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Germany



Siemens



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**SIMATIC:**  
the world's leading  
automation system



**Scalability, long-term availability, openness – SIMATIC provides all the benefits you expect**  
The scalability of SIMATIC enables automation to be extremely flexible and economically match your actual requirements. Additionally, thanks to its strict upward compatibility, the system can be upgraded at any time – for maximum security of investment. You benefit from the long-term availability of the components as well as the opportunity of migrating seamlessly to new technologies such as PROFINET or Embedded Automation. Even system requirements such as functional security or fault-tolerance can be expanded without difficulty. In addition, automation components from other suppliers can be integrated into SIMATIC through standardized interfaces. With SIMATIC, you are benefiting from a system that has 50 years of success behind it.

**Our SIMATIC products include a comprehensive range of service and support:**

- Training
- Solution Partners
- E-Business and Online Support
- Support over the entire product life

The SIMATIC product portfolio for the manufacturing industry:

**SIMATIC Controller**  
Controllers for every requirement: modular, PC-based Automation and Embedded Automation.

**SIMATIC ET 200**  
Distributed, modular I/O system for use in the cabinet or directly on the machine.

**SIMATIC Software**  
Powerful engineering software that covers every phase in the life cycle of an automation solution.

**SIMATIC Safety Integrated**  
Seamless safety program that covers all automation components and is smoothly integrated into the standard automation.

**SIMATIC Technology**  
Comprehensive range of products for performing technological tasks such as counting, measuring, positioning, closed-loop control and cam control.

**SIMATIC HMI**  
Complete range of operator panels and visualization software for machine-level operator control and monitoring up to and including the scalable SCADA system.

**SIMATIC NET**  
Everything you need for powerful, reliable and secure industrial communication.

**SIMATIC Industrial PCs**  
Robust, high-performance industrial PCs with brilliant displays – for a wide variety of requirements.

**SIMATIC IT**  
The perfect basis for customer-specific, integrated MES (manufacturing execution system) solutions which enable the quality and efficiency of production to be optimized at all locations within an organization.

**SIMATIC sensors**  
Comprehensive range of sensors for recording objects, product tracing and quality control, as well as the protection of personnel in hazardous areas.



**Standard programming languages**

SIMATIC STEP 7 software offers six programming languages compliant with both IEC 61131-3 and PLCopen for the programming of controllers. For drives, the PLCopen certified Motion Control blocks in STEP 7 can be used. This simplifies the training period and reduces associated training costs.

**Simple HMI connection**

WinCC flexible is used for the configuration of machine-level HMI devices. WinCC is also available as a SCADA system. Both systems make use of the shared project structure described above. The advantage: Address and symbol designations of a variable or signal that are defined in STEP® 7 can be directly accessed in the HMI configuration. There is no need for repeated configuration or tag data entry. The more information from a process that has to be visualized, the more this level of integration will pay for itself.

**Data exchange via open interfaces**

Interoperability and data transfer are not restricted within SIMATIC software. Open standard interfaces make it possible to incorporate data already available in other software tools, for example, data from electrical design (CAx).

**Digital engineering**

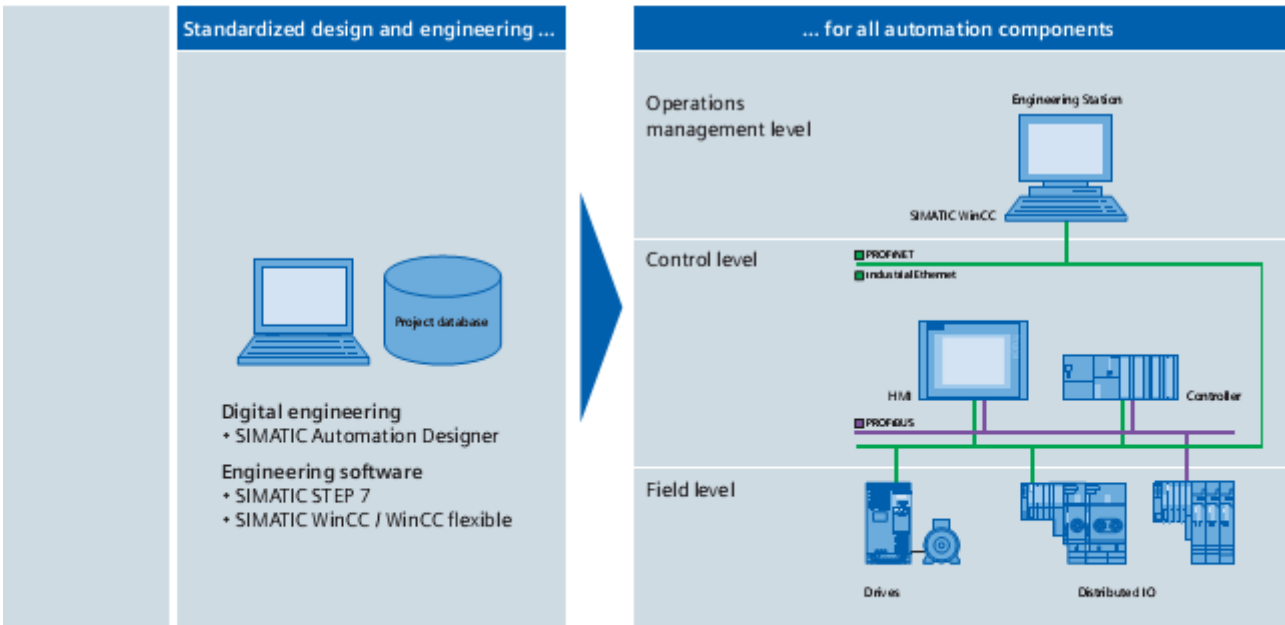
Within the scope of the digital engineering concept, the SIMATIC Automation Designer software provides a universal project view with interdisciplinary interaction of all participants across all levels and the entire life cycle of a plant.

A shared consistent database enables widely varying planning data from mechanical, electrical and automation systems to be integrated in a single plant structure, which can be intelligently managed by modularization, standardization and library concepts.

Functional interrelationships can be easily created and transparent plant configuration is made possible on the basis of the object-oriented, system-independent Automation Designer software. Codes are automatically generated for the target systems involved. Simplified processes up to virtual commissioning result in significantly shortened planning and development procedures and considerably improved quality.

**Further Information on this topic:**

[www.siemens.com/simatic/engineering](http://www.siemens.com/simatic/engineering)



Engineering with SIMATIC – The perfect basis for integrated automation solutions across all levels



# Protection for personnel and machinery

Safety Integrated stands for the seamless integration of safety into standard automation.

For machine builders and plant managers that means: easier and faster access to a safe and productive machine.

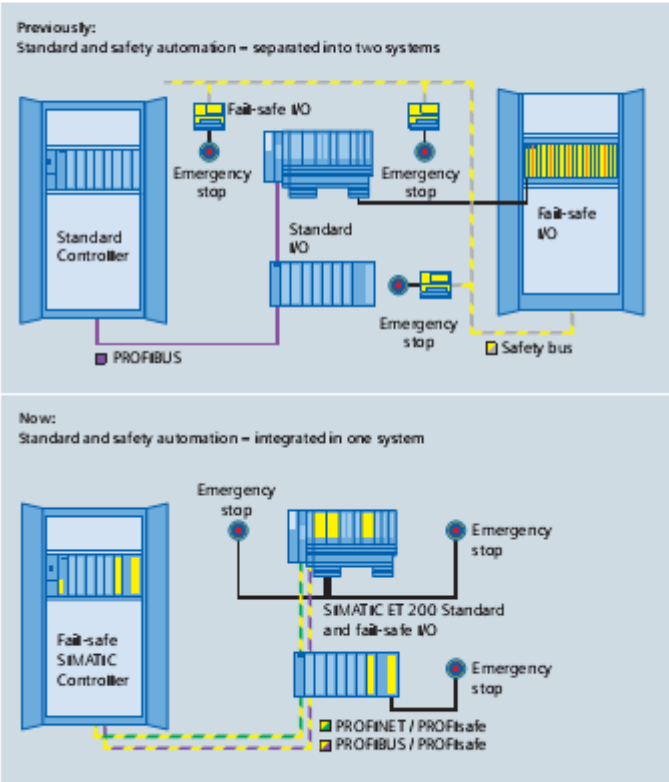
**Integration of safety into standard automation**  
 As a machine and plant builder as well as operator you have a legal obligation to ensure the safety of both your personnel and the environment. With SIMATIC Safety Integrated, Siemens offers products certified by TÜV (German Technical Inspectorate), which make it simple for you to meet the relevant standards: IEC 62061 up to SIL 3, EN ISO 13849-1 up to PL e as well as EN 954-1 up to Cat. 4. In line with the Totally Integrated Automation concept, SIMATIC Safety Integrated incorporates safety functions into standard automation, thus creating an integrated overall system with

One engineering environment for both standard and safety technology means significantly greater efficiency when programming the safety functions. This minimizes overhead for instruction and training and simplifies machine operation. In addition, this consistent integration permits faster and better fault diagnostics and clearance – ensuring greater productivity.

Further information on this topic:  
[www.siemens.com/simatic/safety](http://www.siemens.com/simatic/safety)

Engineering	SIMATIC consistently integrates safety functions into the standard automation, thus creating an integrated overall system with one engineering, one controller, one distributed I/O and one bus.
Communication	
Diagnostics	
<b>Safety</b>	
Security	
Robustness	
High availability	

one engineering, one controller, one distributed I/O, one bus. The system advantages and extensive functionality of SIMATIC are then also available for fail-safe applications, which considerably reduces the interface costs. Fail-safe communication takes place over the universally tried and tested PROFINET or PROFIBUS communication standard using the PROFSafe profile. This enables innovative solutions, such as the wireless fail-safe communication via IWLAN and PROFINET – e.g. using the SIMATIC Mobile Panel 277F IWLAN with integrated safety function.



# MICROMASTER

The universal frequency inverter  
for drive technology

Brochure · April 2008



# MICROMASTER

[www.siemens.com/micromaster](http://www.siemens.com/micromaster)

**SIEMENS**



# MICROMASTER

## The universal frequency inverter for drive technology

### Application:

Everywhere in the manufacturing and process industry

MICROMASTER is used:

- For outputs ranging from 0.12 kW to 250 kW
- In the manufacturing and process industry
- In applications ranging from pumps and fans, to extruders and winding machines, to conveyor systems

### Perfect for centralized requirements

Thanks to its compact design, MICROMASTER is perfectly suited for control cabinet mounting, just as it can be integrated into the design of stand-alone and series machines.

MICROMASTER enables maximum utilization of the available mounting surface, from small outputs to large outputs, with a wide range of supply voltages. As such, it covers a wide field of applications.

The options concept opens up additional possibilities for customization:

- Different communication interfaces enable use in the most common network applications
- Plain-text operator panels simplify operation and also support a wide range of languages
- Base components such as reactors and filters complement the compact solution

### MICROMASTER – The family

MICROMASTER represents system and family cohesiveness: Three models with a comprehensive cross-platform standard and balanced, graded performance features. Tried and tested millions of times worldwide!

Introducing the family members:

- MICROMASTER 420: The universal
- MICROMASTER 430: The specialist for pumps and fans
- MICROMASTER 440: The all-rounder



### Highlights of the entire MICROMASTER family

#### Mechanical components

- Compact, standardized drilling template
- Standardized base components
- Screwless control terminals
- Fulfills the requirements of a wide range of standards

#### Electronics




- Graded I/O quantity structure
- Various supply voltages

#### Communication

- Different fieldbus interfaces (PROFIBUS, CAN, DeviceNet, RS485)
- Integrated into Totally Integrated Automation

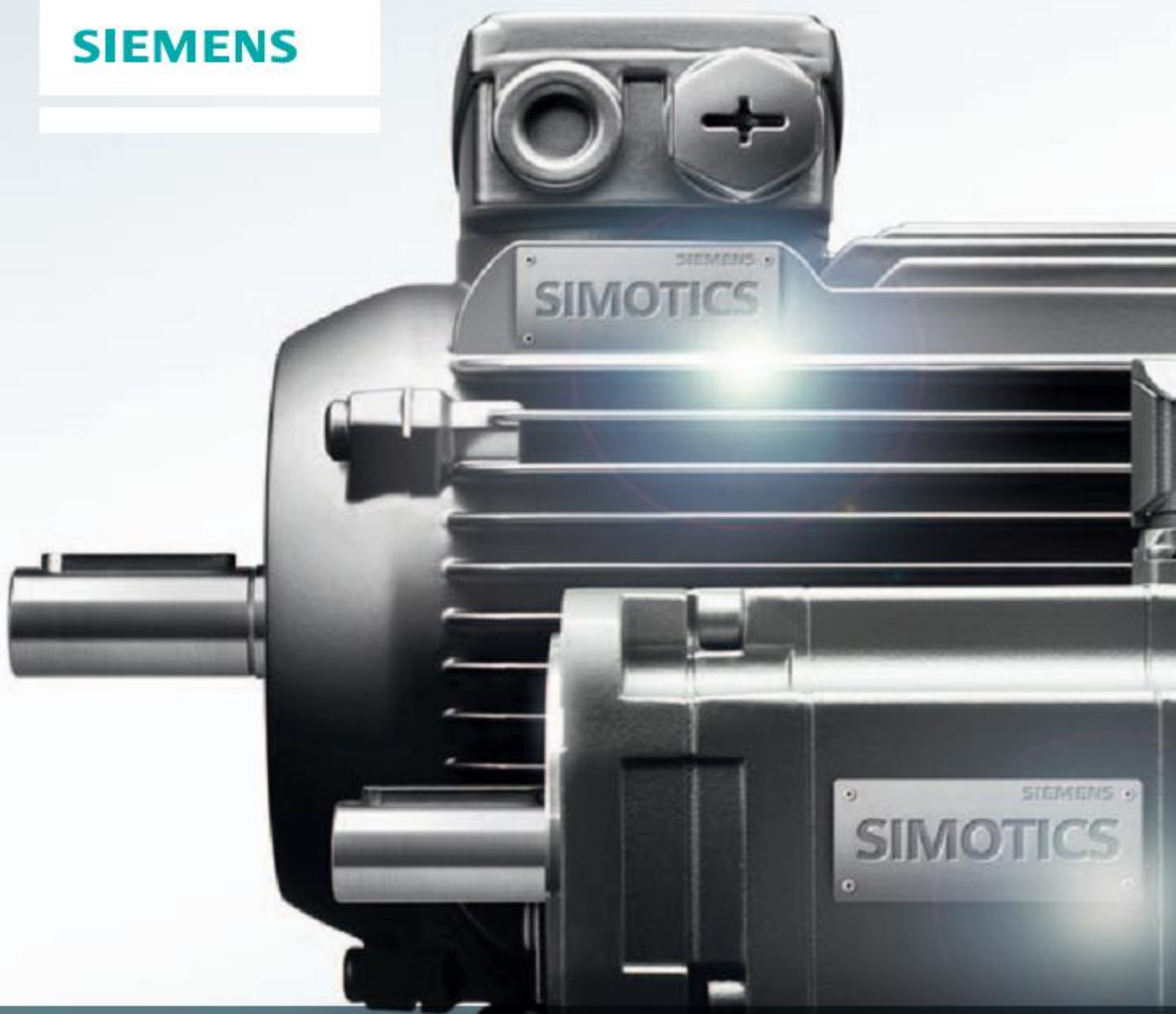
# MICROMASTER

## The universal frequency inverter for drive technology

Feature	MM420 	MM430 	MM440 	Benefits
Type of construction	A-C	C-FX/GX	A-FX/GX	<ul style="list-style-type: none"> <li>Standardized, graded types of construction for all three models</li> <li>Identical drilling template for each type of construction saves time when fitting control cabinets</li> <li>Standardized base components allow for space-saving control cabinet solutions for various applications</li> </ul>
HMI	BOP AOP AAOP CAOP	BOP-2	BOP AOP AAOP CAOP	<ul style="list-style-type: none"> <li>Standard diagnostics via LEDs on every inverter</li> <li>Various operator panel options: from the basic operator panel (BOP) to plain-text operator panels (AOP), also available for Chinese (AAOP) and Cyrillic (CAOP) languages</li> <li>BOP-2 customized for the requirements of industrial pumps and fans</li> <li>Identical operating concepts for all operator panels. "Learn one – operate them all. Anywhere in the world!"</li> </ul>
Motor protection	Locked rotor protection  Motor overtemperature $I_{max}$ controller	Locked rotor protection  Motor overtemperature PTC/KTY84 input $I_{max}$ controller	Locked rotor protection Motor stall prevention  Motor overtemperature PTC/KTY84 input $I_{max}$ controller	<ul style="list-style-type: none"> <li>Standard feature: <math>I^2t</math> motor protection without external sensors or evaluation units</li> <li>In the event of overload, the drive can continue to operate at reduced speed thanks to the <math>I_{max}</math> controller. This ensures a high degree of plant availability.</li> <li>Refined motor protection with MM430 and MM440 by means of a special PTC/KTY84 input</li> </ul>
Braking	Control of external motor holding brakes  DC braking Compound braking	Control of external motor holding brakes  DC braking Compound braking	Control of external motor holding brakes  DC braking Compound braking Integrated brake-chopper control (up to 75 kW)	<ul style="list-style-type: none"> <li>Standard braking option as basic functionality. Can thus be used for many applications even without additional components</li> <li>For stringent braking requirements, dynamic braking with integrated chopper control. Thus, the load can be stopped in a controlled manner, irrespective of the load.</li> </ul>
Inverter protection	Undervoltage Overvoltage Overload Overtemperature $V_{dc max}$ controller	Undervoltage Overvoltage Overload Overtemperature $V_{dc max}$ controller Phase failure	Undervoltage Overvoltage Overload Overtemperature $V_{dc max}$ controller  Phase failure Kinetic buffering ( $V_{dc min}$ controller)	<ul style="list-style-type: none"> <li>Extensive safety mechanisms protect your investment and installation</li> <li>High availability in the event of voltage fluctuations on the power supply. With the <math>V_{dc max}</math> controller, automatic adjustment of the deceleration ramp prevents the inverter from shutting off unintentionally during deceleration with high inertia loads. This enables controlled deceleration of the motor in the event of a power failure. During short voltage drops, the <math>V_{dc min}</math> controller bridges the power failure without compromising application performance.</li> </ul>
Special functions	DIP 50/60 Hz BICO	DIP 50/60 Hz BICO Free function blocks Pump functions (motor staging, power-save mode, dry-run detection, bypass support)	DIP 50/60 Hz BICO Free function blocks	<ul style="list-style-type: none"> <li>Just the right device for every application thanks to graded functionality of all three models</li> <li>DIP switch for easy switchover of the factory setting from IEC to NEMA motor data</li> <li>Free function blocks allow for simple logic tasks and sequence control tasks such as interlocks directly in the inverter even without external miniature controllers. Thanks to the BICO functionality, the assignment of inputs and outputs is user-definable, as is the wiring of parameters.</li> </ul>



**SIEMENS**








The only thing that we were able to improve: the name

The most comprehensive range of motors is now called SIMOTICS

[siemens.com/simotics](http://siemens.com/simotics)

# The complete range for all applications

SIMC

	Low-voltage motors for line and converter operation				
	General Purpose	Severe Duty	Trans Standard	Definite Purpose	Explosion Protected
	GP	SD	TN	DP	XP
					
	<b>Power</b>	IEC: 0.09 ... 45 kW NEMA: 1 ... 200 HP	IEC: 0,75 ... 315 kW NEMA: 1 ... 400 HP	200 ... 1250 kW	0,09 ... 1.250 kW
<b>Torque</b>	IEC: 0.61 ... 292 Nm NEMA: 2 ... 883 lb-ft	IEC: 5 ... 2,022 Nm NEMA: 1.5 ... 1,776 lb-ft	800 ... 8500 Nm	0.61... 8,500 Nm	IEC: 0.61 ... 8090 Nm NEMA: 1.5 ... 1,187 lb-ft
<b>Speed</b>	750 ... 3,600 min <sup>-1</sup>	750...3,600 min <sup>-1</sup>	750 ... 5,000 min <sup>-1</sup>	750 ... 3,600 min <sup>-1</sup>	750 ... 3,600 min <sup>-1</sup>
<b>Applications</b>	Pumps, fans, compressors, with specific requirements relating to low weight and the highest efficiency	Pumps, fans, compressors, marine applications, offshore, mixers, crushers, extruders, rolling mills with special requirements regarding the ruggedness, especially in the chemical and petrochemical industries	Pumps, fans, compressors, mixers, extruders in the chemical and petrochemical industry, paper machines, mining, cement, steel industry, marine applications	Special motors for example transport and working roller tables, ventilating tunnels, parking garages, shopping malls, port cranes, container terminals	For general industrial applications with special requirements relating to explosion protection, e.g. in the process industry

\*) Calculated values



*The ideal partner for our  
SINAMICS DCM converters for  
low investment costs and high  
availability in the widest range  
of applications as:*

- Extruders for the plastics industry
- Hoisting and travel gear drives for cranes
- Rolling mill drives and winders
- Rotary kilns for cement factories
- Drives for wire-drawing machines
- Press drives
- Drives for lifts and cable railways
- Paper machine drives



## OUR PRODUCTS



### MTU 0060 DS / 0080 DS / 0113 DS

50 Hz: 30 - 94 kVA  
60 Hz: 27 - 200 kWe

From 27 to 200 kWe (30 to 94 kVA) of power potential, our generator sets are built with the same engineering and system expertise as our larger generator sets, featuring low fuel consumption, high efficiency and outstanding reliability.



### MTU 1600 DS

50 Hz: 280 - 730 kVA  
60 Hz: 210 - 600 kWe

MTU 1600 DS generator sets bring MTU Onsite Energy power, technology and reliability to the power range from 210 to 600 kWe (280 to 730 kVA).



### MTU 2000 DS

50 Hz: 770 - 1400 kVA  
60 Hz: 615 - 1250 kWe

With the comprehensive choice of power outputs from 615 to 1250 kWe (770 to 1400 kVA) MTU 2000 DS generator sets offer the optimum solution for various applications.



### MTU 4000 DS

50 Hz: 1550 - 3250 kVA  
60 Hz: 1125 - 3250 kWe

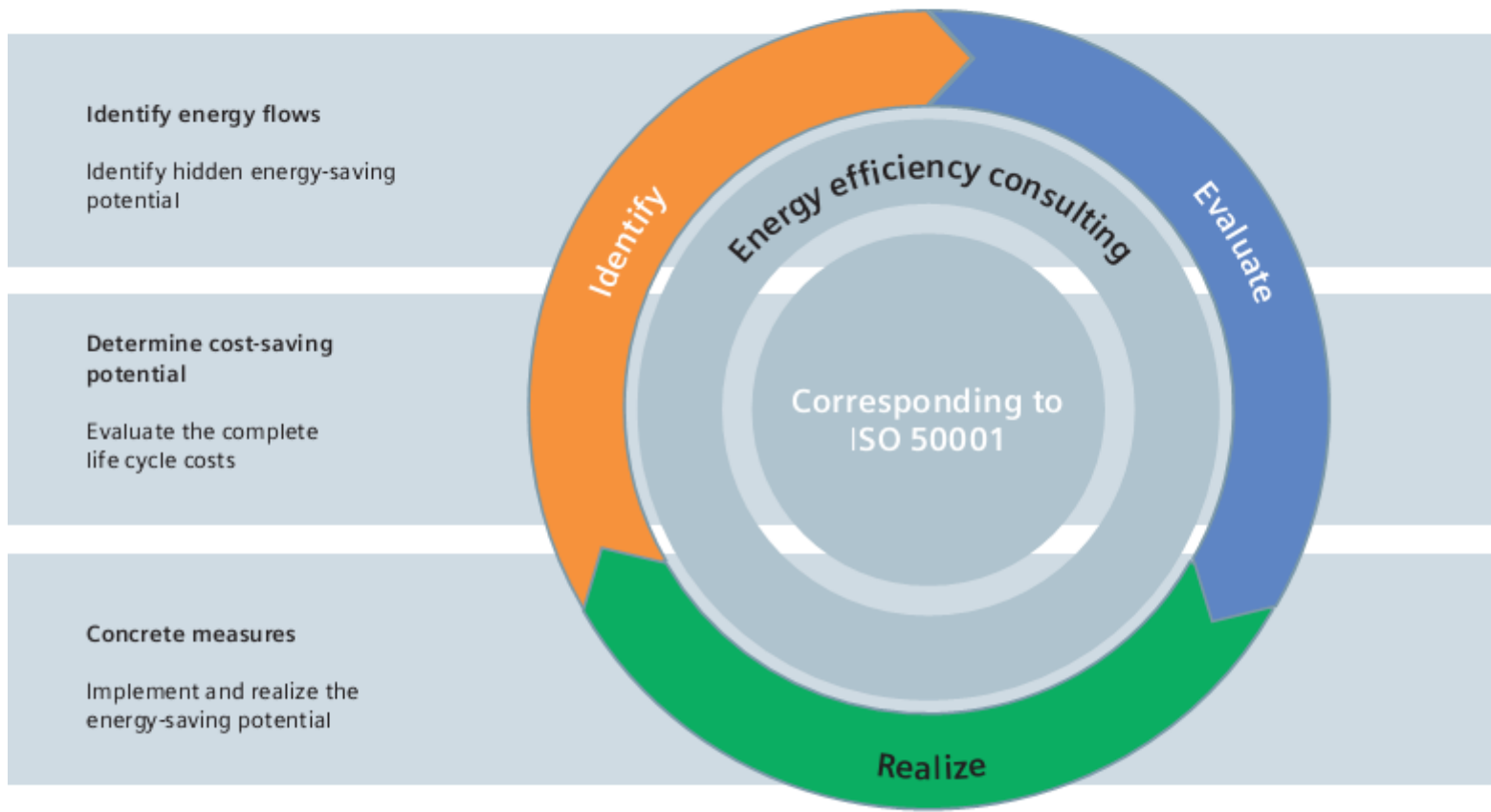
MTU 4000 DS generator sets perform at the highest level and cover the power range from 1125 to 3250 kWe (1550 to 3250 kVA). With a robust design and optimal fuel consumption, our diesel generator sets are trusted by customers around the world.



*Ideal for applications that demand the highest power and performance, such as:*

- Compressors for pumping and transporting natural gas
- Liquid gas compressors that require power ratings of up to 100 MW
- Large oil pumps
- Main pumps in the water and chemical industries
- Boiler feed pumps in power stations
- Platform drives
- Main propulsion drives for freighters, tankers and cruise ships, extruders, kneaders and mixers in the megawatt range, ore mills and stone crushers, bucket wheel and dragline excavators in open-cast mining, conveyor belt systems with high transport capacities, blowers (e.g. for blast furnaces, which blow several 100,000 cubic meters of air), air separation plants, refineries and main rolling mill drives





**Energy efficiency in the future**

In machine and plant construction, energy efficiency is a topic that is becoming increasingly more important: on one hand, because energy is becoming an essential and increasing cost factor for manufacturing industries – and on the other hand, because at the domestic and international level, increasingly more stringent standards and legislation must be complied with. We can offer you everything that is required for a focused energy management:

Products and systems that play a decisive role in significantly reducing operating costs, and at the same time reducing the stress on our climate and environment. As a continuous process, our well-conceived concept ensures continuous reduction of the energy requirement. Our energy management is based on the phases – identify, evaluate and realize. We offer the perfect solutions for each one of these phases.

**Products**

**Analytical Instrumentation**

Automated Chemistry Analyzers

Electrochemistry

Flow, Level & Samplers

Gas Chromatography Detectors & Sample Introduction

Load Gauges (MIPEG)

Online Analyzers

Polarimetry & Refractometry

Spectrophotometry & Photometry

Temperature & Humidity

Titration

Total Organic Carbon Analyzers

Controllers

Pumps & Accessories

Water & Wastewater Treatment Solutions

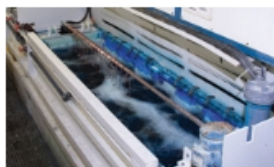


# Measuring, Monitoring and Protecting Your Critical Investments

If you're looking to protect millions of dollars worth of processes and equipment, trust Xylem to safeguard your investments.

We are a leading manufacturer of premium field, portable, laboratory and online analytical instrumentation that touches just about every industry where precise measurement and control are required.

Thousands of end-users worldwide use our meters, sensors, analyzers and related consumables to analyze and control quality in industrial applications, including environmental, food and beverage, pharmaceutical and biotechnology, water and wastewater treatment.



### Automated Chemistry Analyzers

Providing precise, accurate and rapid results using discrete or multichannel continuous flow technology. Learn more about automated chemistry analyzers.



### Electrochemistry

Developing innovative meters, electrodes and systems as the largest global supplier and integrator of electrochemistry products. Learn more about electrochemistry.



### Flow & Level Samplers

Developing several automatic flow and water level sampler products to continually meet your needs. Learn more about flow and level samplers.



### Online Analyzers

Providing solutions for the online monitoring of a wide range of parameters including water, wastewater, environmental, food, beverages and more. Learn more about online analyzers.



### Polarimetry & Refractometry

Enabling the development of market-leading instruments that are used extensively throughout a wide range of industries. Learn more about polarimetry and refractometry.



### Spectrophotometry & Photometry

Producing a wide array of market-leading spectrophotometry products and solutions targeted for the water and environmental markets. Learn more about spectrophotometry and photometry.



### Temperature

Producing high-accuracy, portable and data-logging instruments for temperature and humidity applications in a wide variety of applications. Learn more about temperature.

## Analytical Instrumentation Case Studies

### A Smart Monitoring System for Singapore's Drinking Water Network

Xylem teamed with a local company to develop a monitoring system that will help Singapore address – and avoid – leaks, clogs and water quality issues in its drinking water network.












### Watching Our Waterways During and After Natural Disasters

Hurricane Sandy wreaked havoc on waterways in large parts of the U.S. Xylem instruments helped environmental and public safety agencies assess the immediate damage – and are still being used to measure the health of impacted rivers, bays, streams and other water sources.



## For High Level Technology Solutions

Our production:

- ▶  Cast resin power transformers
- ▶  Special Transformers
- ▶  Cast Resin Transformers HV/HV and HV/LV
- ▶  Cast Resin Transformers LV/LV
- ▶  Dry Type Transformers HV/HV and HV/LV
- ▶  Oil filled transformers
- ▶  Power Oil filled transformers
- ▶  Special Oil filled transformers
- ▶  Dry Type Transformers LV/LV
- ▶  Dry Type Reactances with and without magnetic core
- ▶  Accessories

7





# Refinery chooses ultrasonic flow technology to enhance pipeline upgrade

[siemens.com/flow](http://siemens.com/flow)



### Challenge

An Oklahoma refinery recently required a flow measurement solution for a finished gasoline and diesel fuel line leaving the refinery site. They were already using a Siemens clamp-on check meter and interface detector elsewhere and hoped to install the same product on the fuel line. However, the local Siemens representative, the Ernie Graves Company, determined that there would not be enough straight run of pipe to support a clamp-on meter, and the refinery decided that they would need to bring the pipe above ground. Since they were going to invest so much in altering the pipeline, the representative recommended that they choose a flow solution offering the same benefits as clamp-on technology but with an even higher level of accuracy: the liquid version of the SITRANS FUT1010 ultrasonic flowmeter.

**Answers for industry.**





	Technical Specifications
<b>Calibrated accuracies</b>	Liquid: <0.15% of flow Gas: <0.2% of flow
<b>Repeatability</b>	±0.05% to 0.1% of actual reading
<b>Flow ranges</b>	Liquid: ±40 f/s (±12 m/s) Gas: up to ±120 f/s (±36.5 m/s), both bidirectional
<b>Temperature ranges</b>	-20 °F to 200 °F (-28 °C to 93 °C)
<b>Sensor diameters</b>	4 to 24 inches (DN100 to DN600)
<b>Data inputs</b>	4 x 4-20 mA, programmable (pressure, temp., etc.)
<b>Data outputs</b>	4 x isolated 4-20 mA, 2 x 0-10 VDC, 4 x digital pulse outputs (2x open collector, 2x 0-5V TTL)
<b>Communication</b>	RS232 (standard) and Modbus RS485/422 (optional)
<b>Enclosure ratings</b>	Sensor: IP65 (NEMA 4X), transmitter: IP66 (NEMA 7)
<b>Approvals</b>	INMETRO, CSA, FM, CRN and ATEX

**Solution**

The SITRANS FUT1010 now provides the operators at the refinery with real-time flow information so that they are able to determine media conditions within the pipeline and be made aware of any changes immediately as they occur. The meter supports them in making informed decisions about pipeline operation and helps to maximize delivery and performance control. The customer also likes the fact that there is no need to shut down the flow should a transducer ever need to be replaced, which saves considerable time and money .

“The refined petroleum pipeline required a great deal of precision in flow measurement, so I knew right away that this application would require a very high-performing flowmeter,” said Colby Graves, CEO of the Ernie Graves Company. “I recommended the SITRANS FUT1010 because of its unique combination of flow measurement accuracy and capability for multi-product identification, which makes it an extremely cost-efficient solution. The customer is now reaping the benefits.”

**About the SITRANS FUT1010**

The SITRANS FUT1010 ultrasonic flowmeter was developed specifically for measurement of liquid and gas applications within the hydrocarbon industry, including pipeline, terminal, refinery and transportation applications. It features patented WideBeam ultrasonic transit time technology for high-precision performance.

The newly developed TransLoc mounting system means that the transducers are permanently mounted on the outside of the sensor, providing custody transfer accuracy (±0.15%), no cavities or clogging by the high-paraffin liquids found in many hydrocarbon installations, and measurement of viscosities up to 2800 cSt. The

SITRANS FUT1010 is available in dual-, three- and four-channel configurations and with two enclosures: wall mount and wall-mount explosionproof.

To demonstrate the accuracy and repeatability of the SITRANS FUT1010, the liquid version was recently subjected to extensive tests at an accredited third-party test facility. The excellent results prove that the meter is a perfect match and a wise investment for the hydrocarbon industry.

**Typical liquid applications include:**

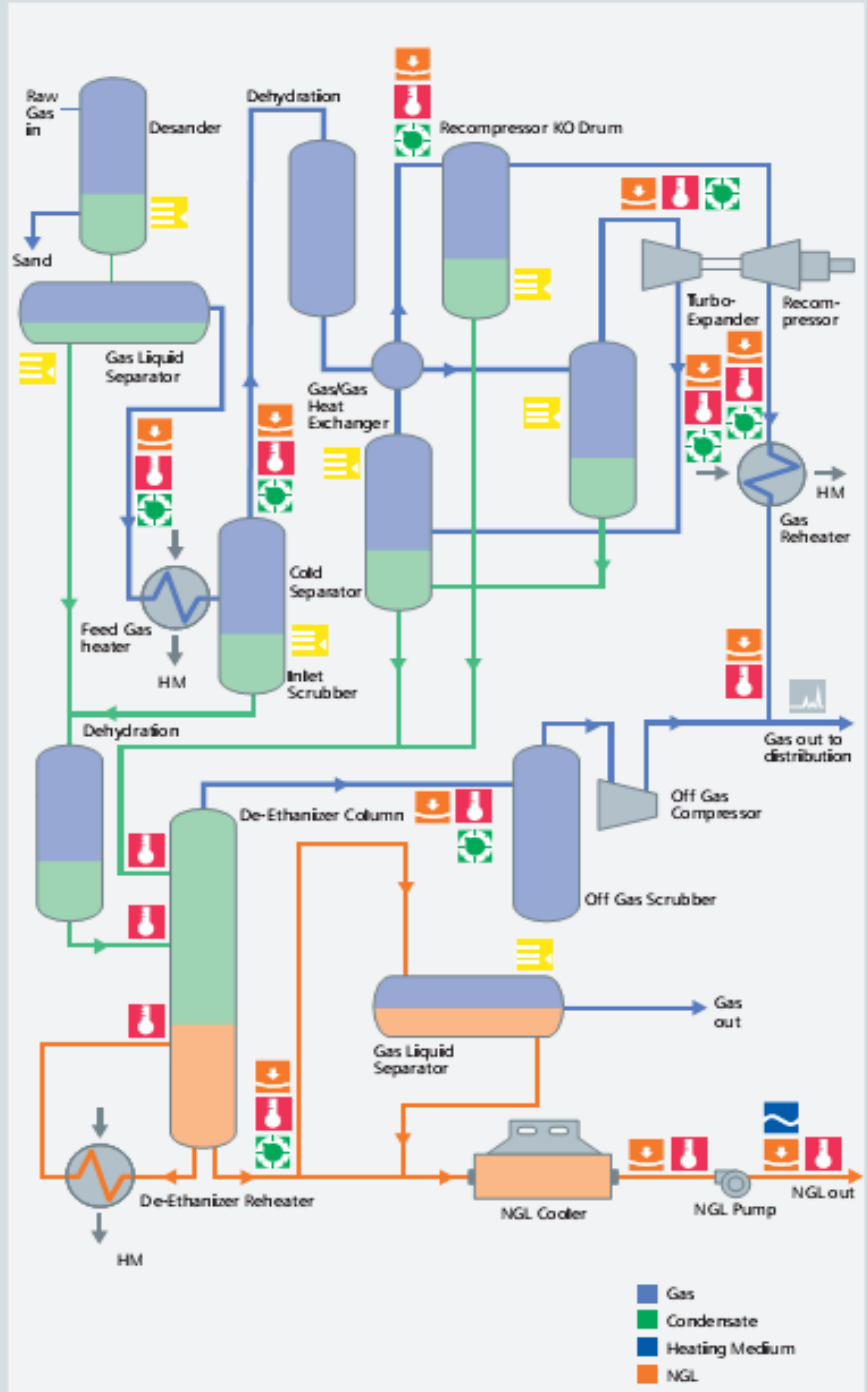
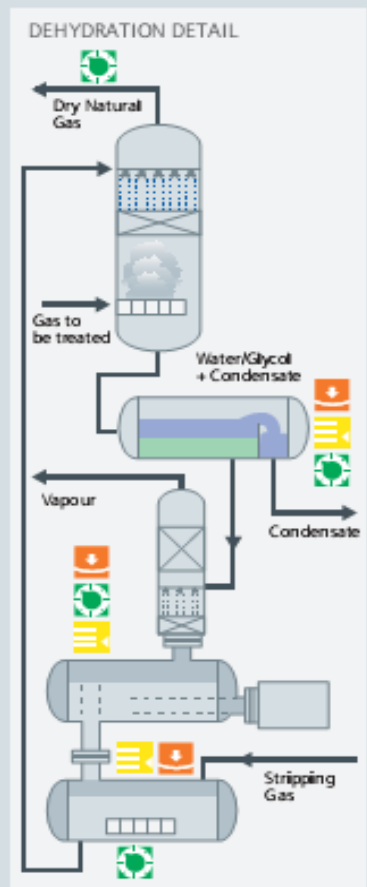
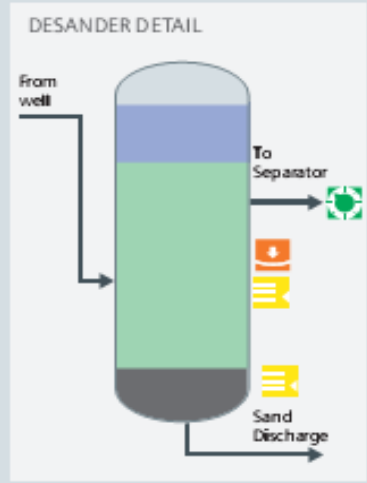
- Pipelines: Allocation, line balance, interface detection, density/densitometer reading
- Terminals: Check metering, transmix metering, product identification
- Refineries: Process control, blending, tank measurement, ship loading and unloading
- Transportation: Crude oil, LPG, refined product

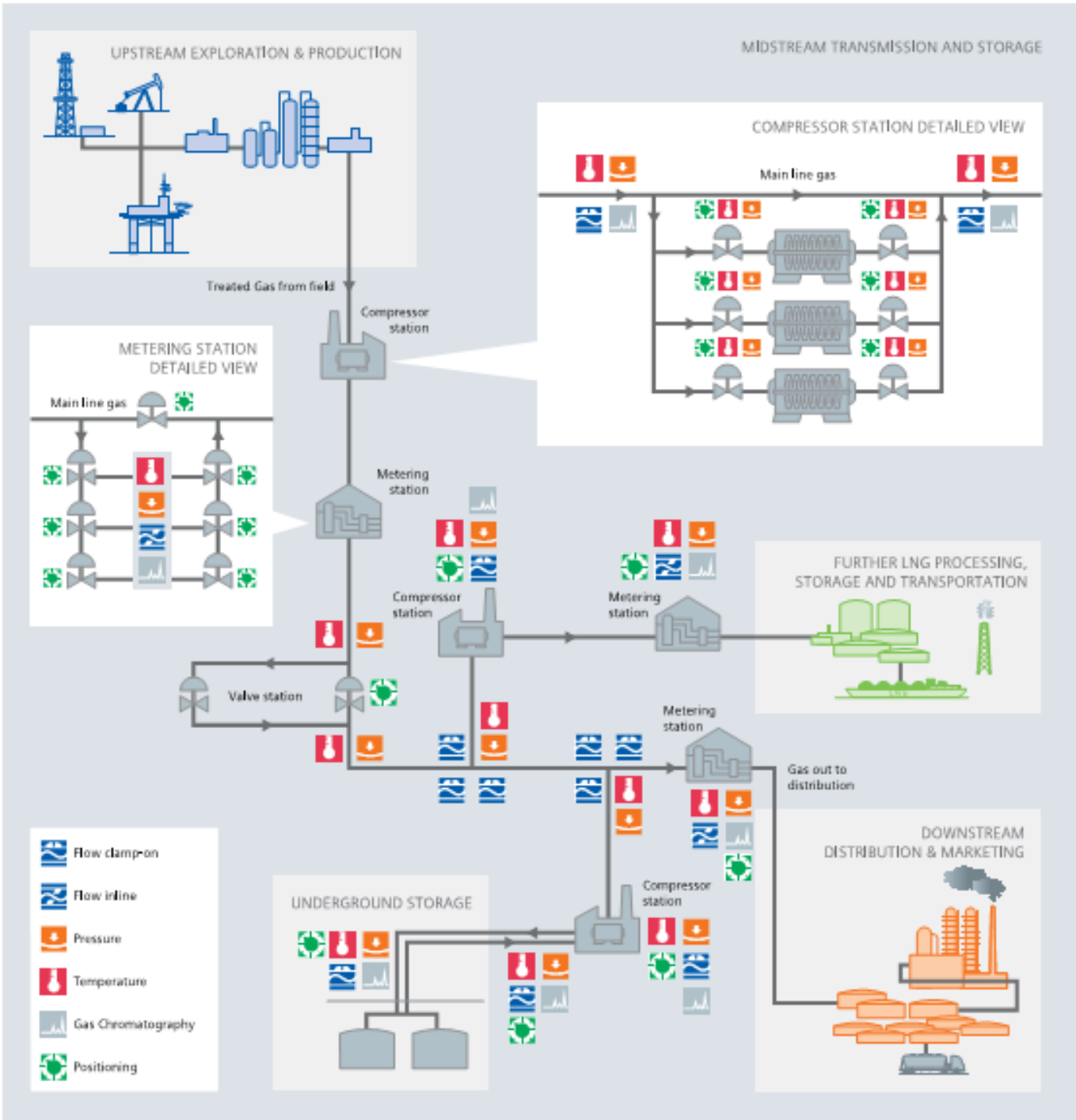
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Industry Automation Division  
CoC Ultrasonic Flow  
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USA

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## Gas treatment process





Siemens understands your requirements – regardless which stages of natural gas transmission and storage require instrumentation, various measurement technologies are available for different applications.

**Siemens quality:**

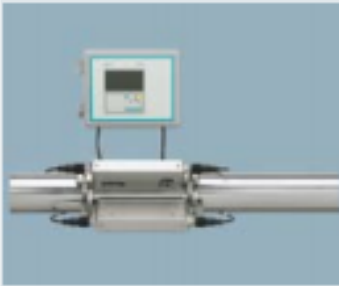
- High degree of product safety – through maximum process transparency
- Optimal resource efficiency – through innovative platform concepts
- Increased productivity – with optimal solutions for the operating phase
- Greater availability – through innovative service and support concepts

- High long-term investment security – through continuous innovation and maximum compatibility

**Siemens results:**

- Fast commissioning, short ramp-up times
- Accurate and reliable measurement
- Low total cost-of-ownership

### Clamp-on flow measurement



SITRANS FUG1010 clamp-on flowmeter

- **Applications:** Gas pipeline monitoring, check measurement in compressor stations, and underground gas storage facilities
- **Technology:** WideBeam ultrasonic, clamp-on
- **Benefit:** Bi-directional flowmeters provide

zero stability and additional diagnostics at low installation costs as no pipe penetration and no system shutdown are required. Due to non-intrusive installation these flowmeters are absolutely environmentally friendly and ensure zero fugitive emissions. Additionally, it features piping correction algorithm, excellent turndown, and has no pressure limits.

### Inline flow measurement



SITRANS FC MASS flowmeter

- **Applications:** Non-custody gas metering in metering stations and in underground gas storage facilities
- **Technology:** Coriolis flowmeter with multi-parameter functionality to measure mass flow, volume flow, density, temperature and fraction

- **Benefit:** No moving parts allow maintenance-free operation, low pressure loss due to sensor design, straight forward calibration, traceability on gases, and wide range of sensors available.

### Pressure measurement

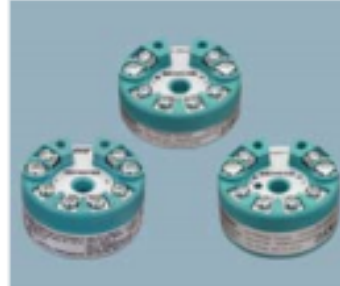


SITRANS P DS III pressure transmitter

- **Applications:** Pressure measurement in compressor and metering stations
- **Technology:** Gauge, absolute and differential pressure
- **Benefit:** Applicable in hazardous zones, designed with local

pushbuttons for setup and numerous diagnostics functions, such as operating hours counters, recording process extremes, and doing simulation checks during startup, help simplify operations.

### Temperature measurement



SITRANS TH temperature transmitters and sensors

- **Applications:** Temperature measurement in underground storage facilities, compressor plants and check metering stations.
- **Technology:** Universal design supports various types of sensors

- **Benefit:** High accuracy across entire ambient temperature range.

### Valve control

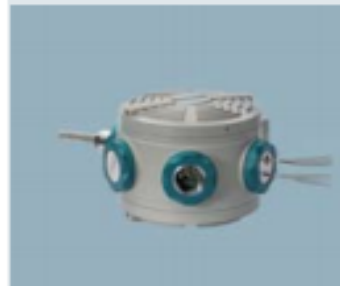


SIPART PS2 valve positioner

- **Applications:** Provides valve control along the pipeline, in valve and metering stations and compressor plants
- **Technology:** Digitally designed device that uses piezo-technology
- **Benefit:** Can be used

for valves from almost all manufacturers. It features negligible air consumption and numerous diagnostic capabilities to detect a variety of abnormalities, such as pneumatic leaks or deposits in pipelines or fittings. Additionally, the partial stroke testing capability ensures proper valve performance and increases safety.

### Gas chromatography



MicroSAM/SITRANS CV gas chromatographs

- **Applications:** analytical process monitoring and control in compressor stations, fiscal metering, gas quality control, calorific value measurement (only SITRANS CV can perform this measurement)

- **Technology:** online microprocess gas chromatograph
- **Benefit:** Compact and modular design permits simple installation directly at the sampling point. It provides faster analysis and allows user-friendly remote operation. Further features are medium power consumption, low utility gases consumption, and low operational costs.



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# Process Analytics throughout the entire natural gas pipeline supply chain

Case Study · November 2008



Natural Gas (NG)

Natural Gas is a vital component of the world's supply of energy. It is one of the cleanest, safest, and most useful of all energy sources. Unlike other fossil fuels, natural gas is clean burning and emits lower levels of potentially harmful by products into the air. While natural gas is formed primarily of methane, it can also include smaller amounts of higher Hydrocarbons. Found in underground reservoirs, natural gas is commonly associated with oil deposits. Once brought from underground, the natural gas is refined to remove impurities like water, other gases, sand, and other compounds. Some hydrocarbons are removed and sold separately, including propane and butane. Other impurities are also removed, like hydrogen sulfide to gain pipeline quality natural gas.



Monitoring NG during pipeline transmission

The purified natural gas is transmitted through a network of pipelines to its point of use. Transmitting natural gas from the wellhead to the end-user typically involves multiple processing steps and several physical transfers of custody. During pipeline transport of NG, it is important to monitor quality parameters such as calorific value (CV), hydrocarbon dew point, hydrogen sulfide and other compounds. Determination of the calorific value is particularly important in the energy measurements of natural gas for billing purposes (fiscal metering) at gas transfer stations. Monitoring of gas quality parameters is also required on the LNG-route where the natural gas is liquefied for easier transportation.

Siemens process gas chromatographs (PGCs) are also applied for NG monitoring: SITRANS CV as especially designed analyzer of the calorific value and MAXUM II as universal PGC for enhanced quality and process control measurements.

## Natural Gas Industry

**SIEMENS**



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## - Motoren

- Niederspannungsmotoren
- Motoren für Motion Control
- Direktantriebe
- Hochspannungsmotore
- Gleichstrommotore
- Gebersysteme
- Getriebemotore
- Ergänzende Komponente



Wassermantelgekühlter  
Loher Industriemotor  
Copyright: Siemens.com



Mittelspannungsumrichter  
SINAMICS GL150  
Copyright: Siemens.com

## - Umrichter

- AC -Niederspannungsumrichter
- AC -Mittelspannungsumrichter
- DC Stromrichter

## - Kupplungen

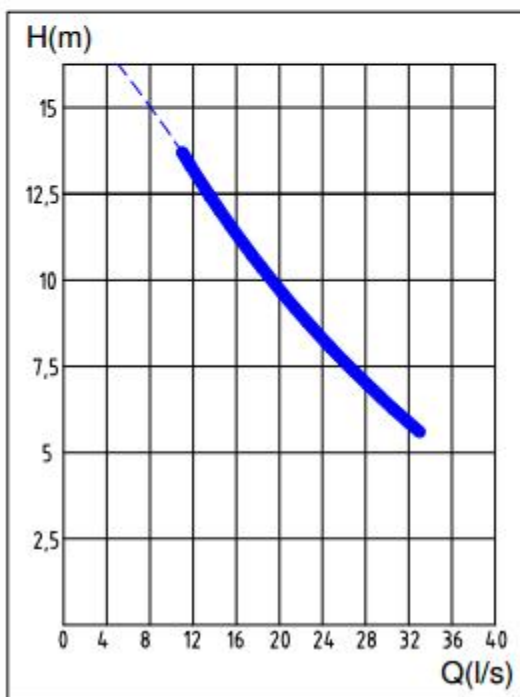
- Elastische Kupplungen
- Hochelastische Kupplungen
- Verdrehsteife Kupplungen
- Kraftschlüssige Kupplungen
- Taper Spannbuchsen



## Diesel sewage vacuum Pump



(Abbildung unverbindlich)



► Sewage vacuum pump with screw impeller

► Easy to maintain

► low fuel consumption

► low noise level

### Description

Self-priming sewage pump on a base frame with a diesel engine and the silencer.

Easy-to-use control device for switching on and off, reading of engine speed, Operating hours and battery voltage, galvanized base frame with leakage tub and fuel tank. Sound enclosure with large lockable access doors

### areas of application

Universally applicable for pumping of sewage sludge, pit contents, viscous media, industrial waste water and for pumping in channel repairs.





## Products

Flygt has products for everything from the toughest applications in wastewater, storm water, effluent, RAS and WAS to lightly contaminated water and clean water applications. Our broad product range and application experience ensure the right solution that meets your specific needs. Our reliable, high-quality products deliver clog-free pumping with unmatched uptime for your peace of mind.

### Wet/Dry well pumps, submersible

- Channel impeller pumps
- Grinder pumps
- Chopper pumps
- N-technology pumps
- Vortex impeller pumps
- Vortex impeller pumps, stainless steel
- Channel impeller pumps, stainless steel



### Dry well pumps, norm motors

- Channel impeller pumps
- Channel impeller pumps, customized
- Split case pumps



### Column pumps

- Mixed flow pumps, submersible
- Propeller pumps, submersible
- Ultra-low head pumps, submersible
- Vertical column pumps
- Horizontal column pumps



### Portable pumps, engine-driven

- Channel impeller pumps



## Product Overview



### Pumping

Flygt is the originator of the reliable, energy-efficient electrical submersible pump. We have been manufacturing high-quality pumps since 1901, and continue to provide our expertise, support, and the highest quality products available. [View products](#)

### Mixing

Flygt has over 50 years of mixing experience with hands-on knowledge of various applications and design to support you. We pioneered the use of thrust as the main performance parameter. [View products](#)

### Dewatering

State-of-the-art technology, durable materials, and few components ensure that Flygt dewatering pumps deliver highly reliable performance at the lowest possible cost of ownership. [View products](#)

### Monitoring and Control

The best of pumps deserve the best of systems. Flygt's products and services work seamlessly together. You are remotely in full control of you pump stations, around-the-clock. [View products](#)

## Wastewater



**Bypass**  
Temporary bypass pumping



**Combined**  
Stations pumping both wastewater and storm water



**Intake station**  
Intake station to a wastewater treatment plant



**Pump stations**  
Any pump station in the sewage collection network



**Pressure sewage system**  
System for transporting domestic wastewater using pressurized piping

## Storm water



**Flood control**  
Pump stations transporting large volumes of lightly contaminated water when flooding or rainstorms occur



# Industrial Hydraulics



→ Pumps



→ Motors



→ Cylinders



→ On/off valves



→ Proportional servo valves



→ Manifolds and plates



→ Electronics



→ Systems



→ Power units

## Product Search by Applications - Resources

By clicking on the product type you will be forwarded directly to product details, available sizes and the corresponding technical documentation.

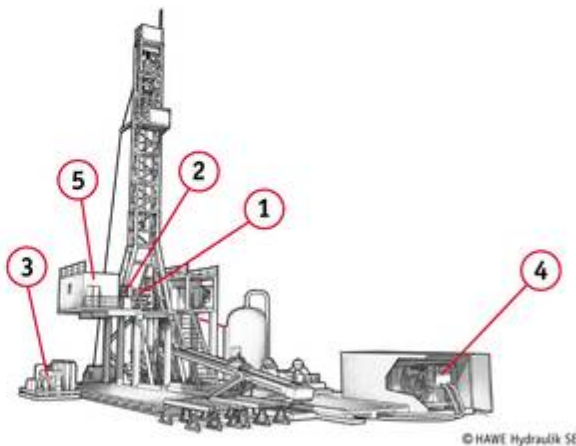
- ▶ Oil Rigs
- ▶ Road Headers

### Oil Rigs - When Safety and Reliability Cannot Be Compromised

Whether it is a mobile truck mounted rig, a permanent land-based rig, or an offshore platform, there is no room for compromise when it comes to the safety and reliability of the equipment used under extreme conditions. HAWE Hydraulics is able to provide uncompromising safety and reliability by using steel for all pressurized components.

- ▶ 1 Hydraulic control valve: PSL
- ▶ 2 Proportional pressure reducing valves: PDM
- ▶ 3 Pressure limiting valves: MV
- ▶ 4 Hydraulic pump: V30E
- ▶ 5 Electronic control: PLVC

📄 Oil rigs brochure



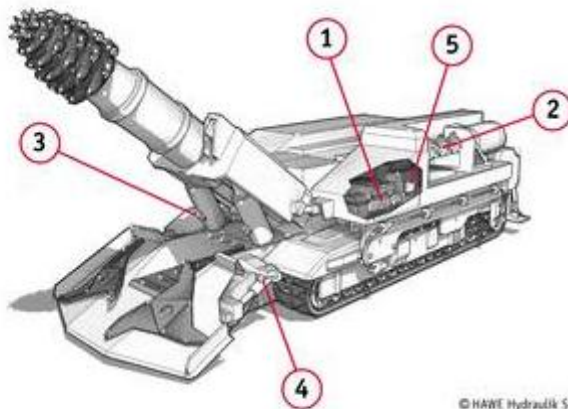
© HAWE Hydraulik SE

### Road Headers - Custom-Made Systems for Every Operation

When you are faced with the ultimate limits set by the machine-rock interaction your machinery should operate reliably and safely. A responsive and yet sturdy hydraulic control increases cutting efficiency, protects the environment and improves operators safety.

- ▶ 1 Hydraulic control valve: PSL
- ▶ 2 Hydraulic pump: V30E
- ▶ 3 Over-center valve: LHT
- ▶ 4 Safety valve: RH
- ▶ 5 Electronic control: PLVC

📄 Road headers brochure



© HAWE Hydraulik SE

## Product Search by Category

HAWE Hydraulik delivers compact ideas to industry and offers solutions for the hydraulic tasks in the mobile world. Find out more about our extensive product portfolio: arranged modular construction kit we use it to build your sophisticated hydraulic system!



### Pumps

Whether they come as compact power packs, radial piston or axial piston pumps, the compact and sturdy design of our hydraulic pumps excels even in demanding applications of up to 700 bar.

► Our pump portfolio



### Valves

Our valve portfolio comprises directional spool valves, directional seated valves, pressure control valves, metering valves and check valves - either as individual components or combined together in valve banks.

► Our valve portfolio



### Electronics

Fine-tuned to the HAWE components are the electronic add-on elements. The programmable valve controls actuate complex hydraulic systems.

► Our electronics program



### Accessories & Clamps

Fittings, pressure switch devices, accumulators, clamps and many more items besides, round out your hydraulic system.

► Accessories & clamps in detail



### SYSTEC - One-Stop-Shop Turnkey Hydraulic Solutions

From the consultation, the design right through to the turnkey installation HAWE offers you a complete one-stop solution, well beyond its modular system.

► SYSTEC in detail





# INDUSTRIAL VALVES

Experience and Quality since 1889



# ▶ Company Information

▶ **Over 120 years of experience**  
 120 years as a strong and reliable partner for our customers.  
 120 years of expertise.  
 120 years of constant research and development.

▶ **PRUSS ARMATUREN AG**  
 With more than 10.000 successfully completed projects for various customers in all kind of industries, we know exactly how to fulfill our customer demands.

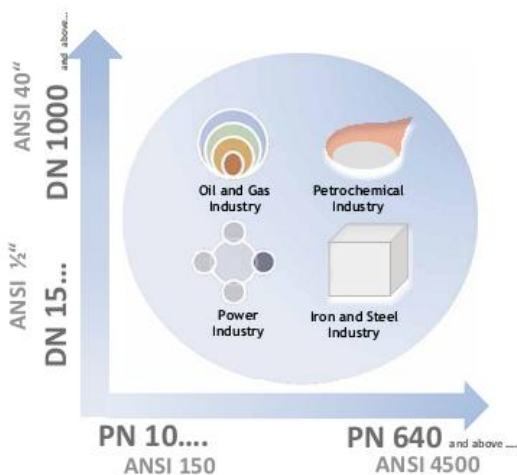
▶ **Our Solutions**  
 We provide custom made solutions for every request. If you are looking for individual solutions, Pruss is the partner you are asking for!



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# ▶ Portfolio

▶ **Wide Range of Possibilities**







▶ **Example**  
 3D-CAD: PRUSS  
 Valve DN 250 PN 40



**pruss**

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# ▶ Product and Market Segments

Target Group	 Power Industry	 Oil and Gas Industry	 Iron and Steel Industry	 Petrochemical Industry
Application	Gas turbine Fuel Control Feed-water preparation Steam turbine Condenser Piping	Gas compressor Cavems Gas separation plant	Blast furnace Contineous casting	Crack application Chemical plant
Products	Oil and Gas control valves Feed-water control valves Steam reducing valves Turbine bypass station Water injection valves Condensate control valves	Anti Surge Valves for Air Oxygen and Nitrogen In- and outsourcing valves	Valves for Oxygen, Nitrogen and Argon Cooling valve	Valves for Chemical Applications

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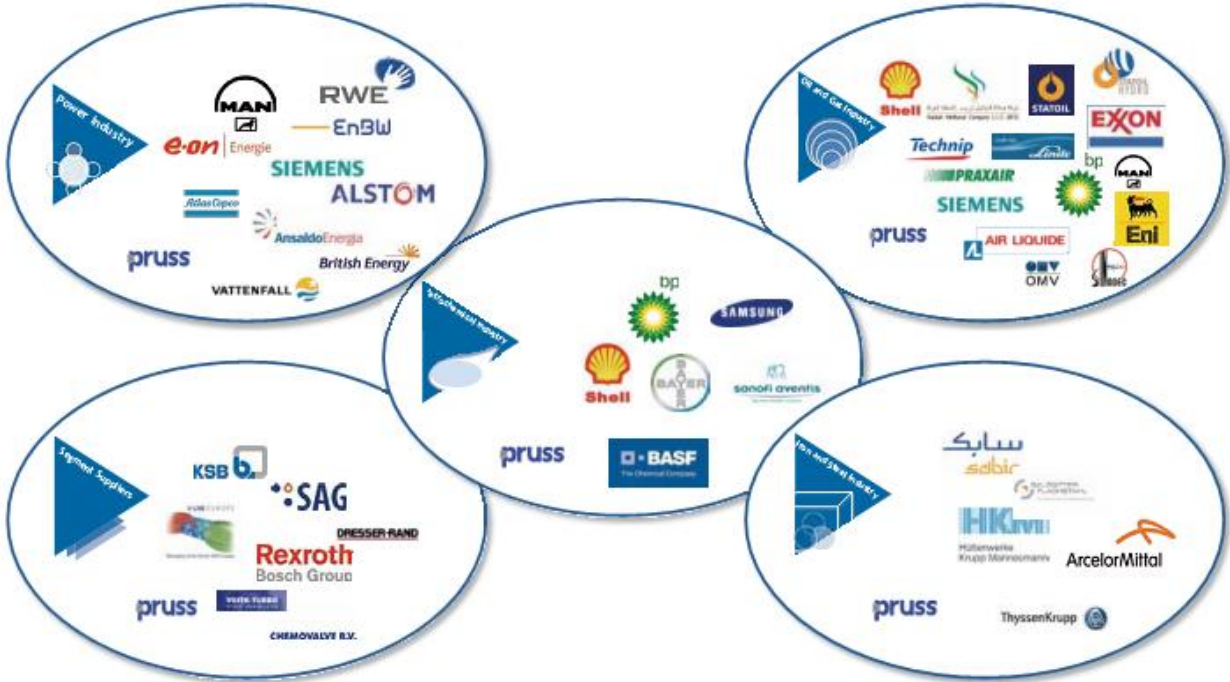
# ▶ Productoverview



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# ▶ References

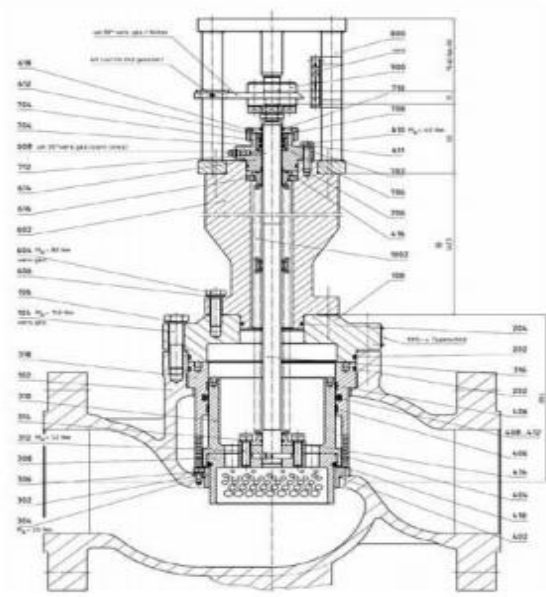


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# ▶ Gas pressure regulator and pipeline valve



Application:	Gas transfer stations Gas distribution stations
Product:	Gas pressure regulator in front of gas turbines Gas pressure regulator of gas networks
Model:	Straight-through type
Housing material:	Cast steel
Pipe joint:	Flanges
Valve cone type:	Multi-level thro ttle system, with perforated basket and perforated cone
Valve seat seal:	With soft packing
Spindle seal:	Soft material packing
Drive type:	Hydraulic actuator drive
Control function and /or safety function:	Gas pressure regulator in front of gas turbines Gas pressure regulator of gas networks

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# ▶ Actuators

- ▶ Pneumatic
- ▶ Hydraulic
- ▶ Electric



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## ► Hydraulic piston actuator type PHA

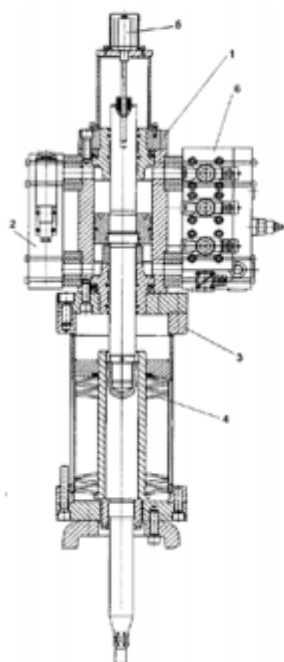


Actuator type		Hydraulic Piston actuator PN 40				
Safety function by loss of hydr. pressure	open	Typ	Spec.	PHA 110	PHA 125	
	close	Typ	PHA 100	Spec.	Spec.	
Piston diameter	mm	100	110	125	125	
Shaft diameter	mm	40	50	50	50	
Stroke	mm	10	50	30	50	
Max. Oil pressure	bar	40	40	40	40	
Act. forces	Spring	kN	6,8...9,6	15,5...26	15...19,3	18...38,3
	Hydraulic	kN	24,6...21,8	16,2...3,8	25...20,5	22...11,6
Material	Body	•	Carbonsteel			
	Piston	•	Carbonsteel with Pistonring from PTFE / NBR			
Shaftsealing	•	Pistonring from PTFE / NBR				
Optional	•	With SOV for open / close applications				
	•	With position control valve for control valves				
	•	Limitswitches ; feedback; manual override by handpump				

**pruss**

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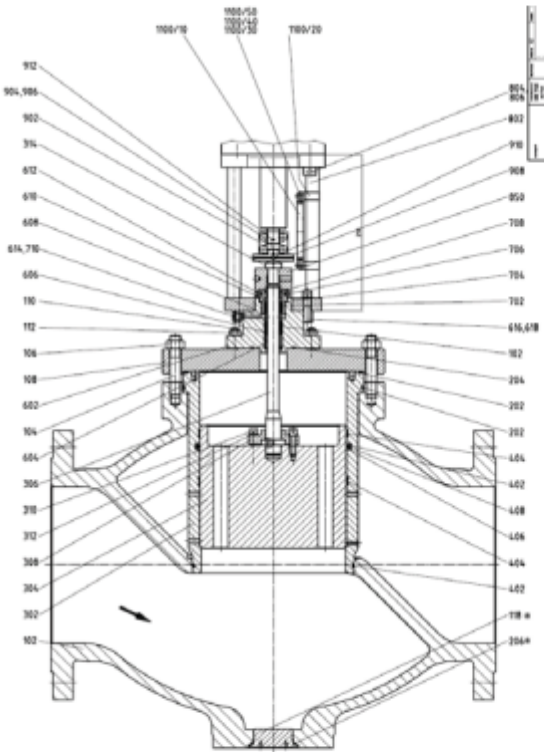
## ► Hydraulic piston actuator type GZ



Actuator type		Hydraulic Piston actuator PN 250										
Safety position by loss of hydr. pressure	Open or Close	Typ	GZ 63	GZ 80	GZ 110	GZ 125	GZ 140	GZ 160	GZ 180	GZ 200	GZ 220	GZ 260
Piston diameter	mm	63	80	110	125	140	160	180	200	220	260	
Shaft diameter	mm	28	30 / 40	40	56	56	60	80	80	90	100	
Stroke	mm	65	100 / 200	100	125	150	150	200	200	200	200	
Max. supply pressure	bar	250	250	250	250	250	250	250	250	250	250	
Spring range		Project related										
Material	Body	•	Carbonsteel									
	Kolben	•	Carbonsteel with pistonring from PTFE / NBR alternative Viton									
	Control block	•	High strength Aluminium									
Shaftsealing	•	Pistonring from aus PTFE / NBR alternative Viton										
Optional	•	SOV / (multiple) Cartridge valves for extreme high speeds										
	•	Position control valve with shaft integrated feedback sensor										
	•	Triple safety device acc. . EU-directive 97/23/EG in connection with Steamtest device. ( former TRD 421)										
	•	Limitswitches, manual override by handpump										



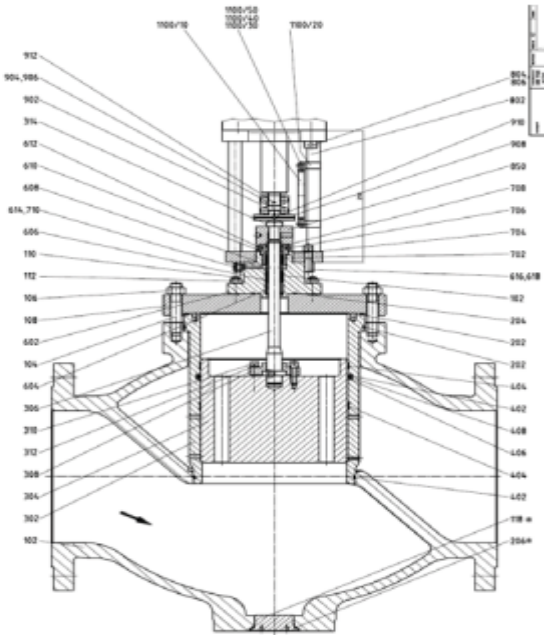
# ▶ Valve for oxygen, nitrogen



Application:	Gas decomposition systems Gas preparation systems
Product:	Valve for oxygen decomposition Valve for nitrogen decomposition
Model:	Straight-through type
Housing material:	Bronze (copper-tin alloy)
Pipe joint:	Flanges
Valve cone type:	Perforated cage
Valve seat seal:	Metallic
Spindle seal:	Gland with V-packings
Drive type:	Pneumatic actuator drive
Control function and /or safety function:	Valve for oxygen decomposition Valve for nitrogen decomposition

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# ▶ Valve for oxygen, nitrogen



Application:	Gas decomposition systems Gas preparation systems
Product:	Valve for oxygen decomposition Valve for nitrogen decomposition
Model:	Straight-through type
Housing material:	Bronze (copper-tin alloy)
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Control function and /or safety function:	Valve for oxygen decomposition Valve for nitrogen decomposition

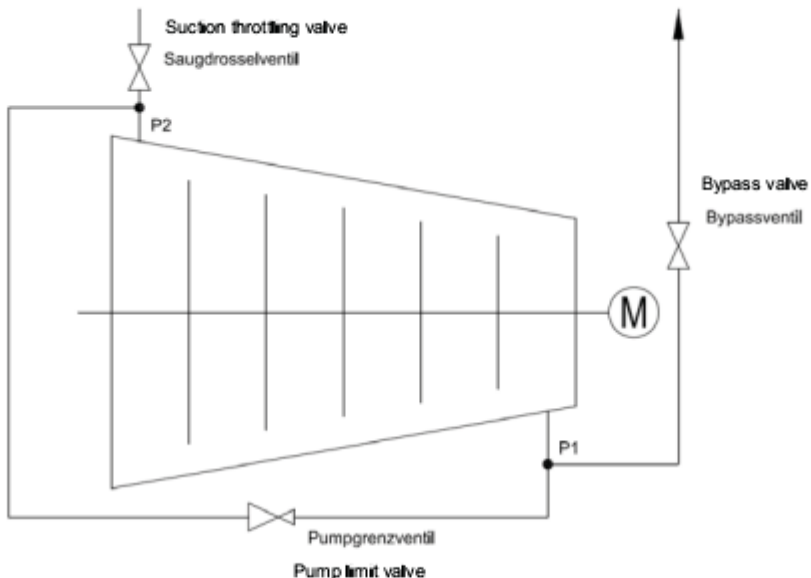
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# ▶ Products for the oil and gas industry



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# ▶ System layout: Oil and gas compressor



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## Test Cell - Engineering

- State of the Art Computer System
- Full Analog to Digital Parameter Conversion
- Multiple Engine Type Test Programming

### Engine Performance Analysis & Diagnostics:

- Engine Vibration Analysis
- Engine Test Reporting
- Research & Development Testing
- Test Cell Correlation Service



## Test Cell

### Capabilities:

- Thrust rating: 100,000 lbs.
- Size: 10 meter
- Adaptable to Aviation Turbine Engines (100K Thrust lbs. Output Power)
- Adaptable to Land Based Turbine Engines





# Teardown Capabilities

OEM	Engine Model	Capabilities		
		Tear Down	Overhaul	Ops Spec
 Pratt & Whitney A United Technologies Company	JT8D-STD	Full	Full	Yes
	JT8D-200	Full	Full	Yes
 cfm	CFM56-2	Full	No Plan	Yes
	CFM56-3	Full	No Plan	Yes
	CFM56-5	Full	No Plan	Yes
	CFM56-7	Full	No Plan	Yes
 GE	CF6-50	Full	No Plan	Yes
	CF6-80C2	In Progress	No Plan	Yes
	LM2500	Full	Full	Yes
 International Aero Engines	V2500	In Progress	No Plan	Yes
 Pratt & Whitney A United Technologies Company	PW 2000	In Progress	In Progress	In progress
	PW 4000	In Progress	No Plan	In Progress



## Honeycomb Seals

### HONEYCOMB INSTALLATION:

- Braze Application both tape and powder
- Hi-temp inert atmosphere brazing capability up to 60' diameter



### FINAL MACHINING:

- CNC Electrical Discharge Machining
- Electrochemical Machining

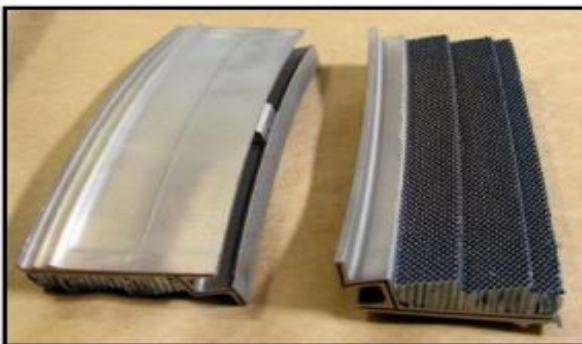


## Honeycomb Seals

- Main capability
- In-house H/C manufacture



CF6-80A No.4 Brg Vent Seal



CFM56-5C LPT Outer Stationary Airseal, Stg 2

## Current Repair Capabilities by Engine

<u><b>G.E.</b></u>	<u><b>P&amp;W</b></u>	<u><b>CFMI</b></u>	<u><b>RR</b></u>
CF6-6	JT8D (ALL)	CFM56-2 (ALL)	RB211-22B
CF6-50	JT9D (ALL)	CFM56-3 (ALL)	RB211-524 (ALL)
CF6-80A	PW2000	CFM56-5 (ALL)	RB211-535 (ALL)
CF6-80C2	PW4000	CFM56-7	
CF6-80E			
CF34			
LM2500	<u><b>IAE</b></u>	<u><b>MILITARY</b></u>	<u><b>SOLAR TURBINES</b></u>
LM5000	V2500 (A1)	F101	MARS
LM6000	V2500 (A5)	F108	MERCURY
TF39	V2500 (D5)	F110	TAURUS
F101		TF34/39	TITAN
F108		AMRAAM MISSILE	
F110			

## Teardown Advantages

- Parts within capabilities can be routed in-house for overhaul providing savings in shipping.
- Parts identified for repair other than can be drop shipped directly within the Chromalloy network.
- As an option, perform clean and inspection on material identified and tag serviceable if it meets manual requirements
- Parts identified for scrap can be disposed of at location



**Providing customers with choice: both an engine overhaul shop and a repair station**



## HIGH QUALITY PARTS

**E**TS has a comprehensive Quality Assurance program that produces defect-free parts. We use ISO 9000 methods to integrate an extensive array of turbine OEM like quality specifications and procedures. We apply the high quality demands of FAA certified aviation jet engines and methods required by NASA for spacecraft. Running through these methods, ETS also applies its rigorous Zero-Tolerance Quality Assurance oversight.



## SERVICE PROVEN

**F**or many years, ETS has produced and installed turbine replacement parts for turbines throughout the world. During the design phase, our structural and thermal analysis tools provide substantiation for the design of performance upgrades. After the parts go into service, ETS Power Group methodically monitors the performance and durability trends in real world environments. These sophisticated reliability methods validate our advanced development process. Service proven parts assure that our customer's parts will provide many years of satisfactory service.



## LTSA's

**T**o allow our customers to effectively manage their risks, ETS Power Group provides comprehensive gas turbine Long Term Service Agreements. These LTSA's provide the full array of on-site turbine inspection services and component repairs. ETS Power Group also provides all of the parts needed for turbine overhauls. We offer combustion components, turbine buckets and nozzles in addition to consumable spares.





**E**TS Power Group is the foremost provider of New Alternative Source Parts for industrial gas turbines. Our turbine parts are the cost-effective solution for combustion turbine owners and operators throughout the world. We are dedicated to producing only the highest quality turbine parts for increased efficiency and maximum durability.

Our mandate is simple: Provide the power generation industry with superior quality, service proven turbine parts. Our commitment to evolutionary turbine design principles enables our team to incorporate thoughtful innovation with time-tested gas turbine technologies. ETS Power Group empowers customers with the best technical turbine design know-how, service and support in the industry. With flawless fleet logistics and risk management tools, our wide range of design and engineering services have a simple aim: minimize your costs and maximize your output.

## IMPROVED DURABILITY

**E**TS Power Group's turbine parts are optimized for durability and ease of repair. Each component that we develop takes full advantage of our decades of turbine design expertise, many years of operational experience and all the lessons we have learned from repairing turbine parts. By listening to our clients and solving their unique problems, ETS Power Group has amassed a wealth of valuable technical expertise that can solve a broad range of turbine problems. Our products incorporate the latest in aero-thermal designs, upgraded materials and protective coatings. World-class engineering combined with our deep understanding of field problems, merge to provide turbine parts that are second to none.

## ENGINES WE SUPPORT

- Westinghouse™ 251B-11, B-12
- Westinghouse™ 501D, 701D
- General Electric™ Frame 6™, Frame 7™, Frame 9™
- ABB GT13E2
- Siemens™ V94, V84, V64

















# CABLES & WIRES



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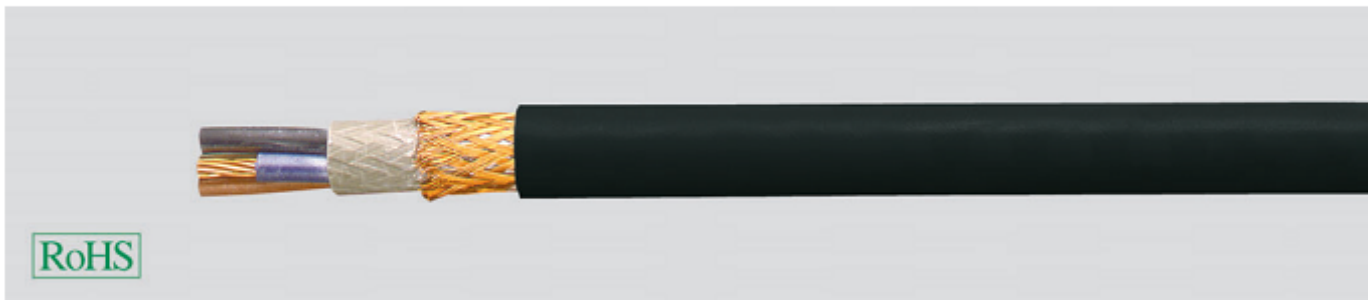
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# Ships Power Cables MGSGO halogen-free, copper screened



## Technical data

- According to VG 95218 part 60, screened. The core insulation continues to function during a fire without the need for extra flame-proof taping
- **Conductor operating temperature** max. +85 °C
- **Nominal voltage**  $U_0/U$  0,6/1 kV
- **Minimum bending radius** approx. 5x cable  $\varnothing$

## Cable structure

- Stranded copper conductors
- Heat-resistant EPR-insulation 3GI3, to DIN VDE 0207 part 20
- Cores stranded in layers with optimal lay-length
- Filling compound covering all cores
- Foil screen
- Plain copper braided screen
- Polyester tape
- Chloroprene based outer sheath 5GM3, to DIN VDE 0207 part 21
- Jacket colour black

## Properties

- halogen-free and flame retardant
- **Colour code**
  - 1 core: black
  - 2 cores: brown/blue
  - 3 cores: brown/black/grey
  - 4 cores: blue/brown/black/grey
- **Approved by** BwB (Bundesamt für Wehrtechnik und Beschaffung), i.e. German Federal Office for Defence and Procurement

## Note

- AWG sizes are approximate equivalent values. The actual cross-section is in mm<sup>2</sup>.

## Application

Halogen-free power cables for marine craft are used for permanent installation on ships in all rooms and open decks as control and power cables.

Part no.	No.cores x cross-sec. mm <sup>2</sup>	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
59270	1 x 4	7,5	81,0	170,0	12
59271	1 x 6	8,4	104,0	200,0	10
59272	1 x 10	9,5	149,0	260,0	8
59273	1 x 16	10,0	214,0	340,0	6
59274	1 x 25	12,0	311,0	480,0	4
59275	1 x 35	13,0	416,0	590,0	2
59276	1 x 50	15,0	572,0	760,0	1
59277	1 x 70	17,0	779,0	980,0	2/0
59278	1 x 95	19,5	1054,0	1300,0	3/0
59279	1 x 120	21,0	1316,0	1550,0	4/0
59280	1 x 150	23,0	1615,0	1850,0	300 komil
59281	1 x 185	25,5	1968,0	2300,0	350 komil
59282	1 x 240	29,0	2506,0	2950,0	500 komil
59283	1 x 300	31,5	3345,0	3600,0	600 komil
59284	2 x 1,5	11,5	105,0	340,0	16
59285	2 x 2,5	12,4	132,0	400,0	14
59286	2 x 4	13,4	170,0	460,0	12
59287	2 x 6	14,7	217,0	570,0	10
59288	2 x 10	16,2	307,0	720,0	8
59289	2 x 16	19,0	471,0	940,0	6
59290	2 x 25	22,5	670,0	1300,0	4

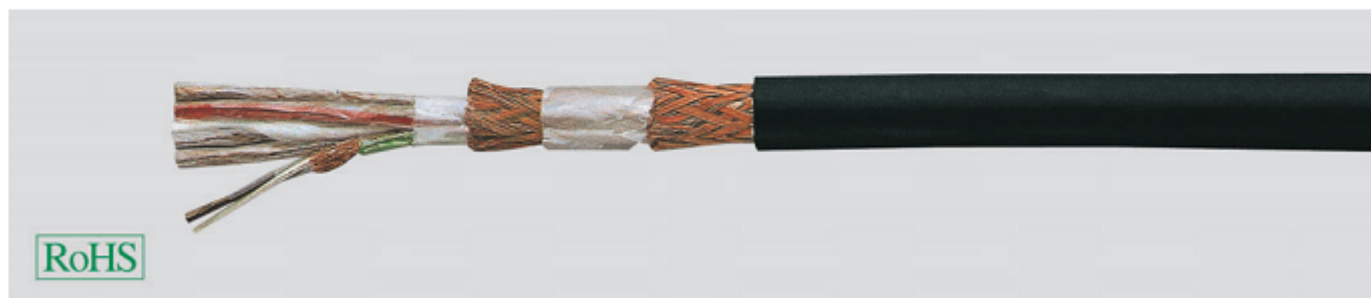
Part no.	No.cores x cross-sec. mm <sup>2</sup>	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
59291	3 x 1,5	12,0	125,0	380,0	16
59292	3 x 2,5	13,0	161,0	440,0	14
59293	3 x 4	14,0	215,0	520,0	12
59294	3 x 6	15,5	282,0	640,0	10
59295	3 x 10	17,6	417,0	840,0	8
59296	3 x 16	20,0	636,0	1110,0	6
59297	3 x 25	24,0	924,0	1610,0	4
59298	3 x 35	26,0	1233,0	2020,0	2
59299	3 x 50	30,0	1703,0	2610,0	1
59300	3 x 70	34,5	2413,0	3450,0	2/0
59301	3 x 95	39,7	3191,0	4710,0	3/0
59302	3 x 120	45,0	3975,0	5680,0	4/0
59303	4 x 4	15,2	284,0	620,0	12
59304	4 x 6	17,0	371,0	750,0	10
59305	4 x 10	19,4	545,0	1010,0	8
59306	4 x 16	22,0	796,0	1400,0	6
59307	4 x 25	26,4	1170,0	2000,0	4
59308	4 x 35	29,2	1578,0	2530,0	2
59309	4 x 50	33,5	2278,0	3280,0	1
59310	4 x 70	38,2	3090,0	4450,0	2/0
59311	4 x 95	44,2	4110,0	5930,0	3/0

Dimensions and specifications may be changed without prior notice. (RVO1)



# Light Marine Telecommunication Cables

## LFMSGSSGO halogen-free, 2x Cu-screened



### Technical data

- According to VG 95218 part 66, 2x copper screening with improved cross-talk protection.  
No loss of insulation if directly exposed to open flame.  
No special flame proof layer necessary
- **Conductor operating temperature**  
max. +85 °C
- **Min. installation temperature**  
-10 °C
- **Nominal voltage** 250 V
- **Minimum bending radius**  
approx. 6x cable ø

### Cable structure

- Stranded (7) tinned copper conductor
- Cross-linked polyolefin-insulation
- Core stranded to pairs with optimal lay-length
- Tinned copper, braided screening over each pair
- Polyester foil separator
- Overall polyester taped inner covering
- Tinned copper, braided overall screen
- Halogen-free insulating layer
- Overall tinned copper, braided screen
- Polyester foil separator
- Elastomere based outer sheath
- Sheath colour black

### Properties

- Oil resistant and flame retardant
- **Colour code**  
All sizes and dimensions are colour coded
- **Approved by**  
BWB (Bundesamt für Wehrtechnik und Beschaffung), i.e. German Federal Office for Defence and Procurement

### Application

For fixed installation on marine craft: above and below decks.

Part no.	No. pairs x cross-sec. mm <sup>2</sup>	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km
59396	5 x 3 x 0,4	16,0	248,0	420,0

Part no.	No. pairs x cross-sec. mm <sup>2</sup>	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km
59397	12 x 3 x 0,4	23,0	500,0	740,0

Dimensions and specifications may be changed without prior notice. (RW01)

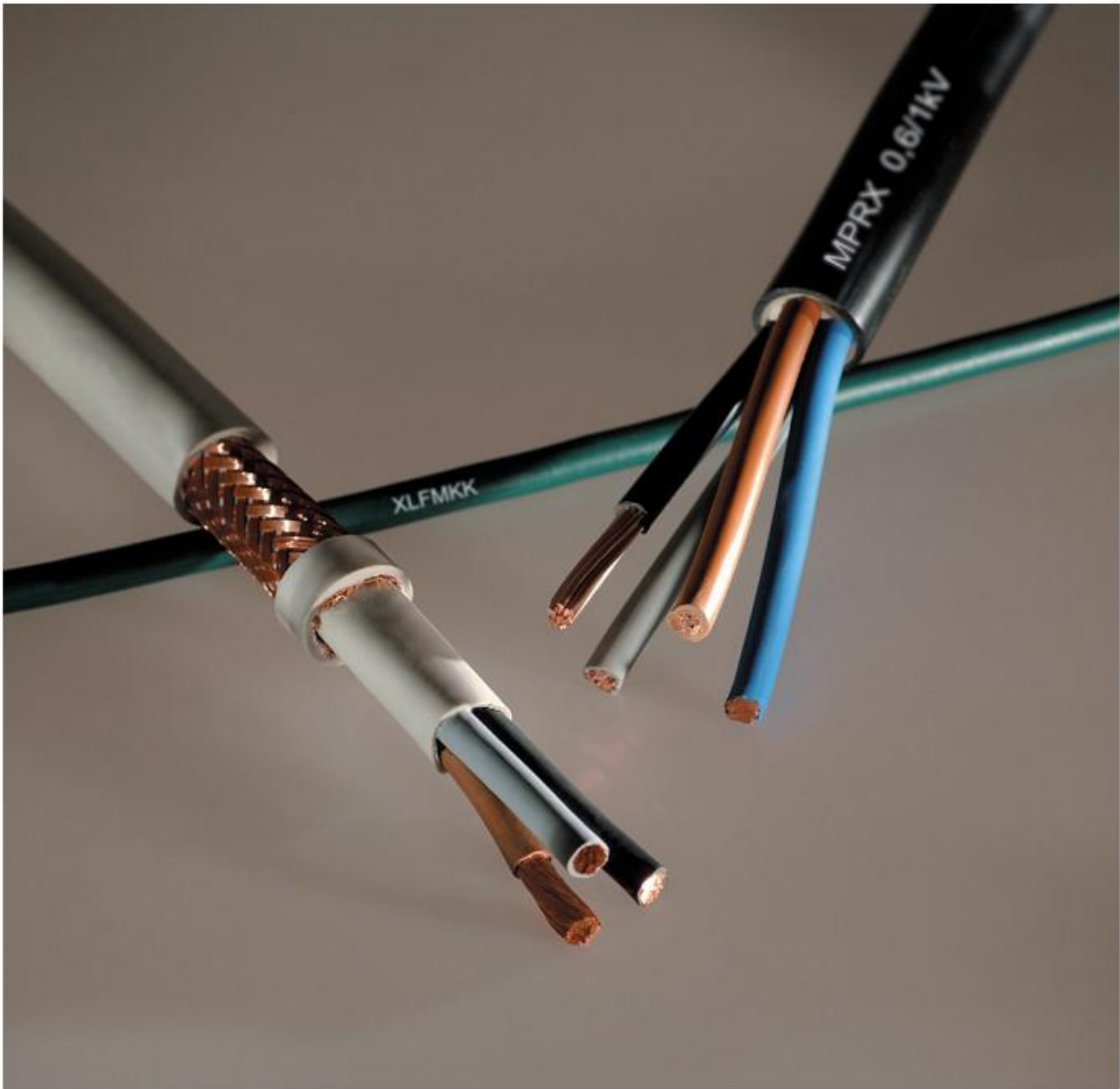


Photo: HELUKABEL®

# Shipwiring and Marine Cables

**Terminal markers Maxicard MC SB | MC BSTR | MC MM**

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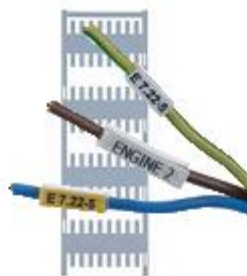
**Wire and terminal markers Maxicard MC KMC**

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**Wire and cable markers Maxicard MC ESS and MC GS**

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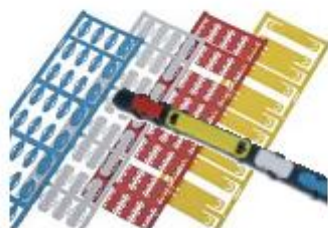
**Cable and wire markers, cable marker sleeves**

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**Wire and cable markers Maxicard MC KMC**

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**Wire and cable markers Cable ties KB | Markers KKM | Marker sleeves KBH-S**

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**Printing systems and software Thermal-transfer printer TTP**

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**Screwdrivers**

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**Crimping tools**

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**DIN rail cutters and stamping tools**

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**Wire-end ferrules | Insulated connectors | crimp cable lugs | Joint connectors**

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**Polycarbonate housing CM | ABS housing CT**

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**Aluminium housing CA**

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**Cable gland systems**

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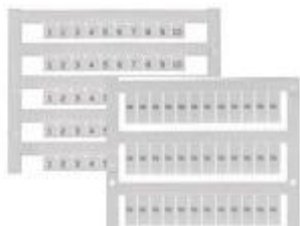


**CONTA-CLIP**

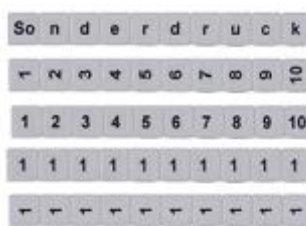
*Product overview*

**MARKING SYSTEMS  
CONTA-LABEL**

**Terminal marker Pocket-Maxicard PMC SB/BSTR**  
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**Terminal markers Quick marking system SB**  
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**Terminal markers Quick marking system AS 3/10**  
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**Wire and cable markers – stainless steel marking system MPS**  
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**Cable and wire markers Adhesive cable labels KKE**  
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**Device and installation markers Maxicard MC GS | MC GST | MC GSU**  
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**Device and installation markers Adhesive device labels GKE**  
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**TOOL SYSTEMS  
CONTA-TOOL**

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**Cable cutter**  
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**Stripping tools**  
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**HOUSING SYSTEMS  
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**Polycarbonate housing CK-PC**  
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**Polyester housing CP**  
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**Terminal blocks for temperature measuring circuits TSK**  
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**Terminal blocks with spade connection FF/SF**  
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**Screw-distributor blocks SVB**  
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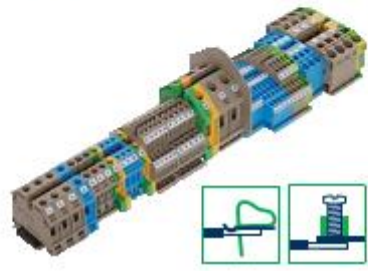
**Pressure-spring junction terminals D**  
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**Shield-connection clip SAB | SSAB**  
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**EX terminal blocks ATEX**  
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**Marker holders for terminal blocks and end stops**  
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**Cross-connections (Potential distribution)**  
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**Covers**  
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**Specific accessories**  
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**CE electrical cabinet socket outlet**  
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**CONTA-CLIP**

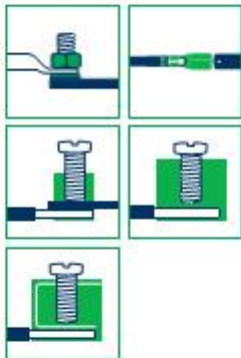
*Product overview*

**SPECIAL TERMINALS**

**Stud connection system HSK**  
Page 186

**Transformer terminals TKS|TK**  
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**Cuttable terminal rails EKB**  
Page 224

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**Shield-connection clip SAB | SSAB**  
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**GENERAL ACCESSORIES CONTA-CONNECT**

**DIN rails TS**  
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**Test adapters**  
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**Fuse holders**  
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## CONTA-CONNECT

### Feed-through terminals SRK | Protective earth terminals SSL

#### Screw connection system



- Foot can be snapped on TS 35 DIN rail
- Housing made from polyamide 6.6 UL 94-V0

#### Connection diagram

SRK 2.5/2A	SRK 2.5/2A SAS	SSL 2.5/2A
M 2.5	M 2.5	M 2.5
Feed-through terminal 2 connections	Feed-through terminal, 2 connections with screen connection rail	Protective earth terminal 2 connections

#### Connection type

Size (L x W x H), mm with TS 35 x 7.5 mm

#### Type

Type colour

Cat. no.

Type colour

Cat. no.

Type colour

Cat. no.

Type colour

Cat. no.

Colours available

#### Ratings

Rated voltage, V

Rated current, A | Max. current capacity, A

Rated wire cross-section, mm<sup>2</sup> | AWG

Rated impulse voltage, kV | Contamination degree

Plug gauge acc. to EN 60 947-1 | Flamm. class acc. to UL 94

#### Connection data

Single wire (solid) | stranded (stranded) mm<sup>2</sup>

F. stranded | f. stranded (w/ferules acc. to DIN 46 228/1) mm<sup>2</sup>

Contact wire range, mm<sup>2</sup>

Stripping length, mm

Torque, Nm | Screw

Special connection, mm

#### Features

Material of insulated housing | Temperature range

Number of cross-connection channels | Test pick-off

#### Accessories

End plate AP

Cat. no.

Partition plate TW

Cat. no.

Insulating cap SQIK for cross-connector

Cat. no.

Insulated cross-connection SQI

Cat. no.

Insulated cross-connection SQI

Cat. no.

Insulated cross-connection SQI

Cat. no.

Insulated cross-connection SQI

Cat. no.

Insulated cross-connection SQI

Cat. no.

Insulated cross-connection SQI

Cat. no.

Insulated cross-connection SQI

Cat. no.

Insulated cross-connection SQI

Cat. no.

End stop ES

Cat. no.

Screwdriver SDB

Cat. no.

Quick marking PMC SB

Cat. no.

#### Screw connection

48 x 5 x 47

Qty.

SRK 2.5/2A BG

17100.2 100

SRK 2.5/2A BU

17100.5 100

Colours available

IEC<sup>+</sup> CSAUs<sup>+</sup> CSA<sup>+</sup>

1000 600 600

24 | 32 20 20

2.5 | 22-12

8 | 3

A3 | V0

0.2-4 | -

0.2-4 | 0.2-2.5

0.2-4

10

0.4-0.8 | Slotted M 2.5

PA 6.6 | -40 to +120°C

2 | 1

Page Qty.

AP 2.5-10 BG

2001.2 278 50

TW 2.5-10 BG

2002.2 316 50

SQIK 2.5-10 YE

17200.8 285 20

SQI 2.5/2 YE

17201.8 284 50

SQI 2.5/3 YE

17202.8 284 50

SQI 2.5/4 YE

17203.8 284 20

SQI 2.5/5 YE

17204.8 284 20

SQI 2.5/6 YE

17205.8 284 20

SQI 2.5/7 YE

17206.8 284 20

SQI 2.5/8 YE

17207.8 284 10

SQI 2.5/9 YE

17208.8 284 10

SQI 2.5/10 YE

17209.8 284 10

SQI 2.5/30 YE

17210.8 284 5

ES 35/K/ST BG

2828.0 274 50

SDB 0.5x3,0

1085.0 422 1

PMC SB 5/50 WH

4600.7 339 500

#### Screw connection

62.5 x 5 x 47

Qty.

SRK 2.5/2A SAS BG

17119.2 80

SRK 2.5/2A SAS BU

17119.5 80

Colours available

IEC<sup>+</sup>

400

24 | 32

2.5 | 22-12

8 | 3

A3 | V0

0.2-4 | -

0.2-4 | 0.2-2.5

0.2-4

10

0.4-0.8 | Slotted M 2.5

Fast-on 2.8

PA 6.6 | -40 to +120°C

2 | 1

Page Qty.

AP 2.5-10 BG

2001.2 278 50

TW 2.5-10 BG

2002.2 316 50

SQIK 2.5-10 YE

17200.8 285 20

SQI 2.5/2 YE

17201.8 284 50

SQI 2.5/3 YE

17202.8 284 50

SQI 2.5/4 YE

17203.8 284 20

SQI 2.5/5 YE

17204.8 284 20

SQI 2.5/6 YE

17205.8 284 20

SQI 2.5/7 YE

17206.8 284 20

SQI 2.5/8 YE

17207.8 284 10

SQI 2.5/9 YE

17208.8 284 10

SQI 2.5/10 YE

17209.8 284 10

SQI 2.5/30 YE

17210.8 284 5

ES 35/K/ST BG

2828.0 274 50

SDB 0.5x3,0

1085.0 422 1

PMC SB 5/50 WH

4600.7 339 500

#### Screw connection

48 x 5 x 47

Qty.

SSL 2.5/2A GNYE

17103.2 100

Colours available

IEC<sup>+</sup> CSAUs<sup>+</sup> CSA<sup>+</sup>

2.5 | 22-12

8 | 3

A3 | V0

0.2-4 | -

0.2-4 | 0.2-2.5

0.2-4

10

0.4-0.8 | Slotted M 2.5

PA 6.6 | -40 to +120°C

1 | 1

Page Qty.

AP 2.5-10 BG

2001.2 278 50

TW 2.5-10 BG

2002.2 316 50

SQIK 2.5-10 YE

17200.8 285 20

SQI 2.5/2 YE

17201.8 284 50

SQI 2.5/3 YE

17202.8 284 50

SQI 2.5/4 YE

17203.8 284 20

SQI 2.5/5 YE

17204.8 284 20

SQI 2.5/6 YE

17205.8 284 20

SQI 2.5/7 YE

17206.8 284 20

SQI 2.5/8 YE

17207.8 284 10

SQI 2.5/9 YE

17208.8 284 10

SQI 2.5/10 YE

17209.8 284 10

SQI 2.5/30 YE

17210.8 284 5

ES 35/K/ST BG

2828.0 274 50

SDB 0.5x3,0

1085.0 422 1

PMC SB 5/50 WH

4600.7 339 500



**Efficient Home**

Improve home comfort, reduce energy bills, be eco-responsible

- Home solutions



**Efficient Enterprise**

Drive enterprise-wide financial performance while conserving resources

- Oil & Gas
- Electric Utilities
- Water
- Mining, Minerals, Metals
- Food & Beverage
- Machines
- Cloud and Service Providers
- Enterprise Data Centre
- Finance
- Healthcare
- Life Sciences
- Hotels
- Transportation
- Marine and Shore connection



**Smart Grid**

Drive network stability, integrate renewables, manage the grid efficiently

- Smart Generation
- Flexible Distribution
- Efficient Enterprise
- Efficient Home
- Demand Response



**Smart Cities**

Make cities smarter: more efficient, liveable, and sustainable

- Smart Cities solutions
- Smart Energy
- Smart Mobility
- Smart Water
- Smart Buildings & Homes
- Smart Public Services
- Smart Integration



**Access to energy**

Provides access to reliable, affordable, and clean energy to people at the base of the pyramid with Bibop programme

- Access to Energy solutions

**Products**



**Access to Energy Collective Solutions**



**Access to Energy Home Systems**



**Audio-Video Solutions**



**Boxes, Cabling & Interfaces**



**Building Management System**



**Busway & Cable Management**



**Contactors & Protection Relays**



**Cooling Solutions**



**Cybersecurity Solutions**



**Data Centers and Server Rooms and Network Closets**



**Din rail modular devices**



**Emergency Lighting**



**Energy and power digitization**



**Energy Management Services**



**EVlink charging solutions for electric vehicles**



**Feeder Automation**



**Fuse Switches**



**HMI (terminals and industrial PC)**



**Home Control**



**IED User Software**



**Industrial & Specialized UPS and Power Conversion**



**Industrial communication**



**Industrial plugs and sockets**



**Installation material**



**IT Services**



**Motion & Drives**



**Motor Starters**



**MV Circuit Breakers & MV Contactors**



**MV Disconnectors, Switches, Switch-Disconnections, Reclosers**



**MV Instrument Transformer**



**MV Switchgear**



**MV Transformers**



**MV/LV Prefabricated Substations**



**Network Connectivity**



**Network Management Software**



**PAC, PLC & other Controllers**



**Panelboards & Switchboards**



**Power & Energy Monitoring System**



**Power Circuit breakers & Switches**



**Power connection and distribution**



**Power Quality**



**Power supplies & transformers**



**Prosumer Microgrid**



**Protection Relays by Application**



**Protection Relays by Range**



**Pushbuttons, Switches, Pilot Lights, Control stations & Joysticks**



**Security and Environmental**



**Sensors & RFID system**





Power Quality



Power supplies & transformers



Prosumer Microgrid



Protection Relays by Application



Protection Relays by Range



Pushbuttons, Switches, Pilot Lights, Control stations & Joysticks



Security and Environmental



Sensors & RFID system



Signaling Units



Software



Solar for Ground Mounted Plants



Solar for Industrial & Commercial Rooftops



Solar for Residential



Solar Off-Grid and Back-up



StruxureWare for Data Centers



Substation Automation Systems



Surge Protection and Power Conditioning



Switches, Sockets & Boxes



Systems and architectures



Telemetry & Remote SCADA Systems



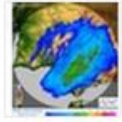
Telemetry System



Uninterruptible Power Supply (UPS)



Universal Enclosures



Weather Observation Hardware

## Screw connection system SRK | SSL

### An overview of the advantages

#### Compact with identical shapes

The external size and shape are identical for the **SRK** feed-through terminal and the **SSL** PE terminal in the cross-sections 2.5 mm<sup>2</sup>, 4 mm<sup>2</sup>, 6 mm<sup>2</sup> and 10 mm<sup>2</sup>. Identical end plates and partition plates can thus be used. The width (pitch) of the terminal blocks is 2.5 mm<sup>2</sup> (5 mm), 4 mm<sup>2</sup> (6 mm), 6 mm<sup>2</sup> (8 mm) and 10 mm<sup>2</sup> (10 mm). Despite their small size, the **SRK** feed-through terminals and the **SSL** PE terminals have a rated voltage range of up to 1000 V.



#### Large wire-entry bay and connection space

The wire-entry bay is very spacious – this permits quick wiring of solid or finely stranded wires, with or without wire-end ferrules. The rated cross-sections specified in our documentation correspond to a connection with stranded wires using wire-end ferrules. It is also possible to use solid wires up to the next larger cross-section size.



#### Security and stability

The insulated terminal housing with its special foot shape guarantees a convenient snap-on to the rail and a secure mount (on TS 35x7.5 and TS 35x15 according to EN 60715). Metal parts – including screws, clamping yoke, busbars, and PE foot – are securely mounted within the terminal housing. In addition, the screws are held captive from above by a screw brake mechanism. The PE terminals (**SSL 2.5** to **SSL 10**) make an electrical and mechanical connection to both sides of the rail. It can be snapped on to the rail with no need for screws and offers a maximum of mechanical and electrical security.



#### Cross-connection system

The standard feed-through terminals in 2.5 mm<sup>2</sup>, 4 mm<sup>2</sup>, 6 mm<sup>2</sup> and 10 mm<sup>2</sup> feature two cross-connection channels. So the two-pole **SQI.../2** cross-connectors can be used to connect any number of terminals with each other.



#### Distributing potentials

The **SQI** cross-connectors are available from 2 to 10 poles and with 30 poles. Two cross-connection channels allow two voltages to be fed across when working with the standard terminals with rated cross-sections of 2.5 mm<sup>2</sup>, 4 mm<sup>2</sup>, 6 mm<sup>2</sup> and 10 mm<sup>2</sup>.

It is possible to shorten the **SQI** cross-connection with a cutting tool. The **SQI** system allows you to maintain touch-protection safety by covering the cut (uninsulated) end with a **SQIK** insulation cap.



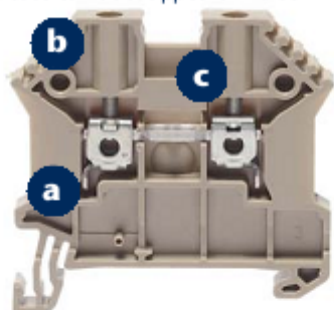
## Screw connection system SRK | SSL

### Features

#### a The connection | Secure contact

The clamping yoke transmits pressure from the screw to clamp the conductor against the busbar. The required contact force is generated by the torque applied to the screw.

- Rising clamp design
- High contact force and contact security | Minimal contact resistance
- Clear separation of electrical and mechanical functions
- Clamping yoke made from hardened steel: galvanized, chrome-plated and additionally thick-film passivated
- The busbars are made from copper with surface coating (tin)
- Resistant to vibration and maintenance-free
- Corrosion-free
- Low voltage drop
- Compact shape
- Foot base can be snapped on TS 35 DIN rail



#### c Pluggable cross-connection options

Distributing potentials with the pluggable **SQI** cross-connection system is quick and easy.

Two cross-connection channels allow two voltages to be fed across when working with the standard terminals with rated cross-sections of 2.5 mm<sup>2</sup>, 4 mm<sup>2</sup>, 6 mm<sup>2</sup> and 10 mm<sup>2</sup>.

- Available in 2 to 10 and 30 poles
- Simple to insert and thus quicker to install
- No insulation plate or partition plate is required between a neighbouring cross-connection, since the **SQI** has a touch-safe protective design
- Cross-connection can carry the full rated current and voltage of the corresponding terminal block
- Individual terminals can be skipped over by breaking out contact pins in the cross-connector

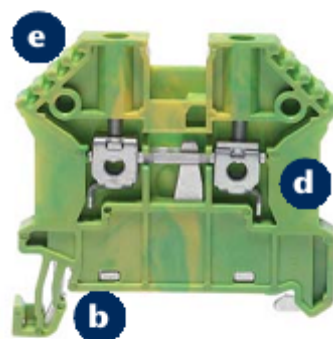
#### Feature

The **SRK 2.5** to **SRK 10** feed-through terminals have a rail adapter built in to the lower part of the terminal housing. This allows the cable shield from a control or data line to

#### b Easy and safe to wire with an established connection system

The screw-connection mechanism is easy to operate and can be used to establish a quick, safe connection using solid and finely stranded wires with or without wire-end ferrules.

- Simple and self-explanatory usage
- Can be used around the world
- A connection mechanism that has proven itself in millions of applications
- Generous wire-entry geometry
- Connection of multiple wires is possible
- PE foot contact on both sides – can be snapped on (no screws) to TS 35x7.5 and TS 35x15 rails.



#### d Housing insulation material

- Polyamide PA6.6 UL 94, flamm. class V0, self-extinguishing without burning drops
- Free of hazardous materials such as halogen or phosphor
- Creepage resistance: CTI 600
- Operating temperature from -40°C to +120°C

#### e Marking options

The standard terminals feature four labelling channels. They can be fitted with four **PMC SB** labelling tags or two **PMC BSTR** tags.



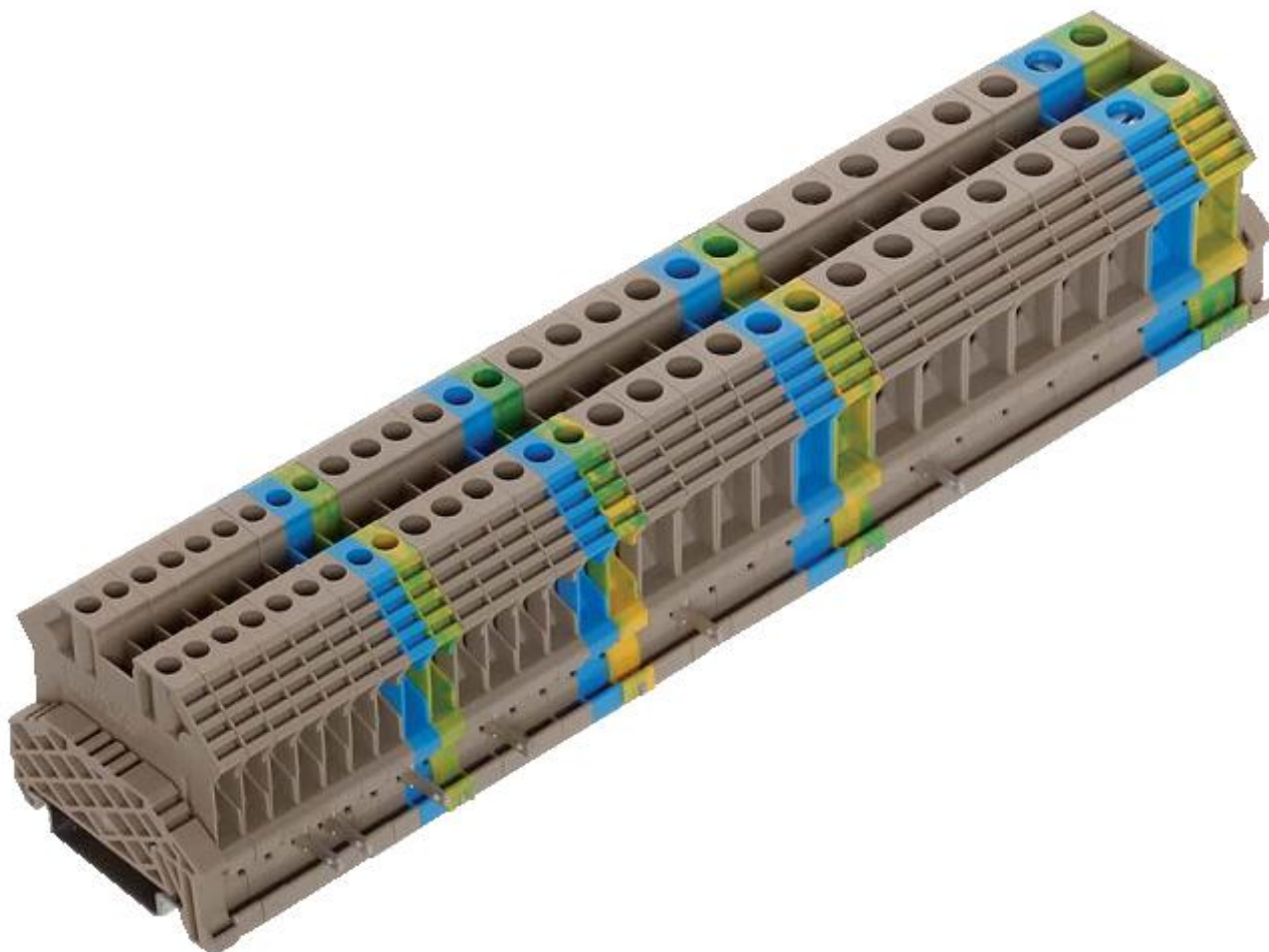
## Screw connection system SRK | SSL *Proven – Safe – Reliable*



**CONTA-CLIP** offers an innovative line of feed-through and protective-earth terminals featuring the proven screw-connection system for the smallest cross-sections ranging from 0.08 mm<sup>2</sup> to 10 mm<sup>2</sup>. The screw-connection mechanism is easy to operate and can be used to establish a quick, safe connection using solid and finely stranded wires with or without wire-end ferrules. The protective-earth terminals feature a PE foot contact that is snapped on without screws, ensuring mechanical and electrical safety.

Our well-designed line of accessories allows you to significantly reduce your installation and storage costs. Potential voltages is muddled, the **SQI** pluggable cross connection system is used to connect together terminals along the rail. All of the insulating materials used in this product line are free of pollutants. They also comply with flammability class V0 (self-extinguishing) according to UL 94.

The basic feed-through and protective-earth terminals are certified as standard ATEX and can thus be used in explosive-risk EEx e. zones.\*1



**Triple-level terminal block  
IKD|DLI**  
Page 56



**Motor-connection terminal  
VMAK**  
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**Triple-level terminal block  
IKD|IK**  
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**Disconnect terminal  
TRK|STK 2|TK**  
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**Pluggable connection system  
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**Three-wire installation  
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**Motor-connection terminal  
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**Disconnect-blade terminals |  
Disconnect terminals | Fused  
terminals FTRK**  
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**Compact terminal series for  
direct mounting ZSRK | ZSLN**  
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**CONTA-CLIP**

*Product overview*

**Screw connection system**



**Screw connection system**  
**SRK|SSL**  
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**Screw connection system**  
**RK|SL**  
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**Double-level terminal blocks**  
**RKD|RKDG**  
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**Test-disconnect terminals**  
**PTK**  
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**Fuse-disconnect terminals**  
**STK|SIK**  
**Fused terminals SK**  
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**Three-wire installation terminals**  
**DLI|DLIS**  
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**Feed-through terminals for direct no-rail mounting**  
 Page 92



**Pressure-spring connection system**



**Pressure-spring connection system**  
**FRK|FSL**  
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**Double-level terminal blocks**  
**FRKD | Double-level PE terminal FSLD**  
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**Disconnect-blade terminals | Disconnect terminals | Fused terminals FTRK**  
 Page 122



**Tension-spring connection system**



**Tension-spring connection system**  
**ZRK|ZSL**  
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**Double-level terminal blocks**  
**ZRKD| Double-level PE terminal ZSLD**  
 Page 152



**Triple-level terminal block**  
**ZIKD**  
 Page 158





## Oil and gas



*Defining the limit as standard*



The oil and gas industry is part of the particularly complex and safety-relevant sectors within plant engineering.

Highest requirements on modulating accuracy, data transfer and switch-off behaviour in emergency situations are standard features.

AUMA has developed special concepts able to meet the special challenges such as covering large distances and the handling of actuators in systems with potentially explosive atmospheres with high safety restrictions.

# Actuators for the oil and gas industry



## Explosion-proof actuators and gearboxes

- Explosion protection: The **plug-in electrical connections** are always designed as "double sealed".
- Fireproof housing - with their special coating, AUMA actuators remain fully functional during 30 minutes even when subjected to **temperatures up to 1,100 °C**.
- Modbus RTU - optimum use of the Modbus RTU protocol to **cover long distances** up to 296 km via conventional cables
- SIL - **functional safety** - all details to draw up a risk analysis for plant operators and consultants



Multi-turn actuator **SAEx** with integral controls **ACExC**

- ▶ Multi-turn actuators **SAEx**
- ▶ Controls **ACExC**



Multi-turn actuator/worm gearbox combinations **SAEx/GS**

- ▶ Multi-turn actuators **SAEx**



Multi-turn actuator/bevel gearbox combinations **SAEx/GK**

- ▶ Multi-turn actuators **SAEx**



Multi-turn actuator **SAEx** with integral controls **ACExC** (wall bracket)

- ▶ Multi-turn actuators **SAEx**
- ▶ Controls **ACExC**



Part-turn actuator **SGExC** with integral controls **ACExC**

- ▶ Part-turn actuators **SGExC**



Multi-turn actuator/bevel gearbox combination **SAEx/GST**

- ▶ Multi-turn actuators **SAEx**



POCKET GUIDE



Basics

# explosion protection







Zone classification		
Gas	<b>Zone 0</b>	area in which an explosive atmosphere consisting of a mixture with air of flammable substances in the form of gas or vapour is present continuously or for long periods or frequently
	<b>Zone 1</b>	area in which an explosive atmosphere consisting of a mixture with air of flammable substances in the form of gas or vapour is likely to occur in normal operation occasionally
	<b>Zone 2</b>	area in which an explosive atmosphere consisting of a mixture with air of flammable substances in the form of gas or vapour is not likely to occur in normal operation but, if it does occur, will persist for a short period only
Dust	<b>Zone 20</b>	area in which an explosive atmosphere in the form of a cloud of dust in air is present continuously, or for long periods or frequently
	<b>Zone 21</b>	area in which an explosive atmosphere in the form of a cloud of dust in air is likely to occur, occasionally, in normal operation
	<b>Zone 22</b>	area in which an explosive atmosphere in the form of a cloud of dust in air is not likely to occur in normal operation but, if it does occur, will persist for a short period only





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# lighting

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# fluorescent lighting

exlux

4

**1 EXLUX 6000/6400**  
Standard light fittings

**2 EXLUX 6008/6408**  
Emergency light fittings

Zone 1, Zone 2  
Zone 21, Zone 22

## Description

- > light fittings for 1 or 2 fluorescent lamps with a power output of 18 W, 36 W or 58 W
- > with electronic ballast
- > emergency light fittings from the EXLUX 6008/6408 series are outfitted with electronic ballasts and integrated emergency light electronics that include microprocessor-controlled monitoring and charging technology
- > compact, sturdy construction, impact-resistant, high degree of dust and water resistance
- > enclosure made of fibre-glass reinforced polyester resin
- > polycarbonate cover with prismatic structure
- > easy maintenance access due to central locking device
- > switch with safety lock
- > power is shut off when the light cover is opened

## Applications

- > as a standard lighting fixture
- > as group or central battery powered emergency light fittings

- > emergency light fittings from the EXLUX 6008/6408 series can be used as safety illumination
- > flexible mounting options due to an extensive selection of accessories

## Lighting technology

- > instant start-up with flicker-free operation
- > high luminous efficiency
- > optimal light distribution
- > light ray angle optimisation and anti-glare protection provided by prismatic design of cover

## Type of protection

- > IP 66/67 in accordance with EN 60598

<b>EN, IEC</b>	<ul style="list-style-type: none"> <li>⊕ II 2 G; EEx ed (m) IIC T4, Zone 1</li> <li>⊕ II 3 G; EEx n A II T4, Zone 2</li> <li>⊕ II 2 D; IP 66 T<sub>0max</sub>*</li> </ul>
<b>NEC</b>	<ul style="list-style-type: none"> <li>Class I Zone 1 and 2, AEx de IIC T4, Div. 2, Groups A, B, C, D, T4</li> <li>Class II Div. 1 and Div. 2, Groups E, F, G</li> <li>Class III</li> </ul>
	* Temperature class or maximum surface temperature depends on lamp selection



# fluorescent lighting

## exlux sheet steel versions

**3 EXLUX 6014/6414**  
Standard light fittings

**4 EXLUX 6012/6412**  
Inset light fittings

**EXLUX 6018/6418**  
Emergency light fittings

Zone 1, Zone 2

### Description

- > light fittings for 1 to 4 fluorescent lamps with a power output of 18 W, 36 W or 58 W
- > with electronic ballast
- > compact, sturdy construction, impact-resistant, high degree of dust and water resistance
- > enclosure made of powder-coated sheet metal or stainless steel
- > safety glass-equipped, hinged cover
- > easy maintenance access due to central locking device
- > switch with safety lock shuts power off when the light cover is opened
- > emergency light fittings from the 6018/6418 series with electronic ballast and integrated emergency light electronics with microprocessor-controlled monitoring and charging technology

### Application

- > for lighting spray and enamelling lines
- > in pharmaceutical cleanrooms
- > installation as pendant, retrofit or inset recessed light fitting

### Lighting technology

- > instant start-up with flicker-free operation
- > high luminous efficiency
- > optimal light distribution
- > reflector can fold outward

### Type of protection

- > IP 65 in accordance with EN 60598





# hand lamps

## portable lamps



12

**1 Portable lamps  
Series 6144**  
Zone 1, Zone 2

**2 Portable lamps  
Series 6149**  
Zone 1, Zone 2  
Zone 21, Zone 22

**3 Hand lamps  
Series 6140**  
Zone 0, Zone 1, Zone 2  
Zone 20, Zone 21,  
Zone 22

**4 Hand lamps  
Series 6147**  
Zone 1, Zone 2  
Zone 21, Zone 22

**Description**

- > designed for mobile use – even in hazardous areas
- > hand lamps/portable lamps with operational functions to match the task
- > sturdy, impact-resistant portable lights
- > high reliability and service life
- > light duration For up to 8 hours
- > rechargeable battery technology (6144)
- > microprocessor-controlled battery capacity indicator – five LEDs display current operation status and charging condition (6144)

**Lighting technology**

- > high luminous efficiency due to special reflector design
- > luminous intensity of up to 15,000 cd
- > continuous and blinking functions
- > equipped with an intensely bright Xenon lamp beam can be externally adjusted to a concentrated point or a wide angle area (6149)

**Applications**

- > for maintenance and servicing tasks
- > for inspection and check patrols
- > use as an emergency light during power failures (6144)

EN, IEC	Symbol	Series	Specifications
II 2 G, EEx ed IIC T3/T4	⊕	6147	II 2 D, IP 65 T 145 °C
II 2 G, EEx ib IIC T4	⊕	6144	
II 2 G, EEx d IIC T*	⊕	6149	II 2 D, IP 66 T <sub>0max</sub> *
II 1 G, EEx ia IIC T4	⊕	6140	II 1 D, IP 65 T 130 °C

\* Temperature class or maximum surface temperature





# emergency light systems

## group and central battery systems

### Group battery system Series 6920

### Central battery system Series 6950

#### Description

- > group and central battery systems control, regulate and monitor the safety illumination system
- > if the mains power is interrupted, general lighting is switched over to safety illumination and battery backup
- > the functionality of the safety light system is automatically monitored and errors are identified
- > microprocessor-controlled rapid and maintenance-charge battery charging
- > special circuit monitoring function, alternatively each light can be individually monitored – even explosion-protected lights
- > documentation of all operation events in an electronic test logbook

#### Lighting technology

- > control of standard lights
- > use with rescue designation lights

- > an integrated address module makes monitoring of individual lights possible
- > various interfaces permit data transmission to external outputs

#### Applications

- > Safety illumination by means of these group or central battery systems meets DIN VDE 0108 and EN 50171 requirements. These systems are suitable for installation in the «non-Ex-area», or as a power supply for safety illumination in the general industrial area and the hazardous area.

#### Type of protection

- > electronic apparatus cabinet IP 54
- > battery compartment IP 43

#### Standards

- > DIN VDE 0108
- > EN 50171





# installation equipment

**1 Control equipment  
Series 8040**

**2 Plugs and sockets  
Series 8570**

**3 Junction boxes  
Series 8102/8118**

**4 Installation switch  
Series 8030/51**

**5 Safety distributor  
switch  
Series 8146**

**Terminal boxes  
Series 8146/8125**

Zone 1, Zone 2  
Zone 21, Zone 22

**Description**

- > installation switch series 8030 and control equipment series 8040 are designed for the switching of circuits
- > junction boxes 8102/8118 and terminal boxes of the 8146/8125 series enable safe distribution and connection
- > plugs and sockets in the 8575 series facilitate mobile power supply
- > safety distributor switches/automatic circuit breakers of the 8146 series serve to protect and safeguard electrical circuits – can be safely switched on/off in the hazardous area

**Applications**

- > for switching, distributing and safeguarding of electrical circuits in hazardous areas
- > installation equipment and lighting all from the same reliable source – the complete solution advantage from R. STAHL!

**Type of protection**

- > IP 65 Series 8030/8040
- > IP 66/67 Series 8102/8118
- > IP 55/66 Series 8570
- > IP 65 Series 8146

EN, IEC	Symbol	Series	Protection
	⊕	8030/8040	II 2 G, EEx de IIC T6
	⊕	8102/8118/8146	II 2 G, EEx e II T6
	⊕	8570	II 2 G, EEx de IIC T6
	⊕		II 2 D, IP 66 T 80 °C
	⊕	8146	II 2 G, EEx de IIC T4
	⊕	all series	II 2 D, IP 65/66 T <sub>0max</sub> *

\* Temperature class or maximum surface temperature



# HMI for Oil & Gas Applications

in hazardous areas





INNOVATIONS  INNOVATIONS

### SERIES 200 – The First 7" Widescreen Display for Zone 1 / 2

Our new SERIES 200 features state-of-the-art technology, and comes with high-performance CPU, capacitive touch screen, and Windows Embedded Compact 7 operating system. A hardened glass layer adds enhanced protection to the 7" widescreen display. With its compact, fully rugged design, seawater resistance and IP66 standard, the SERIES 200 is the ideal solution for applications in harsh and demanding environments worldwide, e.g. tank farms and oil rigs, and is suitable for permanent operation at ambient temperatures between -40 °C up to +65 °C.



### Sunlight-Readable (SR) Displays

Our innovative sunlight-readable (SR) displays ensure best, glare-free readability even in bright ambient light conditions, and are the ideal solution for outdoor applications, e.g. on oil rigs. Compared to other standard sunlight-viewable displays, this display type with its innovative polarization filter system substantially reduces disturbing reflections and glare, thus ensuring best image quality and readability.

direct sunlight



### User-Friendly, Explosion-Protected Widescreen Displays, Standard Keyboard / Mouse

Up until now, standard operator interfaces in container workstations have included multi-monitor configurations, or in case of failure only small HMIs of limited functionality. But this problem now belongs to the past: our explosion-protected widescreen KVM system solution ensures reliable and continuous operation even in case of critical situations. And despite display sizes of up to 24", and 1920 x 1200 resolution, our widescreen displays stand out for their compact design.



### Ready-to-Run Full Clients (Panel PCs) with Pre-Installed Operating System

Our Full Clients (Panel PCs) are ready-to-run – pre-configured, ex-factory, with a closed, multilingual operating system (Windows XP / Windows Embedded / Windows 7 Ultimate, etc.). Designed as OPEN HMI, the systems are open for all types of software applications.

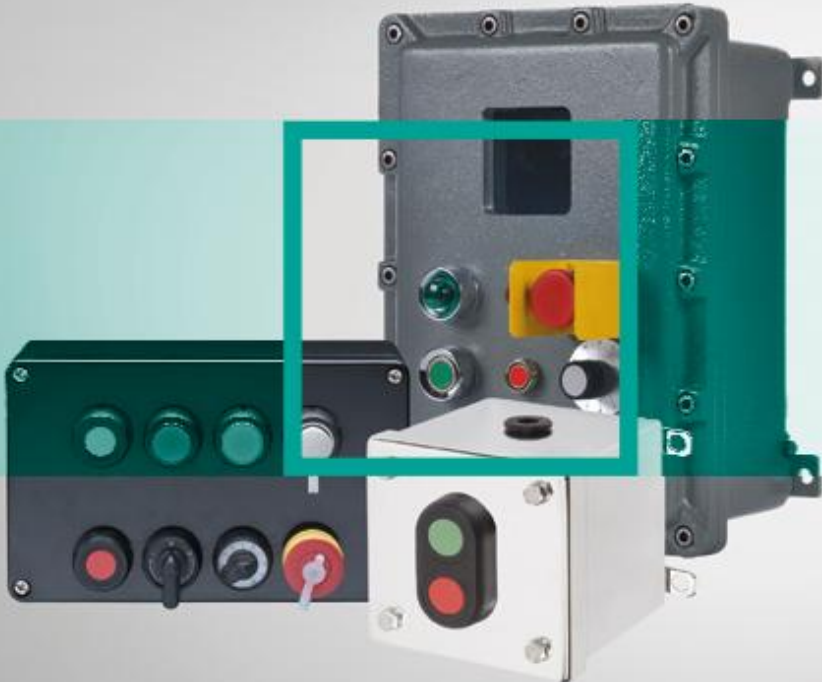


### Thin Clients with REMOTE HMI FIRMWARE

R. STAHL Thin Clients are fitted with a special firmware that protects the HMI system against external manipulations, permanently monitors the entire data communications, and switches to another server in the event of failure. Moreover, the REMOTE HMI FIRMWARE simplifies IP address management, and the overall configuration management.



**PROCESS AUTOMATION**



**EXPLOSION PROTECTION EQUIPMENT**

**Ex d IIB Terminal Boxes, Control Stations and Control Panels**

# EJB - Ex d IIB aluminum and stainless steel

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

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





## SPECIFICATION

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



# DMT - Ex d

## hazardous area grounding

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

### DMT 2B GROUNDING DEVICE

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

### DMT 2C GROUNDING DEVICE

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



# TVCC - Ex d IIC camera enclosures

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

## SPECIFICATION

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





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

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

## SPECIFICATION

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



# Call points, visual, and audible signaling devices

## E0301 AND E0302 MANUAL CALL POINTS WITH BREAK GLASS

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



## E501 STATUS LIGHT

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



## ETH12MD MULTIPLE TONE WARNING DEVICE

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



## LPA AERIAL OBSTACLE SIGNAL DEVICE

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



## EVC100 FLASHING BEACON

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



## Ex enclosures Plastic, empty enclosure with hinged door



Ex enclosure with hinged door, plastic

Model No. ↕	Width ↕	Height ↕	Depth ↕
▶ KEL 9201.600	200 mm	300 mm	150 mm
▶ KEL 9202.600	250 mm	350 mm	150 mm
▶ KEL 9203.600	300 mm	400 mm	200 mm
▶ KEL 9204.600	400 mm	400 mm	200 mm
▶ KEL 9205.600	400 mm	600 mm	200 mm
▶ KEL 9206.600	600 mm	600 mm	200 mm
▶ KEL 9207.600	500 mm	500 mm	300 mm
▶ KEL 9208.600	600 mm	800 mm	300 mm
▶ KEL 9209.600	800 mm	1000 mm	300 mm







**Product Catalog**  
for Industrial Applications  
2013

Dräger. Technology for Life®



## Safety for people and the environment: We know your responsibility – and want to share it with you.

The requirements for safety management in fields that deal with hazardous materials are as diverse as industry itself. No matter whether it is manufacturing companies, the chemical industry or processing operations: Every operation or production location has many different potential hazards to people, the environment and equipment that must be kept to a minimum.

### **YOUR CONTACT FOR INNOVATIVE SAFETY TECHNOLOGY: DRÄGER**

Dräger helps to responsibly meet this obligation – with products, services and training sessions that are tailored to each hazardous situation and that fulfill legal requirements. We will advise you in all questions involving solid, liquid and gaseous hazardous substances and will help you to select appropriate equipment for your needs.

#### **Our focus: detection and protection.**

The life and health of human beings is our first priority. This is why we have developed a range of durable, robust products that warn you and your employees in advance of imminent dangers – and protect you from head to toe in emergencies.

#### **Gas Detection Technology**

Many incidents can be avoided by using reliable early warning systems. The portable and stationary gas detection technology from Dräger indicates precisely when standards and threshold values are exceeded. Thanks to highly sensitive, durable Dräger sensors, the devices detect a multitude of hazardous substances even in very small concentrations, measure them seamlessly and reliably warn people at work of possible dangers.

#### **Protective Equipment**

Despite precise detection technology, human beings working in industrial environments still must work in hazardous areas. These include the repair of leaks, cleaning and maintenance work in confined containers, decontamination work as well as rescue measures following deployments to chemical plants, for example. The equipment from Dräger offers all-round protection during emergencies. Dräger respiratory protection technology reliably provides breathable air, the robust Dräger chemical protective suits protect against hazardous gases, liquids and aerosols. The Dräger portfolio of personal protective equipment is completed by a professional eye protection range.

#### **Alcohol and Drug Testing Devices**

Many industrial activities require the highest degree of attention. As a result, alcohol and drugs present a large risk in safety-relevant industrial applications. This makes it important to detect a possible abuse before people and the environment are damaged. With the help of the alcohol and drug testing devices from Dräger, you can check the fitness for work of your employees quickly and easily at any time.



## Services and training: we protect you and your employees – with everything that goes with it.

What good are the best products if they can't be optimally used or have their operational readiness checked regularly? Dräger prevents this danger as well with a wide spectrum of services.

### Training

Our training units especially contribute to you and your employees being able to appropriately react to a danger. We train you and your employees in safely using Dräger products or rescue techniques in small groups directly on-site or in one of our training centers.



### Service

DrägerService also offers complete safety solutions to ensure that you are optimally armed for emergencies. If desired, we will inspect and maintain your devices. To make sure that the costs remain within the budget, our service team stands by your side to answer all questions related to the efficient use of our products.



### Rental Equipment

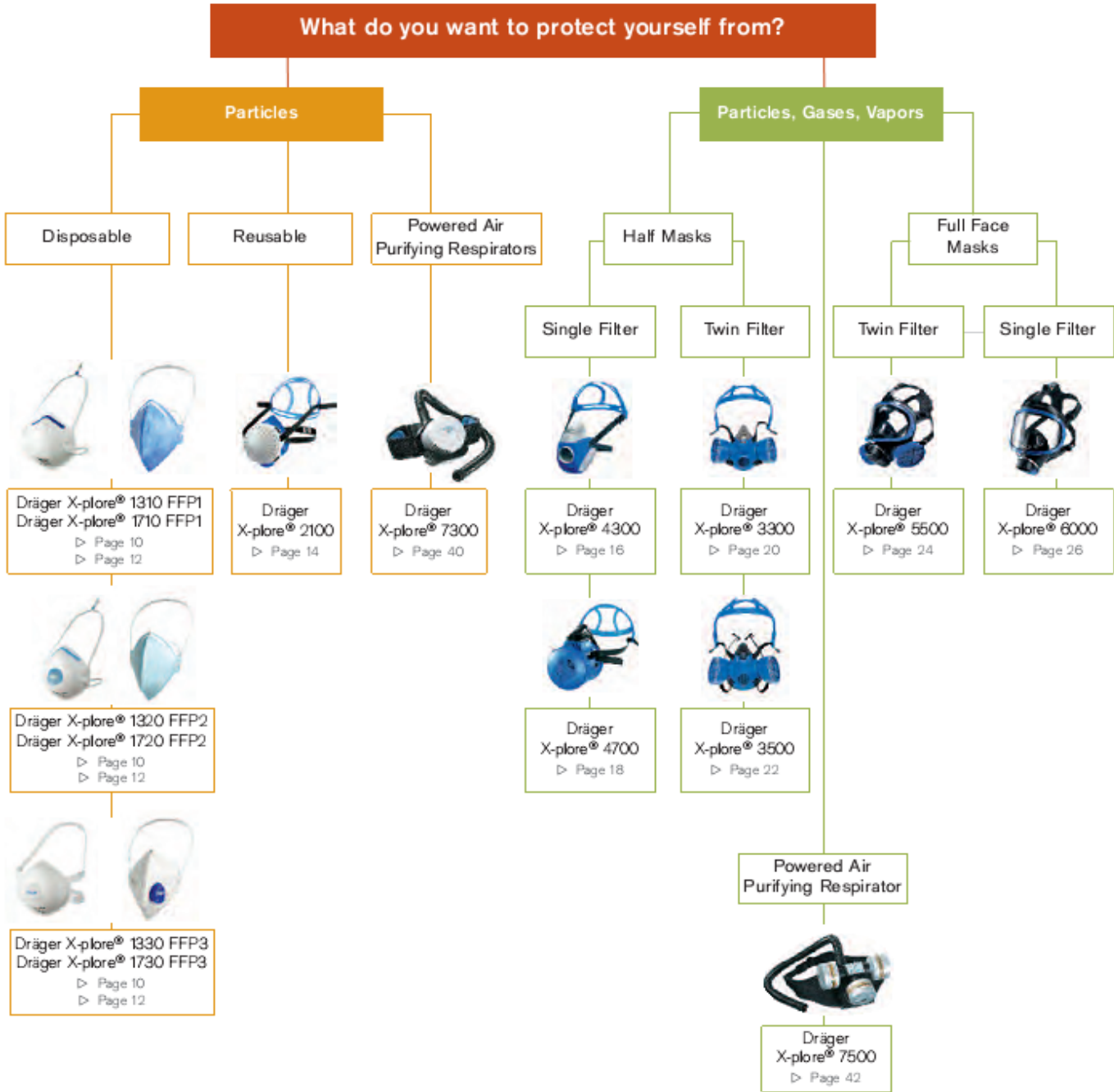
Special situations require special equipment. If, for example, you are faced with comprehensive cleaning and maintenance work, your need for detection technology and respiratory protection can temporarily increase. We are happy to help you out with your bottleneck – with the Dräger rental equipment service.

### Our Partners: the Specialist Dealers

You can naturally continue to order all Dräger products from your usual source. If you would like to take advantage of benefits in consultation and logistics, we recommend contacting our local Dräger specialist dealer partners.



# Overview of Dräger Light Respiratory Protection



▷ Accessory components for air purifying respirators beginning on p. 44

▷ The right filter selection beginning on p. 28

## Dräger X-plore® 1300

### The classic: pre-shaped, particle filtering face pieces

#### ADVANTAGES:

- Versions available in all three EN protection classes: FFP1, FFP2 and FFP3 in accordance with EN 149:2001+A1:2009
- Protects against fine dust as well as solid and liquid particles
- Selectable with or without exhalation valve
- Odour versions: additional protection against unpleasant odours in the workplace

#### Color coding on the nose clip and exhalation valve

- Quick recognition of the respective FFP protection level (dark blue, light blue, white)
- More safety in the selection

#### Flexible nose clip

- For adjustment to the individual face shape
- Strong seal in the nasal area

#### Nose pad

- Safe seal in the nasal area
- Secure seal around the nose
- Sweat-absorbing
- Comfortably soft while wearing

#### CoolMAX™ exhalation valve (optional)

- Very low breathing resistance for especially easy breathing
- No build-up of heat under the mask: effective removal of moisture and warm exhaled air to the outside

#### VarioFLEX™ head harness with EasyStop

- Continuous loop and tear-proof textile strap which is easy to don and doff while fitting comfortably without any pressure
- No fastening with side clips necessary
- No risk of allergic reactions in the face
- Simple donning and doffing – without trapping any hair
- Can be easily adjusted to the individual head shape of the wearer
- Fits comfortably with no pressure
- With 1330 extra-wide textile strap with 4-point adjustment and slip protection

#### CoolSAFE™

- A combination of special high-performance filter media for low breathing resistance and high filter efficiency
- Meets the special requirements of the dolomite clogging test

#### Hypoallergenic inner layer

- Soft and moisture-repellent
- Comfortable wearing sensation – even during prolonged periods of use



D-8-818-2009



Simply practical:  
the continuous loop strap VarioFLEX™  
To remove the mask, the wearer simply pulls it down. The mask will hang around the neck thanks to the continuous strap – without interfering in other activities. This leaves it immediately ready for use when needed.  
(not for Dräger X-plore 1330 V FFP3)

#### SPECIALLY SHAPED MASK BODY

The mask fits safely and comfortably – even with the most varied of face shapes. The spacious interior volume ensures wearing comfort and communication at the same time.

## Dräger X-plore® 4300

Light, comfortable and efficient single filter half masks

**ADVANTAGES:**

- Optimized design for high wearer comfort
- Hypoallergenic material mixture (TPE) and low weight: can be worn for long periods of time
- Available in two different sizes
- Two connection types for various usage options with particle, gas and combination filters
  - ▷ Dräger X-plore Rd40 filters beginning on p. 32
  - ▷ Dräger X-plore Rd90 filters beginning on p. 36

**Head harness with anti-slip head strap**  
 = One-piece with two adjustment points = Quick and easy donning and doffing = Excellent pressure distribution

**Exhalation valve**  
 = Comfortable microclimate in the mask: exhalation valve removes exhaled air to the outside from below

**Flexible textile strap**  
 = Tighten the mask with one pull



**ACCESSORIES**



Dräger X-plore® Rd40 Filter



Dräger X-plore® Rd90 Filter



Compressed-air hose Rd40, including belt and attachment clip (the filter is worn on the belt)



Wäku storage box

**ESPECIALLY LIGHT**  
 The mask has an exceptional low weight.



# Dräger X-plore® 5500

The state-of-the-art twin filter full face mask for various uses

**ADVANTAGES:**

- Complete respiratory and eye protection
- Meets the highest demands for a tight fit and wearer comfort
- Universal size: a good fit for all face sizes, simple storage and spare part storage
- All-round mask with a comprehensive selection of Dräger X-plore filters > Dräger X-plore filters beginning on p. 28

**Double-layered face seal with triple sealing action**  
 = More secure protection and tight fit for all face shapes

**5-point harness**  
 = Simple donning and doffing without trapping any hair

**Large visor**  
 = Optimal view during work  
 = Made from polycarbonate or Triplex

**Safer bayonet-type connector**  
 = Simple insertion of the filters:  
 Both filters are inserted from above and guided down to the connection point = Cannot be fitted incorrectly

**Compact "low profile" design**  
 = Side positioning of the filters and flat construction = Excellent field of vision



S16180/2002

**ACCESSORIES**



S1-2017-009  
 Dräger mask spectacles



S1-8512-002  
 Storage box Mabox II



017580/001  
 Storage box Wikov V

**BAYONET SYSTEM**

The bayonet system allows an ergonomic weight distribution of the filters, while providing an optimal view during work.

## Dräger X-plore® Rd90 Filters

Filters with Dräger-specific thread connection for the single filter half masks Dräger X-plore® 4390 and Dräger X-plore® 4790

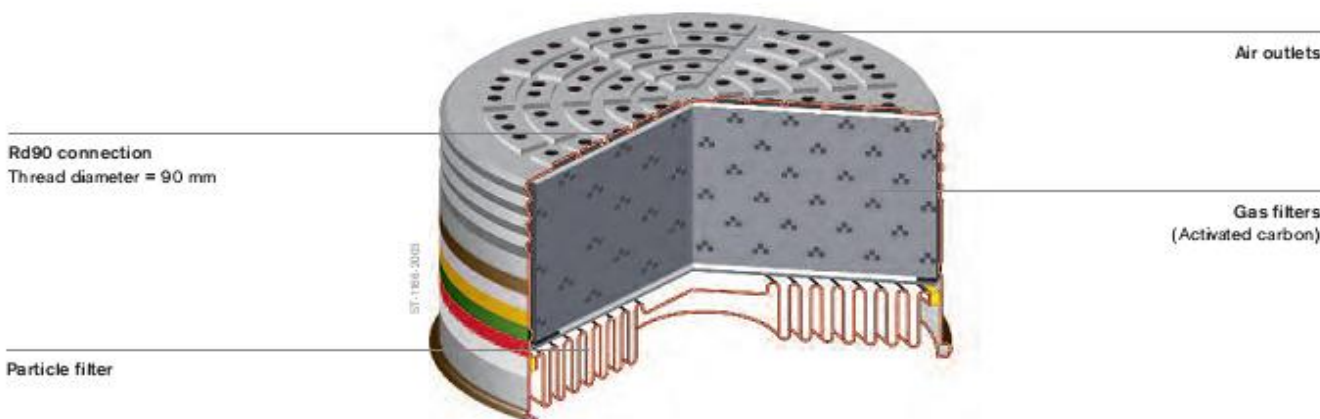
### ADVANTAGES:

- **Aluminum housing**
  - For extra safety: good detection of potential filter damage
- **Individually packaged and sealed**
  - Five filter package
  - Filters are optimally protected until their use
- **Maximum protection with comprehensive range of filter types**
  - Optimal protection for all application area



Dräger X-plore® Rd90 filter

Cross-section of a Dräger X-plore® Rd90 combination filter:

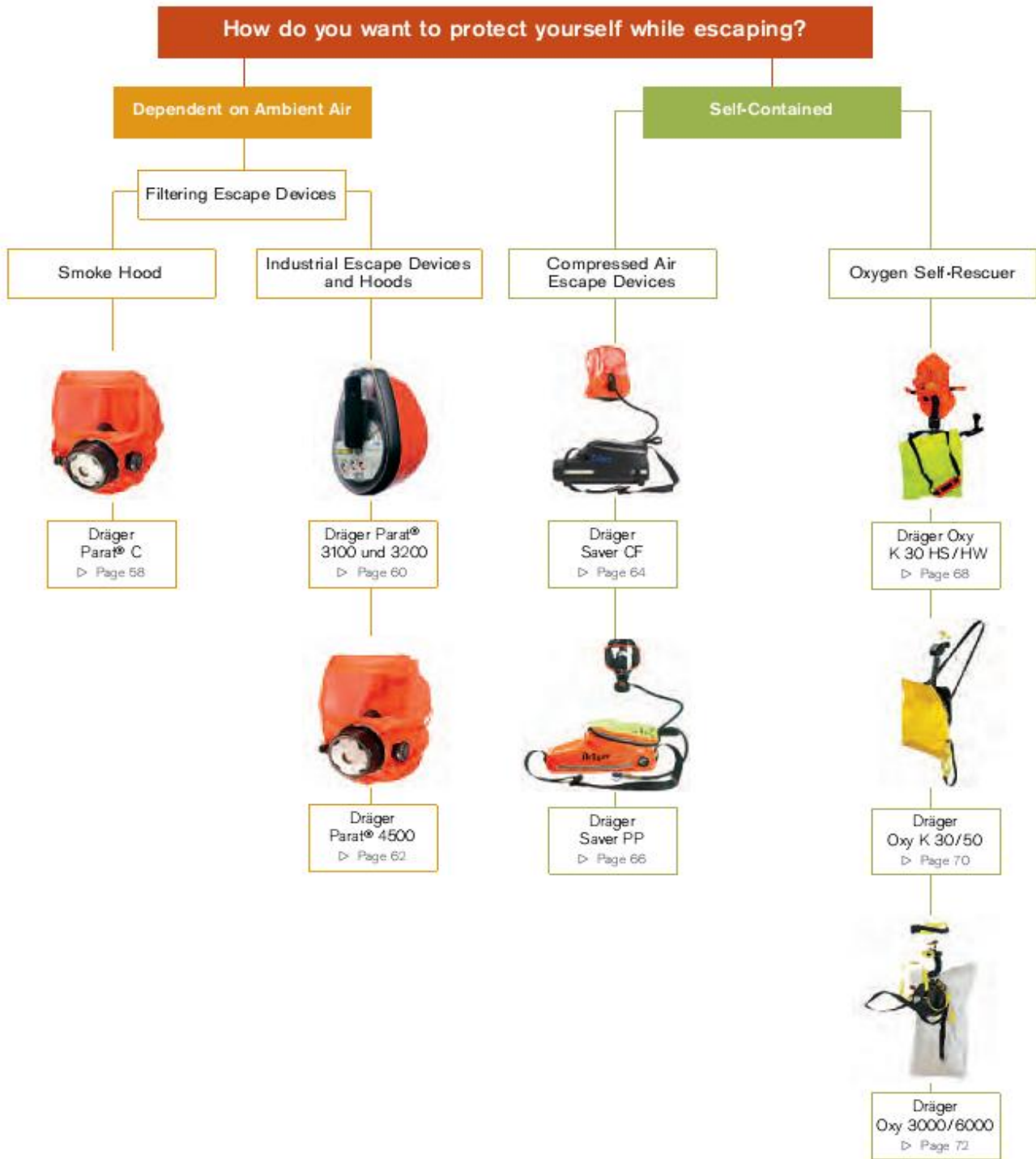


- ▷ Dräger X-plore 4390 beginning on p. 16
- ▷ Dräger X-plore 4790 beginning on p. 18

### FILTER COLOR CODES

Color coding	Filter type	Primary area of application
Brown	A	Gases and vapors of organic compositions, boiling point ≤ 65 °C
Gray	B	Inorganic gases and vapors, (e.g. chlorine, hydrogen sulfide, hydrogen cyanide)
Yellow	E	Sulfur dioxide, hydrogen chloride
Green	K	Ammonia
Red	Hg	Mercury vapor
White	P	Particles

# Overview of Dräger Escape Devices



ESCAPE EQUIPMENT



## Dräger PARAT® 4500

The reliable companion while escaping from suddenly occurring particle and gas hazards

### VORTEILE:

- At least 15 minutes of protection against dangerous industrial gases and particles
- Easy to don
- Good tight fit
- Three different packaging types:
  - Handy travel case (PARAT 4520 Soft Pack)
  - Stable plastic box (PARAT 4530 Traveler Pack)
  - Robust, mining-tested housing (PARAT 4560 Box)

#### Large anti-fog coated visor

- Clear vision and good orientation while escaping
- In combination with the hood: protection of the entire head against flying sparks

#### High performance ABEK-P15 combination filter

- Extension of the hood service life to a total of 12 years by replacing the filter twice after 4 years respectively, and if operated in accordance with the intended use



#### Exhalation valve

- Feeds exhaled air directly out of the nose cup to the outside: reduced heat in the hood

#### Flexible collar

- Universal size: suitable for all head sizes as well as wearers of beards and spectacles

### ACCESSORIES

ST-14171-2008



Wall mount for Traveller Pack

ST-14176-2008



Carrying strap for Traveller Pack and Soft Pack

ST-14170-2008



Waist belt

#### UNMISSABLE WHILE ESCAPING

Due to the bright orange signal color, the escapee can always be seen easily, even under reduced visibility conditions.

## Dräger SPC 3800 (Splash Protective Clothing)

Light, extremely robust protection against fluids (type 3) – for various tasks with high requirements for chemical resistance

### ADVANTAGES:

- One-piece overall for disposable use with full face mask in conjunction with a SCBA or airline hose system
- Especially suited for: cleaning, inspection, renovation and site evaluation work, emergency measures (closing of valves at pipe lines or the recovery of defective containers with chemicals), working with oil, and working with infectious agents and radioactive particles
- Protection against: fine dust and powder, numerous concentrated inorganic acids and alkalis, a wide spectrum of organic chemicals in liquid form
- Available in six different sizes (S – XXXL)

#### Soft and flexible face cuff made from Butyl

■ Can be worn outside or inside of the mask ■ High degree of wearing comfort on the head and face ■ Simple donning and doffing without connected mask – while still providing an outstanding level of gas tightness

#### Elastic band

■ For a comfortable fit at the waist

#### Permanently attached socks

■ With drip cuffs made from suit material – for secure protection against liquid chemicals ■ Fit comfortably into boots (selectable separately if necessary)



#### Double-covered zipper

■ Located on the back to provide extra protection against leaks and releases from the front ■ Wide cut for easy donning and doffing

#### Liquid tight welded seams

■ Permanently attached Butyl gloves ■ Orange suits are equipped with Butyl gloves ■ Gray suits are equipped with Silvershield gloves

### ACCESSORIES



2-321-06

PVC safety boots



ST-8993-200-4

Nitril-P safety boots



ST-12004-200-8

Outer glove K-MEX® Gigant

#### NO ADDITIONAL SEALING NECESSARY

The socks, gloves and collar are already permanently attached to the suit. That means: no extra effort for sealing this connection. This saves you time and gives you the assurance that the suit is fully sealed.

## Dräger CPS 7800

All-round protection (type 1b) – with a great deal of mobility

### ADVANTAGES – IN ADDITION TO THOSE OF THE WORKMASTER UMEX AND INDUSTRY:

- Cut tight to the body
- Suitable for a wide variety of organic and inorganic hazardous substances
- Antistatic material D-mex™
- Especially suited for uses that require a high amount of mobility and high mechanical resistance
- Available in five different sizes (from S to XXL)
- An unused suit with face cuff can even be storage for five years without servicing



**Flexible gas-tight face cuff (optional)**  
 ■ Can be combined with various full face masks

**Braces**  
 ■ Increases wearing comfort

**Gas-tight zipper with cover flap on the front side**  
 ■ Closes from top to bottom ■ No help of a second person required for donning ■ Cover flap made from suit material with hook-and-loop fastener protects the external zipper chain

**Diagonal zipper design**  
 ■ For easier donning and doffing

**Ventilation system Dräger RV PT 120 L (optional)**  
 ■ A connection to a compressed air hose system, a ring line or an external air supply is possible: when connected an adjustable air flow cools the suit and reduces the humidity inside. At the same time, the system ensures the breathing air supply for longer periods of use

**Chemical-tight safety gloves**  
 ■ Easily replaceable ■ Attached to the suit

**Integrated safety boots facilitate donning on the suit**  
 ■ Alternatively, gas tight socks can be chosen which offers flexibility when selecting boots

### ACCESSORIES



The ventilation system RV PT 120 L



Automatic switch-over valve (ASV)



Outer gloves Tricotril or K-MEX® Gigant

### THE HIGHEST DEGREE OF PROTECTION IN CSE AREAS

Dräger CPS 7800 offers its users high mobility with the greatest possible protection. The chemical protective suit is thus especially suited for accessing confined spaces and CSE containers.



# An Overview of Dräger Measurement and Warning Devices



GAS DETECTION INSTRUMENTS



**AESA**  
Automatisierungs- und Elektrotechnik  
Schaltanlagenbau GmbH

Solution Partner  
Automation **SIEMENS**

## Impressum



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