



IT Cooling Solutions

STULZ Test Centre

Putting air-conditioning and refrigeration technology to the test

Tests just as you require them – for stringent performance testing

As one of the world's technology leaders for IT Cooling Solutions, STULZ has its own professional Test Centre in Hamburg. And we have further expanded the Centre's capabilities, to satisfy the future requirements of precision air conditioning. Now as ever, computer-controlled testing of air-conditioning solutions using sophisticated test equipment is at the heart of our endeavours. At a central location, systems can be tested and optimised even during the design and development phase. Extensive test runs under a great variety of conditions demonstrate the actual performance capabilities of systems and components. What's more, we determine the expected running costs and make them available to you

worldwide in our STULZ Select database. The STULZ Test Centre occupies more than 700 m² of the premises of STULZ GmbH. In the sealed bay, our test bench engineers offer two services based on DIN EN 14511. Firstly, the witness test, which gives you, our customer, the opportunity to simulate your precision air conditioner (climatic chamber I) or precision air-conditioning system (climatic chambers I and II) under a huge variety of operating conditions. Secondly, internal prototype tests, which involve extensive testing of mechanical, electrical and electronic components and the control technology of precision air conditioners or chillers during their development.



The STULZ climatic chambers: always open for a test run

Welcome to the STULZ Test Centre! Its advantages for you

- Certified and independent calibrated Test Centre
- Certainty in the calculation of running costs
- Country-specific test scenarios
- Infinitely adjustable for voltages and frequencies all over the world
- Documentation of calibration certificates and test results
- Simulation of different operating states
- Simulation of partial load conditions in precision air-conditioning mode
- Reliability when choosing your air-conditioning system
- Testing of STULZ air-conditioning systems in two test chambers
- Two precision air conditioners can be tested in one day
- Use of ultra-modern, height-adjustable equipment base
- Standard-compliant sound measurements to ISO 9614



Interior dimensions of the climatic chamber: Height 4180 mm, width 9760 mm, depth 5680 mm

Live and up close – in STULZ's Test Centre in Hamburg

Thanks to our two large climatic test chambers, parallel measurements can be performed on different precision air conditioners or chillers. For both climatic chambers,

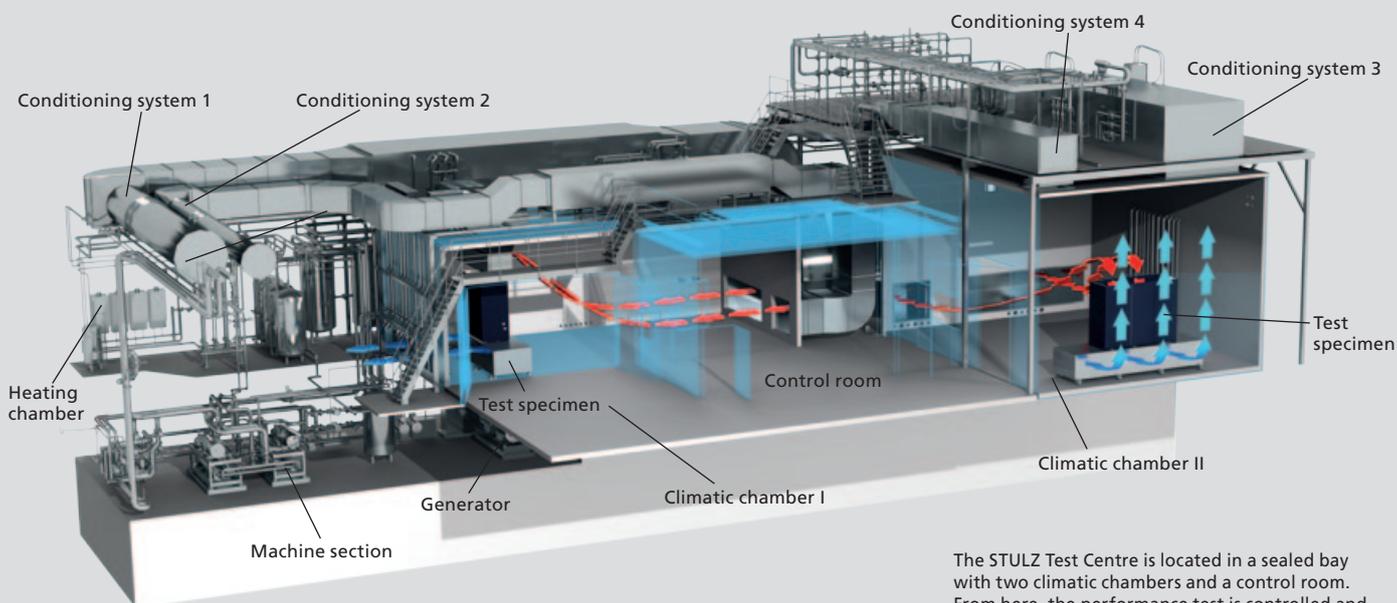
Climatic chamber I:

Interior dimensions:	9.7x5.6x4.1 m (WxDxH) – Room volume 220 m ³
Temperatures in environmental simulation mode:	-20°C to +55°C
Air flow rate in environmental simulation mode:	Up to 106,000 m ³ /h
Cooling capacity in environmental simulation mode:	300 kW
Temperatures in precision A/C mode:	+10°C to +40°C
Air flow rate in precision A/C mode:	2,000 m ³ /h to 40,000 m ³ /h
Operating mode:	Conditioning mode (enthalpy method), environmental simulation mode

700 kW is available for chilled water mode (mechanical chilling) and 1000 kW for heat exchanger mode, plus a heating capacity of 320 kW.

Climatic chamber II:

Interior dimensions:	7.8x9.5x6.2 m (WxDxH) – Room volume 460 m ³
Temperatures in precision A/C mode:	+10°C to +60°C
Air flow rate in precision A/C mode:	500 m ³ /h to 55,000 m ³ /h
Operating mode:	Conditioning mode (enthalpy method), environmental simulation mode (calorimeter method)



The STULZ Test Centre is located in a sealed bay with two climatic chambers and a control room. From here, the performance test is controlled and logged.

STULZ customer tests – Ensuring high availability and creating transparency

Cape Town, Sao Paulo, Paris, Moscow, London, Shanghai, Dubai, Frankfurt – wherever you are planning your data centre, we are there for you. When you perform a witness test at STULZ, we simulate your conditions live in our climatic chambers, and take account of your requirements and influencing variables down to the last detail. Test bench engineers support you in all phases of the performance test – providing you with solid, meaningful performance values for our precision air-conditioning systems and chillers.



Experience the testing of your air-conditioning system live in our control room

Various test options – all under one roof

Cooling IT and telecommunications equipment even more efficiently and reliably – this is what drives us. And in this process we create new products and solutions, which satisfy

your increasingly stringent requirements for the best air-conditioning solution. And this is why we have expanded our Test Centre.

Standard test options in conditioning mode:

- Precise testing of liquid and air-cooled chillers, evaporators, condensers, air coolers, heat exchangers and air conditioners
- Precise adjustment of air temperature and humidity
- Simulation of external pressure by butterfly valves
- Simulation of partial load conditions (variable thermal loads)
- Graphic representation of individual measured values on the computer and in the control room via projection

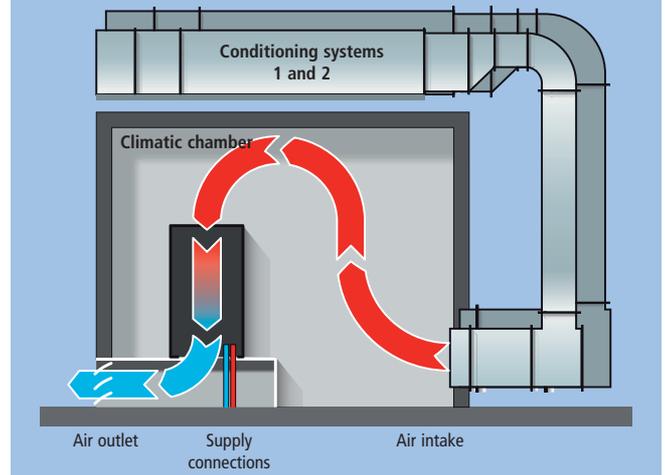
Cold aisle/hot aisle data centre extension for further test options:

- Climatic chamber II is divided into two chambers (hot and cold), to separate the air side from the device air exhaust side.
- The air conditioner is situated in a cut-out in the cold aisle chamber
- Simulation of incoming air conditions (thermal load, air flow rate, temperature, humidity) in line with the requirement, which make up the hot aisle chamber
- Graphic representation of individual measured values on the computer and in the control room via projection

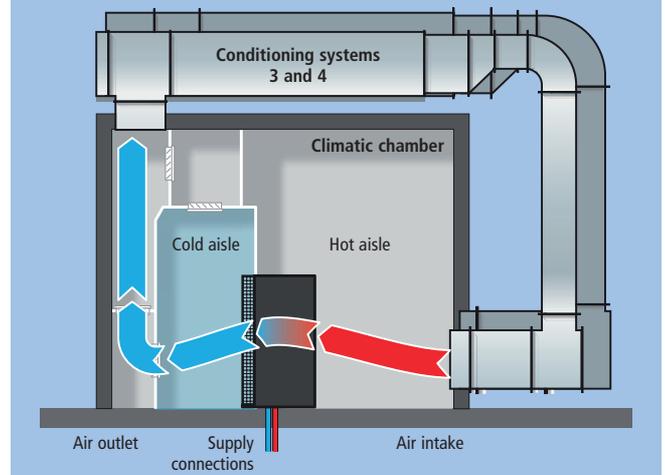
Testing chillers, heat exchangers and air-cooled condensers in environmental simulation mode:

- Environmental simulation mode in climatic chamber I with possible temperatures from -20°C to $+55^{\circ}\text{C}$
- Maximum available unmeasured air flow rate of $106,000\text{ m}^3/\text{h}$
- Simulation of outdoor environmental conditions from around the world
- Graphic representation of individual measured values on the computer and in the control room via projection

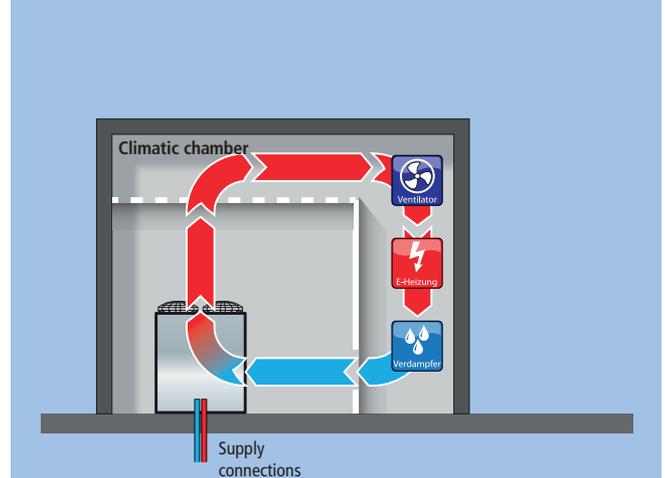
Climatic chamber I



Climatic chamber II, CyberRow Rack Cooling



Climatic chamber I



STULZ: Precise climate control anywhere in the world – You benefit from our expertise

Experience, in-depth development and computer-aided engineering are the keys to success

All the relevant steps, from the rough draft to the finished precision air-conditioning system, are supported by finely tuned development tools. Development, prototyping, accompanying tests and production all take place in one location, enabling speedy intervention at any time.

What you get from us is a sophisticated system that satisfies exacting quality requirements.

Do you need a system that doesn't yet exist? Working in partnership with you, we can develop and create such a system, in a very short time.

Tests in compliance with international standards ensure optimum acceptance

Our test equipment is calibrated annually by independent DKD calibration services/calibration institutes. Our Test Centre complies with all the necessary regulations. We promise you confidential, independent testing.

EN 14511 – Terms, test conditions, test procedures, requirements

EN 1216 – Forced circulation air-cooling and air-heating circuits

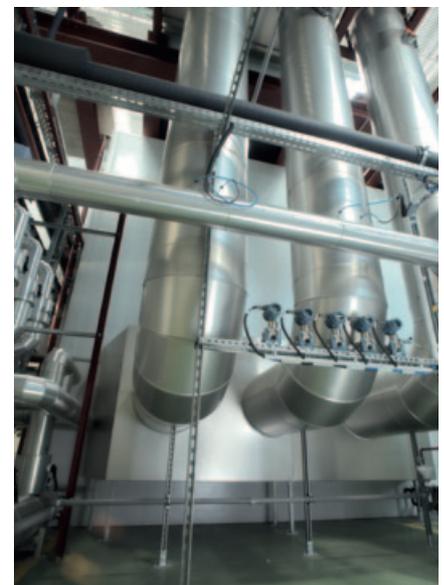
ISO 9614 – Determination of sound power levels of noise sources using sound intensity



Equipment room 1



Pump stations for conditioning system



Pressure sensors for conditioning system

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IT Cooling Solutions

Close to you all over the world.

... With specialist, competent partners in our subsidiaries and exclusive sales and service partners around the world. Our five production sites are in Europe, North America and Asia.