CLEANROOM

INTRODUCTION

As a company we are devoted to creating ideal work environments with minimal expenses and to developing products that can satisfy even the most rigorous of quality and energy efficiency standards. Through compliance with sustainable development principles, our efforts are aimed at Termovent's future evolution.

Cleanroom is an environment that has a controlled level of contamination that is specified by the number of particles per cubic meter for the appropriate particle size.

Termovent specializes in production of modular panel systems, which are used in the field of clean room technology.

The whole system is aligned with GMP and FDA directives, as well as ISO 14644 standard. Compliance with applicable regulations in the field of clean room technology enables its use in rooms from ISO 9 to ISO 1 class (GMP classes A, B, C and D).

OVERVIEW

Production facility:
Kladovo, Serbia

Founded
1993

PART OF SWISS CORPORATION
ARBONIA GROUP

HQ
Belgrade Serbia

Modular component systems are easily integrated with all other systems. By combining a variety of materials in panel production for cleanrooms, Termovent company offers a vast range of use in:

Pharmaceutical industry,
Micro-electronics,
Chemical industry,
Food industry,
Health facilities,
Laboratories etc.

A team of young experts that is responsible for cleanrooms development consists of a group of people that participated in international competitions throughout Europe and Asia, and with their experience, hard work and devotion they are responsible for the great satisfaction of our partners.

Through the pursuit of modernization and contemporaneous business, the entire production and design system is based on automation and BiM design.

CLEANROOM OVERVIEW

LEGEND

- A Wall system
- B Glazing
- C Ceiling
- D Door
- E Floor
- F Air shower
- G Pass box
- H Protection
- I Grids

CONTENTS

INTRODUCTION	**1**
WALL SYSTEM	**5**
GLAZING	**7**
CEILING	**9**
DOOR	**11**
FLOOR	**13**
ACCESORIESS	**15**
AIR SHOWER	**17**
PASS BOX	**19**
PROTECTION	**21**
GRIDS	**22**
LAF	**23**
FFU	**24**
REFERENCE LIST	**25**
QUALITY MANAGEMENT SYSTEM	**26**

WALL SYSTEM

Termovent Cleanrooms are
designed to satisfy all GMP and FDA requirements.

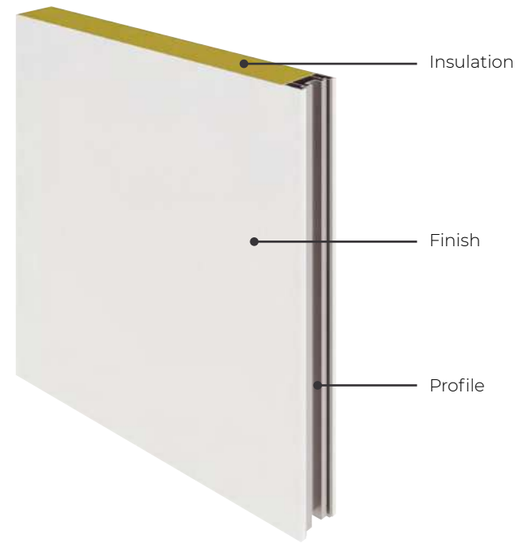
Modular design of Termovent Cleanroom Wall panels allows for their simple integration with other systems, such as: doors, windows, electrical installation, mechanical installation, plumbing installation, etc. Cleanroom Cladding is the solution which could optimize usable cleanroom space, and provide a positive financial impact to projects in spaces with an existing wall structure. Tailor-made solutions ensure high impermeability levels, and application within highly regulated environments.

WALL TECHNICAL DATA

WALL PANEL	
COMPONENT	CHARACTERISTICS
Wall Frame	Aluminum profile
Insulation*	Rock wool 100 kg/m³, XPS 30kg/m³
Finishing Layer*	Galvanized sheet; Aluminum sheet; Stainless steel sheet
Color*	RAL 9016 – 110µm
Modular Dimensions Max	62 x 1200 x 3100 mm
OPTIONAL	CHARACTERISTICS
Pre-fabricated Cut-out	Aluminum profile d=2mm, w/l=60/26 mm
Reinforcement	Aluminum d=10mm
In-Wall Electrical Chanel	Aluminum profile d=2mm, w/l = 60/80mm

* Additional options possible on user request

Finishing of the cladding is the same as of the cleanroom walls and can be perfectly connected to other Termovent cleanroom systems.



GLAZING

Termovent Cleanroom Glazing System is a modular glassing system with high quality tempered glass, designed to be flush on both sides of wall surfaces. It is fully compatible with all other modular Cleanroom Systems. Glass partitions are available in a clear design or in different patterns.

GLAZING TECHNICAL DATA

GLAZING	
COMPONENT	CHARACTERISTICS
Window Frame	Aluminum profile
Insulation	Silica gel
Finishing Layer*	TVG Glass
Color*	Clear
Modular Dimensions Max	62 x 1200 x 3100 mm

* Additional options possible on user request

CEILING

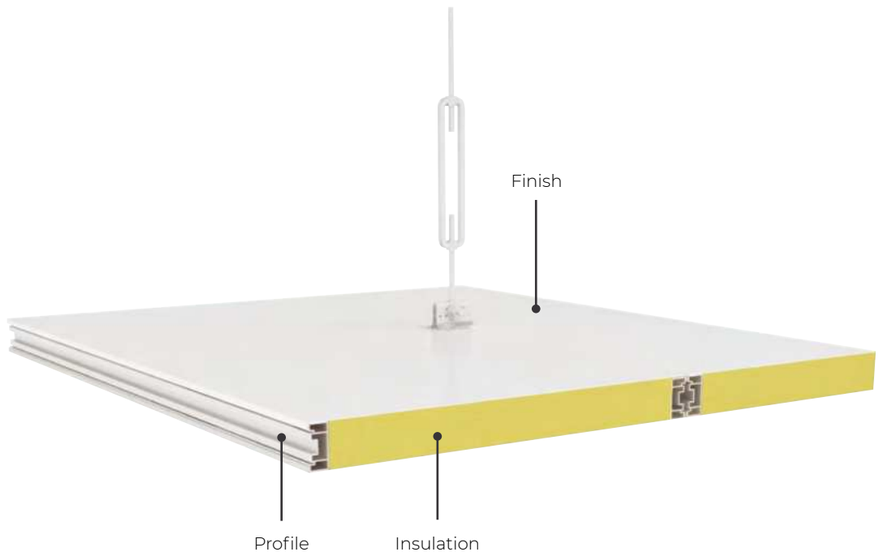
Termovent Ceiling System is prefabricated with all necessary openings for technology integration, and is easily reassembled if needed. Several options of different ceiling types can be used, depending on application, load requirements, cleanroom environment, etc.

Main components of this system include panels with rounded edges, which simplifies their cleaning and maintenance processes. Upon the installation, particle infiltration into cleanrooms is completely prevented.

CEILING TECHNICAL DATA

CEILING PANEL	
COMPONENT	CHARACTERISTICS
Wall Frame	Aluminum profile
Insulation*	Rock wool 100 kg/m3
Finishing Layer*	Galvanized sheet; Aluminum sheet; Stainless steel sheet
Color*	RAL 9016 – 110µm
Modular Dimensions Max	62 x 1200 x 3100 mm
OPTIONAL	CHARACTERISTICS
Pre-fabricated Cut-out	Aluminum profile d=2mm, w/l=60/26 mm

* Additional options possible on user request



DOOR

Termovent Cleanroom Door System prevents air-leaks, which is achieved with permanent concealed magnets.

All door parts are designed to be flush to and perfectly integrated with all cleanroom elements. Termovent Doors comply with ISO and GMP regulations.

DOOR TECHNICAL DATA

DOOR	
COMPONENT	CHARACTERISTICS
Door External Frame	Anodized or powder coated aluminum profile
Door Wing Frame	Anodized or powder coated aluminum profile
Insulation	Rock wool 100 kg/m3
Finishing Layer	Galvanized sheet; Aluminum sheet; Stainless steel sheet
Color*	Wing - RAL 9016 – 110µm; Frame - RAL 9006 – 50µm
Single door Max Dim.	62 x 1200 x 3200 mm
Double door Max Dim.	62 x 2500 x 3200 mm

* Additional options possible on user request

DOOR ACCESSORIES LIST
Window
Door Bottom Seals
Push plate
Kick plate
Door Handle
Emergency push bar
Reed relay
Lock with key
Door Closers
Interlock Equipment

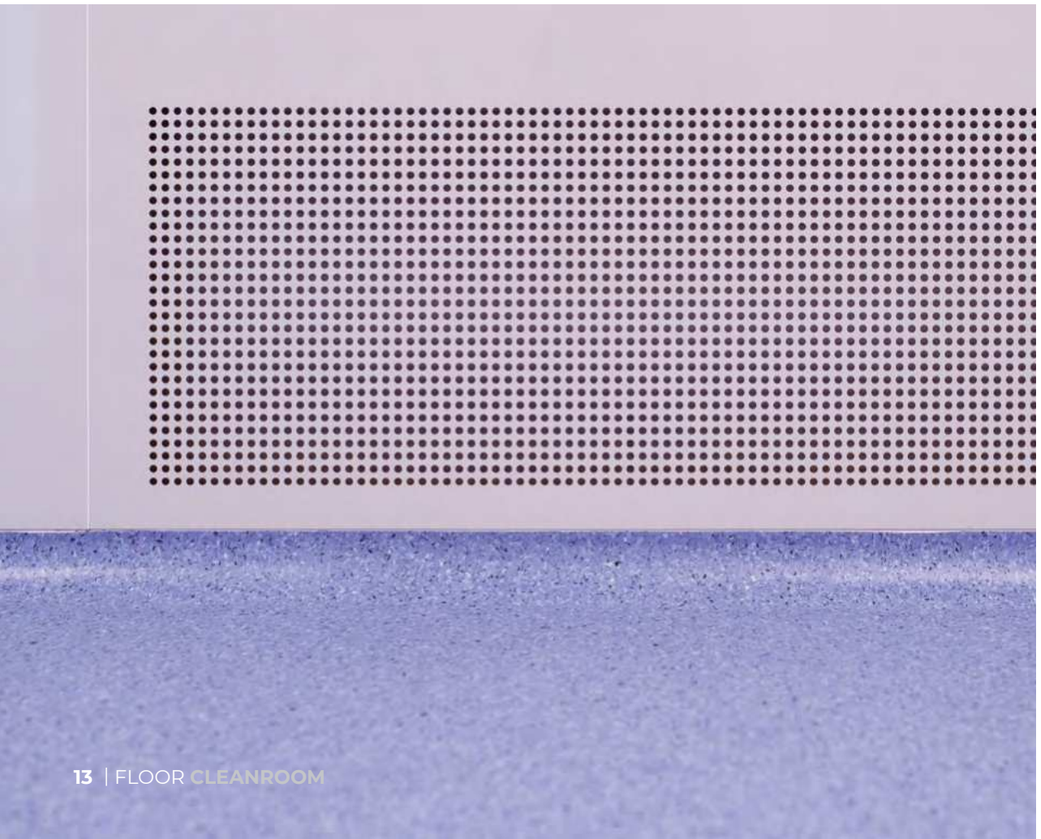
FLOOR

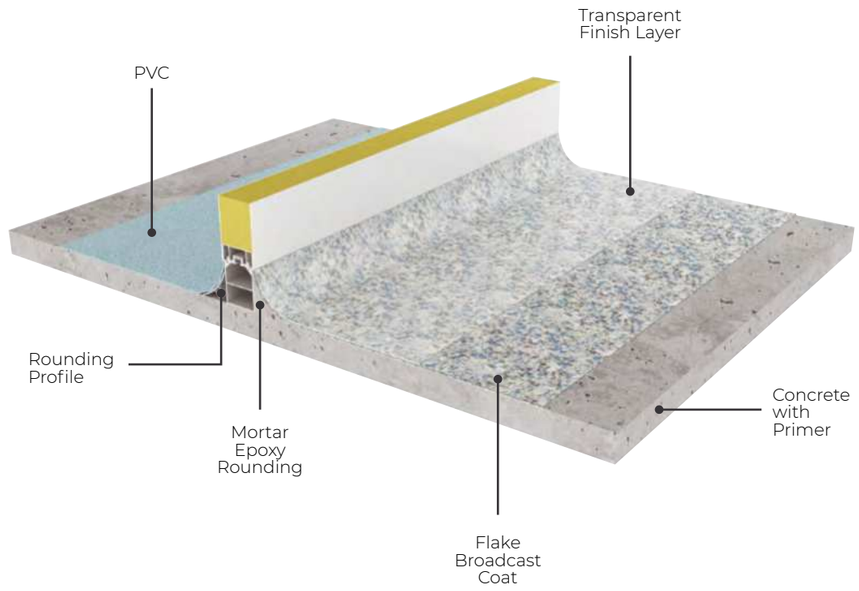
Termovent provides the best floor application options possible. We focus on delivering the best technical solution in terms of traffic load function, processes and GMP requirement fulfilment in the cleanroom area.

FLOOR TECHNICAL DATA

FLOOR	
COMPONENT	CHARACTERISTICS
Type	EP, VE, PVC
Hygienic	Yes
Easy cleaning	No sharp edges – prefabriceted rounded profiles and elements

* Additional options possible on user request





ACCESSORIES

Termovent applies the latest knowhow in the design and production of various Cleanroom accessories - elevating the Cleanroom to its full potential.

All solutions are custom made, to fit all user requirements.

AIR SHOWER

PASS BOX

PROTECTION

GRIDS

GRIDS

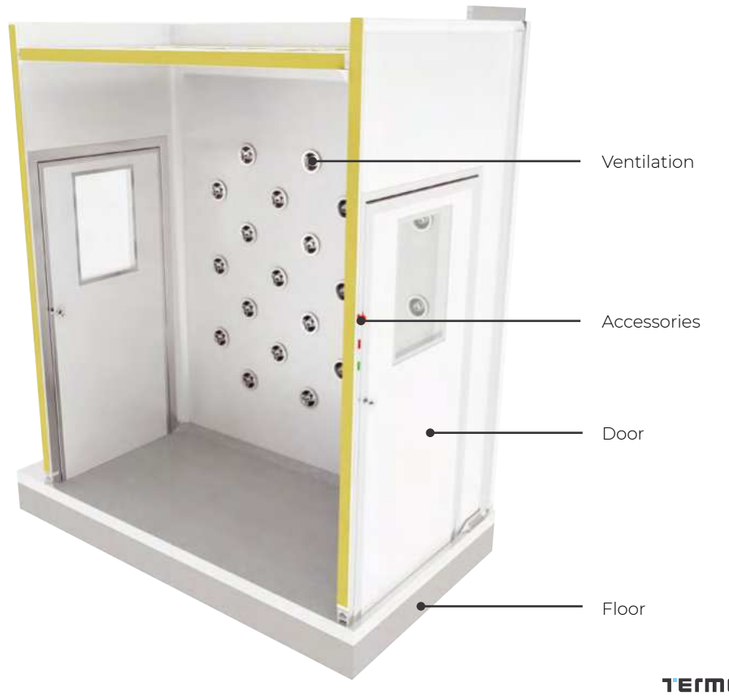
AIR SHOWER

Termovent Air Shower design ensures a high level control of transfer between two different areas.

The Air Shower is fully automated and user friendly. Design is adjustable in terms of personnel capacity and Cleanroom level.

AIR SHOWER TECHNICAL DATA

Position	Component
Wall / Ceiling	Cleanroom Panel TERMOVENT
	Touch Panel
	Nozzles
	Cleanroom Light Fixture
	Revision Hatch
Door System	Door
	Window
	Door Equipment
	Interlock System
Floor	Epoxy or PVC
Ventilation	HEPA 13 or F9
	TERMOVENT AHU Unit
	Wall grid
Accessories	UV Light Pressure & Presence Sensors Touch Screen Automatic Door



PASS BOX

Termovent designs various types of pass boxes to fit all customer requests in terms of material transfer. Pass boxes are modular and can be easily moved and reintegrated in different positions in one factory lifetime. Termovent pass boxes maintain contamination conditions at the lowest point.

PASS BOX TECHNICAL DATA

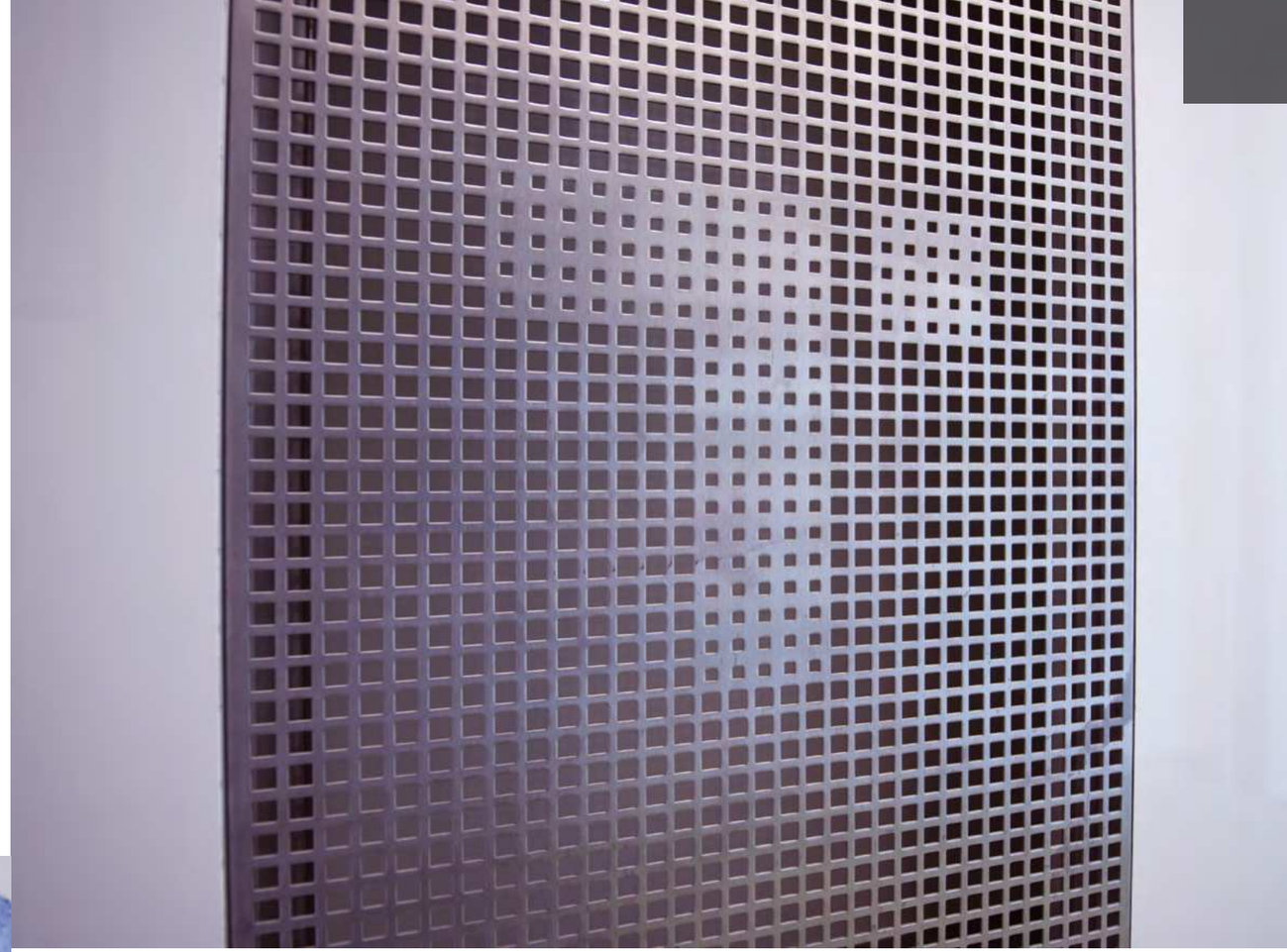
Position	Component
Wall / Ceiling	Cleanroom Panel TERMOVENT
	Cleanroom Light Fixture
Door System	Door
	Window
	Door Equipment
	Interlock System
Floor	Epoxy, PVC or Perforated Inox
Ventilation	HEPA 13
	Wall grid
Accessories	UV Light
	Pressure & Presence Sensors
	Touch Screen
	Automatic Door

PROTECTION

Termovent designs wall and door protection to ensure durability and aesthetical view of cleanroom area.

PROTECTION TECHNICAL DATA

PROTECTION	
COMPONENET	MATERIAL
Wall based	HPL; AISI 304/316; PP Plastic
Floor based	AISI 304/316



GRIDS

Ventilation grids are part of the standard equipment used in Cleanrooms. Termovent designs different types and patterns of grids, to meet the expectations of the most demanding customers.

FFU

Termovent Fan Filter Units (FFU) for Cleanroom environments are used in various healthcare, pharmaceutical, microelectronics and laboratory applications.

These reliable units, designed to provide a uniform micro-filtered air flow, meet air cleanliness standards and deliver high volumes of unidirectional HEPA filtered air, at low noise and high energy efficiency rates.

FFU TECHNICAL DATA

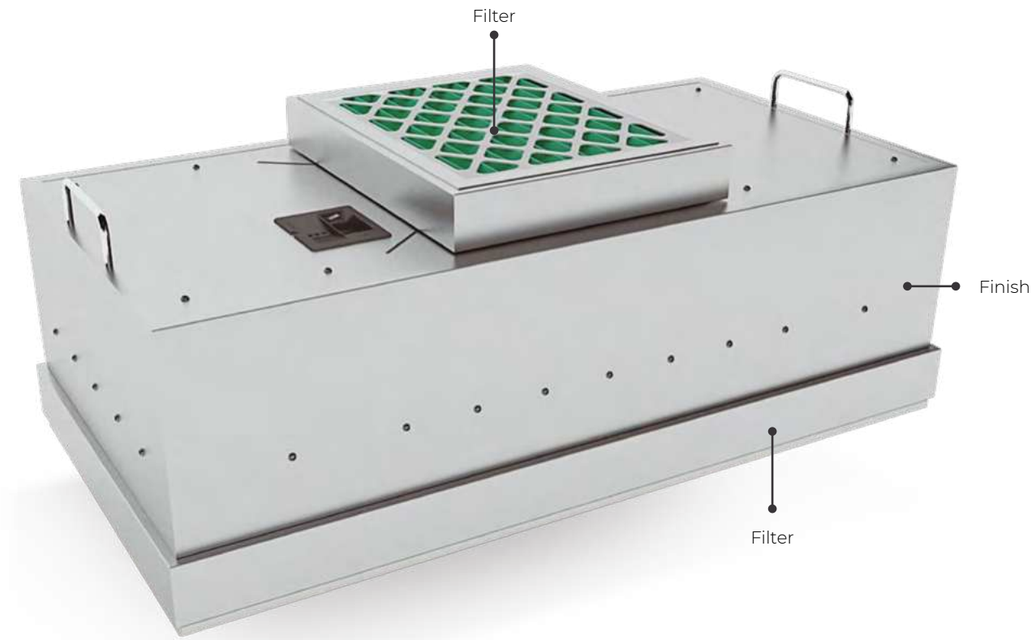
TKFFU Technical Data		1200x600	1200x1200
Length	[mm]	1225	1225
Width	[mm]	625	1225
Height	[mm]	450	450
Unit Casing Standard		Powder coated aluminum sheet	
Unit Casing Optional		Powder coated galvanized steel 304 stainless steel	
Installation side		Top/Plenum (standard)	
Filter inspection side			
Controller options		Continuously variable speed via MODBUS with corresponding connection box; Filter clogging ΔP sensor; Constant air flow;	

LAF

Termovent designs and produces tailor-made solutions for LAF units.

LAF TECHNICAL DATA

Position	Component
Ventilation	H13 to U15
	Ventilation speed ≤ 0,45 m/s
Door System	Door
	Window
	Door Equipment
	Interlock System
Floor	Epoxy, PVC
Control	CFR 21 / 11
	ISO 8 - ISO 5
Accessories	UV Light
	Pressure & Presence Sensors
	Touch Screen



REFERENCE LIST

- **YURA CORPORATION**, Leskovac, Serbia, Automotive industry
  Design, delivery, and installation of clean rooms and air handling units.
- **KOTEKS VISCOFAN**, Novi Sad, Serbia, Food production
- **EVALAR**, Biysk, Russia, Pharmaceutical production
- **COVID LABORATORY FIRE EYE**, Belgrade, Serbia, Laboratory
- **COVID HOSPITAL BATAJNICA**, Belgrade, Serbia, Hospital
- **COVID HOSPITAL KRUSEVAC**, Krusevac , Serbia, Hospital
- **JOCKEY , Nova Pazova**, Serbia, Manufacturing
- **ASPECTUS PHARMA**, Skopje, North Macedonia, Pharmaceutical production
- **WEST PHARMACEUTICAL**, Kovin, Serbia, Pharmaceutical and medical devices
  Design and delivery of clean rooms.
- **NOVARE S**, Zrenjanin, Serbia, Manufacturing
- **BIONIKA**, Skopje, North Macedonia
  Design, delivery, and installation of clean rooms, air handling units, HVAC systems, electrical installations, and BMS (Building Management Systems).
- **APTOS**, Tblisi, Georgia, Medical Services
- **UNIVERCELLS**, Charleroi, Belgium, Pharmaceutical industry
- **DNK LABORATORY BIA**, Belgrade, Serbia, Biotechnology industry
  Design and delivery of clean rooms.
- **SOJA PROTEIN**, Bečej, Serbia, Food and nutrition industry
  Design and delivery of clean rooms.
- **PHI ACADEMY**, Ratkovo, Serbia, Cosmetics industry
  Design, delivery, and installation of clean rooms.
- **MINT PHARMA**, Bačka Palanka, Serbia, Pharmaceutical production
  Design, delivery, and installation of clean rooms.
- **GALENIKA**, Belgrade, Serbia, Probiotics Plant, Pharmaceutical industry
  Design, delivery, and installation of clean rooms.
- **CREANOVA**, Stara Pazova, Serbia, Medical equipment
  Design, delivery, and installation of clean rooms, air handling units, HVAC systems, electrical installations, and BMS (Building Management Systems).
- **STEM CELL BANK**, Belgrade, Serbia
  Design and delivery of clean rooms.
- **IM CLINIC**, Belgrade, Serbia, Hospital
  Design and delivery of clean rooms.
- **ELEVEN ES**, Subotica, Serbia, Battery industry
  Design and delivery of clean rooms.
- **ACG LUKAPS**, Ludbreg, Croatia, Pharmaceutical manufacturing
  Design and delivery of clean rooms.
- **BESI**, Radfeld, Austria, Semiconductors Industry
- **PHARMASYNTEZ**, Irkutsk, Russia, Pharmaceutical production
- **GRAND MEDICA**, Novokuznetsk, Russia, Hospital
- **PHARMASYNTEZ NORD**, St. Petersburg, Russia, Pharmaceutical production
- **BRATSKCHEMSYNTEZ**, Bratsk, Russia, Pharmaceutical production
- **ALTAY VITAMIN**, Biysk, Russia, Pharmaceutical production
- **NIKA PHARM**, Novosibirsk, Russia, Pharmaceutical production
- **VEROFARM**, Belgorod, Russia, Pharmaceutical Industry

QUALITY MANAGEMENT SYSTEM

CERTIFICATES AS THE GUARANTEE OF QUALITY

Termovent is fully committed to meeting the customer's requirements in terms of quality, environmental protection and safety. The set high quality standards are the cornerstone of our operations.

In order to achieve the goals we set at all times, our employees are involved in the processes of continuous improvement and optimization of our products and services. The success of this approach is confirmed by numerous certificates held by Termovent, which guarantee the highest standards to our customers.

Eurovent Certita Certification
Eurovent Certita Certification Eurovent Certita Certification has certified that Termovent Air Handling Units, Range KK, and Software for calculation of performances SELECT:pro, Trade name TERMOVENT, have been assessed according to requirements of the following standard: OM-5-2017

CE marking for Termovent AHUs
CE marking for Termovent AHUs Termovent Air handling Units hold CE Marking of Conformity to Machinery Directive 2006|42|EC Annex II, Point A. In addition, Termovent AHUs are designed and produced according to set of harmonized standards: EN ISO 12100:2010, EN ISO 12100:2010, EN ISO 13850:2015, EN 1037:1995+ A1:2008, EN ISO 14120:2015, EN 60204– 1:2006/A1:2009 and EN 61000-6-2:2005/AC:2005

ISO 13485:2016
ISO 13485:2016 Certification body SIQ confirmed that Termovent introduced Quality Management System in accordance with ISO 13485:2016 in the field of manufacturing, design and installation of Termovent panels for the construction of clean rooms.

ISO 9001: 2015
ISO 9001: 2015 Certification body TUV SUD Management Service GmbH confirmed that Termovent introduced Quality Management System in accordance with ISO 9001:2015 standard in the field of manufacturing, installation and sales of equipment for air conditioning, heating and cooling.

ISO 14001:2015
ISO 9001: 2015 Certification body TUV SUD Management Service GmbH confirmed that Termovent introduced Quality Management System in accordance with ISO 9001:2015 standard in the field of manufacturing, installation and sales of equipment for air conditioning, heating and cooling.

ISO 45001:2018
OHSAS 18001:2007 Certification body TUV SUD Management Service GmbH confirmed that Termovent introduced Health and Safety Management System in accordance with OHSAS 18001:2007 in the field of manufacturing, installation and automation of air conditioning, heating and cooling equipment and systems.

AAA Creditworthiness Rating
AAA Creditworthiness Rating Bisnode Serbia awards Golden certificate of Credit-worthiness Rating

TERMOVENT Komerc d.o.o.
Kneza Miloša 88a
Skyline, object D, 1st floor
11070 Belgrade, Serbia
tel: +381 11 3087404
email: info@termovent.rs

www.termovent.com