15,4 × 50 × 50 mm	20,6 × 65 × 50 mm	23,4 × 63 × 45 mm	M18
function principle (x) / ranges				
diffuse sensors background suppression	**25 ... 300 mm** (OHDM 16)	**210 ... 1500 mm**	**100 ... 1750 mm** (OHDK 25)	
diffuse sensors with intensity difference	**0 ... 250 mm** (OZDM 16)			
SmartReflect® light barriers without a reflector			**100 ... 1900 mm** (ONDK 25)	
retro-reflective sensors	**12 m** (OPDM 16)			
retro-reflective sensors for transparent detection				
through beam sensors				**60 m**
differential sensors				
laser class	2	2	1	1
response time up	< 0,1 ms	< 6 ms	< 10 ms	< 0,34 ms
output	PNP NPN	PNP	push-pull	PNP NPN
housing material	die-cast zinc	die-cast zinc	plastic	brass nickel plated
operating temperature	–10 ... +50 °C	–10 ... +50 °C	–10 ... +50 °C	–10 ... +55 °C
protection class	IP 67	IP 67	IP 67	IP 67

Learn more:
www.baumer.com/laser

Light barriers and light sensors

Light barriers without reflector – *SmartReflect®*

Less is more – reduced operating costs with increased functional reliability

- Reliable barrier principle between the sensor and the machine part
- Suitable for objects of different color, surface or transparency
- Robust with dirt deposit in plastic, stainless steel or hygiene design
- Powerful with < 0.25 ms response time and up to 1.9 m range
- Simple and cost-effective in installation and operation without reflector

y = light source	FNDK 07 FNCK 07	O300.Sy O300.Sy.T	O500.Sy O500.Sy.T	FNDK 14
features	■ Miniature sensor	■ Miniature sensor ■ Transparent detection versions	■ Transparent detection versions	■ Transparent detection versions
dimensions (B × H × T)	8 × 16,2 × 10,8 mm	12,9 × 32,2 × 23 mm	18 × 45 × 32 mm	14,8 × 43 × 31 mm
light source (y)				
standard LED (R)	**17 ... 45 mm**			**50 ... 800 mm**
pinPoint LED (P)		**30 ... 300 mm** (O300.SP / O300.SP.T)	**60 ... 600 mm** (O500.SP) **30 ... 1000 mm** (O500.SP.T)	
infrarot (I)				
laser (L)		**30 ... 250 mm** (O300.SL)		
response time	< 0,5 ms	< 0,25 ms	< 0,25 ms	< 1,8 ms
output	PNP NPN	push-pull PNP NPN	push-pull PNP NPN	push-pull
connection types	cable 2 m flylead connector M8	cable 2 m connector M8 flylead connector M8	cable 2 m connector M12	cable 2 m connector M8 flylead connector M12
housing material	plastic	plastic	plastic	plastic
operating temperature	–20 ... +50 °C	–25 ... +60 °C	–25 ... +60 °C	–30 ... +65 °C
protection class	IP 65	IP 67	IP 67	IP 67

Learn more:
www.baumer.com/smartreflect

IO-Link

IO-Link

ONDK 25	OR18.SP	O300W.Sy O300W.Sy.T	O500W.Sy O500W.Sy.T
■ Standard	■ Standard sensor M18	■ Washdown design ■ Transparent detection versions	■ Washdown design ■ Transparent detection versions
23,4 × 63 × 45 mm	M18 × 65 mm	16,5 × 34,7 × 28,2 mm	20,2 × 47,2 × 37,7 mm
	55 ... 300 mm	**30 ... 300 mm** (O300W.SP / O300W.SP.T)	**60 ... 600 mm** (O500W.SP) **30 ... 1000 mm** (O500W.SP.T)
1900 mm		**30 ... 250 mm** (O300W.SL)	
< 10 ms	< 0,49 ms	< 0,25 ms	< 0,25 ms
push-pull	push-pull PNP NPN	push-pull	push-pull
cable 2 m connector M12	connector M12	connector M8	connector M12
plastic	brass nickel plated	stainless steel, Ecolab-certified, FDA-compliant	stainless steel, Ecolab-certified, FDA-compliant
0 ... +50 °C	–25 ... +60 °C	–25 ... +60 °C	–25 ... +60 °C
IP 67	IP 67	IP 68 / IP 69K *proTect+*	IP 68 / IP 69K *proTect+*

Light barriers and light sensors

Light barriers without reflector – *SmartReflect®*

Less is more – reduced operating costs with increased functional reliability

- Reliable barrier principle between the sensor and the machine part
- Suitable for objects of different color, surface or transparency
- Robust with dirt deposit in plastic, stainless steel or hygiene design
- Powerful with < 0.25 ms response time and up to 1.9 m range
- Simple and cost-effective in installation and operation without reflector

IO-Link

IO-Link

IO-Link

IO-Link

y = light source	FNDR 14	O300H.Sy O300H.Sy.T	O500H.Sy O500H.Sy.T	FNDH 14
features	■ Washdown design	■ Hygiene design ■ Versions pour détection de transparence	■ Hygiene design ■ Versions pour détection de transparence	■ Hygiene design ■ Versions pour détection de transparence
dimensions (B × H × T)	19,6 × 51 × 34,3 mm	16,5 × 34,6 × 28,7 mm	20,2 × 47,7 × 36,4 mm	19,6 × 52,2 × 34,3 mm
light source (y)				
standard LED (R)				
pinPoint LED (P)	**50 ... 800 mm**	**30 ... 300 mm** (O300H.SP / O300H.SP.T)	**60 ... 600 mm** (O500H.SP) **60 ... 1000 mm** (O500H.SP.T)	**50 ... 800 mm**
infrarot (I)				
laser (L)	**30 ... 250 mm**	**30 ... 250 mm** (O300H.SL)		**1900 mm**
response time	< 1,8 ms	< 0,25 ms	< 0,25 ms	< 1,8 ms
output	push-pull	push-pull	push-pull	push-pull
connection types	connector M12	connector M8	connector M12	cable 2 m connector M12
housing material	stainless steel, Ecolab-certified, EHEDG-compliant, FDA-compliant	stainless steel, Ecolab-certified, EHEDG-compliant, FDA-compliant	stainless steel, Ecolab-certified, EHEDG-compliant, FDA-compliant	stainless steel, Ecolab-certified, EHEDG-compliant, FDA-compliant
operating temperature	–30 ... +60 °C	–25 ... +60 °C	–25 ... +60 °C	–30 ... +60 °C
protection class	IP 68 / IP 69K *proTect+*	IP 68 / IP 69K *proTect+*	IP 68 / IP 69K *proTect+*	IP 68 / IP 69K *proTect+*

Learn more:
www.baumer.com/smartreflect

Light barriers and light sensors

Transparent detection

The sensor solutions for the detection of bowls, bottles and foils

- Extremely safe and fast with a response time < 0.25 ms
- Unique range without reflector up to 1 m
- Up to 7 m range with retro-reflective light barriers
- In plastic, hygiene or washdown design, depending on the surroundings

y = light source	O300.SP.T	O300.RP.T	FNDK 14	FRDK 14
features	■ *SmartReflect*®	■ retro-reflective sensors	■ *SmartReflect*®	■ retro-reflective sensors
dimensions (B × H × T)	12,9 × 32,3 × 23 mm	12,9 × 32,3 × 23 mm	14,8 × 43 × 31 mm	14,8 × 43 × 31 mm
light source (y)				
standard LED (R)				
pinPoint LED (P)	**30 ... 300 mm**	**4 m**	**200 ... 800 mm**	**8 m**
infrarot (I)				
laser (L)				
response time	< 0,25 ms	< 0,25 ms	< 1,8 ms	< 0,25 ms
output	push-pull	push-pull	push-pull	push-pull
connection types	cable 2 m connector M8	cable 2 m connector M8	cable 2 m connector M8 connector M12	cable 2 m connector M8
housing material	plastic	plastic	plastic	plastic
operating temperature	–25 ... +60 °C	–25 ... +60 °C	–30 ... +60 °C	–25 ... +60 °C
protection class	IP 67	IP 67	IP 67	IP 68 / IP 69K *proTect+*

Learn more:
www.baumer.com/transparent

OPDK 14	FPDM 16	O500.SP.T	O500.RP.T
■ retro-reflective laser sensor	■ retro-reflective sensors	■ *SmartReflect*®	■ retro-reflective sensors
14,8 × 43 × 31 mm	15,4 × 50 × 50 mm	18 × 45 × 32 mm	18 × 45 × 32 mm
	7,2 m		
		60 ... 1000 mm	6 m
5,2 m			
< 0,25 ms	< 2,5 ms	< 0,25 ms	< 0,25 ms
PNP NPN	PNP	push-pull	push-pull
cable 2 m connector M8 connector M12	connector M12	cable 2 m connector M12	cable 2 m connector M12
plastic	die-cast zinc	plastic	plastic
–10 ... +50 °C	–25 ... +65 °C	–25 ... +60 °C	–25 ... +60 °C
IP 67	IP 67	IP 67	IP 67

Light barriers and light sensors

Transparent detection – Stainless steel

The sensor solutions for the detection of bowls, bottles and foils

- Extremely safe and fast with a response time < 0.25 ms
- Unique range without reflector up to 1 m
- Up to 7 m range with retro-reflective light barriers
- In plastic, hygiene or washdown design, depending on the surroundings

IO-Link

IO-Link

IO-Link

IO-Link

y = light source	O300W.SP.T Washdown O300H.SP.T Hygiene	O300W.RP.T Washdown O300W.RP.T Hygiene	FNDR 14 Washdown FNDH 14 Hygiene	O500W.SP.T Washdown O500H.SP.T Hygiene
features	■ *SmartReflect*®	■ retro-reflective sensors	■ *SmartReflect*®	■ *SmartReflect*®
dimensions (B × H × T)	16,5 × 34,7 × 28,2 mm	16,5 × 34,7 × 28,2 mm	16,5 × 51 × 34,3 mm	20,2 × 124 × 36,4 mm
light source (y)				
standard LED (R)				
pinPoint LED (P)	**30 ... 300 mm**	**4 m**	**20 ... 800 mm**	**60 ... 1000 mm**
infrarot (I)				
laser (L)				
response time	< 0,25 ms	< 0,25 ms	< 0,25 ms	< 0,25 ms
output	push-pull	push-pull	push-pull	push-pull
connection types	cable 2 m connector M8	cable 2 m connector M8	cable 2 m connector M8 connector M12	cable 2 m connector M12
housing material	stainless steel, Ecolab-certified, EHEDG-compliant (hygienic), FDA-compliant	stainless steel, Ecolab-certified, EHEDG-compliant (hygienic), FDA-compliant	stainless steel, Ecolab-certified, EHEDG-compliant (hygienic), FDA-compliant	stainless steel, Ecolab-certified, EHEDG-compliant (hygienic), FDA-compliant
operating temperature	–25 ... +60 °C	–25 ... +60 °C	–30 ... +60 °C	–25 ... +60 °C
protection class	IP 68 / IP 69K *proTect+*	IP 68 / IP 69K *proTect+*	IP 68 / IP 69K *proTect+*	IP 68 / IP 69K *proTect+*

Learn more:
www.baumer.com/transparent

IO-Link

O500W.RP.T Washdown O500H.RP.T Hygiene	OR18.W.RR.T Washdown
■ retro-reflective sensors	■ retro-reflective sensors
20,2 × 124 × 36,4 mm	M18 × 67,2 mm
	800 mm
6 m	
< 0,25 ms	< 1 ms
push-pull	PNP NPN
cable 2 m connector M12	connector M12
stainless steel, Ecolab-certified, EHEDG-compliant (hygienic), FDA-compliant	stainless steel
–25 ... +60 °C	–25 ... +55 °C
IP 68 / IP 69K *proTect+*	IP 67/69K

Light barriers and light sensors

Washdown design

- Robust stainless steel housing
- Long-term sealing thanks to *proTect+*
- IP 69K and Ecolab tested
- Different sizes and sensor principles
- Benefits by *SmartReflect*® light barrier without reflector

IO-Link

IO-Link

IO-Link

IO-Link

x = function principle y = light source	FxDR 14	O300W.xy	O500W.xy	OR18W.xy
dimensions (B × H × T)	19,6 × 62,4 × 34,3 mm	16,5 × 34,7 × 28,2 mm	20,2 × 47,2 × 37,7 mm	M18
function principle (x) / ranges				
diffuse sensors with background suppression	**50 ... 400 mm** (FHDR 14)	**30 ... 250 mm** (O300W.GP / O300W.GL)	**60 ... 400 mm** (O500W.GP)	**40 ... 120 mm** (OR18W.GR)
diffuse sensors with intensity difference				**0 ... 800 mm** (OR18W.ZI)
SmartReflect® light barriers without reflector	**50 ... 800 mm** (FNDR 14)	**30 ... 300 mm** (O300W.SP / O300W.SL)	**60 ... 600 mm** (O500W.SP)	
SmartReflect® transparent	**200 ... 800 mm** (FNDR 14)	**30 ... 300 mm** (O300W.SP.T)	**60 ... 1000 mm** (O500W.SP.T)	
retro-reflective sensors	**3 m** (FPDR 14)	**6 m** (O300W.RP / O300W.RL)	**8 m** (O500W.RP)	**4,5 m** (OR18W.RR)
transparent detection without reflector		**4 m** (O300W.RP.T)	**6 m** (O500W.RP.T)	**800 mm** (OR18W.RR.T)
through beam sensors		**15 m** (O300W.TR / .TL) (O300W.ER / .EL)	**40 m** (O500W.TR / .TL) (O500W.ER / .EL)	**20 m** (OR18W.TI) (OR18W.EI)
contrast sensor	**12,5 mm ±2 mm** (FKDR 14)			
light source (y)				
standard LED (R)	■	■	■	■
pinPoint LED (P)	■	■	■	
infrarot (I)				■
laser (L)		■		
response time	< 1 ms <0,05 ms (contrast)	< 0,25 ms < 0,1 ms (laser)	< 0,25 ms	< 1 ms
output	push-pull	push-pull	push-pull	PNP NPN
connection types	connector M12	connector M8	connector M12	connector M12
housing material	stainless steel, Ecolab-certified, FDA-compliant	stainless steel, Ecolab-certified, FDA-compliant	stainless steel, Ecolab-certified, FDA-compliant	stainless steel, Ecolab-certified, FDA-compliant
operating temperature	–25 ... +60 °C	–25 ... +60 °C	–25 ... +60 °C	–25 ... +55 °C
protection class	IP 68 / IP 69K *proTect+*	IP 68 / IP 69K *proTect+*	IP 68 / IP 69K *proTect+*	IP 67 / IP 69K

Hygiene Design

- EHEDG certified, FDA-compliant, Ecolab tested
- Long-term sealing thanks to *proTect+*
- Different sizes and sensor principles
- Benefits through *SmartReflect*® light barrier without reflector

Learn more:
www.baumer.com/opto

IO-Link

IO-Link

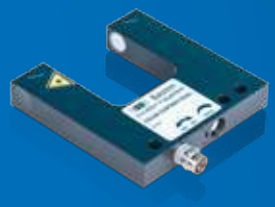
IO-Link

x = function principle y = light source	FxDH 14	O300H.xy	O500H.xy
dimensions (B × H × T)	19,6 × 52,2 × 34,3 mm	16,5 × 34,6 × 28,7 mm	20,2 × 47,7 × 36,4 mm
function principle (x) / ranges			
diffuse sensors with background suppression	**50 ... 400 mm** (FHDH 14)	**30 ... 250 mm** (O300H.Gy)	**60 ... 400 mm** (O500H.Gy)
diffuse sensors with intensity difference			
SmartReflect® light barriers without reflector	**50 ... 800 mm** (FNDH 14)	**30 ... 300 mm** (O300H.Sy)	**60 ... 600 mm** (O500H.Sy)
SmartReflect® transparent	**200 ... 800 mm** (FNDH 14)	**30 ... 300 mm** (O300H.SPT)	**60 ... 1000 mm** (O500H.SPT)
retro-reflective sensors	**3,5 m** (FPDH 14)	**6 m** (O300H.Ry)	**8 m** (O500H.Ry)
transparent detection without reflector		**4 m** (O300H.RPT)	**6 m** (O500H.RPT)
through beam sensors		**15 m** (O300H.Ty) (O300H.Ey)	**40 m** (O500H.Ty) (O500H.Ey)
contrast sensor	**12,5 m ±2 mm** (FKDH 14)		
light source (y)			
standard LED (R)	■	■	■
pinPoint LED (P)	■	■	■
infrarot (I)			
laser (L)		■	
response time	< 1 ms <0,05 ms (contrast)	< 0,25 ms <0,1 ms (laser)	< 0,25 ms
output	push-pull	push-pull	push-pull
connection types	connector 2 m flylead connector M12	connector 2 m flylead connector M8	connector 2 m flylead connector M12
housing material	stainless steel, Ecolab-certified, EHEDG-compliant, FDA-compliant	stainless steel, Ecolab-certified, EHEDG-compliant, FDA-compliant	stainless steel, Ecolab-certified, EHEDG-compliant, FDA-compliant
operating temperature	–30 ... +60 °C	–25 ... +60 °C –10 ... +60 °C (Laser)	–25 ... +60 °C
protection class	IP 68 / IP 69K *proTect+*	IP 68 / IP 69K *proTect+*	IP 68 / IP 69K *proTect+*

Light barriers and light sensors

Fork and angle sensors

- Quick response times up to 0,125 ms
- High repeat accuracy
- Robust metal housing
- Narrow parallel light beam
- Smallest detectable object 0,05 mm
- Different gap widths 20 ... 158 mm
- Output PNP/NPN



	FGUM with	OGUM basic	OGUM	FGLM
category	Pulsed red LED Fork sensors	Laser Fork sensors	Laser Fork sensors	Angle sensors L profile
features	■ Potentiometer or Teach-in version ■ Narrow, virtually parallel light beam ■ Sensors can be mounted side-by-side	■ High resolution ■ Short response time ■ Sensors can be mounted side-by-side	■ Very high resolution ■ Extremely narrow laser light beam ■ Sensors can be mounted side-by-side ■ High repeat accuracy	■ Special L-type ■ Narrow, virtually parallel light beam ■ Sensors can be mounted side-by-side
type	U profile	U profile	U profile	L profile
fork widths	20 mm 30 mm 50 mm 80 mm 120 mm 170 mm	30 mm 50 mm 80 mm 120 mm	30 mm 50 mm 80 mm 120 mm	60 mm 100 mm 158 mm
object size	> 0,4 mm	> 0,1 mm	> 0,05 mm	> 0,5 mm
repeat accuracy	< 0,02 mm	< 0,02 mm	< 0,01 mm	< 0,06 mm
response / release time	< 0,125 ms	< 0,166 ms	< 0,166 ms	< 0,125 ms
connection types	connector M8	connector M12	connector M8	connector M8
housing material	die-cast zinc	aluminum	aluminum	die-cast zinc
operating temperature	–10 ... +60 °C	+5 ... +45 °C	+5 ... +45 °C	–10 ... +60 °C
protection class	IP 67	IP 67	IP 67	IP 67
specific features		■ laser class 1	■ laser class 1	

Learn more:
www.baumer.com/fork-angle

Light barriers and light sensors

Differential, contrast and color sensors

- Fast print mark detection
- Small sizes from 10 mm
- Reliable detection of very low contrasts or very fine color nuances
- Monitoring of position tolerances using differential sensors

	OBDM 12	OZDK 10	OZDM 16
features	■ Difference sensors	■ Diffuse sensors with intensity difference - miniature	■ Diffuse sensors with intensity difference with analog output - standard
dimensions (B × H × T)	12,4 × 37 × 34,5 mm	10,4 × 27 × 16,3 mm	15,4 × 50 × 50 mm
light source	laser	laser	laser
sensing distance Tw	16 ... 120 mm	3 ... 150 mm	0 ... 250 mm
response time	< 1 ms	< 0,05 ms	< 0,1 ms
output	PNP NPN	PNP NPN	PNP 4 ... 20 mA
connection types	connector M8	cable 2 m connector M8	cable 2 m connector M8
housing material	die-cast zinc	plastic	die-cast zinc
operating temperature	0 ... +50 °C	0 ... +50 °C	–10 ... +50 °C
protection class	IP 67	IP 67	IP 67
function	■ monitoring of position tolerances ■ object detection on fluctuating conveyor belts ■ detection of minimum and maximum deviations in the process ■ variant for step / edge detection	■ detection of gradual changes, e. g. when polishing surfaces ■ fast and economical print mark recognition	■ detection of gradual changes, e. g. when polishing surfaces ■ fast and economical print mark recognition

Learn more:
www.baumer.com/contrast

FKDK 14	FKDR 14	FKDH 14	FKDM 22
■ White LED diffuse contrast sensors	■ White LED diffuse contrast sensors ■ Washdown design	■ White LED diffuse contrast sensors ■ Hygienic design	■ Color sensors
14,8 × 43 × 31 mm	19,6 × 51 × 34,3 mm	19,6 × 52,2 × 34,3 mm	22,9 × 50 × 68,7 mm
white LED	white LED	white LED	RGB
12,5 mm ±2 mm	12,5 mm ±2 mm	12,5 mm ±2 mm	25 mm / 40 mm
< 0,05 ms	< 0,05 ms	< 0,05 ms	< 0,34 ms
push-pull	push-pull	push-pull	PNP NPN
cable 2 m connector M8 connector M12	connector M12	cable 2 m flylead connector M12	connector M12
plastic	stainless steel	stainless steel	aluminum
–25 ... +65 °C	–25 ... +65 °C	–25 ... +60 °C	–10 ... +55 °C
IP 67	IP 68 / IP 69K *proTect+*	IP 68 / IP 69K *proTect+*	IP 67
■ detection of gradual changes, e. g. when polishing surfaces ■ fast and economical print mark recognition	■ detection of gradual changes, e. g. when polishing surfaces ■ fast and economical print mark recognition	■ detection of gradual changes, e. g. when polishing surfaces ■ fast and economical print mark recognition	■ 4 color channels ■ Adjustable color tolerance ■ Quick response time of 0,34 ms

Fiber optic sensors

Plastic fiber optic sensors and fiber optic cables

Always close to the action – detecting tiny objects in cramped or inaccessible places

- Large selection of sensing heads with plastic and glass fiber optic cables
- Very small and light sensors for tasks in robotics
- Detection of filling levels or leaks, also in aggressive liquids
- Large sensing range of up to 4 m

	Plastic fiber optic	FVDK 10	FWDK 84	FVDK 66
features	■ Extremely varied beam geometries: spot, coaxial, focused, line ■ Fiber optics resistant to chemicals ■ High temperature fiber ■ Lateral beam emission	■ Smallest fiber optic sensor ■ Sensitivity adjustable with potentiometer	■ Sensitivity adjustable with potentiometer ■ Analog output	■ Sensitivity adjustable with Teach-in ■ Minimized installation effort (master slave) ■ Logical output linking available (Duplex version) ■ Timer functions
dimensions		10,4 × 27 × 19,5 mm	10 × 29,7 × 60 mm	10 × 33,8 × 70,2 mm
ranges (optical fiber dependent)				
with through beam (max.)		**600 mm**	**90 mm**	**1500 mm**
with reflective (max.)		**70 mm**	**45 mm**	**130 mm**
response time		< 1 ms	1 ... 5 ms	0,25 ... 1 ms
output		NPN PNP	1 ... 5 VDC	NPN PNP
connection types		cable 2 m flylead connector M8	cable 2 m	cable 2 m connector M8
housing material		plastic (ASA)	polycarbonate / ABS	polycarbonate / ABS
operating temperature		–25 ... +55 °C	–20 ... +60 °C	–20 ... +55 °C
protection class		IP 40	IP 40	IP 40
additional functions			■ Off delay	■ Alarm output ■ External Teach-in
specific features			■ version with analog output	■ master slave

Learn more:
www.baumer.com/fibre-optic

FVDK 67

- Multi-functional device
- Sensitivity adjustable with Teach-in
- Minimized installation effort (master slave)
- Timer functions

10 × 33,8 × 70,2 mm

4000 mm

550 mm

0,05 ... 5 ms

NPN
PNP

cable 2 m
connector M8

polycarbonate / ABS

–20 ... +55 °C

IP 40

- Response / release time adjustable
- Adjustable minimum pulse length

- version with 2 switching points
- master slave

Fiber optic sensors

Glass fiber optic sensors and fiber optic cables

Always close to the action – detecting tiny objects in cramped or inaccessible places

- Large selection of sensing heads with plastic and glass fiber optic cables
- Very small and light sensors for tasks in robotics
- Detection of filling levels or leaks, also in aggressive liquids
- Large sensing range of up to 4 m

	Glass fiber optic	FZAM 18	FZAM 30	FVDM 15
features	■ Different beam geometries: spot, line ■ Fiber optics with robust metal sheath ■ High temperature fiber ■ Lateral beam emission	■ Sensitivity adjustable with Teach-in or potentiometer ■ Robust metal housing	■ Sensitivity adjustable with Teach-in or potentiometer ■ Robust metal housing ■ For large ranges	■ Sensitivity adjustable with potentiometer ■ Robust metal housing ■ Quick response and release times
dimensions		M18 × 50 mm	M30 × 50 mm	15 × 60 × 45 mm
ranges (optical fiber dependent)				
with through beam (max.)		800 mm	1400 mm	500 mm
with reflective (max.)		150 mm	230 mm	240 mm
response time		< 0,5 ms / < 1 ms	< 0,25 ms / <2,5 ms	< 0,1 ms / <1 ms
output		NPN PNP	NPN PNP	NPN PNP
connection types		cable 2 m connector M12	cable 2 m	cable 2 m connector M12
housing material		brass nickel plated / PC	brass nickel plated	die-cast aluminum
operating temperature		–25 ... +55 °C	0 ... +65 °C	–25 ... +55 °C
protection class		IP 67	IP 65	IP 65
specific features		■ infrared	■ fast version ■ infrared	■ fast version ■ infrared

Learn more:
www.baumer.com/fibre-optic

Ultrasonic sensors

Miniaturized ultrasonic sensors

Small and light sensors for very cramped spaces

- Wide range of round and rectangular designs
- Sensing distances up to 400mm
- Narrow sonic beam for object detection even in the smallest openings
- Lightweight with only 4 grams for gripper applications

	UNAM 12 URAM 12	UNCK / UNDK 09 URCK / URDK 09	UNDK 10 / URDK 10
features	■ Narrow and wide sonic beam angles ■ Highspeed versions ■ Versions with beam columnator	■ Versions with beam columnator ■ Very flat housing ■ Lateral approach accuracy <1, 5 mm	■ The world's smallest sensor ■ Weights only 4 grams ■ Narrow sonic beam angles
dimensions	M12	8,6 × 82 × 24,5 mm	10,4 × 27 × 14 mm
sensing range Sd / sensor principle			
proximity switch (UNxx / xx.PAO)	5 ... 400 mm	3 ... 200 mm	10 ... 200 mm
2 point proximity switch (UZxx)			
retro-reflective sensors (URxx / xx.RAO)	0 ... 70 mm	0 ... 200 mm	0 ... 200 mm
through beam sensors (UExx)			
response time	< 1,5 mm	< 0,5 mm < 1,5 mm	< 0,5 mm < 1,5 mm
output	NPN PNP	Gegentakt NPN PNP	NPN PNP
connection types	connector M12	cable 2 m connector M8	cable 2 m connector M8
housing material	brass nickel plated	plastic	plastic
operating temperature	–10 ... +60 °C	0 ... +60 °C	–10 ... +60 °C
protection class	IP 67	IP 67	IP 67

UNxx / xx.PAO = proximity switch
URxx / xx.RAO = retro-reflective sensors
UZxx = 2 point proximity switch
UExx = through beam sensors

Learn more:
www.baumer.com/ultrasonic

Ultrasonic sensors

Cylindrical standard sensors

Undisturbed by difficult environmental conditions and varying object properties

- Outstanding fast, small and sturdy in one
- Unaffected by object's brilliance, color or transparency
- Impervious to dust, moisture or ambient light

	UNAM 18 UNAR 18	UR18.PAO UR18.RAO	UNAM 30 UZAM 30
features	■ Stainless steel housing V4A ■ Chemically resistant sensor front ■ FDA-compliant materials ■ Internal and external Teach-in	■ *qTeach*® – easy to operate, safe and wear-free ■ Short design	■ Internal and external Teach-in ■ Cable and connector versions ■ Potentiometer versions
dimensions	M18	M18	M30
sensing range Sd / sensor principle			
proximity switch (UNxx / xx.PAO)	60 ... 1000 mm	100 ... 1000 mm	200 ... 1500 mm
2 point proximity switch (UZxx)			100 ... 1000 mm
retro-reflective sensors (URxx / xx.RAO)	0 ... 400 mm	0 ... 1000 mm	
response time	< 0,5 mm	< 0,5 mm	< 0,5 mm
output	NPN PNP	push-pull	NPN PNP
connection types	connector M12	connector M12	cable 2 m connector M12
housing material	brass nickel plated stainless steel	brass nickel plated	brass nickel plated
operating temperature	–10 ... +60 °C	–25 ... +70 °C	–25 ... +60 °C –10 ... +60 °C
protection class	IP 67	IP 67	IP 67

UNxx / xx.PAO = proximity switch
URxx / xx.RAO = retro-reflective sensors
UZxx = 2 point proximity switch
UExx = through beam sensors

Learn more:
www.baumer.com/ultrasonic

UNAM 50 URAM 50 UZAM 50	UZAM 70
■ Large sensing range ■ Internal and external Teach-in ■ Potentiometer versions	■ Large sensing range ■ Internal and external Teach-in
M30	M30
350 ... 2500 mm	
350 ... 2500 mm	600 ... 6000 mm
0 ... 3000 mm	
< 1 mm < 3 mm	< 3 mm
NPN PNP	NPN PNP
cable 2 m connector M12	connector M12
brass nickel plated	brass nickel plated
–25 ... +60 °C	–25 ... +60 °C
IP 67	IP 67

Ultrasonic sensors

Rectangular standard sensors

Undisturbed by difficult environmental conditions and varying object properties

- Sensing distances up to 2000 mm
- Reliable detection of high-reflective and transparent objects
- Tolerant of dust and dirt
- Versions with two separate switching outputs
- Adjustable response times ton/toff for throughbeam barriers

	UNCK / UNDK 09 URCK / URDK 09	UNDK 10 / URDK 10	UNDK 20 URDK 20 UEDK 20
features	■ High resolution ■ Minimal blind region ■ RS 232 ■ Various mounting options ■ Flat housing ■ Narrow sonic beam angle for detection in openings of up to 3 mm	■ Smallest ultrasonic sensor ■ Internal and external Teach-in ■ Very low weight: 4 g ■ Narrow sonic beam angle ■ Cable and flylead connector versions	■ Flat type ■ Internal and external Teach-in ■ Narrow and wide sonic beam angles ■ M8 connector
dimensions	8,6 × 82 × 24,5 mm	10,4 × 27 × 14 mm	20 × 42 × 15 mm
sensing range Sd / sensor principle			
proximity switch (UNxx / xx.PAO)	3 ... 200 mm	10 ... 200 mm	10 ... 1000 mm
2 point proximity switch (UZxx)			
retro-reflective sensors (URxx / xx.RAO)	0 ... 200 mm	0 ... 200 mm	0 ... 1000 mm
through beam sensors (UExx)			0 ... 1000 mm
response time	< 0,5 mm	< 0,5 mm	< 0,5 mm
output	push-pull RS 232	NPN PNP	NPN PNP
connection types	cable 2 m connector M8	cable 2 m connector M8 flylead connector M8	connector M8
housing material	plastic	plastic	plastic
operating temperature	0 ... +60 °C	–10 ... +60 °C	–10 ... +60 °C

UNxx / xx.PAO = proximity switch
URxx / xx.RAO = retro-reflective sensors
UZxx = 2 point proximity switch
UExx = through beam sensors

Learn more:
www.baumer.com/ultrasonic

UNDK 30 / URDK 30 UZDK 30 / UEDK 30	U500.PAO / U500.RAO
■ Compact type ■ Large sensing range ■ Teach-in on the sensor ■ Potentiometer version ■ Narrow and wide sonic beam angles	■ *OneBoxDesign* – flexibility in planning ■ *qTarget*® – time savings during installation ■ *qTeach*® – Easy to operate, safe and wear-free
30 × 65 × 31 mm	18 × 45,1 × 32,2 mm
30 ... 1000 mm	100 ... 1000 mm
30 ... 2000 mm	
0 ... 2000 mm	0 ... 1000 mm
0 ... 700 mm	
< 0,5 mm	< 0,5 mm
NPN PNP	push-pull
cable 2 m connector M12	cable 2 m connector M12
plastic / die-cast zinc	plastic
–10 ... +60 °C	–25 ... +65 °C

Ultrasonic sensors

Application-specific ultrasonic sensors - High-speed / robust

- High-speed sensors
- Robust stainless steel sensors

	UNAM 12 High-speed	URAM 12 High-speed	UxAR 12 mit Parylenebeschichtung	UNAR 18 URAR 18
category	**High-speed sensors**		**Robust stainless steel sensors, high chemical resistance**	
features	■ Fastest ultrasonic sensor ■ External Teach-in	■ Fastest ultrasonic sensor ■ External Teach-in ■ Sensors with sonic nozzle for small openings	■ Miniature sensor for narrow designs ■ Patented all-round protection ■ FDA-compliant materials ■ Very short response time	■ M18 standard housing ■ FDA-compliant materials ■ Internal and external Teach-in
dimensions	M12	M12	M12	M18
sensing range Sd / sensor principle				
proximity switch (UNxx / xx.PAO)	0 ... 40 mm 10 ... 70 mm		30 ... 200 mm	60 ... 1000 mm
2 point proximity switch (UZxx)				
retro-reflective sensors (URxx / xx.RAO)		0 ... 40 mm 0 ... 70 mm	0 ... 200 mm	0 ... 400 mm
repeat accuracy	< 0,5 mm	< 1,5 mm	< 0,5 mm	< 0,5 mm
output	NPN PNP	NPN PNP	NPN PNP	NPN PNP
connection types	connector M12	connector M12	connector M12	connector M12
housing material	brass nickel plated	brass nickel plated	stainless steel	brass nickel plated stainless steel
operating temperature	–10 ... +60 °C	–10 ... +60 °C	0 ... +60 °C	–10 ... +60 °C
protection class	IP 67	IP 67	IP 67	IP 67

UNxx / xx.PAO = proximity switch
URxx / xx.RAO = retro-reflective sensors
UZxx = 2 point proximity switch
UExx = through beam sensors

Application-specific ultrasonic sensors - Sonic nozzles / Sensing distances

- Sensors with sonic nozzles
- Sensors with large sensing distances

Learn more:
www.baumer.com/ultrasonic

	UNDK 09	UNAM / URAM 12	UNAM 50 URAM 50 UZAM 50	UZAM 70
category	**with sonic nozzles**		**with large sensing distances**	
features	■ High resolution ■ Minimal blind region ■ RS 232 ■ Various mounting options ■ Flat housing ■ Narrow sonic beam angle for detection in openings of up to 3 mm	■ Sonic nozzle for very narrow sonic beams ■ External Teach-in ■ Connector M12	■ Internal and external Teach-in ■ Cable and connector versions ■ Potentiometer versions ■	■ Internal and external Teach-in ■ Connector M12
dimensions	8,6 × 82 × 24,5 mm	M12	M30	M30
sensing range Sd / sensor principle				
proximity switch (UNxx / xx.PAO)	3 ... 200 mm	5 ... 400 mm	350 ... 2500 mm	
2 point proximity switch (UZxx)			350 ... 2500 mm	60 ... 600 mm
retro-reflective sensors (URxx / xx.RAO)	0 ... 200 mm	0 ... 70 mm	0 ... 3000 mm	
response time	< 0,5 mm	< 0,5 mm	< 1 mm < 3 mm	< 3 mm
output	push-pull RS 232	NPN PNP	NPN PNP	NPN PNP
connection types	cable 2 m flylead connector M8	connector M12	cable 2 m connector M12	connector M12
housing material	plastic	brass nickel plated	brass nickel plated	brass nickel plated
operating temperature	0 ... +60 °C	–10 ... +60 °C	–25 ... +60 °C	–25 ... +60 °C
protection class	IP 67	IP 67	IP 67	IP 67

Magnetic and cylinder sensors

Magnetic proximity sensors

- Reliable and wear-free object detection
- Large sensing distances up to 60 mm
- Cylindrical and rectangular versions

	MFFM 08	MFRM 08	MFVM 08
features	■ Acquisition of magnet location ■ Large sensing range ■ Object detection through container walls possible	■ Acquisition of magnet location ■ Large sensing range ■ Object detection through container walls possible	■ Full metall sensor ■ Sensing distance to 60 mm
dimensions	8 × 30 × 8 mm	M8	8 × 12 × 30 mm
assured sensing distance Sa max.	to 60 mm	2,5 mT	2,5 mT
switching frequency	5 kHz	5 kHz	5 kHz
voltage supply range +Vs	10 ... 30 VDC	10 ... 30 VDC	10 ... 30 VDC
output circuit	PNP NPN	PNP NPN	PNP NPN
connection types	cable 2 m	cable 2 m	cable 2 m
housing material	brass nickel plated	stainless steel	aluminum
operating temperature	–25 ... +75 °C	–25 ... +75 °C	–25 ... +75 °C
protection class	IP 67	IP 67	IP 67

Cylinder sensors

- Detecting stop positions of pistons in every standard cylinder with C- or T-slots
- Different versions and versatile installation accessories for maximum flexibility
- Non-contact sensing and absolutely wear-free

Learn more:
www.baumer.com/magnetic

	MZCK 03x1011 MZCK 03x1012	MZTK 06x1011 MZTK 06x1012 MZTK 06x1013
features	■ For C slot cylinders ■ Oil- and salt water climate resistant	■ For T slot cylinders ■ Oil- and salt water climate resistant
dimensions	3,7 × 23 × 4,6 mm 3,7 × 11 × 19,5 mm	6,2 × 31 × 4,3 mm 6,5 × 21 × 9,4 mm 6,2 × 31,5 × 4,5 mm
nominal operation point / assured sensing distance Sa max.	4 mT	4 mT 2 mT (MZTK 06x1012)
switching frequency	200 kHz	200 kHz
voltage supply range +Vs	6 ... 30 VDC	6 ... 30 VDC
output circuit	PNP NPN	PNP NPN
connection types	cable 2,5 m flylead connector M8	cable 2,5 m flylead connector M8
housing material	PA 66	PA 66
operating temperature	–40 ... +70 °C	–40 ... +70 °C
protection class	IP 67	IP 67

Hall and magnetic rotary sensors

Hall and magnetic rotary sensors

- Detection of speed and rotation direction at gear wheels
- Absolute acquisition of part location up to 360° rotary angle
- Wear-free and thus extremely low-maintenance
- Particular robust variants available
- High resolution

	MHRM 12 / 18	MTRM 16 / MTR
function	**hall sensors**	**hall sensors**
features	■ Detects gears and racks ■ Sealed metal housing ■ Operating temperature range –40 ... +120 °C	■ Detection of rpm speed and rotational direction of gear wheels ■ Completely sealed metal housing ■ Operating temperature range –40 ... +120 °C
dimensions	M12 × 1 M18 × 1	ø 16 mm
working distance max.	2 mm	2,5 mm
switching frequency / response time	20 kHz	20 kHz
resolution	starting from module 1	module 1 to 3
output	push-pull	push-pull
connection types	cable 2 m connector M12	cable 2 m
housing material	brass nickel plated stainless steel	brass nickel plated stainless steel 1.4404
operating temperature	–40 ... +120 °C	–40 ... +120 °C
protection class	IP 67 (sensor) IP 68 (sensing face)	IP 68 / IP 69K
specific features	■ single and dual channel versions	■ compliant to stringent railway standards: EN 501555 EN 61373 (Kat. 3) EN 45545

Learn more:
www.baumer.com/hall

	MDRM 18 MDFM 20
function	**magnetic angle sensors**
features	■ Can be used as an electronic potentiometer ■ Absolute position feedback to 360° of rotation ■ Cylindrical and rectangular designs
dimensions	M18 × 1 20 × 30 × 8 mm
working distance max.	2 mm
switching frequency / response time	4 ms
resolution	0,09°
output	analog current or voltage output
connection types	cable 2 m connector M12 flylead connector M8
housing material	brass nickel plated
operating temperature	–40 ... +85 °C
protection class	IP 67
specific features	■ suitable magnets available as an accessory

Edge detection / copy counters

Copy counters *SCATEC*®

Number one in flawless edge detection

- Reliable lap stream copy counting – up to 3 million copies per hour
- Detection of individual packages with seamless product conveyance
- Single sheet detection from an edge thickness of 0.1 mm

	SCATEC-J	*SCATEC-2*	*SCATEC-10*	*SCATEC-15*
category	entry-level model edge thickness up 1,5 mm	standard edge thickness up 0,2 mm	precision class edge thickness up 0,1 mm	precision class edge thickness up 0,15 mm
dimensions	33 × 110 × 50 mm	33 × 110 × 50 mm	30 × 170 × 70 mm	30 × 170 × 70 mm
measuring distance	0 ... 55 mm	0 ... 120 mm	0 ... 90 mm	0 ... 120 mm
sensibility	single sheet/edge thickness 1,5 mm	single sheet/edge thickness 0,2 mm	single sheet/edge thickness 0,1 mm	single sheet/edge thickness 0,15 mm
counting rate	280'000 copies/h	600'000 copies/h	3'000'000 copies/h	3'000'000 copies/h
false pulse suppression		on/off switchable	4 program options	4 program options
connection types	connector M12	connector M12	DIN 45322 (main connector) DIN 45326 (interface)	DIN 45322 (main connector) DIN 45326 (interface)
housing material	PA 6	PA 6	die-cast zinc	die-cast zinc
operating temperature	0 ... +50 °C	0 ... +50 °C	0 ... +50 °C	0 ... +50 °C
protection class	IP 54	IP 54	IP 54	IP 54
specific features		■ *SCATEC-2* Box for counting of individual packages (in transport clamps)		

Learn more:
www.baumer.com/opto

Precision mechanical switches

Precision mechanical switches *MY-COM*®

Micrometer precision – 70 times more accurate than a hair is thick

- Repeat accuracy of 1 micrometer – the most accurate mechanical limit switch in the world
- Compact design for very confined installation environment
- Mechanical (NC) and electrical (NO) output circuit

	MY-COM A	MY-COM B	MY-COM C	MY-COM D
features	■ Conical housing front ■ M8 fine pitch thread	■ Brass housing ■ Flat housing front ■ M8 fine pitch thread	■ Flat brass housing ■ 2-hole mounting	■ Robust burnished brass housing ■ Spherical metal tip ■ Protection class IP 67 ■ Lateral approach possible to 30°
all mechanical	■	■	■	
with amplifier				
for lateral approach				■
rugged IP 67				■
dimensions	M8 × 0,5	M8 × 0,5	8 × 12 × 30 mm	M16 × 0,5
repeat accuracy	< 1 µm	< 1 µm	< 1 µm	< 1 µm
output	NC (mechanical)	NC (mechanical)	NC (mechanical)	NC (mechanical) NO (PNP/NPN)
connection types	cable 0,8 m connector M8	cable 0,8 m connector S30	cable 0,8 m connector M8	cable 0,8 m connector M8
activating pin	zirconium oxide ZrO2	zirconium oxide ZrO2	zirconium oxide ZrO2	hardened steel
housing material	brass nickel plated	brass nickel plated	brass nickel plated	burnished brass
operating temperature	–20 ... +75 °C	–20 ... +75 °C	–20 ... +75 °C	–20 ... +75 °C
protection class	IP 50	IP 50	IP 50	IP 67

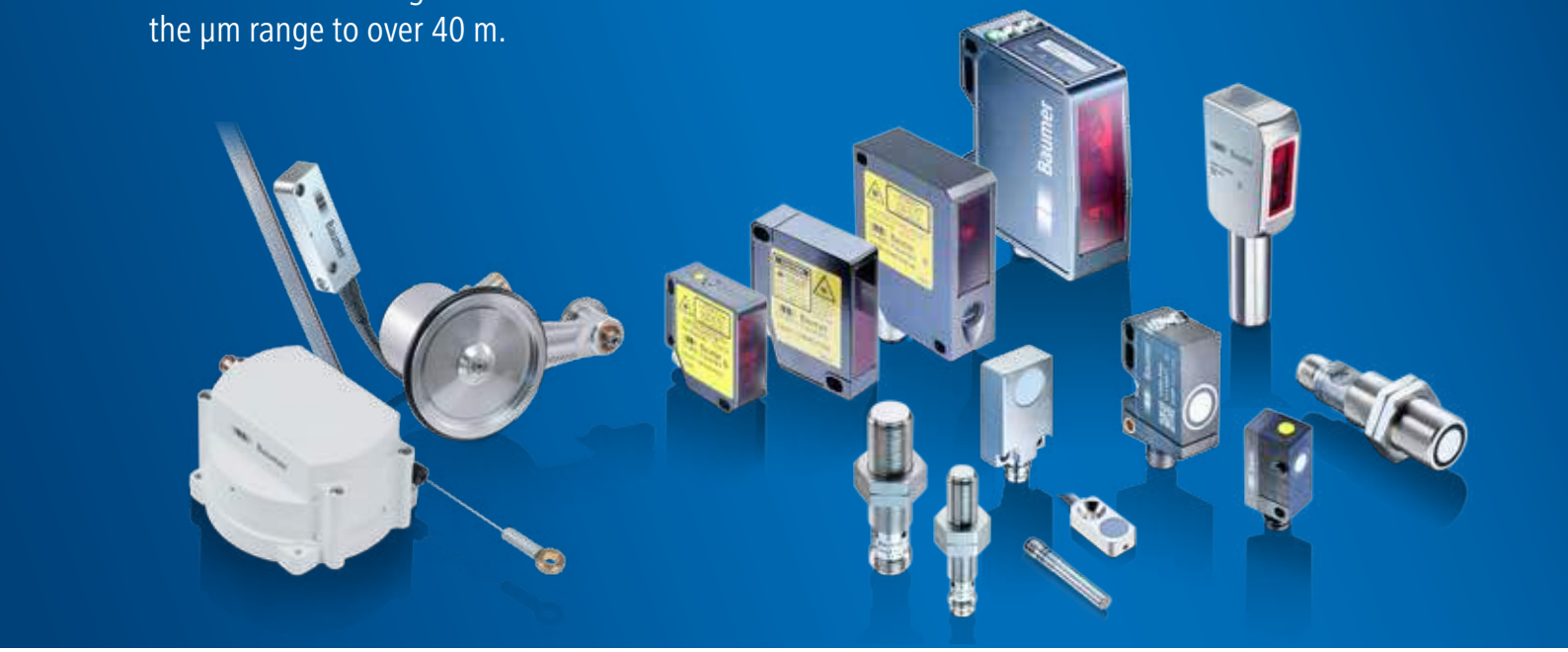
Learn more:
www.baumer.com/my-com




MY-COM E	MY-COM F MY-COM G	MY-COM H MY-COM L	MY-COM M
■ Brass housing ■ M6 fine pitch thread ■ Spherical hard metal tip ■ Lateral approach possible to 30°	■ Brass housing ■ Long M8 fine pitch thread	■ Brass housing ■ M8 fine pitch thread ■ Spherical ruby tip ■ Protection class IP 67	■ Brass housing ■ M8 fine pitch thread ■ Protection class IP 67
■	■	H	■
	G	L	■
■			
		■	■
M6 × 0,5	M8 × 0,5	M8 × 0,5	M8 × 0,5
< 1 µm	< 1 µm	< 1 µm	< 1 µm
NC (mechanical) NO (PNP/NPN)	NC (mechanical) NO (PNP/NPN)	NC (mechanical) NO (PNP/NPN)	NC (mechanical) NO (PNP/NPN)
cable 0,8 m	cable 0,8 m connector M8	cable 0,8 m connector M8	cable 0,8 m connector M8
hardened steel	zirconium oxide ZrO2	ruby	zirconium oxide ZrO2
brass nickel plated	brass nickel plated	brass nickel plated	brass nickel plated
–20 ... +75 °C	–20 ... +75 °C	–20 ... +75 °C	–20 ... +75 °C
IP 50	IP 50	IP 67	IP 67

Distance measurement

Sensors for detecting distances and distance information from the µm range to over 40 m.



Content.

Photoelectric sensors

Optical distance sensors

Precise distance, spacing and position measurements even on challenging surfaces

- Fast, accuracy in the submicrometer range and distances of up to 13 meters
- Reliably even on very rough, shiny or dark surfaces
- Very high ambient light immunity
- Large selection of performance classes, sizes and beam shapes

	OADM 12	OADM 13	OADM 20	OADM 20	OADR 20
category	miniature sensors		performance sensors		
features	■ Smallest laser distance sensor ■ Adjustable measuring range ■ Highest resolution ■ Also as laser class 1	■ Large measuring distance in a small housing ■ Adjustable measuring range ■ Also as laser class 1 & 2 ■ Point and Line	■ The allrounder ■ High vibration resistance ■ Different measuring ranges teachable ■ High measuring rates	■ Increased vibration immunity ■ Increased ambient light immunity 100K lux ■ Suitable for outdoor applica-tions	■ Washdown design ■ Adjustable measuring range ■ Laser Point / Laser line
dimensions	12,4 × 37 × 34,5 mm	13,4 × 48,2 × 40 mm	20,6 × 65 × 50 mm	20,6 × 65 × 50 mm	20,3 × 65 × 50 mm
measuring distance	16 ... 120 mm	50 ... 550 mm	30 ... 1000 mm	50 ... 1000 mm	30 ... 600 mm
resolution	2 µm	10 µm	4 µm	10 µm	5 µm
response time	< 0,9 ms	< 0,9 ms	< 0,9 ms	< 2,5 ms	< 0,9 ms
output	4 ... 20 mA 0 ... 10 V	4 ... 20 mA 0 ... 10 V RS 485 / RS 232	4 ... 20 mA 0 ... 10 V RS 485	4 ... 20 mA 0 ... 10 V	4 ... 20 mA 0 ... 10 V
connection types	connector M8	connector M8	connector M12	connector 2 m	connector M12
housing material	die-cast zinc	aluminum	die-cast zinc	die-cast zinc	stainless steel 1.4404 (V4A)
operating tempe-rature	0 ... +50 °C	0 ... +50 °C	0 ... +50 °C	0 ... +50 °C	0 ... +50 °C
protection class	IP 67	IP 67	IP 67	IP 67	IP 68 / IP 69K & proTect+
specific features	■ suppression of incorrect measuring operations, the last measured value is retained at the output for up to 30 ms	■ suppression of incorrect measur-ing operations, the last measured value is retained at the output for up to 30 ms	■ alarm output to signalize any incorrect measuring operation or out-of-range object ■ input for synchro-nizing measure-ments ■ laser diode can be switched on/off	■ missing measure-ment signals or incorrect measurements are suppressed	■ alarm output to signalize any incorrect measur-ing operation or out-of-range object ■ input for synchronizing measurements ■ laser diode can be switched on/off

Learn more:
www.baumer.com/opto-distance

	OADM 21	OM 70 multi-spot	OM 70 laser point	OM 70 laser line
		high performance sensors		
	■ High resolution at large measuring distance ■ Adjustable measuring range	■ Very high resolution ■ Stable measurements even on shiny and very rough surfaces ■ High ambient light immunity	■ Very small spot size ■ Measurements on very dark objects ■ Function Distance and Tolerance	■ Very fine laser line ■ Measurements on very dark objects ■ Function Distance and Tolerance
	20,4 × 135 × 45 mm	26 × 74 × 55 mm	26 × 74 × 55 mm	26 × 74 × 55 mm
	100 ... 1000 mm	100 ... 500 mm	50 ... 1500 mm	100 ... 1500 mm
	10 µm	4 µm	2 µm	2 µm
	< 5 ms	< 6 ms	< 0,7 ms	< 0,7 ms
	4 ... 20 mA 0 ... 10 V	4 ... 20 mA 0 ... 10 V RS 485	4 ... 20 mA 0 ... 10 V RS 485	4 ... 20 mA 0 ... 10 V RS 485
	connector M12	connector M12	connector M12	connector M12
	aluminum	aluminum	aluminum	aluminum
	0 ... +50 °C	–10 ... +50 °C	–10 ... +50 °C	–10 ... +50 °C
	IP 67	IP 67	IP 67	IP 67
	■ alarm output to signalize any incorrect measuring operation or out-of-range object ■ input for synchronizing measurements ■ laser diode can be switched on/off	■ sensor settings via touch display ■ compact measuring unit without external software ■ values displayed in mm	■ sensor settings via touch display ■ compact measuring unit without external software ■ values displayed in mm	■ sensor settings via touch display ■ compact measuring unit without external software ■ values displayed in mm

Photoelectric sensors

Optical sensors with analog output

- Resolution up to 0.1 mm
- Measuring range up to 1000 mm
- Red LED or laser class 1
- Washdown and hygienic design
- IO-Link

IO-Link

	FADK 14 LED distanz sensor	OADK 25 Laser distanz sensor	OADM 250	OADM 260
category			long range sensors	
features	■ Compact housing ■ Measuring distance 50 ... 400 mm ■ Resolution up to 0,1 mm	■ *qTeach*® ■ Alarm output ■ Laser class 1	■ High resolution ■ Measurement up to 4 m independent of colors ■ Alarm output ■ Adjustable measuring range	■ Large measuring range up to 13 m ■ Alarm output ■ Adjustable measuring range
dimensions	14,8 x 43 x 31 mm	23,4 × 63 × 45 mm	25,4 × 66 × 51 mm	25,4 × 66 × 51 mm
measuring distance	50 ... 400 mm	100 ... 1000 mm	0,5 ... 4 m	0,5 ... 13 m
resolution	0,1 ... 1 mm	0,3 mm	1,2 mm	5 mm
response time	< 3 ms	< 12,8 ms	< 10 ms	< 10 ms
output signal	4 ... 20 mA 0 ... 10 V	4 ... 20 mA 0 ... 10 V	4 ... 20 mA 0 ... 10 V	4 ... 20 mA 0 ... 10 V
connection types	cable 2 m connector M12	cable 2 m connector M12	connector M12	connector M12
housing material	plastic (ASA, MABS)	plastic (SAN LURAN 378P)	aluminum	aluminum
operating temperature	0 ... +50 °C	0 ... +50 °C	–25 ... +50 °C	–25 ... +50 °C
protection class	IP 67	IP 67	IP 67	IP 67
specific features	■ cost-effective solution for simpler measuring tasks	■ cost-effective solution for simpler measuring tasks	■ alarm output to signalize any incorrect measuring operation or out-of-range object	■ alarm output to signalize any incorrect measuring operation or out-of-range object

Robust stainless steel distance sensors

Sensors in Hygiene and Washdown design

- Stainless steel housing V4A
- *proTect+*® sealing concept
- Ecolab-tested and -certified
- EHEDG-compliant
- FDA-compliant materials

Learn more:
www.baumer.com/opto-distance

IO-Link

IO-Link

	FADR 14	FADH 14	OADR 20
features	■ Washdown design ■ Adjustable measuring range ■ Point source LED	■ Hygienic design ■ Adjustable measuring range ■ Point source LED	■ Washdown design ■ Adjustable measuring range ■ Laser beam ■ Laser Point / Laser line
dimensions	19,6 × 62,4 × 33,8 mm	19,6 × 99,5 × 33,6 mm	20,3 × 65 × 50 mm
measuring distance	50 ... 400 mm	50 ... 400 mm	30 ... 600 mm
resolution	0,1 mm	0,1 mm	5 µm
response time	< 3 ms	< 3 ms	< 0,9 ms
output signal	4 ... 20 mA 0 ... 10 V	4 ... 20 mA 0 ... 10 V	4 ... 20 mA 0 ... 10 V
connection types	connector M12	cable 2 m flylead connector M12	connector M12
housing material	stainless steel 1.4404 (V4A)	stainless steel 1.4404 (V4A)	stainless steel 1.4404 (V4A)
operating temperature	0 ... +50 °C	0 ... +50 °C	0 ... +50 °C
protection class	IP 68 / IP 69K & proTect+	IP 68 / IP 69K & proTect+	IP 68 / IP 69K & proTect+
specific features	■ alarm output to signalize any incorrect measuring operation or out-of-range object ■ service status indicator when soiled	■ alarm output to signalize any incorrect measuring operation or out-of-range object ■ service status indicator when soiled	■ alarm output to signalize any incorrect measuring operation or out-of-range object ■ input for synchronizing measurements ■ laser diode can be switched on/off

Ultrasonic sensors

Precise ultrasonic distance sensors – cylindrical

Accurate distance measurement regardless of material, surface, color or transparency

- Small and light miniature sensors, e.g. for robotics
- Measurements in very small containers or openings
- Large measuring ranges up to 6000 mm
- Sturdy sensors also for demanding environments

	UNAM 12 UNAR 12	UNAM 12 with sonic nozzles	UNAM 18 UNAR 18	UR18
category	miniature	miniature	standard	standard
features	■ Narrow and wide sonic beam angles ■ External Teach-in ■ M12 connector	■ External Teach-in ■ M12 connector ■ Beam columnator for very narrow sonic cone profile	■ Stainless steel housing V4A ■ Chemically resistant sensor front ■ FDA-compliant materials ■ Internal and external Teach-in ■ M12 connector	■ *qTeach*® – easy to operate, safe and wear-free ■ Short design
dimensions	M12	M12	M18	M18
measuring distance	20 ... 400 mm	2 ... 82 mm	60 ... 1000 mm	100 ... 1000 mm
response time	< 10 ms	< 1,3 ms	< 50 ms	< 50 ms
resolution	< 0,5 mm	< 0,3 mm	< 0,3 mm	< 0,3 mm
repeat accuracy	< 0,5 mm	< 0,5 mm	< 0,5 mm	< 0,5 mm
output	0 ... 10 mA / 10 ... 0 mA 0 ... 10 V / 10 ... 0 V	0 ... 10 mA / 10 ... 0 mA 0 ... 10 V / 10 ... 0 V	4 ... 20 mA / 20 ... 4 mA 0 ... 10 V / 10 ... 0 V	4 ... 20 mA / 20 ... 4 mA 0 ... 10 V / 10 ... 0 V
connection types	connector M12	connector M12	connector M12	connector M12
housing material	brass nickel plated	brass nickel plated	brass nickel plated stainless steel	brass nickel plated
operating temperature	–10 ... +60 °C	–10 ... +60 °C	–10 ... +60 °C	–25 ... +70 °C (+60 °C in current mode)
protection class	IP 67	IP 67	IP 67	IP 67
specific features	■ with or w/o sonic nozzles		■ optional sonic deflection bracket mounting	

Learn more:
www.baumer.com/ultrasonic-distance

UNAM 30	UNAM 50	UNAM 70
standard	long ranges	long ranges
■ Internal and external Teach-in ■ Cable and connector versions ■ Potentiometer versions	■ Large sensing range ■ Internal and external Teach-in ■ Cable and connector versions ■ Potentiometer versions	■ Large sensing range ■ Internal and external Teach-in ■ M12 connector
M30	M30	M30
100 ... 1000 mm	400 ... 2500 mm	600 ... 6000 mm
< 100 ms	< 160 ms	< 640 ms
< 0,3 mm	< 0,3 mm	< 2 mm
< 0,5 mm	< 1mm	< 1mm
4 ... 20 mA / 20 ... 4 mA 0 ... 10 V / 10 ... 0 V	4 ... 20 mA / 20 ... 4 mA 0 ... 10 V / 10 ... 0 V	4 ... 20 mA / 20 ... 4 mA 0 ... 10 V / 10 ... 0 V
connector M12 cable 2 m	connector M12 cable 2 m	connector M12
brass nickel plated	brass nickel plated	brass nickel plated
–10 ... +60 °C	–10 ... +60 °C	–25 ... +60 °C
IP 67	IP 67	IP 67

Ultrasonic sensors

Precise ultrasonic distance sensors – rectangular

Accurate distance measurement regardless of material, surface, color or transparency

- Small and light miniature sensors, e.g. for robotics
- Measurements in very small containers or openings

	UNxK 09 URDK 09	UNDK 10	UNDK 20	UNDK 30
category	miniature	miniature	standard	standard
features	■ High resolution ■ Minimal blind region ■ RS 232 ■ Various mounting options ■ Flat housing ■ Narrow sonic beam angle for detection in openings of up to 3 mm	■ Smallest ultrasonic sensor ■ Internal and external Teach-in ■ Very low weight: 4 g ■ Narrow sonic beam angle ■ Cable and flylead connector versions	■ Flat type ■ Internal and external Teach-in ■ Narrow and wide sonic beam angles ■ M8 connector	■ Compact type ■ Large sensing range ■ Teach-in on the sensor ■ Potentiometer version ■ Narrow and wide sonic beam angles ■ Cable and connector versions
dimensions	8,6 × 48,8 × 57,5 mm	10,4 × 27 × 14 mm	20 × 42 × 15 mm	30 × 65 × 31 mm
measuring distance	3 ... 200 mm	20 ... 200 mm	20 ... 1000 mm	30 ... 2000 mm
response time	< 7 ms	< 15 ms	< 10 ms	< 10 ms
resolution	< 0,1 mm	< 0,3 mm	< 0,3 mm	< 0,3 mm
repeat accuracy	< 0,5 mm	< 0,5 mm	< 0,5 mm	< 0,5 mm < 1 mm
output	0 ... 10 V / 10 ... 0 V RS 232	0 ... 10 V / 10 ... 0 V	4 ... 20 mA / 20 ... 4 mA 0 ... 10 V / 10 ... 0 V	4 ... 20 mA / 20 ... 4 mA 0 ... 10 V / 10 ... 0 V
connection types	cable 2 m flylead connector M8	cable 2 m connector M8 flylead connector M8	connector M8	cable 2 m connector M12
housing material	plastic	plastic	plastic	polyester / die-cast zinc
operating temperature	0 ... +60 °C	–10 ... +60 °C	–10 ... +60 °C	–10 ... +60 °C
protection class	IP 67	IP 67	IP 67	IP 67
specific features	■ with or w/o sonic nozzles ■ cascadable in 9 mm grid	■ wide range of accessories and installation options	■ optional sonic deflection bracket	

Learn more:
www.baumer.com/ultrasonic-distance

U500

standard
■ *OneBoxDesign* – flexibility in planning ■ *qTarget*® – time savings during installation ■ *qTeach*® – Easy to operate, safe and wear-free ■ Cable and connector versions
18 × 45,1 × 32,2 mm
100 ... 1000 mm
< 10 ms
< 0,3 mm
< 0,5 mm
4 ... 20 mA / 20 ... 4 mA 0 ... 10 V / 10 ... 0 V
cable 2 m connector M12
plastic
–25 ... +65 °C (+60 °C in current mode)
IP 67
■ wide range of accessories and installation options

Ultrasonic sensors

Precise ultrasonic distance sensors – application-specific

Not affected by difficult environmental conditions and varying object properties

- Sturdy stainless steel sensors
- Sensors with sensing ranges up to 6000 mm
- Sensors with sonic nozzles for very narrow sonic beam

	UNAR 18	UNAM 50	UNAM 70	UNDK 30
category	**sturdy sensors**	**sensors with long ranges**		
features	■ Stainless steel housing V4A ■ Chemically resistant sensor front ■ FDA-compliant materials ■ Internal and external Teach-in ■ M12 connector	■ Large sensing range ■ Internal and external Teach-in ■ Cable and connector versions ■ Potentiometer version	■ Large sensing range ■ Internal and external Teach-in ■ M12 connector	■ Compact design ■ Large sensing range ■ Internal Teach-in ■ Potentiometer version ■ Narrow and wide sonic beam angles ■ Cable and connector versions
dimensions	M18	M30	M30	30 × 65 × 31 mm
measuring distance	60 ... 1000 mm	400 ... 2500 mm	600 ... 6000 mm	30 ... 2000 mm
resolution	< 0,3 mm	< 0,3 mm	< 2 mm	< 0,3 mm
response time	< 0,5 mm	< 1mm	< 1mm	< 1 mm
output	4 ... 20 mA / 20 ... 4 mA 0 ... 10 V / 10 ... 0 V	4 ... 20 mA / 20 ... 4 mA 0 ... 10 V / 10 ... 0 V	4 ... 20 mA / 20 ... 4 mA 0 ... 10 V / 10 ... 0 V	4 ... 20 mA / 20 ... 4 mA 0 ... 10 V / 10 ... 0 V
connection types	connector M12	cable 2 m connector M12	connector M12	cable 2 m connector M12
housing material	stainless steel	brass nickel plated	brass nickel plated	plastic / die-cast zincs
operating temperature	–10 ... +60 °C	–10 ... +60 °C	–25 ... +60 °C	–10 ... +60 °C
protection class	IP 67	IP 67	IP 67	IP 67

Learn more:
www.baumer.com/ultrasonic-distance

	UNAM 12	UNCK 09 UNDK 09
category	**sensors with sonic nozzles**	
features	■ External Teach-in ■ Connector M12 ■ Sonic nozzle for very narrow sonic beams	■ High resolution ■ Minimal blind region ■ RS 232 ■ Various mounting options ■ Very flat housing ■ Beam columnator for detection in openings of up to 3 mm
dimensions	M12	8,6 × 48,8 × 57,5 mm
measuring distance	20 ... 400 mm	3 ... 200 mm
resolution	< 0,3 mm	< 0,1 mm
response time	< 0,5 mm	< 0,5 mm
output	0 ... 10 mA / 10 ... 0 mA 0 ... 10 V / 10 ... 0 V	0 ... 10 V / 10 ... 0 V RS 232
connection types	connector M12	cable 2 m connector M8
housing material	brass nickel plated	plastic
operating temperature	–10 ... +60 °C	0 ... +60 °C
protection class	IP 67	IP 67

Inductive distance sensors – *AlphaProx®*

Inductive distance sensors – cylindrical

- High resolution and repeatability
- Wide measuring ranges
- High measuring speed
- Extra-short designs

	IWRM 04	IR06.DxxS	IR08.DxxS	IR12.DxxS
category	**subminiature**	**sub-/miniature**	**sub-/miniature**	**compact**
features	■ Very high resolution ■ Quick response time ■ Fully integrated electronics ■ With M5 connector	■ Large measuring distance ■ Very high resolution ■ Quick response time ■ Fully integrated electronics ■ Short design	■ Large measuring distance ■ Very high resolution ■ Quick response time ■ Fully integrated electronics ■ Short design	■ Large measuring distance ■ Very high resolution ■ Quick response time ■ Linearized output calibration curves with Teach-in
dimensions	ø 4 mm	ø 6,5 mm	M8	M12
housing length	30 mm	up 22 mm	up 22 mm	up 40 mm
measuring distance Sd	0 ... 1 mm	0 ... 3 mm	0 ... 3 mm	0 ... 6 mm
resolution	1 µm	1 µm	1 µm	1 µm
repeat accuracy	5 µm	10 µm	10 µm	10 µm
response time	0,5 ms	0,5 ms	0,5 ms	1 ms
output signal	0 ... 10 V	0 ... 10 mA 0 ... 10 V	0 ... 10 mA 0 ... 10 V	4 ... 20 mA 0 ... 10 V
connection types	connector M5	cable 2 m connector M8	cable 2 m connector M8	cable 2 m connector M12
housing material	stainless steel	stainless steel	stainless steel	brass nickel plated
operating temperature	+10 ... +60 °C	–10 ... +70 °C	–10 ... +70 °C	–25 ... +75 °C
protection class	IP 67	IP 67	IP 67	IP 67

Learn more:
www.baumer.com/inductive-distance

IR18.DxxS	IR30.DxxS
compact	**compact**
■ Large measuring distance ■ Very high resolution ■ Linearized output calibration curves with Teach-in	■ Large measuring distance ■ Very high resolution ■ Linearized output calibration curves with Teach-in ■ Flush and non-flush designs
M18	M30
up 50 mm	60 mm
0 ... 8 mm	0 ... 24 mm
2 µm	5 µm
15 µm	20 µm
2 ms	2 ms
4 ... 20 mA 0 ... 10 V	4 ... 20 mA 0 ... 10 V
cable 2 m connector M12	connector M12
brass nickel plated	brass nickel plated
–10 ... +70 °C	–25 ... +75 °C
IP 67	IP 67

Inductive distance sensors – *AlphaProx*®

Inductive distance sensors – rectangular

- High repeat accuracy
- Large measuring range
- High measuring speed

	IWFM 05	IWFM 08	IWFM 12	IWFM 18
category	subminiature	subminiature	compact	compact
Features	■ Very high resolution ■ Quick response time ■ Fully integrated electronics ■ With M5 connector	■ Very high resolution ■ Compact model ■ Fully integrated electronics ■ Through-hole for M3 bolt	■ Integrated current and voltage output ■ Fully integrated electronics	■ Integrated current and voltage output ■ Fully integrated electronics
dimensions (B × T × L)	5 × 5 × 32 mm	8 × 4,7 × 16 mm	12 × 12 × 60 mm	18 × 10 × 30 mm
measuring distance Sd Sd	0 ... 1 mm	0 ... 2 mm	0 ... 4 mm	0 ... 4 mm
resolution	1 µm	1 µm	1 µm	1 µm
repeat accuracy	10 µm	20 µm	5 µm	5 µm
response time	0,5 ms	1 ms	2 ms	2 ms
output signal	0 ... 10 V	0 ... 10 V	0 ... 10 V 4 ... 20 mA	0 ... 10 V 4 ... 20 mA
connection types	connector M5	cable 2 m flylead connector M8	cable 2 m connector M8	connector M8
housing material	brass nickel plated	die-cast zinc nickel plated	brass nickel plated	brass nickel plated
operating temperature	+10 ... +60 °C	+10 ... +60 °C	–10 ... +70 °C	–10 ... +70 °C
protection class	IP 67	IP 67	IP 67	IP 67
specific features	■ smallest inductive sensor with analog output	■ extremely low-profile version for front-side single-hole installation		

Learn more:
www.baumer.com/inductive-distance

IWFM 20

	compact
	■ Integrated current and voltage output ■ Fully integrated electronics
	20 × 12 × 35 mm
	2 ... 5 mm
	1 µm
	10 µm
	2 ms
	0 ... 10 V 1 ... 9 V 4 ... 20 mA
	connector M8 flylead connector M8
	brass nickel plated
	–10 ... +70 °C 0 ... +60 °C
	IP 67

Inductive distance sensors – *AlphaProx*®

Linearized characteristic curve

- Measuring range configurable by teach-in
- Negligible production lot variations
- Internal temperature compensation
- Easy integration into the controller
- Variants with an additional digital output

linearized characteristic curve	IR06.DxxL	IR08.DxxL	IR12.DxxL	IR18.DxxL	IR30.DxxL
category	miniatur	miniatur	compact	compact	compact
features	■ Adjustable measuring range ■ Linearized output calibration curves ■ External Teach-in	■ Adjustable measuring range ■ Linearized output calibration curves ■ External Teach-in	■ Adjustable measuring range ■ Linearized output calibration curves ■ External Teach-in	■ Adjustable measuring range ■ Linearized output calibration curves ■ External Teach-in	■ Adjustable measuring range ■ Linearized output calibration curves ■ External Teach-in
dimensions	ø 6,5 mm	M8	M12	M18	M30
housing length	up 40 mm	up 40 mm	60 mm	60 mm	60 mm
measuring distance Sd	0 ... 3 mm	0 ... 3 mm	0 ... 6 mm	0 ... 8 mm	0 ... 24 mm
resolution	3 µm	3 µm	3 µm	8 µm	5 µm
repeat accuracy	10 µm	10 µm	10 µm	15 µm	20 µm
response time	2 ms	2 ms	1 ms	1 ms	5 ms
output signal	0 ... 10 V	0 ... 10 V	4 ... 20 mA 0 ... 10 V	4 ... 20 mA 0 ... 10 V	4 ... 20 mA 0 ... 10 V
connection types	cable 2 m connector M8	cable 2 m connector M8	connector M12	connector M12	connector M12
housing material	stainless steel	stainless steel	brass nickel plated	brass nickel plated	brass nickel plated
operating temperature	–25 ... +75 °C	–25 ... +75 °C	–25 ... +75 °C	–25 ... +75 °C	–25 ... +75 °C
protection class	IP 67	IP 67	IP 67	IP 67	IP 67

Inductive sensors with reduction factor 1

- Two to four times larger measuring range for aluminum
- Adjustable measuring range limits (teach)
- Particularly suitable for measurements on non-ferromagnetic metals
- Great flexibility in construction and installation

Learn more:
www.baumer.com/inductive-distance

	IWFM 18	IWFK 20	**factor 1**	IR18.DxxF
	compact	**compact**	**category**	**compact**
	■ Integrated current and voltage output ■ Fully integrated electronics	■ Adjustable measuring range ■ Teach-in button housing-integrated ■ Large measuring range ■ Plastic housing	**features**	■ Very high measurement sensitivity ■ Linearized output calibration curves ■ External Teach-in
	18 × 10 × 30 mm	20 × 15 × 42 mm	dimensions	M18
			housing length	60 mm
	0 ... 4 mm	0 ... 10 mm	measuring distance Sd	0 ... 8 mm
	5 µm	10 µm	resolution	20 µm
	10 µm	15 µm	repeat accuracy	30 µm
	2,5 ms	3 ms	response time	15 ms
	0 ... 10 V	0 ... 10 VDC	output signal	0 ... 10 V
	connector M8	connector M8	connection types	connector M12
	brass nickel plated	plastic	housing material	brass nickel plated
	–10 ... +70 °C	–10 ... +70 °C	operating temperature	–25 ... +75 °C
	IP 67	IP 67	protection class	IP 67

Inductive distance sensors – *AlphaProx*®

High-precision sensors

High-precision and high-sensitivity inductive sensors

- Large signal change for even the smallest position changes
- Solutions for high-end applications with a resolution of up to 4 nm
- Completely integrated in compact housing
- Easy teach option

high-precision and high-sensitivity inductive sensors	IPRM 12	IR12.DxxK IR18.DxxK
category	High-precision sensors	High-sensitivity sensors
dimensions	M12	M12 M18
housing length	90 mm	60 mm
measuring distance Sd	0 ... 3 mm	0,25 mm (Teach-in between 0 ... 3 mm)
resolution	0,004 µm	0,25 µm
sensitivity		40 V/mm 64 mA/mm
repeat accuracy	1 µm	1 µm
response time	2 ms	3 ms
output signal	4 ... 20 mA	4 ... 20 mA 0 ... 10 V
connection types	connector M12	cable 2 m connector M12
housing material	steel nickel plated	steel nickel plated
operating temperature	0 ... +60 °C	–10 ... +60 °C
protection class	IP 67	IP 67

Sturdy sensors / ATEX

Rugged stainless steel housing

- Rugged stainless steel sensors
- Outdoor and Washdown design
- Sensors for potentially explosive areas

Learn more:
www.baumer.com/inductive-distance

sturdy sensors	IWRM 18	IWRR 18
category	Outdoor design	Outdoor design Washdown design
dimensions	M18	M18
housing length	60 mm	60 mm
measuring distance Sd	0 ... 8 mm	0 ... 7 mm
resolution	5 µm	5 µm
repeat accuracy	15 µm	15 µm
response time	2 ms	2 ms
output signal	4 ... 20 mA	4 ... 20 mA
connection types	connector M12	connector M12
housing material	brass nickel plated	stainless steel 1.4404 (V4A)
operating temperature	–40 ... +70 °C	–40 ... +70 °C
protection class	IP 67	IP 68/69K & *proTect+*
specific features		Ecolab-tested FDA-compliant

ATEX sensors	IWRM 12
category	ATEX
dimensions	M12
housing length	50 mm
measuring distance Sd	0 ... 4 mm
resolution	1 µm
repeat accuracy	10 µm
response time	2 ms
output signal	4 ... 20 mA
connection types	connector M12
housing material	brass nickel plated
operating temperature	–10 ... +50 °C
protection class	IP 67
approvals	ATEX 2D

Linear bearingless encoders

Size 10 mm. Unlimited measuring range.

- Non-contact, wearfree magnetic sensing technology
- Impervious to soiling and resistant against vibration
- Extended life span thanks to robustness and durability in extreme conditions
- Maximized machine and system uptime

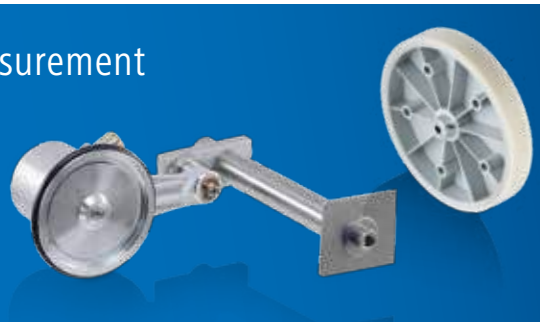
	MIL 10
catory	Linear bearingless Encoder
features	■ Linear measuring system ■ Output signals A 90° B with index pulse ■ Output circuit push-pull or RS422
size (sensing head)	rectangular
dimensions (sensing head)	10 x 15 x 45,5 mm
sensing distance	0,1 ... 0,6 mm
interpolation	factor 20, 50, 100
movement speed	<5 m/s (resolution 5 µm) <10 m/s (resolution 10 µm) <25 m/s (resolution 25 µm)
output circuit	HTL/Push-pull TTL/RS422
output signal	A 90° B
total resolution	5 µm (factor 4 evaluation) 10 µm (factor 4 evaluation) 25 µm (factor 4 evaluation)
system-accuracy	±(0.02 mm +0.04 mm x magnetic belt length)
connection	cable 2 m cable 0.3 m with connector M12
voltage supply	10 ... 30 VDC, 5 VDC ±5 %
operating temperature	–40 ... +85 °C
Protection class	IP 66, IP 67

Learn more:
www.baumer.com/linear-encoders

Measuring wheel encoders

The efficient and reliable solution to length measurement

- Programmable incremental encoders used in conjunction with measuring wheels
- Particularly easy acquisition of position and speed with high flexibility
- Perfect for ink jet and laser printing applications thanks to precise optical sensing



	MA 20
category	Compact, high-resolution measuring wheel system
features	■ Measuring wheel encoder comprising encoder, tether arm and measuring wheel ■ Contact pressure fully adjustable
configurable parameters	16 pre-defined resolutions
configuration	HEX switch
sensing method	optical
dimensions (housing)	ø 40 mm (encoder)
voltage supply	4,75 ... 30 VDC
output stage	HTL/push-pull
output signals	A 90° B
shaft type	solid shaft ø 6 mm
connection types	flange connector M12, cable radial
pulses per revolution	100 ... 25 000
operating temperature	–20 ... +85 °C
protection class	IP 64
operating speed	≤ 3000 U/min
options	measuring wheels available with different rubber surface

	MR series
category	Measuring wheels
features	■ The perfect grip at any surface ■ Different surface profiles to match the application best ■ Circumference 200, 300 or 500 mm ■ For shaft dia. 4 ... 12 mm

Maximum flexibility through versatile configuration options.

Learn more:
www.baumer.com/measuring-wheel

	EIL 580P-SC
category	Incremental encoders – programmable resolution and signals
features	■ Solid shaft with clamping flange max. ø10 mm or synchro flange max. ø6 mm
configurable parameters	Pulses per revolution, output stage HTL or TTL, zero pulse, signal sequence
configuration	Programming software, programming tool
sensing method	optical
dimensions (housing)	ø 58 mm
voltage supply	4,75 ... 30 VDC
output stage	TTL/RS422 HTL/push-pull
output signals	A 90° B, R + inverted
shaft type	Solid shaft ø 10 mm
connection types	flange connector M23, radial / axial cable, radial / axial / tangential
pulses per revolution	1 ... 65536
operating temperature	–40 ... +100 °C
protection class	IP 65, IP 67
operating speed	≤ 12 000 U/min (IP 65) ≤ 6000 U/min (IP 67)
max. shaft load	≤ 40 N axial, ≤ 80 N radial
options	isolated hollow shaft, flange variant, connector variant

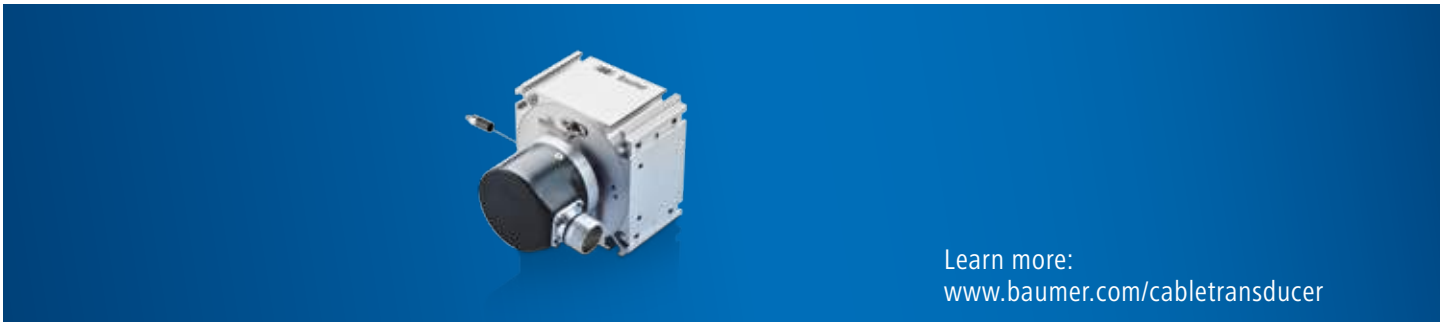
	Z-PA-EI-H
category	Handheld programming tool
features	■ Simple and quick configuration ■ 4 user-assignable buttons ■ Intuitive menu navigation ■ Standard AA battery supply

Cable transducers

Linear travel measurement to 50 meters

- High linearity throughout the entire measuring range
- Measuring length up to 50 m
- High quality and extremely durable designs
- OEM and retrofit

	BMMS K34	BMMS K50	BMMS M75	GCA5	GCA8	GCA12
features	■ Measuring length up to 5 m ■ Non-contact magnetic sensing		■ Measuring length up to 7.5 m ■ Non-contact magnetic sensing	■ Measuring length up to 4.7 m ■ Non-contact magnetic sensing ■ Dirt skimmer ■ Three-chamber structure	■ Measuring length up to 12 m ■ Absolute potentiometer sensing ■ Dirt skimmer ■ Three-chamber structure	
interface						
- SSI	■		■	–	–	
- Analog / redundant	■ / ■		■ / ■	■ / ■	■ / ■	
- CANopen® / redundant	■ / ■		■ / ■	– / ■	– / ■	
sensing method	magnetic				potentiometric	
dimension	88 × 88 × 66 mm		120 × 120 × 70 mm	104 × 104 × 65 mm	104 × 110 × 80 mm	126 × 124 × 92 mm
voltage supply	8 ... 30 VDC			8 ... 30 VDC (Analog) 10 ... 30 VDC (CANopen®)	10 ... 30 VDC	
connection						
- flange connector M12	radial					
- cable	radial					
measuring length	3400 mm	5000 mm	7500 mm	4700 mm	8000 mm	12 000 mm
resolution						
- SSI, CANopen®	0,1 mm/step					
- Analog	12 Bit					
linearity	±0,6 %	±0,5 %	±0,2 %	±1 %	±1 %	
operating temperature	–40 ... +85 °C					
protection class	IP 65 (encoder, except cable outlet)			IP 67 (housing) IP 54 (cable outlet)	IP 67 (housing) IP 54 (cable outlet)	
materials	cable-pull housing: plastic encoder: Aluminium cable: Stainless steel with coating			housing: plastic cable: Stainless steel with coating	housing: plastic cable: Stainless steel with coating	



	GCI2	GCA2	GCI4	GCA4	GCI15	GCA15	GCI50	GCA50
features	■ Measuring length 2.1 m ■ Absolute or incremental encoder		■ Measuring length 3 m ■ Absolute or incremental encoder		■ Measuring length 5...15 m ■ Absolute or incremental encoder		■ Measuring length 30...50 m ■ Absolute or incremental encoder	
interface								
- SSI	–	■	–	■	–	■	–	■
- BiSS-C	–	■	–	■	–	■	–	■
- CANopen® / SAE J1939	–	■ / ■	–	■ / ■	–	■ / ■	–	■ / ■
- DeviceNet	–	■	–	■	–	■	–	■
- Profibus-DP	–	■	–	■	–	■	–	■
- EtherCAT	–	■	–	■	–	■	–	■
- EtherNet/IP	–	■	–	■	–	■	–	■
- Powerlink	–	■	–	■	–	■	–	■
- Profinet	–	■	–	■	–	■	–	■
function principle	Inkremental	Absolute	Inkremental	Absolut	Inkremental	Absolut	Inkremental	Absolut
sensing method	Optical							
dimension	60 × 60 mm		96 × 96 × 56 mm		115 × 115 × 82,5 - 180,5 mm		200 × 200 × 268 - 333,5 mm	
voltage supply	5 VDC 4,75 ... 30 VDC	10 ... 30 VDC	5 VDC 4,75 ... 30 VDC	10 ... 30 VDC	5 VDC 4,75 ... 30 VDC	10 ... 30 VDC	5 VDC 4,75 ... 30 VDC	10 ... 30 VDC
output stage								
- TTL/RS422	■	–	■	–	■	–	■	–
- HTL/push-pull	■	–	■	–	■	–	■	–
connection								
- Flange connector M12, M23	Radial, axial							
- Cable	Radial, axial							
- Bus cover	Radial							
measuring length	2100 mm		3000 mm		5000 ... 15 000 mm		30 000 ... 50 000 mm	
pulses per revolution	≤ 80 000	–	≤ 80 000	–	≤ 80 000	–	≤ 80 000	–
total resolution	–	≤ 36 Bit	–	≤ 36 Bit	–	≤ 36 Bit	–	≤3 6 Bit
linearity	±0,01 %		±0,02 % (3...7,5 m), ±0,01 % (10...50 m)					
operating temperature	–20 ... +85 °C							
protection (encoder)	IP 65							
materials	Cable-pull housing: plastic Encoder: Aluminium Cable: Stainless steel with coating		Cable-pull housing: Aluminium Encoder: Aluminium Cable: Stainless steel with coating					
options	Operating temperature -40...+85 °C							

Accessories

Cables & adapters, mounting accessories

Cables & adapters	Cable socket unassembled	Cable socket	Male connector	Connecting cables
characteristics	■ M8 and M12 ■ Straight or angled ■ 3-, 4- and 5-pole versions	■ M5, M8, M9, M12 or 8 mm snap-in ■ 3- or 12-pole versions ■ Straight or angled ■ Screened or unscreened ■ Various sheath materials ■ Various lengths available up to 25 m	■ M8 ■ 3-pole versions ■ Straight ■ PUR sheath ■ Various lengths available up to 3 m	■ M8 or M12 ■ 3- or 4-pole versions ■ Straight or angled ■ PUR sheath ■ Various lengths available up to 10 m

Mounting accessories	Mounting kits	Mounting bracket	Mounting bracket	Bracket for profiles
characteristics	■ Sensofix Mounting sets ■ Robust metal version ■ Mounting sets for various sensor types ■ Easy, flexible alignment	■ Matching mounting brackets available for various sensor types ■ High quality metal ■ Compatible with flexible Sensofix	■ Easy, fast mounting of smooth and cylindrical sensors ■ Available from ø 6,5 mm to ø 20 mm	■ Mounting adapter for diverse sensor types ■ e.g. for mounting in profiles, slots, cylinders, etc.

Learn more:
www.baumer.com/accessories

IO-Link

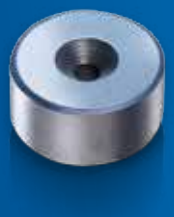
Testing and parameterization	Sensor test equipment	Teach-in Adapter	USB-IO-Link Master
characteristics	■ Display (V or mA) or. LED (PNP/ NPN) reading ■ Sensor programming using integrated teach key ■ Connection option for plug-in power supply (available as accessory)	■ Sensor programming with teach-in pin ■ Teach-in using key ■ For sensors with M12 connection	■ Teach-in, parameterization and operation of IO-Link capable sensors

Network components	AS-i
characteristics	■ Input/output modules ■ Models for control cabinet installation ■ Extra-compact miniature modules ■ Various numbers of inputs and outputs ■ S-slave or A/B slave types ■ Various AS interface accessories such as cables, masters or branches

Accessories

Reflectors Lenses Apertures Glass	Reflectors	Reflective tapes	Apertures	Glass covers Filter Lens
characteristics	■ Self-adhesive or screw-mount reflectors ■ Circular or rectangular ■ All-metal reflectors ■ Ecolab certified types, resistant to cleaning agents	■ Self-adhesive tapes ■ Various widths and lengths	■ Apertures for various sensor types	■ For various sensor types

Beam columnators and deflector (Ultrasonic)	Beam columnators	Beam deflectors
characteristics	■ Replacement nozzles for sensors with sonic nozzles	■ Ideal for cramped spaces ■ Bends the sound 90°



Learn more:
www.baumer.com/accessories

Magnets	Cylindrical magnets	Rectangular magnets and rotors
characteristics	■ For all magnetic proximity switches ■ Magnets in various sizes and strengths ■ Magnetization along the cylinder axis ■ For ambient temperatures up to +180 °C	■ For magnetic rotary encoders ■ Magnets available individually or integrated in the rotor ■ Magnetization throughout the depth ■ For ambient temperatures up to +180 °C

Baumer – the strong partner.

We at Baumer are close to our customers, understand their needs and provide the best solution. Worldwide customer service for Baumer starts with on-the-spot personal discussions and qualified consultation. Our application engineers speak your language and strive from the start, through an interactive problem analysis, to offer comprehensive and user-compatible solutions.

We are close to you across the globe.

The worldwide Baumer sales organizations guarantee short delivery times and readiness to supply. Many of our customers are directly linked via our electronic order system with the JIT logistics process.

A worldwide network coupled with the most modern communication techniques enable us to deliver information quickly and transparently to decision makers in all Baumer locations.

Closeness to the customer for Baumer means being available for your needs anywhere and at any time.

Partout dans le monde.

Afrique
Afrique du Sud
Algérie
Cameroun
Côte d'Ivoire
Égypte
Maroc
Réunion

Amérique
Brésil
Canada
Colombie
États-Unis
Mexique
Venezuela

Asie
Arabie saoudite
Bahreïn
Chine
Corée du Sud
Emirats arabes unis
Inde
Indonésie
Israël
Japon
Koweït
Malaisie
Oman
Philippines
Qatar
Singapour
Taïwan
Thaïlande

Europe
Allemagne
Autriche
Belgique
Bulgarie
Croatie
Danemark
Espagne
Finlande
France
Grèce
Hongrie
Italie
Malte
Martinique
Norvège
Pays-Bas
Pologne
Portugal
République Tchèque
Roumanie
Royaume-Uni
Russie
Serbie
Slovaquie
Slovénie
Suède
Suisse
Turquie

Océanie
Australie
Nouvelle-Zélande

Pour plus d'informations sur notre présence à travers le monde :
www.baumer.com/worldwide

Baumer
Passion for Sensors

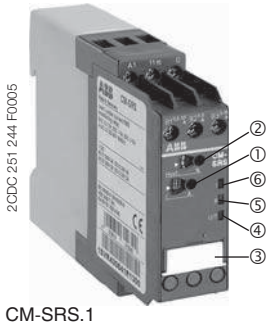
Baumer Group
International Sales
P.O. Box · Hummelstrasse 17 · CH-8501 Frauenfeld
Phone +41 (0)52 728 1122 · Fax +41 (0)52 728 1144
sales@baumer.com · www.baumer.com

Représenté par :

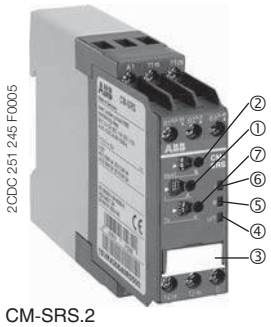
Sous réserve de modifications techniques et d'erreurs.
01/18 No. 11193791

Реле контроля тока, однофазные AC/DC CM-SRS.1 и CM-SRS.2

Данные для заказа



CM-SRS.1



CM-SRS.2

① Настройка порогового значения
② Настройка гистерезиса
③ DIP-переключатели (см. Функции DIP-переключателей)
④ U: зеленый СИД - Напряжение питания, отсчет времени
⑤ I: красный СИД - перегрузка/пониж. ток
⑥ R: желтый СИД - состояние реле
⑦ Настройка времени выдержки при срабатывании T_V

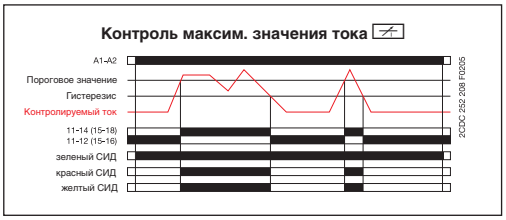
- Контроль постоянного и переменного токов **CM-SRS.x1:** 3 мА - 1 А **CM-SRS.x2:** 0.3-15 А
- RMS принцип измерения
- 3 диапазона измерений в одном приборе
- Контроль максим. или миним. значений тока по выбору
- Регулируемый гистерезис 3-30 %
- **CM-SRS.2:** Выдержка при срабатывании T_V с регулир. 0; 0.1-30 с
- 3 варианта напряжения питания
- **CM-SRS.1:** 1 п.к. **CM-SRS.2:** 2 п.к.
- Ширина 22.5 мм
- 3 СИДа для индикации состояния

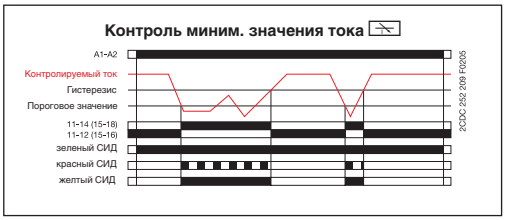
В зависимости от конфигурации, реле контроля тока **CM-SRS.1** и **CM-SRS.2** могут использоваться для контроля максимального или минимального тока в однофазных системах переменного или/и постоянного тока. Контролируемый ток (измеряемое значение) прикладывается к клеммам B1/B2/B3-C. Реле функционирует по принципу разомкнутой цепи.

Если конролируемый ток превысит или соответственно опустится ниже установленного порога срабатывания, выходно(ы)е реле активируе(ю)тся: в реле CM-SRS.1 немедленно, в реле CM-SRS.2 после заданной задержки срабатывания T_V. Если контролируемый ток возвращается в заданные пределы, т.е. превышает минимальный порог/опускается ниже максимального порога на величину установленного гистерезиса, то выходно(ы)е реле деактивируе(ю)тся (возвращае(ю)тся в исходное состояние).

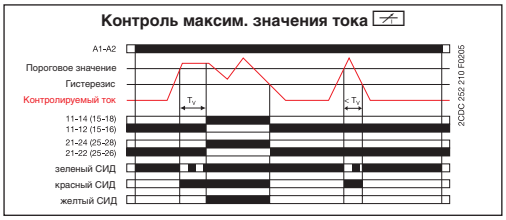
Гистерезис регулируется в пределах 3-30% от порогового значения.

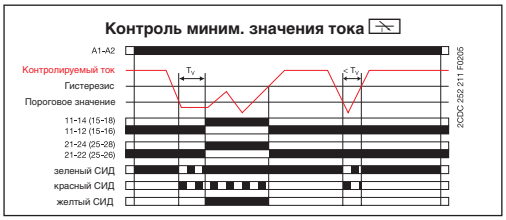
Функциональные диаграммы CM-SRS.1





Функциональные диаграммы CM-SRS.2





Расположение зажимов и схема подключения CM-SRS.1

A1-A2	Напряжение питания
B1-C	Диапазон измерений 1: 3-30 мА или 0.3-1.5 А
B2-C	Диапазон измерений 2: 10-100 мА или 1-5 А
B3-C	Диапазон измерений 3: 0.1-1 А или 3-15 А
11_{15}-12_{16}/14_{18}	Выходной контакт - Принцип разомкнутой цепи

Расположение зажимов и схема подключения CM-SRS.2

A1-A2	Напряжение питания
B1-C	Диапазон измерений 1: 3-30 мА или 0.3-1.5 А
B2-C	Диапазон измерений 2: 10-100 мА или 1-5 А
B3-C	Диапазон измерений 3: 0.1-1 А или 3-15 А
11_{15}-12_{16}/14_{18} 21_{25}-22_{26}/24_{28}	Выходной контакт - Принцип разомкнутой цепи

Функции DIP-переключателей CM-SRS.1, CM-SRS.2

1	ON Функция "Контроль миним. значения тока" OFF Функция "Контроль максим. значения тока"
2	нет функции

Тип	Напряжение питания 50/60 Гц	Выдержка при срабатывании T_V	№ для заказа	Упак. ед. шт.	Вес 1 шт. кг
Измерительные диапазоны: 3-30 мА; 10-100 мА; 0.1-1 А					
CM-SRS.11	24-240 В AC/DC	нет	**1SVR 430 840 R0200**	1	0.12
	110-130 В AC		**1SVR 430 841 R0200**	1	0.15
	220-240 В AC		**1SVR 430 841 R1200**	1	0.15
Измерительные диапазоны: 0.3-1.5 А; 1-5 А; 3-15 А					
CM-SRS.12	24-240 В AC/DC	нет	**1SVR 430 840 R0300**	1	0.12
	110 -130 В AC		**1SVR 430 841 R0300**	1	0.15
	220-240 В AC		**1SVR 430 841 R1300**	1	0.15
Измерительные диапазоны: 3-30 мА; 10-100 мА; 0.1-1 А					
CM-SRS.21	24-240 В AC/DC	регул. в пределах 0; 0.1-30 с	**1SVR 430 840 R0400**	1	0.12
	110-130 В AC		**1SVR 430 841 R0400**	1	0.15
	220-240 В AC		**1SVR 430 841 R1400**	1	0.15
Измерительные диапазоны: 0.3-1.5 А; 1-5 А; 3-15 А					
CM-SRS.22	24-240 В AC/DC	регул. в пределах 0; 0.1-30 с	**1SVR 430 840 R0500**	1	0.12
	110-130 В AC		**1SVR 430 841 R0500**	1	0.15
	220-240 В AC		**1SVR 430 841 R1500**	1	0.15

Реле контроля тока, однофазные CM-SRS.1, CM-SRS.2, CM-SRS.M и CM-SFS.2

Технические параметры

Тип		CM-SRS.1	CM-SRS.2	CM-SRS.M	CM-SFS.2
Входная цепь - питающая цепь	**A1-A2**				
Напряжение питания U_S	A1-A2	110-130 В AC			
	A1-A2	220-240 В AC			
	A1-A2	24-240 В AC/DC			
Допуск напряжения питания U_S		-15...+10 %			
Номинальная частота	версии AC	50/60 Гц			
	версии AC/DC	50/60 Гц или DC			
Потребляемый ток / потребляемая мощность		24 В DC	115 В AC	230 В AC	
	110-130 В AC	-	24 мА/2.6 ВА	-	
	220-240 В AC	-	-	12 мА/2.6 ВА	
	24-240 В AC/DC	30 мА/0.75 Вт	17 мА/1.9 ВА	11 мА/2.6 ВА	
Продолжительность включения		100 %			
Буферизация оключения питания		20 мс			
Защита от перенапряжения		Варисторы			
Входная цепь - измерит. цепь	**B1/B2/B3-C**				
Функция контроля		конфигурируемая функция контроля пониженного и повышенного тока			Контроль перегрузки и пониженного тока
Метод измерения		RMS принцип измерений			
Входы измерения		CM-SxS.x1			CM-SxS.x2		
	Клеммы	B1-C	B2-C	B3-C	B1-C	B2-C	B3-C
	Измерительные диапазоны	3-30 мА	10-100 мА	0,1-1 А	0,3-1,5 А	1-5 А	3-15 А [2]
	Входное сопротивление	3,3 Ом	1 Ом	0,1 Ом	0,05 Ом	0,01 Ом	0,0025 Ом
	Импульсная перегрузка < 1 с	500 мА	1 А	10 А	15 А	50 А	100 А
	Длительная перегрузка	50 мА	150 мА	1,5 А	2 А	7 А	17 А
Пороговое значение(я)		Регулир. в пределах указанного диапазона измерений			
Точность уставки порогового значения		10 %			
Точность повторения (постоянные параметры)		+/- 0.07 % от полной шкалы			
Гистерезис по отношению к пороговому значению		3-30 % регулир.			5 % пост.
Частота измеряемого сигнала		DC/50-60 Гц			
Максимальное время отклика		AC: 80 мс/DC: 120 мс			
Погрешность измерения в пределах допуска напряжения питания		≤ 0.5 %			
Погрешность измерения в пределах температурного диапазона		≤ 0.06 %/°C			
Времязадающая цепь					
Время нереагирования T_S		нет		0 или 0.1-30 с регулир.	
Выдержка при срабатывании/отпускании T_V		нет	0 или 0.1-30 с регулир.		
Точность повторения (постоянные величины)		+/- 0.07 % от полной шкалы			
Погрешность времени в пределах допуска напряж. пит.		-	≤ 0.5 %		
Погрешность времени в пределах допуска температуры		-	≤ 0.06 %/°C		
Индикация рабочих состояний					
Напряжение питания	U/T: зеленый СИД	⎍: Напряжение питания приложено ⎍⎍⎍: Идет отсчет времени нереагирования T_S ⎍⎍⎍: Идет отсчет времени срабатывания / отпускания Tv			
Измеряемая величина	I: красный СИД	⎍: повышенный ток, ⎍⎍⎍: пониженный ток			
Состояние реле	R: желтый СИД	⎍: реле возбуждено, без функции запоминания ⎍⎍⎍: реле возбуждено, функция фиксации активирована ⎍⎍⎍: реле обесточено, функция запоминания активирована			
Выходные цепи	**11(15)-12(16)/14(18), 21(25)-22(26)/24(28)**	Реле			
Количество контактов		1 п.к.	2 п.к.		1x2 п.к. или 2x1 п.к. с переконфигурир.
Принцип работы [1]		принцип разомкнутой цепи		принцип разомкнутой или замкнутой цепи с переконфиг.	
Материал контактов		AgNi			
Ном. напряжение согл. VDE 0110, IEC 947-1		250 В			
Мин. коммут. напряжение/мин. коммут. ток		24 В/10 мА			
Макс. коммут. напряжение/макс. коммут. ток		250 В AC/4 А AC			

Реле контроля тока, однофазные CM-SRS.1, CM-SRS.2, CM-SRS.M и CM-SFS.2

Технические параметры

Тип			CM-SRS.1	CM-SRS.2	CM-SRS.M	CM-SFS.2
Ном. рабочий ток согл. IEC 60947-5-1	AC12 (активная)	при 230 В	4 A			
	AC15 (индуктивная)	при 230 В	3 A			
	DC12 (активная)	при 24 В	4 A			
	DC13 (индуктивная)	при 24 В	2 A			
Механическая долговечность			$30x10^6$ циклов переключения			
Электрическая долговечность (AC12, 230 В, 4 А)			$0,1x10^6$ циклов переключения			
Устойчивость к к.з. / макс. плавкие предохранители		н.з. контакт	10 А быстрые, 6 А gL			
		н.о. контакт	10 А быстрые, 6 А gL			
Общие параметры						
Размеры В x Ш x Г			22.5 x 100 x 78 мм			
Электрическое подключение						
Сечения присоединительных проводов- (мин./макс.	тонкожильный с металлическим наконечником		$2x0.75$ мм^2/$2x2.5$ мм^2			
	тонкожильный без металлического наконечника		$2x0.75$ мм^2/$2x2.5$ мм^2			
	жесткий		$2x0.5$ мм^2/$2x4$ мм^2			
Длина зачистки			8 мм			
Момент затяжки			0.8 Нм			
Монтаж			DIN рейка (EN 50022)			
Монтажное положение			любое			
Материал корпуса			PA 6			
Степень защиты		корпуса/зажимов	IP50/IP20			
Климатические параметры						
Диапазон температур окружающей среды		рабочая/хранения	-20...+60 °C/-40...+85 °C			
Влажность (IEC 60068-2-30)			55 °C, 6 циклов			
Категория климата (EN 60721)						
Вибрация (синусоидальная) (IEC/EN 60255-21-1)			класс 2			
Ударопрочность (IEC/EN 60255-21-2)			класс 2			
Параметры изоляции						
Напряжение изоляции (VDE 0110, IEC 60947-1, IEC/EN 60255-5)		питающ.цепь/измерит. цепь	600 В			
		питающ.цепь/выходная цепь	250 В			
		измерит. цепь/выходная цепь	600 В			
		выходная цепь 1/выходная цепь 2	250 В			
Степень загрязнения (VDE 0110, IEC 664, IEC/EN 60255-5)			2			
Категория перенапряжения (VDE 0110, IEC 664, IEC/EN 60255-5)			III			
Испытательное напряжение между всеми изолир. цепями (стандартное испытание)			2.0 кВ, 50 Гц (Номинальное напряжение изоляции 250 В)			
			2.5 кВ, 50 Гц (Номинальное напряжение изоляции 600 В)			
Стандарты						
Производственный стандарт			IEC 255-6			
Директива по низкому напряжению			73/23/EEC			
Директива по электромагнитной совместимости			89/336/EEC			
Электромагнитная совместимость						
Помехоустойчивость			IEC/EN 61000-6-2			
ЭСР		IEC/EN 61000-4-2	уровень 3			
Электромагн. поле (устойч. к ВЧ излуч.)		IEC/EN 61000-4-3	уровень 3			
Быстрый переходный режим (пачка импульсов)		IEC/EN 61000-4-4	уровень 3			
Мощные импульсы (броски)		IEC/EN 61000-4-9	уровень 3			
ВЧ излучение		IEC/EN 61000-4-6	уровень 3			
Излучение помех			IEC/EN 61000-6-3			
Электромагнитное поле (устойчивость к ВЧ излучению)		IEC/CISPR 22; EN 55022	класс B			
ВЧ излучение		IEC/CISPR 22; EN 55022	класс B			

[1] Принцип разомкнутой цепи: выходное реле возбуждено, если измеряемая величина превышает ⊿ / ниже порогового значенения ⊿
Принцип замкнутой цепи: выходное реле обесточенно, если измеряемая величина превышает ⊿ / ниже порогового значенения ⊿

[2] Если измеренная величина тока > 10 А, расстояние до др. приборов должно быть мин. 10 мм

Контрольно-измерительные реле Типоряд CM и C51x
Габаритные чертежи

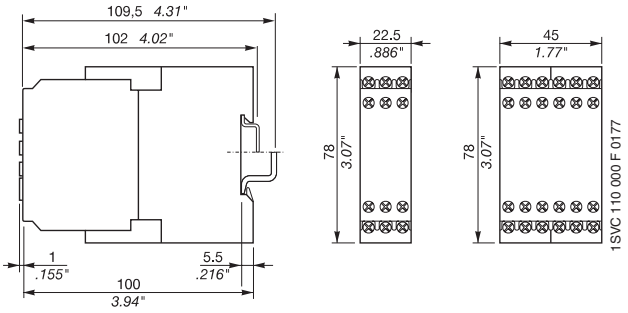
Габаритные чертежи

Размеры указаны в мм

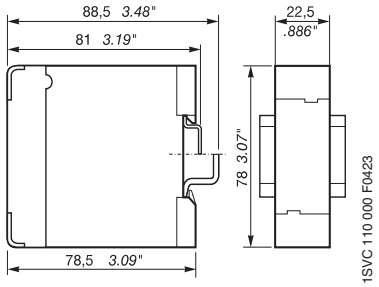
Контрольно-измерительные реле, типоряд CM

CM-S
22.5 мм

CM-N
45.5 мм

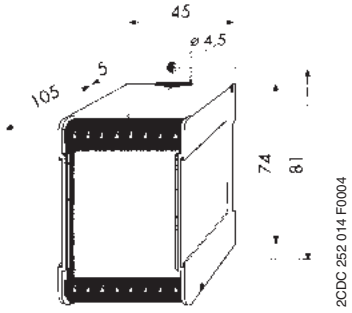


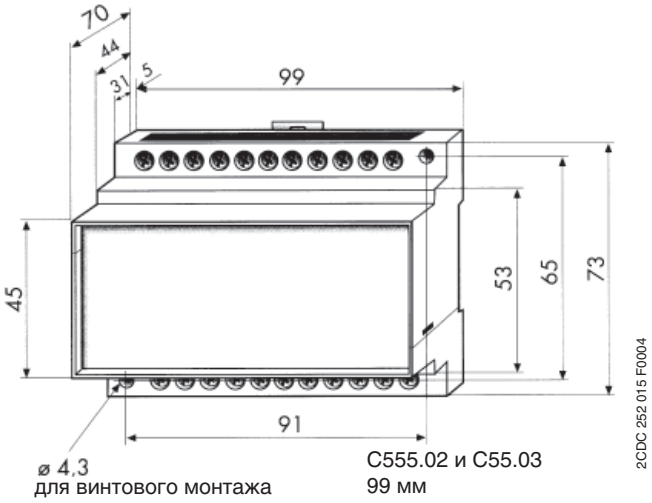
CM-E
22.5 мм



Контрольно-измерит. устройства изоляции для незаземленных сетей C558.xx

C558.01
45 мм

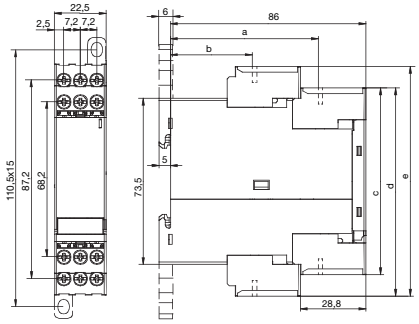




C555.02 и C55.03
99 мм

Реле контроля температуры, типоряд C51x

C510/C511
22.5 мм

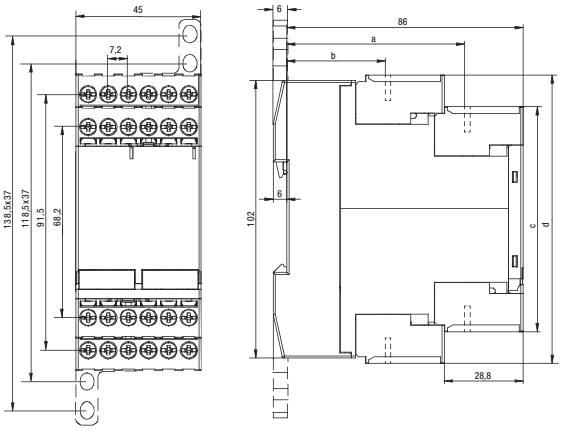


	C510, C511
∅ 5 ... 6 mm / PZ2	0,8 ... 1,2 Nm 7 ... 10.3 lb·in
10	1 x 0,5 ... 4,0 mm² 2 x 0,5 ... 2,5 mm²
10	2 x 0,5 ... 1,5 mm² 1 x 0,5 ... 2,5 mm²
10	—
AWG	2 x 20 ... 14

2CDC 252 287 F0005

	a	b	c	d	e
C510, C511	65	36	82,6	92,2	101,6

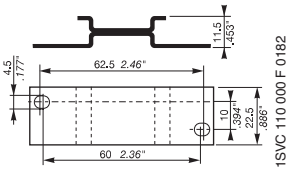
C512/C513
45 мм



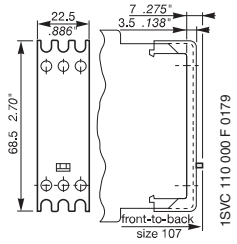
	C512 C513
∅ 5 ... 6 mm / PZ2	0,8 ... 1,2 Nm 7 ... 10.3 lb·in
10	1 x 0,5 ... 4,0 mm² 2 x 0,5 ... 2,5 mm²
10	2 x 0,5 ... 1,5 mm² 1 x 0,5 ... 2,5 mm²
10	—
AWG	2 x 20 ... 14

2CDC 252 288 F0005

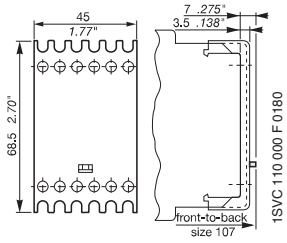
	a	b	c	d
C512, C513	65	36	82,6	105,9



Крышка для CM-S 22.5 мм



Крышка для CM-N 45 мм



Аксессуары

Адаптер для винтового монтажа

Тип	Ширина в мм	№ для заказа	Упаковочная единица шт.
CM-S	22.5	**1SVR 430 029 R0100**	1
CM-N	45.0	**1SVR 440 029 R0100**	1

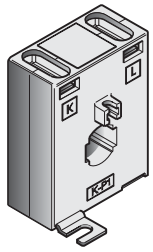
Маркер

Тип		№ для заказа	Упаковочная единица шт.
CM-S, CM-N		**1SVR 366 017 R0100**	1

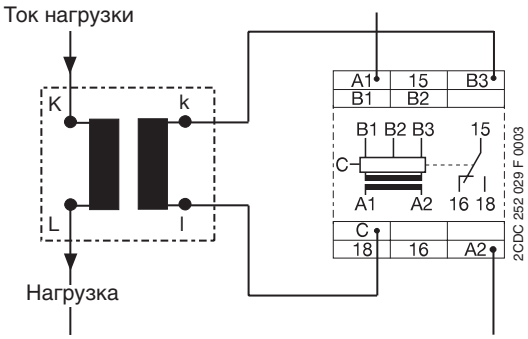
Пломбируемая крышка

Тип	Ширина в мм	№ для заказа	Упаковочная единица шт.
CM-S	22.5	**1SVR 430 005 R0100**	1
CM-N	45.0	**1SVR 440 005 R0100**	1

Аксессуары для реле тока - трансформаторы тока



Принцип работы, схема



Тип	№ для заказа	Упак. единица шт.
Трансформатор тока 25/5А, класс 0.5, 5VA	**ELCCTA/25**	1
Трансформатор тока 40/5А, класс 0.5, 5VA	**ELCCTA/40**	1
Трансформатор тока 50/5А, класс 0.5, 5VA	**ELCCTA/50**	1
Трансформатор тока 60/5А, класс 0.5, 5VA	**ELCCTA/60**	1
Трансформатор тока 80/5А, класс 0.5, 5VA	**ELCCTA/80**	1
Трансформатор тока 100/5А, класс 0.5, 5VA	**ELCCTA/100**	1
Трансформатор тока 100/5А, класс 1, 3VA	**ELCCT 3/100**	1
Трансформатор тока 150/5А, класс 0.5, 3VA	**ELCCT 3/150**	1
Трансформатор тока 200/5А, класс 0.5, 3VA	**ELCCT 3/200**	1
Трансформатор тока 250/5А, класс 0.5, 5VA	**ELCCT 3/250**	1
Трансформатор тока 300/5А, класс 0.5, 5VA	**ELCCT 3/300**	1
Трансформатор тока 400/5А, класс 0.5, 6VA	**ELCCT 3/400**	1
Трансформатор тока 600/5А, класс 0.5, 6VA	**ELCCT 3/600**	1

Baumer, Минск +375447584780 viber email minsk17@tut.by
www.fotorele.net www.tiristor.by радиодетали, электронные компоненты
tel.+375 29 758 47 80 мтс

каталог, описание, технические, характеристики, datasheet, параметры, маркировка, габариты, фото, модуль, **Baumer**

КАТАЛОГ 2019г.

Baumer в Беларуси

купить, продажа в **Минске, Беларусь**

электронные компоненты

где и как купить в Минске?