



mediclean

System Unit



The New MEDICLEAN® System Unit

The Ideal Solution for Operating Theatres

Innovative, Compact, Energy Saving



MEDICLEAN® System Unit for operating theatres

meets DIN EN 1946-4, April 2005 (HTM 2025)

Well proven Weiss advantages:

- compact and ready for connection (ducts, filters and electronics pre-installed)
 - flexible duct connections
 - 3 sizes, capacities from 2500 – 9500 m³/h
 - large inspection windows
 - machine components insulated from air flow
 - modular design
- new** energy efficient 4-way hot gas switching (heat recovery with the heat pump principle), low internal pressure loss
 - new** operating safety provided by 100% fan (see TWIN* redundancy option below)
 - new** fresh air filter with anti-freeze protection (option)
 - new** integral fresh air damper
 - new** thermally insulated corner profiles
 - new** mirror image designs available
 - new** refrigeration circuit and heat recovery tested in the factory
 - new** integral sound attenuation (option)

A system unit sets new standards

The New MEDICLEAN® System Unit sets new standards in healthcare ventilation and air-conditioning technology, a field always known for stringent requirements. Features of the new unit include innovative technological design, reduced operating costs and compact dimensions. The New MEDICLEAN® System Units are suitable for a range of projects: new facilities or modernisation of existing operating theatres, intensive care units, diagnosis areas, etc. The new units meet all requirements of DIN 1946-4 and all requirements of related DIN-, VDI- and hygiene regulations. (HTM 2025).

Simple to locate

MEDICLEAN® System Units consist of a maximum of 5 modules, which simplifies location when space is limited. The modules are also available in mirror image design. If humidification is not required, this module may be omitted, saving additional space. The horizontal air flow allows for simple on-site ductwork connections by the customer (outgoing + supply and fresh + exhaust, one on each side of the unit). Housings made of aluminium profiles, with partial thermal break.

Minimal commissioning work

The unit is delivered to site pre-commissioned, with the electrical module, machine module, heat exchangers (heat recovery, cooling, heating) including ducting already installed at the factory and charged with refrigerant or brine. This high degree of pre-installation significantly reduces on-site commissioning with only connections to services required.

Designs and damper arrangements

- double-skinned design; all interior air-guiding walls and condensate trays made of stainless steel
- high flexibility in damper arrangement (side, top, rear)
- fresh air and outgoing air dampers conforming to tightness class 4 (to DIN EN1751)
- All dampers have a motor with spring reset, which automatically closes upon power failure.

Energy saving by means of heat recovery

In units with a refrigeration circuit heat recovery is achieved by 4-way hot gas switching (heat pump principle). Thus additional heat exchangers, such as run around coils, are no longer required for heat recovery.

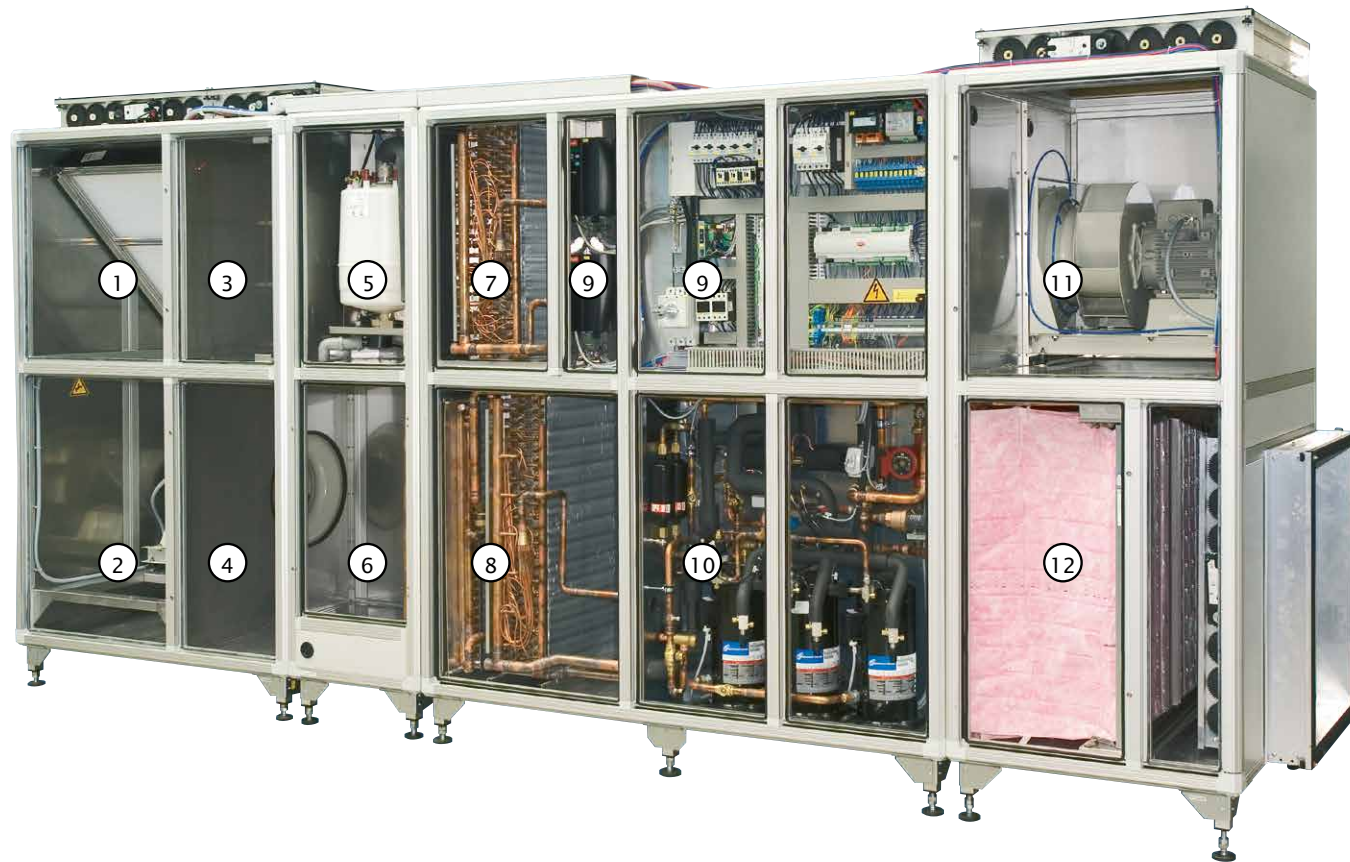
This principle reduces the internal air pressure loss, which leads to energy savings in fan operation. Frost protection on the fresh air intake prevents frost damage to the unit. The casing floor of the fresh air intake, cooling coil, humidifier and heat recovery system are designed as stainless steel trays.

Mechanical properties according to DIN EN 1886

- mechanical stability class D2
- housing leakage class L2
- filter bypass leakage 0,5% V_{rated}
- thermal insulation (DIN EN 1886)
- heat bridge factor (DIN EN 1886)
- SNIP (RUS), (option)
- HTM 2025 (UK), (option)
- DIN EN 1946-4

* TWIN OPTION: for 75.3 and 95.3 two fans, operating at 50% of the nominal air volume. In case of fan failure, the second fan takes over 100% of the duty. Meets the requirements of the English HTM standard as well as the Russian SNIP standard (not for unit 55.3).

Fig. Mediclean interior view



1 Supply air filter 2nd filter step

- rugged fresh air cassette filter
- quality F9 (option F7)
- easy filter change on the dirty side
- material: fibre glass
- filter cassette with seal all around – thus the seal is replaced automatically with each filter change
- fresh air filter visible through large inspection windows
- differential pressure gauge

2 Fresh/supply air fan

- full capacity even in emergency service
- plastic coated fan unit
- on request (e.g. to meet SNIP or HTM) TWIN fans can provide redundancy (see page 2)
- continuous, load-dependent, energy optimized control by inverter
- standard motor or external rotor motor
- radial fan without housing, single intake
- backward inclined impellers
- wear-free operation
- fan unit visible through large inspection windows

3 Return air filter

- rugged supply air cassette filter
- quality: F7 (DIN EN779)
- easy filter change possible on the dirty side
- fibre glass media
- filter cassette with seal all around – thus the seal is replaced automatically with each filter change
- outgoing air filter visible through large inspection windows
- differential pressure gauge

4 Isolation damper for fresh air fans (TWIN option only)

- This damper is installed in the unit only if twin fans are installed.
- If a fan is defective, the damper automatically isolates the fan from the air stream to prevent re-circulation.

5 Humidifier

- electronic electrode steam humidifier
- fully automatic generation of sterile, mineral-free and odourless steam
- insulated from the air flow, thus easily accessible for maintenance

6 Steam distributor/humidification path

- Steam distributor especially adapted to the unit's cross-section, ensures homogeneous distribution of steam across the whole flow cross-section and thus allows for a short humidification path.
- humidification path visible through large inspection windows

7 Condenser

- large surface Cu/Al heat exchanger with 2.5 mm rib spacing
- stainless steel tray
- easy access to the intake and output sides
- switch-selectable for heat recovery operation

8 Evaporator

- large surface Cu/Al heat exchanger with 2.5 mm rib spacing
- switch-selectable for heat recovery operation
- easy access to the intake and output sides
- The complete module base is designed as a stainless steel tray.

9 Electrical module

- control and output section included in the lockable module,
- contains the complete control of all components in the air-conditioning unit
- wired according to VDE regulations
- standardised design, clearly arranged and easy to maintain
- easily accessible main switch on the outside of the unit
- freely programmable controller PC3 – other controller brands can be installed
- bus hook-up possible

10 Machine module

- chilled water models: fully packaged unit for pumped warm water, pumped cold water and heat recovery
- DX models: with two or three compressors, depending on unit size.
- Scroll compressors for quiet, wear-free operation and easy maintenance
- refrigerant: R417a: environmentally friendly, no ozone-depleting properties
- constant power control via hot gas bypass
- The machine module is completely insulated from the air flow; this allows fine tuning and various service functions to be performed while the unit is operating.

11 Exhaust air fan

- plastic coated fan unit
- optionally (e.g. to meet SNIP or HTM) TWIN fans can provide redundancy (see page 2)
- continuous, load-dependent, energy optimized control by inverter
- standard motor or external rotor motor
- radial fan without housing, single intake
- backward inclined impellers
- wear-free operation
- fan unit visible through large inspection windows

12 Fresh air filter 1st filter step

- outgoing air filter as bag filter, standard dimension
- quality F7, optionally F5 (DIN EN 779)
- high dust storing capacity
- no synthetic fibres, only fibre glass fabrics
- easy filter change
- external air filter visible through large inspection windows

1 Fan, standard version



The standard version of the unit includes one fresh air fan.

The TWIN-version has two fans and the necessary shut-off damper (see below).

Outside air connection



- integrated outside air dampers, motor with spring reset; no insulation required, no condensation possible
- connections for pumped warm water and pumped cold water
- Flap closes automatically upon power failure.

Exhaust air filter



- exhaust air filter as bag filter, standard dimension
- removable, easy handling
- filter quality F7, high dust storing capacity
- Seal on filter frame is renewed automatically at each filter change.

Redundant fans, TWIN



- redundant fan arrangement possible (to meet HTM 2025 and SNIP standard)
- simultaneous air conditioning of several operating theatres possible where permitted
- maximum safety

Insulation damper for fresh air fans, TWIN



- stainless steel base tray with drain opening
- siphon with non-return system, self-closing and self-filling

Inspection windows



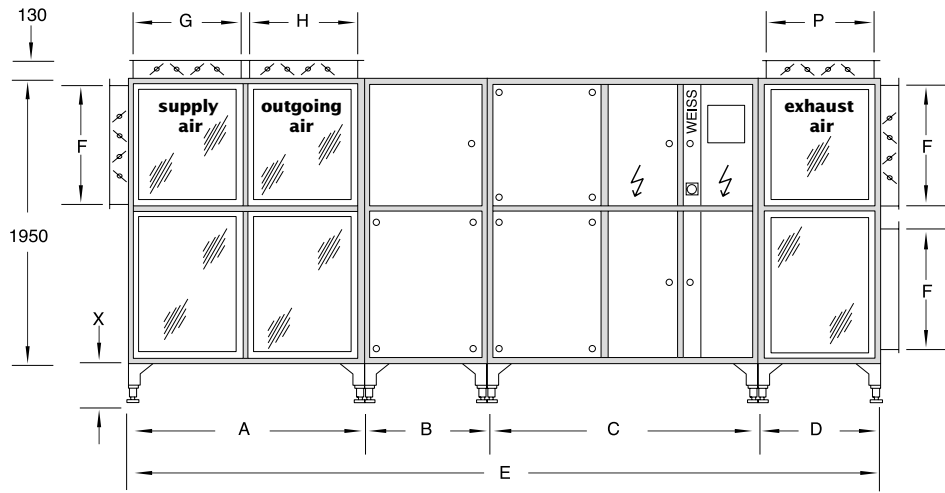
- large inspection windows
- double glazed windows, each with 4 mm thick safety glass
- sealed-pore profiled rubber gasket, inserted
- easy replacement when needed
- Because of the large windows no interior lighting is required (HTM 2025).
- easy to clean, hygienic

Housing profiles

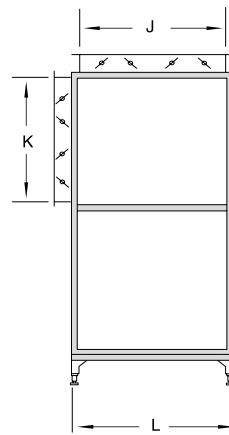


- housing profiles joined by corner connections consisting of fibre glass reinforced plastics PA6 GF30 with flame protection
- profiles of anodized aluminium
- high rigidity
- corrosion-resistant
- functional design
- innovative design

View from front



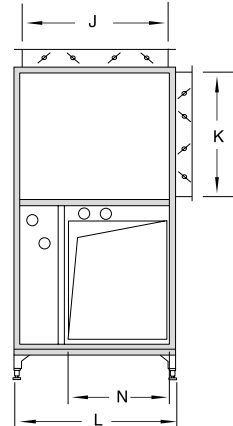
View from left side



View from top



View from right side



SIZE	55.3	75.3	95.3	
OVERALL HOUSING DIMENSIONS				
Width	mm	4100	4620	5140
Depth	mm	850	1100	1300
Height	mm		1950	
HOUSING DIMENSIONS OUTGOING/SUPPLY AIR MODULE				
Width	mm	1090	1350	1610
Depth	mm	850	1100	1300
Height	mm		1950	
HOUSING DIMENSIONS HUMIDIFIER MODULE				
Width	mm	570	570	830
Depth	mm	850	1100	1300
Height	mm		1950	

SIZES	55.3	75.3	95.3	
HOUSING DIMENSIONS ELECTRICAL MODULE				
Width	mm	1610	1870	1870
Depth	mm	850	1100	1300
Height	mm		1950	
HOUSING DIMENSIONS FRESH/EXHAUST AIR MODULE				
Width	mm		830	
Depth	mm	850	1100	1300
Height	mm		1950	

SIZES	A	B	C	D [mm]	E	F	G	
MEDICLEAN 55.3	1090	570	1610	830	4100	807	600	
MEDICLEAN 75.3	1350	570	1870	830	4620	807	730	
MEDICLEAN 95.3	1610	830	1870	830	5140	807	990	
	H	J	K	L [mm]	M	N	P	X
MEDICLEAN 55.3	325	600	807	850	807	600	730	200
MEDICLEAN 75.3	450	807	807	1100	807	807	730	200
MEDICLEAN 95.3	450	990	807	1300	807	990	730	200

SNIP: P=730
 J=807 (Mediclean System Unit 75.3)
 J=990 (Mediclean System Unit 95.3)

SIZES	55.3	75.3	95.3	
Total weight (DX) without media	kg	1600	1888	2395
Weight OUTGOING/SUPPLY AIR MODULE	kg	407	461	580
Weight humidifier module	kg	150	160	196
Weight installations module	kg	723	902	1194
Weight FRESH/EXHAUST AIR MODULE	kg	320	365	425
Sound pressure level at rated flow volume, ext. pressure loss				
FRESH AIR connection	dB (A)	84	86	90
SUPPLY AIR connection	dB (A)	92	94	98
OUTGOING AIR connection	dB (A)	83	85	89
EXHAUST AIR connection	dB (A)	91	92	97
Radiated by housing	dB (A)	72	72	76
Sound pressure level, in free field (1 m distance)	dB (A)	67	69	73
Supply voltage	V/Ph/Hz		400/3/50	
Connected electric load	kVA	60.3	79.0	99.0
Current consumption	A	87.0	114.0	143.0

Subject to technical changes in the interest of advancement.

SIZES	55.3 R/L	75.3 R/L	95.3 R/L
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RATED VOLUME FLOW SUPPLY AIR/OUTGOING AIR

Rated volume flow at max. external pressure loss	m ³ /h	5500	7500	9500
Lower volume flow	m ³ /h	2500	3500	4500
Max. external pressure loss	Pa	900	900	900

FAN MOTOR UNIT SUPPLY AIR/OUTGOING AIR

Type	directly driven, free running, backward inclined impellers			
Number	pcs	1	1	1
Impeller diameter	mm	560	450	450
Motor design		external rotor	B3	B3
Motor control		FU	FU	FU
Rated output at shaft	kW	7.4	7.5	7.5
Current consumption	A	12.7	13.8	13.8
Connected electric load	kVA	8.8	9.6	9.6
Speed	1/min	2095	2900	2900
Enclosure type	IP		54	
Isolation class			F	

FAN MOTOR UNIT SUPPLY AIR/OUTGOING AIR (TWIN)

Type	directly driven, free running, backward inclined impellers			
Number	pcs	-	2	2
Impeller diameter	mm	-	450	450
Motor design		-	B3	B3
Motor control		-	FU	FU
Rated output at shaft	kW	-	2 x 7.5	2 x 7.5
Current consumption	A	-	2 x 13.8	2 x 13.8
Connected electric load	kVA	-	2 x 9.6	2 x 9.6
Speed	1/min	-	2900	2900
Enclosure type	IP		54	
Isolation class			F	

FILTER F7, FRESH AIR

Type	bag filter			
Filter class to DIN EN 779		F7		
Number	pcs	1	2	2
Rated dimension	mm	592 x 892	490 x 892	592 x 892
Bag length	mm		534	
Filter surface	m ²	7.9	11.8	15.8
Spec. filter surface per surface of unit cross-section	m ² /m ²	10	11.8	13.2
Recomm. final pressure to DIN EN 13053	Pa		200	

Subject to technical changes in the interest of advancement

SIZES	55.3 R/L	75.3 R/L	95.3 R/L
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FILTER F9, SUPPLY AIR TOP/REAR

Type	cassette			
Filter class to DIN EN 779		F9		
Number	pcs	1	1	4
Frame dimensions	mm	590 x 1150 x 96	675 x 1150 x 96	675 x 410 x 96
Filter surface	m ²	28	32	45.6
Spec. filter surface per surface of unit cross-section	m ² /m ²	35	32	38
Recomm. final pressure to DIN EN 13053	Pa		300	

FILTER F9, SUPPLY AIR, SIDE

Type	cassette			
Filter class to DIN EN 779		F9		
Number	pcs	1	1	1
Frame dimensions	mm	780 x 750 x 96	780 x 1000 x 96	780 x 1150 x 96
Filter surface	m ²	24.1	32.1	37
Spec. filter surface per surface of unit cross-section	m ² /m ²	30	32.1	30.8
Recomm. final pressure to DIN EN 13053	Pa		300	

FILTER F7, OUTGOING AIR

Type	cassette			
Filter class to DIN EN 779		F7		
Number	pcs	1	1	2
Frame dimensions	mm	780 x 750	780 x 1000	780 x 600
Filter surface	m ²	13.4	18	21.6
Spec. filter surface per surface of unit cross-section	m ² /m ²	16.7	18	18
Recomm. final pressure to DIN EN 13053	Pa		200	

COOLING (DX) CONDENSER INTERNAL, GROSS

Cooling capacity at intake temp. +32°C/40% r.hum.-tot./sens.kW		30.1/26.5	45.2/37.9	50.9/45.4
Condenser capacity at outgoing air temp. +27°C	kW	39.6	58.3	63.4

Type	SCROLL			
Number	pcs	2	3	3
Refrigerant			R417A	
Connected electric load	kVA	2 x 9.1	3 x 9.1	3 x 9.1

COOLING (DX) ADD. LIQUEFIER UNIT EXTERNAL, GROSS

Cooling capacity at intake temp. +37°C/40% r.hum.-tot./sens.kW			84.0/53.1	89.3/59.8
Refrigerant			R417A	R417A
Connected electric load external liquefier	kVA		22.4	22.4

Subject to technical changes in the interest of advancement.

SIZES	55.3 R/L	75.3 R/L	95.3 R/L
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COOLING (CW) chilled water 7/12.5°C, GROSS

Cooling capacity at intake temp. +32°C/40% r.hum.-tot./sens.kW	33.1/24.8	52.0/37.8	66.7/48.3	
Water volume	m ³ /h	5.2	8.1	10.4
Pressure loss on water side	kPa	15.4	11.2	14.6
Valve	DN	32	40	40
Pressure loss on water side, valve	kPa	10	10	17

HEATING PUMPED WARM WATER PRE-HEATER 70/50°C (CW-UNITS)

Heating output at intake temp. -15°C	kW	34.9	48.8	61.2
Water volume	m ³ /h	1.5	2.1	2.7
Pressure loss on water side	kPa	8.8	11.0	11.6
Valve	DN	25	25	25
Pressure loss on water side, valve	kPa	6.0	11.0	18.4

HEATING PUMPED WARM WATER RE-HEATER 70/50°C (DX-UNITS)

Heating output at intake temp. -15°C	kW	72.5	100.0	125.7
Water volume	m ³ /h	3.2	4.4	5.5
Pressure loss on water side	kPa	13.2	11.1	11.7
Valve	DN	25	25	25
Pressure loss on water side, valve	kPa	10.2	19.4	30.0

HEATING HEAT RECOVERY (CW VERSION)

Heating output at intake temp. -15/27°C	kW	39.2	58.6	73.5
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HEATING HEAT RECOVERY (DX VERSION)

Heating output at intake temp. -15/27°C	kW	29.7	55.3	70.4
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HUMIDIFIER, INTEGRATED STEAM GENERATOR

max. steam output	kg/h	30	40	68
Water supply	bar		1-10	
Conductivity of water	µS/cm		125-900	
Number	pcs	1	1	2
Current consumption	A	33	44	2 x 37
Connected electric load	kVA	23	30	2 x 26

Subject to technical changes in the interest of advancement.

MEDICLEAN Units are equipped with a PC 3 controller as standard. Other controller brands available.

Control / Regulation by "pcs+"

Weiss compact air-conditioning units are equipped with a pcs+ control as standard. Other controller brands available.

Operating Terminal

- LCD display, 8 lines, 22 symbols
- 6 keys with LED acknowledge message
- Alarm horn
- Installation in front
- Protection IP 65

Controller

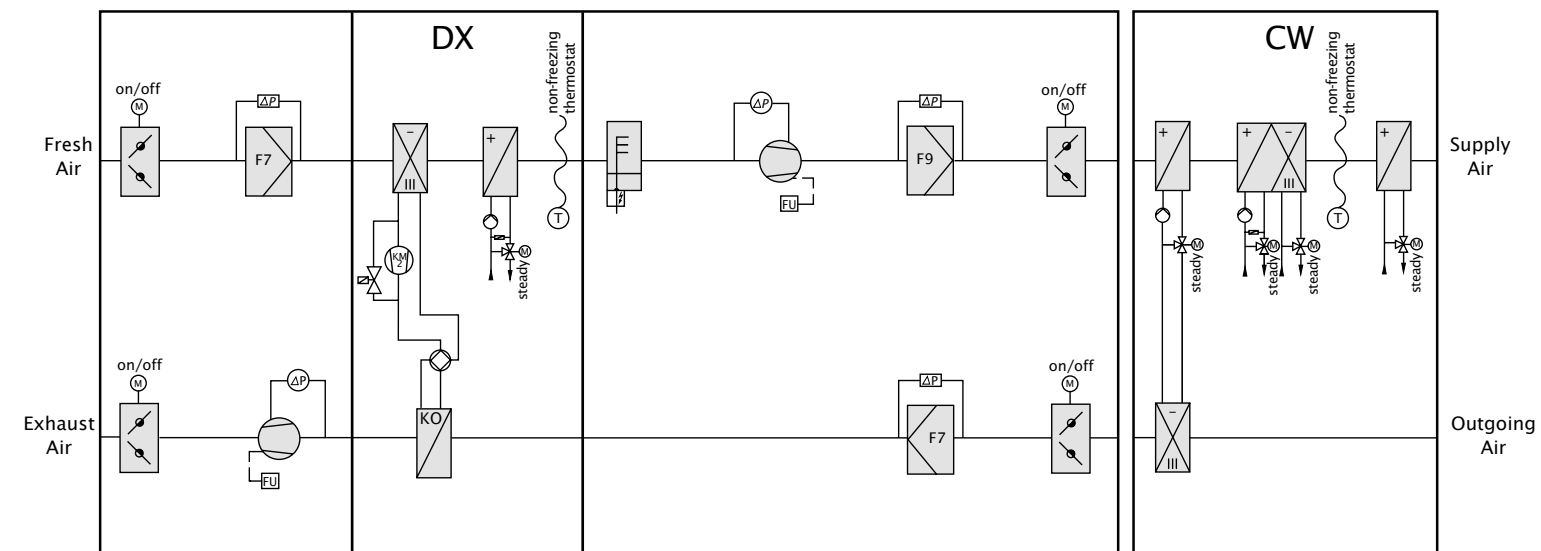
- Microprocessor 16 bit, 16 Mhz, 256 kBRAM
- Clock, battery resilient
- RS485 interface for pLAN
- Display connection
- Program register at non-volatile flash register



Inlets and Outlets

- 8/14/18 digital inlets
- 8/13/18 digital outlets
- 2/2/4 sensor inlets
- 3/6/6 universal inlets
- 4/4/6 analogue outlets

Functional diagram of the New MEDICLEAN® System Unit with mechanical cooling (DX)
Alternative: chilled water (CW)



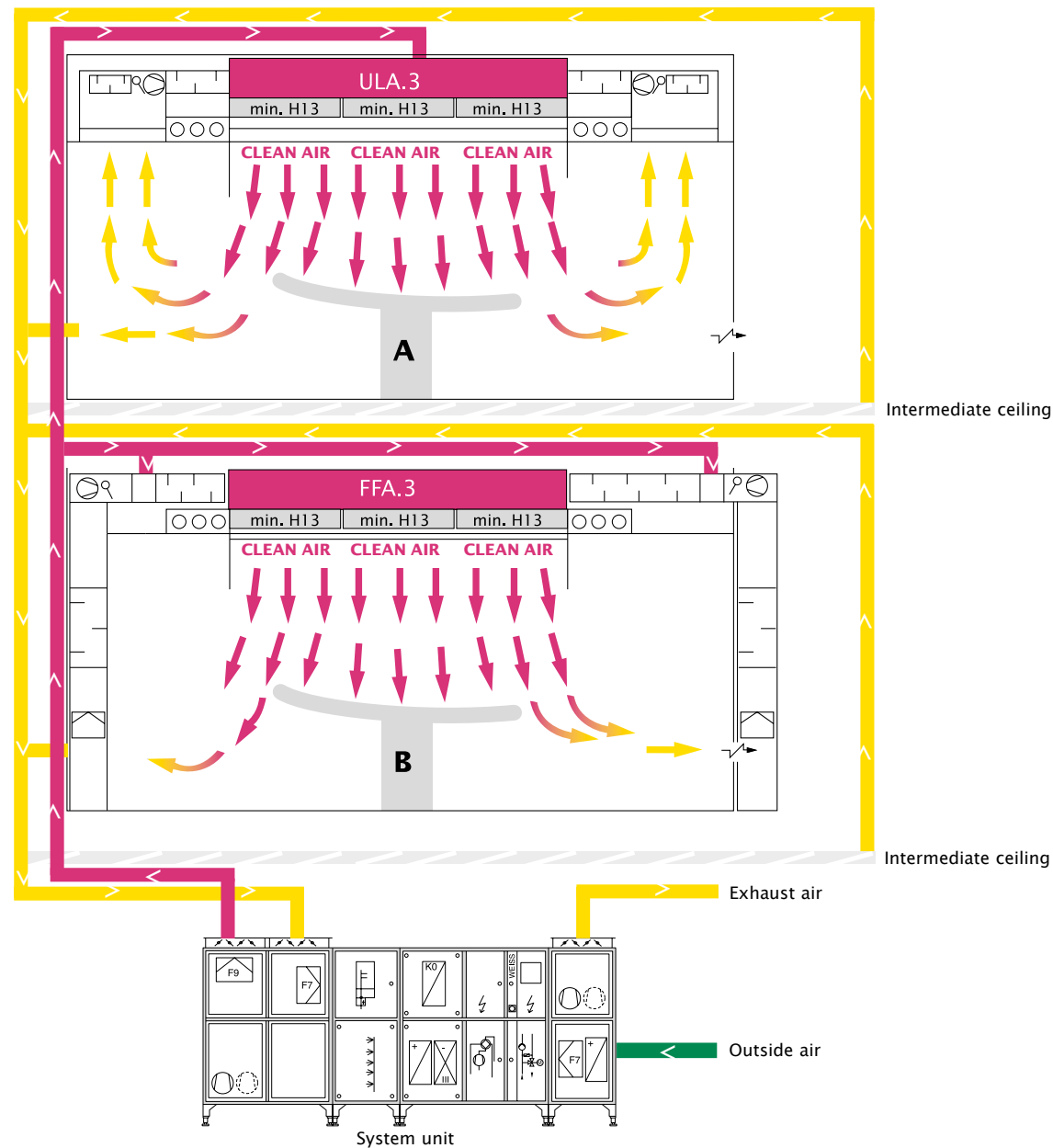
The above drawing shows the functional diagram of a MEDICLEAN® System Unit with mechanical cooling:

DX = direct expansion.

The alternative is shown right: functional diagram with chilled water cooling.

CW = chilled water

Example of air conditioning of two operating theatres by means of a single unit (simplified schematic representation)



MEDICLEAN® System Units can supply fresh air to one or several operating theatres at the same time. The optional redundant fans ensure highest operating safety. The above drawing shows how a MEDICLEAN® System Unit operates two clean air ceilings in two operating theatres located on separate floors.

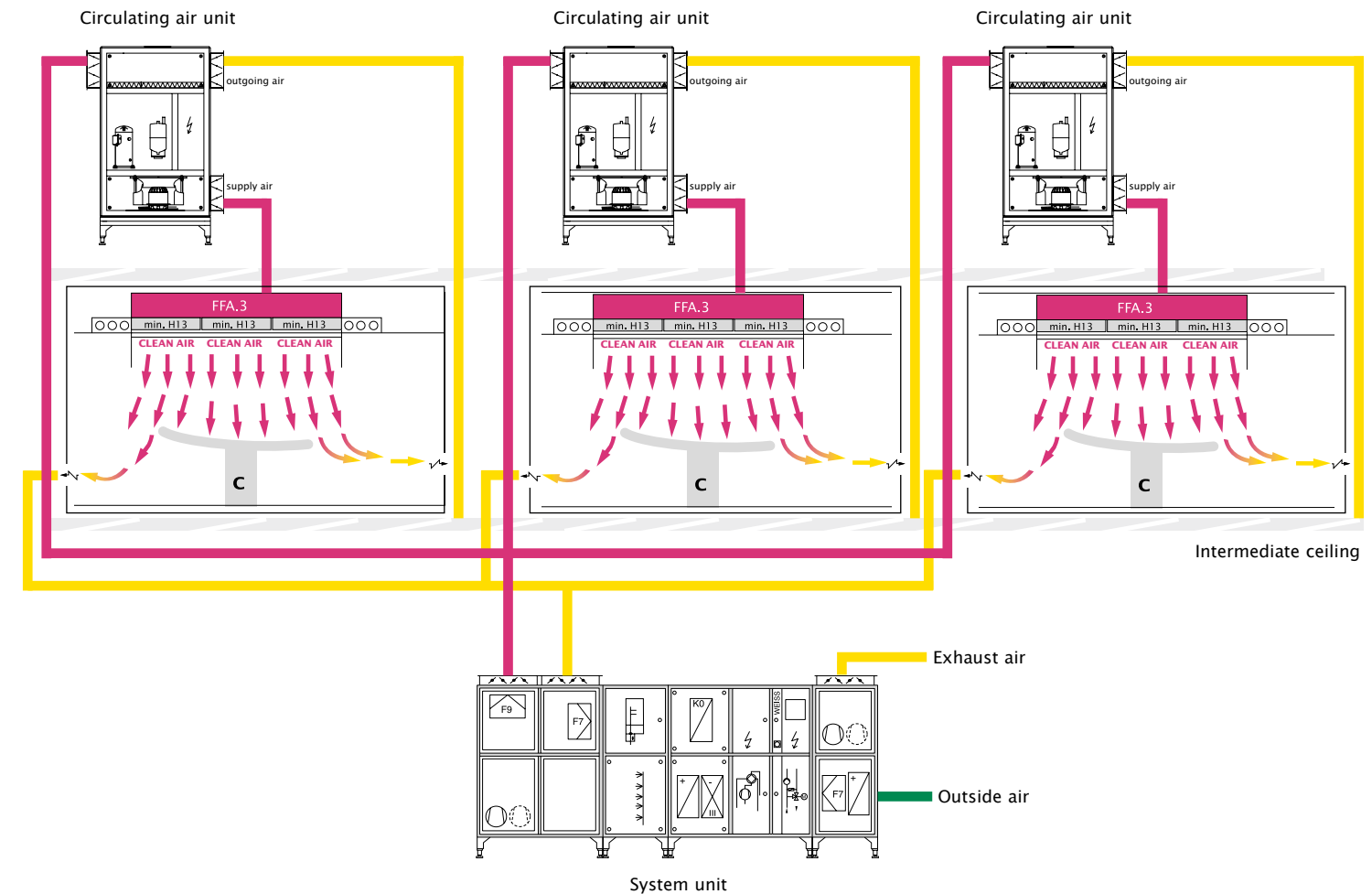
Variant A

- The operating theatre is fitted with two ceiling-mounted circulating air modules.

Variant B

- This variant offers a hygienically compatible alternative solution with a wall-mounted module. The operating theatre is furnished with two wall-mounted circulating air modules. Service and maintenance for clean room class 2 is possible. Either the unit is installed inside the room and has revision openings towards the wall. Or the unit is located outside the operating theatre. The outlet is achieved through a duct in the wall.

Example of air conditioning three operating theatres with a single MEDICLEAN® System Unit and three circulating air units (simplified schematic representation)



MEDICLEAN® System Units can also be combined with circulating air units and may thus supply fresh air to one or several operating theatres.

Variant C*

- If variant A or B cannot be used for hygienic reasons or lack of space, variant C is recommended.
- Variant C is viewed as future-oriented. NB: The building must be adapted to accommodate this solution prior to installation.
- It meets the latest hygienic requirements.
- The fresh air supply to the individual operating theatres can be adjusted separately.

* DIN EN 1946-4.6.7.2.1 TAV outlets without mixing function: "Air circulation, mixing and complete homogenisation of outside and circulating air is performed in a central air-conditioning unit located outside the operating theatre. Preferably it is installed directly above the operating theatre."

weisstechnik

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Our solutions are deployed around the world in research, development, production and quality assurance of numerous products. Our experts from 21 companies are at your service in 14 countries, ready to provide support to ensure high operational reliability of your systems.

Weiss Umwelttechnik is one of the most innovative and significant manufacturers of environmental simulation systems. With these testing systems, we can simulate all climatic conditions around the globe and beyond, under accelerated conditions. Whether temperature, climate, corrosion, dust or combined shock testing: we have the proper solution. We supply systems in all sizes, from standard versions up to customised, process-integrated facilities - for high reproducibility and precise test results.

Vötsch Industrietechnik, a subsidiary of Weiss Umwelttechnik, offers a wide product portfolio in the field of heating technology. With an experienced team of engineers and designers, we develop, plan and produce high-quality and reliable heating technology systems for virtually any field of application. Products include heating/drying ovens, clean room drying ovens, hot-air sterilisers, microwave systems and industrial ovens. The portfolio reaches from technologically sophisticated standard versions to customised solutions for individual production operations.

A further Weiss Technik company, Weiss Klimatechnik, also offers reliable climate solutions wherever people and machinery are challenged: in industrial production processes, hospitals, mobile operating tents or in the area of IT and telecommunications technology. As one of the leading providers of professional clean room and climate solutions, we deliver effective and energy-saving solutions. Our experts will guide you from the planning to the implementation of your projects.

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