

ABB automation products for water

Enhanced plant performance, efficiency and reliability



ABB



Water – a critical resource

Water is a limited resource. Frequent water shortages; reduced water quality; and increasing supply and processing costs are the most evident impacts of this. To achieve an effective reversal of this trend, water resources need to be protected and activities related to water intake, treatment, transmission and distribution need to be optimized.

The actions to be taken should target different aspects, including programs to raise users' consciousness of the importance of water conservation, as well as the upgrading of facilities involved in the supply, processing and distribution of primary waters according to specific energy saving and industrial resource management criteria. Other areas where upgrades can benefit is in wastewater processing such as purification and disposal, including its treatment for industrial and farming uses.

How to improve facility efficiency and cost-effectiveness

To reduce energy consumption and costs, ABB offers one of the most advanced ranges of high efficiency motors and variable speed drives (VSDs).

ABB manufactures EFF 1 and EFF 2 motors; class EFF 1 motors – the most efficient category of motors – can provide energy savings up to 20%.

VSDs are used to control the pumps' speed, thereby efficiently regulating flow and pressure levels according to the water consumption demand. This can lead to 30 to 60% energy savings.

Additionally, maintenance costs are lower as motor speed control through VSDs reduces mechanical and electric stress that impacts the pump set components. Even pumps that operate at constant flow can benefit from the soft-start and soft-stop functionality of a VSD, thereby placing less stress on the motor and pump.

A complete range of products for the water industry

For nearly 50 years, ABB has been equipping thousands of water treatment facilities, with electric systems through to automation for any type of water application.

In addition to motors, VSDs and soft-starters ABB provides:

- process instrumentation for system control, automation and monitoring, including:
 - flowmeters for water, air and methane
 - on-line analyzers for water, wastewater and gas measurements
 - pressure, level and temperature meters
 - recorders and controllers





■ industrial control, protection and automation, including:

- overload cutouts
- contactors
- control and signaling units
- programmable logic controllers
- limit switches and sensors
- Field Bus Plugs

■ power supply systems and installations can also be built from the most suitable solutions among ABB's wide-ranging offering, from:

- medium voltage systems and equipment
- low voltage distribution, including:
 - panels or insulating material
 - control, protection, monitoring and measurement devices
 - wiring and connection components
 - cable ducts, equipment holders and gangways

ABB products are compliant with international standards and are designed and built in accordance with the most advanced environmental compatibility standards.

One stop, one shop: The benefit of partnering with ABB

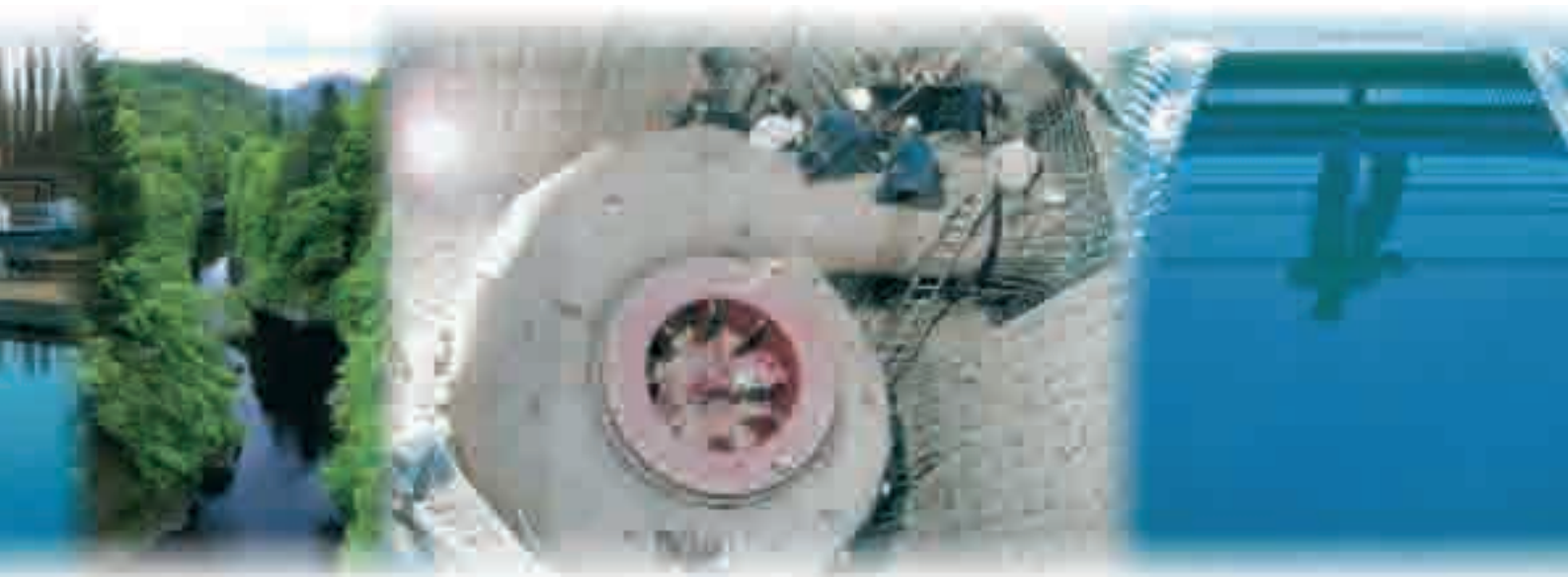
The more complex the facility, the more beneficial it is to rely upon a single supplier.

A supplier that is able to provide top-quality products and systems to equip the entire process, from on-site instruments to remote control and monitoring stations.

A supplier that ensures component operation is fully integrated without any risk of incompatibility.

A supplier that, when needed, provides technical support across all of the equipment and functionalities which make up the systems.

This is why ABB is the ideal partner for companies operating in the water distribution and treatment and distribution sector. With a presence in over 100 countries worldwide, ABB's expertise and full-range offering can help to solve all issues, from the design stage to the startup, and then throughout the systems' entire lifecycle.



Products utilization

Automation products for the complete water cycle

Industrial Use

- Motors
- VSDs & soft starters
- Control gear & MCCs
- Instrumentation
- PLC
- Installation equipment

Residential

- Motors
- Instrumentation
- Installation equipment

Water Storage

- Motors
- VSDs & soft starters
- Control gear & MCCs
- Instrumentation
- Installation equipment

Boreholes

- VSDs
- Instrumentation
- Installation equipment
- Motors

Pressure Boosting

- Motors
- VSDs & soft starters
- Control gear & MCCs
- Instrumentation
- PLC
- Installation equipment

Rain Water Pumping

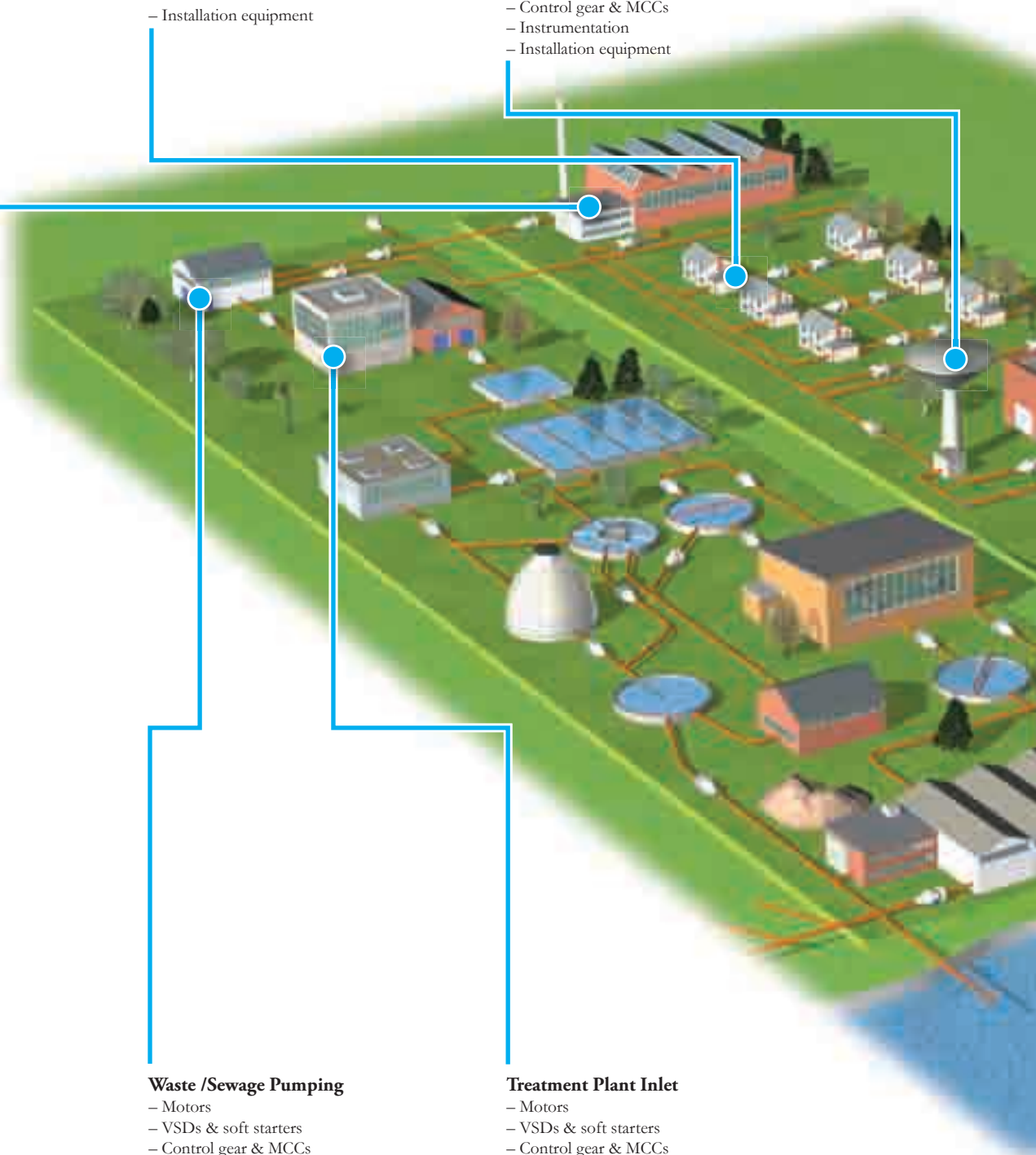
- Motors
- VSDs & soft starters
- Control gear & MCCs
- Instrumentation
- Installation equipment

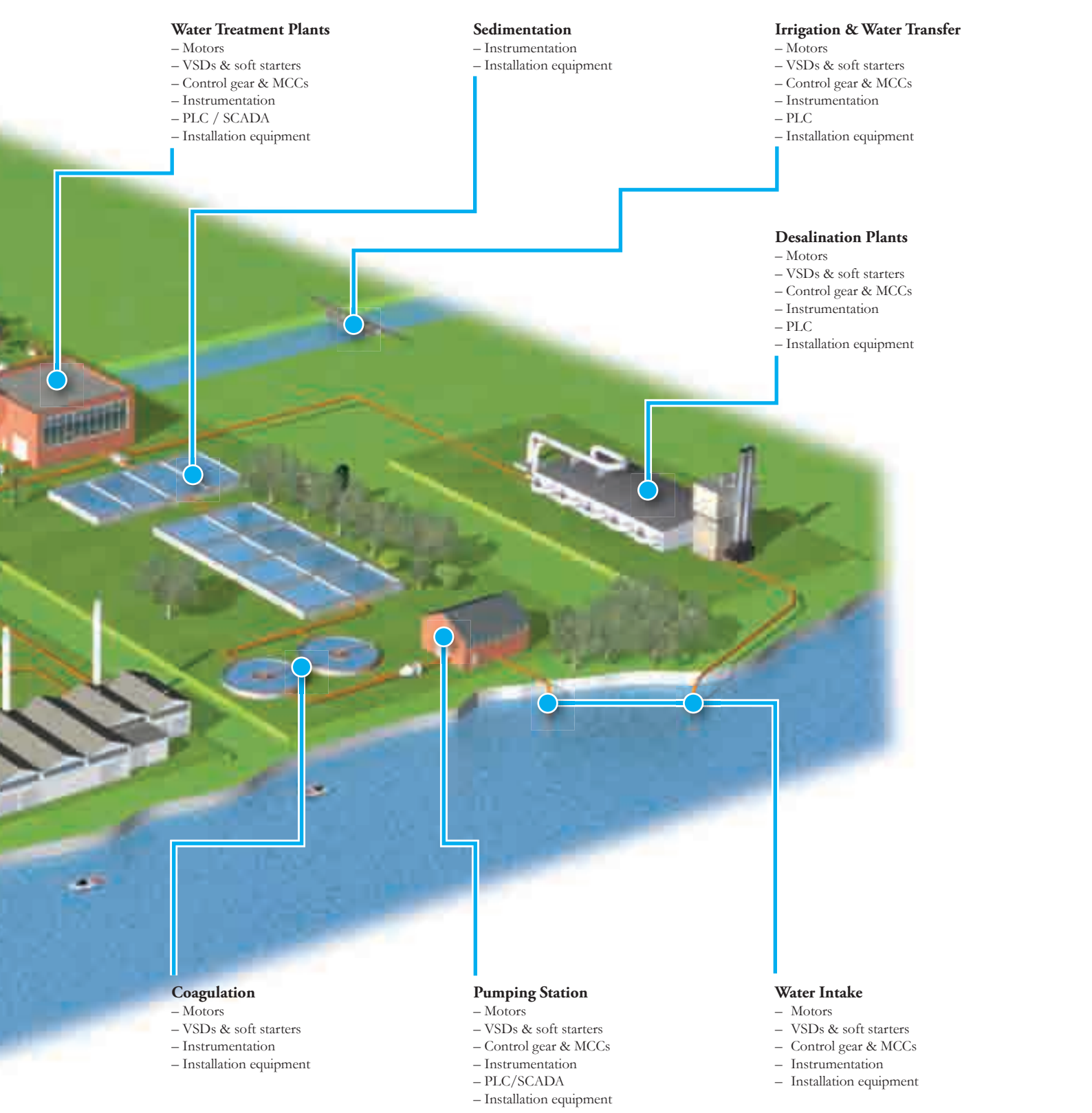
Waste /Sewage Pumping

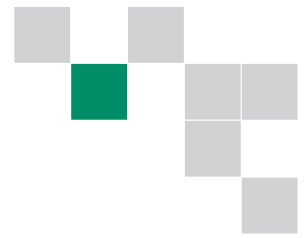
- Motors
- VSDs & soft starters
- Control gear & MCCs
- Instrumentation
- PLC / SCADA
- Installation equipment

Treatment Plant Inlet

- Motors
- VSDs & soft starters
- Control gear & MCCs
- PLC
- Instrumentation
- Installation equipment







Variable speed drives

Low voltage AC drives



Machinery drives (0.18 to 45 kW)

Standard drives (0.75 to 355 kW)

Industrial drives (0.55 to 5600 kW) including low harmonic drives, multidrives and intelligent pump control software

Mains voltages: 208 to 690 V

Medium voltage AC drives



Power range from 315 kW to more than 100 MW; voltages 2.1 to 10 kV. For induction, synchronous and permanent magnet motors.

ABB MV drives are suitable for new or existing motors and meet the most stringent requirements for current and voltage harmonic distortions as defined by international standards.

Motors

Low voltage motors



Process performance motors for demanding applications, cast iron and aluminum frames, 0.25 to 1000 kW.

General purpose motors for standard applications, cast iron, aluminum and steel frames, 0.06 to 630 kW.

Hazardous area, high speed, water cooled and permanent magnet motors for special applications.

High voltage motors

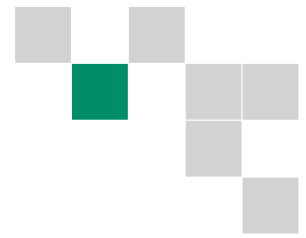


Modular induction motors ranging up to 15 kV and 18 MW, 50 and 60 Hz.

Modular synchronous motors ranging up to 15 kV and 60 MW, 50 and 60 Hz.

High voltage cast iron motors ranging up to 2250 kW.

Products



Instrumentation



Flowmeters

Electromagnetic flowmeter, line-, dc and battery-powered with Fieldbusses, with GSM module
Coriolis- and Thermal Mass flowmeter
Vortex-, Swirl-flowmeter
dp-flowmeter, VA (Variable Area) flowmeter
CalMaster (Verification)

Pressure transmitters

Complete range of intelligent electronic transmitters for measuring absolute pressure, gauge pressure, differential and level pressure

Level measurements

Piezoresistive, variable capacitance

Temperature measurements

Thermo-couples, thermo-resistances
Transmitters

Analytical instruments



Sensors for conductivity, dissolved oxygen, pH/redox
Turbidity analyzers
Ion-sensitive and colorimetric analyzers: chlorides, fluorides, nitrates, phosphates
UV monitors: nitrates

Recorders and controllers



Recorders

Circular or strip chart recorders
Videographic recorders

Analogue and digital indicators

Single loop controllers

ABB

Metering devices



Electricity meters

Single-phase and three-phase meters

Measurement instruments

Digital and analogue instruments

LV system



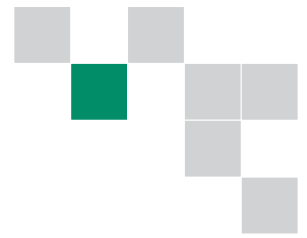
MNS switchgear platform for low voltage (400 V and 690 V) Motor Control Center (MCC) and switchgear

The MCC and switchgear system comes with an option to add microprocessor based motor protection control. The DCS and SCADA system can easily communicate for control and diagnostics information with MCCs and switchgear. Multiple communication protocols are supported.

Modular DIN rail products



A wide product range offering functionalities like protection and switching, checking and monitoring, control and programming.



Circuit-breakers and switches



Automatic

MCBs: In up to 100 A; Icu up to 25 kA
MCCBs: Iu up to 630 A; Icu (380/415 V a.c.) up to 200 kA
Moulded-case: Iu up to 630 A; Icu (400 V a.c.) up to 50 kA

Isolators

Switch disconnectors: from 16 to 3150 A
Switch fuses: from 16 to 160 A
Enclosed safety switches

Motor protection and control



Circuit breakers for motor protection

Modular motor starters: regulation field from 0.1 to 100 A
UMC

Soft starters

From 3 to 1810 A

Contactors and miniature size contactors

For power up to 400 kW

Thermal overload & protection relays

Bi-metal or electronic

Command and signaling units

(modular and compact versions) Push-buttons, switches, warning lights, luminous floor boxes

Electronic products and relays

Power supply

Relays (conventional and electronic)

Signal converters

Timers

Programmable logic controllers



Logic modules

AC010: from 12 to 40 I/O

PLCs

Scalable modular PLC - simply and continuously expandable.

I/Os

Local and remote I/Os freely configured by SW.

Human-machine interfaces

Enclosures

Sheet-steel boards



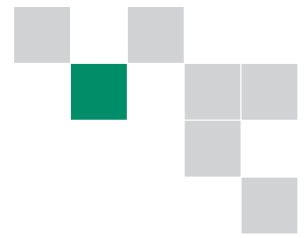
Boxes, multipurpose enclosures

H.: from 300 to 1200 mm; W.: from 200 to 800 mm; D.: from 150 to 300 mm

Switchboards and cabinets

H.: from 1800 to 2200 mm; W.: from 400 to 1200 mm; D.: from 300 to 1000 mm

Products



Plastic enclosures



- Consumer units and special enclosures
- Emergency enclosures
- Modular enclosures for IEC 309-1 sockets

Metal distribution boards



- Switchboards, installation boards, distribution boards, monoblock and kit up to 4000 A

Terminal blocks

Terminals for remote controls



- Self stripping connections in A.D.O. technology
- Screw and spring terminals
- Faston terminals

Power connections

- Studs

Trunking systems



- Feeder and cable trunkings
- Industrial trunkings and cable trays

Other products

Transformers



- Distribution, power and industrial transformers for all power and voltage ratings.

Medium voltage products



- Medium voltage switchgear, apparatus, modular systems (up to 52 kV) and distribution automation (up to 110 kV) for industrial, commercial and utility applications.

SCADA



- SCADA and automation integration solutions for plant control and optimization.

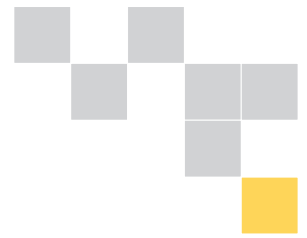


ABB is a leading supplier of automation products and services. It operates in more than 100 countries and has one of the largest service organizations with field service engineers located all over the world. Wherever you are, ABB is there for you.

The following services are part of ABB's comprehensive service portfolio:

- Diagnosis/Verification
- Engineering and consulting
- Environmental services
- Extension
- Installation and commissioning
- Maintenance and field services
- Migration and upgrades
- Repair and refurbishment
- Retrofit
- Spare parts
- Support and remote services
- Training

www.abb.com/ServiceGuide

References



ABB has nearly half a century experience in equipping thousands of water treatment facilities. It supplies products and systems for any type of application in the water cycle. Below are some examples.

Urban water distribution

ABB supplied motors, drives, control switchgear and instrumentation to MWA (Metropolitan Waterworks Authority) in Bangkok, which provides tap water to 11 million people.

MWA owns and operates one of the world's biggest water treatment plants and more than 30 pumping stations.

Electricity cost amounted to almost 50% of MWA's production cost.

The equipment supplied by ABB helps MWA to achieve energy savings of more than USD 10000/month for a pumping station.

Industrial water

ABB supplied drives, motors, transformers and control panels for the Ras Laffan Common Cooling Water Project, which supplies vital cooling water to Ras Laffan Industrial City, one of the world's fastest growing industrial export locations.

The cooling water system pumps 833'000 cubic meters of cooling water an hour to the power plant, LNG trains and petrochemical facilities.

Sewage

ABB supplied instrumentation, motors and drives for Singapore's Changi Water Reclamation Plant project, which is designed to meet Singapore's waste water treatment needs through the 21st century. The new water reclamation plant will treat 528 million gallons of used water/day.

Water treatment

ABB supplied motors, drives and instrumentation to Scottish Water, the fourth-largest water utility in the UK. Scottish Water operates about 47'000 kilometers of water mains, 48'000 kilometers of sewers, 370 water treatment works and 1800 waste water treatment works.

Desalination

ABB supplied drives to one of the largest seawater reverse osmosis desalination plants in the Western Hemisphere. The plant has a total capacity of 130'000 m³/d and supplies the desalinated water to the local water utility which serves industrial estates and private homes.





Automation Products Division

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