ENELPS

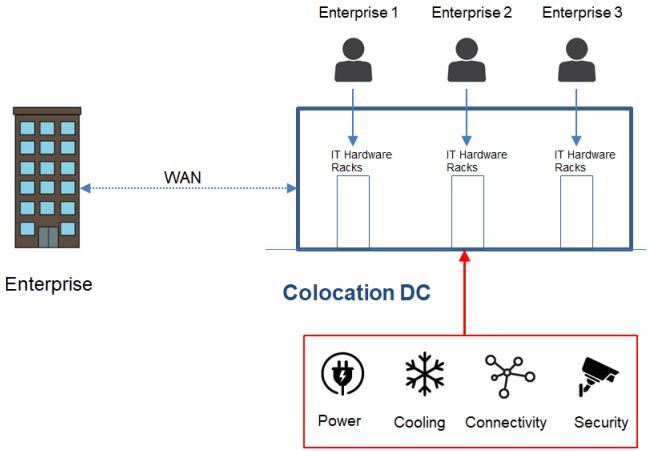
Postavljanje novih standarda - Schneider Electric Hub DC (Novi Sad)

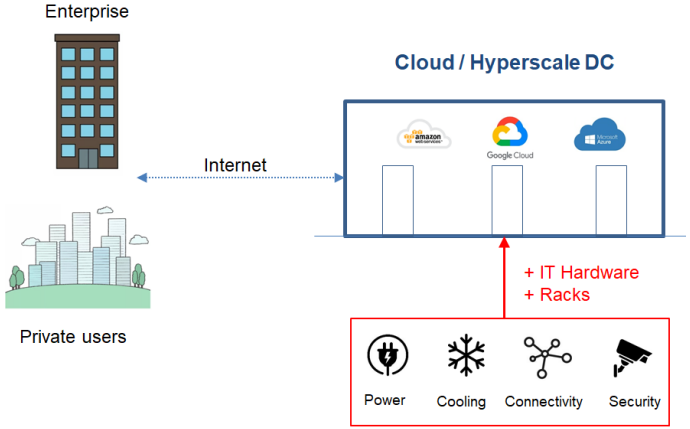
Koncept SE Hub-a

Sa ciljem da postavi primer najbolje prakse u biznisu data centara u Srbiji, Enelps je koncipirao Schneider Electric Hub koristeci najnovije trendove i odrzivost kao imperativ.

White space je obuhvatio:

- Eneterprise deo (SE koriscenje)
- Colocation (mogucnost iznajmljivanja prostora klijentu)





Postavljeni zahtevi za DC

Postavljeni su sledeci zahtevi za DC:

1. Visoka pouzdanost – nivo Tier IV ili klasa 4
2. Niska potrosnja energije – free cooling tokom 50% sati godisnje
3. Koriscenje dela otpadne toplote iz DC za grejanje poslovne zgrade SE koja je pored DC
4. Odrzivost (Sustainability) – niska potrosnja vode i energije, nizak CO2 otisak, freon sa niskim GWP

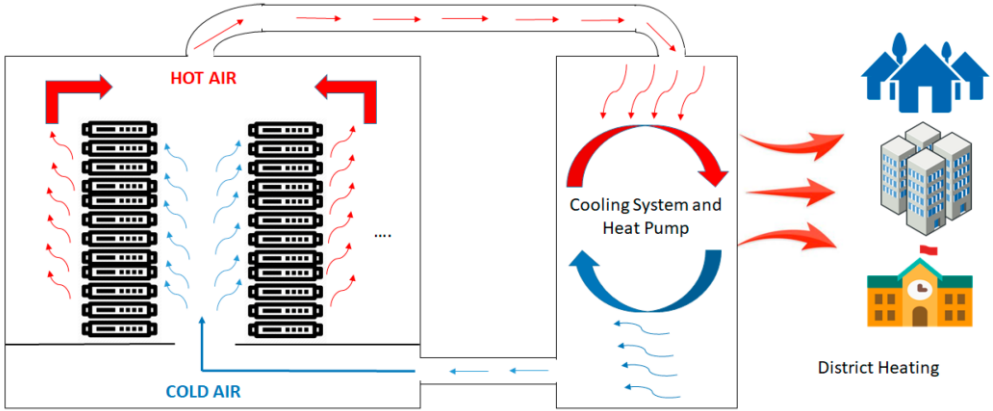
Prema standardu SRPS EN-50600 najbitniji aspekti DC su:

1. Pouzdanost (Klase 1, 2, 3 ...) - koncept redundanse ide i izvan pojedinacne zgrade tj DC – multi-location availability (Amazon availability zones x3)
2. Bezbednost – fizicka i digitalna
3. Energetska efikasnost – PUE vise nije jedini parametar – sad imamo i CUE (carbon), WUE (water), REF (renewable), ERF (energy re-use)

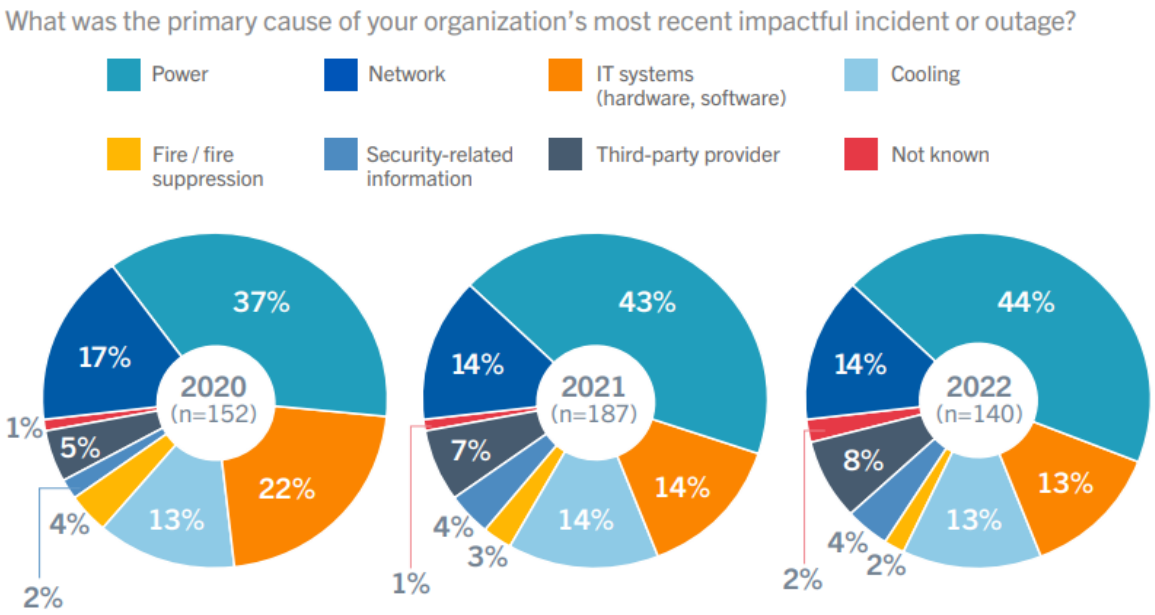
ISO/IEC 22237 i EN 50600 se referisu (usvajaju) na ISO/IEC 30134 seriju koja je definisala sve prethodne indekse, kao i metodologiju racunanja i izvestavanja

Sta ce biti obavezno za DC ?

- EU Energy Efficiency Directive 2023 - all data centers **> 500 kW** must start reporting metrics like PUE, WUE, ITEE, REF, and more in 2023.
- Minimum energy performance standards for data centres will be introduced by 2025 - European Commission Directive 2023/1791.
- Waste heat reuse assessments and cost-benefit analyses will become required for large data centres.



Pouzdanost



- Ljudska greska?....Ona se kategorizuje sada kao kontributor u primarnom uzroku (napajanje, network ...)
- U DC sa neuredjenom infrstrukturom i losim obelezavanjem greska coveka je laksa

Efikasno napajanje - UPS

- **Izabran je UPS sa e-Conversion rezimom rada, koji omogucava online napajanje uz samo 1% gubitaka u konverziji.**

The Galaxy VL is the best footprint saver of its class, thanks to:

- Ultra high density design
- Most compact footprint at only 0.8 m^2
- Front service access
- No shadow footprint
- Well-suited for confined spaces

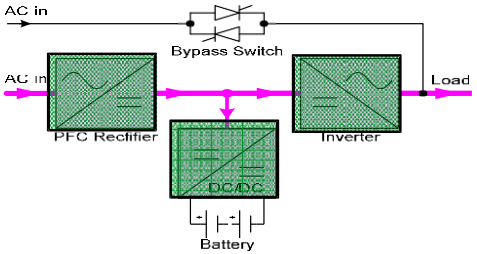
	Industry Average	Galaxy VL
Square footprint	1.6m^2	0.8m^2
Dimensions (W x D)	1712.42 x 942.75 mm	850 x 925 mm

*Based on the average square cm footprint (WxD) of 500 kW modular scalable UPS models offered by top 9 global manufacturers (based on published market share of the UPS category in the last 3 years)

GVL500KDS

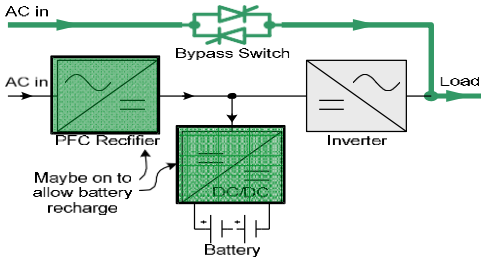
UPS – Schneider Electric Galaxy UPS

Double conversion



- Regulate Voltage ✓
- Regulate frequency ✓
- Recharge batteries ✓
- Load PFC ✓
- No time transfer ✓
- Efficiency : 96+% ✓
- Efficiency : 99 % ✗

Usual ECO mode



- Regulate Voltage ✗
- Regulate frequency ✗
- Recharge batteries ✓
- Load PFC ✗
- No time transfer ✗
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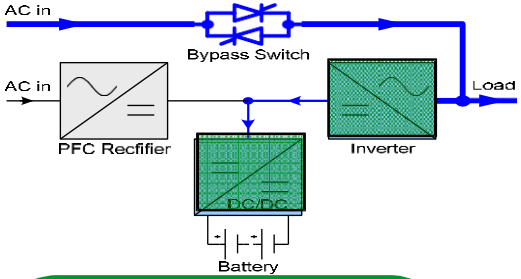
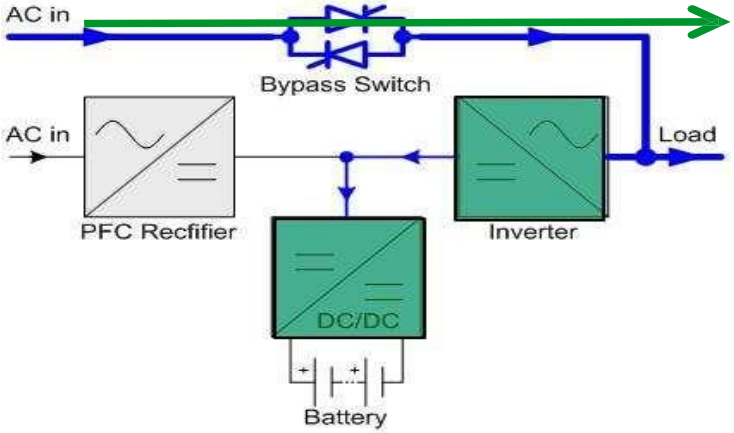
ECOnversion mode



- Regulate Voltage ✓
- Regulate frequency ✗
- Recharge batteries ✓
- Load PFC ✓
- No time transfer ✓
- Efficiency : 96+% ✗
- Efficiency : 99 % ✓

ECOnversion rezim

99% efficiency : ECOnversion



- Very high efficiency : up to 99%
- Primary power path is through static bypass switch
- Bi-directional Inverter is charging the DC Bus, batteries charge
- Inverter is always on :
  - Harmonics and power factor correction
  - Battery recharge
- If power to bypass is interrupted, Inverter seamlessly powers load (no break in output power)
- Class 1 output voltage according to 62040-3
- Patents on new Static switch command
- No break transfer

Li-ion baterije za UPS

Lithium-ion compared to VRLA batteries

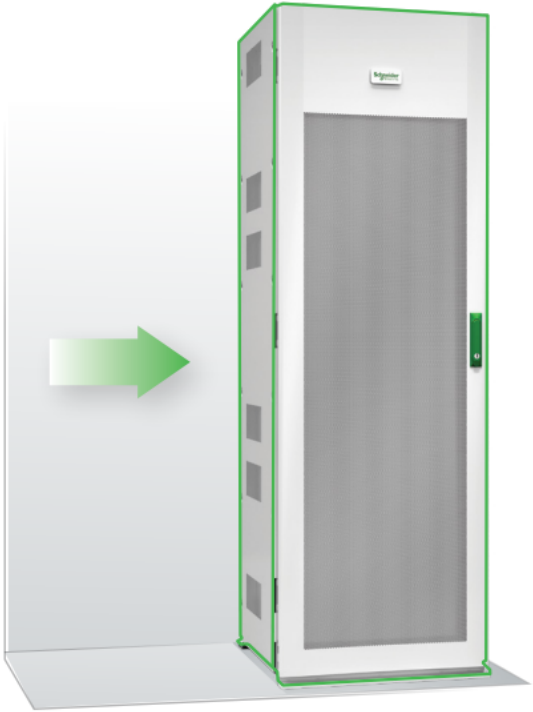
Higher operating temp. (less cooling)

2 – 3X expected life

60 – 70% less weight

2 – 3X Faster recharge

	Classic battery cabinet with VRLA	Galaxy Lithium-ion Battery Cabinet
Square footprint	3.4m²	1.1m²
Dimensions (W x D)	4000 x 845 mm	1950 x 587 mm



Efikasno hladjenje – CW sistem – XRAF1812 ciler

- Sistem hladjenja je izveden sa hladnom vodom i koriscenjem visoke temperature 17-24°C.
- Rashladni agregati (cileri) su najnovije generacije sa ekoloskim freonom i najmanjim GWP - vrednost samo 4!!
- Ciler koristi i mixed-mode free cooling gde izbacuje toplotu u okolni vazduha bez koriscenja kompresora i pri visim temperaturama od klasicnog free coolinga.

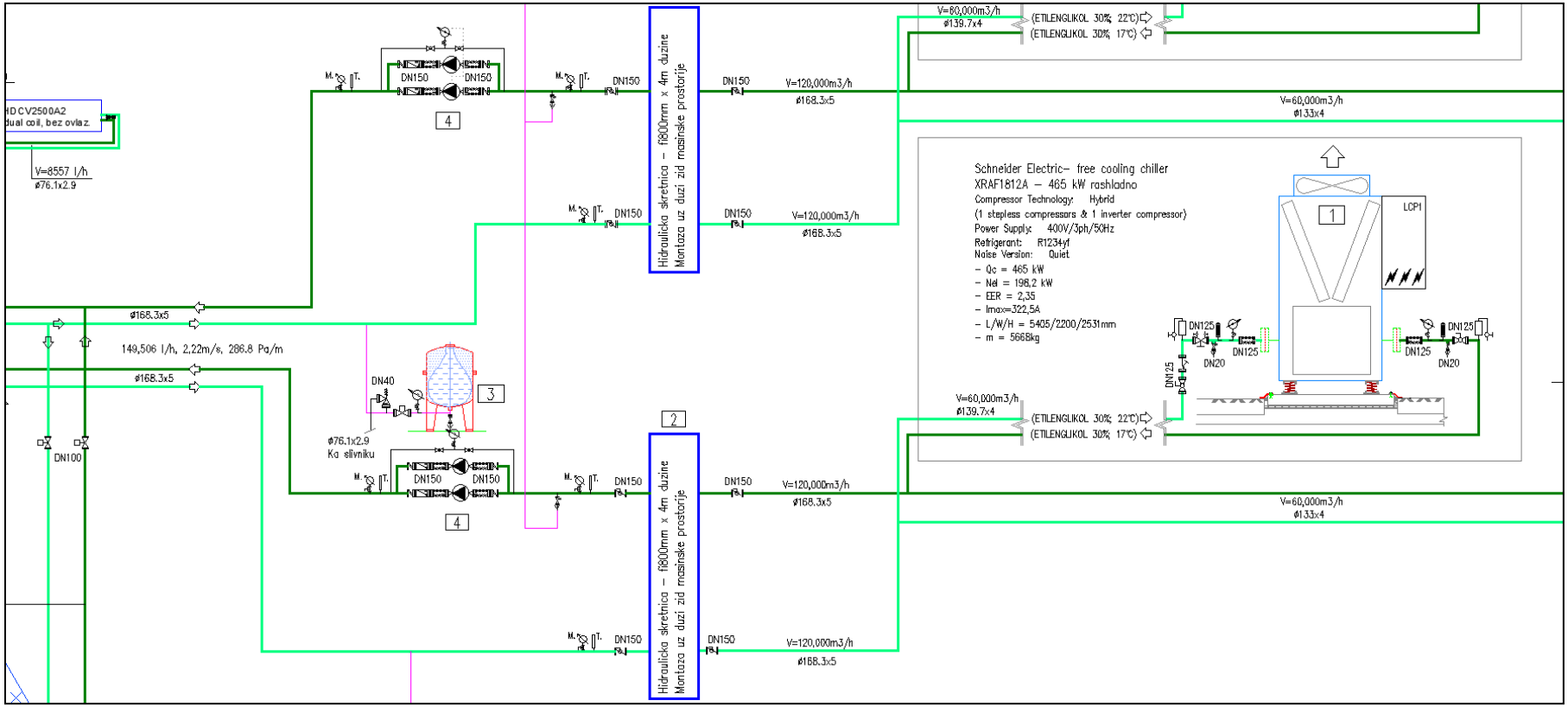
Extra operating conditions

- Designed optimized for IT application temperatures (up to 25°C outlet water temperature) and wide delta T.

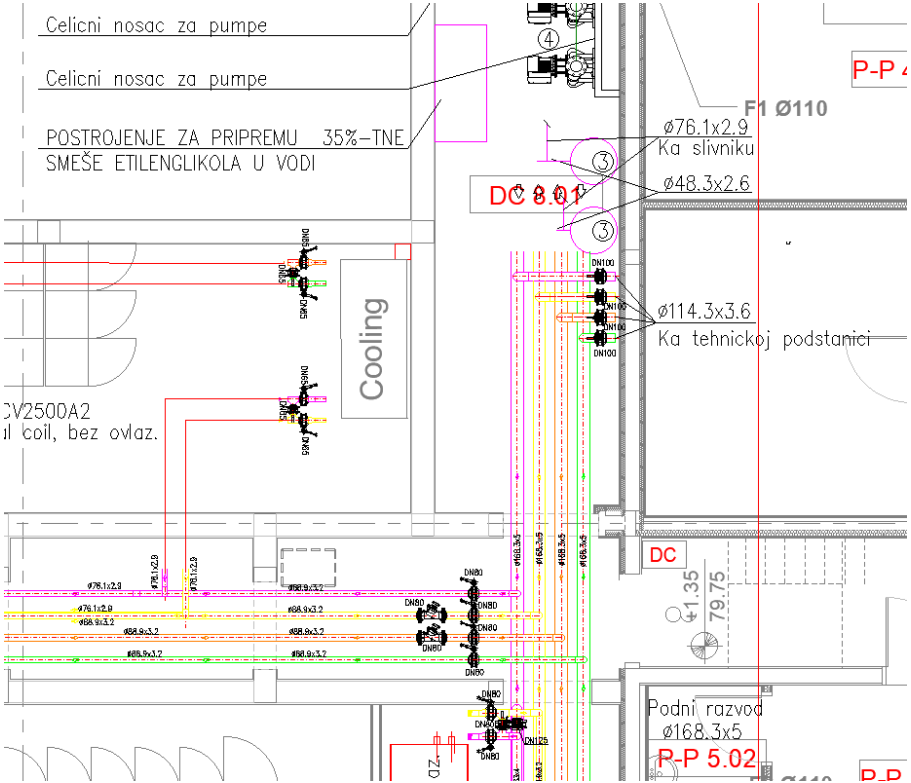
Refrigerant

- R134a refrigerant with GWP=1430
- R513A refrigerant with GWP=631
- R1234ze refrigerant with GWP=7
- R1234yf refrigerant with GWP=4

Sistem hladjenja



Heat re-use sistem

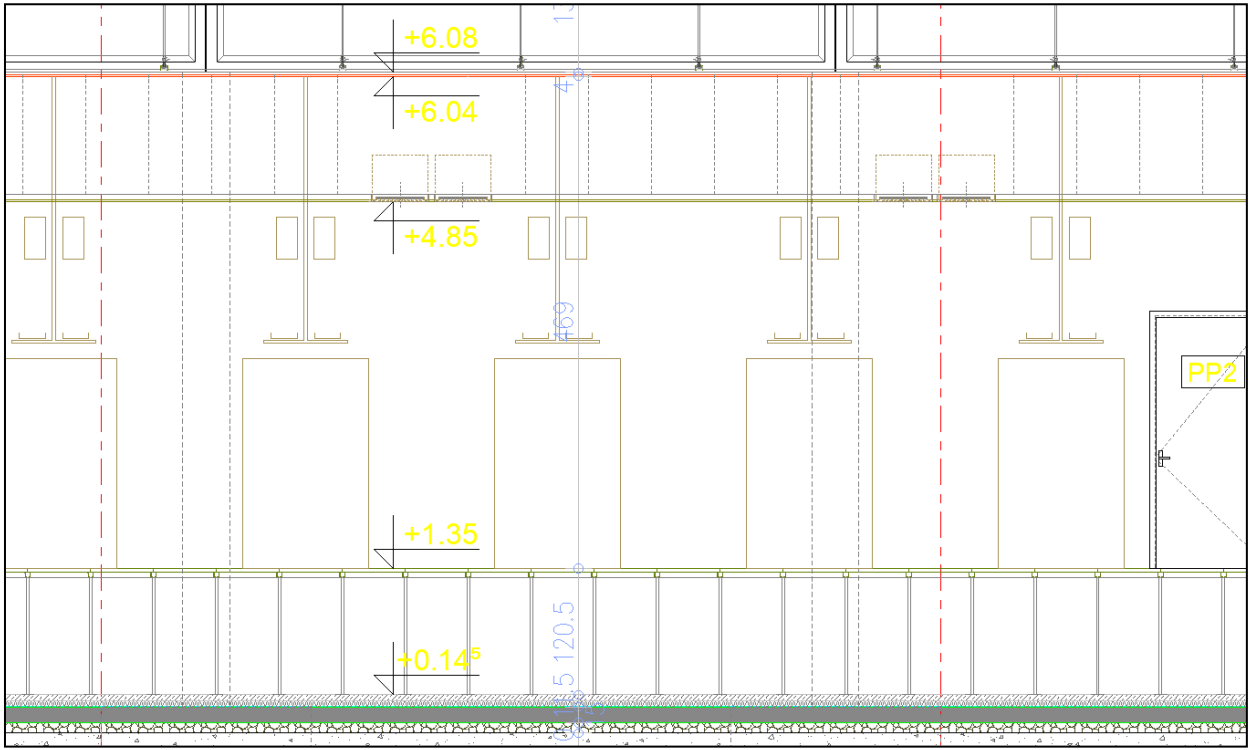


- Koriscenje dela otpadne toplote iz DC za grejanje poslovne zgrade
- 4 DN100 cevi koje vode do podstanice, i koje se povezuju na toplotnu pumpu
- Onoliko koliko zgrada bude odvukla energije na grejanje, toliko ce cileri biti rastereceniji za rad (cca 200 kW)

CRAC jedinice – HXCV5000

- Ulazna temperatura vode je 17°C
- Dual coil klima ormar – dva nezavisna registra cevi sa dve nezavisne grane
- AFC sistem – kontrola pritiska vazduha u duplom podu, omogucava setovanje pritiska od npr 15Pa, i time korisnik moze dodavati i oduzimati opremu u server Sali, kao i podne resetke – a AFC sistem ce uvek obezbedjivati vazduha koliko je potrebno
- Kontrola vlaznosti
- Susenje vazduha externim jedinicama
- Kontrola temperature i vlažnosti vazduha na izlazu klima ormara (ne povrat) i time u hladnoj zoni (ne sobe)

Presek kroz objekat



- Visina duplog poda 120cm
- Visina spustenog plafona 120cm
- Brzina strujanja vazduha < 2m/s

Enelps – Sistem Integrator

- Dizajn koncept resenja – uz KOnsultanta
- Upravljanje izradom projektne dokumentacije
- Odobravanje PZI (projekte za izvodjenje) – uz Nadzor i Ugovaraca elektro radova
- Koordinacija i vodjenje svih radova vezano za UPS napajanje i hladjenje
- Commissioning sistema napajanja i hladjenja – uregulisavanje, podesavanje parametara, komunikacija ka BMS-u, integracija svih sistema, resavanje problema

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