ELNIC KLIMAMODULE (EKM)

PORTABLE AC SYSTEM & E-MODULE SERIES

HEATING, VENTILATION AND AIR CONDITIONING (HVAC)

STATE-OF-THE-ART MODULAR SYSTEMS
FOR DECENTRALISED IT SOLUTIONS
IN OPERATING AND TRANSPORT CASES

AND

HVAC TESTING DEVICE

Mobile AC supply?

Let us take control ... customized!

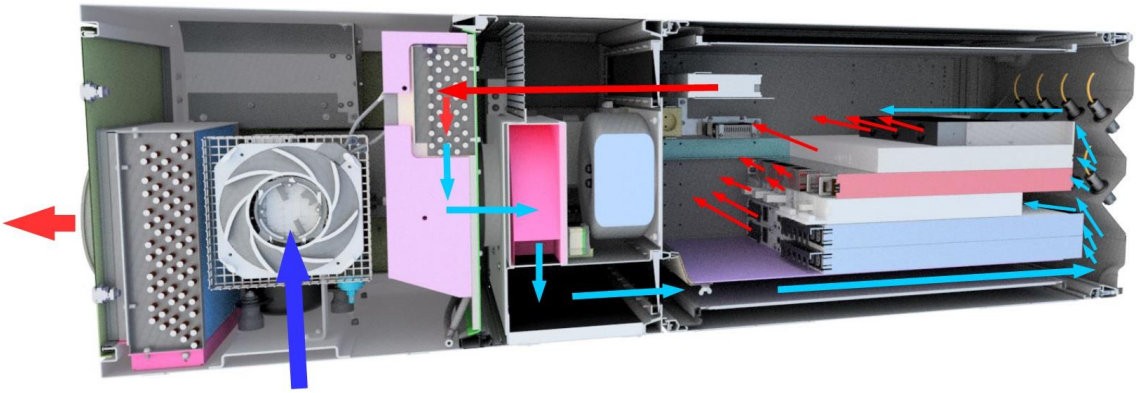
Contents

Mobile IT Solutions in hardened and air-conditioned cases

For more than 20 years a decentralized provision of IT solutions has seen a steadily increasing use in the global field of security and emergency services.

Due to their technical design options and construction properties such as low dead weight, protection class, shock resistance and high flexibility, they can be used for more and more applications.

In order to achieve the required air conditioning and supply properties, the IT containers require a permanent supply of mechanically generated ventilation. The air source must always comply with the ideal ambient temperature range for IT components, which lies between 10 and a maximum of 30 degrees Celsius.



In addition to temperature changes in the ambient air and varying solar radiation, temperature changes within the container caused by waste heat of built-in devices such as power supplies, which act on the internal temperature, must also be taken into account and require an adjustment of the air conditioning. In order to ensure the required temperature at any given time, the air supply through the air supply systems is permanently adjusted.

In collaboration with the engineers of the market-leading companies in the IT sector, elnic has developed a series of portable air conditioning systems and energy modules that are explicitly designed for their requirements. With reliable operation, easy installation and maintenance as well as a responsible and sustainable use of resources, these systems permanently provide conditioned air - the essential requirement for trouble-free operation of a highly complex, highly flexible IT system housed in service cases.

Characteristics of the elnic components

High-quality components and in-house developments of the modules within the portable air conditioning systems and energy cases justify their technological lead. For contractors and their end users, this means a significant economic and environmental benefit.

The elnic assemblies can be installed in containers of all well-known manufacturers. This has the advantage for our customers that new systems can be procured that fit existing containers and can thus be combined.

elnic systems combine the temperature control and distribution of circulating air as independent systems with integrated fans, evaporators and condenser, programmable controllers and associated sensors.

The combination of high-quality components and sophisticated functions significantly contribute to the leading position of the elnic systems. Modular design, highest system availability, ecological sustainability and economic operation underline the latest state of the art

- All portable AC systems can either be powder-coated or wet painted in aluminium design to ensure a durable function and the immaculate appearance of the casing.
- All elnic air conditioning systems use only high-quality fans whose performance is exactly tailored to the respective requirements of pressure and air volume. The required values are permanently determined via the connected sensors.
- All sensors are electronically connected to the device.
- All elnic container solutions are equipped with programmable logic controllers that provide easy-to-use parameterization and display possibilities.
- The elnic series offers an additional, significant energy-saving potential through the use of a closed air circuit and the significantly shorter runtime of the air conditioning.
- The integrated condenser and evaporator units are designed for long-term operation and energy-efficiently controlled by the software in the elnic systems.
- Temperature sensors can control the temperature of the indoor air and allow an ecologically efficient control of the air conditioning system.

The above technical characteristics of the elnic portable AC and energy modules have already convinced our customers.

Meanwhile, elnic has delivered almost 500 such air conditioning units, 200 of them in 7HU (height units) in combination with one permanently installed power module.

The elnic system design is based on the following MIL standards:

- high temperatures: MIL-STD 810F 501.4
- low temperatures: MIL-STD 810F 502.4
- Vibration: MIL-STD 810F 514.5
- Impact: MIL-STD 810F 516.5
- Air loading capability: MIL-STD 810F 500.4
- Humidity: MIL-STD 810F 507.4
- Dust protection: MIL-STD 810F 510.4
- Splash water: MIL-STD 810F 506.4

Portable AC units with 4, 6, 7, 8, 10 or 14 Height Units (HVAC)

A 4HU portable AC unit to air-condition 4HU cases

System description

The air conditioning system processes the supply air and distributes it in the connected 4HU case. There it cools or heats the built-in equipment. The now thermally-modified exhaust air circulates back to the air conditioner where it is reprocessed.

The switching between cooling and heating operation is carried out automatically with temperature control and internally set target / desired temperature, variable using parameters, for the connected 4HU case.

In addition to measuring the temperature of incoming and outgoing air, the direct indoor conditions in the AC case, such as the current temperature, mean temperature and air humidity, can also be measured and evaluated.

Purpose

As soon as the interior of a 4HU case has to be kept at a desired constant temperature level, regardless of the prevailing outside temperature, the portable AC system with power module from elnic can be used.

Technical data

Input voltage	230V 50Hz	
Cooling performance	Up to 700 W	
Electrical heating performance	800 W	
Current rating	10A	
Operating temperature range	-32°C to + 55°C	(-25.6°F to +131°F)
Climate zones	A1/A2/A3/B3/C0/C1	
Dimensions H x W x D	4HU / 310 x 600 x 700mm	(4HU / 12.20“ x 23.62“ x 27.56“)
Weight	approx. 36kg	(approx. 79 lb)
IP Protection class	IP21	
EMC version	possible	

elnic also offers adjusted case systems (standard splash-proof, or EMC-tight), which can be equipped to your specifications.

B 7HU portable AC unit with energy module to air-condition 7HU cases (option: 6HU)

System description

The air conditioning system processes the supply air and distributes it in the connected 7HU case. There it cools or heats the built-in equipment. The now thermally-modified exhaust air circulates back to the air conditioner where it is reprocessed.

The switching between cooling and heating operation is carried out automatically with temperature control and internally set target / desired temperature, variable using parameters, for the connected 7HU case.

In addition to measuring the temperature of incoming and outgoing air, the direct indoor conditions in the AC case, such as the current temperature, mean temperature and air humidity, can also be measured and evaluated.

As pointed out in the headline, an energy module function is fully integrated in this casing consisting of: main switch for IT components, main switch for air conditioning, connection bolt for equipotential bonding, supply plug for mains supply, overvoltage protection, circuit breaker and isolation transformer.

elnic offers an option for **6HU HVAC units**. These have the same functionality and performance but are inside a 6HU case.

Purpose

As soon as the interior of a 7HU case has to be kept at a desired constant temperature level, regardless of the prevailing outside temperature, the portable AC system with power module from elnic can be used.

Technical data

Input voltage	230V 50Hz	
Cooling performance	Up to 750 W	
Heating performance	800 W	
Current rating	13A	
Operating temperature range	-32°C to + 49°C	(-25.6°F to +120.2°F)
Climate zones	A1/A2/A3/B3/C0/C1	
Dimensions H x W x D	7HU / 394 x 535 x 718mm	(7HU / 15.51“ x 21.06“ x 28.27“)
Weight	approx. 53kg	(approx. 117 lb)
IP Protection class	IP21	
EMC version	feasible	

Accessories

- Flexible exhaust hose, length tbd.
- Transport and storage container

elnic also offers adjusted case systems (standard splash-proof, or EMC-tight), which can be equipped to your specifications.

C Power-controlled 8HU portable AC unit to air-condition 8HU cases

System description

The air conditioning system processes the supply air and distributes it in the connected 8HU case. There it cools or heats the built-in equipment. The now thermally-modified exhaust air circulates back to the air conditioner where it is reprocessed. This portable air conditioning system works with a frequency converter to control the performance of the compressor, depending on the cooling requirements. With this method, the power consumption can be significantly reduced.

The switching between cooling and heating operation is carried out automatically with temperature control and internally set target / desired temperature, variable using parameters, for the connected 8HU case.

In addition to measuring the temperature of incoming and outgoing air, the direct indoor conditions in the AC case, such as the current temperature, mean temperature and air humidity, can also be measured and evaluated.

Specialty

This portable air conditioner can be converted into "room air mode" in a few simple steps.

By opening the flap and the sliding grill, the connected device case is ventilated with circulating air from the room. If the temperature and air quality are right, the device case can be operated without any significant consumption of electricity.

Purpose

As soon as the interior of a 8HU case has to be kept at a desired constant temperature level, regardless of the prevailing outside temperature, the portable AC system with power module from elnic can be used.

Technical data

Input voltage	230V 50Hz	
Cooling performance	500W to 1,100W (adjustable)	
Heating performance	1 kW	
Current rating	13A	
Operating temperature range	-32°C to +49°C	(-25.6°F to +120.2°F)
Extended operating temp range	-34°C bis +55°C	(-29.2°F to 131°F)
Climate zones	A1-A3, B1-B3, C0-C1, M1-M3	
Vibration	MIL-STD-810H METHOD 514.8[1]	
Schock	MIL-STD-810H METHOD 516.8[1]	
Dimensions H x W x D	8HU / 438 x 535 x 682mm	(8HU / 17.24“ x 21.06“ x 26.85“)
Weight	approx. 46kg	(approx.100 lb)
IP Protection class	IP21	
EMC version	CE and separately	

[1)] The requirements for vibration and shock as well as acceleration values differ from Fig.: 514.8C-6-Cat.4, V rms=1.97 g (reduced by 6 dB below 20 Hz)
see also VG 95447-2:2015-12.

Accessories included:

- Flexible exhaust hose, length: Ø 200mm, length 5m
- Pipe tension lock Ø 200mm
- Hose connection flange
- Condensation drain
- Control cabinet key (double bit)
- Locking key coupling mechanism

Accessories on request:

- Power cable can be individually configured
- Transport and storage containers

elnic also offers adjusted case systems (standard splash-proof or EMC-tight), which can be equipped according to your ideas.

D 10HU portable AC unit

D1 10HU portable AC unit to air-condition 10HU cases

System description

The air conditioning system processes the supply air and distributes it in the connected 10HU case. There it cools or heats the built-in equipment. The now thermally-modified exhaust air circulates back to the air conditioner where it is reprocessed.

The switching between cooling and heating operation is carried out automatically with temperature control and internally set target / desired temperature, variable using parameters, for the connected 10HU case.

In addition to measuring the temperature of incoming and outgoing air, the direct indoor conditions in the AC case, such as the current temperature, mean temperature and air humidity, can also be measured and evaluated.

Purpose

As soon as the interior of a 10HU case has to be kept at a desired constant temperature level, regardless of the prevailing outside temperature, the portable AC system with power module from elnic can be used.

Technical data

Input voltage	230V 50Hz	
Cooling performance	Up to 2.2 kW	
Electrical heating performance	2 kW	
Current rating	13A	
Operating temperature range	-32°C to +49°C	(-25.6°F to +120.2°F)
Climate zones	A1/A2/A3/B3/C0/C1	
Dimensions H x W x D	10HU / 527 x 535 x 568mm	(10HU / 20.75“ x 21.06“ x 22.36“)
Weight	approx. 47kg	(approx.103 lb)
IP Protection class	IP21	
EMC version	feasible	

Accessories

- Flexible exhaust hose, length tbd.
- Transport and storage container

elnic also offers adjusted case systems (standard splash-proof, or EMC-tight), which can be equipped to your specifications.

D2 Power-controlled 10HU portable AC unit to air-condition 10HU cases

System description

The air conditioning system processes the supply air and distributes it in the connected 10HU case. There it cools or heats the built-in equipment. The now thermally-modified exhaust air circulates back to the air conditioner where it is reprocessed. This portable air conditioning system works with a frequency converter to control the performance of the compressor, depending on the cooling requirements. With this method, the power consumption can be significantly reduced.

The switching between cooling and heating operation is carried out automatically with temperature control and internally set target / desired temperature, variable using parameters, for the connected 10HU case.

In addition to measuring the temperature of incoming and outgoing air, the direct indoor conditions in the AC case, such as the current temperature, mean temperature and air humidity, can also be measured and evaluated.

Purpose

As soon as the interior of a 10HU case has to be kept at a desired constant temperature level, regardless of the prevailing outside temperature, the portable AC system with power module from elnic can be used.

Technical data

Input voltage	230V 50Hz	
Cooling performance	500W to 1,100W (adjustable)	
Electrical heating performance	2 kW	
Current rating	13A	
Operating temperature range	-32°C to +49°C	(-25.6°F to +120.2°F)
Climate zones	A1/A2/A3/B3/C0/C1	
Dimensions H x W x D	10HU / 527 x 535 x 568mm	(10HU / 20.75“ x 21.06“ x 22.36“)
Weight	approx. 47kg	(approx.103 lb)
IP Protection class	IP21	
EMC version	feasible	

Accessories

- Flexible exhaust hose, length tbd.
- Transport and storage container

elnic also offers adjusted case systems (standard splash-proof, or EMC-tight), which can be equipped to your specifications.

E 14HU portable AC unit to air-condition 14HU cases

System description

The air conditioning system processes the supply air and distributes it in the connected 14HU case. There it cools or heats the built-in equipment. The now thermally-modified exhaust air circulates back to the air conditioner where it is reprocessed.

The switching between cooling and heating operation is carried out automatically with temperature control and internally set target / desired temperature, variable using parameters, for the connected 14HU case.

In addition to measuring the temperature of incoming and outgoing air, the direct indoor conditions in the AC case, such as the current temperature, mean temperature and air humidity, can also be measured and evaluated.

Purpose

As soon as the interior of a 14HU case has to be kept at a desired constant temperature level, regardless of the prevailing outside temperature, the portable AC system with power module from elnic can be used.

Technical data

Input voltage	230V 50Hz	
Cooling performance	Up to 800 W	
Electrical heating performance	800 W	
Current rating	13A	
Operating temperature range	-32°C to + 52°C	(-25.6°F to +125.6°F)
Climate zones	A1/A2/A3/B3/C0/C1	
Dimensions H x W x D	14HU / 705 x 535 x 388mm	(14HU / 27.76“ x 21.06“ x 15.28“)
Weight	approx. 34kg	(approx. 75 lb)
IP Protection class	IP21	
EMC version	possible	

elnic also offers adjusted case systems (standard splash-proof, or EMC-tight), which can be equipped to your specifications.

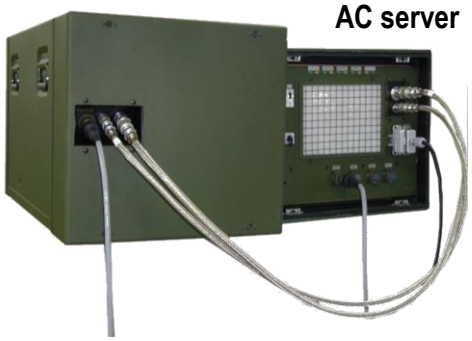
F AC server TC²

System description

The AC server „**Temperature Controlled Transit Case**“ can simultaneously cool up to 4 connected cases. For this concept, the compressor and condenser are inside the server. The evaporators and heating are housed in the lid of the operating and transport containers.

electronics case

AC server

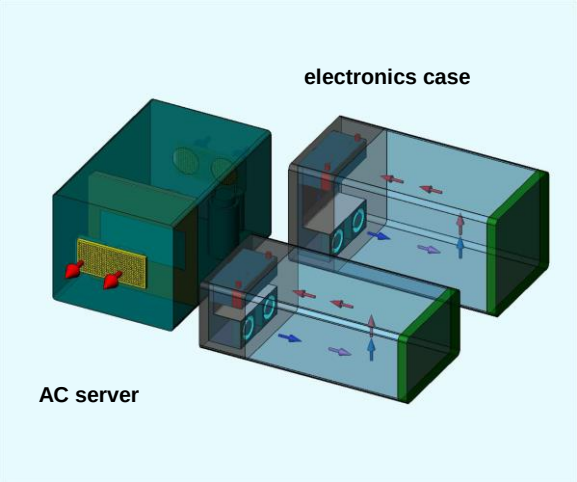


Purpose

As soon as the interior of several cases has to be kept at a specific constant temperature level, regardless of the prevailing outside temperature, the climate server from elnic finds its application.

Technical data

AC server TC²	
Cooling performance max.	2400 W
Size	8HU, depth 610 mm (24.02”)
Electrical connection	230/115V 50/60Hz 16A
Weight	+/-45 kg incl. case (+/-99lb)
Compressor	
Condenser temperature	70°C (158°F)
Evaporation temperature	15°C (59°F)
Engine power	0.55 kW
Condenser	
Condenser temperature	70°C (158°F)
Air volume stream	700 m³/h



Evaporator modules	**TC²-1**	**TC²-2**	**TC²-3**
Cooling performance	Up to 500 W	Up to 700 W	Up to 2200 W
Electrical heating performance	800 W	800 W	800 W
Case size	At least 5HU	At least 9HU	At least 14HU
Cover depth	+/-150 mm (+/-5.91”)	+/-350 mm (+/-13.78”)	+/-350 mm (+/-13.78”)
Air volume stream	250 m³/h	400 m³/h	600 m³/h
Weight condensor incl. cover	+/-15 kg (+/-33 lb)	+/-30 kg (+/-66 lb)	+/-32 kg (+/-70 lb)

Special accessories

Specialized elnic engineers are there to help with the individual configuration of the portable AC cases and energy modules as well as with the overall planning of the decentralized IT system.

A Energy module for 10HU AC unit

Control panel with

- Main switch for IT components
- Main switch for air conditioning
- Connection bolt for equipotential bonding
- Supply plug for mains supply
- Overvoltage protection
- Circuit breaker
- Isolation transformer

To put into operation, attach the power supply to the round connector and secure the equipotential bonding to the thumbscrew.

After connecting the supply voltage, the system is started by turning the selector switch to the circulating air position and, if necessary, when the recirculating air fan starts, to the air conditioning position.

The integrated light signals the switch status and the presence of the supply voltage.

For the user, apart from the two selector switches, there are no other operating elements.

After reaching the operating temperature range, the power supply of the IT area can be switched on with the left selector switch.

Technical data

Input	via Binder flange plug 094223 00 04	
Input voltage	230V 50Hz	
Current rating	16A	
Overvoltage protection	combi Type 1, 2 and 3	
Operating temperature range	-32°C to + 49°C	(-25.6°F to +120.2°F)
Dimensions H x W x D	10HU / 527 x 535 x 310mm	(10HU / 20.75“ x 21.06“ x 12.20“)
Weight	+/-34kg	(+/-75 lb)
Main switch for IT	switch S1 – on/off	
Performance isolating transformer for IT	1600 VA	
Supply IT	via RCD and isolating transformer	

B Integrated energy module

Refer to portable AC cases 7HU.

C 60 Hertz version

The systems can be modified accordingly for the use in regions with a power supply of 60 Hertz (for example USA). The efficiency and reliability of the system is identical to the operation in a 50 hertz environment.

D Integration

Upon request, we integrate BtuLBs according to your specification with the IT or other components you have specified.

The components can also be provided by you of course.

E Stowage

elnic can design and offer stowage solutions with its partners at any time.

F EMC Seals

Upon request, all elnic AC cases, energy modules and TUPP' can be offered EMC shielded.

G Exhaust hose in desired length

H Connection flange suitable for exhaust hose

Testing device for Portable AC units (HVAC) with 4, 6, 7, 8, 10 or 14 Height Units

It is obvious that the behavior and reliable operation of the HVAC component is crucial for the overall operation of a mobile IT system. In order to guarantee the quality of our products, elnic has further developed a device for testing the HVAC modules.

The testing device is designed to emulate the temperature conditions of the IT side of the portable system. In this way, the cooling or heating capabilities of the HVAC component are tested.

All different types of elnic portable HVAC components can be tested using the same device by only modifying the cooling/heating power of the testing device. Additionally, the last part of the testing device is used as an 'adapter' for connecting the different types of the HVAC components.

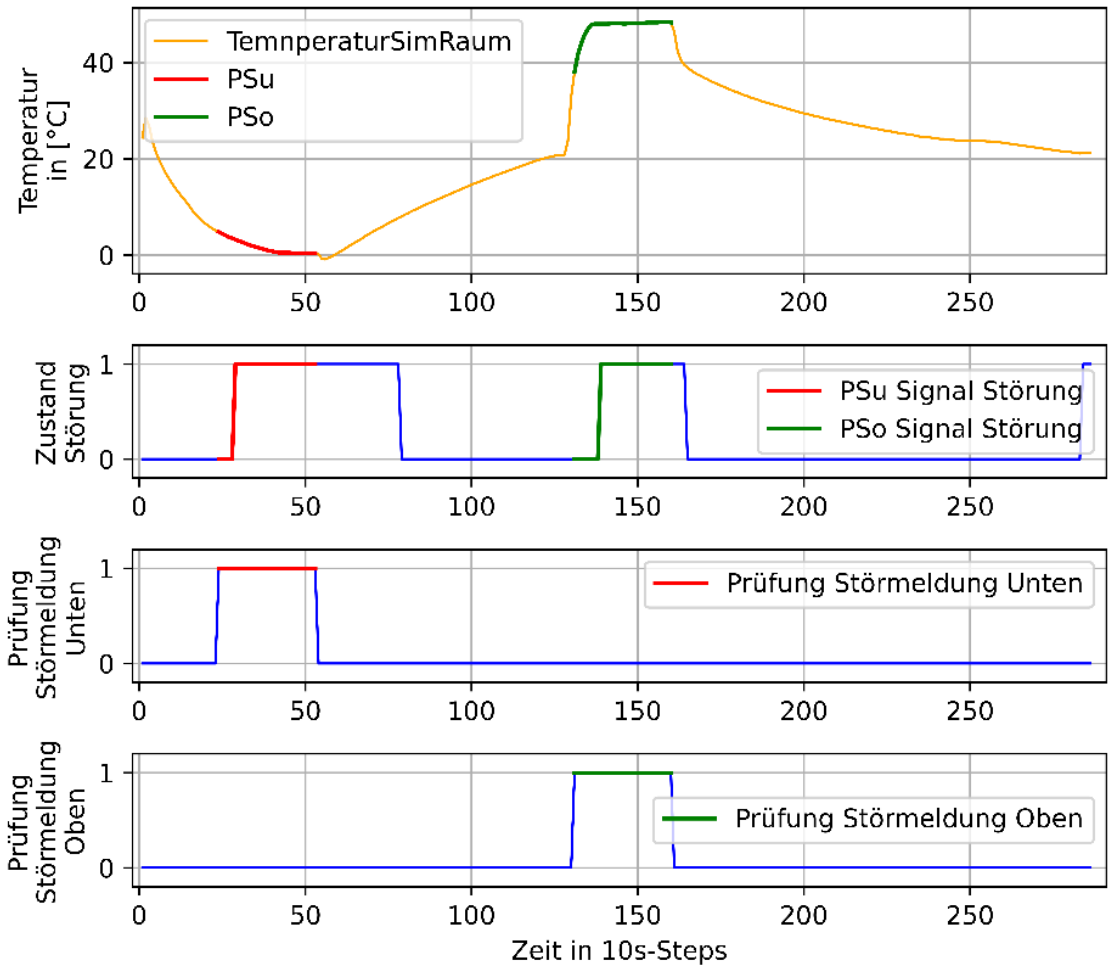
The functionalities of the HVAC components are

- heating, when the ambient temperature is low,
- cooling, when the ambient temperature is high, and
- ventilation, when no need for extra cooling or heating is required.

The operation of the test device is similar but inverse to the operation of the HVAC component. That is, in order to test the cooling capability of the HVAC device, the air in the simulation chamber is heated and vice versa, the air in the simulation chamber is cooled when the heating capability of the HVAC device needs to be tested.

Test of HVAC capability	Testing device works as
Cooling	Heater
Ventilation	Ventilation
Heating	Cooler

The automated test cycle takes place in five test steps and then automatically outputs a report. For example, the error message check of the upper and lower limit temperatures results in the following figure.

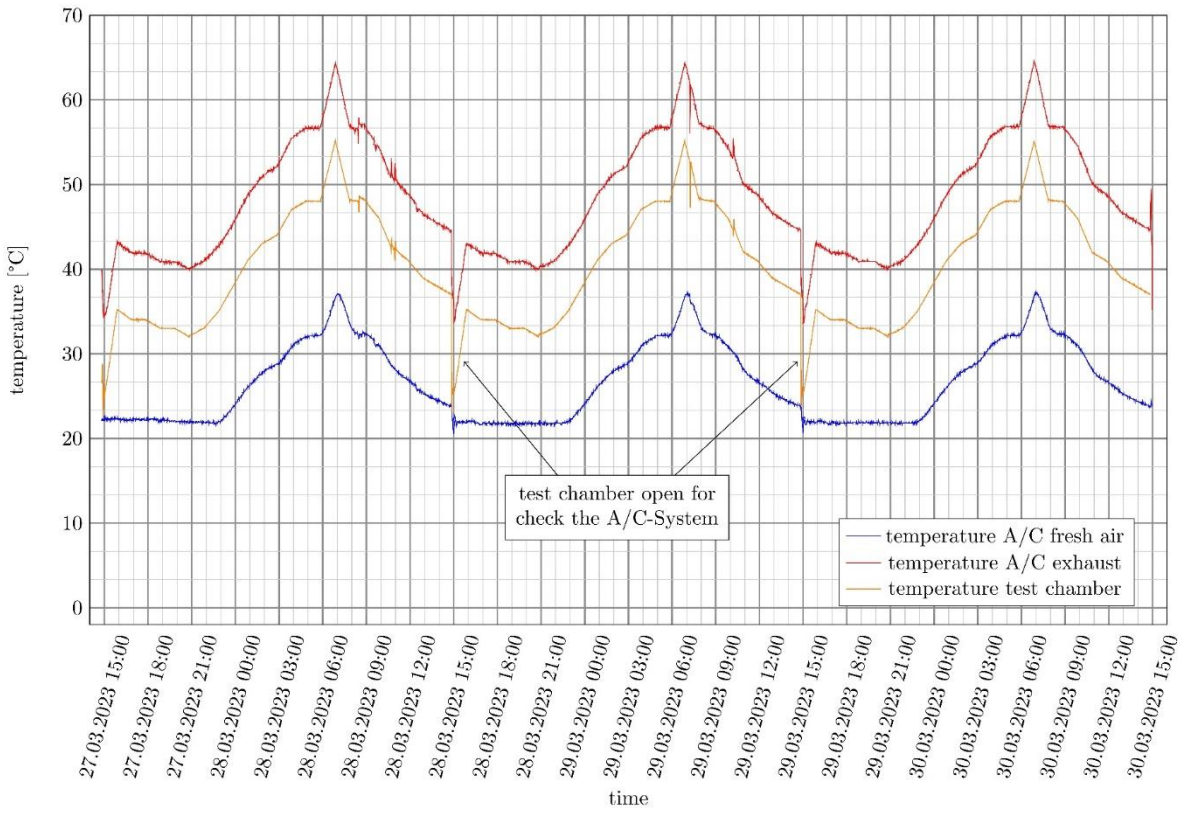


Example of fault message test

The solution developed allows our QA engineers to automatically test our HVAC equipment under all possible temperature conditions before delivery to our customers.

Qualification through climate tests

The following diagram shows the most important measurement results at temperatures in the measuring chamber up to 55°C (131°F).



Climate test results

These results come from an accredited laboratory. The start of the elnic climate module at -33°C (-27°F) was also successfully completed.

elnic GmbH, based in Rosenheim, Germany, has been a reliable partner for technical project and system solutions in the field of special technology for almost 50 years.

Both for pre-planning, development as well as implementation and maintenance, our experts are at your disposal. We are looking forward to your contact.

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