

The Siemens logo is displayed in a bold, blue, sans-serif font. Below it, the tagline "Ingenuity for life" is written in a black, cursive script font. The background of the entire page is a composite image showing industrial workers on a metal platform, large industrial pipes, and a futuristic green hexagonal grid overlay with glowing yellow lines.

SIEMENS

Ingenuity for life

Line Card

Chemical Industry Solutions

Complete offering – products, software, solutions and services

50% of the world's data was created in the past twelve months. Less than 1% of it was used or analyzed.

In the next few years, billions of new devices will join the Internet of Things. Devices in your own operations - like valve positioners, gas analyzers and motors of every type - will be online and sharing their data. We saw this coming and we're ready to help Chemical companies turn this into competitive value.

We make the digital enterprise real for customers, from the field level to the management level. For decades we have advanced the integration and information capabilities of our industrial portfolio. We have added software offerings for engineering, design and operations management. We have added service offerings for cybersecurity and operational networking. Now, MindSphere, our cloud-based, IoT operating system, can turn your operational data into insights for better – even transformational – decision-making.

In this document you will discover a Siemens portfolio that is ready to serve you today and for decades into the future. From electrification to automation to digitalization, here are the products, software, solutions and services that will help you to define and realize your digital enterprise.

usa.siemens.com/chemical

MindSphere

MindSphere – the cloud-based, open IoT operating system from Siemens

- 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 Siemens products
- Industry applications and partner development ecosystem
 - MindApps from Siemens and its partners
 - Application Programming Interfaces (API) for developers
- Aligned with relevant industry security standards (IEC 62443, ISO/IEC 27001)



Process Automation

Distributed Control System (SIMATIC PCS 7)

- Distributed Control System (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
- Cyber security
- High performance graphics
- Virtualized solutions
- Service and support
- Process simulation (SIMIT)
- Energy management solutions
- Alarm management
- Redundant real time I/O bus (PROFINET)
- Compact, fault tolerant, environmentally robust I/O (SIMATIC ET 200SP HA)
- Configurable I/O (CFU)
- Scalable, redundant capable controller (CPU 410 E)



Automation Migration Solutions

- Honeywell
- ABB/Bailey
- TI
- APACS
- Gateways for integration – CM104, CM105
- Rockwell
- Allen Bradley
- Siemens S5
- Teleperm XP

Safety Systems

- SIL3 certified according to IEC 61508
- Flexible Modular redundancy
- Burner management (BMS)
- High integrity protection (HIPPS)
- Fire and gas (F&G)
- Fault tolerant architecture to reduce spurious trips
- 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
- Cyber security



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



Industrial Identification

- 1D, 2D code reading, OCR and pattern recognition
- HF and UHF RFID systems



Process Automation (continued)

Industrial Power Supplies

- The first PROFINET enabled power supplies with OPC UA
- Single phase and three phase power supplies
- 24VDC power supplies and power security



Operations Intelligence Software (XHQ)

- Aggregating, relating and presenting operational and business data
- Asset performance management, analytics and visualization solutions



Process Instrumentation & Analytics

Analytical Products & Solutions

- Process gas chromatographs
- Continuous gas analyzers
- In-situ laser spectroscopy
- Front End Engineering and Design (FEED)
- Turnkey system integration
- Lifecycle customer support



Pressure

- Gauge
- Absolute
- Differential
- Hydrostatic



Temperature

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



Level

- Radar & Guided Wave Radar
- Ultrasonic
- Capacitance
- Point Level



Flow

- Electromagnetic
- Ultrasonic clamp-on
- Coriolis
- Vortex



Valve Positioners

- Digital
- Electro Pneumatic
- Pneumatic



Factory Automation

SIMATIC Controllers

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



SIMATIC Distributed I/O

- I/O Systems for Control Cabinets, IP20 (ET200SP / ET200MP / ET200S / ET200M / ET200isp)
- I/O Systems without Control Cabinets, Machine Mount IP65/67 (ET200AL / ET200pro / ET200eco PN)
- Modular/scalable/compact
- I/O modules can be configured as remote or local
- PROFIBUS, PROFINET, or EtherNet/IP (only in ET200S / ET200pro)
- Failsafe options
- Intrinsically safe options (ET200S / ET200M / ET200isp)
- Integrated motor starter option (ET200SP / ET200S / ET200pro)



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 (IPC347E, IPC547E, IPC647D, IPC847D)
 - Box (IPC227E, IPC427E, IPC627D, IPC827D)
 - Panel (IPC277E, IPC477E, IPC677D, HMI Panel PC Ex)
- Industrial Monitors & 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



Factory Automation (continued)

SCADA System (SIMATIC WinCC Open Architecture)

- Object orientation
- Scalable to more than 10 million tags
- Platform-independent
- SIL3 certified according to IEC 61508
- Platform for customized solutions
- Comprehensive range of drivers and connectivity



Machine Safety (SIMATIC Safety Integrated)

- One controller, engineering and communication for standard and fail-safe automation
- Wide range portfolio from micro-processors to PC-base 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 TUV approval



Motion Controllers

- Drive-based (SIMOTION D)
- PC-based (SIMOTION P)
- Controller-based (SIMOTION C)
- Distributed level-event monitoring and power metering



Industrial Controls

- SIRIUS IEC Control
- Motor Starter Protectors
- SIRIUS Overload Relays
- Contactors
- Motor Management
- Complete Motor Starters
- Busbar System
- Soft Starters
- Pilot Devices
- Function Relays
- Terminal Blocks
- Limit Switches
- SIRIUS Safety Integrated
- Control Power Transformers



Industry Services

On-call, on-site, and on-line 24/7 services

- Service Programs and SIEPRO® Technical Service Agreements
- Original OEM Spare Parts and Asset Optimization
- Retrofit and Modernization
- Technical Support and Consulting
- On-site and Factory-certified Repair
- Field Service and Maintenance
- SITRAIN® Workforce Development Training
- Digital Monitoring and Data Analytics

Industry Customer Care Center 800-333-7421

On-line Support (<http://support.industry.siemens.com>)



Industrial Network Solutions

- Industrial ethernet switches and routers for transparent industrial ethernet communications (SCALANCE and RUGGEDCOM)
 - Fiber options integrated and modular
 - Extended temperature range, ATEX, UL hazloc, Class I Div 2,
- IECex and IEC 61850
 - Integration support for PROFINET and Ethernet/IP
 - Durable wireless hardware for reliable communications
 - Security modules
 - Network management
 - Remote management solutions



Low Voltage Drives (continued)

Enclosed (Cabinet) Drives (575V / 690V)

- SINAMICS
 - G150 NEMA-rated (150–800 hp)
 - S150 NEMA (150–1250 hp)
 - S120CM NEMA Cabinet Modules NEMA-rated (up to 5000 hp)

Chassis (Open) (480V / 575V)

- SINAMICS
 - G130 (150–800 hp)
 - S120 (150–1150 hp)

Chassis (Open) (690V)

- SINAMICS
 - G130 (75–800 kW)
 - S120 (75–1200 kW)



Medium Voltage Drives

- Engineered drives
- SINAMICS AC drives 150 HP -100,000 HP
 - SINAMICS GL150 LCI drives
 - SINAMICS GM150/SM150 NPC drives
 - SINAMICS PERFECT HARMONY GH180/GH150 drives
 - All weather environmental enclosures (NEMA 3R, 4R and 4X)



Drives, Motors and Motion Control

Low Voltage Drives

General Purpose Drives

- SINAMICS V (0.16–40 hp)
- SINAMICS G (0.5–400 hp)

High-Performance Vector and Servo Drives

- SINAMICS
 - S120 (0.25–1500 hp)

DC Drives

- DC Converters (3 – 2000 hp)
- Base Drive Panels (3 – 2000 hp)
- Control Modules for external power sections up to 40,000 hp

DC-DC Converters

- 30kW
- 120kW
- Up to 4 in parallel

Enclosed (Cabinet) Drives (480V)

- SINAMICS
 - G150 NEMA-rated (150–800 hp)
 - 18-pulse NEMA (150–800 hp)
 - S150 NEMA (150–1150 hp)
 - S120CM NEMA Cabinet Modules NEMA-rated (up to 5000 hp)

Drives, Motors and Motion Control (continued)

Mechanical Drives

Helical, bevel, bevel-helical and couplings

- Aerator Gear Unit
 - Torques 10.5 to 173 kNm
- Helical and helical-bevel gear units
 - Torques 25,000 – 12,400,000 in-lbs
- Planetary gear units
 - Torques 88,000 – 23,000,000 in-lbs
- Gearboxes for Pump Drives
- Coupling types
 - Flexible, gear, fluid and rigid
- Aerators
 - Torques 10.5 to 173 kNm
- Agitators
 - Torques up to 240,000 Nm
- Water Screw Pumps
 - Torques 5.8 to 1,400 kNm
- Water Turbines
 - Torques 8.5 to 195 kNm

High-Performance Motors – Inverter Duty

Low Voltage Motors

NEMA Induction Motors

- Severe Duty 1HP - 400 HP
- Explosion Proof 1 HP - 250 HP
- Vertical Solid Shaft 3 HP - 250 HP
- Heat Exchanger 5 HP – 75 HP
- AboveNEMA (SLV Brg) 200HP – 800HP

IEC Induction Motors

- Severe Duty 0.18kW – 800kW
- Explosion Proof 0.25kW – 460kW

IEC Technology Motors

- Reluctance 7.5 – 40 HP
- Servomotors 0.06 – 1217 lb-ft
- Torque Motors 74 – 5163 lb-ft
- Linear Motors 34 - 2332 lbf

Medium and High Voltage Motors

- AboveNEMA Horizontal and Vertical Motors
- 200 HP - 18,000 HP Standard Specific
- ODP / WPI / WPII / TEAAC / TEFC / TEWAC / WPII
- NEMA / API 541 / API 547 / IEEE 841

IEC Trans Norm Motor

- Asynchronous Squirrel Cage Motors 0.15 - 38MW
- Asynchronous Slip Ring Motors 1.3- 8MW
- Synchronous Motors 2.1 - 100MW

Gear Motors

- Helical Bevel
- Parallel Shaft
- Helical In-line
- Available with integral induction or servo motors



Power Distribution

Medium-Voltage Switchgear, Circuit Breakers & Controls

- Medium-voltage, arc-resistant and non-arc-resistant, air-insulated, metal-clad switchgear up to 63 kA
 - Integrated electrical-racking system for circuit breakers and auxiliaries
- Medium-voltage, arc-resistant, low-maintenance, gas-insulated switchgear in a unique isolated-phase design
- Medium-voltage, non-arc-resistant, metal-enclosed interrupter switchgear
- Medium-voltage, arc-resistant and non-arc-resistant controllers up to 63 kA
- Power distribution center solutions to house various types of electrical equipment
- Medium-voltage, outdoor, distribution circuit breakers
- Smart low-voltage switchgear with best arc flash mitigation solutions
- Arc-resistant switchgear up to 100 kA with outdoor plenum venting
- Medium-voltage vacuum roll-in replacement circuit breakers for most major models from 5-38 kV, 250-1,500 MVA, 1,200-3,000 amperes
- Low-voltage replacement circuit breakers designed with a direct connection to the primary contacts, and available Dynamic Arc Sentry (DAS) mode for arc flash mitigation.



Motor Control Centers

tiastar™ Motor Control Centers

- Standards
- High density units
- Smart
 - PROFIBUS, PROFINET, MODBUS RTU, EtherNet IP
 - Sm@rtGear
- Arc Resistant
 - Dynamic arc-flash sentry (DAS)
 - High-resistance ground (HRG)



SIMOCODE Pro – provides solid-state overload protection, local control and extensive data communication:

- SIMOCODE pro C
- SIMOCODE pro V

Installed components:

- Automation
- Control
- Power distribution devices
 - AC drives
 - Circuit breakers
 - NEMA starters
 - Pilot devices



Power Distribution (continued)

High Voltage Circuit Breakers

SF6 Dead Tank circuit breakers and Live Tank Breakers/Circuit Switchers are available from 15-550kV. 12 year inspection/25 year maintenance cycle, the high voltage circuit breakers are the workhorse of the system.

- Compact Construction
- Common Frame
- 3AP Arc-assist interrupter
- Spring-spring Mechanism
- All components are factory tested and require no in field adjustments.



High Voltage Dead Tank Breakers



Live Tank Circuit Breaker/Circuit Switcher

Power and Distribution Transformers

Power and Distribution transformers are a critical link between power plants, supply systems and distribution networks. Each transformer is engineered to the customer's specific needs.

- New or replacement ANSI / IEEE transformers sales and installation, oil immersed or dry type cast resin.
- Fluid Immersed Distribution Transformers for industrial applications FITformer® IND, for ratings up to 50 MVA (ONAN) and 161 kV
- Medium Power Transformers up to 250 MVA and 230 kV



- Cast Resin Dry Type Transformers up to 50 MVA and 52 kV



Substations & Transformers

- High, medium and low voltage distribution and protection
- Complete transformer rewind, remanufacture or replacement
- New transformer sales and installation, oil immersed or cast resin



MV Protection and Control (SIPROTEC and SICAM)

- MV protection and control, motor, feeder, transformer protection, arch flash sensing
- Automatic transfer schemes, fast load shedding, remote breaker operation, automatic fault record retrieval and analysis, as set monitoring
- Sm@rtGear™ Power Monitoring and Control



Power Distribution Solutions Energy Management

- Energy and power monitoring and control software



Building Technologies

Building Comfort

- HVAC
- Building automation
- Energy management



Building Technologies (continued)

Fire Protection

- Fire safety systems



Electronic Security

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



Industrial Power Generation

Gas Turbines

Aeroderivative Gas Turbines

- Flexible, lightweight and compact design ranging from 4 to 66 MW
- Suitable for power generation and mechanical drive applications, including peak, intermediate, cogeneration simple or combined cycle
- Line includes: SGT-A05 AE, SGT-A30 RB, SGT-A35 RB, and SGT-A45 TR, SGT-A65 TR

Industrial Gas Turbines

- Compact and rugged design ranging from 2 to 54 MW
- Industrial power generation and mechanical drive applications
- Line includes: KG2 SGT-100, SGT-300, SGT-400, SGT-600, SGT-700, SGT-750, and SGT-800

Large (Heavy Duty) Gas Turbines

- Robust and flexible engines ranging from 100 to 425 MW
- Electrical generators from 25 to 2,235 MVA
- Designed for large simple or combined cycle power plants
- Suitable for peak, intermediate or base load duty, as well as cogeneration applications
- Line includes: SGT-8000H, SGT-4000F and SGT-2000E



Industrial & Utility Steam Turbines

Industrial Steam Turbines

- Market leader with a reliable and versatile range from 0.1 to 250 MW
- Flexible layout provides easy constructability, fast start-up and economical operation
- Solutions with controlled and uncontrolled extractions
- Line includes: SST-150, SST-200, SST-300, SST-400, SST-500, SST-600, SST-600, SST-700/900, and SST-800
- Dresser-Rand, A Siemens Business line includes: Single-stage (RLA, RLVA, RLH, 350/500/700, AVTTW/GTW, 2TA, and C) and Multi-stage (GAF, K, U, R, RS, TT14, TT22, B, Tandems/Triple Turbine, and Custom Engineered)

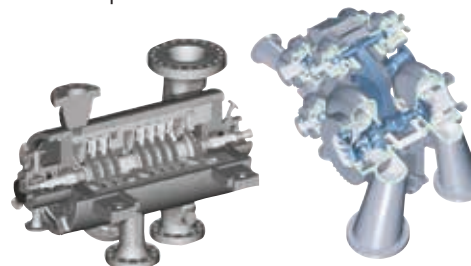
Utility Steam Turbines

- Comprehensive range of products from 90 to 1,900 MW
- Used in conventional steam power plants and combined-cycle power plants
- Line includes: SST-3000, SST-4000, SST-5000, SST-6000, and SST-9000



Compressors

- Turbocompressors, reciprocating compressors and expanders for the chemical industry as well as for refineries, petrochemical plants and further industrial applications
- Industrial as well as aero derivative gas turbines, steam turbines, reciprocating engines and e-drives to serve our customer needs
- Leading technology in PTA application securing future plant potential higher than 1.2 MTPA
- Process air compressor with highest efficiencies in the market for ammonia production
- Integrally geared compressors for urea production plants offering a high efficiency due to inter cooling stages
- CO₂ compression solutions for various range of applications with volume flows of 140.000Nm³/h and pressures up to 200 bar



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