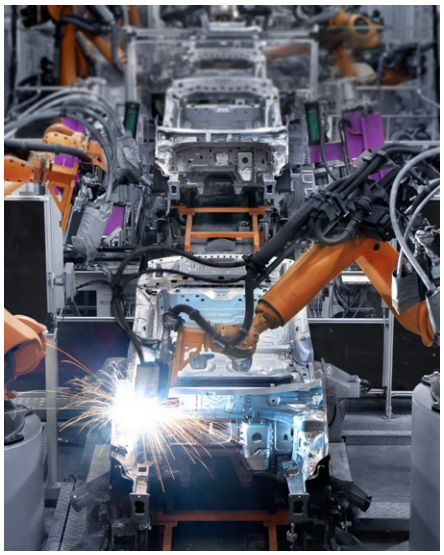
STULZ

CLIMATE. CUSTOMIZED.



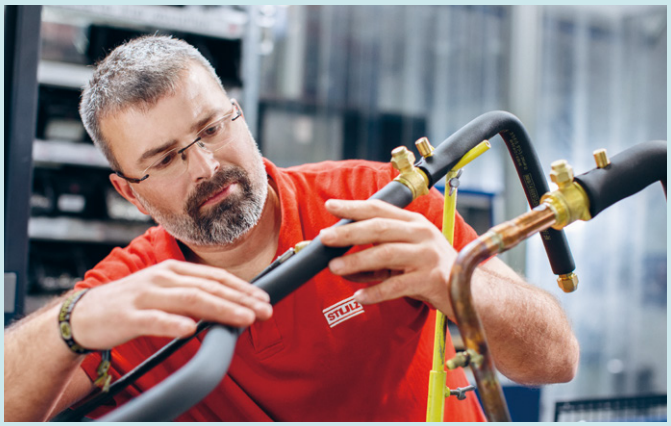
STULZ Explorer WPA$_{mini}$

Chiller with Free Cooling for high temperature.
STULZ quality and experience.

STULZ air conditioning systems for mission-critical applications – around the globe

For over 40 years we have been one of the world's leading manufacturers of air conditioning solutions for mission-critical applications. For our customers, we develop and produce air conditioning systems and chillers, plan individual air conditioning solutions, implement the systems and keep them up and running with our own Service.

Our headquarters are in Hamburg. With 20 subsidiaries, 10 production sites, and sales and service partners in more than 140 countries, we make sure we are close to our customers wherever they are in the world.



Technical peak performance from Germany
It is the combination of decades of experience and a continuous innovative spirit that makes STULZ unique. From engineers to customer advisers, we work in closely intertwined teams, which jointly develop and continually optimize our air conditioning and chiller systems throughout all stages of development. So it should come as no surprise that our systems are extremely reliable and durable, and set the benchmark for energy efficiency around the globe.

Service 24/7, 365 days a year
In Germany, 140 highly qualified service engineers at 10 sites guarantee fast, expert solutions to your problems – around the clock. For 40 years, our customers have placed their trust in STULZ Service's technical expertise, comprehensive resources and seamless availability.

Wide operating range. Efficiency always, everywhere.

STULZ's experience in data center and process application cooling has enabled us to develop a chiller that is capable of meeting the wide operating limits (in terms of users and the environment) required by new energy-saving technologies.

WPA_{mini} ambient temperature

WPA_{mini} applications are located around the world, in different environmental conditions.
For this reason, the working range of WPA_{mini} is:

Version	Min	Max
Standard	-10 °C	+55 °C
Free Cooling	-20 °C	+55 °C
Free Cooling -40°C	-40 °C	+55 °C

WPA_{mini} chilled water limits

Unlike the "Comfort" segment, WPA_{mini} operates in markets which require high supply fluid temperatures. WPA_{mini} range is designed to operate within the following limits:

Version	Min	Max
Standard	0 °C	+20 °C
Fluid low temperature	-5 °C	+20 °C

WPA_{mini}

WPA$_{mini}$ at a glance

Designed for data centre and process cooling.
Operation 24/7/365

1. **Large microchannel condensers**
   - Minimized air-side pressure drops
   - Improved heat transfer
   - Lower refrigerant quantities needed

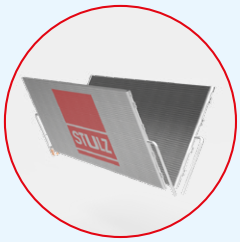
2. **Integrated Free Cooling coils**
   - Possibility of Free Cooling even with low capacities
   - Reduce electricity power consumption
   - Designed with copper and aluminum coils

3. **Closed compressor compartment**
   - Two refrigerant circuits working independently
   - 4 compressors for more compressor stages
   - Closed compartment to reduce noise emissions

4. **Interconnection**
   - Ethernet
   - ModBus
   - Web monitoring
   - Sequencing

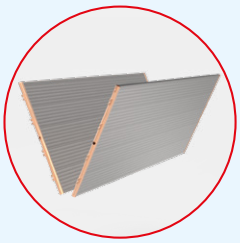
SEPR Seasonal Energy Performance Ratio according to the European Regulation 5539/16 (see S. 8)

- Low noise
- Networked
- User-friendly
- Easy to maintain
- Redundant
- 2 refrigerant circuits 4 compressors



SEPR

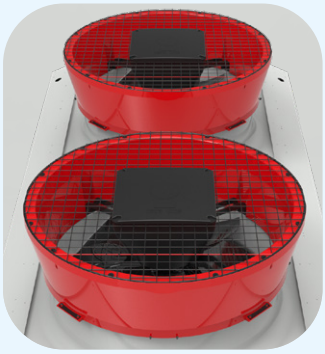
V shape to maximize the surface.
Aluminum microchannel condensers.



Free Cooling integrated.

SEPR

Ample space for the hydraulic circuit



Options:
- EC fans
- Axitop®

AC fans (Ø 800mm).
Variable speed.

STULZ SEC.blue

Large electrical cabinet
with maximized space
for electrical options

Multi-circuit. Multi-compressor.
Closed compressor compartment

Climate. Customized. You have the challenge, we have the solution.

Every application has different requirements for ambient temperature, fluid temperature, noise level, positioning, etc. STULZ is able to meet the most diverse requirements, thanks to a wide range of options and the possibility of expanding the operating limits of the $WPA_{mini.}$, if requested.

weather

Environment: extremely hot, dusty location

What makes WPA_{mini} ideal for warm regions:

- **Frequency: 60Hz (optional)**
- **Metal air filters** to protect the condensers from dust and dirt.
- **Operation up to +55°C with Unloading**. Up to +45°C the cooling capacity is 100% guaranteed. If the temperature rises above +45°C, the Unloading function modulates compressors without switching them off.

Desert Climate, Steppe

External Temperature	+15°C	+35°C	+50°C
Operating Point	Water: 18/12°C		
Cooling Capacity	**115 kW**	**92 kW**	**72 kW**
EER	6.08	3.56	2.13

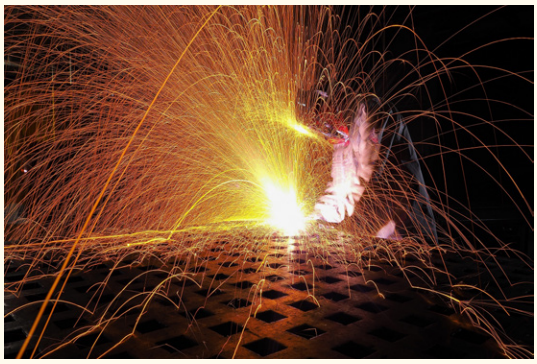
Technical Data of WPA_{mini} WPA0302DNA00000, designed for this kind of application.

application

Application: high water temperature

What makes WPA_{mini} ideal for high water temperatures:

- **Cooling circuit specially designed** to reach high outlet temperatures.
- **Wide Compressor operating limits**
- **Compressor with high suction temperature**



Welding

External Temperature	+35°C		
Operating Point	Water: 18/12°C	Water: 25/20°C	Water: 30/25°C
Cooling Capacity	**92 kW**	**119 kW**	**136 kW**
EER	3.56	4.68	5.39

Technical Data of WPA_{mini} WPA0302DNA00000, designed for this kind of application.

- **Location**
- **Room planning**
- **Local climate**
- **Environmental protection**
- **Noise protection**
- **Heat production**
- **Security**
- **Integration and connectivity**
- **In-house engineering**
- **In-house software development**

The WPAmini range is the ideal solution to every requirement: it guarantees durability, flexibility and operates 24/7/365 days a year in all conditions.

weather

Polar desert

Environment: extremely cold

What makes WPA$_{mini}$ ideal for cold regions:

- **Closed compressor compartment**
- **Heating resistance** to protect the electric panel, compressors, evaporator and hydraulic circuit
- **Free Cooling up to -40°C** with components specifically selected for a long service life.

External Temperature	-40°C	-10°C	+35°C
Operating Point	Water: 18/12°C		
Cooling Capacity	**115 kW**	**115 kW**	**88 kW**
EER	>250	6.33	3.24

Technical data of WPA$_{mini}$ WPA0302LNA00000, designed for this kind of application

application

Iced water

Application: cold water

What makes WPA$_{mini}$ ideal for low water temperatures:

- **Cooling circuit specially designed**

to reach low outlet temperatures.

- **Increased thickness of the thermal insulation**
- **Standard antifreeze system** to protect the hydraulic and refrigerant systems both in operating mode and standby.

External Temperature	+35°C		
Operating Point	Water: 0/-5°C	Water: 5/0°C	Water: 10/5°C
Cooling Capacity	**46 kW**	**57 kW**	**70 kW**
EER	1.72	2.12	2.55

Technical data of WPA$_{mini}$ WPA0302CNA00000, designed for this kind of application

Efficiency challenging the future: ErP 2018 ready

The European Regulation 5539/16, known as ErP 2018, sets the new SEPR parameters for assessing the energy efficiency of chillers. The entire WPA_{mini} range complies with the limits required by ErP 2018.

E.E.R.: Energy Efficiency Ratio
Chiller efficiency at a certain condition.

E.S.E.E.R.: European Seasonal Energy Efficiency Ratio
Seasonal efficiency of a chiller for comfort: ambient air from 25 to 35°C

S.E.P.R.: Seasonal Energy Performance Ratio
Evaluates the load and temperature variations during the year, relative to the chiller's electricity consumption.

ErP 2018 READY
Reg. 5539/16

Parameters for high-temperature process cooling chillers (reg. 5539/16):

		ErP 2018
Nominal Cooling Capacity	<400 kW	4.5
	≥ 400 kW	5.0

Water In/Out: 12/7°C, Air: 35°C

The entire **WPA_{mini}** range already complies with the limits required by ErP 2018:

Standard Version

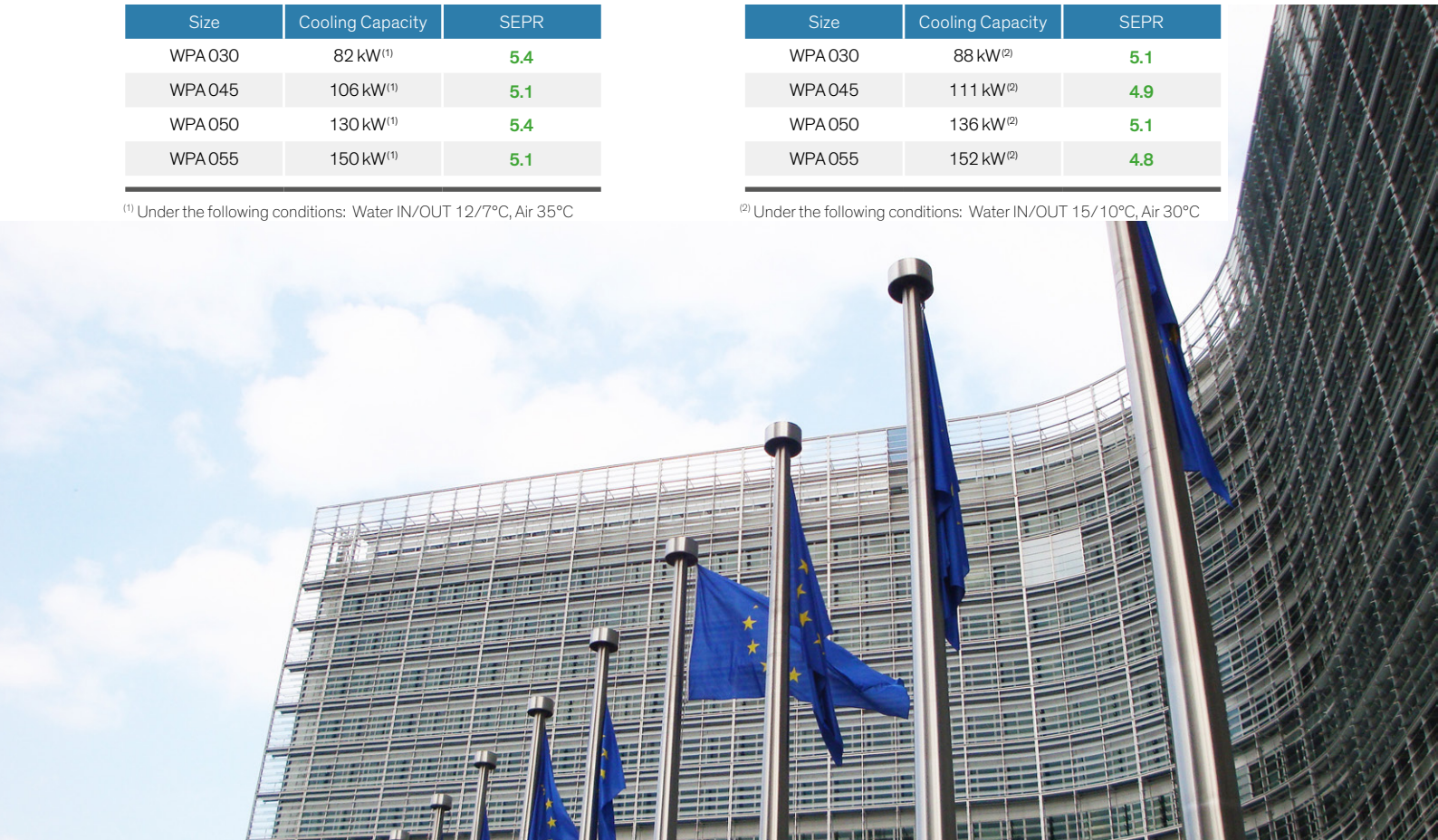
Size	Cooling Capacity	SEPR
WPA 030	82 kW(1)	5.4
WPA 045	106 kW(1)	5.1
WPA 050	130 kW(1)	5.4
WPA 055	150 kW(1)	5.1

(1) Under the following conditions: Water IN/OUT 12/7°C, Air 35°C

Free Cooling - Low Noise Version

Size	Cooling Capacity	SEPR
WPA 030	88 kW(2)	5.1
WPA 045	111 kW(2)	4.9
WPA 050	136 kW(2)	5.1
WPA 055	152 kW(2)	4.8

(2) Under the following conditions: Water IN/OUT 15/10°C, Air 30°C



Test Laboratory. Proven quality.

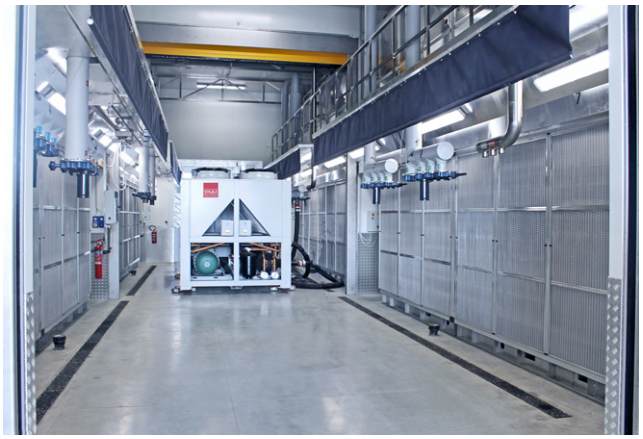
In 2016, the new Climatic Chamber for the testing of large industrial chillers was officially opened.

The Climatic Chamber is located at the new production plant in Valeggio Sul Mincio (VR), and covers an area of over 230 m², allowing the testing of chillers up to 1,500 kW.

This facility enables customers to supervise tests on their STULZ chillers and to receive a report in accordance with the EN 14511 and UNI 3744 Regulations.

Figures:

1400 kW	air cooled
1500 kW	water cooled
+5/+55 °C	condenser side
+5/+25 °C	evaporator side
136 m²	testing area
3 x 3.2 m	doors dimensions
2	simultaneous units



Climatic Chamber in STULZ S.p.A., Valeggio S/M (Italy)

Tested and guaranteed!

With the new Climatic Chamber, it is possible to carry out all the performance tests required by the new regulations.

The principal tests are:

- Performance
- Part load
- Sound levels

Tests comply with the EN14511 and UNI3744 Regulations.

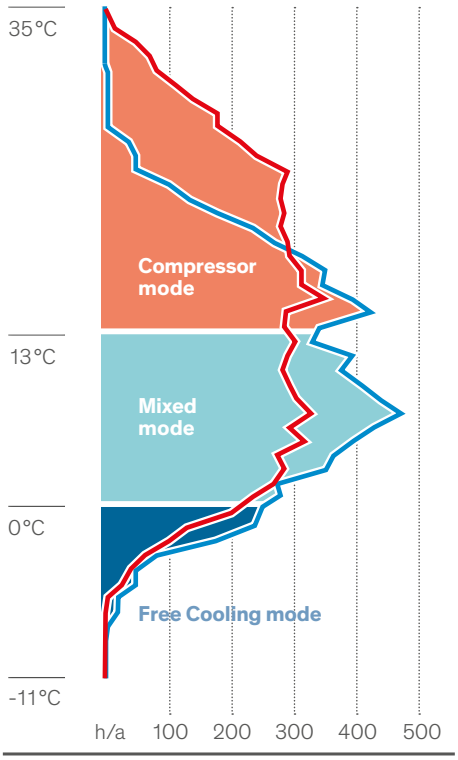
Free Cooling.
Energy Saving.

The WPA_{mini} range is available in a Free Cooling version, which allows significant energy savings, especially in cold and temperate climates.

The Free Cooling uses the external air to cool the fluid and may entirely replace the cooling circuit, enabling the compressors to be switched off.

The operating modes are:
- **DX**: the heat load is satisfied by the cooling circuit.
- **Mix**: part of the heat load is exchanged with the environment; the remaining heat is absorbed by the cooling circuit.
- **Free Cooling**: the entire heat load is released directly into the ambient air, thanks to water-air heat exchangers.

WPA_{mini} - plus:
- Total Free Cooling at 0°C
- Water-air heat exchangers with maximized surface.



Calculation Basis: 30 % ethylene glycol

Comparison:
- WPA0552CNA0000
- WPA0552FNA0000

Conditions:
- Ambient temperature In: 30°C
- Fluid In/Out: 15/10°C

Compressor mode (DX)

Hamburg	34 %	2,940 h/a
Verona	51 %	4,477 h/a

Mixed mode

Hamburg	56 %	4,896 h/a
Verona	42 %	3,713 h/a

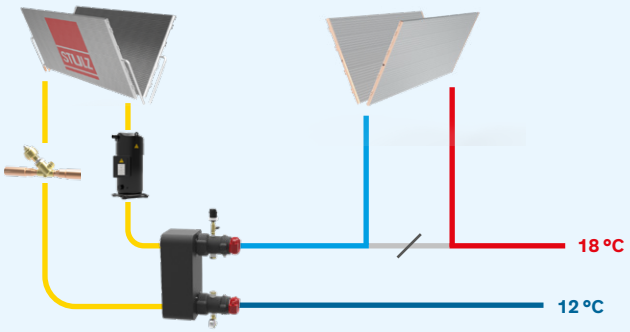
Free Cooling mode

Hamburg	10 %	924 h/a
Verona	7 %	570 h/a

R.O.I.	
Hamburg	**1** year, **2** months
Verona	**2** years

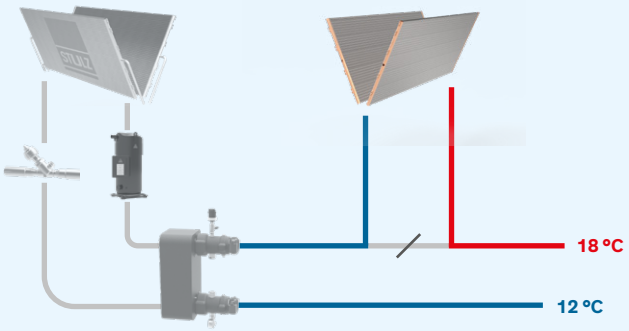
Mixed Mode

In temperate climates, the energy consumption of the cooling circuit can be reduced by exchanging part of the heat load with the ambient air. Compressors work less, as they have to cover just the missing part of the cooling capacity.



Free Cooling

At low outside temperatures, the fluid is cooled entirely by the ambient air.
The energy consumption is minimized due to the use of variable speed fans and modulating valves.



Quiet.
Just like home.

A chiller has to operate at full load with the lowest possible noise level, since more and more sites are in the proximity of residential areas.
Our solution to meet this requirement, while maintaining an excellent cooling performance and energy savings, is the WPA$_{mini}$ Low Noise version, also available with Free Cooling.
Optionally Axitop® conveyors are available, to further reduce noise levels.

Priority: energy efficiency

SEPR

Standard chiller, with high-speed fans.
Compressor compartment closed by sheet-metal panels.
Available in standard and Free Cooling version

Version	Sound Pressure (1m)	EER	**Cooling Capacity**	Air Flow	Fans Consumption
Standard	61,2 dB(A)	3.16	**120 kW**	40.805 m³/h	3.45 kW
Free Cooling	61,2 dB(A)	3.11	**118 kW**	36.630 m³/h	3.45 kW

Priority: noise level

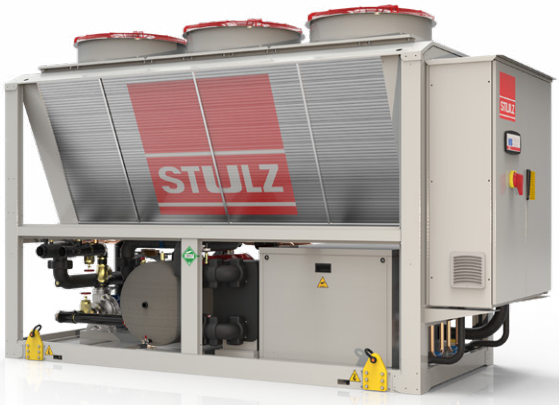
SEPR

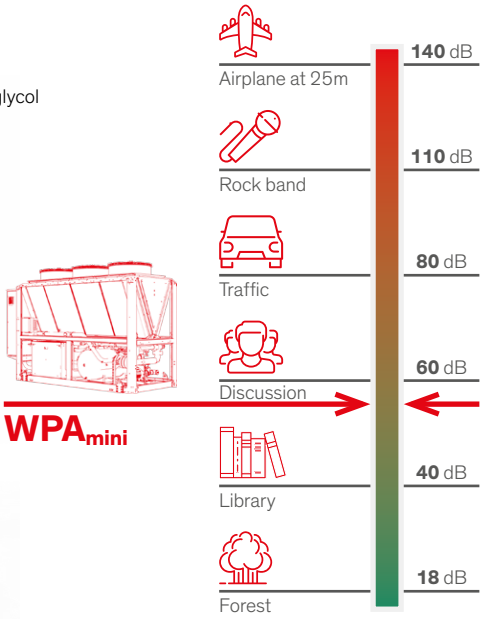
Low-noise chiller, with fan speed reduced by 30%
Closed compressor compartment with specific acoustic panels.
Available in standard and Free Cooling version

Version	Sound Pressure (1m)	EER	**Cooling Capacity**	Air Flow	Fans Consumption
Standard LN	57,2 dB(A)	2.92	**114 kW**	29.795 m³/h	2.26 kW
Free Cooling LN	57,2 dB(A)	2.71	**111 kW**	25.650 m³/h	2.26 kW

Operating Conditions:

Technical data of WPA045 under the following operating conditions:
Water 18/12°C, ambient temperature 35°C
Noise level (full load) measured in free-field conditions at a distance of 1m (according to ISO 3744) with 30% glycol

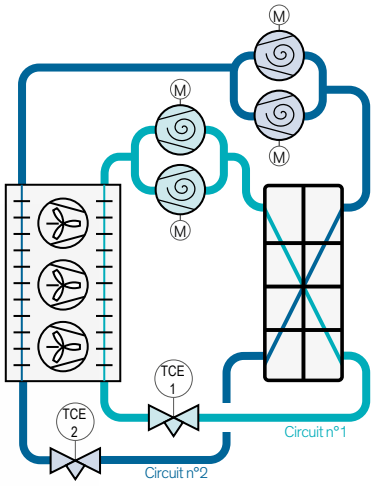


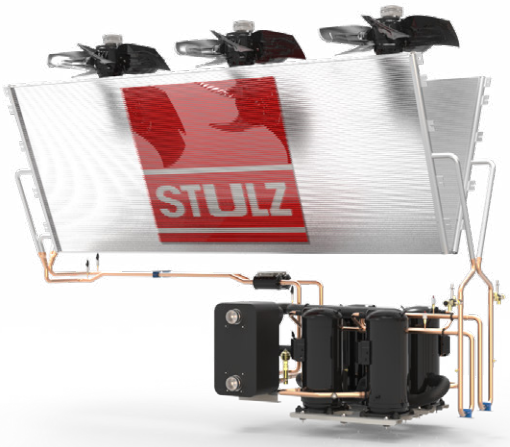


Redundancy for non-stop operation.

Double cooling circuit

WPA_{mini} is designed to operate 24/7/365, without downtimes.
Taking advantage of two independent and redundant cooling circuits, the chiller can avoid downtimes by working in partial load mode.





Four compressors

Scroll compressors are in tandem and independently controlled, in order to optimize cooling performance and guarantee their operation in all conditions.
This configuration allows the chiller to operate even in the event of compressor malfunction.
With four stages of capacity modulation (25-50-75-100%), WPA_{mini} efficiency at partial loads and, consequently, the SEPR index are higher.

Hydraulic circuit

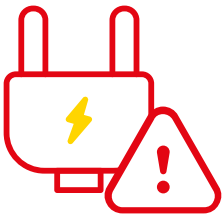
WPA_{mini} is available with two standard pumps or two high-pressure pumps.
Pumps, combined with a tank for a pressurized circuit, are managed for 100% redundancy: one pump is switched on, the other is on standby.

SEC.blue

In the WPA_{mini}, redundancy is managed by the SEC.blue electronic controller, which switches on the backup components in the event of a malfunction. Furthermore,the **SEC.blue** controls their start-up to equalize operating hours, and extend chiller working life. The rotation time is the result of experience and tests made by STULZ on every element.

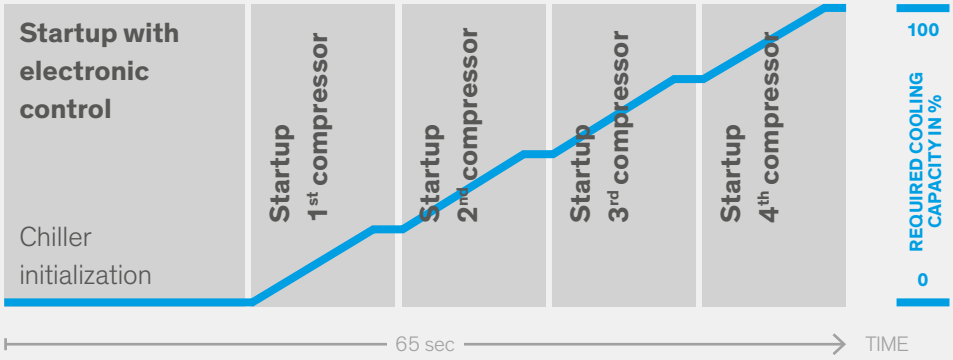
Quick start in case of power blackout.

The options of the WPA$_{mini}$ cut downtimes caused by power failure to a minimum, and restore full cooling capacity as quickly as possible.

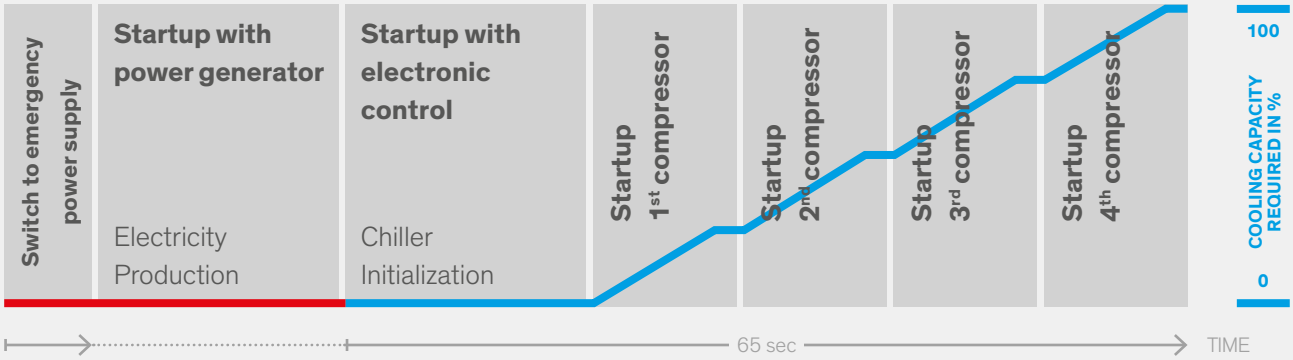


The available options are:
- Double power supply line, with automatic and manual switch
- Compressor soft start, to reduce inrush current
- Electronic control supplied by UPS, for a quick restart time and to send a continuous alarm to the plant control center.

Standard startup



RESTART after a blackout with automatic switch to emergency power supply



Controller

SEC.blue

In order to monitor your applications all around the world, STULZ has designed and developed **SEC.blue**, the new electronic controller able to manage all WPA_{mini} components, options included.

The new electronic board includes as standard:

- Ethernet port on RJ45 connector, for HTTP, SNMP, ModBus TCP protocols and for the remote software upgrade
- RS485 port for ModBus RTU protocol
- MicroSD slot for storing the event history and for software updates
- Dbus port to interface with future expansions

Pre-installed on the controller:

- Monitoring via a web page with e-mail alarm notification, to constantly check the status of the unit
- Sequencing to automatically manage up to 10 chillers in 5 different operating zones
- Component redundancy (pumps, compressors) with rotation according to the actual operating hours
- Unloading for chiller operation even at high ambient temperatures
- Antifreeze safety system, to ensure the continued safety of the unit

Thanks to the new, highly flexible operating system, the working logic can be enriched with new parameters and associated functions, at the customer's request.

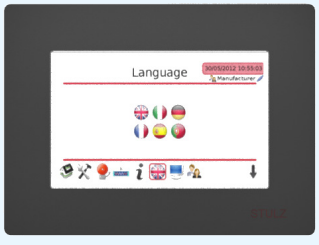
Three user interfaces are available:

- Graphic display IP54 with 6 capacitive keys and 2 LEDs (standard)
- 7" touchscreen color display IP67 (optional), with easy synoptics menu.
- Computer screen for remote monitoring via web, using ethernet port (standard)

- Ethernet
- 1011010 ModBus RTU
- HTTP, SNMP
- Micro SD
- Programmable
- Graphic Display
- Colour Touch-screen (optional)

Web server

Graphic display



7" touchscreen display

Coding

WPA mini

n° digit	1°	2°	3°	4°	5°	6°	7°	8°	9°	10°	n° digit
	W	P	A	0	4	5	S	C	N	A	

Liquid chiller

Type

A	AC fans
E	EC fans
X	AC fans + Axitop
Y	EC fans+ Axitop

Cooling Capacity

030	80 kW(1)	**045**	110 kW(1)
050	130 kW(1)	**055**	150 kW(1)

(1) at 50 Hz, W7L35

Compressors

S	Scroll compressor R410A

Power supply

A	400 V / ~3 / 50 Hz
B	460 V / ~3 / 60 Hz

Sound level

N	Standard
S	Low Noise

Version

C	Chiller
D	Chiller with cataphoresis condensers
F	Free Cooling
G	Free Cooling with epoxy coated coils
L	Free Cooling -40°C
M	Free Cooling -40°C with epoxy coated coils

(1) not in Free Cooling -40°C version

Technical Data

Standard version

MODEL	M.U.	WPA 030	WPA 045	WPA 050	WPA 055
Cooling capacity W18/12 L35 [1]	kW	95	120	150	170
Absorbed power W18/12 L35 [1][5]	kW	27	38	45	53
Cooling capacity W12/7 L35 [2]	kW	82	106	130	150
Absorbed power W12/7 L35 [2][5]	kW	26.4	36.1	42.9	50.7
Sound pressure at a distance of 1 m	dB(A)	61.2	61.2	61.2	64.9
Refrigerant		R410A			
Refrigerant charge	kg	8 + 8	11 + 11	14 + 14	16 + 16
N° cooling circuits / N° compressors		2 / 4	2 / 4	2 / 4	2 / 4
Power supply	V ~ Hz	400/3/50 - 460/3/60			
Height x Width x Depth	mm	2316 × 1370 × 3650			
Shipping weight [6]	Kg	1579	1634	1670	1778

Low-noise version

MODEL	M.U.	WPA 030	WPA 045	WPA 050	WPA 055
Cooling capacity W18/12 L35 [1]	kW	92	114	144	161
Absorbed power W18/12 L35 [1][5]	kW	27	39	46	55
Cooling capacity W12/7 L35 [2]	kW	79	101	125	142
Absorbed power W12/7 L35 [2][5]	kW	26.2	37.1	43.6	52.2
Sound pressure at a distance of 1 m	dB(A)	57.2	57.2	58.1	60.9
Refrigerant		R410A			
Refrigerant charge	kg	8 + 8	11 + 11	14 + 14	16 + 16
N° cooling circuits / N° compressors		2 / 4	2 / 4	2 / 4	2 / 4
Power supply	V ~ Hz	400/3/50 - 460/3/60			
Height x Width x Depth	mm	2316 × 1370 × 3650			
Shipping weight [6]	Kg	1594	1649	1685	1793

([1]) Evaporator Fluid (in/out) 18/12°C; Condenser Air (in) 35°C. Fluid: water

([2]) Evaporator Fluid (in/out) 12/7°C; Condenser Air (in) 35°C. Fluid: water

([3]) Evaporator Fluid (in/out) 15/10°C; Condenser Air (in) 30°C. Fluid: water + 30% ethylene glycol

([4]) Free Cooling Fluid (in/out) 15/10 °C; Air (in) 0 °C. Fluid: water + 30% ethylene glycol

([5]) Full load unit. According to ISO 3744. Pump contribution not considered.

([6]) Unit without tank and pumps

Free Cooling version

MODEL	M.U.	WPA 030	WPA 045	WPA 050	WPA 055
Cooling capacity W18/12 L35 [1]	kW	94	118	147	166
Absorbed power W18/12 L35 [1][5]	kW	28	38	46	55
Temp. 100% Free Cooling [1]	°C	2,5	1	1	-0,5
Cooling capacity W15/10 L30 [3]	kW	92	117	145	165
Absorbed power W15/10 L35 [3][5]	kW	24.9	34.2	41.2	49.2
Temp. 100% Free Cooling [4]	°C	1	-1	-1	-2,5
Sound pressure at a distance of 1 m	dB(A)	61.2	61.2	62.1	64.9
Refrigerant		R410A			
Refrigerant charge	kg	8 + 8	11 + 11	14 + 14	16 + 16
N° cooling circuit / N° compressors		2 / 4	2 / 4	2 / 4	2 / 4
Power supply	V ~ Hz	400/3/50 - 460/3/60			
Height x Width x Depth	mm	2316 × 1370 × 3650			
Shipping weight [6]	Kg	1842	1882	1933	2041

Free Cooling Low-noise version

MODEL	M.U.	WPA 030	WPA 045	WPA 050	WPA 055
Cooling capacity W18/12 L35 [1]	kW	90	111	136	150
Absorbed power ca. W18/12 L35 [1][5]	kW	28	41	49	60
Temp. 100% Free Cooling [1]	°C	-0,5	-2	-2,5	-4
Cooling capacity W15/10 L30 [3]	kW	88	111	136	152
Absorbed power ca. W15/10 L30 [3][5]	kW	25.1	36	43.7	53
Temp. 100% Free Cooling [4]	°C	-1,5	-4	-5	-6
Sound pressure at a distance of 1 m	dB(A)	57.2	57.2	58.1	60.9
Refrigerant		R410A			
Refrigerant charge	kg	8 + 8	11 + 11	14 + 14	16 + 16
N° cooling circuit / N° compressors		2 / 4	2 / 4	2 / 4	2 / 4
Power supply	V ~ Hz	400/3/50 - 460/3/60			
Height x Width x Depth	mm	2316 × 1370 × 3650			
Shipping weight [6]	Kg	1858	1897	1948	2056

([1]) Evaporator Fluid (in/out) 18/12°C; Condenser Air (in) 35°C. Fluid: water

([2]) Evaporator Fluid (in/out) 12/7°C; Condenser Air (in) 35°C. Fluid: water

([3]) Evaporator Fluid (in/out) 15/10°C; Condenser Air (in) 30°C. Fluid: water + 30% ethylene glycol

([4]) Free Cooling Fluid (in/out) 15/10 °C; Air (in) 0 °C. Fluid: water + 30% ethylene glycol

([5]) Full Load unit. According to ISO 3744. Pumps contribution not considered.

([6]) Unit without tank and pumps

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