SIGMA Thermal Cycling System

SMART TESTING.PROVEN EXCELLENCE

About TCA

Scope

SCITEQ's SIGMA flexible thermal cycling system, TCA is mainly used to determine the leakage status of composite pipes and fittings when subjected to cycles under specified internal pressure load and temperature.

The TCA system can perform tests of up to six pipe sample strings simultaneously depending on diameter and for diameters up to 110mm.

The pre-tensioning is conveniently placed outside the chamber allowing for easy instrumentation and measuring of tension. **The system uses tanks containing the hot and cold water supplies.**

The all-in-one compact solution requires only connection to power and water.

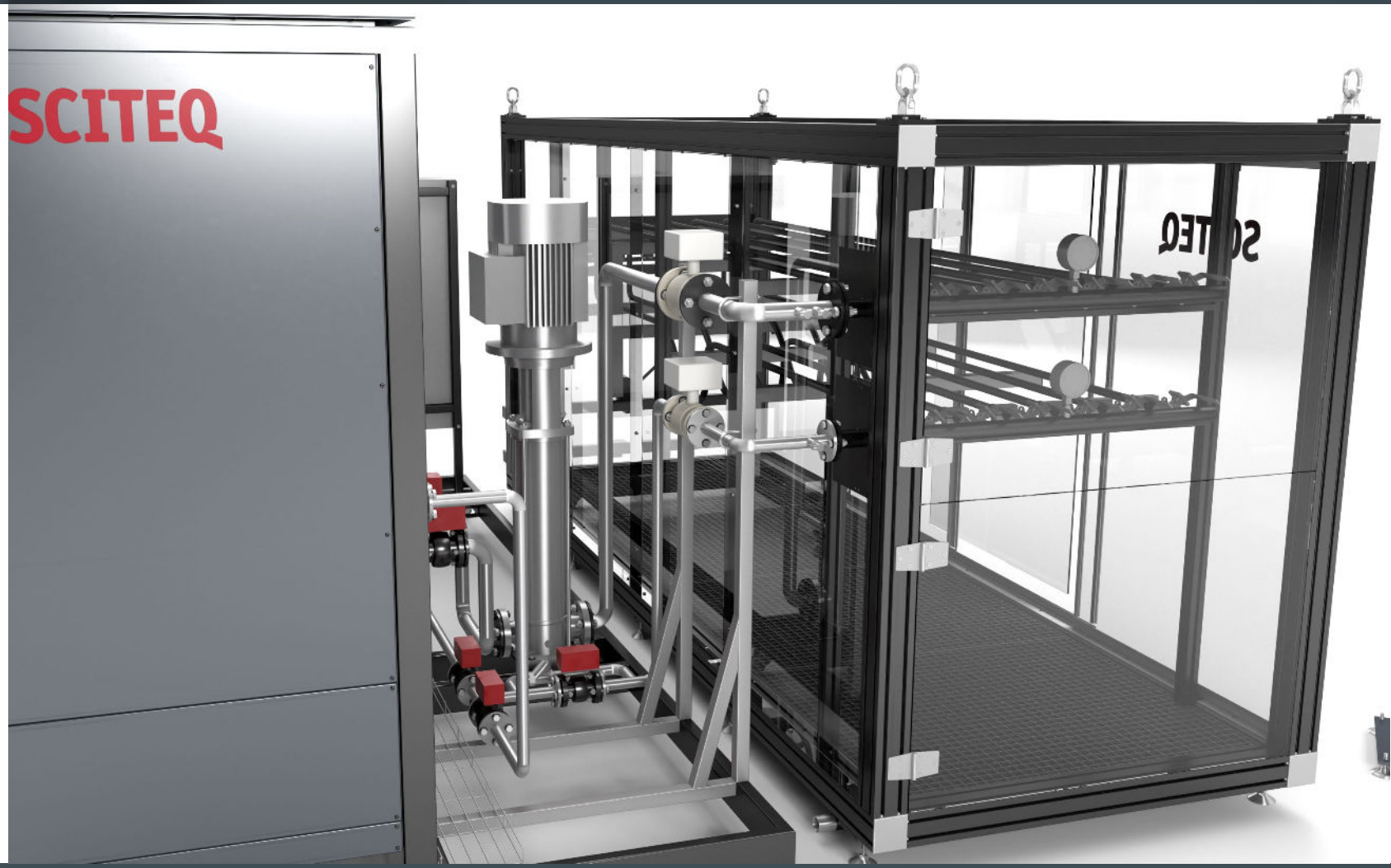
The system complies with various standards*
*ISO 10 508, ISO 15874-5, EN ISO 15875-5, EN 12 293, BS 7291 and equivalent.

About TCA

Accuracy

The TCA system is build entirely of European high quality components ensuring not only long service lifetime, but also high accuracy of pressure and flow.

Multiple automatic leak-detection functions included in software interface.

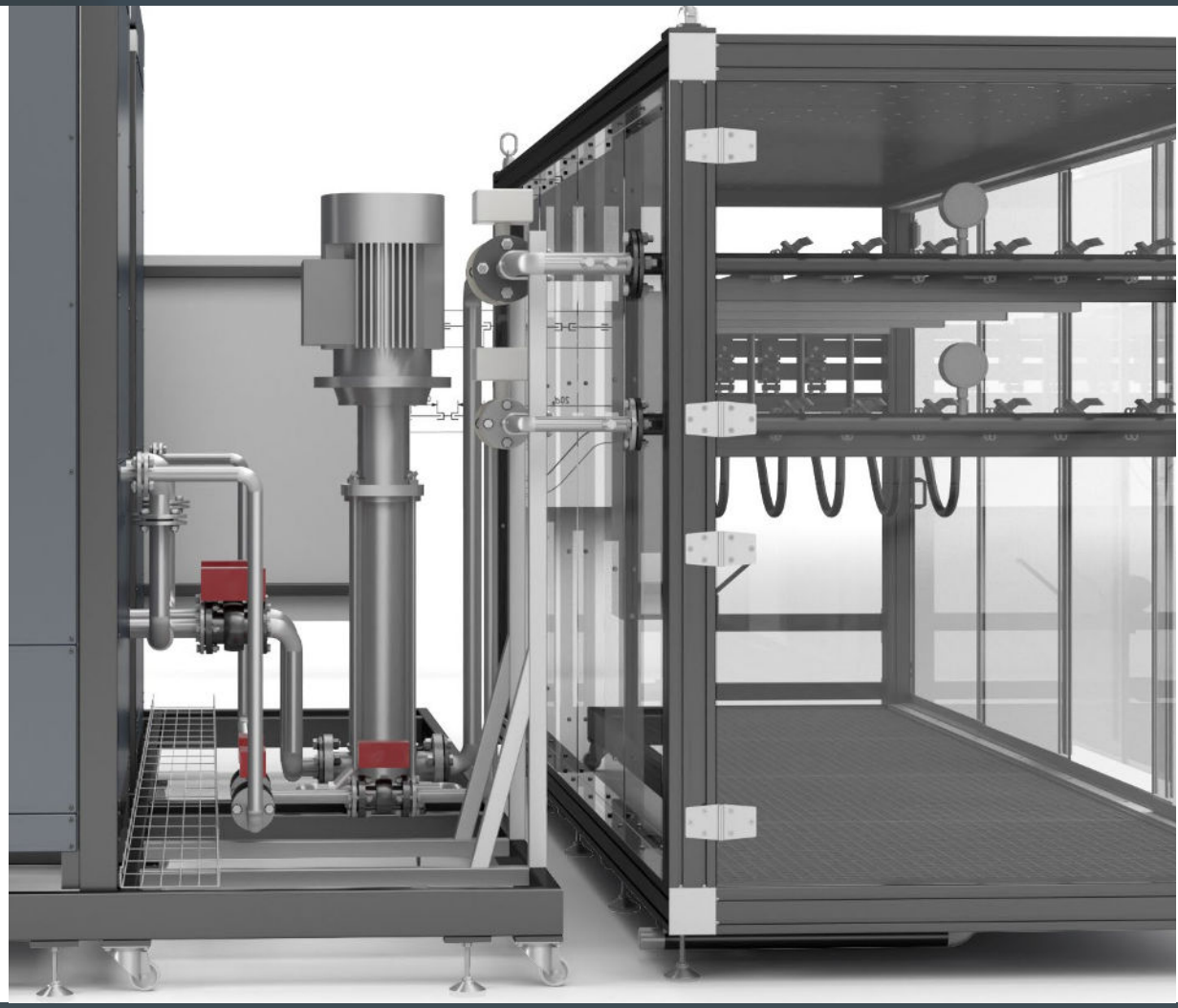


About TCA

Easy calibration & maintenance

The system enables calibration of pressure and temperature during test, meaning that the system may continue running during calibration.

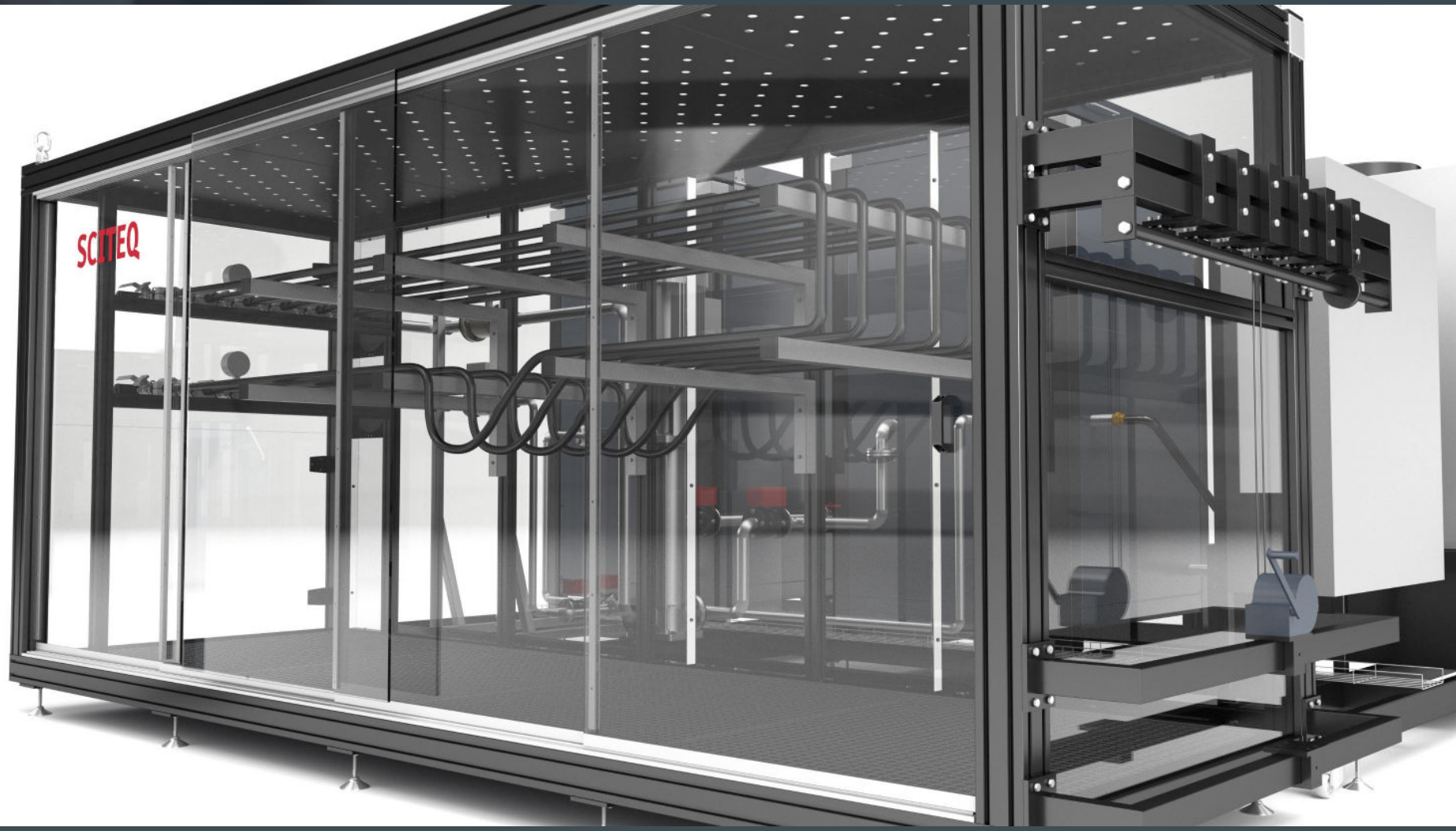
The design enables safe and easy access to the complete system from all sides and allows full visual inspection.



About TCA

Safety

The SCITEQ TCA design enables safe and easy access to all sample strings. The closed test room has transparant doors providing easy sample access, with full visual inspection during tests. Build-in emergency shut-down feature ensure safe operation at all times i.e. doors automatically locks once the pressure pump starts.



About TCA

Non-pressurized tanks

The system has non-pressurized water reservoirs ensuring safe operation as well as minimizing maintenance costs.

The test system is designed to minimize the volume of pressurized water.

About TCA

Energy saving system

Energy saving pressure and circulation pumps automatically ensures consistent temperatures and sufficient flow. The build-in energy saving system automatically delays hot water flow to the cold water reservoir and visa versa during hot and cold water cycle changeover.

About SIGMA TCA software

SCITEQ

SIGMA browser based control

The complete TCA system is operated from SCITEQ's browser-based user interface is accessible from any device – any time, anywhere.

Advantages

- ✓ Full real-time monitoring view
- ✓ 4 different user levels
- ✓ Easy recipe set-up
- ✓ Dynamically adjusted real-time finish time
- ✓ Multiple simultaneous users
- ✓ One page overview
- ✓ SQL database which is compatible with all server types
- ✓ OPC UA compatible

About SIGMA TCA Software interface

SCITEQ

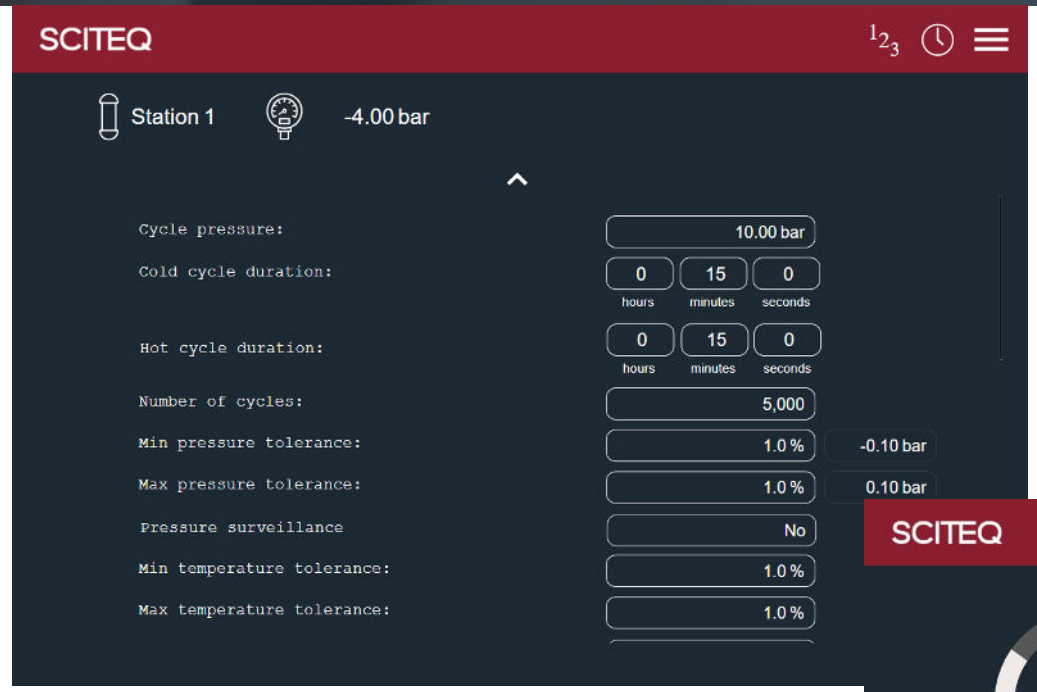
Test paramaters

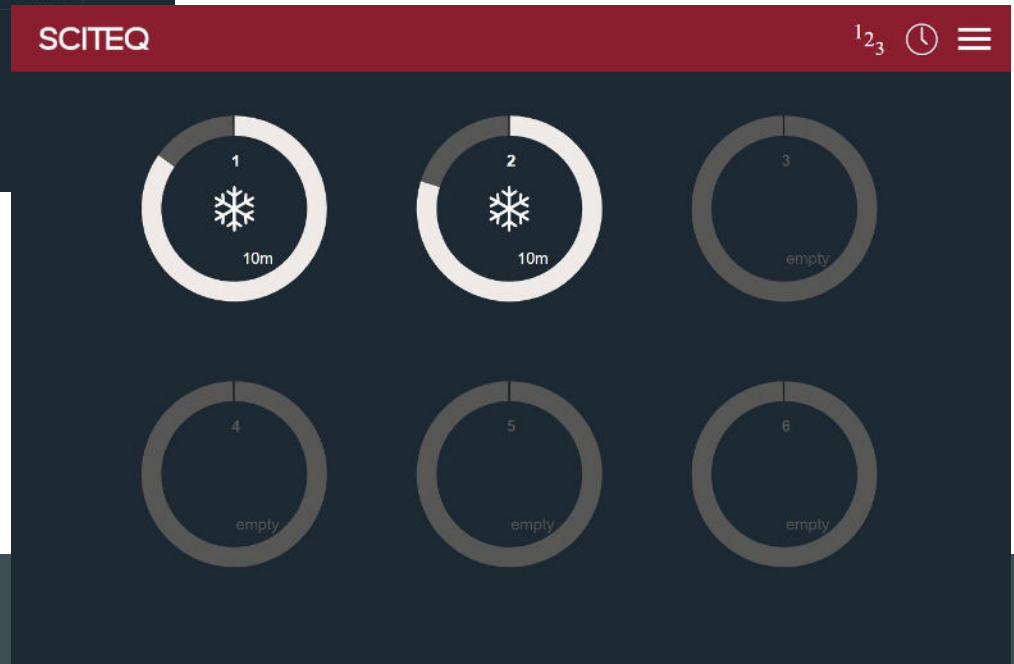
All most every test parameter can be modified if wanted, especially useful for R&D where testing is not according to a specific standard.

Furthermore data such as batch no, machine no. Customer name, operator name etc. can be entered, which is valuable for the test report.

‘One page overview’

The “One page” overview provides full view of all stations. Multiple filtering options. Displaying ongoing tests listed in order ranked according to ‘attention urgency’/ time left to completion.





About TCA Recipe

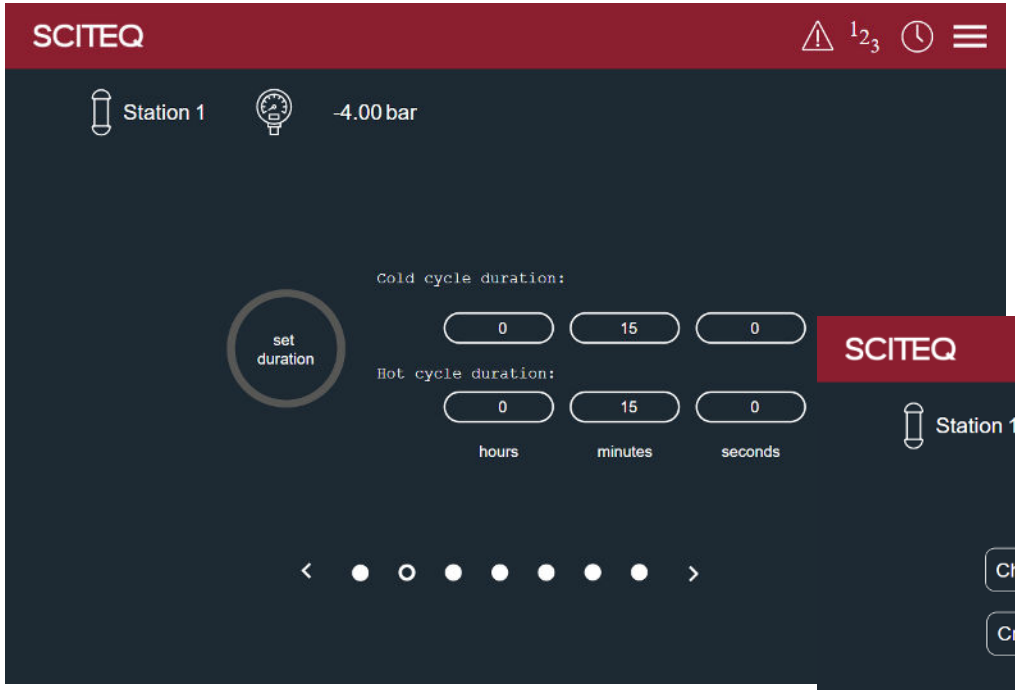
Recipes

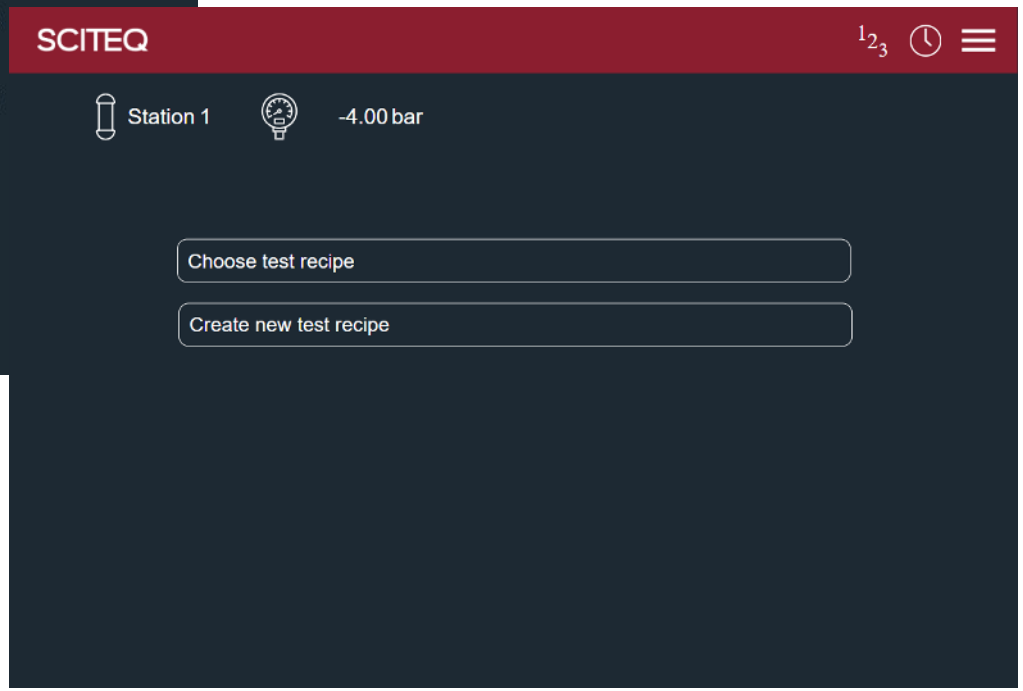
The TCA software offers a recipe system enabling quick start and repeat of tests. When parameters are pre-programmed; set pressure, cycle time, specimen type it only takes the operator a couple of clicks to fast and easy start and repeat test.

Recipe guide

When creating new recipe the SIGMA TCA software will guide the operator through the parameter setup needed for easy loading and start of test.

The Super-user (laboratory manager) will be able to create/add non-editable quality assured recipes for operators' everyday use.





About TCA Dash board

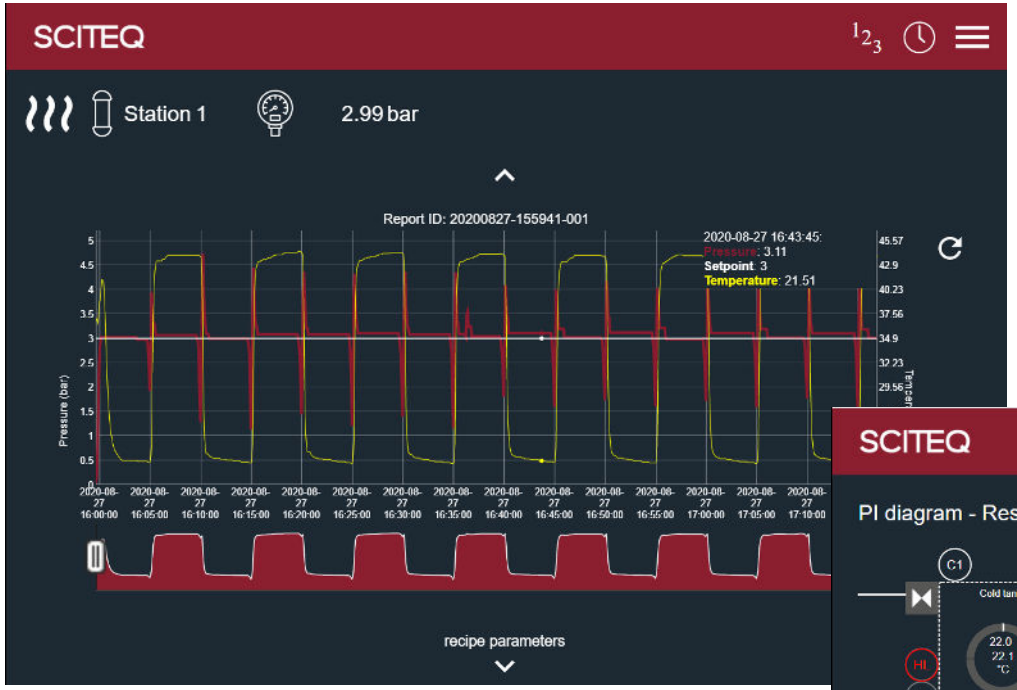
Individual dash board

For each station an individual dash board will provide the user with more detailed info on the current status of the test. Predicted finish time, current temperature, number of completed cycles etc. is displayed here. From here it is also possible to pause and stop the test station in case a sample has bursted and operator wishes to end the individual test, until remaining test stations are finished

About Full view

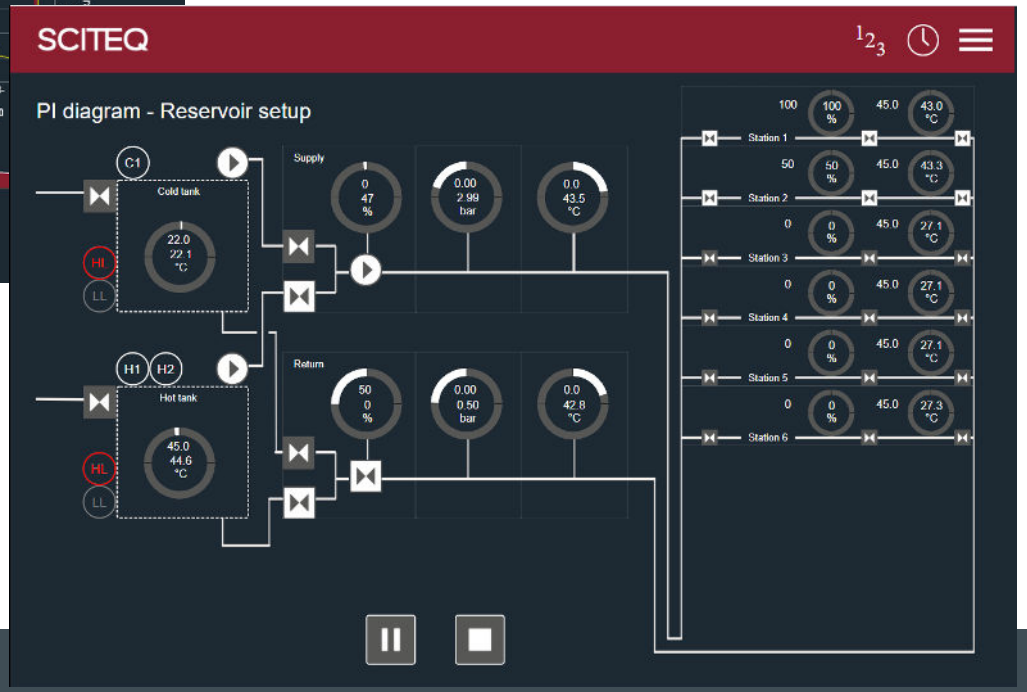
Full view

For each station it is possible to see graph of current test in real time. This provides full details about pressure and temperature and enables the user to zoom in and monitor current test, directly from the handheld UX device.



PI diagram

The system overview provides the user with full overview of current status of each valve, pump, pressure, heating, cooling, sensors etc. With needed user level access it is also possible to manually control all components



Standards TCA

Standards

The SCITEQ Thermal Cycling systems complies with the below standards. Referring national, or sub standards referring to the below and others on request .

Standards:

EN 12293
EN ISO 15875-5,
ISO 19893
ISO 15874-5
ISO 10 508
BS 7291

CE approval:

73/23/EEC (LOW VOLTAGE)
89/655/EEC (WORK EQUIP-MENT)
89/392/EEC (MACHINES)
89/336/EEC (ELECTRONAGNETIC COMPAT-ABILITY)
89/656/EEC (PROTECTION

BRITISH STANDARD

BS 7291-1:2010

Contents

DS/EN ISO 19893:2018

INTERNATIONAL STANDARD ISO 19893:2011(EN)

Plastics piping systems — Thermoplastics pipes and fittings for hot and cold water — Test method for the resistance of mounted assemblies to temperature cycling

1 Scope

This International Standard specifies a method for testing the resistance to temperature cycling of joints for piping systems with rigid or flexible thermoplastics pipes.

It is applicable to thermoplastics piping systems intended to be used in hot and cold water pressure applications.

2 Principle

A test assembly of pipes and fittings (see Figure 1) is subjected to temperature cycling by the passage of water under pressure using hot and cold water alternately, for a specified number of cycles.

While being subjected to temperature cycling, parts of the assembly of pipes and fittings are maintained under tensile stress and/or flexural strain using static clamps.

During and after the test, the assembly is monitored for signs of leakage.

NOTE — It is assumed that the following test parameters are set by the reference product standard (i.e. the standard making reference to this International Standard):

a) the test temperatures (see 3.1, 3.2 and 6.1);

b) the duration of a complete cycle and each part of the cycle (see 3.1, 3.2 and 6.1);

c) the test pressure (see 3.6 and 6.1);

d) the tensile stress (see 3.8 and 5.3);

e) the bending radius (see Clause 4 and Figures 1 and 2);

f) the total number of cycles, including the first five cycles (see 6.2 and 6.3).

Dimensions & Configuration TCA

Dimensions

Test cabinet L4460 x W1450 x H2040mm

Supply frame L4200 x W2300 x H2360mm
When open lid on tank: H3420mm

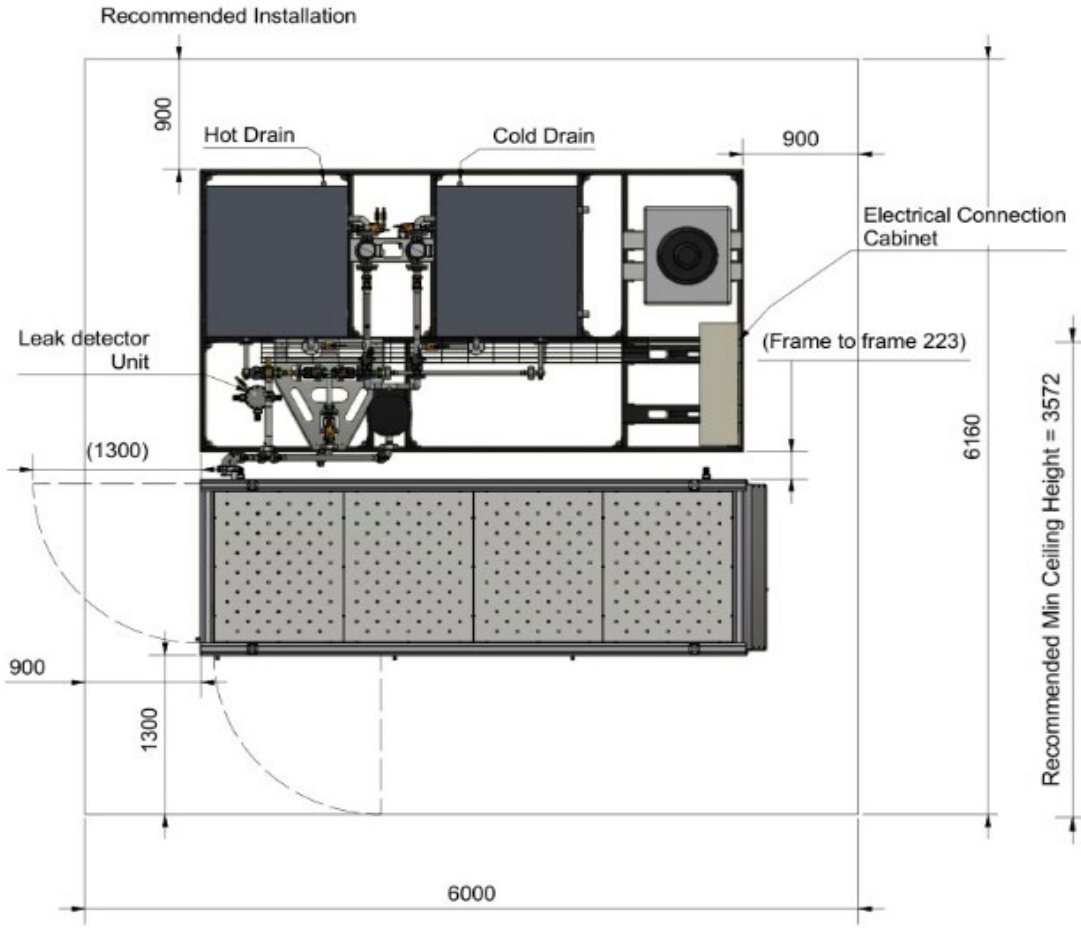
Weight approx. 2400 kg.

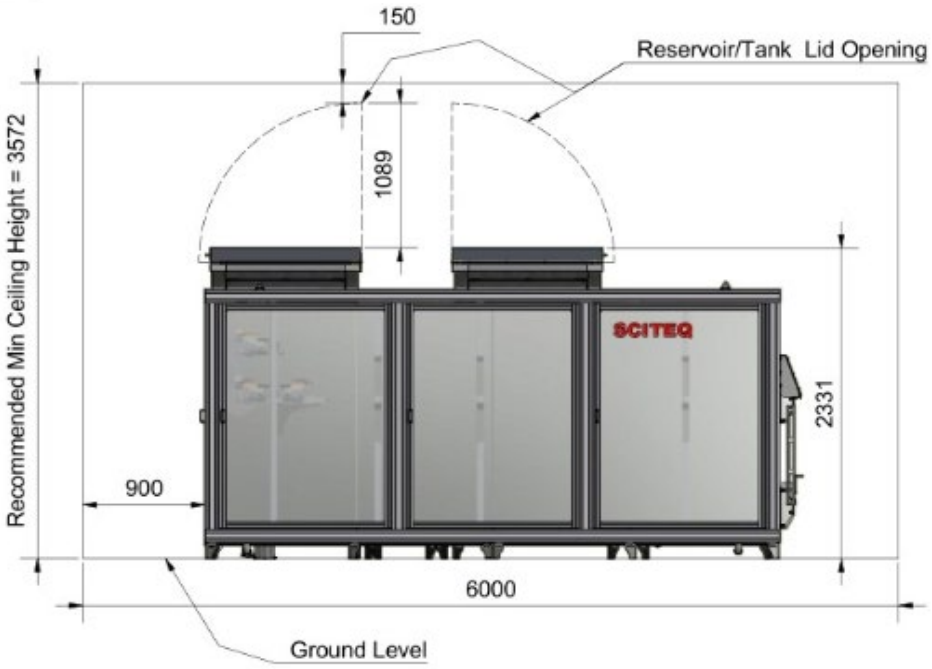
Recommended foot print for TCA

6000x6200 mm

Recommended ceiling height

(floor to ceiling): 3600mm





Dimensions & Configuration TCA

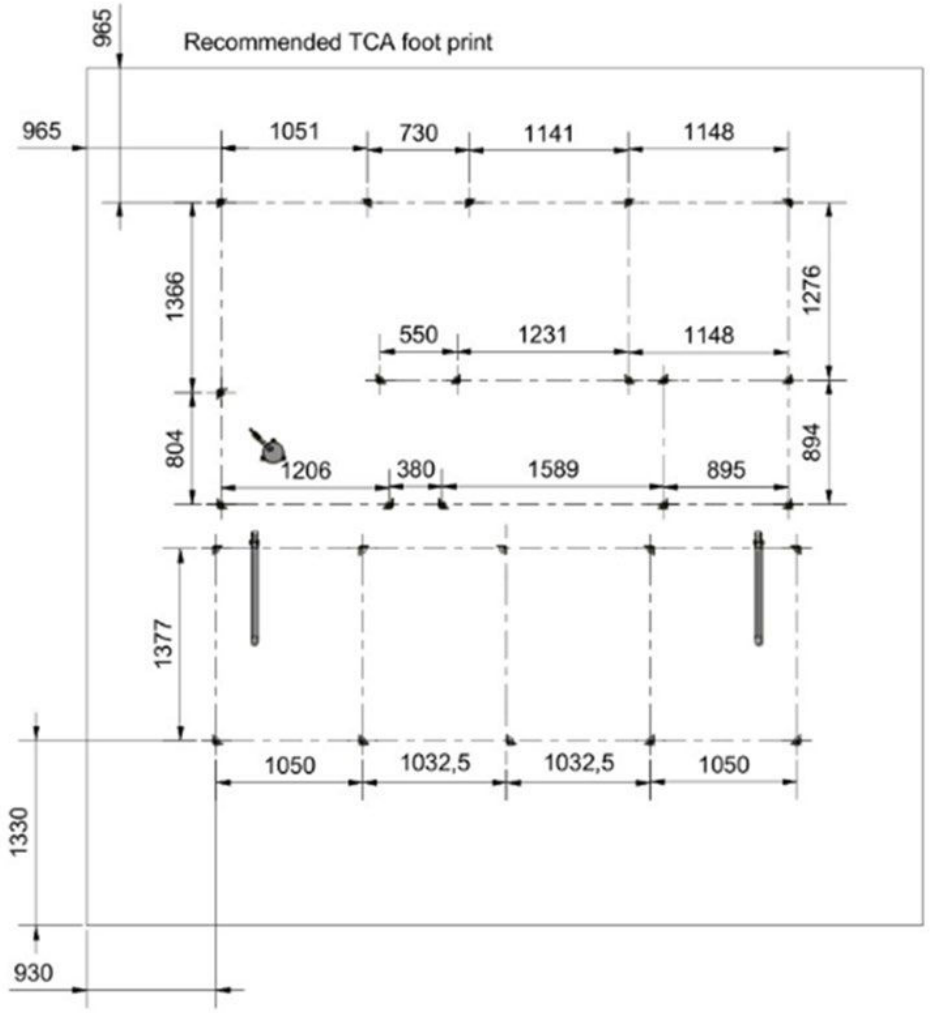
Recommended foot print for TCA
6000x6200 mm

Recommended ceiling height
(floor to ceiling) : 3600mm

Configuration

The layout of the supply frame and test chamber can be configured in a L-shape. SCITEQ pipes and electrical wires will be adapted according to chosen layout.

Please contact SCITEQ for guidance.



Specfications TCA

Number of sample connections	6 individual
Sample connection interface	1” male thread BSP
Build in sample tensile stress system*	√ individual
Complied standards	EN/ISO 13257:2017, EN/ISO 19893:2018, ISO 15874-5, EN 12293, EN ISO 15875-5, ISO 10 508, BS 7291 and equivalent
Programmable test cycles recipe	√ 6 individual
Data logging	√ 6 individual
Touch, user interface	√
Water temperature regulation accuracy	Within +/- 2 K
Maximum water temperature [°C]**	95
Minimum water temperature [°C]**	15
Adjustable sample support brackets included	√ In test chamber
Maximum water flow [m3/h]	17
Maximum pressure (at max flow) [bar]	10 (16 bar on request)
Flow monitoring * **	On request
Temperature change over time [s]	60
Sample size capacity	Max. DN110 or equivalent cross sectional area [mm2]
Leak detection	Build-in mechanical detection – in software

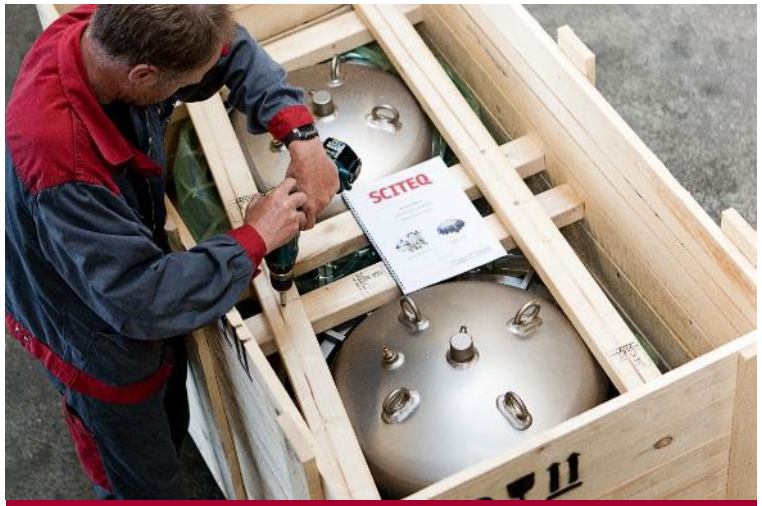
* Manual system, standard delivered without load gauge. Load gauge can be supplied on request –please specify force range
** Other temperatures is available on request
*** Flow monitoring on total water supply or per sample on request

Specfications TCA

External dimensions, Test cabinet LxWxH [mm]	4460 x 1450 x 2040
Weight, test cabinet [kg]	Approx: 700
External dimensions, Supply frame LxWxH [mm]	4200 x 2300 x 2360 (when open lid on tank: H3420mm)
Weight, supply frame [kg]	Approx: 2400
Water supply	Normal tap water, 1,5-4 bar
Lighting	Build-in light /alarm inside test chamber
Material: piping and inner tank and lid*	AISI 304
Material: frame and cover plates	S235JR (Powder coated) and aluminum
Power supply*	3x 400 V, 50/60 HZ
Max. power consumption	Approx 54 KW
Operation temperature	From 10 °C to 35 °C
Storage temperature	From 1 °C to 50 °C
CE approval	√

* Other materials available on request

Service & Support

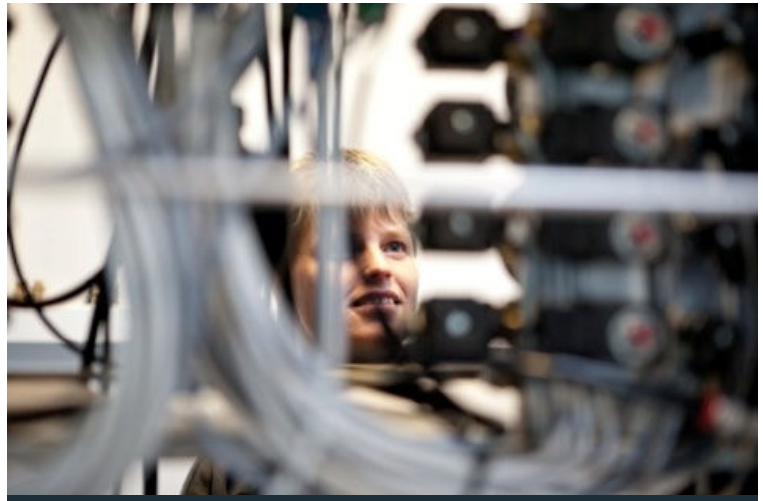


Installation & training

SCITEQ's trained service technicians perform onsite installation of your new SCITEQ equipment as well as onsite or remote training of your operating personnel who will be using the equipment.

SCITEQ Care

You will find the level of service suitable for your test setup with SCITEQ Care. SCITEQ service engineers will visit you annually to perform the best service and calibration. With SCITEQ Basic, More or All Care package you gain access to a long list of advantages, discounts and free support from SCITEQ skilled technician. Learn more about SCITEQ Care



Support online & on-site

SCITEQ offers online and on-site support on all SCITEQ products, for fast and effective problem solving, training, setup, etc. If you have an unforeseen challenge or you need advise asap, you can contact service@sciteq.com or call us for urgent support.