

# Customer Services

Putting customers first



**CHRIST**

BWT Best Water Technology Group

**Water is a raw material – we are responsible for how we use it**

Water is the most important raw material on our planet for human beings, for animals, for plants and for micro-organisms. Practically all processes in the biosphere that create and maintain life depend on the availability of water. Water is thus a living environment, an energy medium and a transport medium, and also an important element for all types of production.

The total amount of water available has remained practically constant over the last few thousand years. 2000 years ago, 200 to 300 million inhabitants of Earth could utilise the available resources. Today, more than 6 billion persons have to make do with almost the same amount of water. This means that the raw material water, which was for a long time freely available in many parts of the world, is now seriously stressed. Furthermore, the natural cleaning systems of our planet are considerably overloaded.

The Christ Water Technology Group is fully aware of its major responsibilities in maintaining water resources as a raw material and this contribution will become even more important in the future.



**The range of services offered during the project cycle and the entire lifetime of water treatment systems**

By integration of all process steps, the Christ Water Technology Group offers its customers a total solution, extending from project identification through construction to commissioning, operator training, customer services and system operation and maintenance. According to customer needs, specific service contracts can be set up with the Christ Water Technology Group. The Christ Water Technology Group consists of the individual companies of the group and several Customer Service Centres, which were founded in order to span bridges between our company's locations and our customers. The companies of the Christ Water Technology Group are certified in accordance with BS EN ISO 9001 and many to ISO 14001. Christ AG, for example, has been certified since December 5, 1997 (ISO 9001) and since February 6, 2003 (ISO 14001).

#### Single-source solutions for all sectors of industry

The Christ Water Technology Group works constantly to expand its range of services to meet the demands of its business partners. These partners increasingly expect services, which exceed the scope of our basic competence. In such cases, the Christ Water Technology Group can obtain specialist assistance from system partners who possess the appropriate expertise, particularly in the engineering sector and in the development of plant-specific special solutions, and can thus offer complete solutions which include the planning, commissioning and maintenance of large technical plants.

The Christ Water Technology Group can provide existing and new customers with quick and reliable solutions for complex problems. These solutions may be as simple as a special mechanical and control system design for a water treatment system or as complex as the complete planning and design of a large process system for the Semiconductor Industry, Pharmaceuticals and Life Sciences, for Power Generation, and Industrial Process and Waste Water, together with systems for the Food & Beverage industry or for Municipal Drinking Water & Sewage.

#### Service overview, branch solutions

The companies of the Christ Water Technology Group provide their customers with advice supply products and solutions tailor-made to meet their requirements, and commission systems and provide regular maintenance operations.



**Commissioning**

Fast, structured and reliable commissioning of water treatment systems

**Application areas**

- DQ Design Qualification
- IQ Installation Qualification
- OQ Operational Qualification
- PQ Performance Qualification
- System erection inspection
- System commissioning
  - Mechanical
  - Electrical
  - Control system
  - Device-specific
  - Functional checks
  - Quality checks (certification)
  - Training of operating personnel
  - Provision of operational documentation

**Benefits for the customer**

- Inspection equipment and special tools are provided
- Uniform documentation of the commissioning work to ensure traceability, particularly in the case of malfunctions
- Competent customer service engineers ensure fast and technically correct commissioning

**Proof of quality, certificates**

- Inspection certificates
  - Factory certification
  - Work certification
  - Final inspection certificates
  - FDA conformity declaration
  - Additional quality tests
- Proof of design
- Computations
- Markings
- Technical documentation and data sheets
- Acceptance tests (FAT)
- Additional system-specific services

**Application areas**

- High quality demands on the system process technology
- Special proof requirements (DQ, IQ, OQ documentation)
- Transparency of the instrumentation
- Individual factory acceptance tests of the finished components (FAT)

**Benefits for the customer**

- Compliance with special quality requirements (ISO 9001/14001)
- Simple assignment and recognition of the installed components
- Confidence due to provable quality

**On-demand service**

Quick assistance from competent customer service staff in the case of problems

- Central hotline in Great Britain and Switzerland (will be set up in other countries in the near future)
- System function (standard devices) restored within 48 hours in emergencies
- Optimal personnel planning: a telephone call on the service hotline is sufficient to find out which engineer is available
- Confirmation by fax of the planned service actions
- Detailed service reports

**Application areas**

- Repairs in the case of device failures
- Support in the solution of process problems
- Reduced workload for the local maintenance personnel

**Benefits for the customer**

- Minimum system down-times
- The Christ Water Technology Group makes every effort to respond within 24 to 48 hours. Special agreements can be made with the companies of the Christ Water Technology Group closest to the system location
- Prompt availability of spare parts
- Rapid fault analysis by regularly trained service engineers
- Correct use of test equipment, simulators and special tools
- Detailed documentation of the work carried out
- Many years of experience with the applications

**Laboratory analyses**

With the water chemistry laboratories available at some of the companies of the Christ Water Technology Group and with mobile laboratories, all with state-of-the-art technical equipment, a complete spectrum of analytical services, including the laboratory examination of ion exchanger resins and of wastewater is offered.

In special cases, such as in the Semiconductor Industry or in Pharmaceuticals & Life Sciences, the Christ Water Technology Group can offer supplementary analytical services provided by our system partners.



**Short, medium and long-term maintenance and supervision agreements**

The companies of the Christ Water Technology Group test and confirm the operating capabilities of the system. Regular inspections include the checking of all settings and the performance of the system is certified in an independent report.

**Application areas**

- Regular inspection of the quality-relevant measuring devices (calibration)
- Modular maintenance concept tailor-made to meet the customer's requirements
- Inspections in accordance with Paragraph 19 I WHG
- Certified processes
- Regular inspection of the entire system process technology (supervision agreements)

**Benefits for the customer**

- Increased operating reliability and system availability
- Reduced workload for the operating personnel at prices which can be calculated in advance
- Optimum function of the system for the best possible process results
- Favourable fixed maintenance prices with clearly defined maintenance activities (maintenance agreements and plans)
- Full warranty on spare parts and system devices which are replaced
- Advice and training for the operating personnel
- Software and hardware updates
- Maintenance by specially trained engineers
- Documentation of the functional test in order to maintain the quality audit

**Tailor-made agreements**

Safe and reliable operation with a maintenance agreement designed to meet the customer's specific requirements. In co-operation with the customer, the companies of the CWT Group define a specific set of services, and the customer signs a corresponding agree-

ment. This ensures that all necessary maintenance work is carried out and provides the customer with an individual service solution. The maintenance contracts with CWT Customer Services are an optimal supplement to the customer's internal resources.

Christ is currently extending the necessary service for remote support of special, large CWT water treatment systems.

**The CWT Customer Services maintenance agreement includes:**

- Maintenance graphics
- A daily maintenance plan (operational data sheet) (work carried out by the customer)
- A weekly maintenance plan (work carried out by the customer)
- A monthly maintenance plan (work carried out by the customer)
- An annual maintenance plan with details of the activities (work carried out by CWT Customer Services)
- Regular service visits (work carried out by CWT Customer Services)

The CWT Customer Services maintenance handbook can be ordered free of charge from the CWT service locations. Please have the CWT commission number available when ordering.



**Calibration agreements for measuring equipment**

The CWT calibration service offers optimum solutions for the regular calibration of the process technology used in the water treatment systems. The certified reference measurement included in the calibration set for conductivity complies with the requirements of the ASTM standard. The direct comparison measurement at the same location represents an ideal measuring method; all important parameters, the temperature and the flow conditions are all the same, the medium is absolutely identical. The calibration is certified by CWT for the customer's documentation.

**Recalibration of the customer's most important measuring points**

- Calibration of pure water conductivity measurements with the Thornton comparison measurement in accordance with the ASTM standard
- Calibration of the O<sub>3</sub> measurement with the proven surrounding-air calibration
- TOC – Total Oxidisable Organic Carbon

**Application areas**

- Support in the validation of calibration processes
- Quality assurance
- Execution of the calibration in accordance with DIN ISO 17025
- Certified reference measurement as demanded by the ASTM standard

**Benefits for the customer**

- Cost savings, since the test solutions are provided (a sufficient quantity of calibration solution must be provided by the customer)
- Early detection of deviations from setpoints which are important for quality and for the process
- Practical comparison standards (certified) for simple and quick recalibration
- Reduced work load for the customer's personnel
- Documentation of the calibration for maintenance of the quality audit
- Guaranteed system availability
- Conforms with international standards (such as USP 26)

**On-site calibration of pressure measuring devices**

Pressure measurements are checked with a reference device with a manufacturer's calibration certificate (calibrated in the factory to 0.1 %). Three to four measuring points within the measuring range to which the device is set are checked and the results are documented.

**Measuring ranges between 0 and 16 bar**

Safety and traceability in the evaluation of measured values is mandatory, particularly when it is necessary to prove the measuring accuracy in order to ensure the quality of the treated water. This is important in Pharmaceuticals & Life Sciences, for example for WBI and WFI systems.

**On-site calibration of temperature measuring devices**

Temperature sensors are tested in a hot cabinet whose temperature is accurate to within +/- 0.5 °C. Three to four measuring points within the measuring range to which the device is set are checked and the results are documented. Measuring ranges between ambient temperature and 155 °C.

**On-site calibration of flow measuring devices**

- Calibration of flow measuring devices in areas not subject to explosion risks
- Measuring ranges between 0.3 and 70 m<sup>3</sup>/hr
- Nominal diameters from DN 15 to DN 65



**Hotline services (24 hours a day, 365 days per year)**

The companies of the CWT group have a central contact for customer problems. This ensures short reaction times and efficient, customer-oriented processing of the problems. Specialists handle the problem without delay in order to assist the customer as quickly as possible.

- Service support by telephone
- On-demand service
- Spare parts and consumables
- Maintenance
- On-site calibration

**Telephone support**

In order to help customers to maintain the maximum possible availability of their systems, CWT Customer Services is continually extending the spectrum of available services. Specialists from the departments for on-demand service and spare parts provide advice and assistance at any time, even by telephone. Some problems have to be addressed immediately, and telephone support is crucial.

**Spare parts and consumables**

CWT offers favourably priced supply agreements for consumables and spare parts to ensure the quality of the water produced by the customers' systems. Simple, fast and reliable delivery is guaranteed. All CWT products are carefully selected and the companies of the CWT Group make every effort to ensure their availability. Customers can order consumables and spare parts by telephone, by fax or by email.

**Audits of water treatment systems**

**Application area**

If requested by a customer, the companies of the Christ Water Technology Group send an experienced process engineer for water treatment systems. Basing on a comprehensive audit of the customer's system, the general condition of the system and its function and the data provided by the customer, he produces a concept for

- Advice
- Checking of the treatment methods
- Calculation of the economic efficiency
- Revisions
- Modifications
- System optimisation
- Upgrade proposals and upgrades
- Expansion
- Supplements to the legal applications in the case of system expansion
- New systems

**Warranty on deliveries**

CWT products have an excellent reputation for quality. If a mistake should be made, CWT will replace or take back the product, providing it is received in its original condition. The companies of the CWT Group can also provide and, if necessary, adjust the technical specifications, such as for the replacement of resins and for the replacement of reverse osmosis and/or ultrafiltration modules, in order to ensure that the process components meet the highest demands at all times.

**Result report and documentation**

**The comprehensive report after completion of the audit includes:**

- An analysis of the installed process technology (system status)
- A risk analysis
- The recommended measures

**Benefits for the customer**

- Technically competent execution of the audit
- A customer specific audit report
- Proposals for achieving the desired objective



**Competent systems engineering**

- Situation analysis and co-operative definition of the requirements for system functions
- Creation of an optimally designed solution
- Basic engineering and creation of the user requirements specification
- Technically correct detail engineering
- Professional project management
- Commissioning and comprehensive functional tests
- Operator training
- Documentation (operating instructions, logic documents, etc.)

**Benefits for the customer**

- Everything – from the raw water to the purified water, with process visualisation – from a single source
- Reliable and competent project management
- Tailor-made service package

**System operation and maintenance agreements**

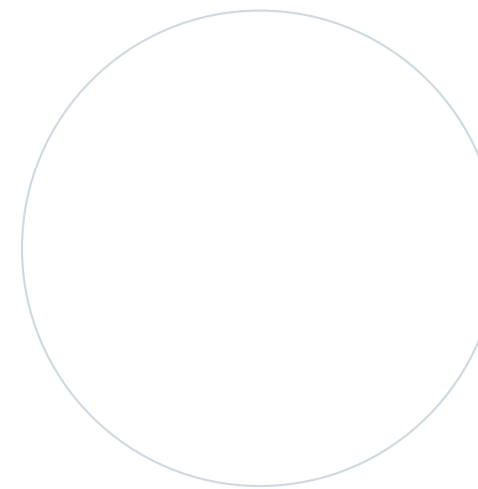
Process-specific support in operation of the system by qualified and experienced process engineers.

**Support in operation and maintenance of the system**

Provision of qualified personnel for monitoring of the system or supervision of operators.

**Benefits for the customer**

- Reduced costs and higher system availability
- Long-term reduction of the total costs
- More safety and documentation for the processes
- Optimised maintenance/calibration intervals
- Reduced stocks of spare parts
- Current system status available as the basis for decisions



Overview of services: equipment/system engineering/integration		
Project progress	Contact	Services
Customer advice "Solutions with CHRIST process technology"	Project manager (sales department)	Commissioning, training courses, on-site measurements, calibration, leasing contract, self-monitoring, factory repairs, on-site rectification of deficiencies, quotations for spare parts and delivery of parts
Customer advice "Complex solutions for system functions"	Company staff and project engineer	Situation analysis, creation of a requirement profile, preliminary planning
Basic engineering	Company staff, project engineer	Creation of the final user requirement specifications or functional specifications for the process control technology, DQ
Detail engineering	Project manager	Detailed technical specifications, specification of the control system, creation of installation and commissioning documents, IQ
Installation	Project manager/Installation manager	Timely delivery and installation of the field equipment, the control cabinets and the hardware components for the control system
Commissioning	Commissioning engineer	Configuration of the field equipment and commissioning of the control system, handover of the documentation, OQ
Training of the operating personnel	Commissioning engineer	Training courses
Customer services	Sales department, project manager, commissioning engineer, service engineer	Hotline, on-site rectification of deficiencies



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