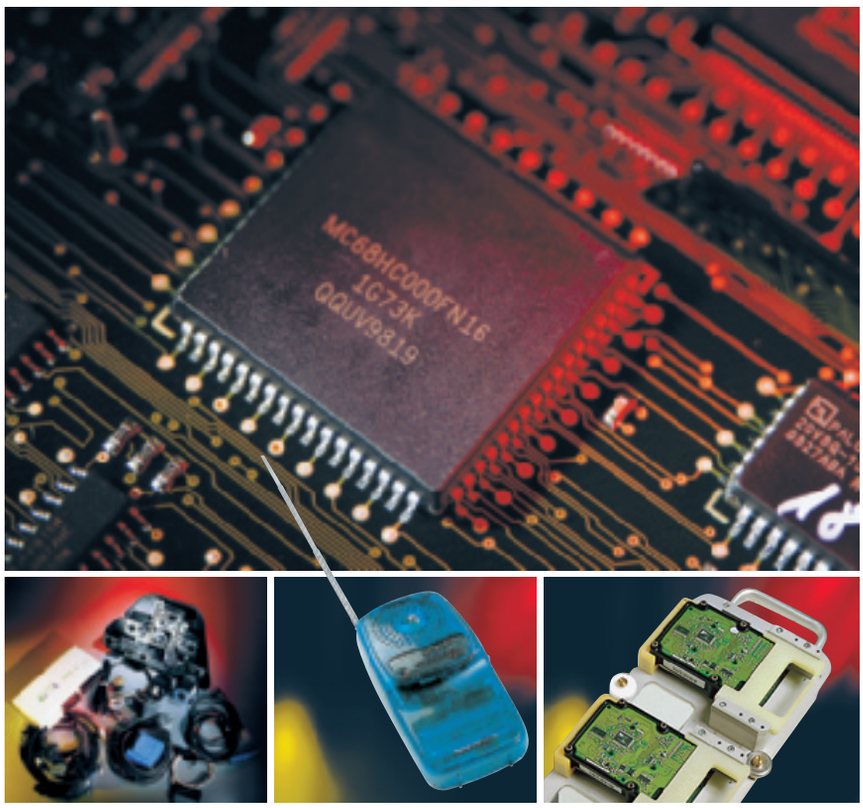
High Speed ...

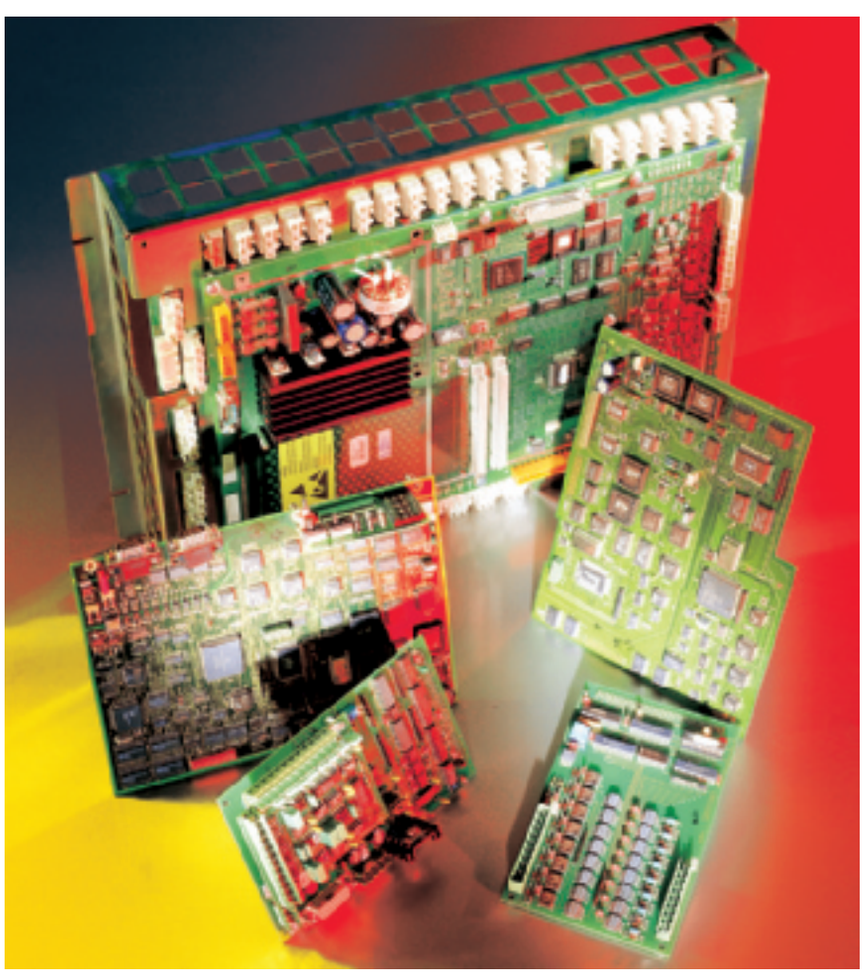
Vötsch
Industrietechnik

Rapid Temperature Change Rates
with VTS & VCS Stress Screening Systems

Tested for absolute reliability ...



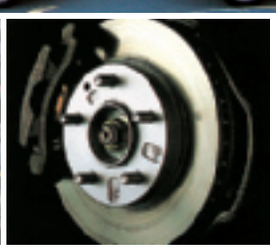
The testing of individual components ensures the reliability of your final product.



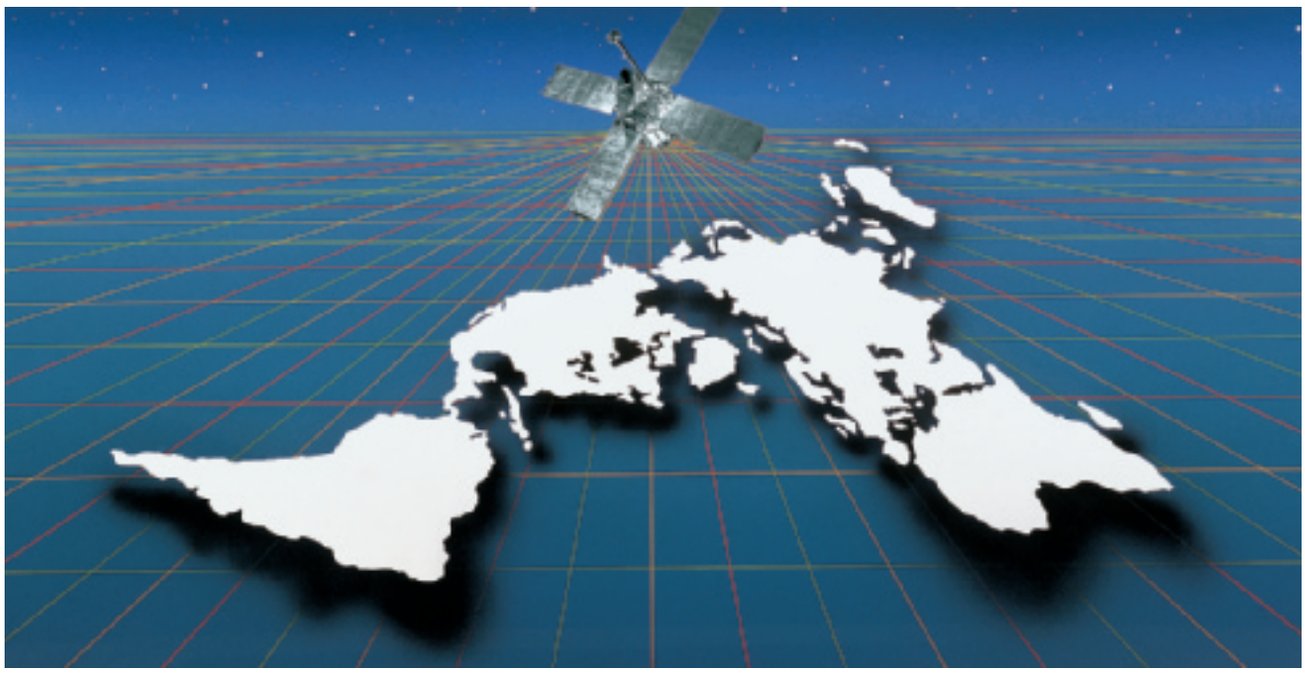
ESS

... Safety reliability and much more

In critical situations we must fully rely on the safety systems functioning at all conditions.



Put reliability to the test ...



„photo ACOME“

Today, at the beginning of global communications, we take fault-free operation for granted.

... and don't leave anything to chance

ESS

You can only successfully market a perfectly functioning product.

ESS ...

Environmental Stress Screening (ESS) is a process which induces latent flaws in a product before it leaves the factory. Hence, ESS is always applied if the reliability of a product requires enhancing.

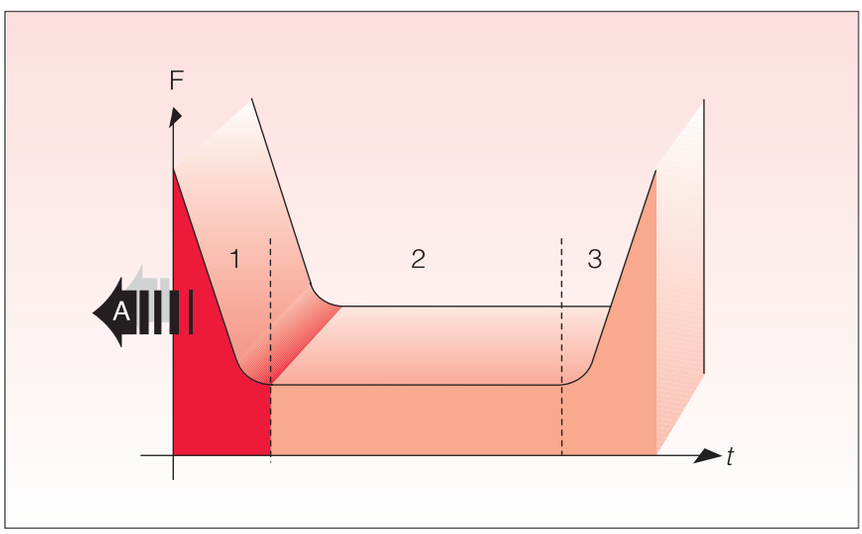
The application of temperature shock cycling is the most effective method of creating premature failure in the production phase.

Temperature shock cycling for accelerated inspections are determined by test tailoring, with regard to both temperature extremes and the rapidity at which change occurs.

Highly rapid temperature change rates create mechanical and thermal stress in specimens.

Therefore it's possible to more rapidly detect weak points in design, material or in the production of electronic assemblies.

5 K/min, 10 K/min and 15 K/min are the preferred change rates. For special applications we produce test chambers with temperature change rates up to 30 K/min.

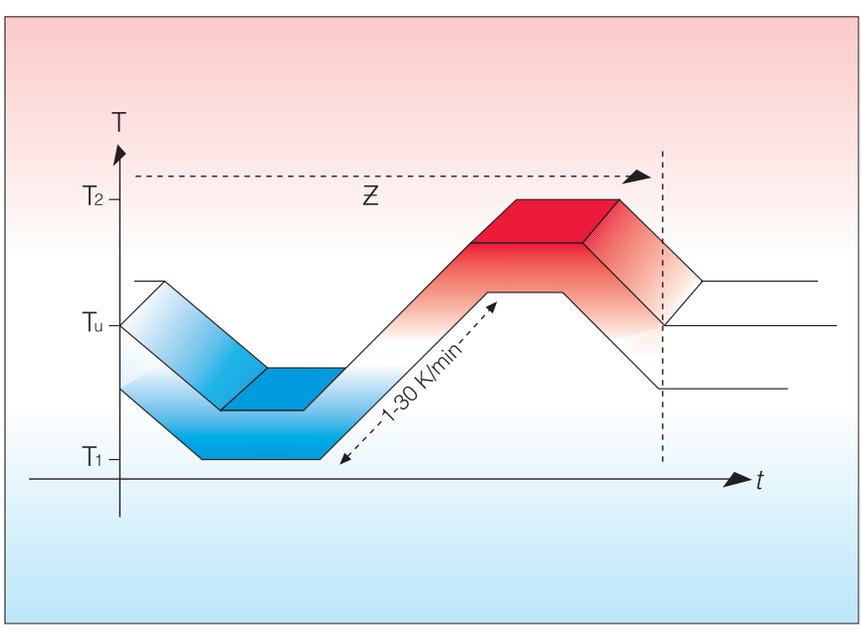


Life time graph of electronic components
A = ESS moves these failures from field to factory
F = Failures *t = Time*
1 = Infant mortality *2 = Operational lifetime* *3 = Wear out phase*

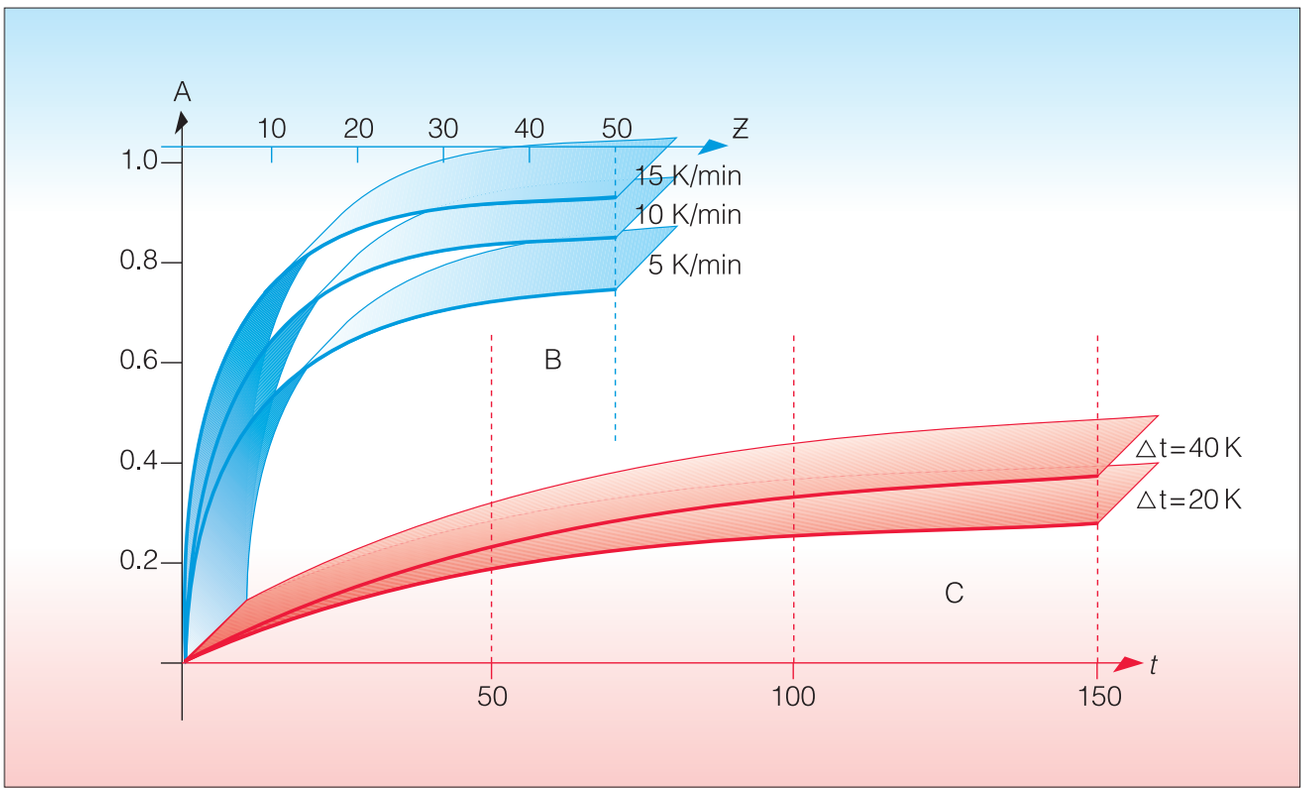
ESS comprises the processes **HALT** (High Accelerated Life Testing) and **HASS** (High Accelerated Stress Screening) for the support of production development and quality assurance.

HALT is a process which generates an accelerated simulation of the product service life. Detection of weaknesses or errors in product design is extremely successful using this method.

HASS, in contrast, is a process which induces more intensively latent flaws in a product.



Changing temperature according IEC 60068-2-14, Test Nb
T = Temperature *T_U = Ambient temperature*
T_1 = Low temperature *Z = N-cycles*

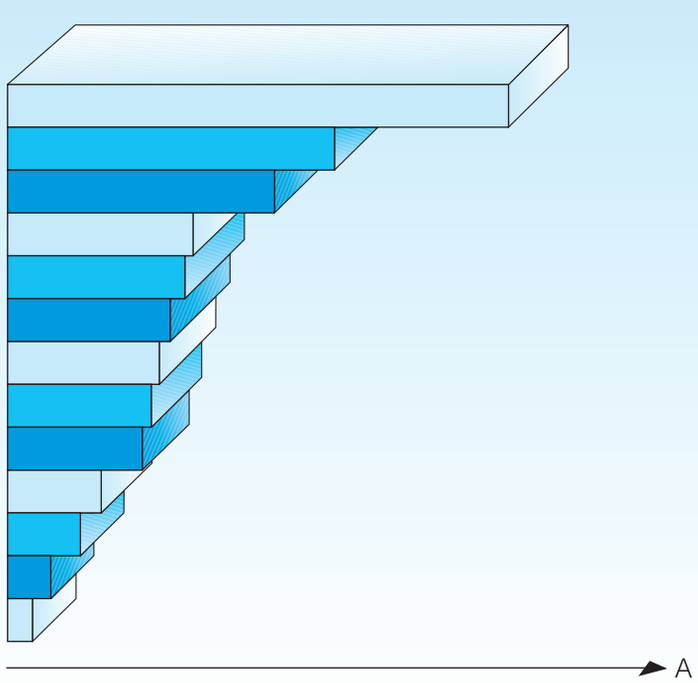


Effectiveness of thermal cycles and high temperature storage for preconditioning of circuit boards

A = Effectiveness, B = Thermal cycles, C = High temperature storage, Z = Cycles, t = Time
Δt = Increased temperature to max. temperature for use

Effectiveness of different environmental screening methods

Temperature cycling
Random vibration
High temperature
Electrical stress
Thermal shock
Sine vibration, fixed frequency
Low temperature
Sine vibration, sweep frequency
Combined environmental
Mechanical shock
Humidity
Acceleration
Altitude
A = Weighted Rank



ESS ...

... in practice

Temperature and climatic test systems in the VTS & VCS series fill the gap between the well-proven VT/VC series and shock test systems. The test systems, which are equipped to offer greater power, are available in stylish designs.

Various power modules as heating, cooling and circulating air form the basis of tailor-made model ranges.

Test chamber volumes from 190 to 1540 litres in a temperature range from -70 °C to +180 °C enable us to meet practically all customer requirements.

Current climatic test standards are realised with the VCS series. Test systems in the VTS & VCS series are the true all-rounders among test systems.

The speedy systems enable you to move into the overtaking lane with regard to the safety and reliability of your products.

The integration of different power modules result in first-rate test systems to suit application specifications. Constant temperatures, constant climatic conditions, temperature changes and climatic changes enhanced by rapid temperature changes confirm the **"all inclusive"** definition.

The technology employed (which impresses through its sophisticated simplicity) leads to the achievement of results with the new VTS & VCS series which are extremely convincing as regards their value. Comprehensive services become comprehensive solutions.

- Colour touchpanel for self-guiding, simple "touch and go" operation
- High-performance 32 bit control and monitoring system
- Specimen protection with independent measurement of temperature
- Automatically wetted, self-cleaning humidity sensor
- Service-friendly construction
- Optimum air flow

Function and technology in detail ...

Due to direct temperature and climatic systems energy is transformed into power and not released.

The high-gloss polished stainless steel test space is vapour-tight welded, with rounded edges and moulded shelf supports. It is resistant to corrosive attack and can be easily cleaned.

Emissions from the system itself are minimized.

Integrated illumination can be directly activated, and provides excellent light for the test chamber. It will, when necessary, be switched off automatically.

The temperature systems provide high change rates in the range from -70 °C to +180 °C. High air flow rates ensure that temperature and humidity distribution is balanced. It goes without saying that it complies with the most common temperature and climatic test standards.

The basis of the humidification and dehumidification system in climatic tests is the humidification bath. This technology ensures that water consumption is kept low, along with rapid reaction times and a high degree of long-term constancy.

The measuring system required for humidity is considerably improved by an automatically wetted humidity sensor.

This method of wetting leads to self-cleaning of the sensor and, as a result, an enormous increase in the service life of the psychrometric measuring principle. Other measuring systems are optionally available.

... and operation free of stress

The control and communication system provides the highest possible operating convenience thanks to user interfaces with graphic symbols.

A high-performance 32 bit control system (SIMCON/32*-NET) provides the basis for the monitoring and control of the test systems.

The pivotable and removable colour touchpanel with a menue-guided graphics display coordinates and monitors the tasks of the individual components.

Process cycles, system states and other process diagrams can be represented as graphs thanks to self-explanatory pictograms and can be designed and operated intuitively in a manner so far not possible.

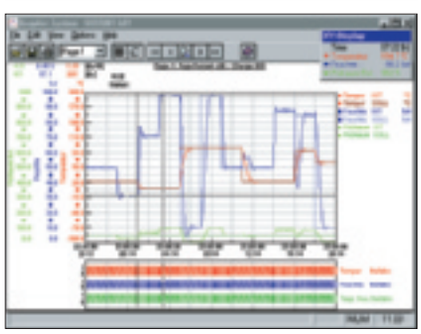
Extensive test programs can be easily and reliably created, safeguarded and reactivated. A touch is sufficient and the desired functions are actuated.

Climatic test programs compatible with current test standards are stored in our software.

External control via the RS 232 interface is, of course, provided.

The communication link to the chamber contains the basic functions emergency OFF, test specimen protection (min/max), serial and parallel interface as well as analogue and digital port for I/O signals.

Supply connections are easily accessible and the separate electrical compartment is located in a maintenance-friendly place.



SIMPATI*

What would a highly developed, high-performance system be without software which is clear and easy to operate, enabling you to master the flow of information.

It is called SIMPATI* and determines the optional operating parameters for systems and test specimens.

In addition to the well-known windows standards, the software can also be integrated into networks.

Operation of test systems becomes simple and time-saving. System operating reliability is assured, thanks to the integrated monitoring routines.

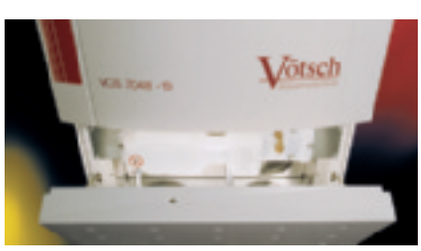
Evaluation and documenting of test cycles and the integration of special measuring data guarantees an improved standard.

Data and facts ...

Stress Screening Systems — VTS & VCS 5 K/min

Type		VTS/VCS	4018-5	7018-5	4034-5	7034-5	4060-5	7060-5	4100-5	7100-5	4150-5	7150-5
Test space volume		litres	190	190	335	335	600	600	990	990	1540	1540
Performance for temperature tests												
Temperature range		°C	-40	-70	-40	-70	-40	-70	-40	-70	-40	-70
			+180	+180	+180	+180	+180	+180	+180	+180	+180	+180
Temperature deviation in time		K	±0.1 to ±0.5									
Temperature deviation in space		K	±0.5 to ±2.0									
Temperature gradient [1]		K	1 to 4									
Temperature rate of	Cooling	K/min	8.0	7.5	6.8	6.7	6.5	6.0	6.7	6.0	6.3	5.0
change acc. to IEC [1]	Heating	K/min	7.0	7.5	6.5	6.8	6.0	6.0	6.1	6.1	6.0	6.0
Heat compensation	at +20 °C	W	4000	3000	4000	3000	5000	5000	5000	5000	5000	5000
	at -20 °C	W	1500	3000	1500	3000	2000	5000	2000	5000	2000	5000
Temperature calibration values			+23 °C and +80 °C									
Performance for climatic tests			**only VCS**									
Temperature range		°C	+10 to +95									
Temperature deviation in time		K	±0.1 to ±0.3									
Temperature deviation in space		K	±0.5 to ±1.0									
Temperature gradient [1]		K	1 to 2									
Humidity range		%	10 to 98									
Humidity deviation in time		%	±1 to ±3									
Dew point range		°C	-3 to +94									
Heat compensation [2]		W	400	400	400	400	500	500	500	500	500	500
Climatic calibration values			+23 °C / 50 % RH and +95 °C / 50 % RH									
Test space dimensions	Width	mm	580	580	580	580	800	800	1100	1100	1100	1100
	Depth	mm	450	450	765	765	800	800	950	950	1475	1475
	Height	mm	750	750	750	750	950	950	950	950	950	950
External dimensions	Width	mm	870	870	870	870	1090	1090	1390	1390	1390	1390
	Depth	mm	1280	1280	1595	1595	1660	1660	1855	1855	2380	2380
	Height	mm	1775	1775	1775	1775	1995	1995	1995	1995	1995	1995
Electrical connection			3/N/PE AC, 400 V ±10 %, 50 Hz									
Rated power		kW	8	10	8	10	11	17	23	26	23	26
Noise level [3]		dB(A)	61	64	61	64	66	69	72	73	72	73
Cooling water consumption [4] max.		m^3/h	1.9	1.4	1.9	1.4	2.7	2.1	3.5	3.0	3.5	3.0

Performance data refer to +25 °C ambient temperature. [1] According to IEC 60068-3-5, measured in the supply air stream.
[2] At +25 °C to +95 °C, humidity up to max. 90 % is maintained. [3] free field, 1 m distance from the front, as per DIN 45635, part 1, accuracy class 2.
[4] At a cooling water temperature of +28 °C and a temperature difference of 5 K, water temperature +12 °C to max. +28 °C.



Standard equipment, perfect to the smallest detail...

- Colour touchpanel
- Microprocessor monitoring and control unit SIMCON/32-NET
- Digital I/O, potential-free 24 V, 4 freely available I/O
- Independent adjustable temperature limiter t_{min}/t_{max}
- Adjustable software temperature limiter min./max.
- Humidity input and display in % *)
- Serial interface RS 232
- Potential-free contact for switching-off of test specimens
- Water-cooled refrigeration unit
- Aerosol-free humidification and dehumidification*)
- Psychrometric humidity measuring system*)
- Water supply tank for humidification water with level indication*)
- Automatic water replenishment with low water alarm*)
- European socket
- Calibration of 2 temperature values
- Calibration of 2 climate values*)
- 2 Entry ports
- 1 Shelf made of stainless steel

***) only VCS**

VTS & VCS 10 K/min

4027-10	7027-10	4048-10	7048-10	4080-10	7080-10	4130-10	7130-10
270	270	480	480	800	800	1300	1300
-40	-70	-40	-70	-40	-70	-40	-70
+180	+180	+180	+180	+180	+180	+180	+180
±0.3 to ±0.8							
±0.5 to ±2.0							
1 to 4							
12.5	14.5	12.5	11.0	12.0	12.0	11.5	10.5
10.0	10.0	10.0	10.0	12.0	12.0	12.0	11.0
6000	6000	8000	8000	8000	8000	8000	8000
2000	6000	3000	8000	3000	8000	3000	8000
+ 23 °C and +80 °C							
only VCS							
+10 to +95							
±0.1 to ±0.5							
±0.5 to ±1.0							
1 to 2							
10 to 95							
±1 to ±3							
-3 to +94							
400	400	500	500	500	500	500	500
+23 °C / 50 % RH and +95 °C / 50 % RH							
580	580	800	800	1100	1100	1100	1100
620	620	650	650	800	800	1300	1300
750	750	950	950	920	920	920	920
870	870	1090	1090	1390	1390	1390	1390
1895	1895	2480	2480	2675	2675	3200	3200
1775	1775	2025	2025	2020	2020	2020	2020
3/N/PE AC, 400 V ±10 %, 50 Hz							
8.0	14	16	17	28	34	28	34
68	73	72	73	73	73	73	73
2.4	3.8	3.5	4.2	4.2	5.5	4.2	5.5

VTS & VCS 15 K/min

4027-15	7027-15	4048-15	7048-15	4080-15	7080-15	4130-15	7130-15
270	270	480	480	800	800	1300	1300
-40	-70	-40	-70	-40	-70	-40	-70
+180	+180	+180	+180	+180	+180	+180	+180
±0.3 to ±0.8							
±0.5 to ±2.0							
1 to 4							
16.0	18.0	18.0	15.0	18.0	15.5	17.0	14.5
16.0	17.0	16.0	17.0	16.0	16.0	16.0	16.0
8000	8000	8000	8000	8000	8000	8000	8000
3000	8000	3000	8000	3000	8000	3000	8000
+ 23 °C and +80 °C							
only VCS							
+10 to +95							
±0.1 to ±0.5							
±0.5 to ±1.0							
1 to 2							
10 to 95							
±1 to ±3							
-3 to +94							
400	400	500	500	500	500	500	500
+23 °C / 50 % RH and +95 °C / 50 % RH							
580	580	800	800	1100	1100	1100	1100
620	620	650	650	800	800	1300	1300
750	750	950	950	920	920	920	920
870	870	1090	1090	1390	1390	1390	1390
1895	1895	2480	2480	2675	2675	3200	3200
1775	1775	2025	2025	2020	2020	2020	2020
3/N/PE AC, 400 V ±10 %, 50 Hz							
12	16	20	24	35	44	35	44
70	73	72	73	73	73	73	73
3.5	4.2	6.1	6.3	7.0	8.0	7.0	8.0

We reserve the right of changes in construction resulting from technical progress.
Some of the illustrated systems contain optional extras.

The most important options ...

- Software SIMPATI*
- Adjustable circulating air quantity
- Analogue transducer card I/O
- Measuring data acquisition system
- Temperature measuring on test specimen
- Interface converter RS 232
  - RS 422/485 or
  - IEEE 488
- Interface RS 422/485 (Network card for test cabinet)
- Printers
- UV- and/or IR-Irradiation unit
- GN_2 - Inerting
- Water sprinkling device *)
- Demineralization unit *)
- Additional insert shelves
- Door with window
- Door with window and 2 handholes
- Notch
- Mobile design
- Special voltages
- Other options upon request

***) only VCS**

... Under stringent conditions

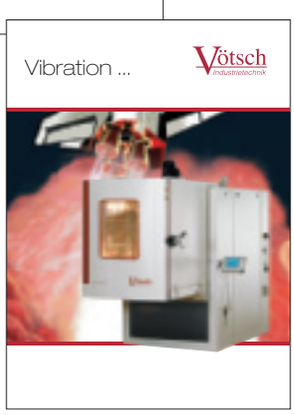
ESS

Extremely rapid temperature cycling rates with 2 or 3 chamber method.

Enhanced assignment conditions via combination of temperature cycles and vibration.

ESS

Special applications



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