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Precious and heavy metals continue to be among the world’s most valuable resources. However, they haven’t been the easiest materials to process. Significant advances in the extraction of aluminum, copper and pig iron, as well as the processing of steel, have made this more economical and environmentally friendly. This is due, in part, to products from the WAGO "smithy."

Metal production relies on exacting standards that must be controlled and regulated closely. In addition, metal production systems rely on high-quality, durable components for maximum efficacy. WAGO components have proven themselves by offering superior contact quality, vibration-resistance, efficiency and reliability.

**Explosive environments – Reliability with CAGE CLAMP®**

CAGE CLAMP® Spring Pressure Connection Technology provides proven performance under extreme conditions and is approved for hazardous areas. All CAGE CLAMP® components and materials are also ideal for aggressive environments plagued by temperature cycling.
Increasing global competition requires steel producers to strive for higher product quality while conserving materials and power. This drives steel production and processing facilities to employ the latest process techniques. The complex procedures for capturing signals from sensors and actuators demand high data rates and forms the basis for safe automation and process control.

Aggressive environments, hazardous areas, scalability for future system expansions and low maintenance costs – precisely the right environment for the WAGO-I/O-SYSTEM.

**Maximum output, minimum space**

In addition to ease of integration, scalability and international safety approvals, the WAGO-I/O-SYSTEM impresses with potential savings for operation, maintenance and service.

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The most compact, modular and fieldbus-independent I/O system for decentralized automation.

Fine modularity and fieldbus-independence are hallmarks of the WAGO-I/O-SYSTEM, which boasts worldwide approvals for a diverse range of applications. The system was developed to account for the requirements placed on decentralized fieldbus systems.

The system is optimized for process-oriented communication and is a scalable-performance solution for high integration density with an unbeatable price/performance ratio.

Advantages for building and industrial automation:

- Modular construction: Digital, analog and specialty modules can be combined in virtually any manner within a node, including outputs with different capacities up to 230V.
- Freely programmable: Comprehensive programming possibilities in compliance with IEC 61131-3
- Supports all common fieldbus systems: telecontrol protocol, PROFIBUS, PROFINET, ETHERNET, etc.
- Safety approvals
- Easy integration of specialty functions, such as safety modules, Exi, vibration analysis and motor controls.
- Radio technology
Strand casting molten steel is arduous multi-phase process. After pouring the cast, hot rolling is typically used to form molten steel into slabs for further processing. The steel, which has been “warmed” to a mere 1,250°C places extreme demands on more than just the rollers. Sprayed cold water, radiating heat, constant vibrations and severe shocks stress all peripheral systems. The remote WAGO SPEEDWAY 767 I/O SYSTEM was engineered to withstand these stressors. Furthermore, SPEEDWAY provides reliable, high-performance data transmission between sensors, actuators and the fieldbus.

Eliminate enclosures
With IP67-grade protection, WAGO SPEEDWAY 767 resists spray water, dust, oil and higher temperatures. The fully encapsulated system eliminates expenses associated with costly installations and enclosures. Similarly, secure connections for sensors and actuators, as well as signal processing within the PLC, have been streamlined to minimize installation time and materials.

The new performance standard in cabinet-free automation.
Perfection - in every detail:
- Modular design
- High-performance data transfer
- CoDeSys 3 programmable (IEC 61131-3)
- FDT/DTM configuration
- Asynchronous and synchronous diagnostics
- Fieldbus independent
- USB interface
- Comprehensive safety features
- Excellent EMC protection
- Efficient power supply solution
- Temperature range from -25°C to +60°C
- IP67 degree of protection (fully encapsulated)
- Screw and DIN-rail mount options
- Ergonomic design
Timely information provides a sound basis for control systems and actions before a costly, and often preventable, interruption stops production. TO-PASS®, WAGO’s latest solution, transmits data from difficult-to-reach areas and hazardous zones securely, continuously and wirelessly.

**Exact measurement values for the control center**

Measurement values are transmitted autonomously and wirelessly to control systems or transmitted to secure Web pages. Via GSM network, the measurement data can be stored on a Web server and made available for system monitoring.

Naturally, TO-PASS® telecontrol solutions are compatible with your Web server and MySQL database.

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**From fault detector to intelligent telecontrol PLC.**

- A seamless telecontrol solution, consisting of stand-alone fault detectors with GSM connection, optional IP66 protection and a telecontrol PLC that links to the WAGO-I/O-SYSTEM.
- Transmission based on the international IEC 60870-5-101/104 telecontrol protocol standard.
- Use of GSM (GPRS, CSD, SMS) mobile radio network.
- Open system with user-selected Internet server.
One of the greatest challenges the steel industry faces is the efficient production of high-strength, yet light-weight materials. We view this challenge as an opportunity and have developed hard-working communication technologies — efficient, reliable data processing is vital to multi-step production processes.

Near the action
The JUMPFLEX® 857 Series is ideal for recording, conditioning, converting and forwarding measurement data in the metalworking industry. As a reliable, system-wide solution, JUMPFLEX® boasts an extended temperature range of -25°C to +70°C while the ultra-compact design permits installations close to machinery.

For extreme applications
Greater application range due to extended temperature range of -25°C to +70°C.

Industry’s most compact
„True“ 6.0mm/0.23in width maximizes panel space.

Flexibility at its finest
Configuration via DIP switch. Transducers can also be configured via software (FDT/DTM).

Highest safety
All devices provide „safe isolation“ with 2.5kV test voltage to EN 61140.

Transducers:
- Millivolt transducer
- Threshold value switch
- Temperature transducer for RTD
- Temperature transducer for thermocouples
- Isolation amplifier
- Passive isolator
- Repeater power supply
- Signal splitter

Relay and optocoupler modules:
- DC relay modules
- DC relay modules with gold contacts
- Optocouplers
- AC/DC relay modules
- AC/DC relay modules with gold contacts
Heavy-duty furnaces can produce up to 12,000 tons of pig iron and 3,000 tons of slag daily. Pig iron is further processed for other iron products while slag is used in road construction. With searing production temperatures and molten by-products, production system failures could have fatal consequences. With the multi-step production handled by complex production systems, featuring numerous contact points, human error may lead to equipment damage, rework, lost productivity or even injury. TOPJOB®S rail-mount terminal blocks help safeguard installations against wiring errors. Rather than rely on terminations requiring specialty tools or training, CAGE CLAMP®S Spring Pressure terminations are simple and automatically make secure terminations.

When unreliable would be inexcusable

Temperature fluctuations, vibrations and other environmental aggressors mean screw connections must be checked and adjusted frequently. This is where CAGE CLAMP®S excels. In addition to minimizing wiring and installation times, all terminations are permanently gas-tight, maintenance-free and vibration-resistant.

The range of rail-mount terminal blocks.
Simply brilliant.

With just one range of rail-mount terminal blocks, WAGO can fulfill virtually all industrial, Ex application and building installation needs. Thanks to CAGE CLAMP®S technology, the TOPJOB®S DIN-rail mount terminal blocks are the industry’s most compact. Their design can save up to 30% more space over other terminal blocks – ideal for space-restricted applications such as switch cabinets or junction boxes. CAGE CLAMP®S provides tool-free terminations for all conductor types. Other benefits:

- Extremely compact design for more wiring space or smaller switch cabinets/terminal boxes.
- Robust, spring-loaded jumper system for full nominal current
- Connectors are reliably connected
- Cost-effective marking system
- Ex approvals are standard
- POWER CAGE CLAMP terminal blocks also provide screwless termination of conductors up to 4/0 AWG (95mm²)
Project Support
From The Very Beginning...

Advice
- Planning support
- Component selection
- Assistance with project bidding

We will assist you with:
- Product documentation
- Manuals
- Application notes
- Component libraries

Expertise in:
- PLC programming
- Fieldbus applications
- Measurement value processing
- Telemetry
- Ex-Anwendungen
Casting, rolling and bending with the WAGO-I/O-SYSTEM
All WAGO products depicted in this brochure are in the following WAGO full line catalogs:

**Full Line Catalog Volume 1**
**Rail-Mounted Terminal Block Systems**
- Rail-Mounted Terminal Blocks
- X-COM®-SYSTEM
- Terminal Strips
- Patchboard Systems
- Shield (Screen) Connecting System

**Full Line Catalog Volume 2**
**PCB Terminal Blocks and Connectors**
- PCB Terminal Blocks
- Feedthrough Terminal Blocks
- PCB Connectors
- Connectors for Special Applications

**Full Line Catalog Volume 3**
**I/O Systems**
- Modular IP20/IP67 I/O-SYSTEM
- Radio Technology
- IP20/67 AS-Interface I/O-SYSTEM
- IP67 Block I/O-SYSTEM
- IP67 Sensor/Actuator Boxes
- IP67 Cables and Connectors
- Power Supplies

**Full Line Catalog Volume 4**
**Interface Modules**
- Interface Modules
- IP67 Sensor/Actuator Boxes
- Radio Technology
- Overvoltage Protection
- Power Supplies
- Empty Housings and DIN-Rail Mounting Carriers
To get a quick product overview, please use the Internet industry portal or the online catalog. We will be glad to answer your questions at metals@wago.com.