Your partner for success in the oil and gas industry

Boost competitiveness while staying sustainable, reliable, and safe in operation.
Comprehensive portfolio for digital transformation

Digital transformation promises more efficient processes, greater plant availability, raised asset and resource flexibility. But it takes a strong partner to leverage every benefit of digitalization for oil and gas industry. We will be at your side every step of the transformation journey, offering innovative, connected, and sustainable solutions for electrification, automation, and digitalization.

As an industry leader, we understand your challenges and can provide you with a comprehensive, flexible portfolio that meets all your demands along the lifecycle. We help companies in the oil and gas industry to master the transition into a sustainable future, offering cloud-based solutions with the highest cybersecurity standards at the core of all our connected products. Digitalization for oil and gas industry means that equipment such as process instrumentation, gas analyzers, and motors can send and receive data – increasing plant transparency and creating valuable insights for operators to make well-informed decisions. With more control comes more safety and efficiency.

In a highly competitive market, we offer solutions that are scalable from single plant sections to vast petrochemical complexes. Enabling you to get a competitive edge and take advantage of the potential of digitalization to the fullest. We are your partner for success.
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Digitalization

- MindSphere – the cloud-based, open IoT operating system
  - Open standards and interfaces to exchange data of many different manufacturers
  - Connectivity suite is available as hardware and software
    - MindConnect Nano, MindConnect IoT 2040, MindConnect Software
  - Integration in SIMATIC S7, SINUMERIK, and other products
  - Industry applications and partner development ecosystem
    - MindApps
    - Application Programming Interfaces (API) for developers
  - Aligned with relevant industry security standards (IEC 62443, ISO/IEC 27001)

- NXPower Monitor – a cloud-based application to start and accompany your digital journey in energy distribution
  - Visualize and monitor electrical assets in electrical distribution systems across multiple locations anytime and anywhere
  - Customize the application thanks to a modular and configurable approach
  - Transparency through assets summary and operations overview
  - Condition monitoring
  - Energy monitoring
  - Maintenance view

- SIMARIS Control – the innovative diagnostic station
  - Integration of the existing IEDs at field level for data collection, graphical representation, and control functions
  - Visualizing power flows and electrical measured values, switching device status
  - Recording measured values or device status
  - Condition-based monitoring by means of diagnostics data
  - Easy, reliable, and safe distance operation
  - Documentation management
  - Gateway and Cloud connectivity, i.e., MindSphere
  - OPC UA connectivity

- SIDRIVE IQ – IIoT solution and service for large drive systems
  - Cloud-based condition monitoring system
  - Digital platform tracks and visualizes various drive system conditions, shows trends and error messages, and generates reports
Digitalization

CloudConnect – cloud connectivity for connecting existing plants
Cloud applications are an important prerequisite for utilizing the benefits of digitalization in an industrial setting. With the Industrial IoT gateways, e.g., SIMATIC CloudConnect 716, even existing plants can be easily connected to a wide variety of cloud platforms that support the standardized MQTT protocol, such as to the MindSphere. Other IoT gateways such as RUGGEDCOM RX1400 with CloudConnect for special environmental conditions, SITRANS CC240, and SIMATIC IOT2050 specially for MindSphere connection complete our spectrum.

Asset Performance Suite
• Boost your asset performance through holistic data-driven analytics
• Navigate with Google-like searches across fleets, plants, sub plants, and assets
• Unlock industrial data by creating a 360° view of every asset, enabling advanced analytical and AI applications
• Makes industrial data accessible to people in your organization and software applications with its open, integrated solution
• Connect, manage, and analyze data across your whole fleet
• Zero onboarding of data sources resulting in 20x faster data integration combined with data quality by design
• Easy build-up of asset models with only 25% of original costs
• Enhance asset optimization management and strategic decisions with advanced asset intelligence
• Intuitive design for all stakeholders, including specialists wanting dedicated asset details or users wanting plant overviews

Example: SITRANS IQ – enabling you to talk to and understand your production plant

Store IQ & CC240
Understand the conditions of your silos better and manage your inventory efficiently to optimize logistics and secure your supply chain.

SAM IQ
Evolve your asset management to smarter asset management. SAM IQ gives you an overview of your plant’s entire assets, no matter the make.

Multi Sensors
Gain additional knowledge about your devices and process in a secure way. Now you can easily multiply your insights about processes and minimize any unforeseen surprises.

Serve IQ / Mobile IQ
Collect and analyze process data from remote points of measurement. Now you can remotely read and define parameters of field devices easily from short distance via Bluetooth.
Digitalization

Example: Siemens Predictive Analytics (SiePA) – a tool system for predictive maintenance of mission critical processes and equipment

Key Features
• Historical operating data for detection of process parameters correlated to the performance and health status of the equipment
• Model training based on integration of Machine Learning and domain experience
• Equipment and process condition pre-alert/prediction
• Problem diagnosis based on Natural Language Processing
• Modern dashboard with interactive and user-friendly data visualizations

User Benefits
• Increases asset uptime
• Enables remote monitoring and issue identification
• Increases operation efficiency
• Consolidates expert knowledge by constructing models to reduce workload of limited experienced engineers
• Supports better decision accuracy by combining data-driven solution with domain knowledge

Plant Engineering Software (COMOS)
• Integrated data management over the entire plant life cycle
• Common database with object-oriented data management
• Process engineering, pipe specification and isometrics
• Electrical, instrumentation, and control system engineering
• Project and plant documentation
• 3D virtual reality visualization
Digitalization

SIMIT Simulation Platform
- Virtual commissioning with SIMIT even without access to real systems and machines
- Extensive integration and use of existing data for easy creation of the Digital Twin
- Operator Training System (OTS) for safe and efficient training of plant personnel in a virtual environment
- Ready-to-use libraries with simulation components provide a quick-start in creating a virtual plant
- The Component Development Center (CDC) supports users in creating individual simulation components

gPROMS Platform
- Design of desirable production processes based on idea and definition of a product
- Digital Twin supports design of the process and equipment
- Detailed chemical simulation supported with advanced process modeling technology in gPROMS portfolio
- gPROMS supports from steady state to dynamic process design
- Provides optimization power to find the best design
- Helps designing the operating policy

Safety Verification and Analysis (gPROMS Flare)
- Relief, flare, and blowdown analysis as well as verification software
- Ensures safe design while minimizing CAPEX
- High-fidelity dynamic modeling
- High-CO₂ applications
- Related safety services

Real-time Optimization of Operations
- Optimization of LNG operations to minimize emissions and energy usage
- Integrated well-to-facilities oil field production optimization to maximize daily production value
- Integrated multi-site gas network optimization, management, analytics, and visualization solutions
Digitalization

**XHQ – Operations Intelligence Software**
- Simple access to complex data
- Aggregate, integrate, analyze, and visualize asset and business information from multiple back-end data sources
- Real-time information
- Make use of data you already have
- Break down barriers between software silos
- Drive collaboration at all levels
- Empowered decisions anytime, anywhere

**PlantSight – cloud services for the Digital Twin**
- Provides an immersive view of reality
- PlantSight consolidates assets of a plant and brings together various types of data from different sources
- Information centric solution including consistent and living Digital Twin of the entire plant
- Continuous change management for tracking every change and eliminating data duplicates
- Contextualized search and find for better and faster decisions at your fingertips
- Increase asset availability
- Decision-making based on real-time data
- Immediate overview of the facility condition with focus on critical assets
- Improve workforce efficiency through collaboration across all levels and disciplines
- Lower total cost of asset ownership

[siemens.com/plantsight](https://siemens.com/plantsight)

**Edge Computing with Industrial Edge**
A highly functional system with Edge applications, devices, and management
- Optimal use of data in the field
- No more resource- and time-intensive manual updates
- Data acquisition and processing directly and securely at the machine
- No latency using self-designed software and a central system for administration, deployment, and updates
- A security solution for the protection of data
- Shorter innovation cycles and greater flexibility
- Reduce the time to market
- Open ecosystem with low initial barrier

Digitalization

Moby.Check Digital Checklists
- Standalone software solution for digitizing MS Office templates for personnel in the field
- Runs on standard PCs, tablets, and smartphones via WLAN as well as on the mobile network
- Keyboard- and voice-controlled

High Flexibility
- Fast digitization of existing checklists in formats such as MS Excel and MS Word
- Quick and easy integration in existing maintenance or ERP systems
- Support of various (mobile) operating systems
- Simple release management for checklist templates

Practical Handling
- Only basic knowledge of MS Office required
- Minimal training required for users and administrators

Targeted Functionalities
- Low costs and integration effort
- Use of all features of mobile devices

Additive Manufacturing
- Allows individualized mass production, functional design, high energy and resource efficiency as well as shorter innovation cycles
- All techniques build work pieces layer by layer based on digital 3D design data
- Create complex structures that are light, stable, and might even offer improved functionality and performance
- Cost-effective even with a batch size of 1
Distributed Control System (DCS)

SIMATIC Hardware for DCS
- Fast and powerful automation systems
- Standard, high-availability, and safety-related
- Industrial Ethernet, PROFINET, and PROFIBUS interfaces
- Robust and secure
- Most powerful controller and highly-scalable based on the number of process objects (SIMATIC CPU 410-5H)
- Dedicated to small applications with a maximum of 200 process objects (SIMATIC CPU 410E)
- High processing speeds and deterministic reaction times for data-intensive tasks in the process and manufacturing industry (SIMATIC S7-400)

High-performance IO Systems
- Modular, scalable, compact
- Environmentally robust with conformal coating and extended temperature range
- Fail-safe options
- Intrinsically safe options
- Highest availability with PROFINET R1 redundancy, IO redundancy, and Change in Run (CiR) (SIMATIC ET 200SP HA)
- Fail-safe IO directly in Ex zone 1/21 with redundant power supply and certified up to SIL 3 (SIMATIC ET 200iSP)
- Decentralized and standardized management of field devices, connectivity for PROFIBUS PA devices, and freely configurable IO directly in the field (SIMATIC Compact Field Unit (CFU))
Distributed Control System (DCS)

SIMATIC PCS 7
- Continuous, batch, and sequential control
- Integrated asset management
- Advanced process control
- Flexible and scalable architectures
- Integrated control and process safety
- Batch management
- Cybersecurity
- High-performance graphics
- Virtualized solutions
- Service and support
- Process simulation (SIMIT)
- Energy management solutions
- Alarm management

SIMATIC PCS neo
- Process control innovation which opens up entirely new possibilities in the age of digitalization
- Based on the same hardware portfolio and application architecture as SIMATIC PCS 7
- Completely web-based process control system without installation effort
- Multi-User Engineering for global collaboration on projects
- Intuitive graphical user interface (GUI) for all users and applications in a single workbench
- Object-oriented data management for highly efficient and consistent workflows in engineering and operations
- Open and flexible architecture for modular automation and highest scalability (MTP)

Safety Systems
- TÜV certified from IEC 61508 to SIL 3
- Flexible, modular redundancy
- Burner management (BMS)
- High integrity pressure protection (HIPPS)
- Fire and Gas (F&G)
- Fault tolerant architecture to reduce spurious trips
- Emergency Shutdown Systems (ESD)
- Safety Life Cycle tools via cause and effects programming
- Compliant to IEC 61511 and ANSI/ISA standards
- Low cost standalone solutions
- Supports OSHA PSM requirements
- Cybersecurity
Distributed Control System (DCS)

Telecontrol Technology (RTU)
- Combining automation of central plants and monitoring of distributed units in a single process control system
- Homogenous operator control and monitoring using a common control station
- Uniform configuration with the same engineering system
- Consistent utilization of hardware components from TIA
- Remote Terminal Units (RTUs)
- Supported by SIMATIC
- Performance classified as small, medium, or large
- SIMATIC F controllers for implementing safety-related applications on-site
- SIMATIC F controllers automatically set plant to safe status in event of a dangerous fault
- Fulfill international standards such as IEC 61508, IEC 61511, and ISA S84 and are SIL 3 TÜV certified

The SIMATIC RTU3000C Family – remote yet reliable
- Compact, energy self-sufficient, low-power Remote Terminal Units (RTUs)
- Reliable monitoring of most remote measuring points
- Flexible power supply concept: 2 x 3 redundant battery modules, accumulator with a solar panel, or 12 – 24 V DC power source
- Operating condition from -40 to +70 °C
- IP68 degree of protection for use in areas at risk of flooding

Telecontrol Protocols Supported
- TeleControl Basic
- SINAUT ST7
- DNP3
- IEC 60870-5-104

Tank Farm Management System – TMS
Safety. Transparency. Availability. Efficiency. Today’s tank farms must fulfill all of these criteria to operate successfully. As a partner with comprehensive knowledge of seaport terminals, tank farms, loading and unloading stations as well as highly customizable solutions, including for digitalization, we can support your specific applications every step of the way.
Measurement Intelligence

Extractive and In Situ Continuous Process Gas Analysis

- Continuous determination of concentrations of one or more gases in a gas mixture
- Control and monitor process flows
- Check emissions

Process Gas Chromatography – MAXUM edition II

- Combines the most diverse detectors with a flexible oven solution
- Eminently suitable for applications ranging from simple to complex

Analytical Application Sets

- Standardized system solutions
- Supplement the range of individual system solutions
- For a wide range of sector-specific applications

Analyzer System Manager

- PC-based HMI system for monitoring, testing, and management of analyzers
- Information collected via various communication protocols and saved in a central database
- User-friendly operator interface for accessing measured value trends, device states and statistical evaluations, or starting test routines
- Comprehensive reporting module with predefined reports for documenting evaluations
- Maintenance module for planning, monitoring, and documenting device-specific maintenance tasks
Measurement Intelligence

Pressure
- Gauge
- Absolute
- Differential
- Hydrostatic

Temperature
- Head, rail, and field mounted transmitters
- Temperature transmitters
- Sensors
- Wireless transmitters
- Fiber-optic sensors

Level
- Radar and guided wave radar
- Ultrasonic
- Capacitance
- Point level

Flow
- Electromagnetic
- Ultrasonic inline and clamp-on
- Coriolis
- Vortex
Measurement Intelligence

SIPART Valve Positioners
• For linear and part-turn actuators
• SIPART PS2: particularly flexible stroke ranges, intelligent diagnostics, and various communication protocols
• SIPART PS100: simple handling and fast commissioning for standard applications

SIWAREX Weighing Components for Automation Systems
• Comprehensive range of weighing electronics
• Continuous SIMATIC hardware
• Seamless integration into Step 7, TIA Portal, and PCS 7
• Long-term availability

SIWAREX Load Cells
• Correct load cell for every nominal load
• Wide selection of different designs: from platform load cells to bending and shear beam, s-type, and compression cells
• Static and dynamic weight measurements

Dynamic Weighing
• Weighing on a running belt
• Precise and reliable dosing of components
Discrete Automation

SIMATIC Controllers
- Basic controllers for simple and standalone automation tasks (S7-1200)
- Advanced controllers for medium and highly complex machine/plant automation (S7-300, S7-400, S7-1500)
- Distributed controllers for serial machines with limited footprint and machines with distributed architecture (ET 200SP, ET 200S, ET 200pro CPU)
- Software controllers for PC-based automation (S7-1500 software controller, WinAC)

SIMATIC S7-1500
- CPUs with display for plain text information about system settings and diagnostics
- System diagnostics integrated in CPU, activated by default
- Integrated PROFINET and PROFIBUS interfaces
- Integrated Modbus TCP interface
- Supports Telecontrol protocols such as IEC 60870-5-101/104 and DNP3
- Fail-safe SIMATIC S7-1500F Controllers for processing standard and safety programs on the same controller
- Additional access protection by means of a firewall and establishment of secure VPN connections (using communication processor CP 1543-1)

SIMATIC Distributed I/O
- I/O Systems for Control Cabinets, IP20 (ET 200SP, ET 200SP HA, ET 200MP, ET 200S, ET 200M, ET 200iSP)
- I/O Systems without Control Cabinets, Machine Mount IP65/67 (ET 200AL, ET 200pro, ET 200eco PN)
- Modular, scalable, compact
- I/O modules can be configured as remote or local
- PROFIBUS, PROFINET, or EtherNet/IP* (*only in ET 200S or ET 200pro)
- Fail-safe options
- Intrinsically safe options (ET 200S, ET 200SP HA, ET 200M, ET 200iSP)
- Integrated motor starter option (ET 200SP, ET 200S, ET 200pro)
Discrete Automation

Totally Integrated Automation (TIA) Portal Software
- Single engineering framework
- Reduced engineering time
- Increased transparency and diagnostics
- Intuitive
- Common tag database
- Custom libraries

SIMATIC PC-based Automation
- Industrial PCs
  - Rack
  - Box
  - Panel
  - HMI Panel Ex
- Industrial Monitors and Thin Clients (SCD Monitors, Flat Panels, Industrial Flat Panels, Thin Clients)
- Expansion components/accessories
- Customization
- PC-based Controllers (S7-1500 Software Controller)
- Embedded Controllers (S7-1500 Open Controller)
- Embedded Bundles/Software Packages (Box Bundles, PC Bundles, Software Packages)

SIMATIC HMI Panels
- Comfort panels for performance and functionality (Standard, Outdoor, INOX)
- Basic panels for economical, high-resolution visualization solutions (2nd gen)
- Mobile panels for maximum mobility and flexibility (2nd gen)
- Key panels for flexible expansion with keys or safety functions (KP8/KP8F, KP32F)

SCADA System SIMATIC WinCC
- User-friendly, scalable system to meet your needs
- Absolute openness
- Integrated process database and Plant Intelligence
- Innovative web solutions
- Openness and international standards
Discrete Automation

SCADA System SIMATIC WinCC Open Architecture
- Object orientation
- Scalable to plus 10 million tags
- Platform-independent
- SIL 3 certified according to IEC 61508
- Platform for customized solutions
- Comprehensive range of drivers and connectivity

SIMATIC Safety Integrated
- One controller
- Engineering and communication for standard and fail-safe automation
- Wide range portfolio from micro-processors to PC-based controller
- Ability for local safety modules
- Centralized safety IO, PC-based safety, wireless safety
- Wide range of integrated drive technology
- Safety controller with single processor for TÜV approval
**Industrial Controls – Power Circuit Components**

**SIRIUS 3RV20 Motor Starter Protectors**
- UL-approved as Self Protected Combination Motor Controllers (Type E)
- Manual motor controller, disconnect, short circuit and overload protection
- 3RV201/2 – Size S00, S0, Trip Class 10 up to 40 A
- 3RV203 – Size 2, Trip Class 10 or 20 up to 65 A
- 3RV204 – Size 3, Trip Class 10 or 20 up to 100 A
- Screw or spring clamp connections

**SIRIUS 3RV27/28 Circuit Breakers**
- UL489-rated
- Sizes S00 to S3
- For motor and transformer protection
- Range 0.16 A to 70 A
- S3 delta rating 10 A to 30 A at 480 V AC
- Screw or spring clamp connections

**SIRIUS 3RV29 Infeed System**
- Space saving infeed system for group motor starter installation
- Use with sizes S00 and S0, 3RV20 MSP, and 3RT contactors
- Expandable up to 63 A
- Plug-in design for quick installation and reduced wiring

**SIRIUS 3RU Thermal Overload Relays**
- Sizes S00 to S3
- Up to 100 A, Trip Class 10
- 1 NO + 1 NC Aux contacts
- Manual/automatic reset
- Switching position indication

**SIRIUS 3RB2 and 3RB3 Solid-State Overload Relays**
- Sizes S00 to S12
- Up to 630 A, Trip Class 5, 10, 20, or 30
- 1 NO + 1 NC Aux contacts
- Manual/automatic reset
- Self-evaluating and indication
Industrial Controls – Power Circuit Components

ESP200 Solid-State Overload Relay
• Rugged and reliable design for both industrial and commercial applications
• Self-powered
• Market leading trip accuracy greater than 99%
• Trip class selectable (5, 10, 20, 30)
• Class 958 version provides protection for sealed compressors and artificially cooled motors
• Class 958L version is designed for oil market and pumping applications with precise trip curve
• Rugged and reliable design for NEMA

SIRIUS 3RB24 Electronic Overload Relay with IO-Link Communications
• Overload protection, control, and monitoring of three-phase and single-phase motors
• Easy 3-wire connection interface to IO-Link master
• Flexible trip class selection (5, 10, 20, 30)
• Spring or screw connections (removable)
• Available operator panel for local interface

SIMOCODE pro 3UF7 Motor Management System
• Extensive motor protection, monitoring, and control functions, independent of the automation system
• Detailed operational, service, and diagnostics data – at any time or place
• Open communications via PROFBUS DP, PROFINET, OPC UA, Modbus RTU or EtherNet/IP
• Safety relay function for fail-safe shutdown of motors up to SIL 3 – also supports PROFIsafe communication to fail-safe SIMATIC S7 controller
• Scalable, flexible solutions for all plant configurations
• Integration in process control systems such as SIMATIC PCS 7 as well as TIA Portal software
• Sensorless pump dry-run protection for ATEX areas and flammable liquids
**Industrial Controls – Power Circuit Components**

**SIRIUS 3RT2 Contactor**
- Designed for premium efficient motor control (IE3/4 ready)
- Energy-efficient coil and contacts reduce energy costs and heat generation during operation
- Available in sizes S00 to S3 (75 kW)
- Available with extended temperature and rail-certified
- Resistive load rated up to 110 A with 3RT23 series
- Screw or spring-loaded terminals
- Safety-rated according to IEC 60947-4
- S6 – S12 up to 400 kW available

**SIRIUS 3RF Vacuum Contactor**
- UL-rated to 700 kW at 480 V
- AC and DC coil options
- Ideal by-pass contactors for large low voltage Soft Starters and VFDs
- Accessories available

**NEMA Rated Class 40 Contactor**
- Available NEMA sizes 00 to 8
- AC and DC coil options
- Open and enclosed options
- Enclosed NEMA 1, 4/4X SS, 4X FG, NEMA 7 & 9 Hazloc, NEMA 12 & 3/3R water proof
- Up to 900 kW at 480 V
- Accessories available
- Reversing version Class 43

**SIRIUS 3RA2 Reversing Contactors**
- Designed for premium efficient motor control (IE3/4 ready)
- Energy-efficient coil and contacts reduce energy costs and heat generation during operation
- Completely assembled out of the box with 3RT2 contactors
- Touch-safe connection system
- Available in sizes S00 to S3 (75 kW)
- Resistive load rated up to 110 A with 3RT23 series
- Screw or spring-loaded terminals
- Safety-rated according to IEC 60947-4
- S6 – S12 up to 400 kW available
Industrial Controls – Power Circuit Components

SIRIUS 3TC V DC Power Contactor
- Ideal applications include, battery chargers/testing, solar, rail, heaters, lamps, cranes, plating, etc.
- 1-pole and 2-pole
- Up to 600 V DC at 330 A
- AC and DC coil options
- Available in sizes 2, 4, 8, 12
- 2 NO and 2 NC mirror Aux contacts

SIRIUS 3RM1 Hybrid Motor Starter
- Up to 3 kW at 480 V
- Slim design, only 22.5 mm width
- Non-reversing, reversing, O.L protection, and available safety integrated
- Hybrid start uses solid-state switching on start-up and relay on run
- Optional control bus and comb system reduces wiring for installation with 3SK safety relays

SIRIUS 3RA6 Compact Motor Starter
- Up to 20 kW at 480 V
- Modular motor control system with plug-in design for non-reversing and reversing motor starters
- 3RA68 power bus offers snap-in design for adding starters up to 63/100 A
- Available in standard and networkable, AS-Interface, and IO-Link
- Spring or screw connections (removable)
- Motor modules consist of circuit breaker disconnect, contactor, and overload protection

SIRIUS 3RA2 Combination Starter
- Integrated 3RV2 MSP and 3RT contactor offers circuit, O.L protection, and contactor in one unit
- Mounting rail or FastBus busbar system mounting
- Designed for premium efficient motor control (IE3/4 ready)
- Energy-efficient coil and contacts reduce energy costs and heat generation during operation
- Available in sizes S00 to S3 100 A
- Screw or spring-loaded terminals
Industrial Controls – Power Circuit Components

SIRIUS 3RA22 Reversing Combination Starter
- Integrated 3RV2 MSP and 3RT contactor offers circuit, O.L protection, and dual contactors in one unit
- Mounting rail or FastBus busbar system mounting
- Designed for premium efficient motor control (IE3/4 ready)
- Energy-efficient coil and contacts reduce energy costs and heat generation during operation
- Available in sizes S00 to S3 100 A
- Screw or spring-loaded terminals

NEMA Rated Class 14 Motor Starter
- Available NEMA sizes 00 to 8
- AC and DC coil options
- Includes ESP200 solid-state overload relay on common mounting plate
- Open and enclosed options
- Enclosed NEMA 1, 4/4X SS, 4X FG, NEMA 7 & 9 Hazloc, NEMA 12 & 3/3R water proof
- Up to 900 kW at 480 V
- Accessories and field kits available

NEMA Rated Class 22 Reversing Starter
- Same features as Class 14
- With dual contactors

Other NEMA
- Class SMF Fractional HP Starters
- Class MMS and MRS Switches
- Class 11 Starter and Switches
- Class 17, 18 Combination Starters
- Class 25, 26 Combination Reversing Starters
- Class 30 Multi-Speed Starters
- Class 32 Combination Multi-Speed Starters
- Class LE, LC, CLM Lighting Contactors
Industrial Controls – Power Circuit Components

8US FastBus
- Ideal applications include automotive power distribution panels
- 3-phase insulated busbar system
- Permits flexible, high-density panel design of motor starters and power control components up to 1400 A at 600 V
- Ideal for 3RA2 and 3RA22 combination starters up to 75 kW as well as 3VA and SENTRON circuit breakers
- Busbar shoes available for circuit breakers, starters, and other products
- U.S. and international approvals
- Extensive line of accessories available

SIRIUS 3RW Soft Starters
- Reduce current peaks on motor starts with configurable ramp-up times
- Integrated by-pass contactor after ramp reduces heat and provides increased energy efficiency
- Available in (3) series depending on the motor size and needs of the application
  - 3RW30: standard applications, 2-phase controller for 1.5 kW to 75 kW at 200 – 480 V
  - 3RW40: standard applications, 2-phase controller for 7.5 kW to 300 kW at 200 – 600 V, overload protection, and current limiting
  - 3RW44: high-feature, 3-phase controller for 15 kW to 900 kW, communication and advance motor management, configuration with Soft Starter ES software
- Available in enclosed versions

SIRIUS 3SU1 Pilot Devices
- 22 mm pilot devices include indicator lights, pushbuttons, illuminated pushbuttons, emergency-stop pushbuttons, selector switches, and stations
- Quick and easy installation, mounting is 50% faster with single screw installation
- High degree of protection IP69K standard
- Available in plastic and metal options
- Options for 30 mm mounting
- Innovative 4-position RFID selector switch available
- Networkable via IO-Link, AS-Interface, and PROFINET including PROFIsafe
Industrial Controls – Control Circuit Components

Class 50 Pilot Devices
- Available standard NEMA 1 & 1B and heavy duty NEMA 4 pushbutton stations
- Flush or surface mounting

Class 51 Pilot Devices
- 30.5 mm hazardous location NEMA type 7 & 9 pilot devices, selector switches, pushbuttons, and stations
- UL and cUL listed for Class I (gases), Groups C & D; Class II (dust), Groups E, F & G; Class III (fibers) hazardous location ratings

Class 52 Pilot Devices
- 30.5 mm heavy duty, watertight/oiltight pilot devices, selector switches, pushbuttons, and stations
- Meets type 1, 3, 3R, 4, 4X, 12, 13 NEMA protection standards
- BlackMax version is available for increased corrosion-resistance in harsh environments

SIRIUS 8WD4 Signaling Columns
- Two series available: 8WD42 50 mm, IP54 and 8WD44 70 mm, IP65
- Flexible and modular design for visual and acoustic warning
- Shock- and vibration-resistant
- Available with AS-Interface for 2-wire networking with power

SIRIUS 8WD53 Beacons
- 70 mm, IP65 protection
- 24 V to 230 V AC/DC operating voltage
- LED and incandescent lamp options
- 360 degree continuous or flash indication
- Easy mounting base with screw and nut
SIRIUS 3RS2 Temperature Monitoring Relays
- Monitors temperatures of solids, liquids, and gaseous media
- Two series available: analog or digital adjustable
- Due to an integrated infrared interface (SIL 1), the digital basic unit can be expanded by up to three sensors and an analog input (4 ... 20 mA)
- Spring or screw connections (removable)
- Local or remote configuration
- Built-in IO-Link communications

SIRIUS 3RN2 Thermistor Motor Protection Relay
- Overheating protection for motors
- Bimetallic and PTC sensor inputs for low cost and high feature protection options
- Plug and play installation, no configuration required
- Spring or screw connections (removable)
- ATEX hazardous location options

SIRIUS 3UG4 and 3RR2 Electrical and Mechanical Monitoring Relays
- Monitoring and protection of various electrical and mechanical parameters
- Digital local and IO-Link configuration
- Stand-alone (3UG4) or integrated on 3RT2 contactors (3RR2)
- Line- and single-phase voltage monitoring (3UG4)*
- 3RT2 contactor mounting for current monitoring (3RR2)*
- Current and power factor monitoring (3UG4)*
- Residual current monitoring (3UG4)*
- Speed monitoring of motors and belts (3UG4)*
- Spring or screw connections (removable)
*Available IO-Link communications

SIRIUS 3RP25 Timing Relays
- Cost effective 17.5 mm and high feature 22.5 mm relay options
- Wide voltage range 12 to 240 V AC/DC
- Up to 27 timing functions make relay flexible for all timing applications while reducing inventory
- Spring or screw connections (removable)

SIRIUS 3RA28 Timing and Electrical Interlocking Functions for 3RT2 Contactors
- Direct mount to 3RT2 contactors expands functionality
- Timing, IO-Link, and AS-Interface
- Local configuration
- Load and auxiliary functions
Industrial Controls – Control Circuit Components

SIRIUS 3RQ1 Coupling Relays
- Wide voltage ranges from 24 to 240 V AC/DC
- Force-guided contacts
- Safety certification based on functional safety up to SIL 3, PL e (IEC 61508/ISO 13849)
- Usable as an output expansion for SIRIUS 3SK safety relays via a device connector
- Genuine load contacts, including in NC circuit
- Push-in or screw connection

SIRIUS 3RQ2 Coupling Relays
- Wide voltage range from 24 V to 240 V AC/DC
- Optionally with one, two, or three changeover contacts
- High contact reliability thanks to hard gold-plated contacts

SIRIUS 3RQ3 Coupling Relays
- Cost-effective and space saving isolation only 6.2 mm wide
- Multiple options for voltage and contacts or solid state
- Available with replaceable relays and indication
- Bridging combs and universal accessories available
- Push-in or screw connection
- Built-in arc suppression diode

SIRIUS 3RS70 Interface Converters
- Simple signal conversion of standard and non-standard signals, both analog and frequency for interface to controllers or other devices
- 3-way isolation keeps signals separate
- Push-in or screw connection

SIRIUS 3RH2 Control Relays
- 4-pole control circuit relays
- 10 A current rating
- AC or DC coil options
- Surge suppressor options
- Spring or screw connections
Industrial Controls – Control Circuit Components

8W Terminal Blocks
- Globally accepted
- Connection types available
  - 8WH1 – screw
  - 8WH2 – spring loaded
  - 8WH5 – combination
  - 8WH6 – push-in
  - 8WH3 – insulation displacement
- Single- and multi-tier
- Compact design
- Accessories available

3SE5 International (IEC) Limit Switches
- Different operator types and styles
- Available in plastic and metal
- Different sizes available (31, 40, 50, 56 mm)

3SE03 North America (NEMA) Limit Switches
- Modular, plug-in design
- Heavy duty
- NEMA 6P rated, submersible available
- Different connections available
  (Plug-in, Pin connector, Prewired cable)

SIRIUS 3SE Mechanical Safety
- Machine door and perimeter guarding solutions
- 5 different families with many options in plastic and metal
- 3SE7 Cable-operated switches
- 3SE5 Interlock switches with separate actuator
- 3SE5 Interlock switches with solenoid locking
- 3SE5/3SE2 Hinge switches
- 3SE6 RFID non-contact safety switches
- 3SE6 Magnetic monitoring systems

SIRIUS 3SU1 Two-Hand Control Station
- Cost-effective and configurable operator control stations for two-hand machine cycling
- Integrated E-stop
- Capacitive or operator actuator buttons
Industrial Controls – Control Circuit Components

SIRIUS 3SK Safety Relays
- Simple to advanced safety functions can be handled by the 3SK series of safety relays
- Modular and flexible design
- Available bus for simple expandability
- Safety-rated according to SIL3, PL e
- 3SK1 Standard: simple functions with DIP switch setting
- 3SK1 Advanced: same as Standard, expandable with additional functions
- 3SK2: software configurable and expandable with up to 20 inputs, configurable independent outputs
- 3SK2: diagnostic display optional
- Easy integration with 3RM1 motor starters

Control Power Transformers (CPT)
- Rugged and reliable design for both industrial and commercial applications
- Domestic and global application by class: Class MT for domestic only, Class MTG for domestic and global
- 50 VA up to and including 5 000 VA, 600 volts 50/60 Hz primary, secondary 24 to 240 volts
- NEMA ICS2, UL-506 listed, CSA-certified, Class MTG also meets IEC and EN requirements
- Class KT kit available for mounting and wiring

3WL5 Air Circuit Breakers
- 3WL5 ACB Standard
  - UL 489, UL 489B
  - IEC 60947-2
- Ranging from 1 000 A to 5 000 A and up to 100 kA
  \( I_{cu} = I_{cs} \times 480 \text{ V AC} \)
- As incoming-feeder, distribution, tie, and outgoing-feeder circuit breakers in electrical installations
- For switching and protecting motors, capacitors, generators, transformers, busbars, and cables
- Innovative software products for parameterization, operation, monitoring, and diagnostics of circuit breakers both locally or via PROFIBUS DP, Modbus, or Ethernet/Intranet/Internet
- Complete integration of the circuit breakers into the Totally Integrated Power and Totally Integrated Automation solutions
- UPS battery and capacitor
- Power Security modules
Industrial Controls – Control Circuit Components

3VA Molded Case Circuit Breakers
- 3VA available from 15 A to 600 A and up to 150 kA
- VL-150-1600 A frame, global ratings, and up to 100 Kaic interrupt ratings
- G Frame: 25 A and less and interrupt ratings to 65 Kaic
- Supplementary protection
- UL 489 – 5SJ power circuit protection
- UL 1066 – 5SY control circuit protection

5S Branch Circuit and Supplementary Protectors
- 1-pole to 4-pole circuit protection
- UL 489- or UL 1077-rated
- AC or DC voltage options
- Up to 63 A (5SP4 up to 125 A)
- 5SY1 CBE for equipment protection behind the DC power supply
- DIN rail mountable
- Accessories available

Industrial Communications

F-CM AS-I Safety ST for SIMATIC ET 200SP
- AS-I fail-safe master
- Supports PROFIsafe communications to fail-safe SIMATIC S7 controller (PROFIBUS DP or PROFINET)
- Process image supports up to 31 fail-safe inputs and 16 fail-safe outputs
- Supports simple replacement thanks to automatic importing of safety parameters from the coding element
- Extensive diagnostics including 8 LEDs on module
- Configures with TIA Portal V14
Industrial Communications

**SIRIUS K20F Compact Safety IO Module**
- 20 mm width for confined space applications
- IP67 degree of protection
- 2 fail-safe digital inputs
- M12 AS-I connection for use with round cable

**SIRIUS 3RK1105 AS-I Safe Safety Monitors**
- Monitors safety slaves and performs safety operations up to SIL 3, PL e, Category 4
- Option for 1 or 2 enabling circuits
- Screw or spring connection system
- Versions available with integrated safe slave
- AS-Interface 3.0
- AS-I Master
- Supports connection of up to 62 AS-I slaves
- Configures with TIA Portal Step 7

**SIRIUS K45F Compact Safety IO Module**
- 45 mm width
- IP67 degree of protection
- Options for 2F-DI, 2F-DI/2-DO, or 4F-DI (M12)

**SIRIUS SC17.5F SlimLine Compact Safety IO Module**
- 17.5 mm width
- IP20 degree of protection
- DIN rail mounting
- Options for 2F-DI and 2F-DI/2-DO
- Screw or spring connection system

**AS-Interface Masters**
- AS-I Master
- Supports connection of up to 62 AS-I slaves
- Configures with TIA Portal Step 7
- AS-Interface 3.0
Industrial Communications

SIRIUS K20 Compact AS-I Module
• AS-I Slave
• IP67 degree of protection
• IO combinations available: 4I/4O, 4I, 2I/2O, 4O
• Round cable only

SIRIUS K45 Compact AS-I Module
• AS-I Slave
• IP67 degree of protection
• IO combinations available: 8I, 4I/4O, 4I, 2I/2O, 4O, 3O
• Flat cable only

SIRIUS K60 Compact AS-I Module
• AS-I Slave
• IP67 degree of protection, K60R IP69K
• IO combinations available: 8I/2O, 8I, 4I/4O, 4I/3O, 4I/2O, 4I, 2I/2O, 4O, 3O
• Analog IO options available: voltage, current, and RTD
• Flat/Round

SIRIUS SC17.5 and SC22.5 SlimLine AS-I Module
• AS-I Slave
• IP20 degree of protection
• IO combinations available: 4I/4O, 4I, 4I/2O, 4O
• Relay and solid-state output options
• Analog IO options available: voltage current selectable or RTD
• Round cable only

SM 1278 IO-Link Master for SIMATIC S7-1200
• 4-channel IO-Link module
• IP20 degree of protection
• 32 bytes input and output per channel
• Up to 8 SM 1278 can be used per SIMATIC S7-1200 CPU
• IO-Link specification v1.1
• Data rates supported: 4.8 k, 38.4 k, and 230.4 k baud
• Configured with Port Configuration Tool (PCT)
• Programming and setup supported by TIA Portal
**Industrial Communications**

**CM 4 x IO-Link Master for SIMATIC ET 200SP**
- 4-channel IO-Link module
- IP20 degree of protection
- 32 bytes input and output per channel
- IO-Link specification v1.0 and 1.1
- Data rates supported: 4.8 k, 38.4 k, and 230.4 k baud
- Configured with Port Configuration Tool (PCT)
- Programming and setup supported by TIA Portal

**ET 200eco IO-Link Master**
- 4-channel IO-Link module, additional non-IO-Link inputs and outputs onboard
- IP67 degree of protection
- M12 connections
- 2 models available: 30 mm and 60 mm width
- 32 bytes input and output per channel
- IO-Link specification v1.0 and 1.1 on 30 mm model, v1.0 only on 60 mm model
- Data rates supported: 4.8 k, 38.4 k, and 230.4 k baud
- Configured with Port Configuration Tool (PCT)
- Programming and setup supported by TIA Portal

**ET 200eco IO**
- 4-channel IO-Link module
- IP67 degree of protection
- M12 IO connections, M8 backplane and power connections
- 30 mm width
- 32 bytes input and output per channel
- IO-Link specification v1.0 and 1.1
- Data rates supported: 4.8 k, 38.4 k, and 230.4 k baud
- Configured with Port Configuration Tool (PCT)
- Programming and setup supported by TIA Portal

**K20 IO-Link Input Modules**
- Connection to IO-Link Master allows standard sensors, either 4 or 8, to be connected to 1 IO-Link channel
- Ideal for replacing “sensor boxes”
- IP67 degree of protection
- 2 models available: 4 inputs which uses M12 connections with Y pin and 8 inputs which uses M8 connections
- 20 mm width
Industrial-grade network components enable secure, reliable, and high-availability connectivity in challenging environments. With key international industry approvals including ATEX, UL HazLoc, IECEx, and IEC 61850, these products ensure greater operational efficiency and object recognition.

**Industrial Security**
Industrial Security Appliances from SCALANCE and RUGGEDCOM protect industrial networks and automation systems by segmenting the network and establishing secure communication channels.

**SCALANCE S Industrial Security Appliances**
- User-specific firewall and securing local network access
- Simple device replacement with C-PLUG
- Redundancy mechanisms through VRRPv3
- Flexible and user-specific access rights

**RUGGEDCOM Multi-Service Platforms**
- All-in-one layer 3 router, VPN, and firewall
- Provide enhanced IPsec and encryption performance for data security
- Easily deploy third-party applications for Edge computing and cybersecurity at the OT Edge, for example: secure access management, next-generation firewalls, intrusion prevention, and anomaly detection with RUGGEDCOM APE1808 (application processing engine)

**RUGGEDCOM Layer 2 Switches**
- Ideally suited for mission-critical control applications
- High degree of reliability and availability in extreme harsh environments
- Smooth operation in extended temperature range from -40 to +85 °C
Industrial Network Components

**Industrial Ethernet Switches SCALANCE X**
- Large portfolio with compact, flat, modular, and 19" rack devices in layer 2, layer 2/3
- High data rate up to 10 Gbps and Power over Ethernet (PoE)
- NAMUR NE21-compliant variant: conformal coating (G3), temperature range -40 °C to +70 °C, installation altitude up to 4 000 m, IP65 degree of protection for applications without control cabinet
- Approvals for ATEX Zone 2/IECEx, cULus HazLoc, FM

**RUGGEDCOM WIN**
- Broadband wireless product portfolio for private networks
- Delivers the benefits of carrier-grade 4G technology

**SCALANCE W Devices**
- Offer reliable industrial wireless communication at various automation levels
- Support fail-safe data transmission according to IEEE 802.11n standard

**SCALANCE M Family**
- Includes modems and routers
- For wired or wireless private and public IP-based networks
- High level of immunity to EMI, shocks, and vibrations

**SINEC NMS – OT Network Management System**
- Flexible and scalable
- Overall and transparent monitoring of the entire industrial network
- Policy-based configurations of the network infrastructure
- Centralized firewall/NAT and firmware management via topology-based rollout
- Policy-based user management
- Northbound interface for connecting to other systems, e.g., for sending security-relevant messages via syslog
Industrial Network Components

FastConnect Cabling System
- Designed for industrial networks
- Optimally matched components for quick configuration and assembly of network structures
- No specialist knowledge necessary

Additional Products
- Multi-service platforms
- Media converters
- Serial device servers
- Software solutions
- Compact RTU3000C
- Communication modules, e.g., CP 1542-1 IRC supporting telecontrol protocols (TeleControl Basic, SINAUT ST7, DNP3, IEC 60870-5-10x) for modular RTUs based on SIMATIC Controller

Industrial Identification and Locating

Industrial Identification
- Complete, scalable portfolio of powerful RFID and optical readers
- Simple integration into the SIMATIC automation environment
- High process security
- Very secure investment thanks to flexible and economical solutions
- Components with a high protection class for use in tough industrial environments

Real Time Location – comprehensive localization platform including hardware and software components
- Transponders
- Anchors
- Gateways
- Locating Manager
Industrial Power Supplies

SITOP Power Supplies and Power Security
- Extensive line of single-phase and three-phase DC power
- Supplies, some with networking
- UPS battery and capacitor
- Power Security modules

Reliability
- Flexible wide range input
- Excellent load characteristics
- All relevant certification
- Add-on modules counteract disturbances on the DC voltage or line side

Efficiency
- Low power loss – even during no-load operation
- Power supply outputs can be specifically switched off with the support of PROFlenergy
- TIA Selection Tool makes it easy to select the right power supply and DC UPS uninterruptible power supply

Integration
- SITOP UPS1600 can be easily integrated via USB or Ethernet
- SITOP library for SIMATIC PCS 7 enables transparent 24 V supply in the process control system during ongoing operation
- SITOP PSU8600 and SITOP UPS1600 can communicate via PROFINET and OPC UA
- OPC UA server enables direct incorporation of controllers or PCs into automation applications with OPC UA clients from different manufacturers
SIMOTICS Motors and SINAMICS Drives – the reliable path to maximum safety

The oil and gas industry is characterized by extreme demands placed on the drive technology used – from high explosion risk to the aggressive salt laden air offshore, extreme low temperatures in polar regions, or the heat and dust of the desert. Drives for the oil and gas industry meet the IEC and NEMA standards and offer maximum protection for people, machines, and the environment.

The rugged SIMOTICS motors and SINAMICS drives are fail-safe and extremely durable in operation even under the most extreme conditions and in hazardous areas. Their performance profile makes them the ideal solution for all applications in the process industry from pumps, fans, and compressors to extruders, separators, and agitators.

The CHEMSTAR Concept – tailored to the oil and gas industry

- SIMOTICS SD for safe area applications
- Explosion protected SIMOTICS XP motors and SIMOTICS SD in the industry specific CHEMSTAR design
- SIMOTICS motors in CHEMSTAR design are equipped with adapted, preconfigured options
- Steel fan cover
- Stainless steel screws and bolts
- External grounding
- Reinforced bearings
- Application specific painting up to grade Cx, with optional painting thickness of 400 µm they fulfil NORSOK requirements
- Increased durability against high humidity
- IP66 degree of protection
- Extended warranty of 36 months
- Project specific documentation
- Combination with all available variants and options, e.g., motors with reduced starting current, premium insulation for systems up to 690 V, motor monitoring by PTC and PT100 for bearings and windings
- Flameproof motors can be designed for gas group IIB and IIC over the complete power range
- Meet standards like the new harmonized specification of IOGP (The International Association of Oil & Gas Producers)
Drives, Motors, and Motion Control

Standard Performance Drives
- SINAMICS V20 0.12 – 30 kW
- SINAMICS G120C 0.55 – 132 kW
- SINAMICS G120 0.55 – 250 kW
- SINAMICS G130/G150 110 – 2 700 kW

Industry Specific Drives
- SINAMICS G180 2.2 – 6 000 kW
- SINAMICS G120X 0.75 – 630 kW

High Performance Drives
- SINAMICS S120 0.55 – 6 840 kW
- SINAMICS S150 110 – 1 200 kW
- SINAMICS DCM 1.61 – 2 500 kW

Distributed Drives
- SINAMICS G115D 0.37 – 7.5 kW

Servo Drives
- SINAMICS S120 0.25 – 6 840 kW
- SINAMICS S210 0.1 – 7 kW

Engineered Drives
- SINAMICS AC Drives 150 kW – 100 000 kW
- SINAMICS GL150 LCI Drives
- SINAMICS GM150/SM150 NPC Drives
- SINAMICS PERFECT HARMONY GH180/GH150 Drives
- SINAMICS SH150 Drives M2C VSI
- All weather environmental enclosures (NEMA 3R, 4R, 4X)

Motion Controllers
- Drive-based (SIMOTION D)
- PC-based (SIMOTION P)
- Controller-based (SIMOTION C)
- Distributed level-event monitoring and power metering
Drives, Motors, and Motion Control

Low Voltage Motors (SIMOTICS LV)
- NEMA Induction Motors
- Severe Duty: 1 HP – 400 HP
- Explosion Proof: 1 HP – 250 HP
- Vertical Solid Shaft: 3 HP – 250 HP
- Heat Exchanger: 5 HP – 75 HP
- AboveNEMA (SLV Brg): 200 HP – 800 HP

Low Voltage Motors SIMOTICS SD for Safe Area and SIMOTICS XP for Hazardous Zones (IEC) – overview
- Consistent platform for safe area as well as explosion protected motors
- Power range from 0.09 – 1 000 kW
- Voltage range from 230 – 690 V
- Fixed speed and variable speed operation
- Degree of protection from IP55 up to IP66
- Types of explosion protection: Ex db, Ex db eb, Ex eb, Ex ec, Ex tb, Ex tc
- Seamless offering Ex db and Ex db eb from 0.25 up to 460 kW in IIB and IIC
- High efficiencies: IE3 and IE4
- Number of poles: 2 – 8
- Design in IMB3, B5, B34, B35, V1, etc.
- Rugged and reliable
- Standardized tools and processes

Medium and High Voltage Motors (SIMOTICS HV)
- Standard and special motors: 150 kW – 100 MW
- SIMOTICS HV C, SIMOTICS HV M, SIMOTICS HV HP, SIMOTICS HV ANEMA
- Asynchronous Squirrel Cage Motors: 150 kW – 40 MW
- Asynchronous Slipring Motors: 500 kW – 18 MW
- Synchronous Motors: 5 – 100 MW
- Horizontal and vertical motors for voltages up to 13.8 kV
- Standards IEC, NEMA, API 541, API 547, IEEE 841
- Explosion protection Ex db, Ex db eb, Ex ec, Ex tc, Ex pxb, Ex pzc
- Different cooling types: open, air, water
Power Distribution

Medium- and Low-Voltage Switchgear, Circuit Breakers, and Controls

- Medium-voltage, air-insulated switchgear, type-tested as per IEC (up to 50 kA)/ANSI (up to 63 kA)
- Medium-voltage, maintenance-free, gas-insulated switchgear in single-phase encapsulated design
- Smart low-voltage switchboard with best arc flash mitigation solutions and with powerful motor management system
- High-current and generator switchgear with vacuum switching technology answers highest technological, quality, and personnel safety requirements enabling maximum operational reliability in oil and gas applications up to 450 MW
- Low-voltage busbar trunking systems for flexible power distribution for both indoor and outdoor applications
- Medium-voltage outdoor distribution equipment including Live/Dead tank circuit breakers, vacuum reclosers, traction breaker, and accessories
- The fusesaver is the perfect protection solution for overhead spur lines against temporary faults
- Low-voltage replacement circuit breakers designed with a direct connection to the primary contacts and with arc flash mitigation
- Medium-voltage vacuum roll-in replacement circuit breakers for ANSI switchgear applications
- Power distribution center solutions to house various types of electrical equipment, i.e., E-House
Power Distribution

NXAIR Air-Insulated Switchgear (AIS)

Technical Features
• Up to 17.5 kV / 50 kA / 4 000 A; up to 24 kV / 25 kA / 2 500 A; up to 36 kV / 31.5 kA / 2 900 A
• Factory-assembled, type-tested metal enclosed switchgear according to IEC 62271-200
• Evidence of the making and breaking capacity of the CB and the make proof earthing switch tested inside the panel
• Air as insulating medium always available
• Marine certification

Benefits
• Maintenance interval for switchgear >10 years
• Positively driven lockable shutters
• Fast access to all switchgear compartments
• All operations with HV door closed
• Logical mechanical interlocks as standard

8DA10/8DB10 Gas-Insulated Single-/Double-Busbar Switchgear

Technical Features
• Up to 40.5 kV / 40 kA / 5 000 A (busbar), 3 150 A (feeder)
• Hermetically sealed primary enclosure
• Factory-assembled and type-tested switchgear according to IEC 62271-200
• Busbar and circuit breaker are single-pole encapsulated in different vessels (IP65)
• Logical mechanical interlocks according to IEC 62271-200

Benefits
• Maintenance-free and climate-independent
• Two- and three-phase short circuits not possible because of single-phase encapsulation
• Extension 8DB10 without shutdown of the busbar
• Highly available: zero ingress of moisture, small animals, and dust
Power Distribution

NXPLUS C Gas-Insulated Single-/Double-Busbar Switchgear

Technical Features
• Up to 17.5 kV / 31.5 kA / 2 500 A; up to 24 kV / 25 kA / 2 500 A; up to 36 kV / 25 kA / 2 500 A
• Factory-assembled and type-tested switchgear according to IEC 62271-200
• Hermetically enclosed (SF6), solid insulated
• Only permitted operations possible due to logical mechanical interlocks
• Climate-independent and reliable even under the most extreme ambient conditions
• Marine Certification

Benefits
• Compact design
• Maintenance-free for lifespan
• Highest personnel safety and highest security of operation
• CAPEX and OPEX efficient

blue GIS

Technical Features
• Up to 12 kV / 40 kA / 2 750 A (8DAB 12 – blue GIS)
• Up to 12 kV / 20 kA / 630 A (8DJH 12 – blue GIS)
• Up to 24 kV / 25 kA / 1 250 A (NXPLUS C 24 – blue GIS)
• Insulation medium based on the component of the ambient air
• Switching technique based on proven vacuum technology
• All the benefits of gas-insulated switchgear

Benefits
• No F-gases: significant reduction in greenhouse gas emissions
• Long-lasting design
• Use of environmentally safe materials
Power Distribution

SIQuench® by Siemens

Technical Features
- Active arc effect mitigating system
- Quenches the internal arc in sub-cycle times
- Reduces pressure and avoids thermal, contamination, and toxicity effects which damage the equipment and its surroundings
- Minimizes duration of downtime for operations and reduces economic losses in event of internal arc fault

Benefits
- Highly increased equipment and process availability
- Reusable: can switch 5 times without the need for replacement
- Maintenance-free for 20 years
- Can switch 30 times without load for testing/commissioning purposes without need for replacement
- Contains no explosive medium as energy storage for switching operations

SIVACON S8plus Power Distribution Board and Motor Control Center

Technical Features
- Up to 690 V / 150 kA (I_{cw}) / 7 010 A
- Integrated solution for intelligent power distribution with links to automation and energy management systems
- Design verified power switchgear and control gear assembly according to IEC 61439-2 in single-/double-front designs (Marine Certification available)
- High level of safety for personnel and switchboard: arc fault test according to IEC/TR 61641 and optional, active, and resettable arc fault protection system
- Combination of different mounting designs: withdrawable, fixed mounted, and plug-in

Benefits
- Flexible, modular, cost-efficient, and space saving solution
- Preventive maintenance supported by diagnostic information
SIVACON 8PS – LI Busbar Trunking System

Technical Features
- 800 A to 6 300 A
- Design verified switchgear and control gear assembly according to IEC 61439-1/-6
- Safe connection to SIVACON S8 switchboards and transformers
- High short-circuit rating
- High degree of protection and fire safety
- Reliable operation due to high operating voltage and full load at high ambient temperature (40 °C)

Benefits
- Integrated solution for safe and efficient power supply for infrastructure and industrial applications
- Cost-efficient infrastructure
- Smart data transmission with innovative powerline technology for data transparency and predictive maintenance

SIVACON 8PS – LR Busbar Trunking System

Technical Features
- 400 A to 6 300 A
- Safe connection to SIVACON S8 switchboards and transformers
- High short-circuit rating
- High degree of protection IP68 (suitable for outdoor) and fire safety
- Epoxy cast-resin housing
- Easily combined with LI system

Benefits
- Reliable busbar for high protection in harsh ambient conditions (air humidity and corrosive or salty atmospheres)
- Strong resistance to chemical substances and high mechanical rigidity
- Flexible power transmission with low space requirements thanks to various junction elements
**Power Distribution**

**Generator Circuit Breaker**

**Technical Features**
- Up to 24 kV / 110 kA / 15 000 A
- Type-tested according to IEC/IEEE 62771-37-013
- Compact and space saving design

**Benefits**
- Increased cost efficiency and service continuity
- Minimized installation and maintenance costs
- Optimum personnel safety
- Eco-friendly design
- Solutions tailored to individual requirements

**E-House**

**Technical Features**
- E-House Substation, E-House Skid or Mobile E-House
- Customized solutions for all industrial applications and verticals
- Efficient equipment installation in controlled environment
- Testing and pre-commissioning off-site
- "Plug & Play delivery" for rapid deployment on-site

**Benefits**
- Speed up of overall project lead times
- Reduced manhours and EHS risks on-site
- One single point of contact from ordering to execution
- Local and global E-House expertise
- Global footprint for site services and after-sales service

**8DJH, 8DJH36 Gas-Insulated Switchgear**

**Technical Features**
- Up to 36 kV / 25 kA / 630 A
- Factory-assembled and type-tested switchgear according to IEC 62271-200
- Gas-insulated, sealed for life
- Flexible due to extension option and block formation

**Benefits**
- Maintenance-free and climate-independent
- Compact design for low space requirements
- Interlock control prevents mal operation
- Totally flexible switchgear concept, extendable on both sides with panels or blocks
3TM Vacuum Contactors
- Different pole-center distances (120 mm or 150 mm)
- 1-pole, 2-pole, and 3-pole versions
- Type test documentation based on IEC 62271-106
- Country specific standards (GB, DL, UL, DNV-GL, CSA, GOST)
- Highly shock-resistant
- Suitable for ambient temperature from -40 °C to +70 °C
- Suitable for applications at altitudes of up to 5 000 m
- Set of individual switching times
- Different operating directions for the release of the mechanical latch

SION 3AE5 Vacuum Circuit Breakers
- Up to 17.5 kV / 40 kA / 3 150 A
- Maintenance-free design up to 10 000 operation cycles, with proper maintenance up to 30 000 operations possible (without M30)
- Fast switch-off time (without additional release) of 30 ms (3 cycles)
- Meets the requirements of IEC 62271-100 revised 2017
- Very compact design
- Additional insulating shells allow further increase in the insulation level
- Expandable with various release and interlocking mechanisms
- Future-proof through the use of the latest interrupter type
- Available for different pole-center distances

ACB (Air Circuit Breaker), SENTRON 3WA

Technical Features
- Rated current: 630 A – 6 300 A
- Rated voltage: up to 1 150 V
- Breaking capacity: Icu up to 150 kA
- Ambient temperature: -40 °C up to +70 °C
- High mechanical and electrical life cycle
- Trip unit: easy upgrade, flexible adaptation at any time
- Trip unit with integrated metering function according to IEC 61557-12
- Voltage tap integrated
- Ethernet ports: simultaneous use of Modbus TCP and PROFINET IO

Benefits
- Reduced complexity due to less engineering, avoiding misinterpretation, and wrong order number
- Updatable and upgradeability at any time
- New protection feature and ready for digitalization: new market solution and opportunities
- Cybersecurity: prevent the possibility of unauthorized remote switching and protection hacking attempts
Power Distribution

MCCB (Molded Case Circuit Breaker), SENTRON 3VA

Technical Features
• Rated current: 100 A – 1 600 A
• Rated voltage: up to 690 V
• Breaking capacity: 3VA1 (TMTU) \( I_{	ext{cu}} \) up to 70 kA, 3VA2 (ETU) up to 150 kA
• No derating up to +50 °C
• Mounting: fix, plug-in, draw out version
• Trip unit with integrated metering function according to IEC 61557-12
• Ethernet (Modbus TCP) and PROFINET

Benefits
• Reduced complexity: same internal accessories up to 1 000 A frame
• Easy selection and assembly
• Digital available support tools from planning phase up to test/maintenance phase
• QR code for fast and easy commissioning (test and maintenance)

Fuseless Switch Disconnector, SENTRON 3K, 3V, 3LD

Technical Features
• Rated current: 16 A – 2 000 A
• Rated voltage: up to 690 V
• Breaking capacity: up to 100 kA

Benefits
• The right solution for your customized application
Power Distribution

Short Circuit and Overload Protection
• Two MCB lines: 5SY for industry and 5SL for infrastructure applications
• Extensive auxiliaries portfolio
• Approvals for worldwide application
• Quick mounting and timesaving installation

Personal and Fire Protection
• RCD type A, AC, F
• 5SV3 RCCB type B, B+ for inverter applications
• Extended inspection period of up to 48 months
• 5SV1: the most compact voltage independent RCBO in only 1 MW
• AFDD for prevention of dangerous arc faults
• 5SV6: the most compact AFDD with integrated MCB in only 1 MW

Overvoltage Protection
• Graded portfolio of lightning and surge protection devices
• Majority of lightning arresters have remote signaling contact
• Defect protection modules can be replaced modularly

Switching and Control Devices
• Safe switching with switching devices in AC/DC-technology usable in many applications
• Monitoring devices for electrical values enable monitoring of motors and other applications
• Energy efficient operation with 5TT4 remote control switches

SENTRON PAC Measuring Devices

Technical Features
• Energy Counters, Branch Circuit Monitoring Systems, Power-Multimeters and Power Quality Meters (Class S) for buildings and all industrial applications
• PRONINET, PROFIBUS, Modbus TCP, Modbus RTU, M-Bus, and S0-Interfaces
• High accuracy up to Class 0.2S; fulfill IEC 61557-12
• Digital and analog I/Os to integrate further signals

Benefits
• Energy efficiency optimization for cost savings (e.g., supporting ISO 50001, EN 16247 Energy Audits)
• Identification of power-intensive processes and loads
• Adjustment of usage behavior
• Cost savings through adjustments to energy supply contracts
• Early intervention in case of limit value violations
• Prevention of system outages due to overload
• Cost center specific billing for energy costs
• Efficient use through multi-site power monitoring
Energy Automation, Protection, and Power Quality

Highest levels of power availability and preventing power outages are most important for the oil and gas industry. To ensure day-to-day reliability and availability of their equipment in hostile environments, oil and gas companies require robust power supply solutions. These solutions must also be safe, flexible, and cost efficient – over their entire lifecycle. And as even smallest fluctuations in power supply can harm upstream, midstream, and downstream process steps, optimal power quality also becomes a key success factor. Totally Integrated Power, the hassle-free solution for power distribution across all voltage levels, is our answer to this challenge. Our Power Management Systems ensure increased power availability, quality, and efficiency. They keep your production running smoothly – in any upstream, midstream, or downstream application.

**SOLUTION**
Our Power Management and Control Systems feature
- A centralized monitoring and control system of the overall power infrastructure, e.g., switchgear, transformers, generators, batteries, etc.
- Automation controllers to integrate multiple devices (protection devices, power quality recorders, sensors, etc.) with different interfaces (e.g., IEC 61850, Modbus, etc.) and execution of automated control sequences
- Protection for critical devices and assets against possible damage
- Additional applications like Load Shedding, Generation Control, Power Quality, or Microgrid Management for renewable integration

**SYSTEM**
The Power Management and Control Systems are based on a common platform with different integrated application and functions.

**SICAM Load Shedding**
- Fully integrated, fast Load Shedding application powered by SICAM with response rates < 70 ms to keep production running

**SICAM Generation Control – integrated application**
- Keeps system frequency and voltage in a specified range
- Maintains intended value of interchange at tie lines
- Shares total generated power between assigned generators and load optimization
Energy Automation, Protection, and Power Quality

SICAM PQS – data collection and archiving
- Central collection and archiving of all fault records and power quality data from field level devices, irrespective of their manufacturer

SICAM PQ Analyzer – monitoring and analysis
- Comprehensive evaluation options for archived PQ measuring data and fault records
- Measured value testing compared to Power Quality Standards and individually specified limits (Grid Code Evaluation)
- Target-oriented analysis and reports

Digital Solutions and IoT
- SIPROTEC Digital Twin integrates all data, models, and other information of a physical asset generated during engineering, commissioning, operation, or service. Role of the Digital Twin is to predict and optimize performance of a physical asset (whether for design, production, or operation). To this purpose we use simulation methods and/or data-based methods. Key is to reduce a lot of work during the engineering, parameterization and commissioning.
- SIPROTEC Dashboard enables power grid operators to monitor the operational status of their SIPROTEC devices and optimize maintenance activities.
- Power Quality Advisory enables power grid operators to monitor the power quality status of their grids using SICAM power quality recorders to optimize power quality and avoid non-conformance cost.

COMPONENTS
Control Center
Spectrum PowerTM 5
- The flexible, large control center for oil and gas customers for archiving and analyzing control center data, integrated load management, and forecast applications

SICAM SCC
- Scalable small control center with efficient engineering for energy automation applications

Substation Automation
SICAM PAS
- Power Automation System for energy automation, PC-based, flexible, and tailored solutions for a wide range of applications

SICAM A8000
- Remote terminal unit, modular device range for telecontrol and automation applications, scalable from small to large data volumes
Energy Automation, Protection, and Power Quality

Protection
SIPROTEC and REYROLLE
- Protection, automation, and monitoring of power grids including switchgear, feeders, busbars, cables, transformers, generators, etc.
- Fault recorder

Power Quality
- SICAM power quality with web technology
- High accuracy measurement
- Energy and demand tracking
- Historical trending and harmonic distortion
- Recorder and analyzer

Benefits
- Modular or fixed design
- Open standardized architecture
- Certified Cybersecurity framework according to the international standard IEC 62443
- IoT connectivity to the cloud for easy monitoring with Grid Diagnostic Suite

Improved Efficiency
- Lower CAPEX
- Integrated functions and modular approach
- No additional systems and infrastructure needed
- Easy future expansion
- Reduced OPEX
- Central operation, switching, and administration of the power system and optimized power generation
- Prevention of critical situations early-on
- Countermeasures in time through consistent and permanent grid and quality monitoring
- Trend supervision: take preventive measures to eliminate faults in advance
- SICAM: controlling and telecontrol for small to large data volumes
Higher Availability
- Avoiding power outages
- Automated reactions in case of faults, e.g., fast load shedding of low priority loads, starting of additional or boost of generators and switching to backup batteries
- Ensuring fast reaction
- Minimizing downtimes by central operator information on fault type and location to define countermeasures
- Fast reaction of mobile workforce with dedicated location, affected equipment, and related spare parts

Protection and Safety
- SIPROTEC and Reyrolle: protection of primary equipment, e.g., generators, switchgear, transformers, cables, etc.
- Personnel safety

Building Technology

Building Comfort
- HVAC products
- Building automation
- Energy management

Fire Safety
- Fire protection systems

Electronic Security
- Access control
- Intrusion detection
- Command and control
- Perimeter intrusion control
- Remote video
- Visitor management solutions
- Video management systems
- Video analytics
Services

Global Project Execution Capabilities
- Complete professional project management
- Design clarifications
- Basic and detail designing
- Hardware engineering
- Software engineering
- Project documentation
- Extensive testing
- Factory acceptance testing
- Delivery
- Commissioning and site acceptance
- Warranty support

Consulting Services for Process Industries
Professional support on your way to digital transformation
- Digitalization-Consulting
- Consulting for optimized Processes
- Data analysis Consulting

Analytical Solutions
- Front End Engineering (FEE)
- Turnkey system integration
- Lifecycle customer support

SIPIX-based Mobile Asset Management
The on-site engineer and the remote expert can collaborate remotely with the pre-installed SIPIX RC App via Real-Time Audio/Video transmission to fix the malfunction. This provides a short response time and avoids travel and mobilization time for an on-site field service of the expert.
Services

Industrial Security Services
- Necessary hardware and software
- Service experts with expertise in automation, digitalization, and security
- End-to-end approach

Security Consulting – evaluation of the current security status of an industrial environment
- Security Assessments: identifying security gaps and defining countermeasures
- Scanning Services: faster transparency over assets and vulnerabilities
- Industrial Security Consulting: support with policies and secure network design

Security Implementation – risk mitigation through the implementation of security measures
- Security Awareness Training: cybersecurity knowledge transfer from a production perspective
- Automation Firewall: continuous network protection with Next Generation Firewalls
- Endpoint Protection: continuous endpoint protection with Whitelisting and Antivirus

Security Optimization – comprehensive security through managed services
- Industrial Anomaly Detection: early detection of cyberthreats
- Industrial Security Monitoring: proactive protection thanks to comprehensive end-to-end monitoring
- Remote Incident Handling: rapid response to cyberthreats
- Industrial Vulnerability Manager: efficient vulnerability management to improve availability
- Patch Management: managing critical updates in Microsoft products
- SIMATIC Security Service Packages: unleashing your assets’ full security potential

SIMATIC Virtualization as a Service
Offers a preinstalled and preconfigured virtualization system with all associated hardware and software components, including the necessary lifecycle services like spare parts and online support – all perfectly coordinated and from a single source
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