Reliable measurement and control – with ProMinent

Perfect interaction between all components

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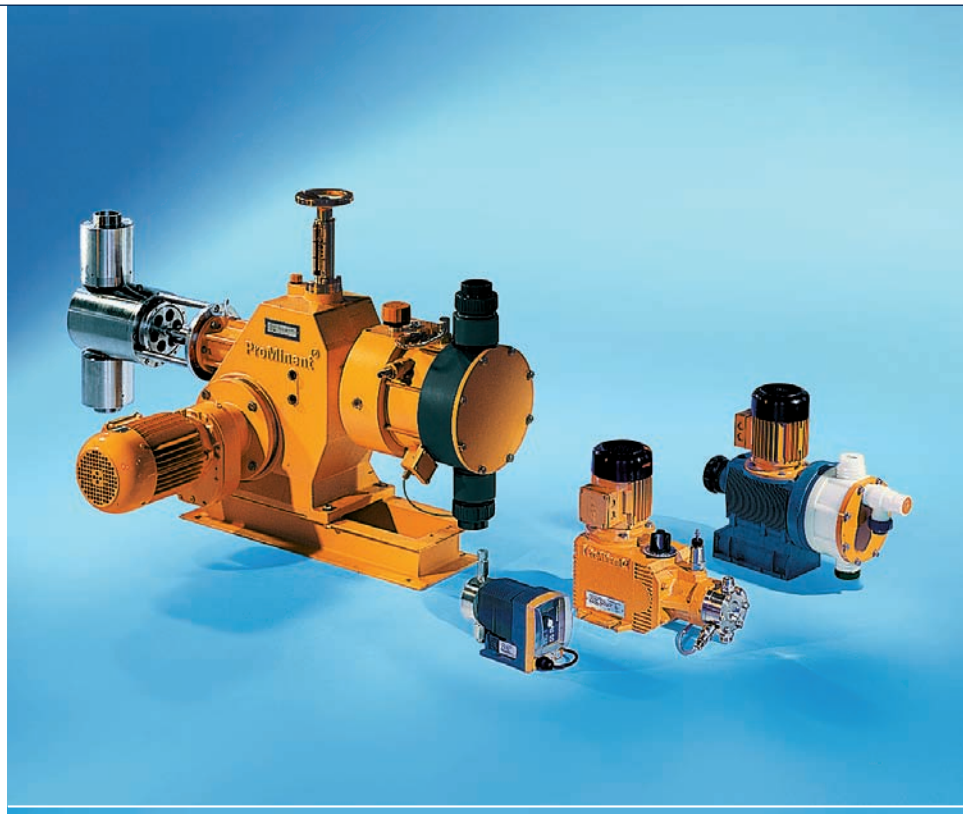


Metering pumps

Metering chemicals – the core task of a metering pump. And ProMinent offers metering pumps in every performance class and profile. The world market leader in solenoid-driven diaphragm metering pumps is equally convincing when it comes to medium- and high-pressure pumps.

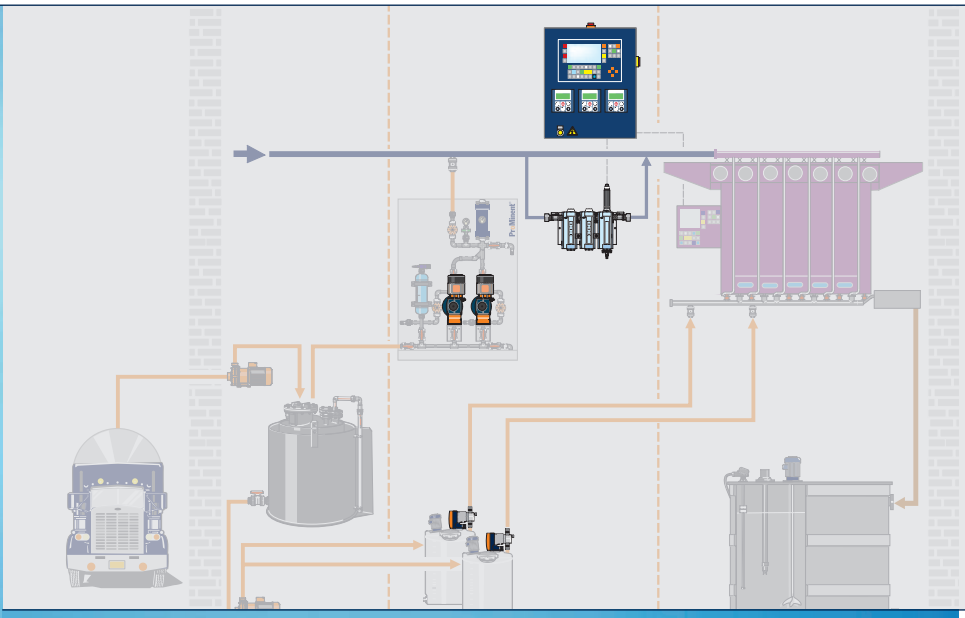
- Solenoid-driven diaphragm pumps: up to 30 l/h
- Motor-driven diaphragm pumps: up to 4,000 l/h
- Hydraulically actuated diaphragm pumps: up to 40,000 l/h
- Plunger pumps: up to 40,000 l/h
- Custom metering pumps

Sensors

The DULCOTEST® sensors deliver exact, reliable and application-adjusted measured values in real time – for the monitoring or control of processes. The sensors can be optimally integrated into the ProMinent control loop together with controllers and metering pumps. Numerous probe housings are available for individual integration into the process.

- pH
- Redox/ORP
- Conductivity
- Chlorine
- Chlorine dioxide
- Chlorite
- Bromine
- Ozone
- Dissolved oxygen
- Hydrogen peroxide
- Peracetic acid
- Fluoride
- Temperature

The heart of an optimum solution



The precise interplay of metering pump, controller and sensor is a guarantee of optimum metering. Components from ProMinent are perfectly interacting and together they form a perfect control loop.

Measurement and control systems
Our measurement and control instrumentation is adjusted to each specific application: Finely graduated performance classes offer the right technology for every metering task. ProMinent offers full product lines from the simple transformation of measured signals for transmission to a central control unit via user-calibrated instruments with measured variable display, to controllers for complex control tasks. We offer PROFIBUS® DP and CANopen-BUS components to enable integration of the control loop into a bus system.

- 1-channel controller DULCOMETER® D1C
- 2-channel controller DULCOMETER® D2C
- Multi-channel controller DULCOMARIN® II
- Various measurement transducers/transmitters
- Handheld measurement units

Further information:
www.prominent.com/metering_pumps
www.prominent.com/mcs

Online process measurement station

Matched components at a measurement station

Online process measurement stations are suitable for efficient determination of the chemical condition of process water, or for determining the quality – in real time – round the clock. They are a central component of a control loop for chemical dosing.
ProMinent process measurement stations are reliable: they are almost exclusively our own design and manufacture – this guarantees compatibility and an optimal performance/price ratio. ProMinent® measurement stations can be individually built up from separate components and configured specifically to customer requirements.
Alternatively, fully-assembled panel-mounted measurement stations are available for immediate delivery. Commissioning of these units is very simple, thanks to Plug & Play technology.

- Reliable and accurate measurements
- Simple and flexible installation
- Cost-effective operation thanks to low expenditure on maintenance
- Long service life through the use of high-grade materials and rugged construction
- Precise workmanship

Process measurement stations are available for the following parameters:

- pH
- Redox/ORP
- Conductive/inductive conductivity
- Free chlorine
- Total chlorine
- Bromine
- Chlorine dioxide
- Chlorite
- Ozone
- Hydrogen peroxide
- Peracetic acid
- Fluoride
- Dissolved oxygen
- Temperature

Further information:
www.prominent.com/mcs

Controllers DULCOMETER® D1C/D2C

The brain of the control loop

The DULCOMETER® D1C/D2C controllers make up the core of the extensive range of controllers and transmitters available from ProMinent. They are reliable, universally usable and can control a wide range of parameters.

DULCOMETER® D1C

- Universally usable for 14 different measured variables
- Optimised process sequences through special functions such as disturbance signal activation, pH compensation for chlorine, base load dosing and numerous limit value functions
- Special “Cool control” version, tailored to the special requirements of cooling tower conditioning

DULCOMETER® D2C

- The efficient solution for simultaneous control/measurement of: pH/redox, pH/chlorine, pH/pH and chlorine/chlorine
- Optimised process sequences through special functions such as base load dosing and numerous limit value functions

DULCOMETER® D1C

Measured Variable	Measurement and control range
pH	0 - 14
Redox/ORP	-1,000 mV ... 1,000 mV
Chlorine	in 7 graduated measuring ranges between 0.05 and 100 ppm
Bromine	in 2 graduated ranges between 0.02 and 10 ppm
Conductive conductivity	in 4 graduated ranges between 0.00 µS/cm and 200 mS/cm
Inductive conductivity	in 4 graduated ranges between 0 µS/cm and 2000 mS/cm
Chlorine dioxide	in 4 graduated ranges between 0.05 and 20 ppm
Chlorite	in 2 graduated ranges between 0.05 and 2 ppm
Ozone	0.05 - 2 ppm
Fluoride	0.05 - 10 mg/l
Hydrogen peroxide	in 3 graduated ranges between 1 - 2,000 ppm
Peracetic acid	in 3 graduated ranges between 1 and 2,000 ppm
Dissolved oxygen	in 2 graduated ranges between 0.1 and 20 ppm
Temperature	0 - 100 °C
Analogue signal	0/4 ... 20 mA

DULCOMETER® D2C

Measured Variable	Measurement and control range
pH (Measured variable 1,2)	0 - 14
Redox/ORP (Measured variable 2)	0 - 1,000 mV
Chlorine (Measured variable 1,2)	in 3 graduated ranges between 0.05 and 20 ppm

Further information:
www.prominent.com/mcs

Transmitters DULCOMETER® DMT

The link to the process control system

DULCOMETER® Type DMT transmitters are compact 2-wire transmitters for pH, redox, chlorine, conductive conductivity and temperature parameters.
They convert the primary sensor signal to a standard 4-20 mA signal, and act as an interference-proof link between the sensor and other control systems (e.g. PLCs) or DULCOMETER® controllers positioned some distance away.

Parameters for transmitters DULCOMETER® DMT

Parameter	Measurement and control range
pH	-1 ... 15
Redox/ORP	-1,200 ... +1,200 mV
Chlorine	0.01 - 5 ppm 0.10 - 50 ppm
Temperature	-20 ... +150 °C
Conductive conductivity	1 µS/cm - 200 mS/cm (auto-ranging)

Transmitter DULCOMETER® DMT

- With display of the parameter so that it can be controlled locally at the sensor location
- With calibration function of the sensor in its immediate vicinity
- Version available for linking to PROFIBUS® DP

Tubular housing transmitters
DULCOTEST® PHV1, RH V1, Pt 100 V1

- For pH, redox/ORP and temperature
- Space-saving mounting on the sensor
- Cost-effective transmission without display or calibration function

Further information:
www.prominent.com/mcs

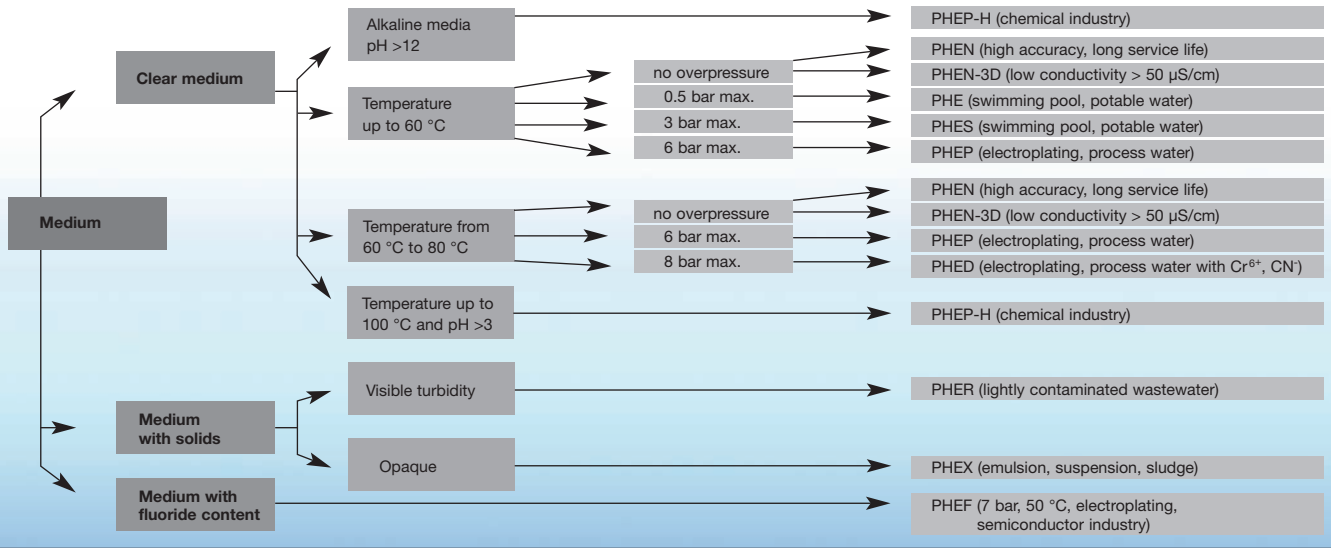
Sensors DULCOTEST®

Reliable pH sensor technology

The DULCOTEST® range of pH electrodes provides a broad programme of electrodes to solve all measurement problems. Applications range from simple water treatment applications to industrial process applications with more exacting requirements with regard to temperature, pressure, contamination compatibility and chemical resistance.

- Long service life achieved through use of the finest quality glass and an optimal combination of automated and manual manufacture
- Highly accurate and reliable measurement for efficient processes and a high level of process safety
- Tailor-made process connections possible through special versions with individual installation lengths, cable lengths and connectors
- Optimal utilisation of service life of the electrodes through short delivery and storage periods

Selection aid for DULCOTEST® pH electrodes



Further information:
www.prominent.com/ph_sensors

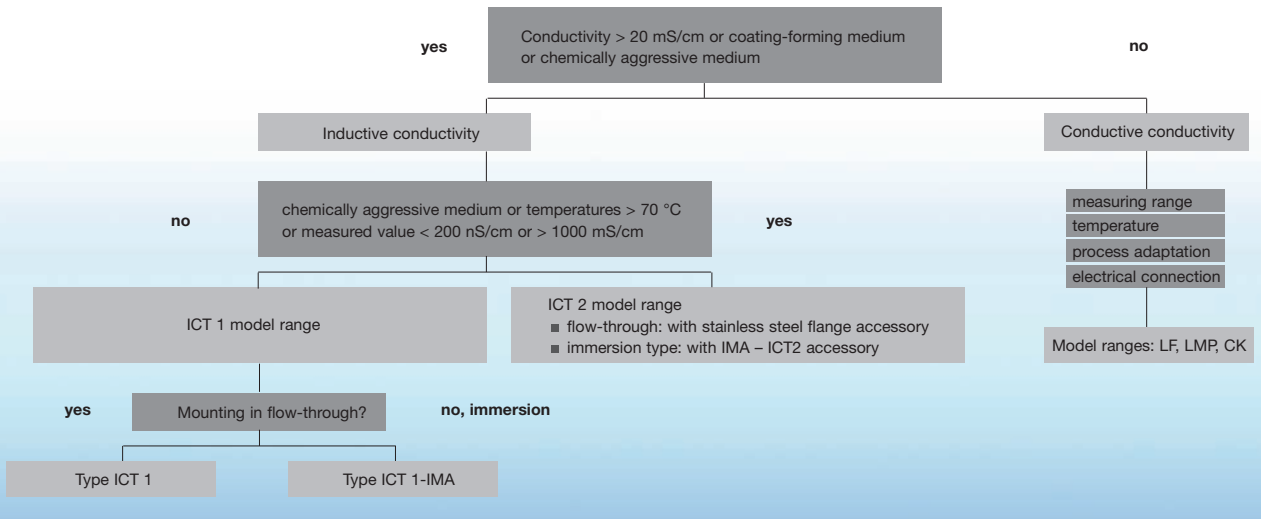
Sensors DULCOTEST®

Versatile conductivity sensor technology

The wide product range of the DULCOTEST® conductivity sensors enables the correct choice of sensor for applications ranging from simple water treatment, up to problematic industrial process water and offers optimal performance/price ratio.

- 27 different sensor types tailor-made for the different requirements: measuring range, temperature, chemical resistance, contamination compatibility and process connection
- From simple conductometric 2-electrode sensors, through 4-electrode sensors, up to inductive high-end sensors
- Highly accurate and reliable measurement for efficient processes and a high level of process safety
- Long service life and long maintenance intervals reduce downtimes and increase availability of the measurement values
- Complete, pre-assembled sets of housing and sensor for the simplest possible, fast and trouble-free installation

Selection aid for DULCOTEST® conductivity sensors



Further information:
www.prominent.com/cond_sensors

Sensors DULCOTEST®

Innovative amperometric sensor technology

Amperometric sensors in the DULCOTEST® product range supply measured values for the most widely different disinfectants, and the by-products arising from them. The selective and precise measured values ensure the highest level of process safety and are available for monitoring or control in real time, round the clock.

ProMinent sets the standard with its sensor technology: innovative sensors, such as those for chlorite, total chlorine, peracetic acid or hydrogen peroxide complete the extensive product range. The sensors are available with different measuring ranges, with various connection variants for DULCOMETER® instruments and as special versions for specific applications.

Selection aid for amperometric sensors

Parameters	Application	Graduated ranges	Connection to DULCOMETER®	Type
Free chlorine	drinking water, swimming pool water, process- and utility water	0.01 - 100 ppm 0.01 - 50 ppm 0.01 - 10 ppm	D1C, D2C, DULCOMARIN® DMT DULCOMARIN® II	CLE 3 (.1)-mA-xppm CLE 3 (.1)-DMT-xppm CLE 3 (.1)-CAN-xppm
Total available chlorine	swimming pool water with chlororganic disinfectant	0.02 - 10 ppm 0.01 - 10 ppm	D1C, D2C, DULCOMARIN® DULCOMARIN® II	CGE 2-mA-xppm CGE 2-CAN-xppm
Total chlorine	drinking water, utility water, process water and cooling water	0.01 - 10 ppm 0.01 - 10 ppm 0.01 - 10 ppm	D1C, D2C, DULCOMARIN® DMT DULCOMARIN® II	CTE 1-mA-xppm CTE 1-DMT-xppm CLE 1-CAN-xppm
Combined chlorine	swimming pool water	0.02 - 2 ppm 0.01 - 10 ppm	D2C DULCOMARIN® II	CTE 1-mA-2ppm & CLE3.1-mA-2ppm CLE 1-CAN-xppm & CLE3.1-CAN xppm
Bromine	cooling water, swimming pool water, spa pool water	0.02 - 10 ppm	D1C	BRE 1-mA-xppm BRE 2-mA-xppm
Chlorine dioxide	drinking water, utility water, process water, bottle washing machines	0.01 - 10 ppm 0.02 - 2 ppm	D1C D1C	CDE 2-mA-xppm CDP 1-mA-xppm
Chlorite	drinking water, wash water	0.01 - 2 ppm	D1C	CLT 1-mA-xppm
Ozone	drinking water, utility water, process water, swimming pool water	0.02 - 2 ppm	D1C	OZE 1-mA-xppm
Dissolved oxygen	drinking water, surface water, clarification plant activated sludge	0.02 - 20 ppm 0.01 - 10 ppm	D1C D1C	DO 1-mA-xppm DO 2-mA-xppm
Peracetic acid	CIP, aseptic food filling	10 - 2,000 mg/l	D1C	PAA 1-mA-xppm
Hydrogen peroxide	clear water, fast control, process water, swimming pool water	1 - 2,000 mg/l 2 - 10,000 mg/l	PEROX controller D1C	H2.10 P PER 1-mA-xppm

Further information:
www.prominent.com/mcs

Housings

For all applications

The correct housings facilitate the best measurement position and hence the optimal deployment of sensors in the process. ProMinent offers the right housings for all applications; for direct mounting in the main process flow pipework – with and without flange – immersion housings for tanks and channels or by-pass housings for use in a secondary flow.

- Fast, simple fitting and removal of the sensors and space-saving housing construction
- Full compatibility with all current process interfaces
- Fast response time of the measuring system through low volume
- Robust against electrical interference through equipotential bonding lug

By-pass housing DGMa

Properties	Advantages and benefits
■ Modular construction housing for up to **five** sensors of any type ■ Pre-assembled on plate ■ Integrated sampling cock	■ Cost-effective, simple installation and retrofitting through flexible modules ■ High level of measuring/process safety thanks to flow monitoring module ■ Simple, fast commissioning and safe calibration local to the sensor

By-pass housing DLG III + DLG IV

Properties DLG III	Advantages and benefits
■ Multi-position housing for **two** sensors (pH, redox, conductivity, temperature, fluoride) plus ■ **One** sensor (chlorine, bromine, chlorine dioxide, ozone)	■ Simple cleaning of housing and sensor through removable cup ■ Cup can be used as a container for a calibration solution

Properties DLG IV

- Multi-position housing for **four** sensors (pH, redox, conductivity, temperature)

Immersion housing IPHa1 + IPHa3

Properties IPHa1	Advantages and benefits
■ For **one** sensor (pH, redox, conductivity, temperature, PG 13.5 thread) ■ Insertion depth: 1 m, 2 m	■ Space for a transmitter next to the sensor ■ Simple withdrawal of the tube and length adjustment by customer, as no coupling point ■ Extremely flexible thanks to extensive range of accessories ■ Flange mounting possible

Properties IPHa3

- For up to **three** sensors (pH, redox, conductivity, temperature, fluoride)
- Insertion depth: 1 m, 2 m

Immersion housings TA-LM(P)

Properties	Advantages and benefits
■ For **one** conductivity sensor, M28 thread (LM(P) types) ■ Insertion depth: 1 m	■ Flexible mounting on the tank possible, from the side or from above ■ 1 m extension tube available as accessory, also for subsequent adaptation ■ Also available fully pre-assembled complete with sensor for fast, safe installation

Further information:
www.prominent.com/mcs

Accessories for measurement and control equipment

A complete programme

ProMinent offers a complete accessory programme for operation and maintenance of process measurement stations. All genuine parts and consumables can be obtained quickly and conveniently from a single address. This makes the day-to-day work in chemical process analysis much easier.

- Portable instruments for calibration of process measurement stations
- Comparison solutions and reagents for calibration
- Test leads, connectors and electrical adaptors
- Recorders
- Accessories for housings, such as adaptors and flanges
- Consumable materials for sensors

Further information:
www.prominent.com/mcs

World-wide contact

ProMinent is at home in more than 100 countries of the world. This guarantees world-wide availability of the products and short distances to the customer. All over the world, ProMinent offers identical quality standards for products and services. ProMinent is where you need it: experience and know-how in water treatment and chemical fluid handling are available world-wide.

For detailed information, please visit our website www.prominent.com

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