

RACK COOLING SOLUTIONS

STULZ

CLIMATE. CUSTOMIZED.



Prodigy



Prodigy

High density Data Centres produces ever increasing computing power on an ever decreasing floor area, resulting in high specific thermal loads. To ensure IT equipment reliability an appropriate cooling system is mandatory. Prodigy modules are the optimal answer to the requirements of modern Data Centres, in terms of:

Flexibility

- the reduced dimensions allow the installation in every kind of rack, starting from a height of 42U
- two different kinds of cooling system (CW and DX), combined with different cooling capacities, make Prodigy suitable both for small server rooms and big Data Centres.
- Prodigy fit into both closed and open loop.
- water and refrigerant connection is available either from bottom or top side.

Scalability

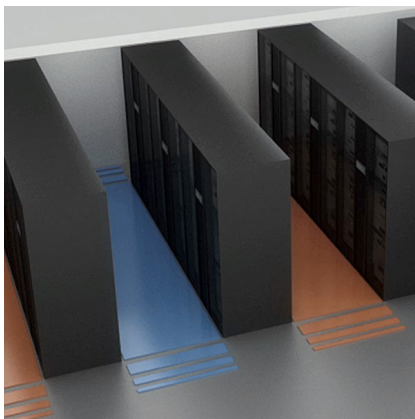
Prodigy has a modular structure that can easily fit into a wide range of rack layouts. This feature allows to quickly increase the computing power without altering the existing structure of server rooms.

Code	Type	Width
RAW	Water	300 mm
RAWEO	Water	600 mm
RAC	Direct Expansion connected to external motocondensing	300 mm
RCM	Direct Expansion with compressor on board and external motor-condensig	400 mm

Prodigy are designed to be placed beside the racks containing IT equipments.

Closed Loop:

this configuration is suitable for both “self contained” data centre and high density racks. Heat generated by server remains inside the cabinet and is disposed without entering the room.



Prodigy is equipped with **electronically commutated EC Fans**, optional on RAC, RAW and RCM version, standard on RAWEO. The electronic control adjusts the speed of fans, powered by energy saving motors. EC fans react continuously to system changes, keeping maximum efficiency in every condition.



Open Loop:

for Data Centres organized in hot and cold aisles. The air heated by the servers is discharged to the hot aisle, and sucked in by the Prodigy unit. After cooling the air is delivered to the cold aisle, ready to be used by the servers again. The open loop units are equipped with high efficient EU3 Zig Zag Air Filter.



PUE (Power Usage Effectiveness)

Fans and proportionally controlled CW valve are the keys to higher performance and efficiency of the air conditioning system, reducing TCO. These three factors contribute to achieve an important goal: minimizing the energy absorbed by support equipment (like air conditioners) and maximizing the one used for the operation of the servers.

PUE

PUE (Power Usage Effectiveness) is the ratio of the total power consumed by a Data Centre to the power consumed by the IT equipment that populates the facility. The goal of a fully efficient Data Center is to reach a PUE value equal to 1, that is when the power is entirely used by IT equipment.

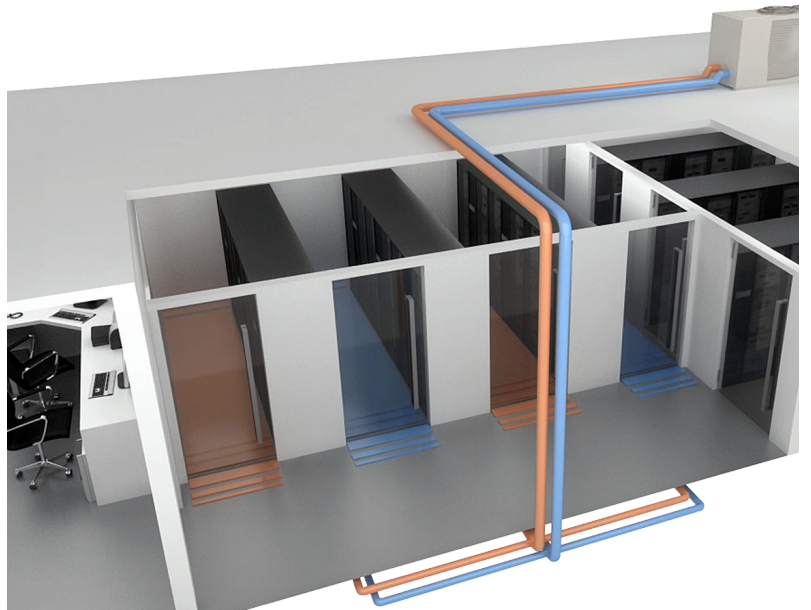
$$PUE = \frac{\text{Total Facility Power}}{\text{IT equipment Power}}$$

Presence of Prodigy units in a Data Centre provides a strong contribution to PUE improvement.

RAW - Chilled Water Unit

Prodigy RAW units use chilled water, supplied by an indoor or outdoor chiller. In presence of a free cooling system, external air cools water through a heat exchanger. Thus, working time of energy-intensive compressor cooling is drastically reduced.

Prodigy units are particularly suitable for systems with free cooling, due to their high performance in heat load disposal. Their very efficient coil allows an efficient cooling also at high entering water temperature (up to 15°C), thus maximizing the use of the free cooling.



Fan Hot Swap:

through fan switches on a "multi-switch bar, power supply of each single fan can be interrupted to allow maintenance operations, while the other fans keep on working.

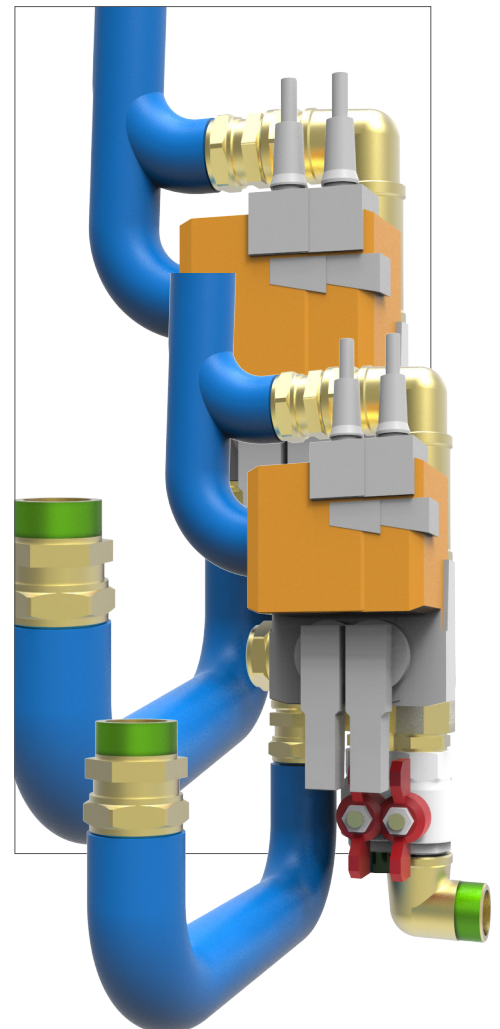


CW valve with proportional control:

receives a modulating signal from C2020 to vary the water flow through the heat exchanger, in order to adjust the unit cooling capacity to the actual heat load. CW valve is available in two versions: 3 way valve for constant flow system, and 2 way for variable flow system.

Manual operation of CW valve:

when the valve actuator is broken, the valve can be adjusted manually, modulating cooling capacity with fans speed.

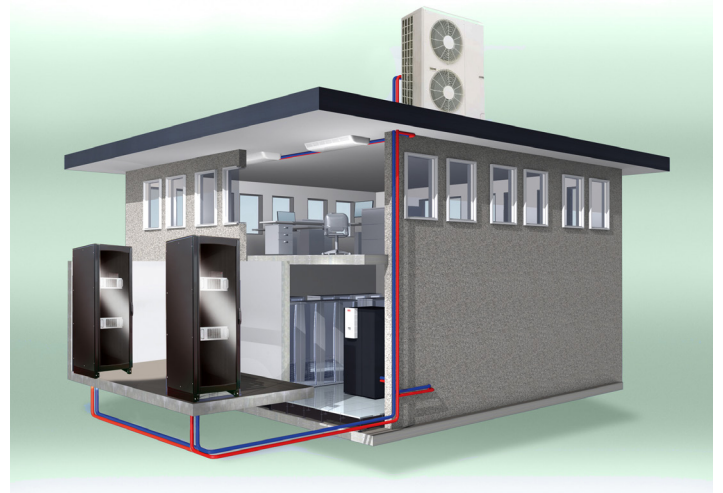


RAC - Direct Expansion Unit

Direct Expansion DX units (open and closed loop) are a suitable solution for data centres of any size. The heat load absorbed by the refrigerant gas is released to the external environment through modular motor-condensing units, with cooling capacity from 4 kW to 20 kW.

Direct expansion Prodigy units are equipped with:

- **Fan Hot Swap:** on "multiswitch bar
- **Temperature probe** on return air
- Fixed or variable **fans speed** according to set point
- **Humidity Sensor** for dehumidification mode
- **External motor-condensing unit** with **inverter compressor**.



RCM - Unità ad Espansione Diretta con compressore a bordo macchina

Prodigy DX units are also available with on board compressor.

EC compressor, with brushless motor, is continuously adjusted by an on board inverter, allowing a perfect correspondence between the cooling capacity and the actual thermal load.

The **electronic expansion valve** improves the performance and the efficiency of the cooling system, thanks to an accurate control of the flow rate and of the refrigerant gas pressure.

Zig-zag G4 protection filter in metallic structure (washable)

5 **EC fans** electronically commutated, which reacts continuously to power requirements changes. EC fans can be controlled independently from one another.

RCM units, like other Prodigy units, can be configured to have both frontal and lateral air flow, and must be connected to a remote condenser for heat disposal.



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 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 to store events history and for software updating
- Dbus port to interface with future expansions

Pre-installed on the controller:

- Monitoring through web page with e-mail alarm notification, to constantly check the status of the unit
- Sequencing to manage automatically up to 10 chillers in 5 different working zones
- Components 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, upon customer request.

Two user interfaces are available:

- graphic display IP54 with 6 capacitive keys and 2 led (standard)
- computer screen for remote monitoring via web, using ethernet port (standard)



Ethernet



ModBus RTU



HTTP, SNMP



Micro SD



Programmable



Graphic Display



Web server



Graphic Display

Technical Data

Prodigy RAW - Chilled Water	M.U.	RAW A1	RAW A7	RAW B1	RAW A6	RAW B2	RAW C4	RAW E0
Loop		Open	Open	Open	Closed	Closed	Closed	Open/Closed
Power Supply	V/ph/Hz	230/1/50	230/1/50	230/1/50	230/1/50	230/1/50	230/1/50	400/3+N/50
Cooling Capacity	kW	12,3	16,0	19,5	22,6	31,0	37,7	41,3
Air Flow	m³ / h	2600	3800	3800	2800	4400	4400	8000
Dimensions (H x L x P)	mm	1870 x 290 x 750 (770 with EC)						EU3:1870x590x927 EU4:1870x590x977
Connection	in	1	1	1	1	1	1	1 ½

Nominal Conditions

Closed Loop: return air T 45°C / RH 15%
Open Loop: return air T 30°C / RH 30%
EWT: 7°C
Water ΔT = 5°C

Nominal Conditions RAW E0

Closed Loop: return air T 45°C / RH 15%
Open Loop: return air T35°C / RH 30%
EWT: 10°C
Water ΔT = 7°C

Air flow on closed loop models refers to unit not installed in racks

Prodigy RAC - Direct Expansion	M.U.	RAC 80	RAC A2	RAC 80	RAC A2
Loop		Open	Open	Closed	Closed
Power Supply	V/ph/Hz	230/1/50-60	230/1/50-60	230/1/50-60	230/1/50-60
Cooling Capacity*	kW	4,4 8,0	10,3 12,8 21,2	4,5 8,4	11,2 14,0 23,3
Air Flow	m³ / h	2600	3800	2800	4400
Dimensions (H x L x P)	mm	1870 x 290 x 750 (770 with EC)		1870 x 290 x 702 (722 with EC)	
Motor-condensing		SCR40ZIX-S FDC71VN	FDC100VN FDC125VN FDC200VS	SCR40ZIX-S FDC71VN	FDC100VN FDC125VN FDC200VS

Nominal Conditions

Return air T: 35°C / RH 30%
Return Air T 35°C

* according to the motor-condensing used

Prodigy RCM - Direct Expansion	M.U.	RCM B4
Loop		Open / Closed
Power Supply	V/ph/Hz	400 / 3+N / 50
Cooling Capacity*	kW	22,5
Air Flow	m³ / h	4300
Dimensions (H x L x P)	mm	1892 x 390 x 978 (993 with EC)

Nominal Conditions

Return air T: 35°C
Return air : RH 30%
Refrigerant R410A
Condensate T: 45°C

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