



DRUŽENJE



NOVOSTI



NOVOSTI

NOVOSTI: Module 2500 TT

■ Ispitivanje na kratki spoj 85 kA



NOVOSTI

- Ormari od
nehrđajućeg
čelika



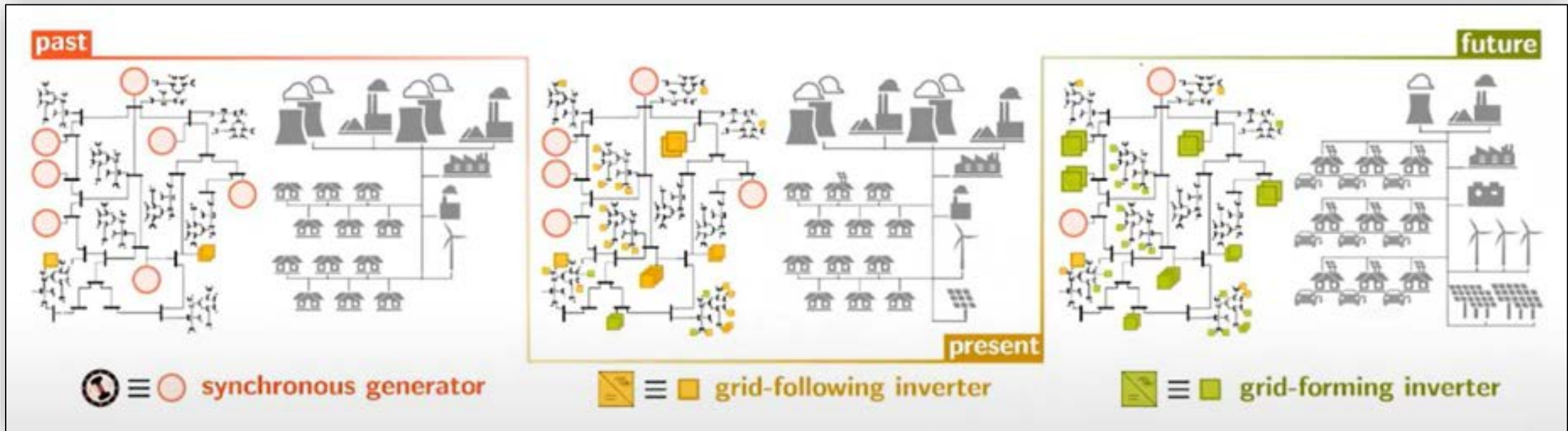
- Lenze
frekvencijski pretvarači
serija i510, i550



- Označni sustav



MREŽA NEKADA, DANAS I SUTRA



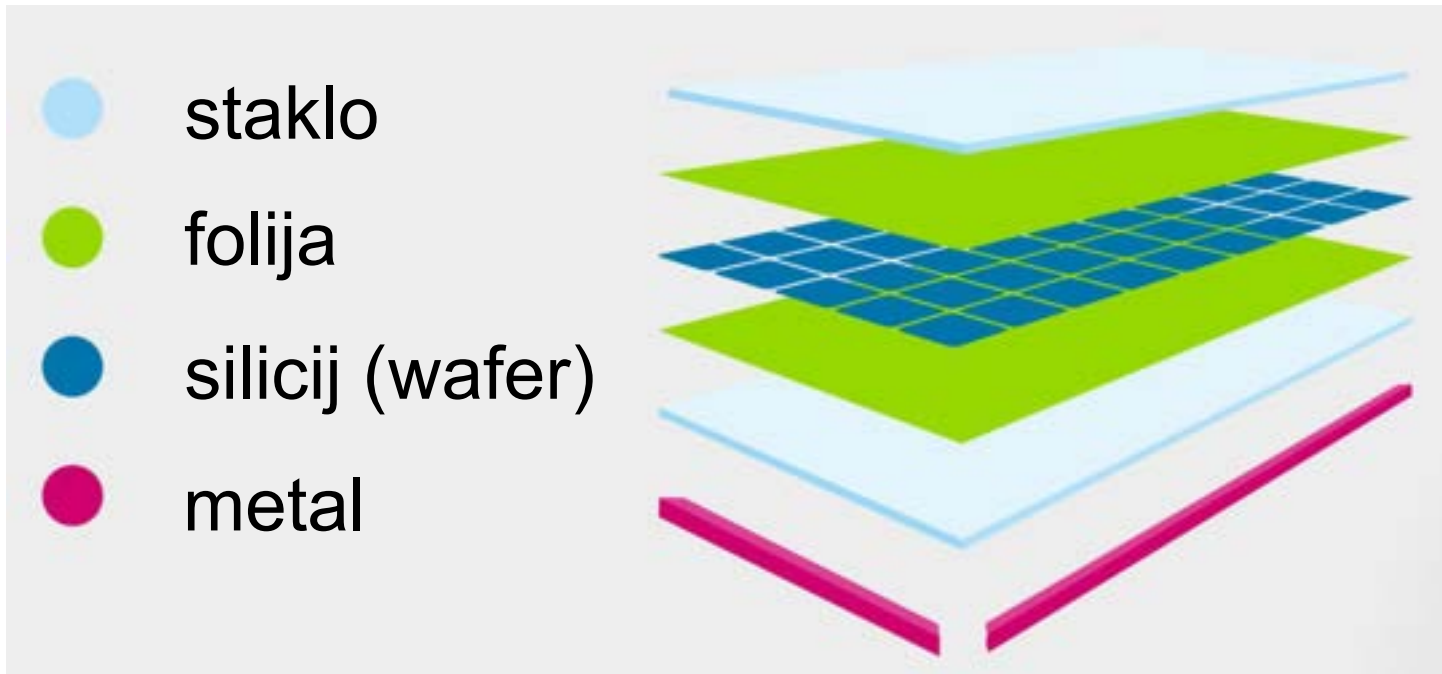
- Grid following inverter: utiskuje struju u mrežu, ne može raditi sam
- Grid forming inverter: sam stvara i održava mrežu



OPORABA FN modula

■ Naknada zbrinjavanja: 0,3 €/kg = 5,4 €/modulu

■ Cijena zbrinjavanja: 1,5 €/kg = 27 €/modulu



digitalna putovnica svakog modula

SCHRACK DESIGN 6.0

ELEKTROMOBILNOST

IZAZOVI IZGRADNJE FN SUSTAVA



RASVJETA

IT TEHNOLOGIJA

NOVOSTI

SCHRACK DESIGN 6.0

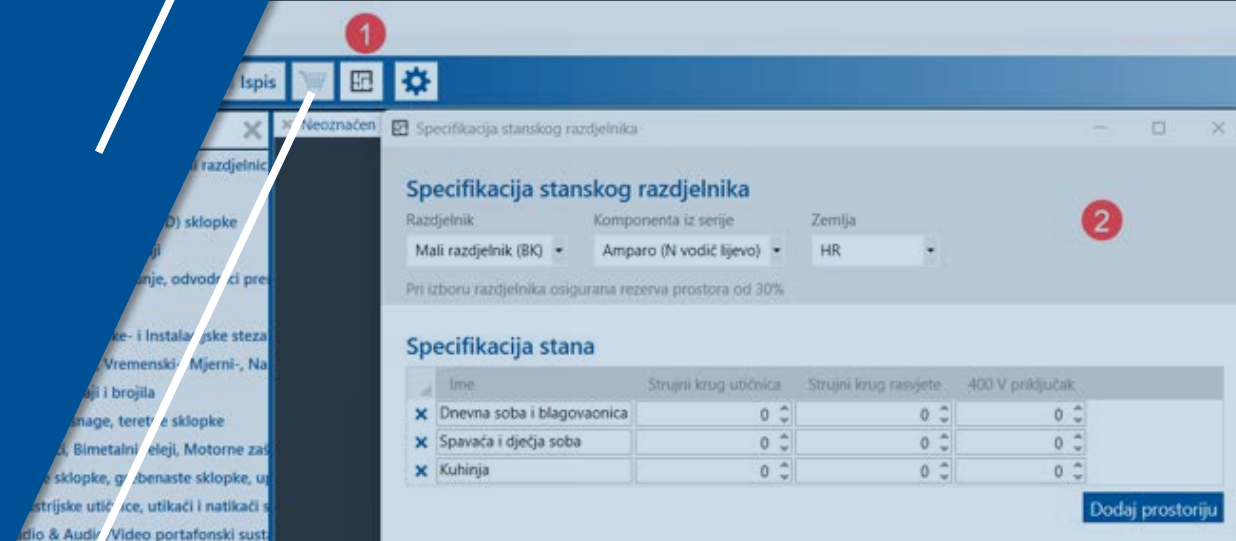
SCHRACK
TECHNIK

NOVO!

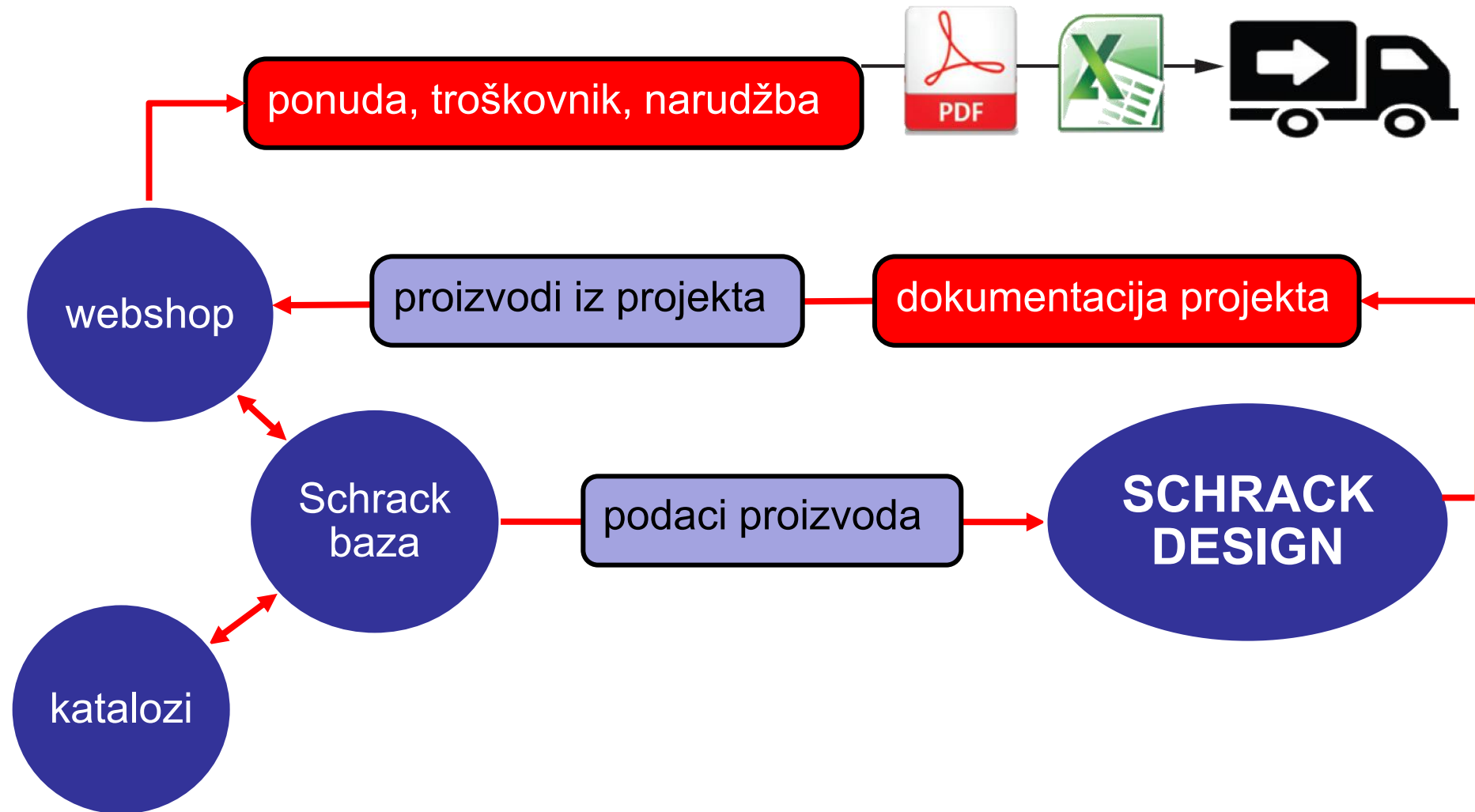
POMOĆNIK



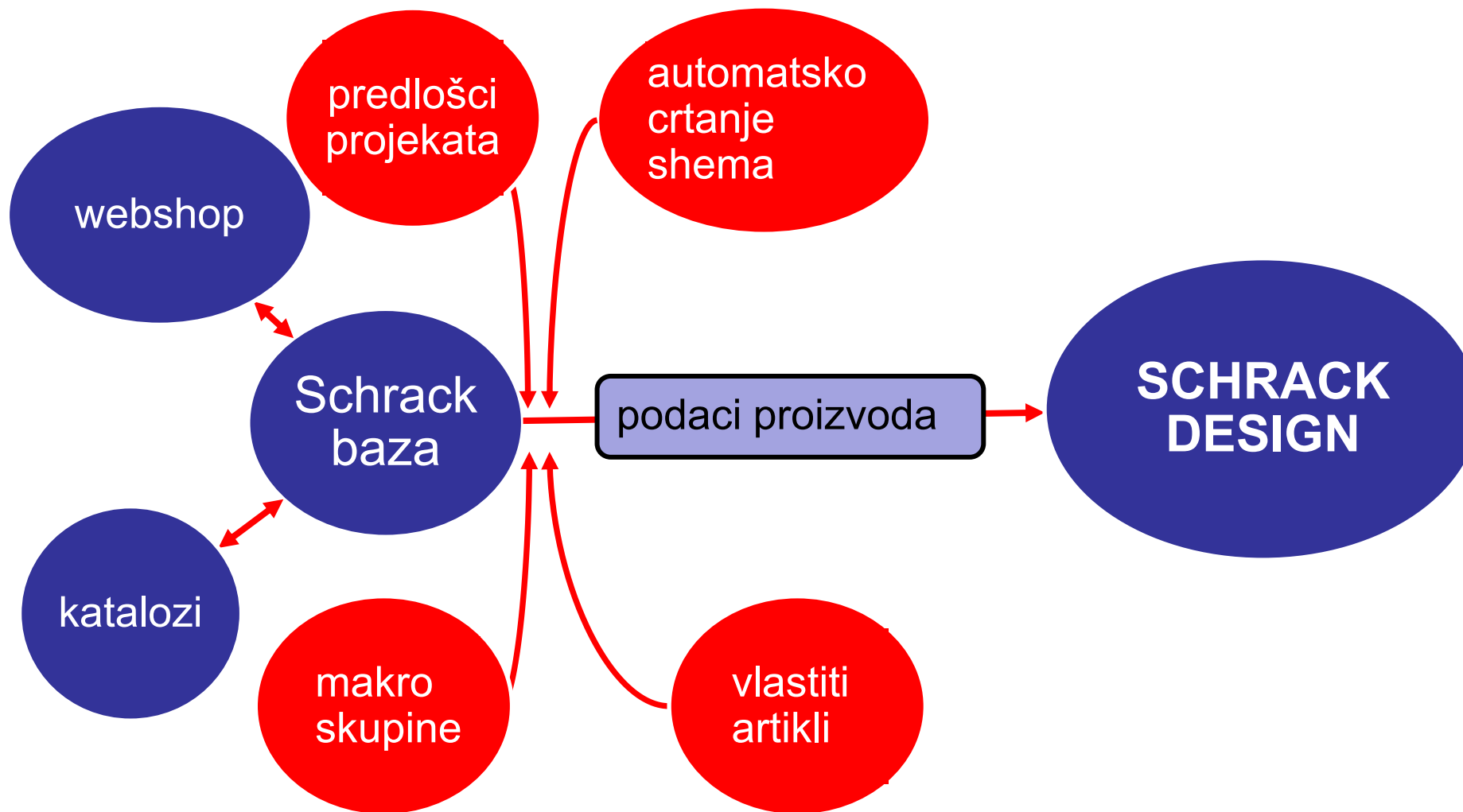
Get Ready.
Get Schrack.



SCHRACK DESIGN

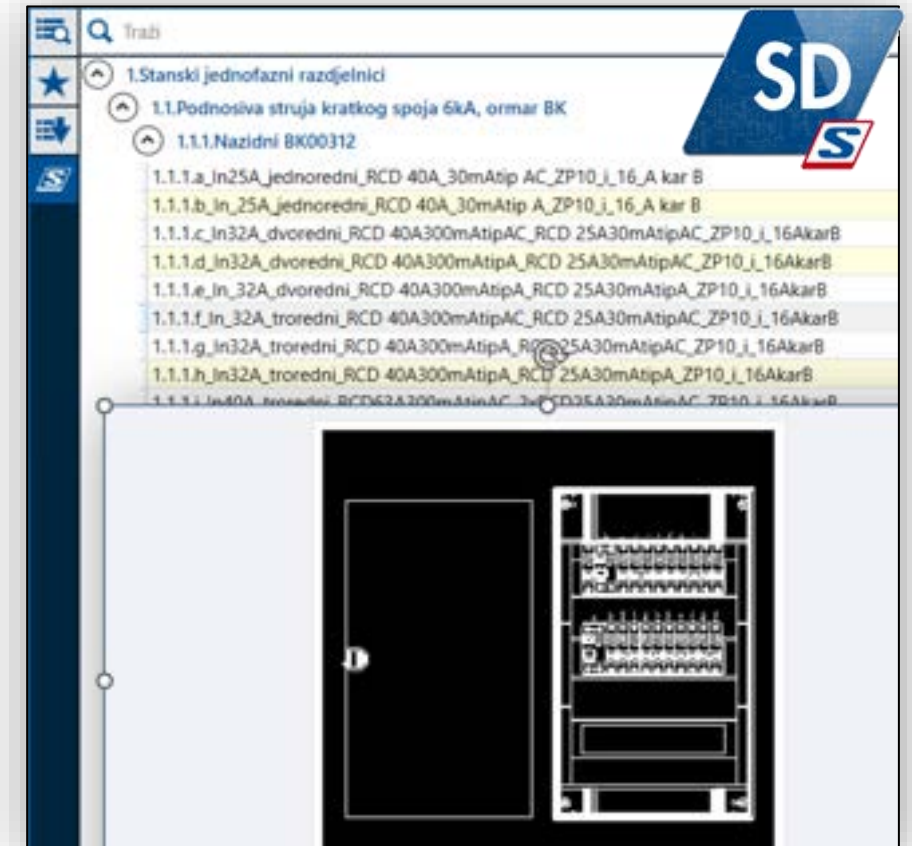


SCHRACK DESIGN



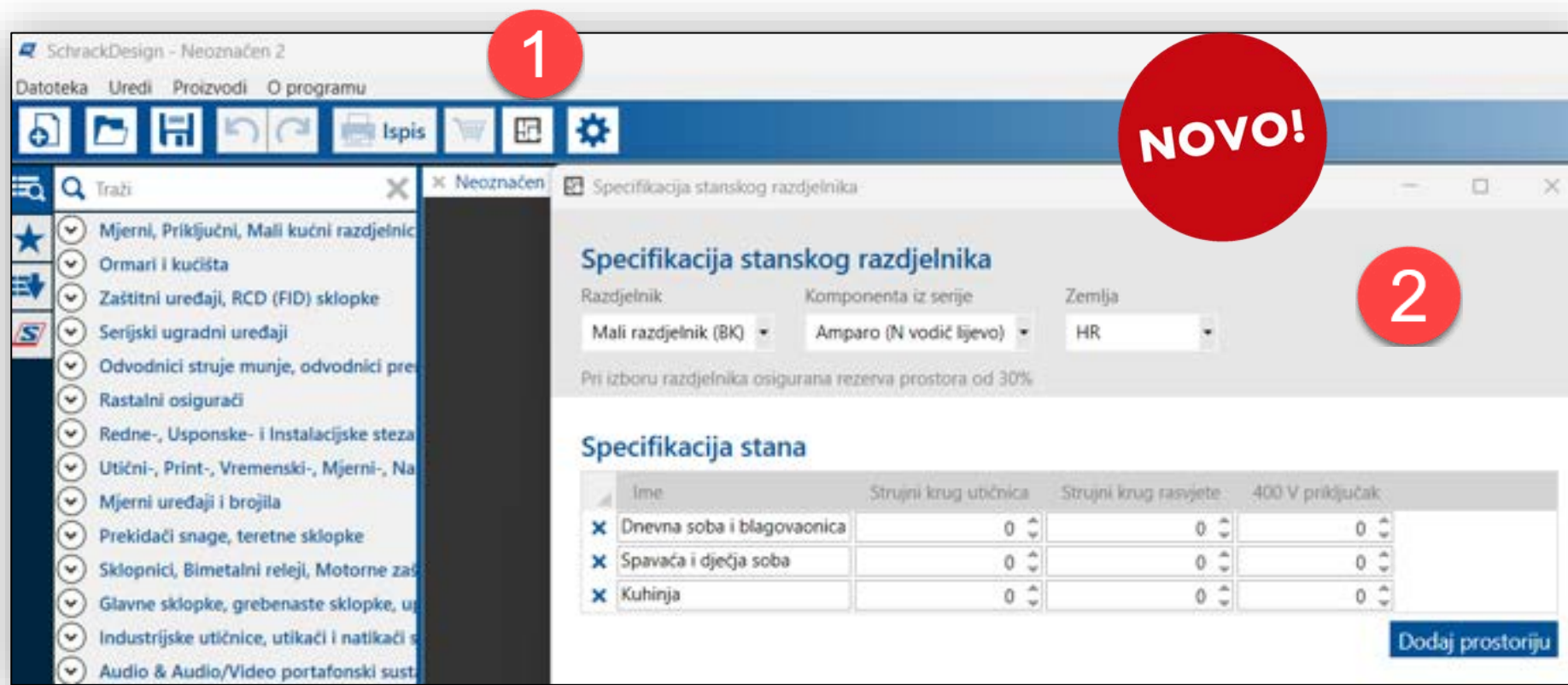
Predlošci

540 predložaka



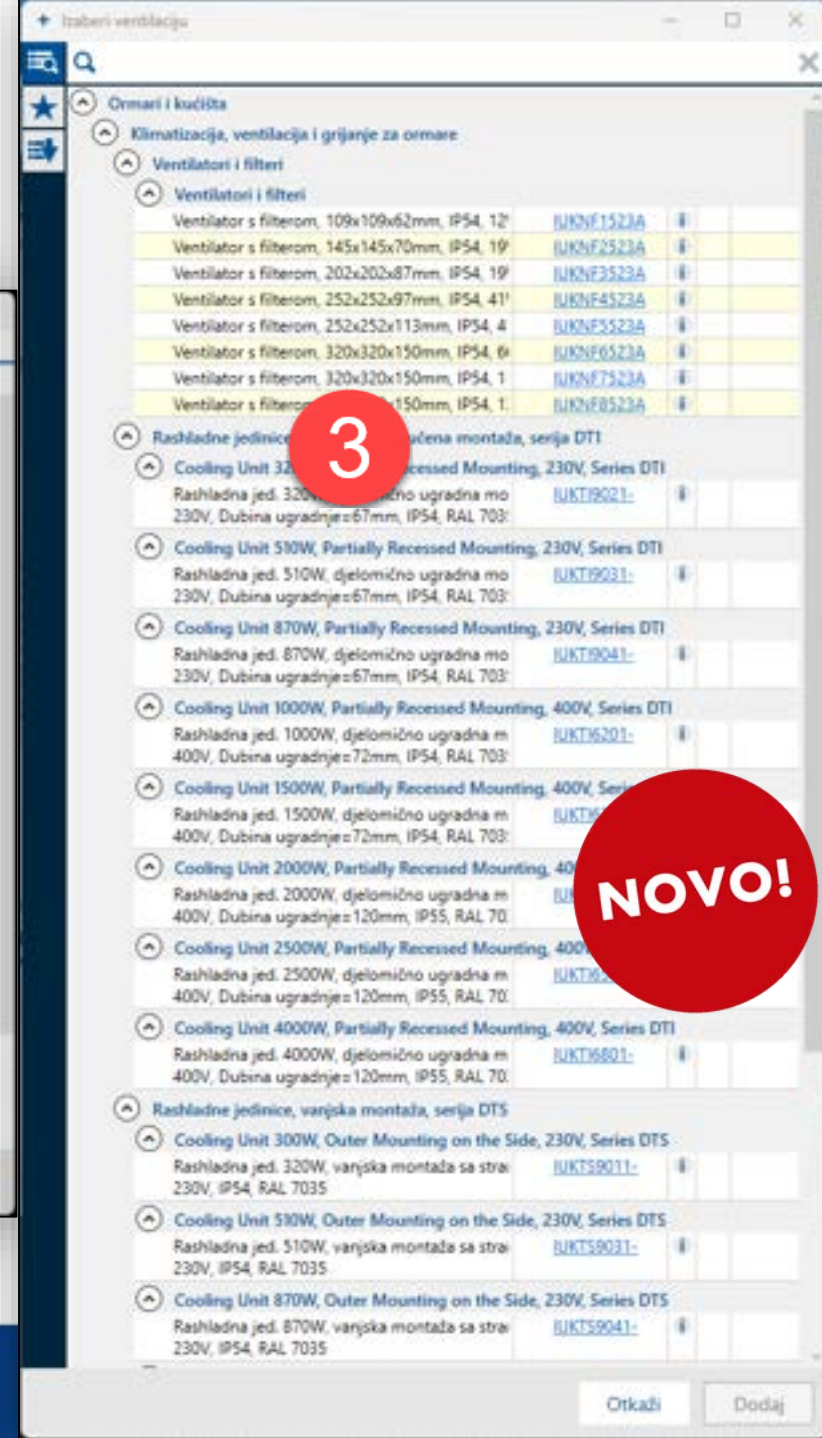
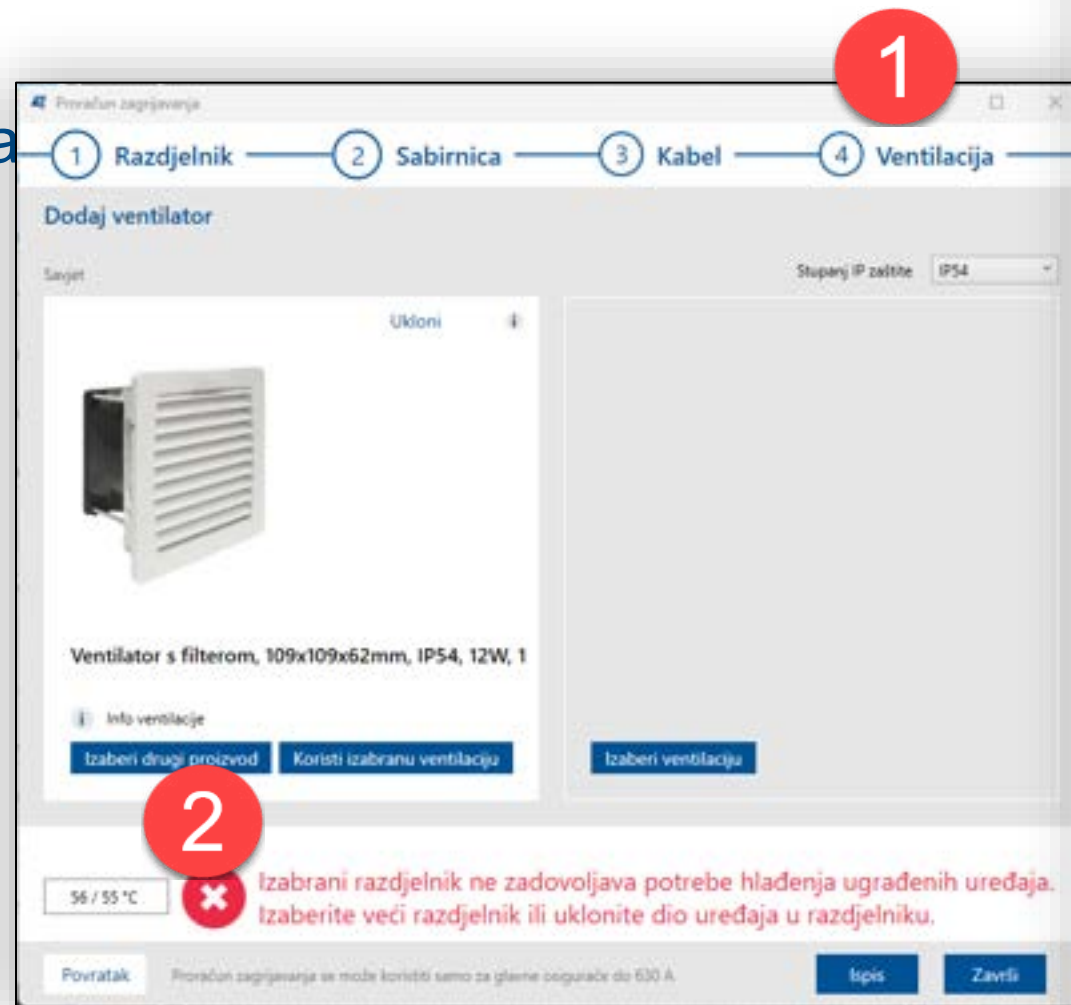
Pomoćnik: od opisa stana do dokumentacije

- opisati razvod energije u stanu
- pomoćnik stvara popis dijelova, pogled sprijeda, višepolnu i jednopolnu shemu

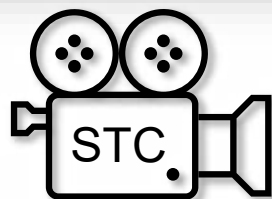
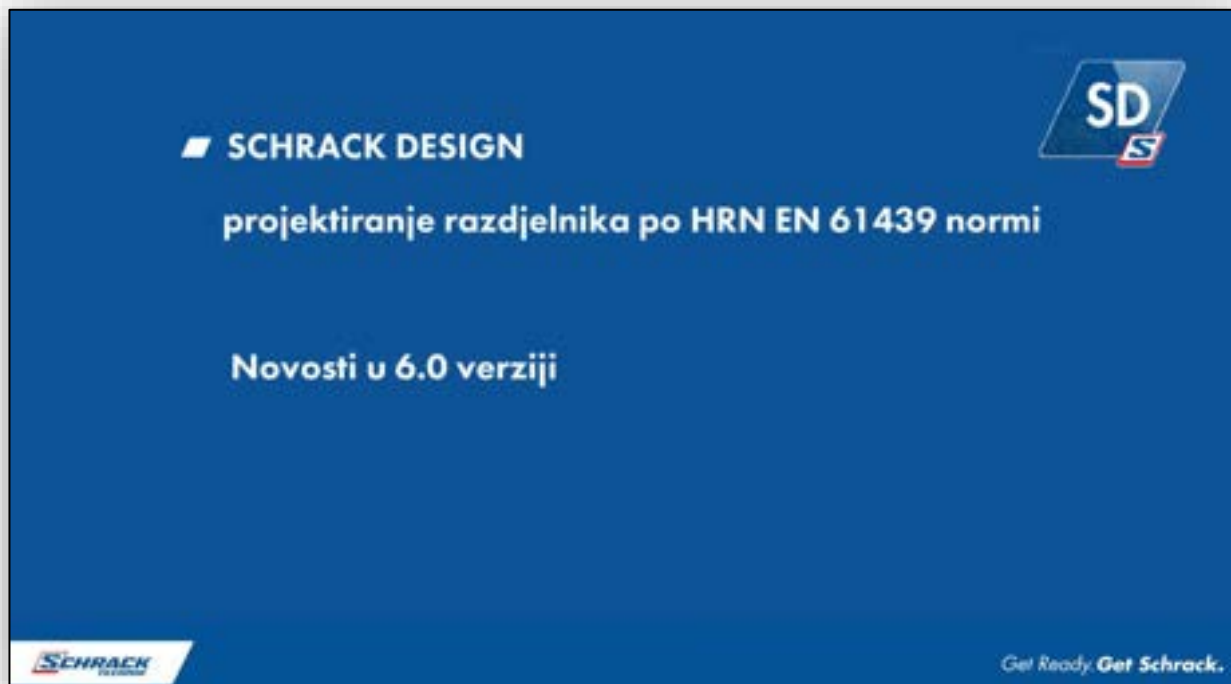


Rashladne jedinice

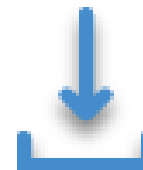
osim ventilatora na raspolaganju su i rashladne jedinice



Saznajte više o SCHRACK DESIGN V 6.0



SCHRACK TRENING CENTAR



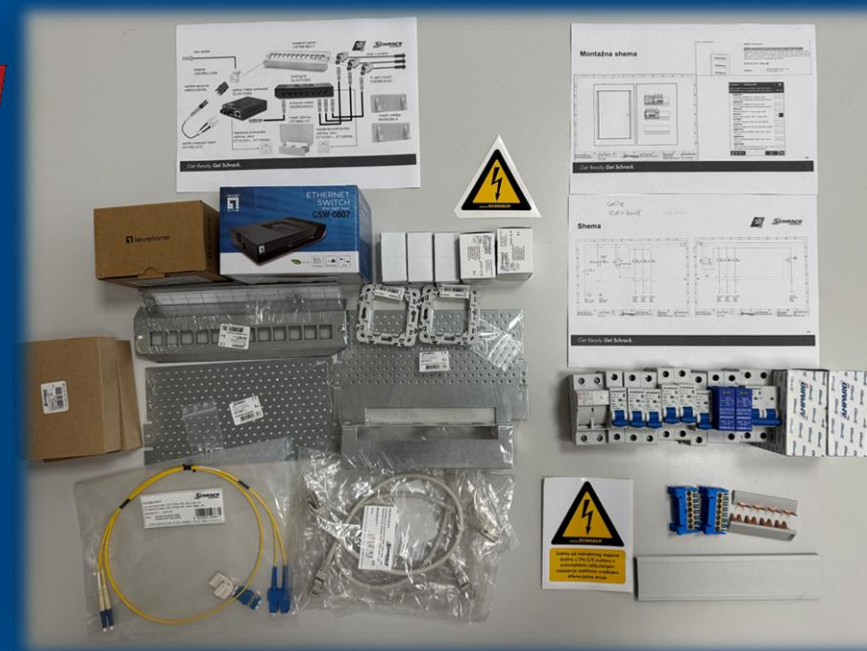
besplatno
preuzimanje

SCHRACK DESIGN RADIONICA

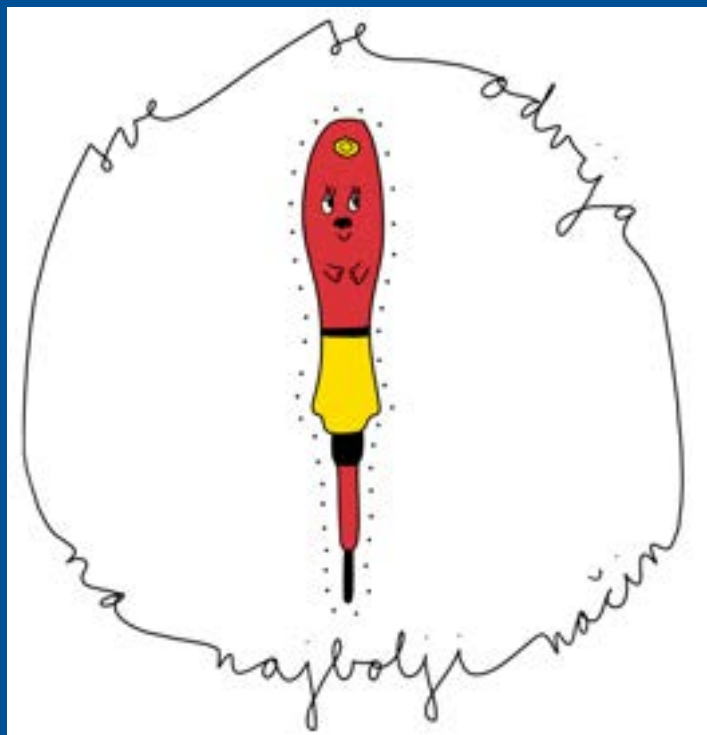


UČENIČKI INFO DANI 2025

18 ŠKOLA



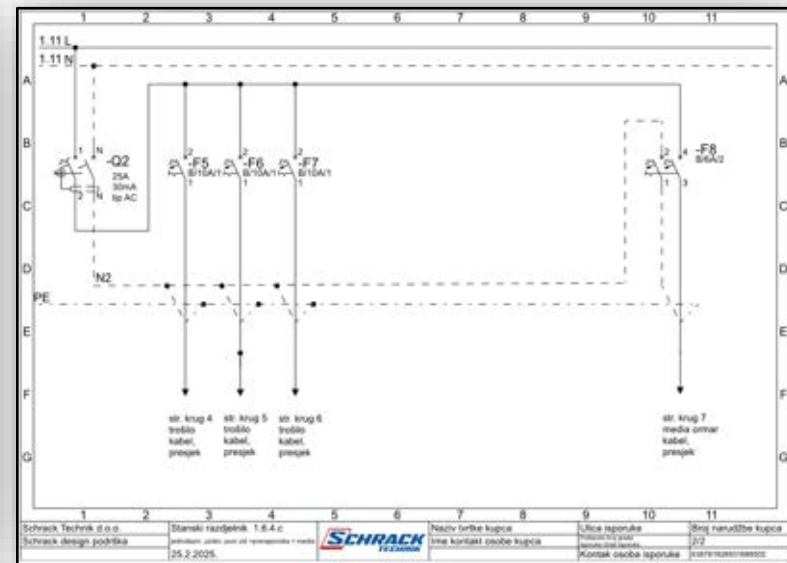
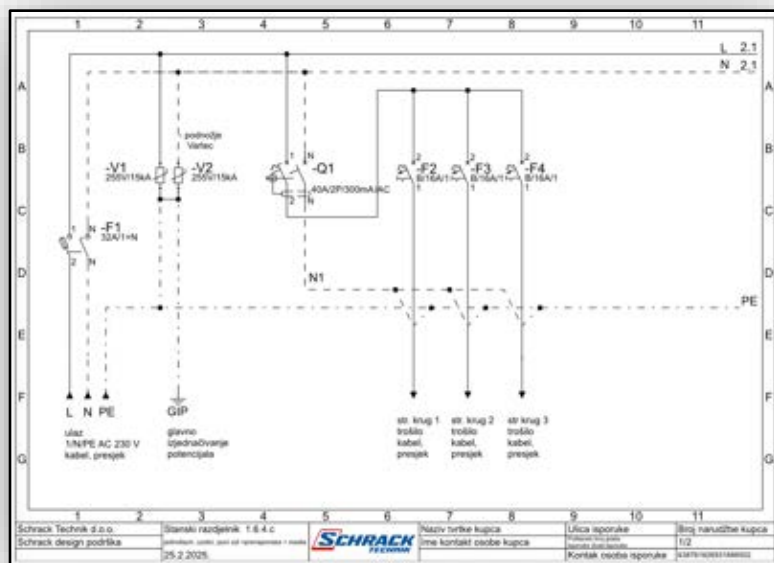
ENERGETSKI RAZDJELNIK



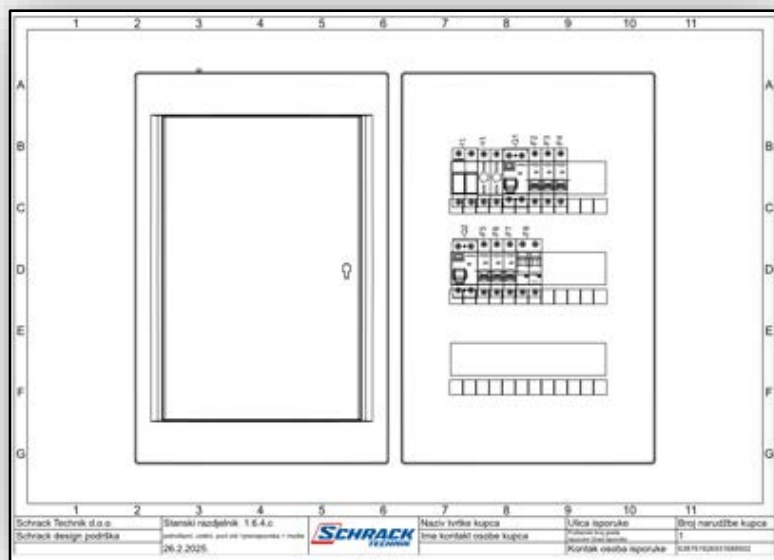
SCHRACK
TECHNIK

UČENIČKI
INFO DANI 2025
18 ŠKOLA





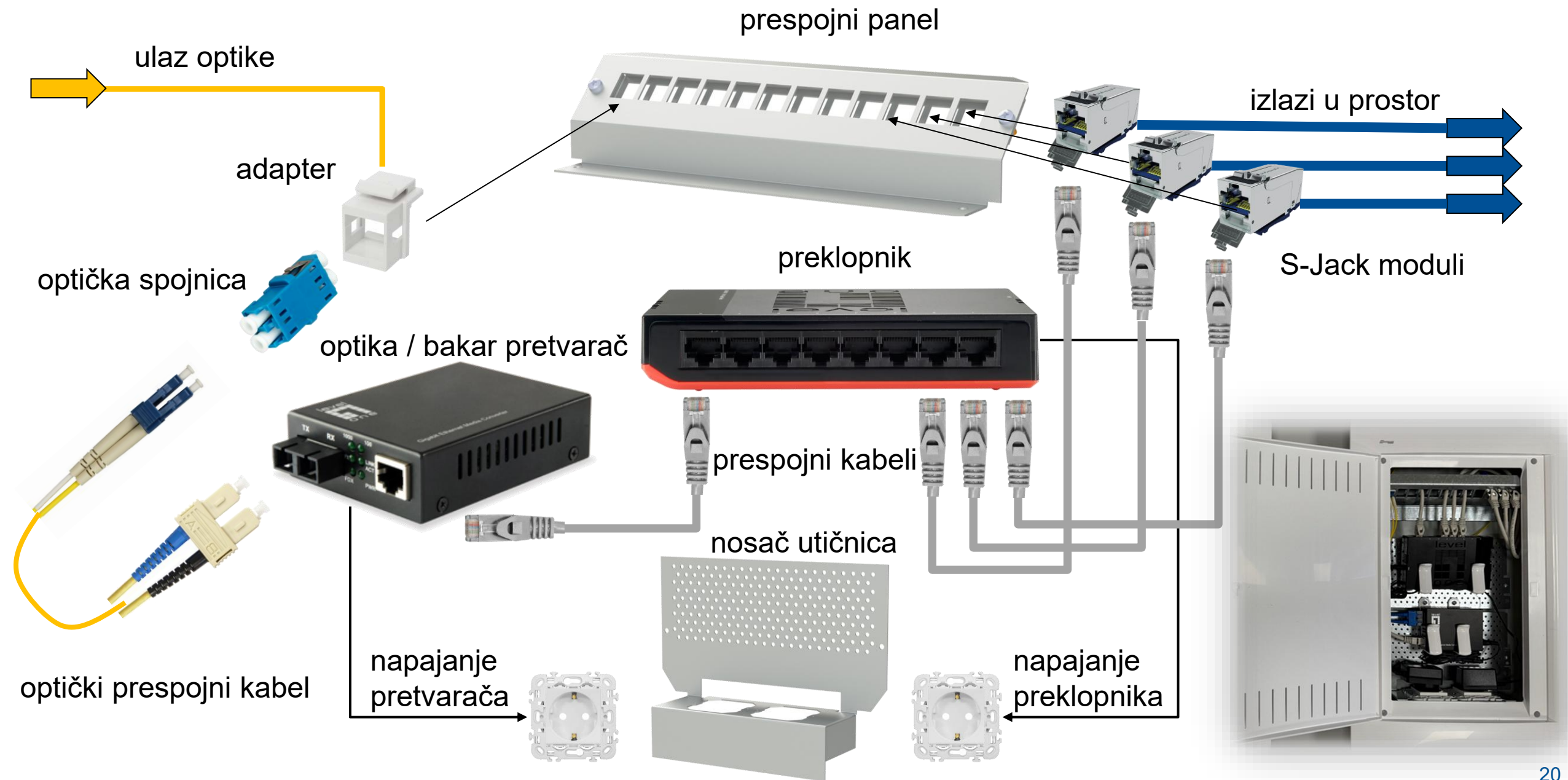
SCHRACK
TECHNIK
FOR STUDENTS



INFORMACIJSKI RAZDJELNIK

UČENIČKI
INFO DANI 2025
18 ŠKOLA





Saznajte više o učeničkim Info danima

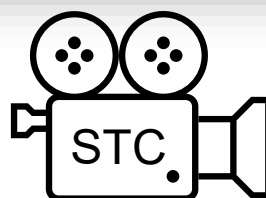
provedeno u 18 škola



kad je dobra shema



onda problema nema



SCHRACK TRENING CENTAR

ELEKTROMOBILNOST

Nadzorni sustav CION Pro stanica za punjenje električnih vozila

SCHRACK
TECHNIK



*Get Ready.
Get Schrack.*

i-CHARGE CION Pro stanice

CION Home, Semipublic, Pro



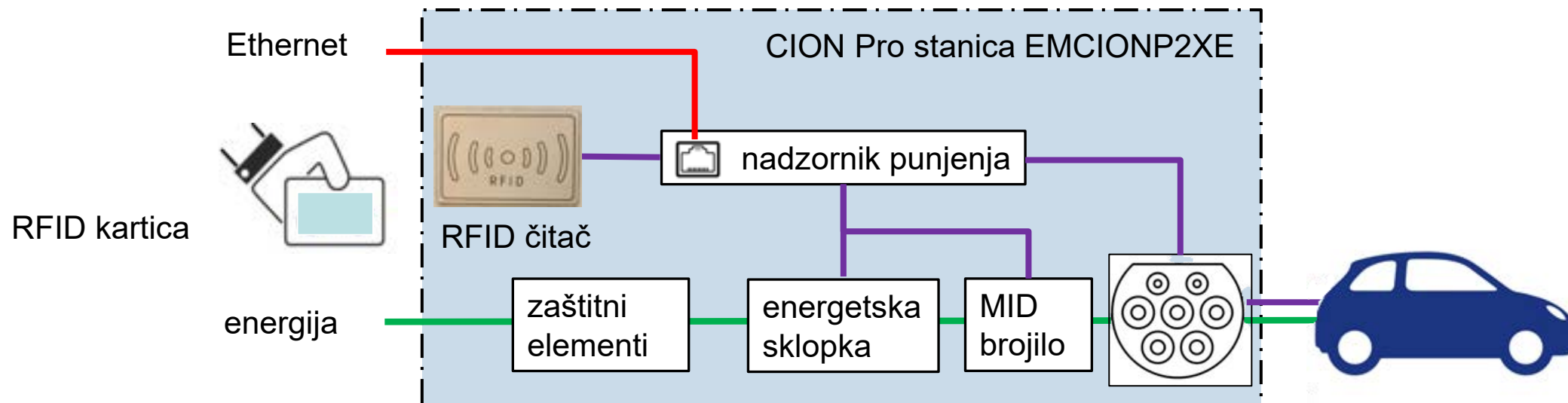
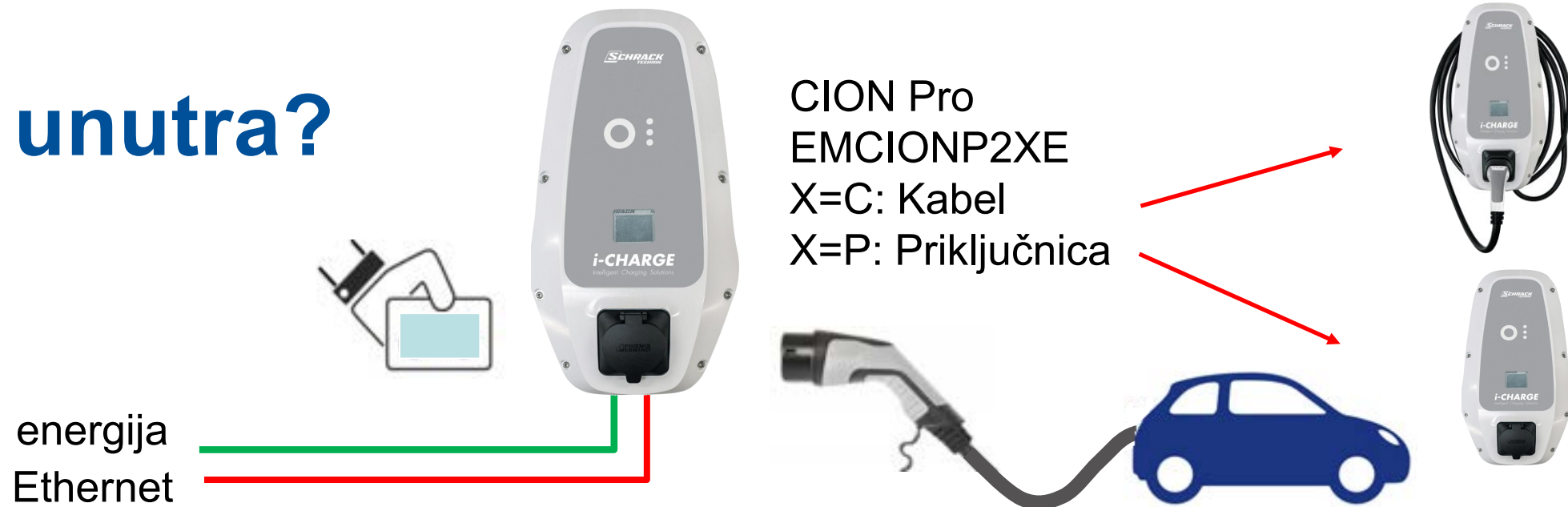
značajke:

- identifikacija RFID karticom
- MID brojilo, RCMU
- WiFi, Modbus TCP
- upravljanje snage za 250 stanica
- OCPP 1.6 kompatibilno

izvedbe:

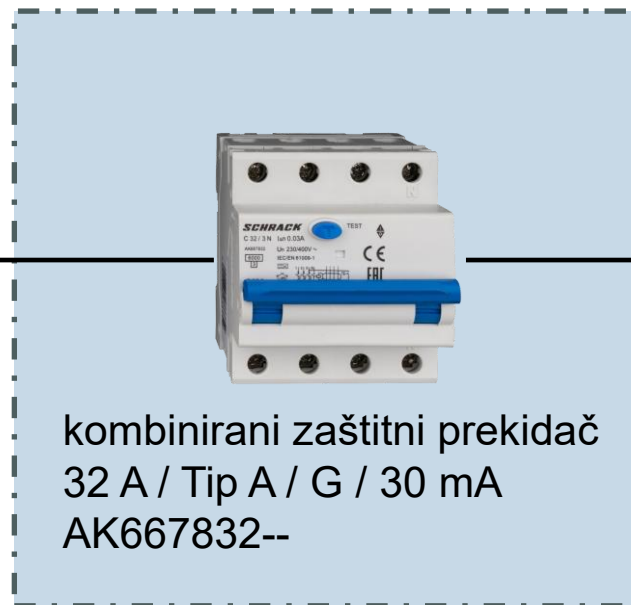
- utičnica ili kabel
- GSM+Ethernet ili Ethernet

Što je unutra?



Zaštitne komponente uz CION Pro stanice

trofazni priključak,
struja punjenja do 32 A

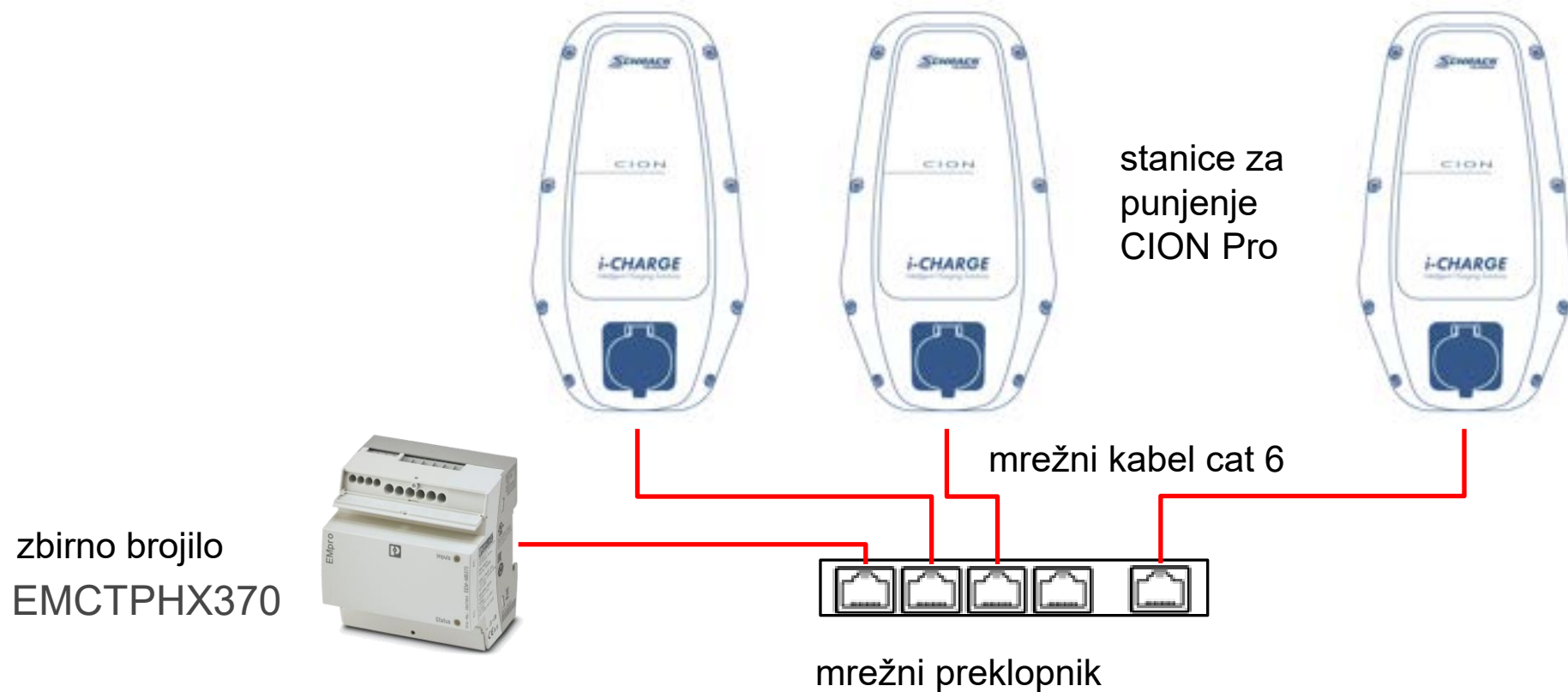


kombinirani zaštitni prekidač
32 A / Tip A / G / 30 mA
AK667832--



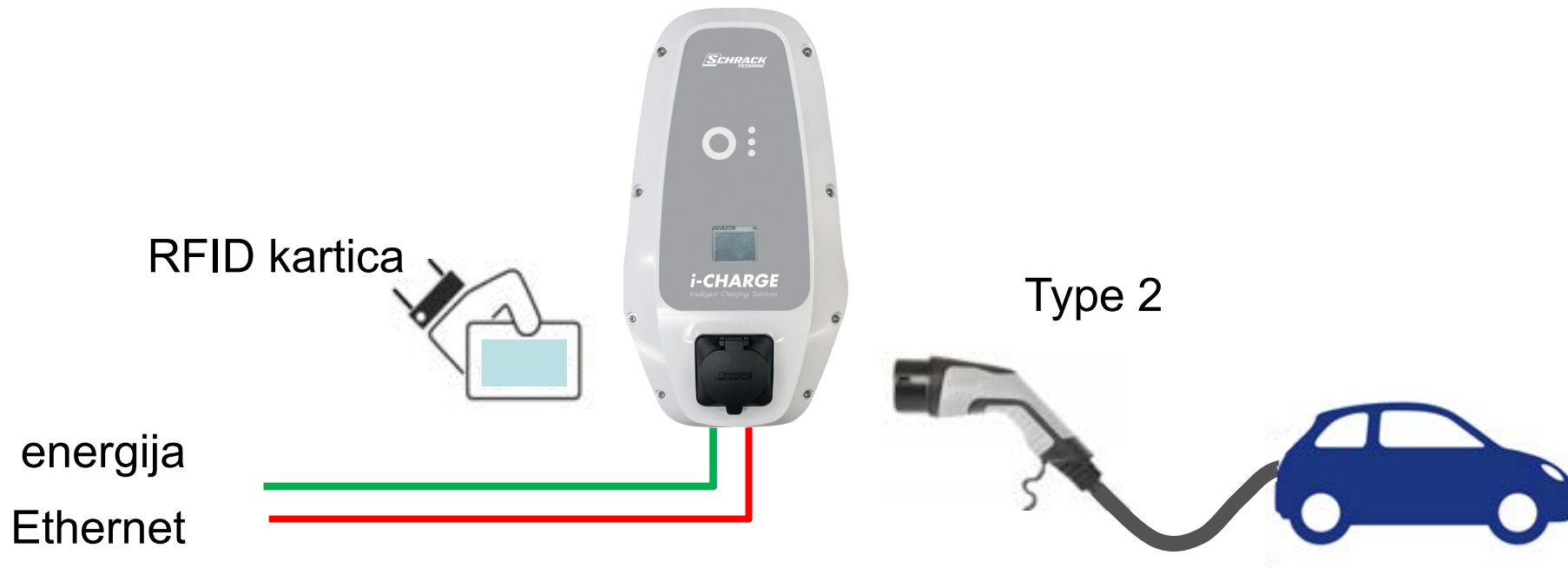
stanica za punjenje 22 kW
EMCIONP2CE
EMCIONP2PE

Dinamičko upravljanje opterećenjem mreže

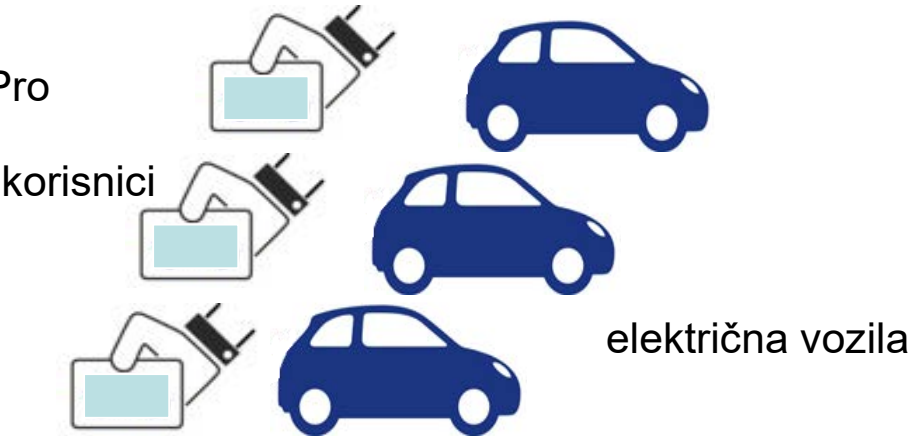
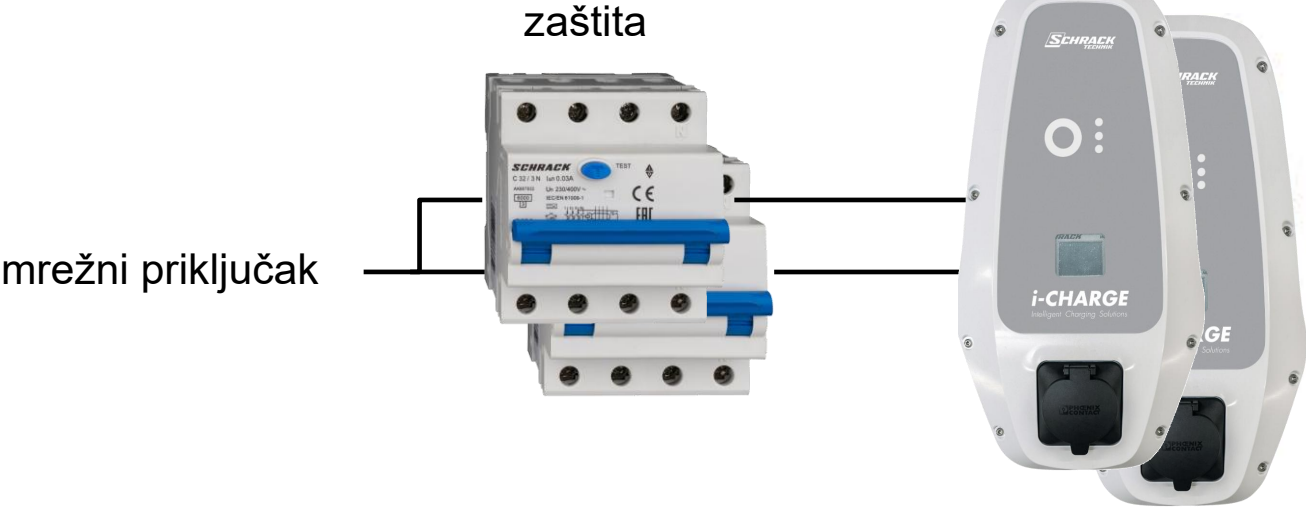


Što smo iskoristili za nadzorni sustav?

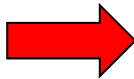
- identifikacija RFID karticom
- mjerenje energije, MID brojilo
- komunikacija: Ethernet + OCPP V 1.6 protokol



Nadzorni sustav *i-CHARGE* CION Pro stanica



i-CHARGE programska aplikacija



izvještaji o predanoj energiji



Charging sessions report for account

Account Id:

82izy14x60904oy

Account name:

Range from:

2025-07-12 22:00:00

Range to:

2025-07-16 21:59:59

Sessions:

2

Total energy:

61.37 kWh

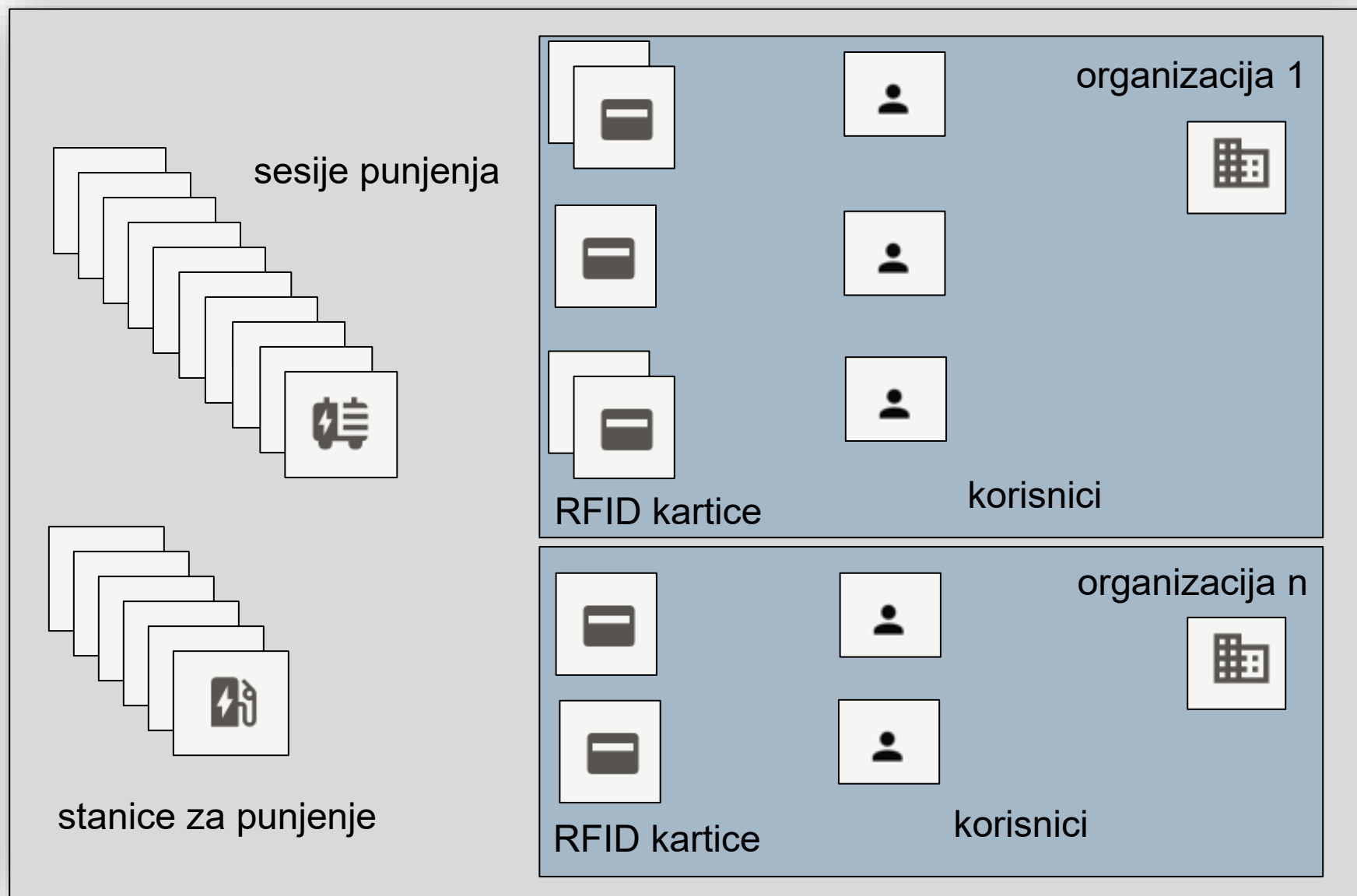
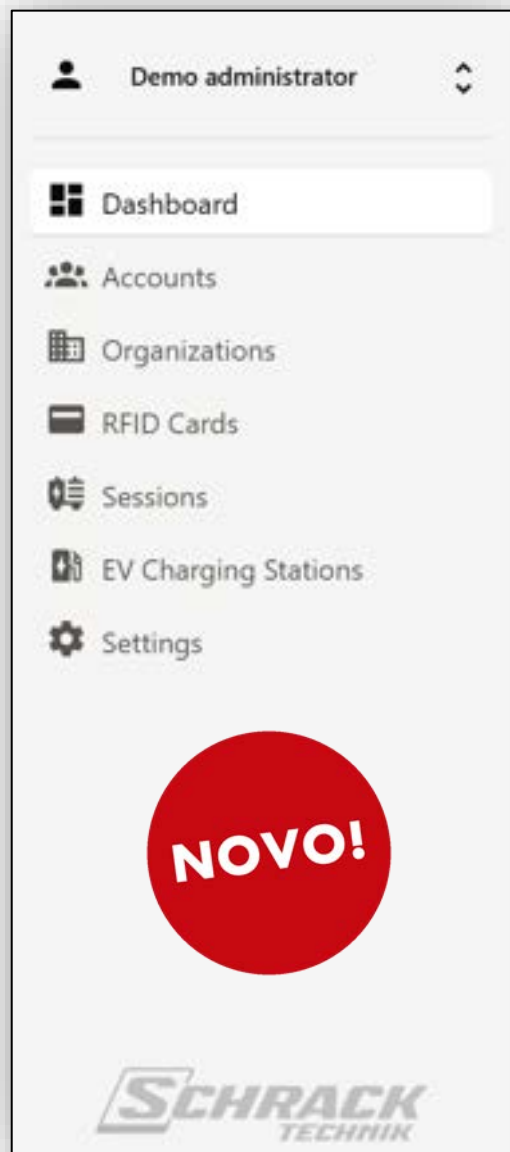
Total duration:

9h 37m 49s

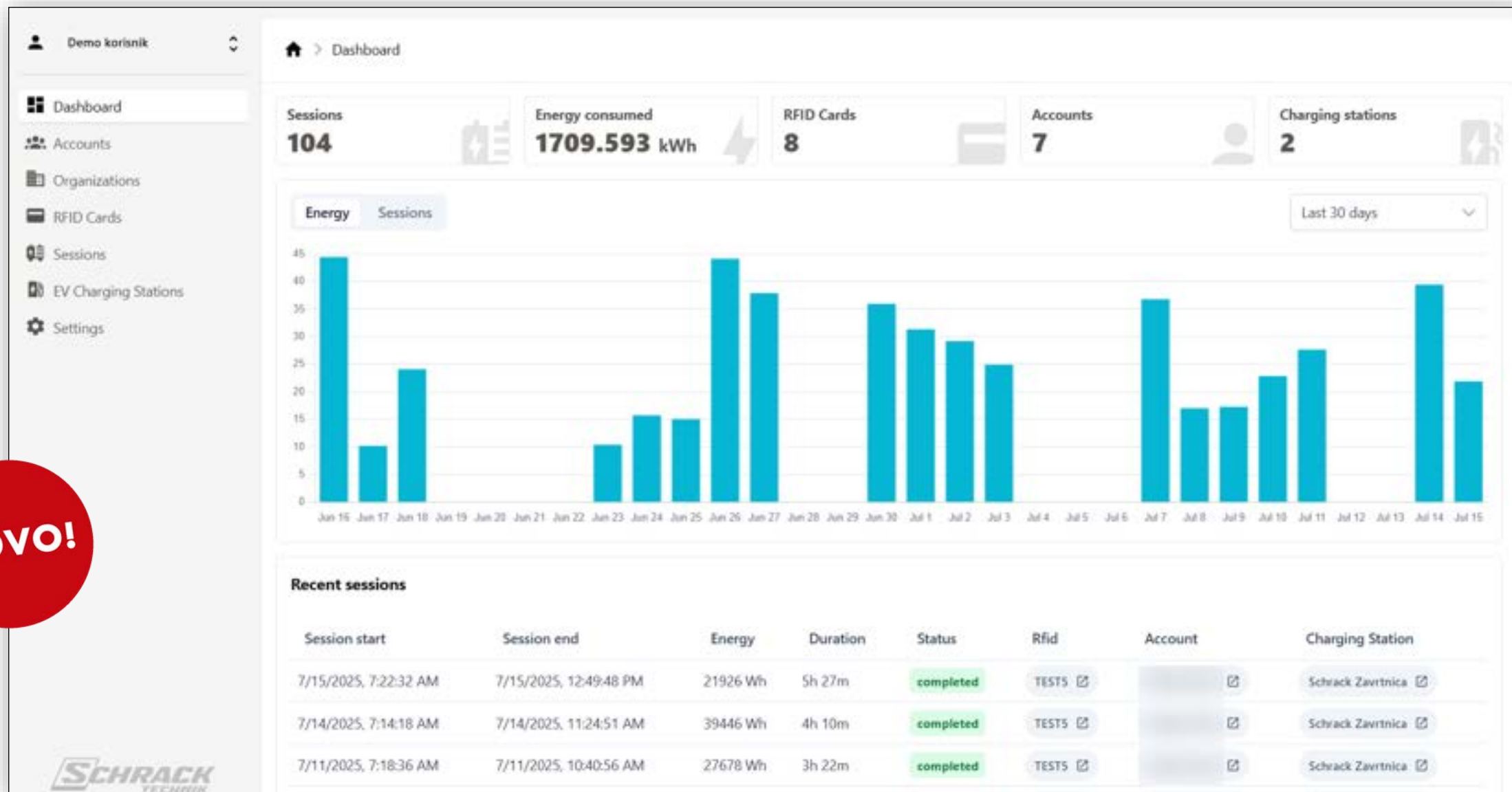
Sessions

Session start	Session end	Duration	Energy	Rfid	Charging Station
2025-07-14 05:14:18	2025-07-14 09:24:51	4h 10m 33s	39.45 kWh	TEST5	Schrack Zavrtnica
2025-07-15 05:22:32	2025-07-15 10:49:48	5h 27m 16s	21.93 kWh	TEST5	Schrack Zavrtnica

i-CHARGE programska aplikacija

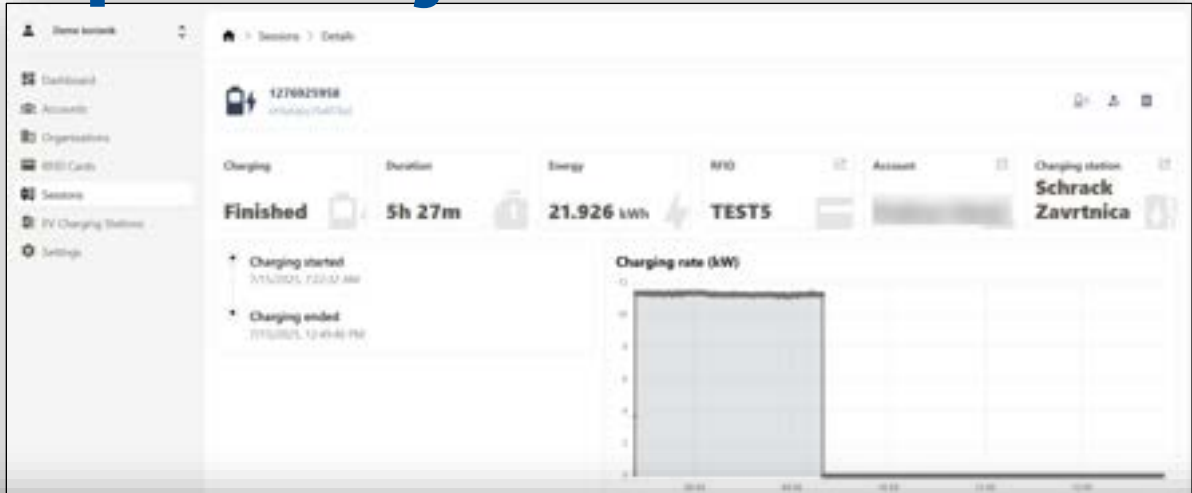


i-CHARGE programska aplikacija



i-CHARGE programska aplikacija

izvještaji o predanoj energiji



NOVO!

Charging sessions report for account

Account Id: 82izy14x60904oy
Account name: [redacted]
Range from: 2025-07-12 22:00:00
Range to: 2025-07-16 21:59:59
Sessions: 2
Total energy: 61.37 kWh
Total duration: 9h 37m 49s

	Session Start	Session End	Duration	Energy(Wh)	RFID	Account	Organization	Charging Station
[redacted]	1.7.2025 5:19	1.7.2025 8:41	3h22m12s	31356	TEST5	[redacted]	Schrack Technik	Schrack Zavrtnica
[redacted]	2.7.2025 7:18	2.7.2025 10:12	2h53m43s	29214	TEST5	[redacted]	Schrack Technik	Schrack Zavrtnica
95dinx8fe0k31au6	3.7.2025 5:13	3.7.2025 7:55	2h41m58s	24953	TEST5	[redacted]	Schrack Technik	Schrack Zavrtnica
rz215f3sx3g1q95	7.7.2025 5:17	7.7.2025 8:53	3h35m14s	36807	TEST5	[redacted]	Schrack Technik	Schrack Zavrtnica
21q1ue5eyw39746	8.7.2025 5:13	8.7.2025 7:51	2h37m36s	17046	TEST5	[redacted]	Schrack Technik	Schrack Zavrtnica
1kvg0ep48s1fps	9.7.2025 5:18	9.7.2025 7:06	1h48m50s	17300	TEST5	[redacted]	Schrack Technik	Schrack Zavrtnica
gohr4y22qrd48g2	10.7.2025 5:11	10.7.2025 7:16	2h5m12s	16857	TEST5	[redacted]	Schrack Technik	Schrack Zavrtnica
f2u6d61sg32c46c	10.7.2025 11:15	10.7.2025 13:14	1h58m27s	6014	TEST5	[redacted]	Schrack Technik	Schrack Zavrtnica
9c98x0l4lc3fq5t	11.7.2025 5:18	11.7.2025 8:40	3h22m20s	27678	TEST5	[redacted]	Schrack Technik	Schrack Zavrtnica
842v0a92w5i72or	14.7.2025 5:14	14.7.2025 9:24	4h10m33s	39446	TEST5	[redacted]	Schrack Technik	Schrack Zavrtnica
et9atq6z7b4f7bd	15.7.2025 5:22	15.7.2025 10:49	5h27m16s	21926	TEST5	[redacted]	Schrack Technik	Schrack Zavrtnica

Sessions

Session start	Session end	Duration	Energy	Rfid	Charging Station
2025-07-14 05:14:18	2025-07-14 09:24:51	4h 10m 33s	39.45 kWh	TEST5	Schrack Zavrtnica
2025-07-15 05:22:32	2025-07-15 10:49:48	5h 27m 16s	21.93 kWh	TEST5	Schrack Zavrtnica

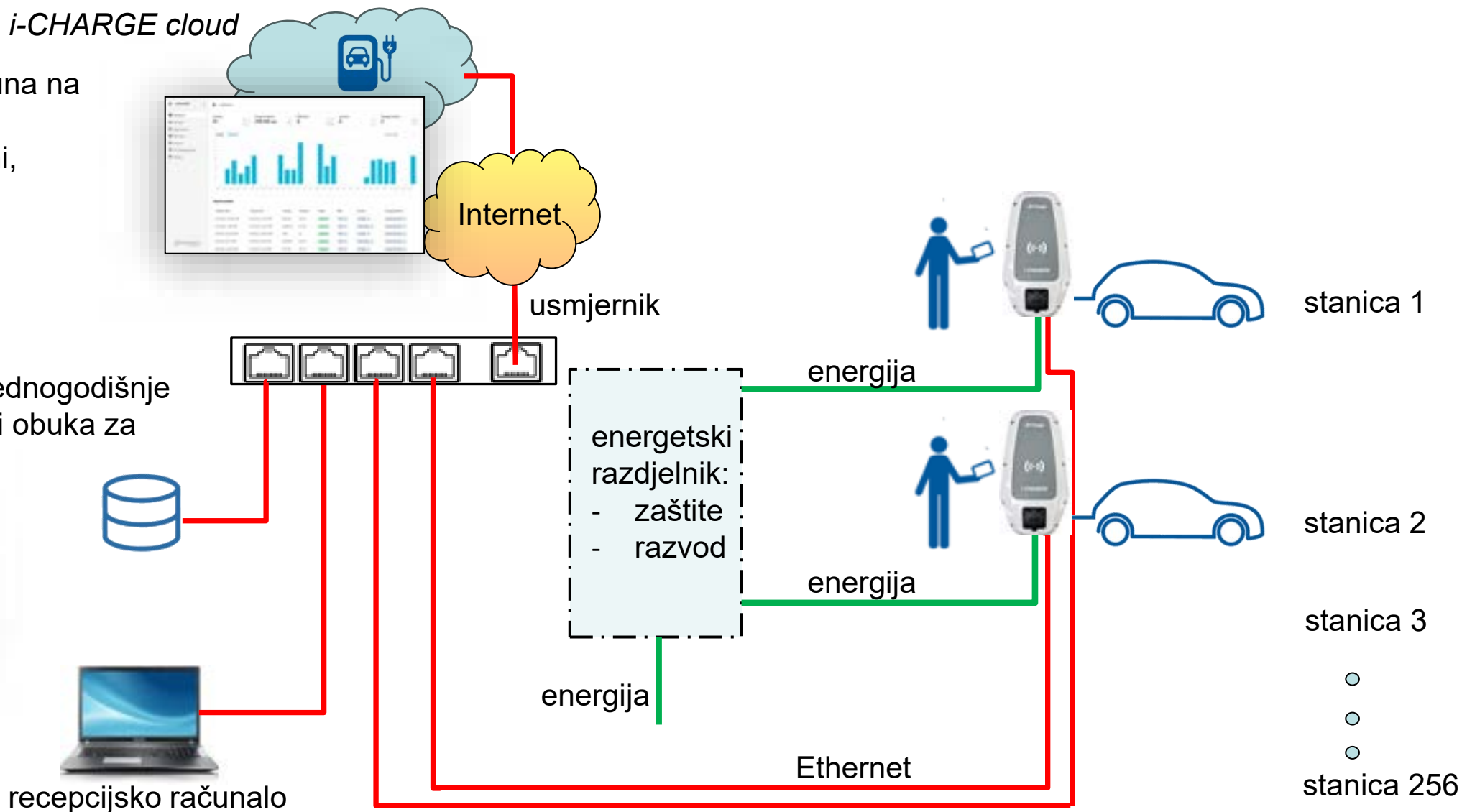
i-CHARGE instalacija u oblaku ili lokalno

A

otvaranje računa na
i-CHARGE
cloud platformi,
obuka za rad

B

licencija, instalacija, jednogodišnje
održavanje aplikacije i obuka za
i-CHARGE aplikaciju



Saznajte osnovno o nadzornom sustavu!



Saznajte više!

Nadzorni sustav CION Pro stanica za punjenje električnih vozila

■ O sustavu

NOVO!

Get Ready. Get Schrack.



Nadzorni sustav CION Pro stanica za punjenje električnih vozila

■ i-CHARGE programska aplikacija

NOVO!

Get Ready. Get Schrack.



SCHRACK TECHNIK

Korisničke upute za programsku aplikaciju i-CHARGE

V1.0 - siječanj 2025.

Prosjekcijski prikaz sadržaja svih uputa i dodataka glavnim programiranim aplikacijama. Prikaz namijenjen je samo za informaciju i ne smije se koristiti kao vodič za postupak. Za detaljniju informaciju o svim postupcima posjetite našu web stranicu. Zadržavamo pravo na tehničke promjene.



Nadzorni sustav CION Pro stanica za punjenje električnih vozila

NOVO!

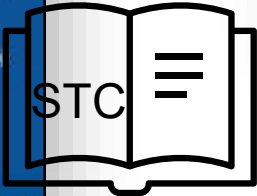
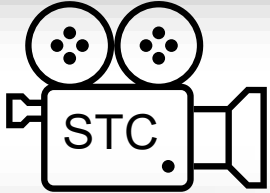
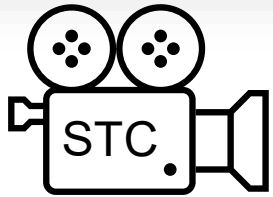
Parkiralište opremljeno s jednom ili više stanica za punjenje električnih vozila nužno mora biti povezano s nadzorom i sistemom ako se želi pratiti i upravljati troškovima za korištenje električne energije korisnicima stanica za punjenje.

Primjena sustava je na parkiralištima hotela, apartmana, kampa, marine ili poslovnog prostora. Za takav sustav karakteristično je jedno centralno mjesto nadzora svih stanica, primjerice recepcija.

Nadzorni sustav mora moći potvrditi identitet korisnika koji aktivira stanicu za punjenje kako bi se mogla povezati izmjerena predana energija s korisnikom stanice.

Srpanj 2025.

Get Ready. Get Schrack.



SCHRACK TRENING CENTAR

FOTONAPON

SCHRACK
TECHNIK

NOVO!



Get Ready.
Get Schrack.



Izazovi tehnologije izgradnje FN sustava

Posebne primjene FN elektrana

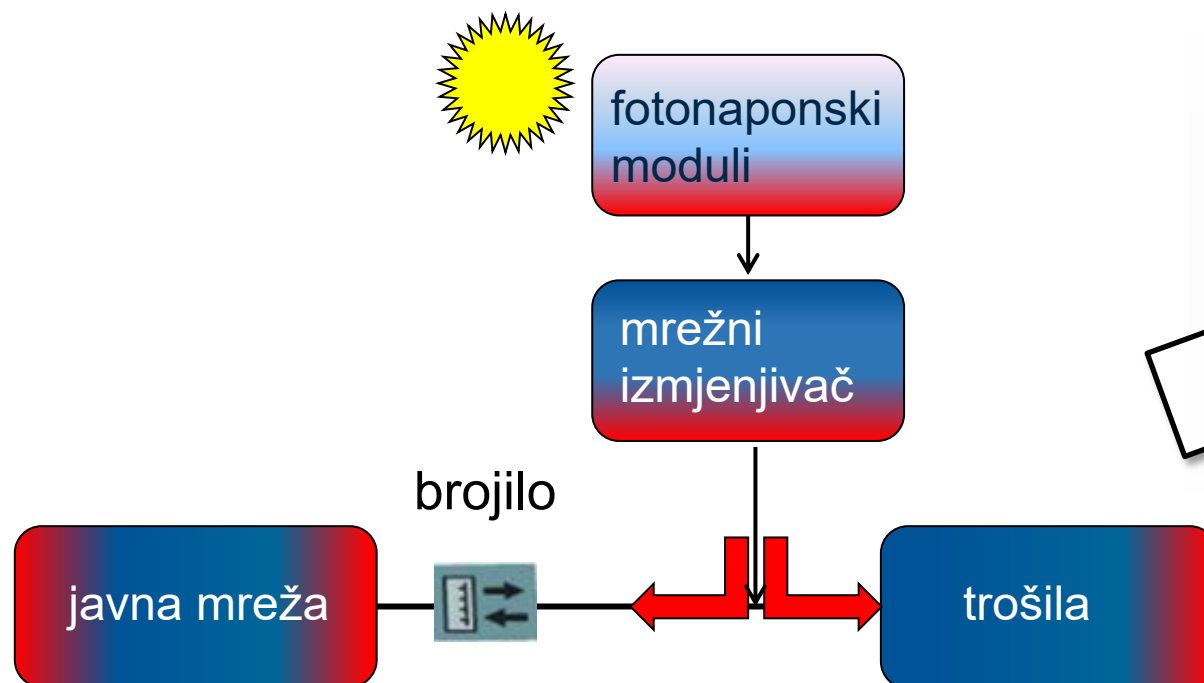
Priprema za dinamičku cijenu energije

Izazovi izgradnje fotonaponskog sustava



Mrežni sustav

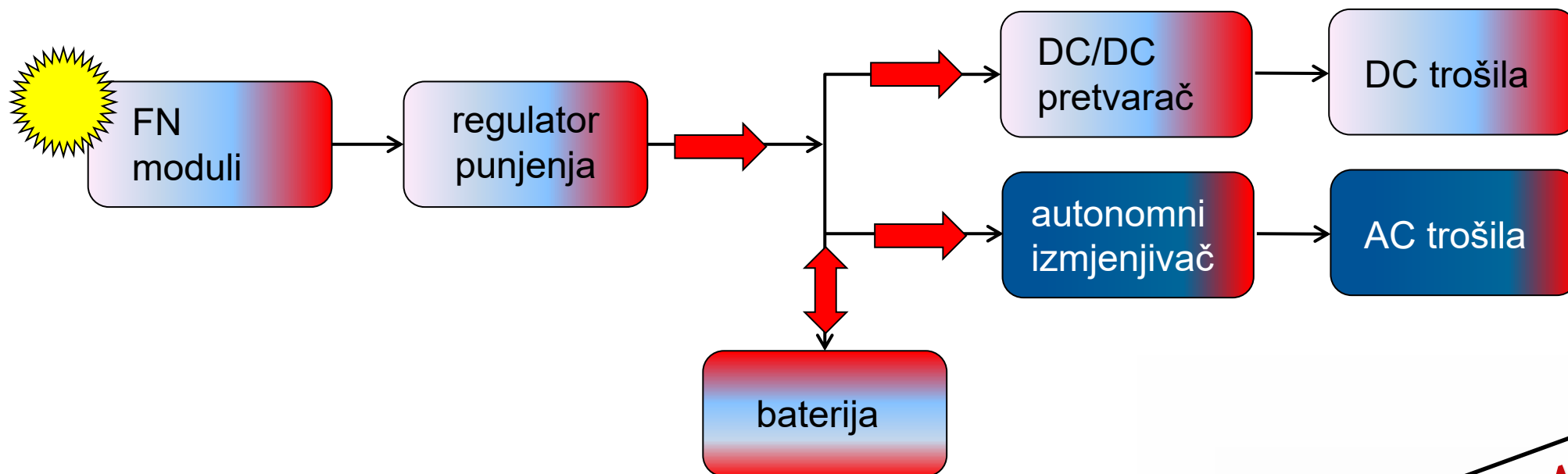
- mreža je „spremnik“ za „višak“ proizvodnje



HRN HD 60364-7-712

Otočni sustav (1)

■ bez priključka na javnu mrežu

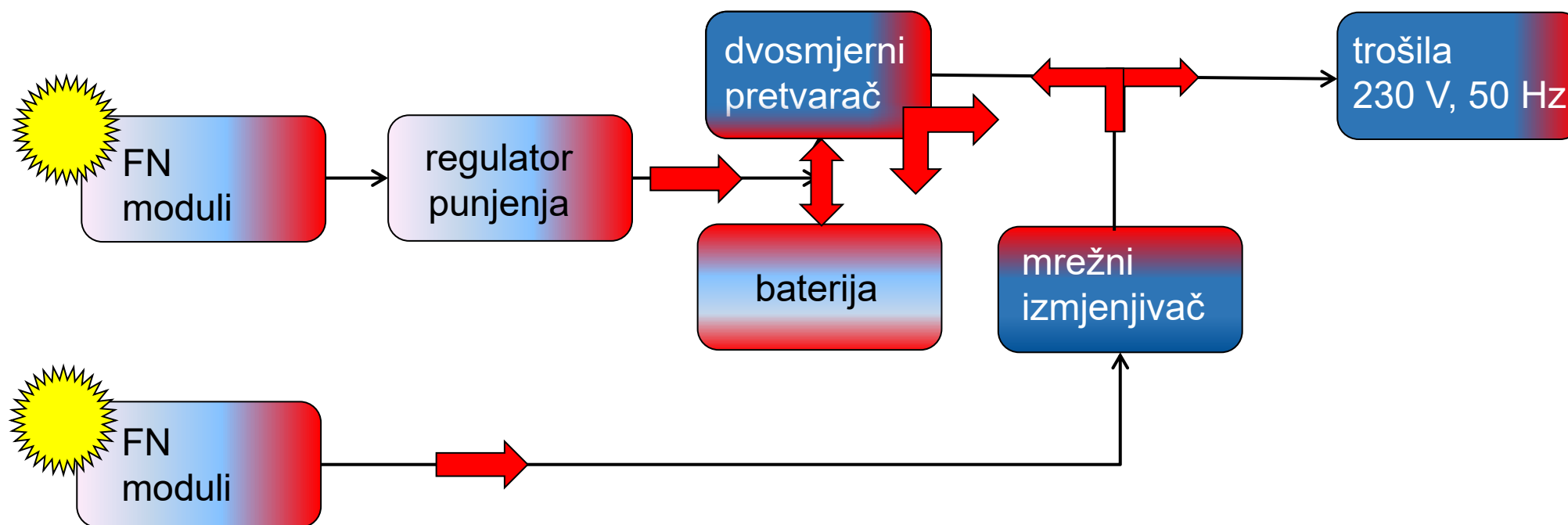


HRN HD 60364-7-712

HRN HD 60364-4-41

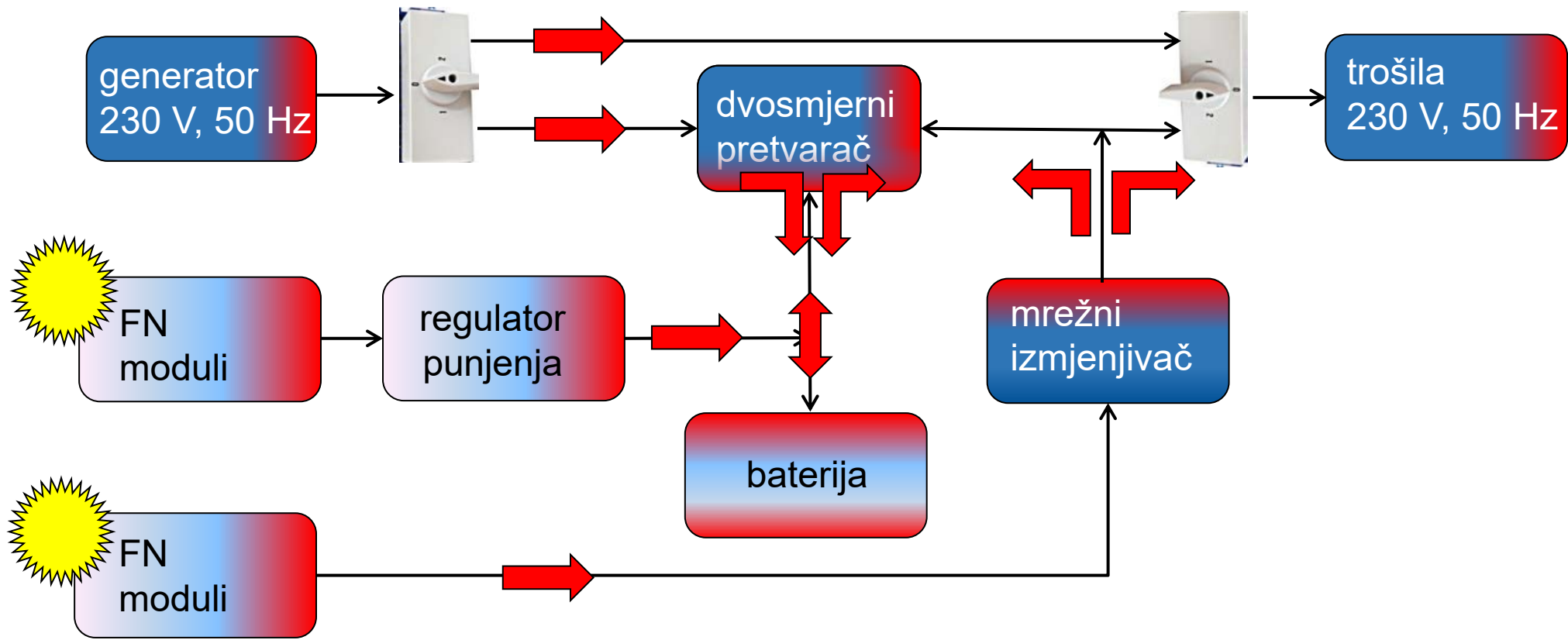
Otočni sustav (2)

■ s dvosmjernim pretvaračem



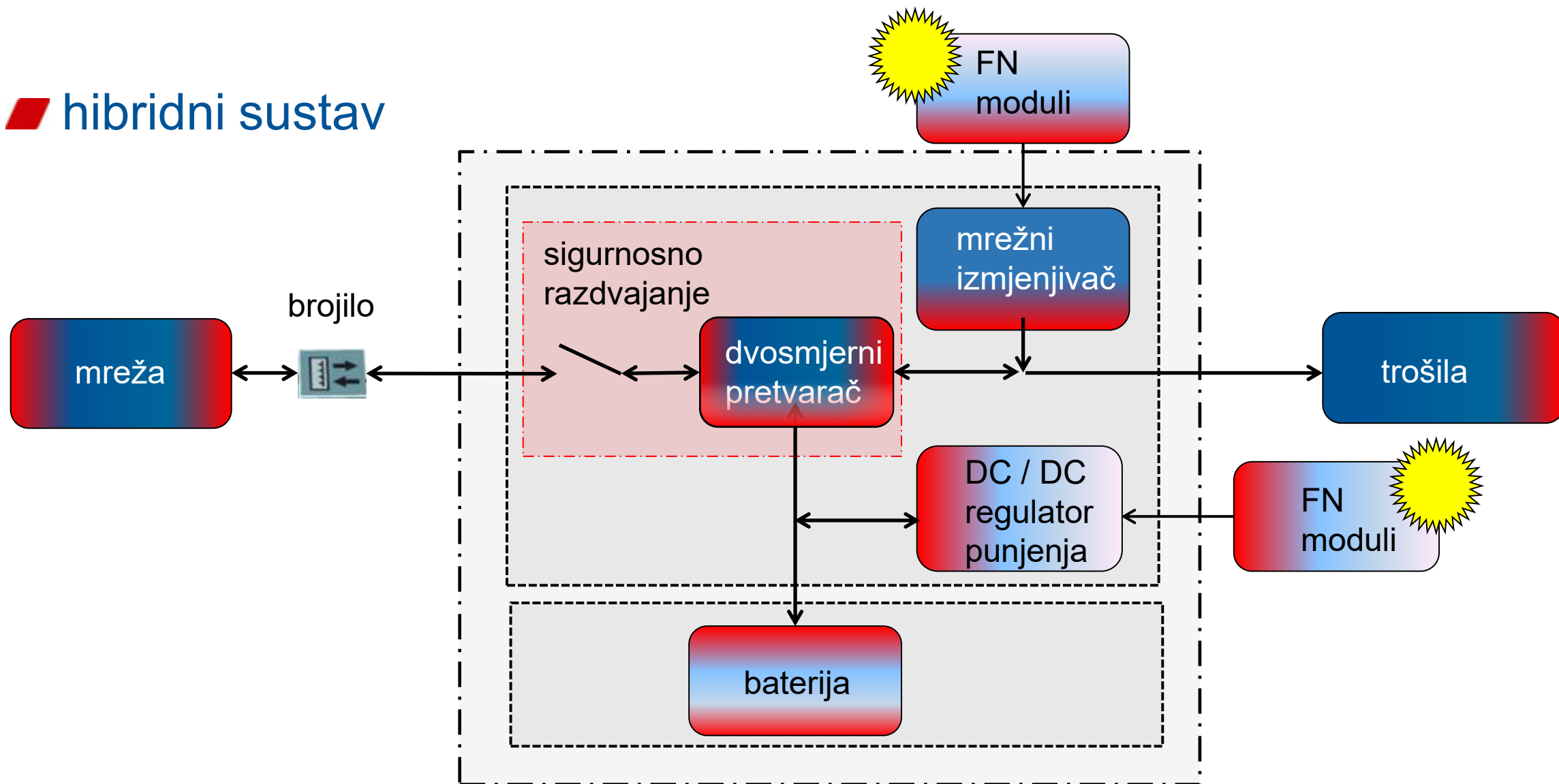
Otočni sustav (3)

■ s pomočnim izvorom i premosnom sklopnom opremom

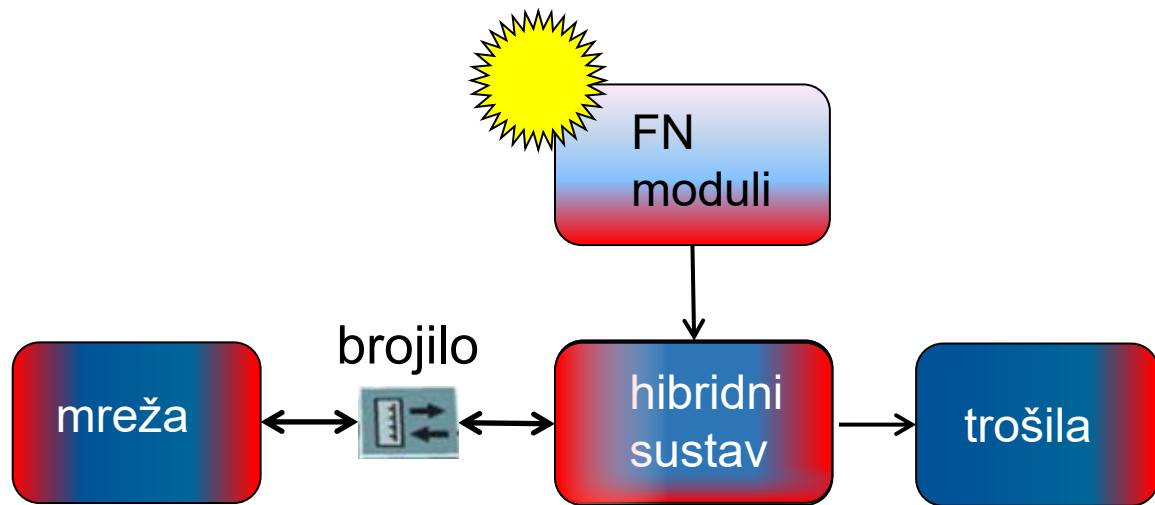


Otočni sustav priključen na mrežu

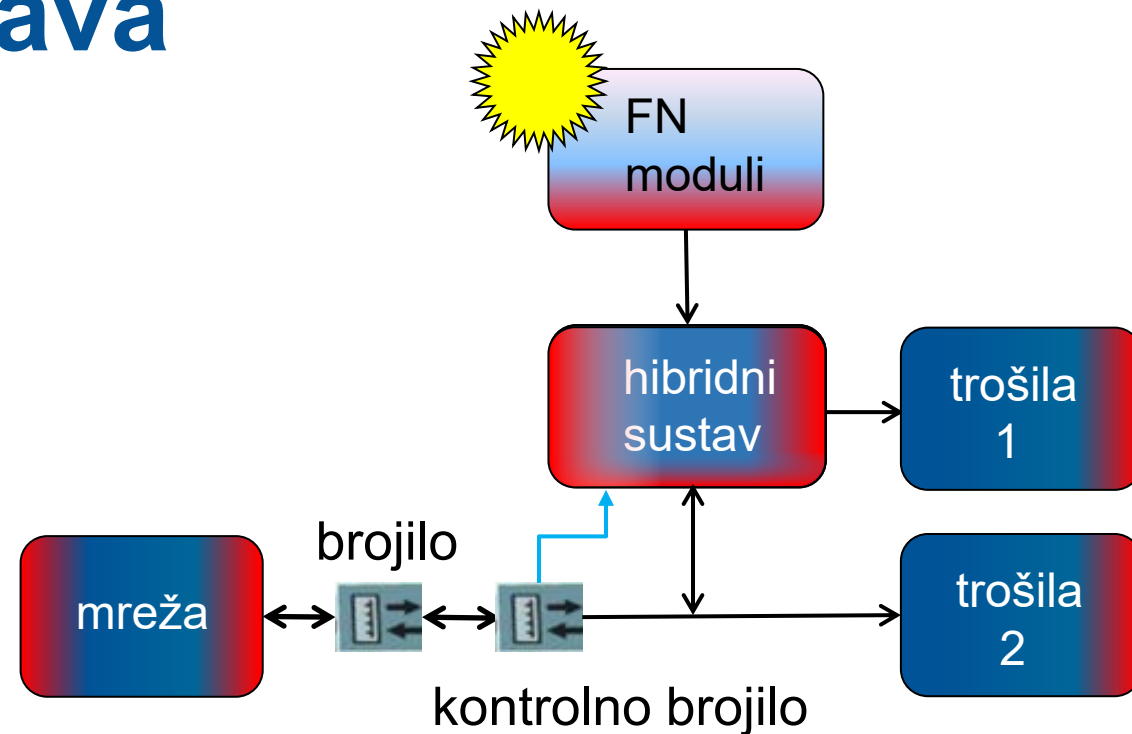
■ hibridni sustav



Izvedbe hibridnog sustava

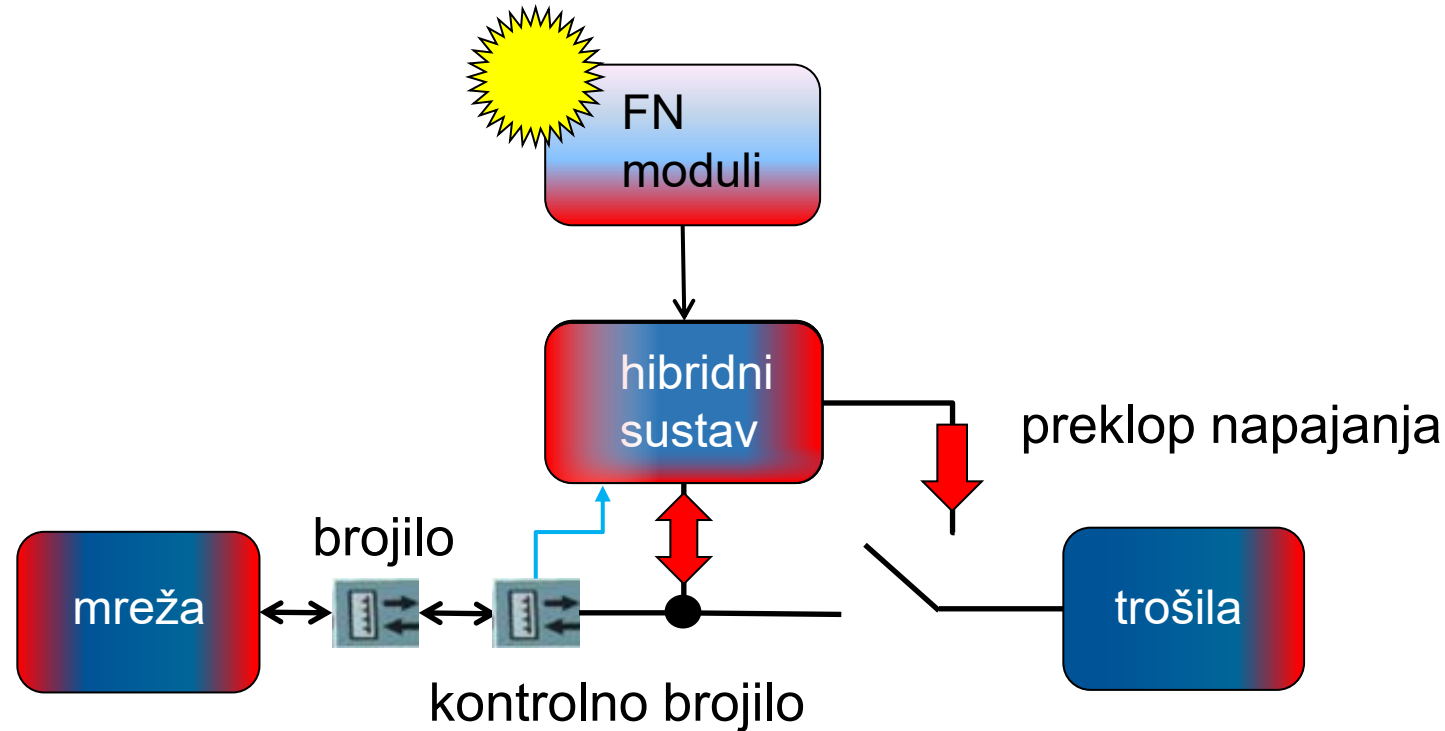


- sva trošila imaju uvijek napajanje
- sustav pokriva sva trošila



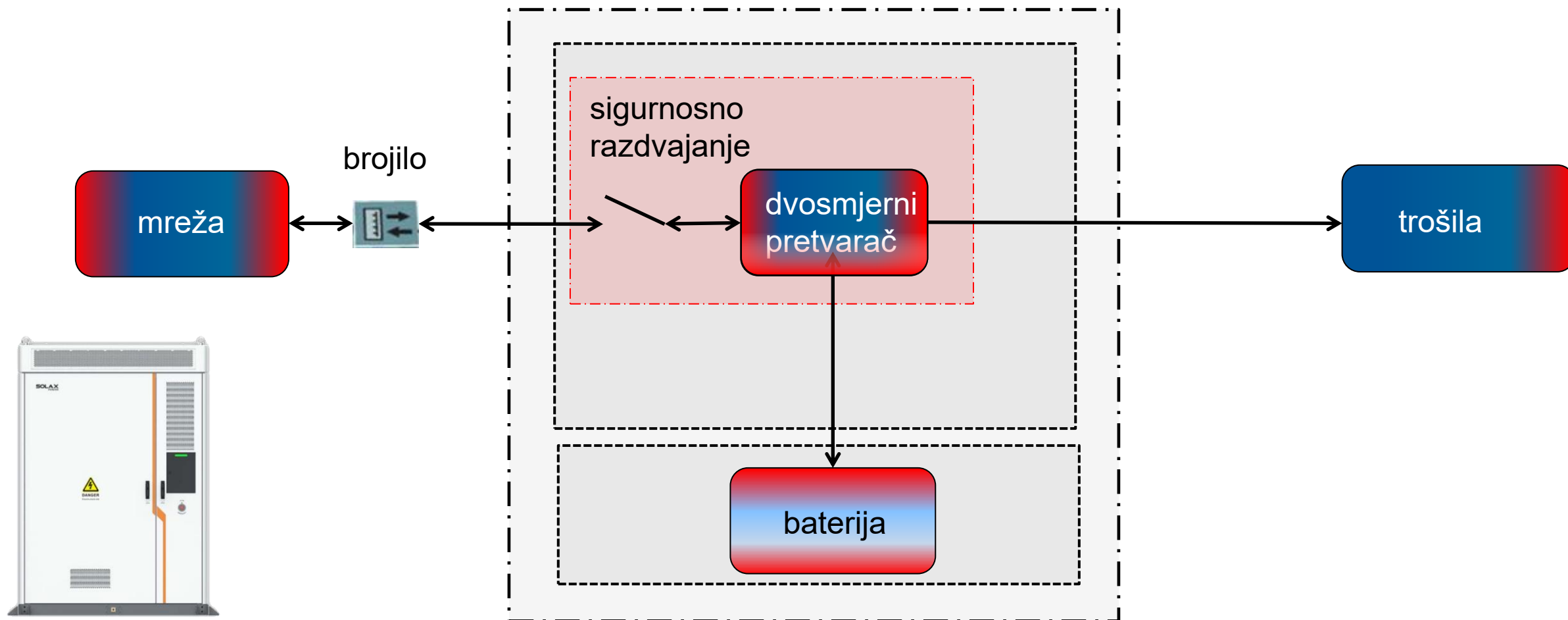
- trošila 1 imaju uvijek napajanje
- manji sustav: pretvarač, baterija, cijena

Izvedbe hibridnog sustava



- trošila imaju uvijek napajanje uz kratkotrajnu beznaponsku pauzu
- sustav pokriva sva trošila

Pohrana mrežne energije za odgođeno korištenje



Trene: 100 -125 kW, 200 kWh

Fotonaponski otočni sustavi - priručnik

7. prošireno izdanje



Fotonaponski otočni sustavi - priručnik

7. prošireno izdanje

640 stranica

90 članaka

besplatan

12.000 komada

NOVO!

Kabel

▀ Krivo mjesto za štednju



Konektori

▀ Krivo mjesto za štednju



Konektori



▀ Krivo mjesto za štednju

Norma iz 2020 ne definira izmjere konektora!

Norma zahtijeva ispitivanje konektora uvijek u paru, dakle uvijek od istog proizvođača!

Konektori

■ Krivo mjesto za štednju

PV connector product liability excluded

As market leader, and with over 360 GW connected electrical power within the PV industry, Stäubli hereby draws your attention to the existing regulations and standards and emphasizes the fact that our PV connector portfolio (i.e. Original MC4 and MC4-Evo 2) may not be mated with products from other PV connector manufacturers.

The responsibility for any damage and liability for any claims resulting from negative effects of the described interconnection lies exclusively with the person or entity that has recommended or performed such misuse of our products. Stäubli may not be held liable for any damage resulting from such actions.

Sincerely,

Stäubli Electrical Connectors AG
Allschwil, Switzerland on March 25, 2021



Matthias Schuerch
Head of Global Product Management
Alternative Energies



Joachim Hirmke
Head of Engineering Alternative Energies

Konektori

■ Krivo mjesto za štednju

RC62: Recommendations for fire safety with PV panel installations

The Joint Code of Practice for fire safety with photovoltaic panel installations, with focus on commercial rooftop mounted systems

5.7.4 Mixing of PV DC connectors from different manufacturers should be avoided, and all panel connections should use the connector(s) recommended by the panel manufacturer. System operators should hold spare PV DC connectors compatible with the PV installation for future maintenance, to avoid the potential use of incorrect PV DC connectors. Internationally documented PV fire loss data identifies faults with DC connectors and DC isolators as primary causes of fire. Therefore, it is essential to use the correct PV DC connector, assembled according to the manufacturer's guidelines, with the correct length and thickness of exposed DC cable, the correct crimping tool for the connector pins, and the correct torquing of the connector cable glands. IEC 62548:2016 and IEC 60364-7-712:2017 explicitly do not allow the connection of DC connectors from different manufacturers.

Konektori

■ Krivo mjesto za štednju

Ako odrežete konektor s modula gubite garanciju modula!



Kliješta

■ Krivo mjesto za štednju



Pritezanje spojeva – moment ključ

■ Krivo mjesto za štednju

3,4 Nm



Zaštita od požara

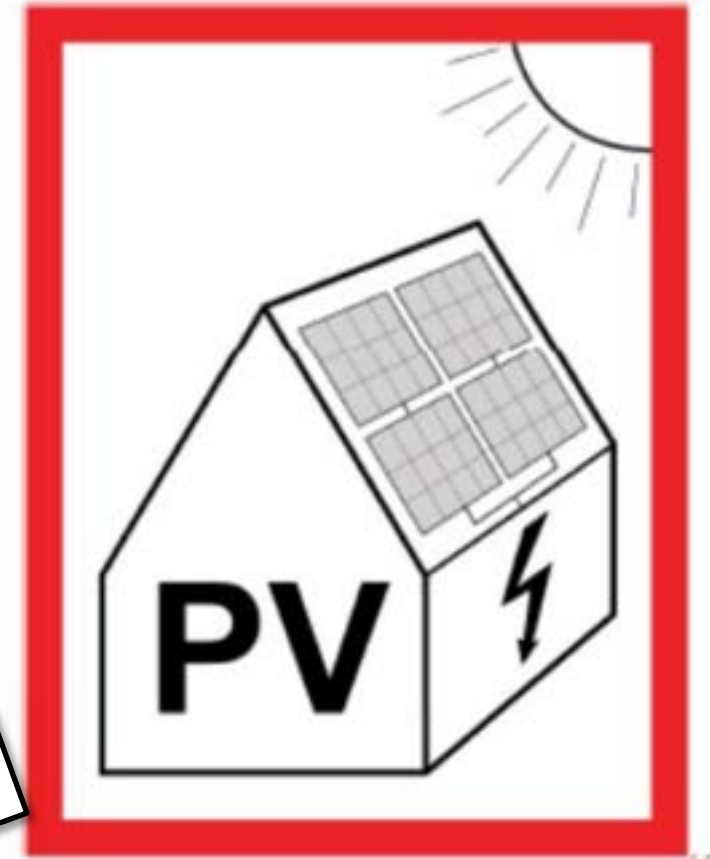
- za slučaj intervencije vatrogasaca poduzeti
- organizacijske mjere
- građevinsko-izvedbene mjere
- tehničke mjere



Zaštita od požara – organizacijske mjere

- označivanje kućnog priključka i glavnog razdjelnika zgrade sigurnosnom oznakom
- pregledni planovi postrojenja za vatrogasce
- preventivni pregledi

SZPV 512



Zaštita od požara – građevinsko izvedbene mjere

- vatrootporno polaganje DC kabela u metalne cijevi ili ispod 15 mm mineralne žbuke
- DC kabele izvan zgrade
- izmjenjivač izvan zgrade



SZPV 512

Zaštita od požara – tehničke mjere

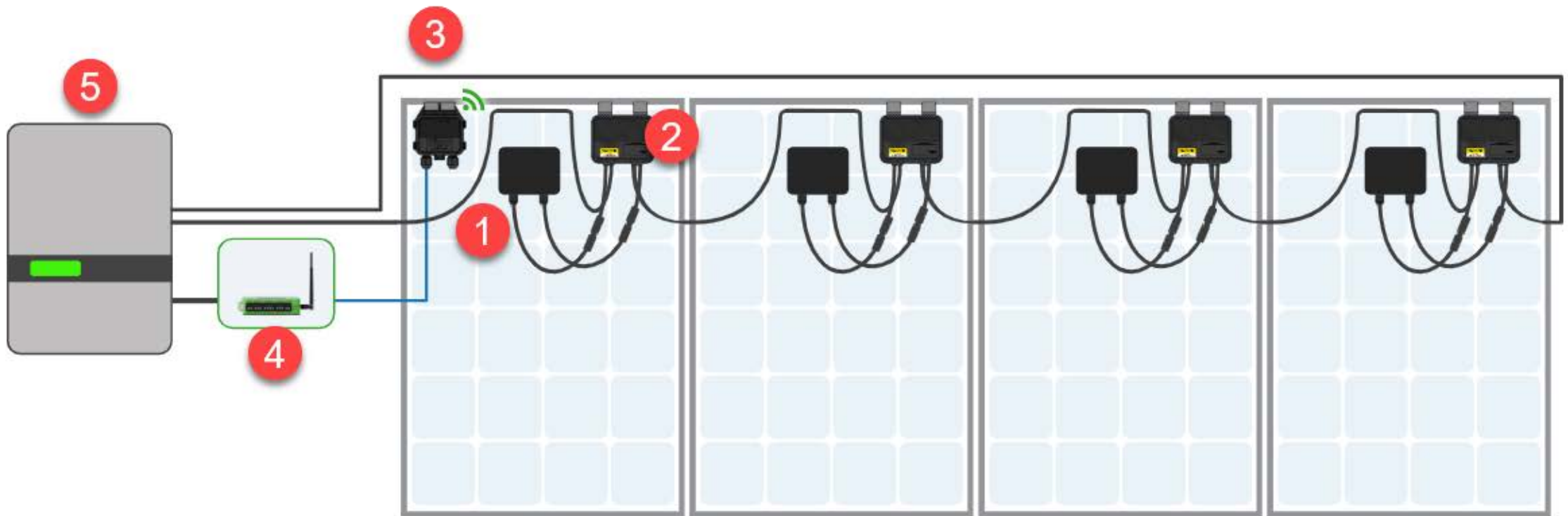
- isključenje DC kabela na krovu
- daljinski iskllop sa zaštitom od ponovnog uklopa

SZPV 512



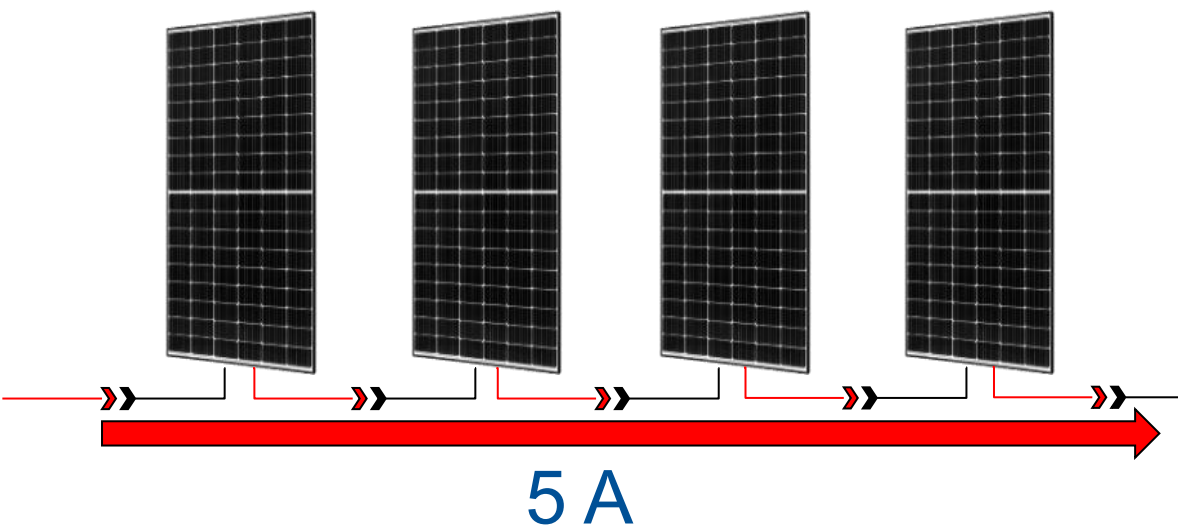
Zaštita od požara i optimizatori

- rastavljanje modula u nizu „optimizatorom”

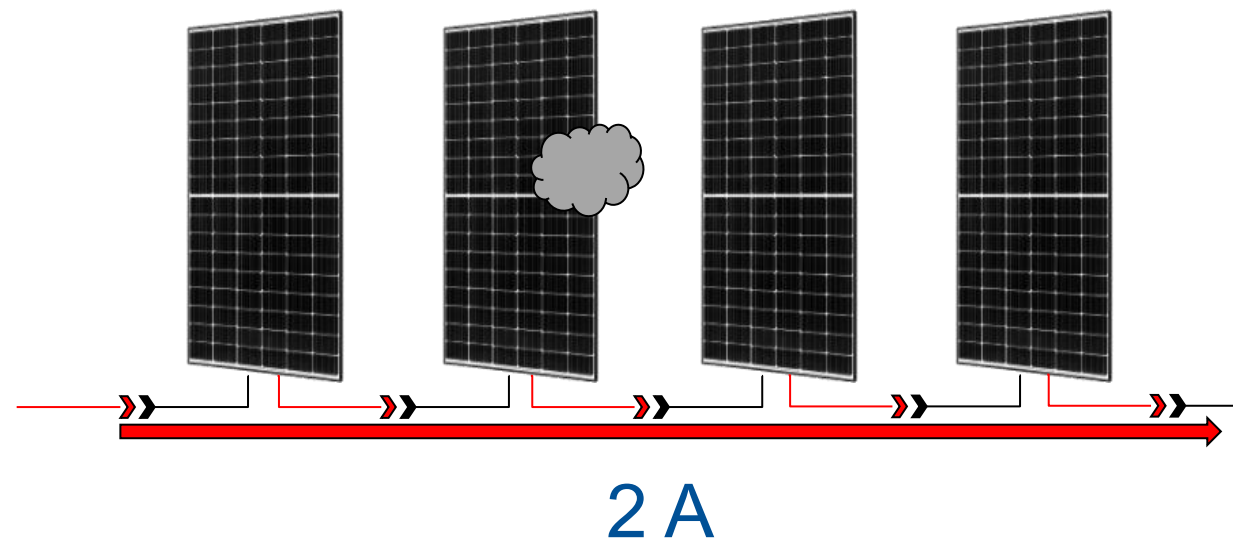


Zašto optimizatori?

bez zasjenjenja

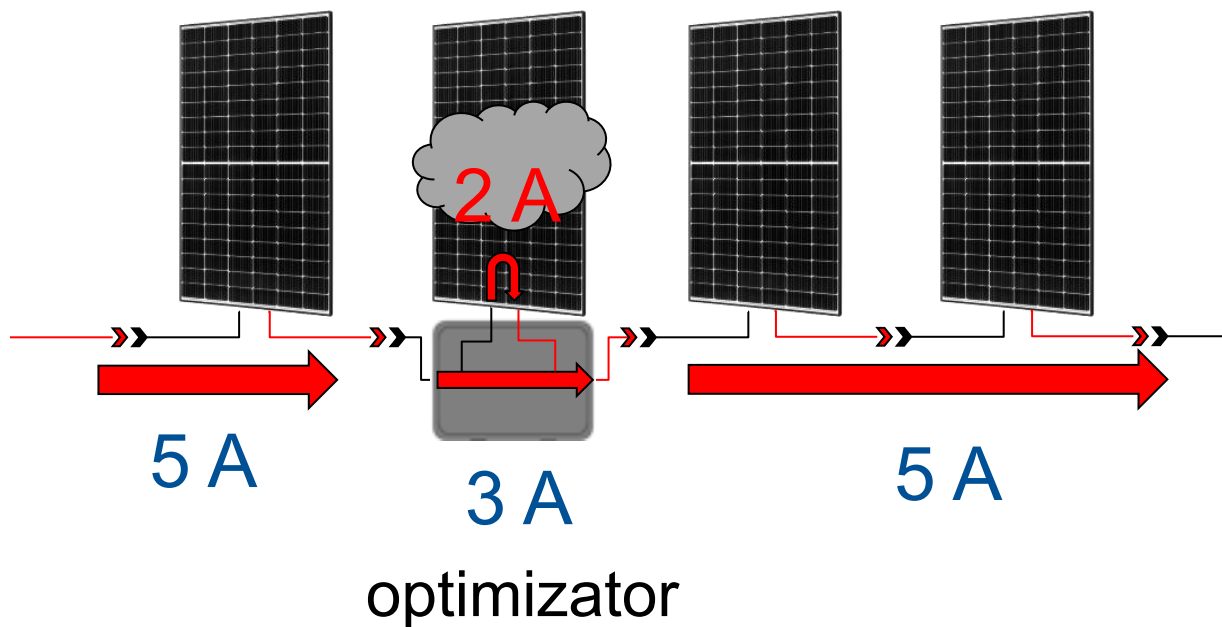


sa zasjenjenjem



Zašto optimizatori?

sa zasjenjenjem uz optimizator



Zaštita od struje munje i prenapona

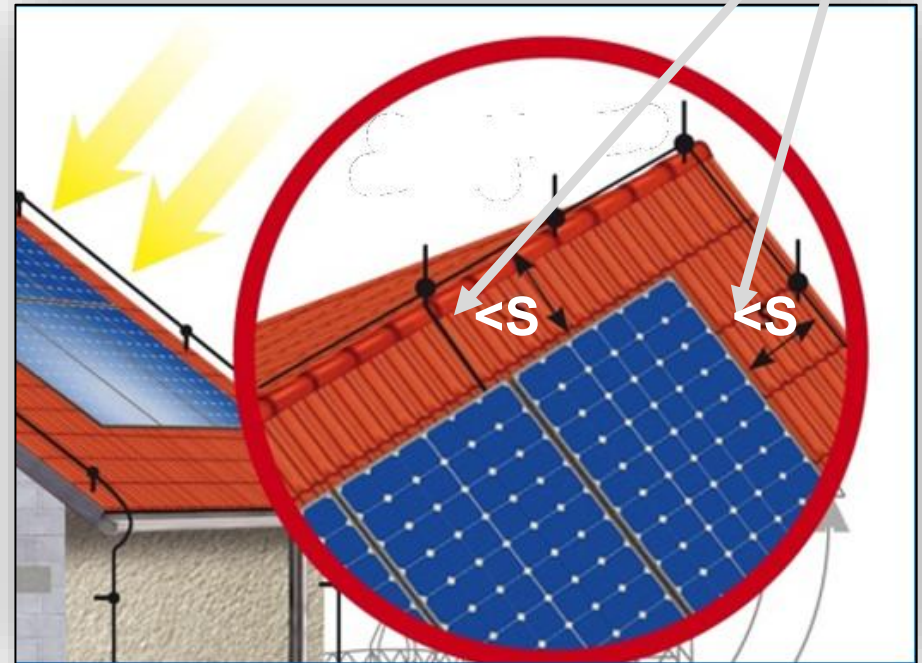
U DC krugu

- odvodnici struje munje
- odvodnici prenapona
- kombinirani odvodnici
- DC zaštitne kutije



Zaštita od struje munje

- uz vanjski sustav zaštite od struje munje i ne pridržavanje sigurnosnog razmaka
- odvodnik struje munje



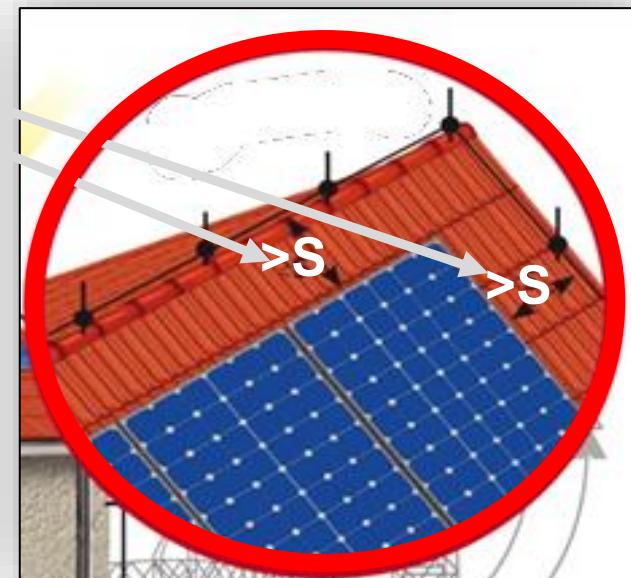
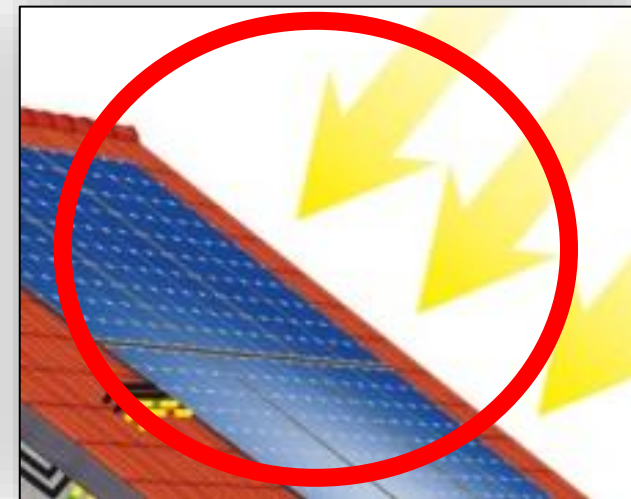
Zaštita od struje munje

- spoj potkonstrukcije s odvodima sustava zaštite od struje munje
- najmanji presjek: bakar 16 mm² za izjednačivanje potencijala i vođenje struje munje



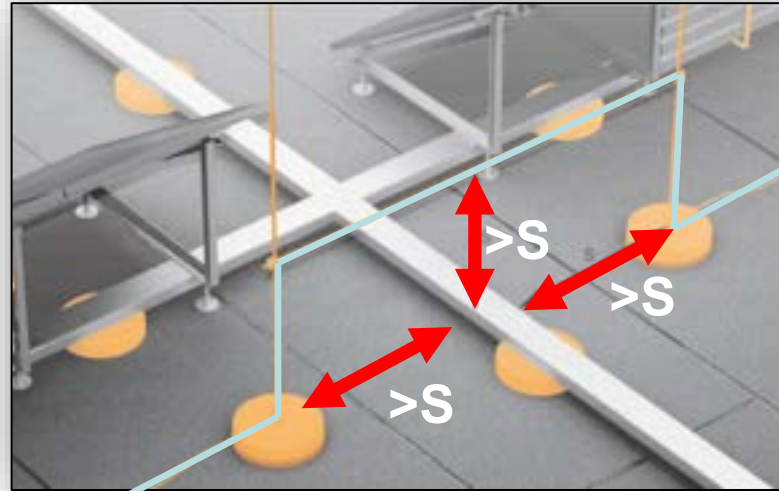
Zaštita od prenapona

- bez vanjskog sustava zaštite od struje munje
- uz vanjski sustav za zaštitu od struje munje uz pridržavanje sigurnosnog razmaka
- odvodnici prenapona
- najmanji presjek: bakar 6 mm² za izjednačivanje potencijala



Zaštita od struje munje

■ prema normi



■ praksa

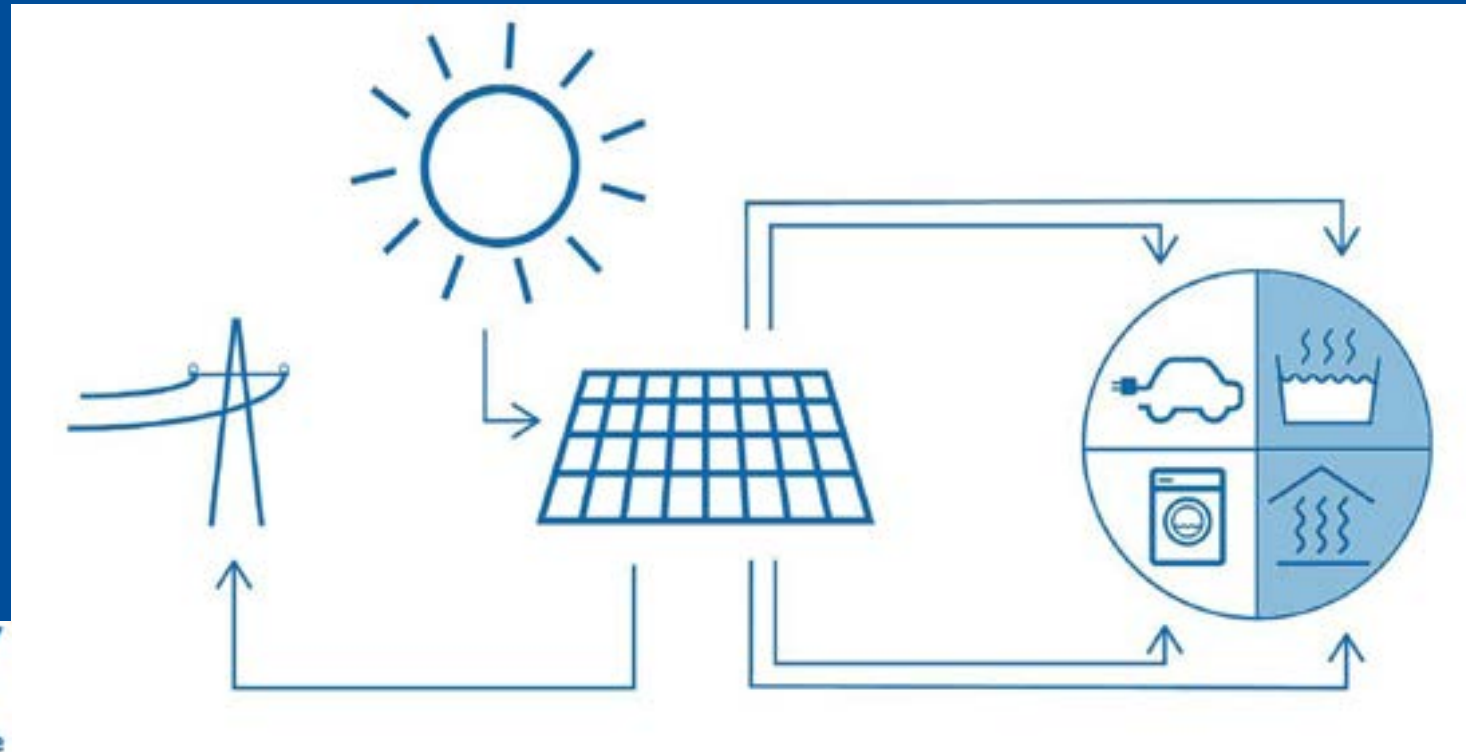


Radionica



Posebne primjene fotonaponskih elektrana:

- priprema tople vode



Posebne primjene FN elektrana



■ otočna FN elektrana samo za pripremu tople vode



■ mrežna FN elektrana + priprema tople vode

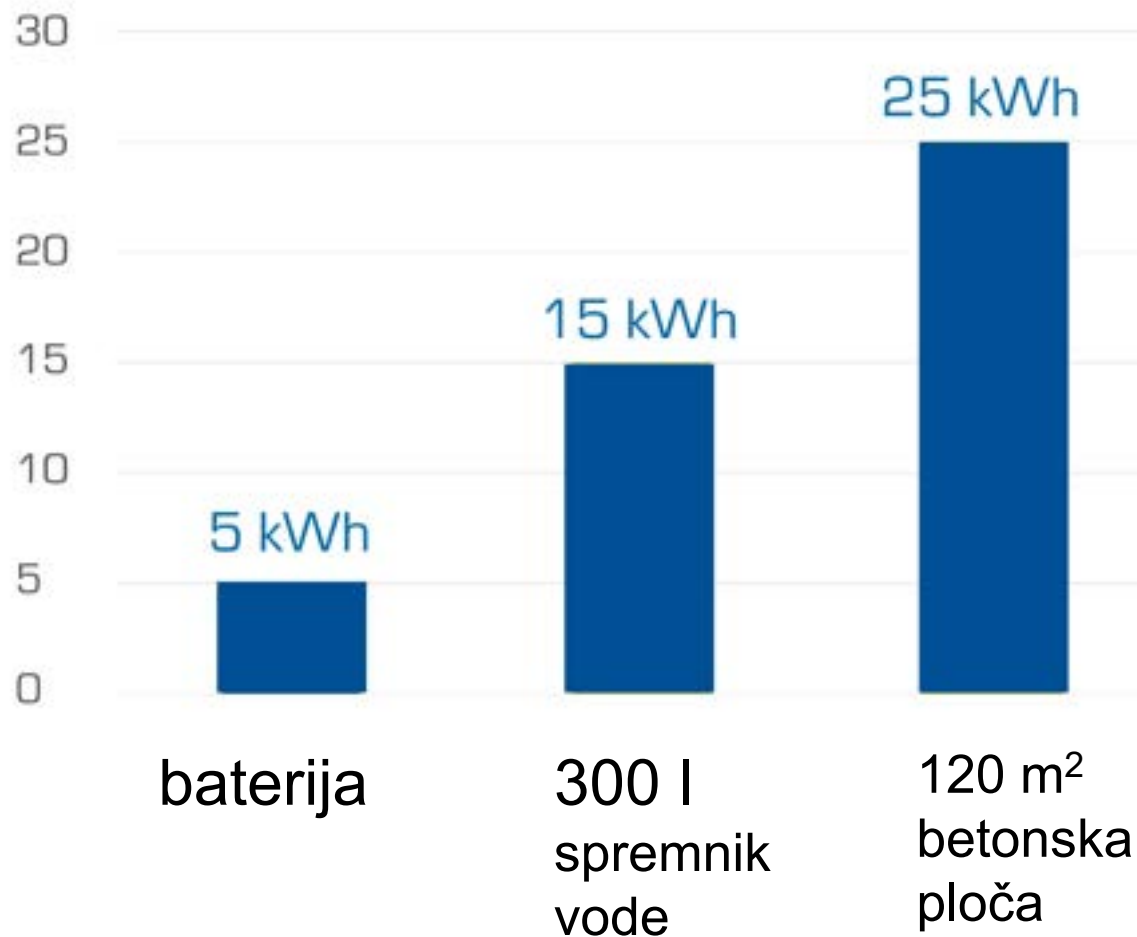


■ mrežna FN elektrana + priprema tople vode + grijanje

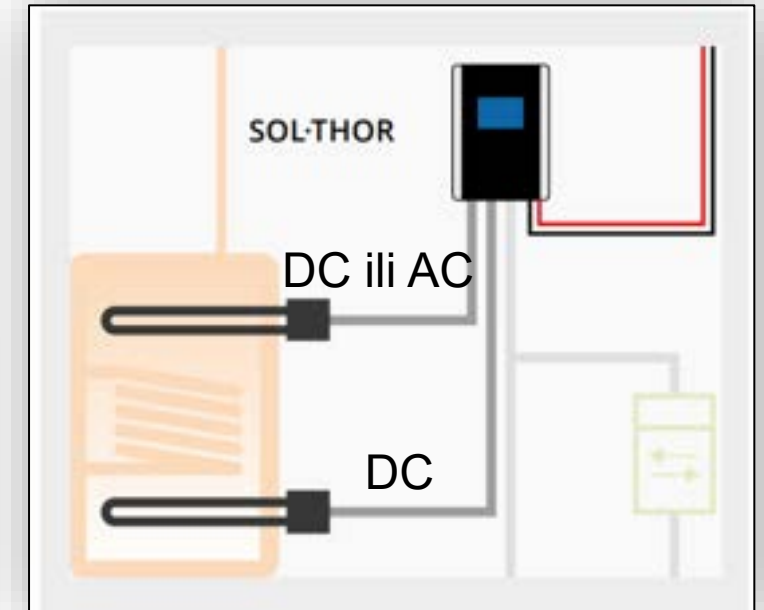
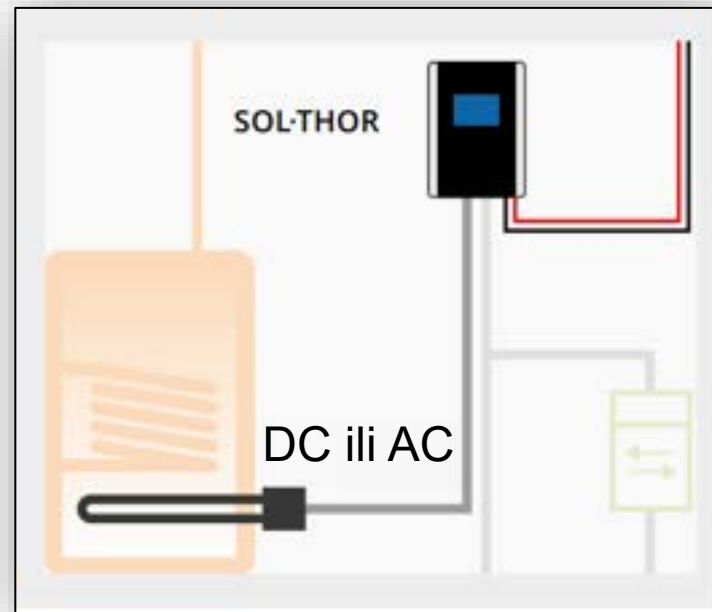
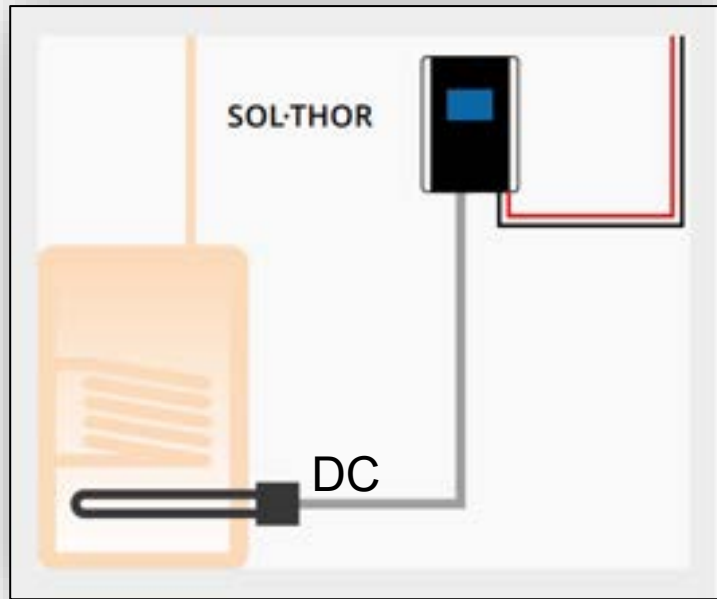
Gdje spremati energiju ?

1l vode za povišenje temperature 1 °C traži 1.16 Wh
300 l spremnik od 12 °C do 55 °C traži 15 kWh

kapacitet
spremnika

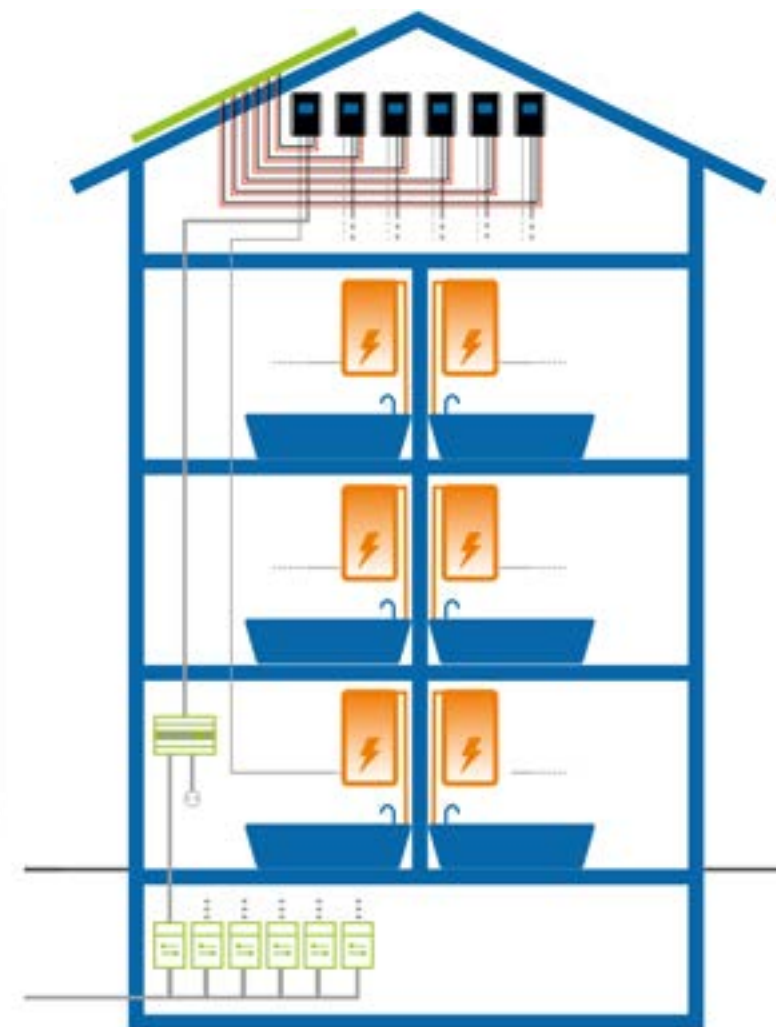
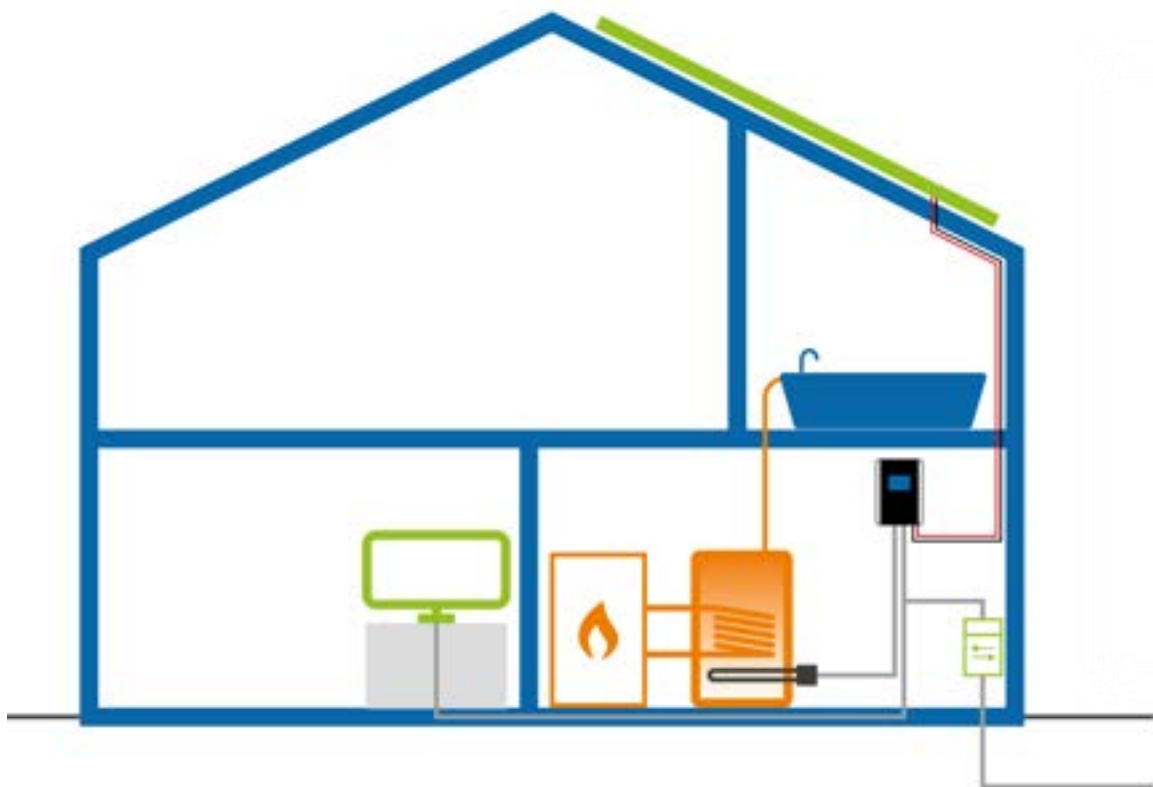


Priprema tople vode



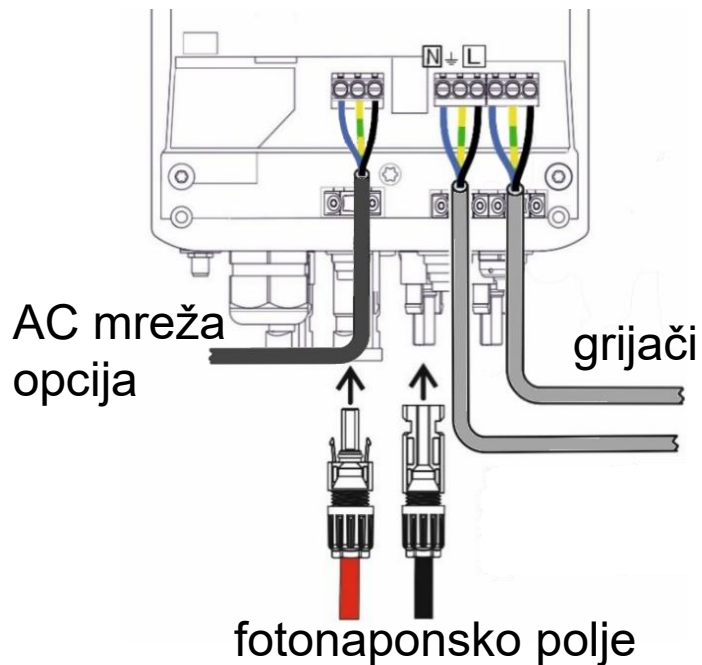
Za jedan ili za više stanova

SOL•THOR

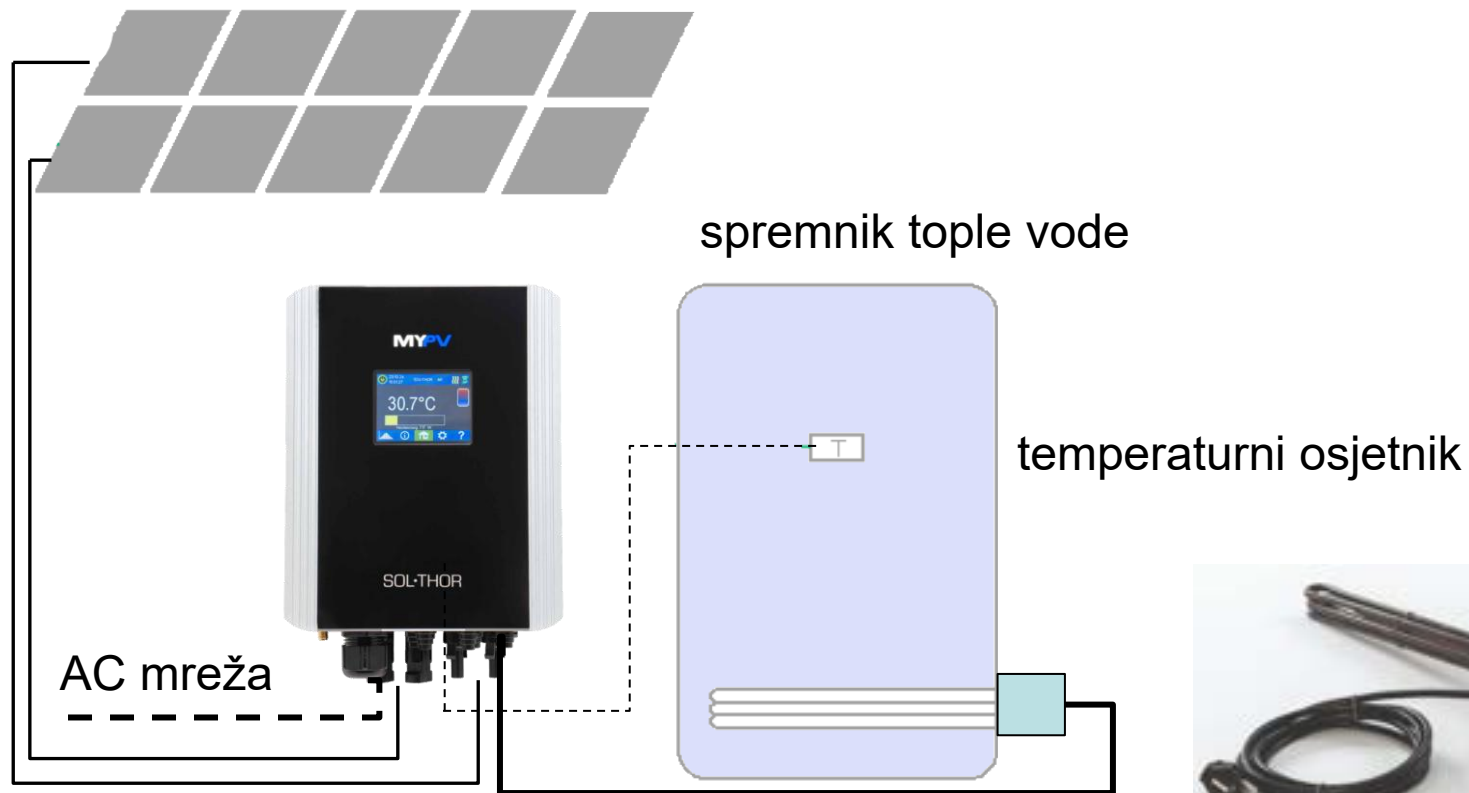


Priključci i tipičan spoj

SOL•THOR

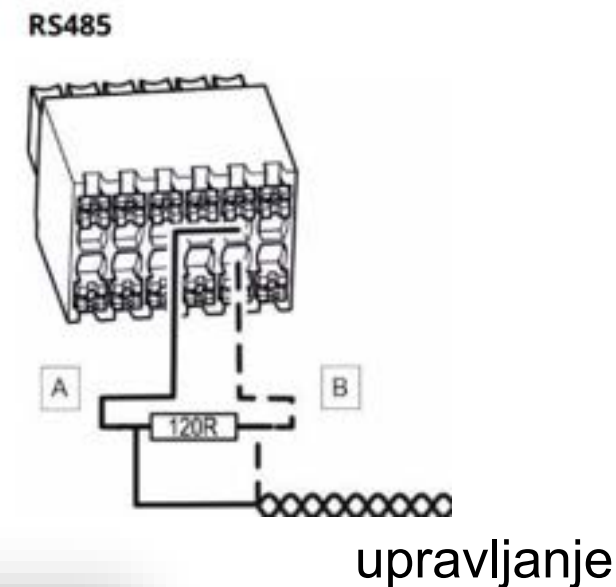
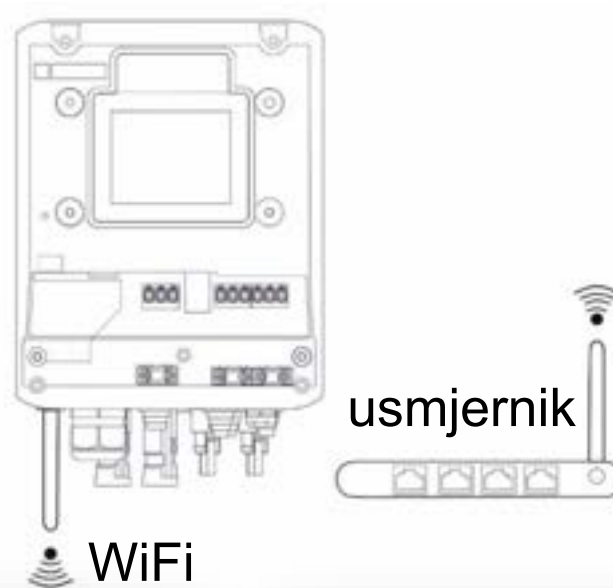
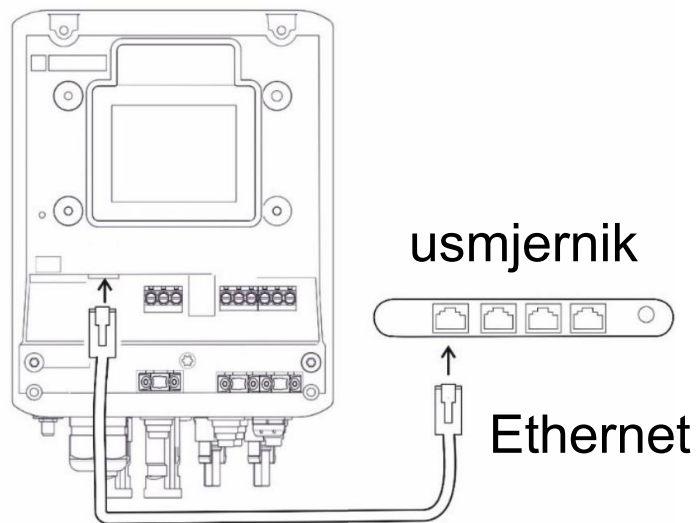


fotonaponsko polje, dva niza



grijač:
- sa sigurnosnim termostatom
- snaga $\leq 3,6$ kW

Komunikacija

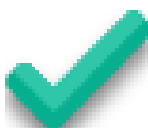


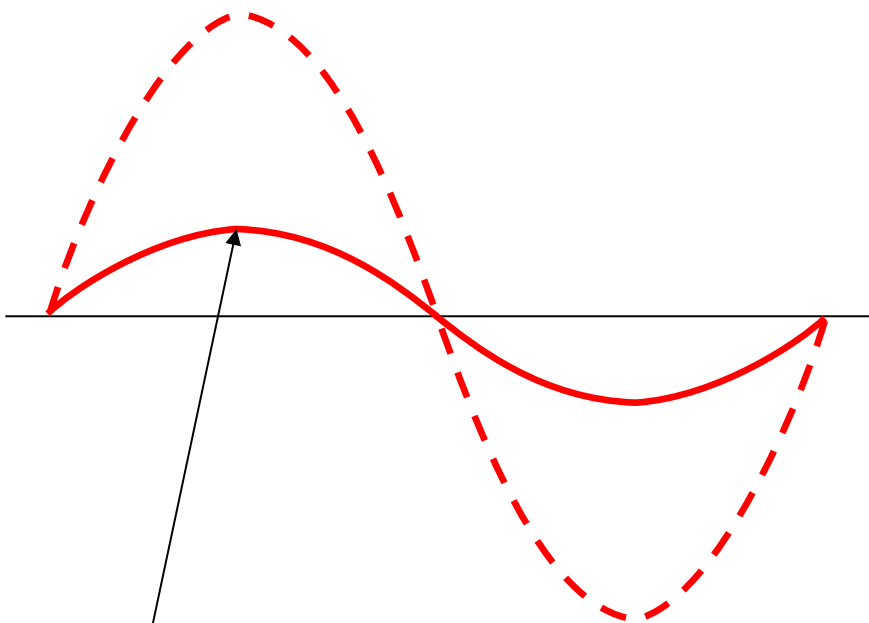
Značajke

- bez spoja i utjecaja na AC mrežu, bez dozvola
- radi i sa komercijalnim zidnim bojlerima
- 2 FN niza, ulazna struja do 26 A, ulazni napon 30 do 230 VDC
- mreža ili dodatni izvor može dogrijavati vodu
- bez cijevi, vode, antifrizu, smrzavanja, pucanja cijevi, curenja
- faktor snage 1
- godišnje uštede veće od 50% troška pripreme tople vode

- mrežna FN elektrana > 5 kWp
- umjesto predaje viška u mrežu grije se voda

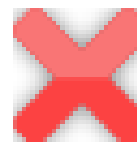


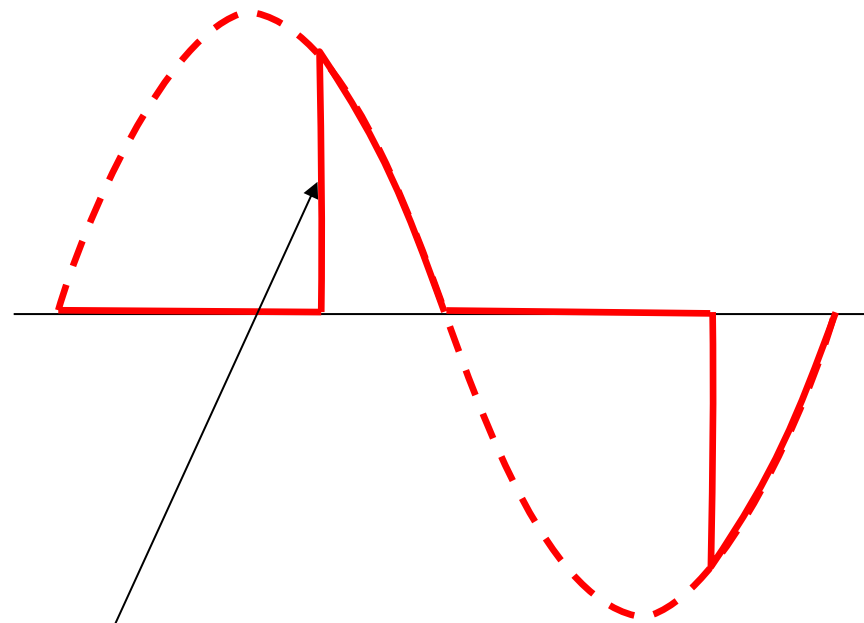
AC ELWA 2 



pri 25% snage:

- sinusni valni oblik struje iz mreže
- THD s mrežne strane $< 3\%$

tiristorski regulator snage 

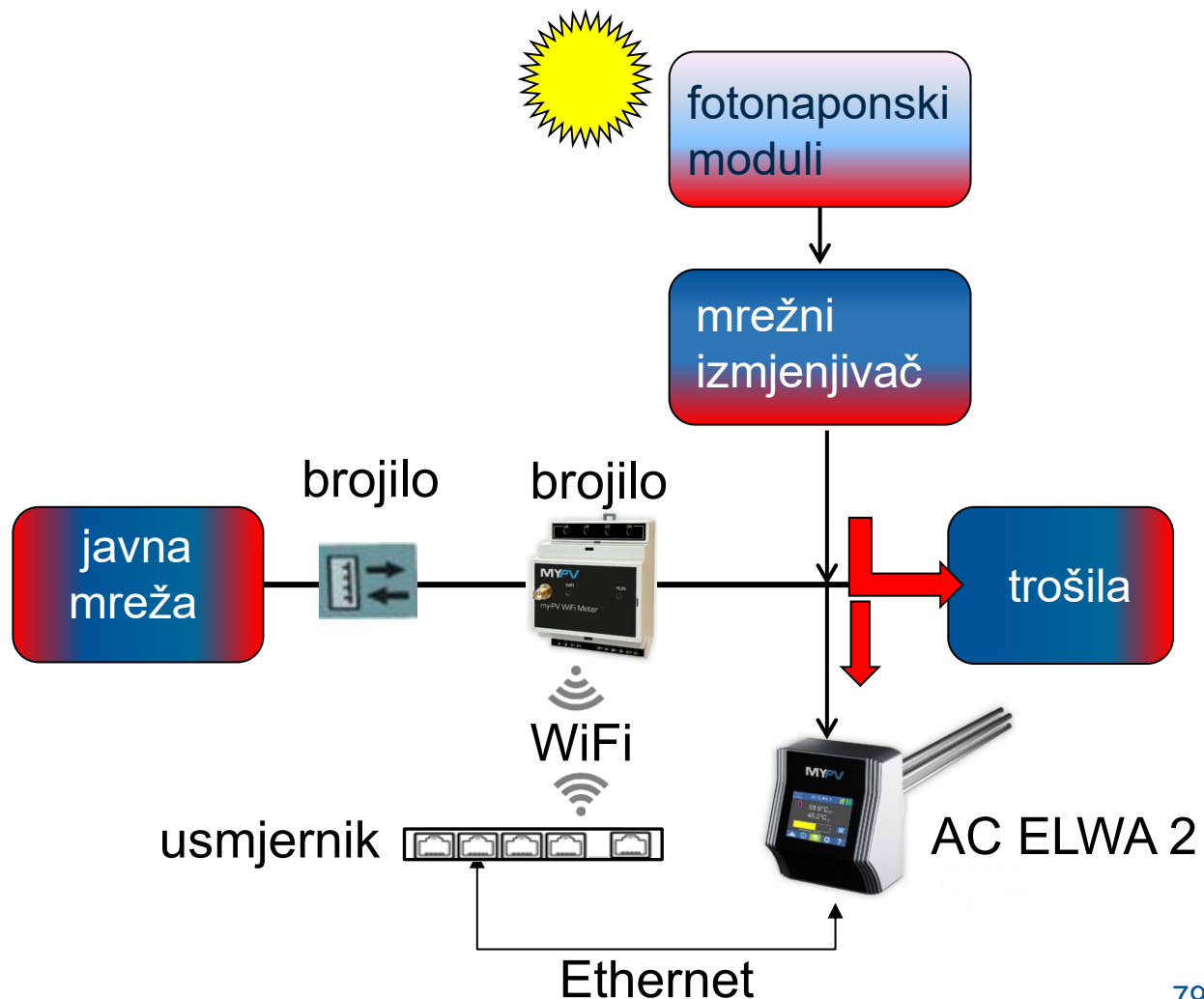
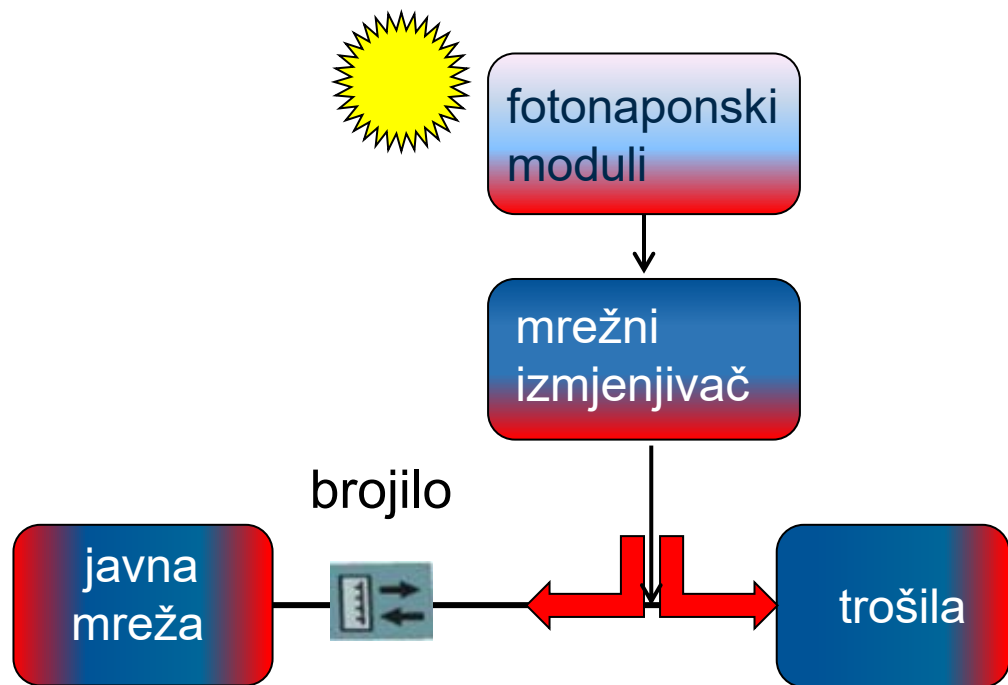


pri 25% snage:

- nesinusni valni oblik struje iz mreže
- viši harmonici, prljanje mreže

Mrežni sustav + AC ELWA 2

AC ELWA 2

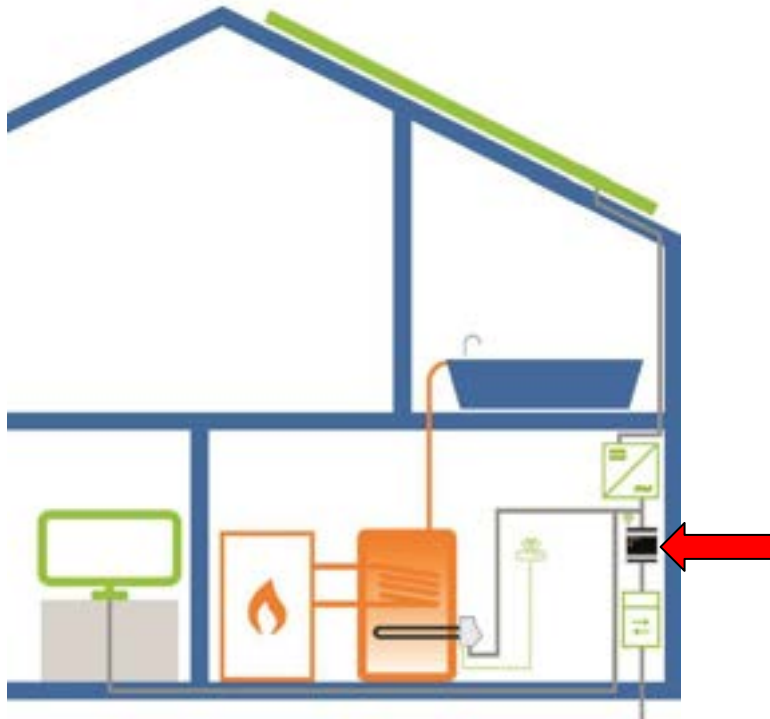


Tipične primjene

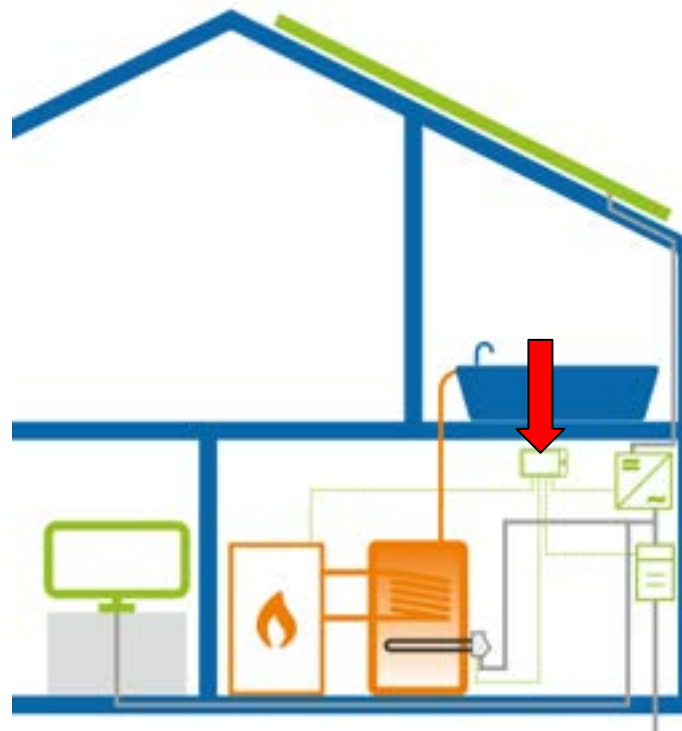
AC ELWA 2



■ mrežne FN elektrane



■ Smart home sustavi



■ FN sustavi s baterijskim spremnikom

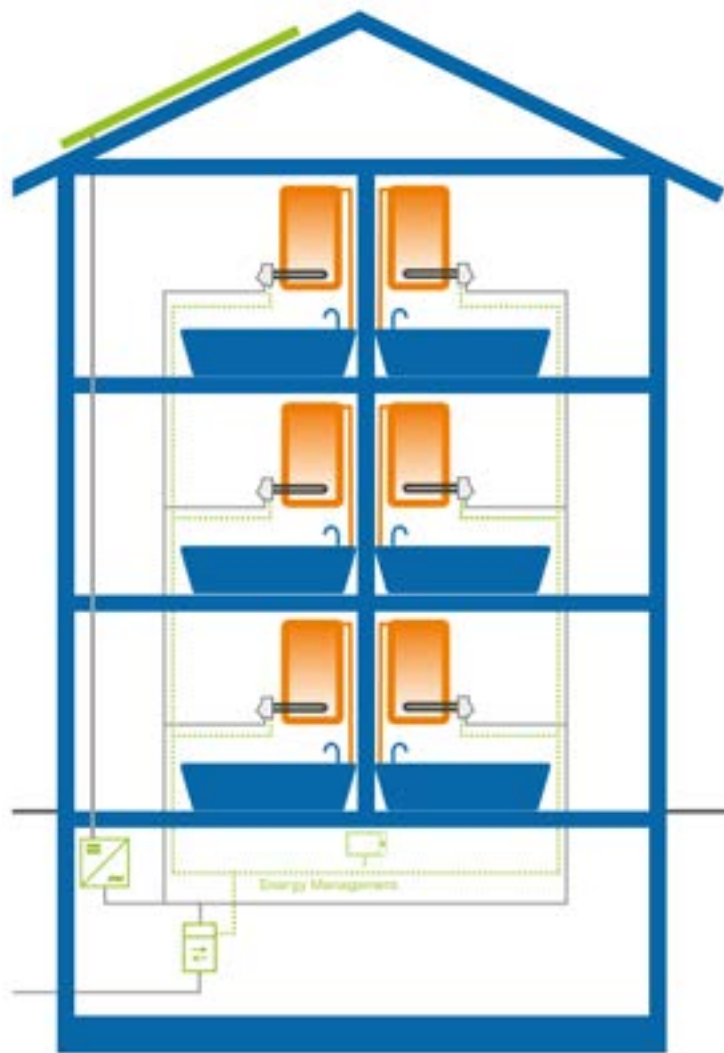


I za više stanova

AC ELWA 2

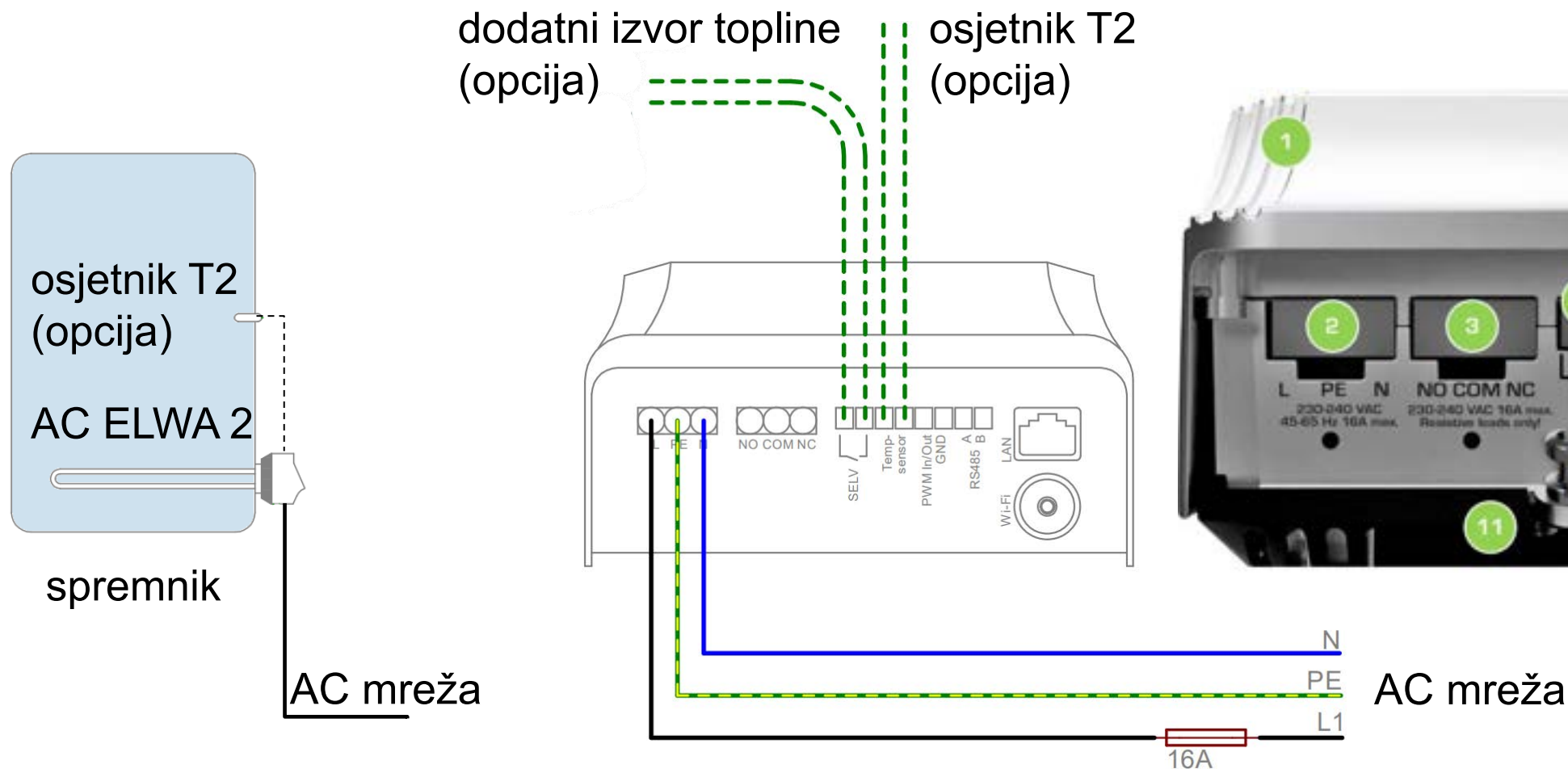


- bez gubitaka razvoda tople vode
- osigurana higijena spremnika



Tipičan spoj za jedan grijač

AC ELWA 2



Tipičan spoj za dva grijača (3 + 3 kW)

AC ELWA 2

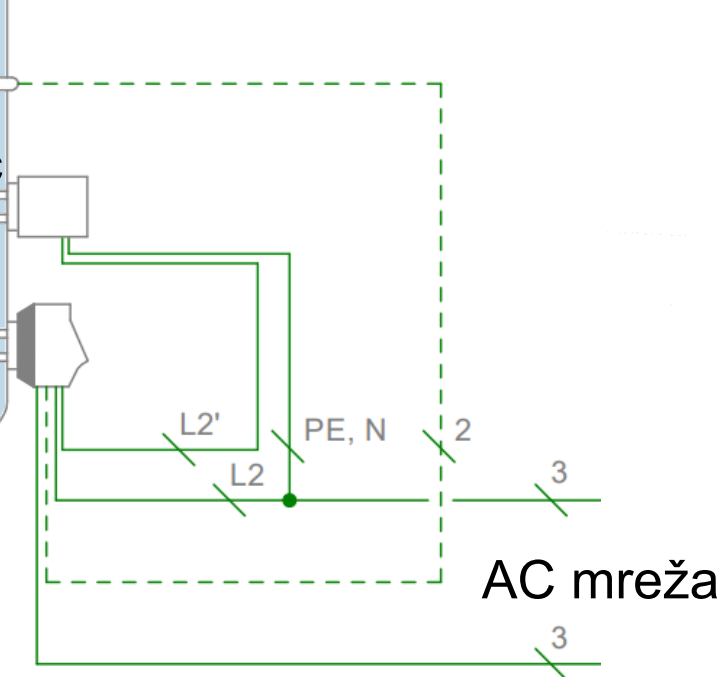


osjetnik T2

dodatni grijač

AC ELWA 2

spremnik

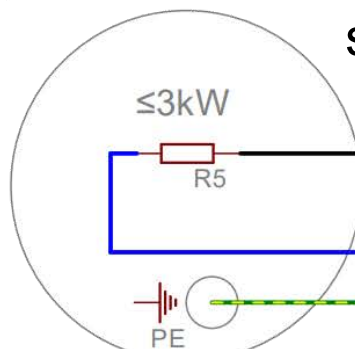


AC mreža

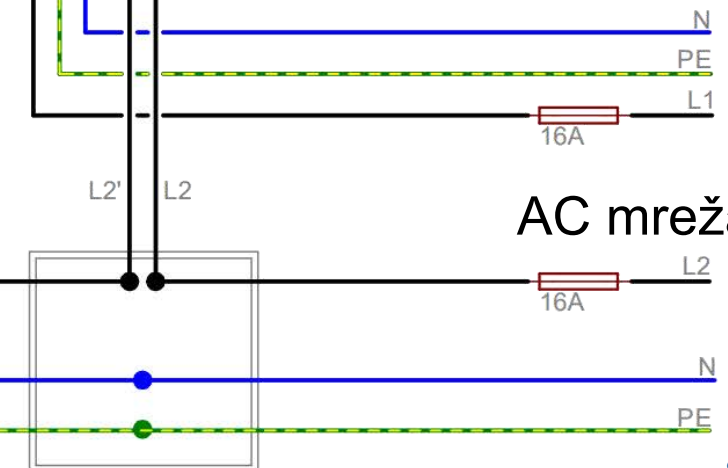
sigurnosna sklopka

termostat

dodatni grijač



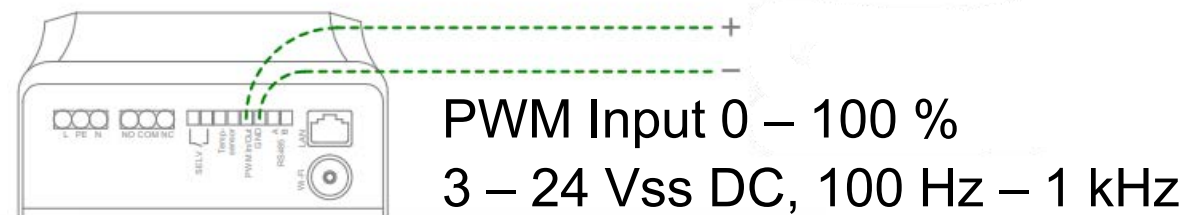
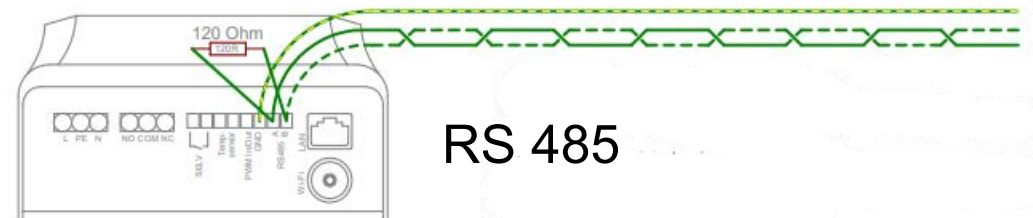
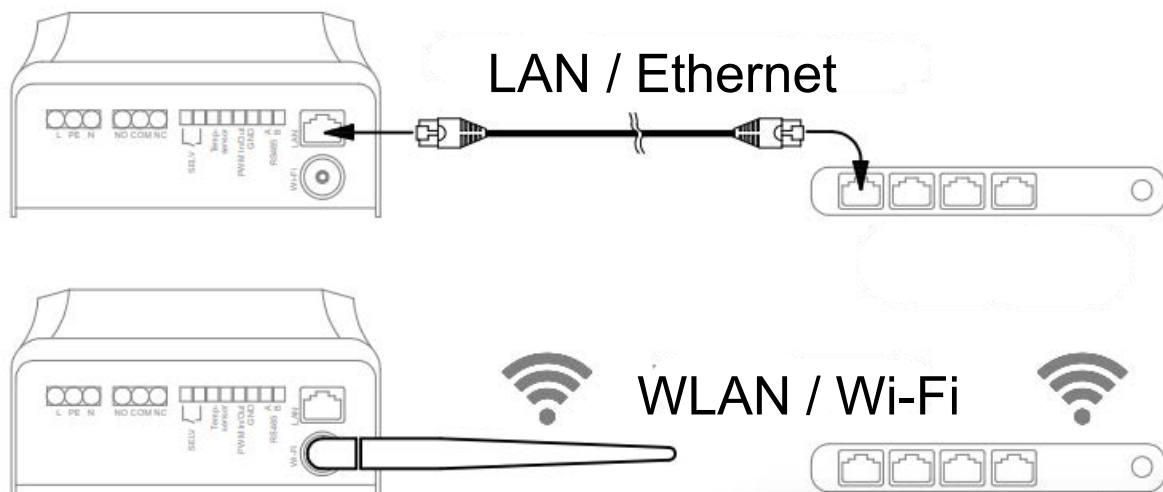
osjetnik T2 (obavezan)
dodatni izvor topline (opcija)



AC mreža

Komunikacija

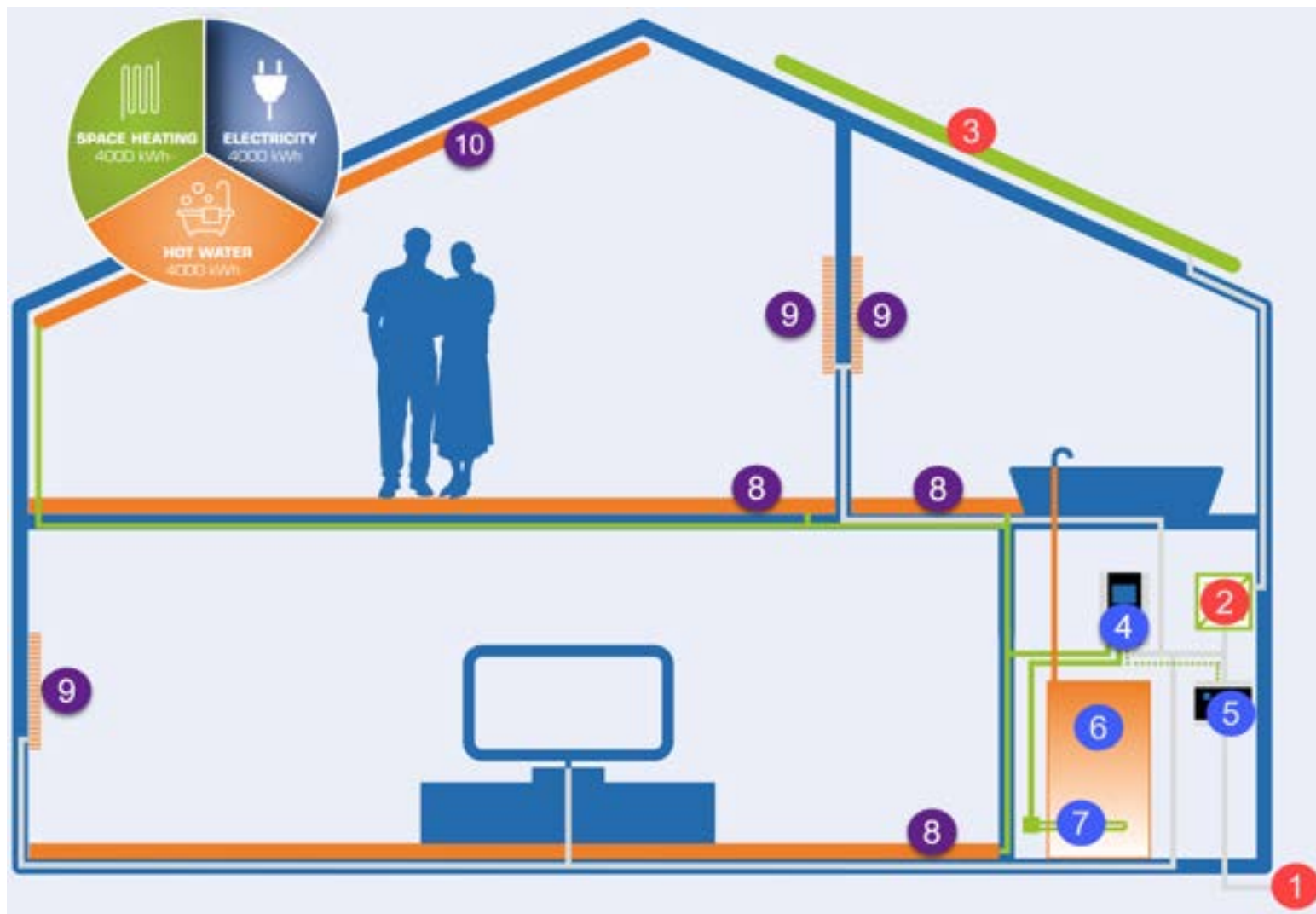
AC ELWA 2



My PV Cloud servis

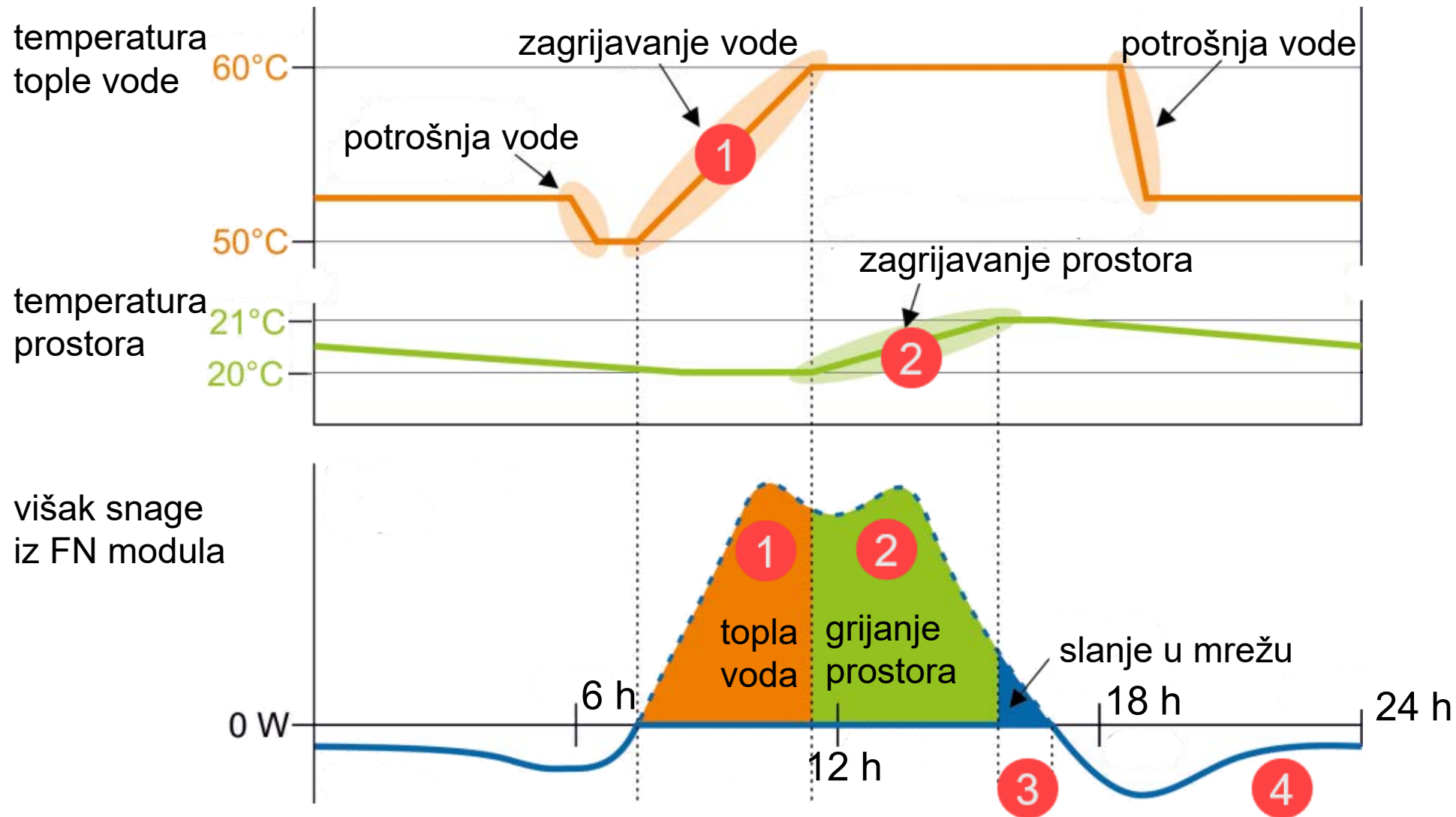


Tri sustava zajedno!



- mrežna FN elektrana
- priprema tople vode
- grijanje prostora
- 2 strujna kruga trošila





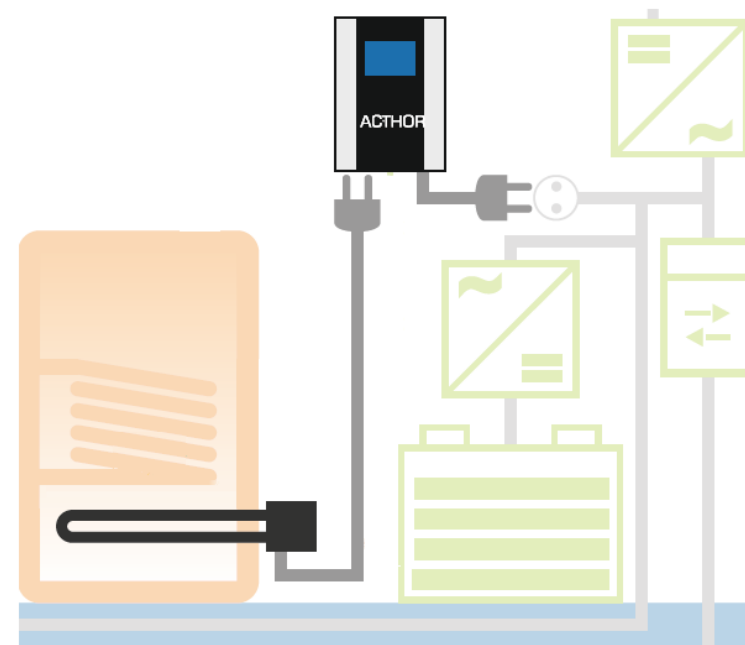
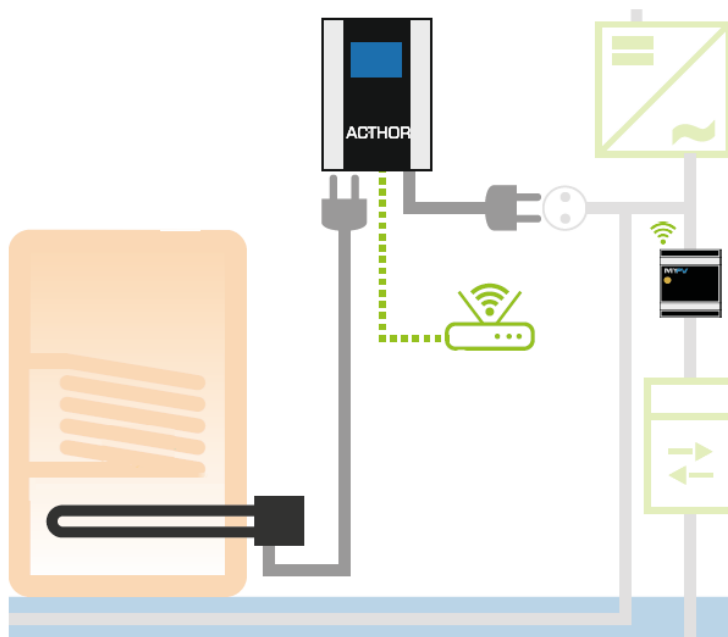
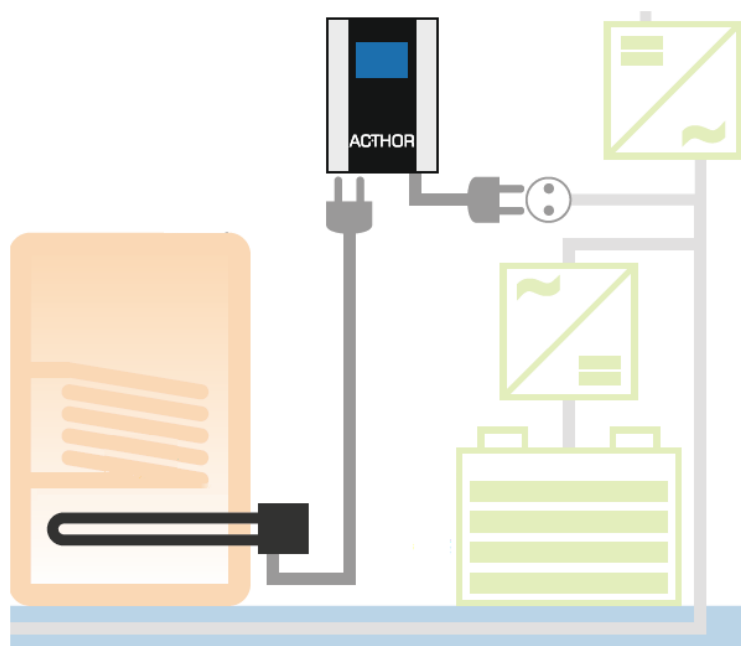
Primjenjivost

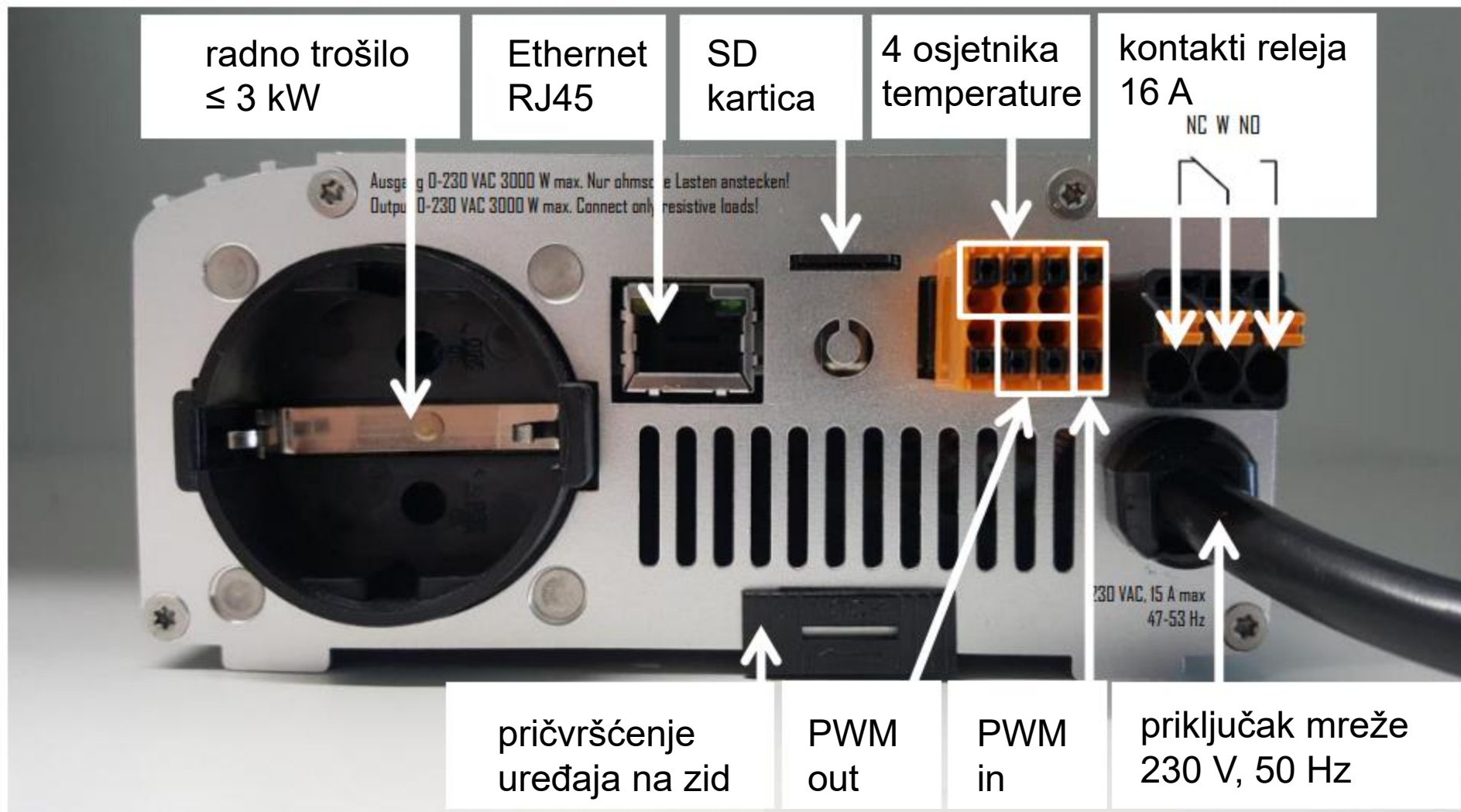


■ otočni FN sustav

■ mrežni FN sustav

■ mrežni FN sustav s baterijom

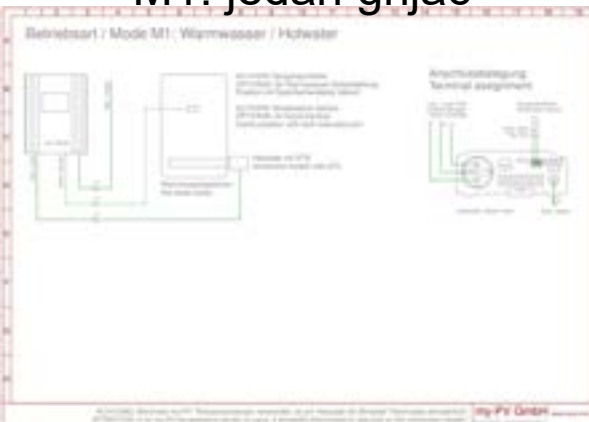




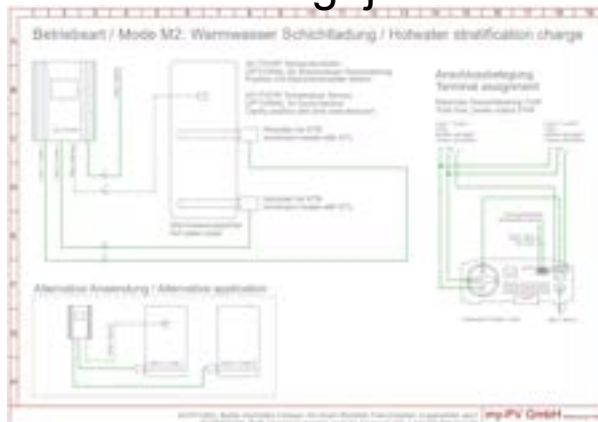
Tipični primjeri spoja

ACTHOR

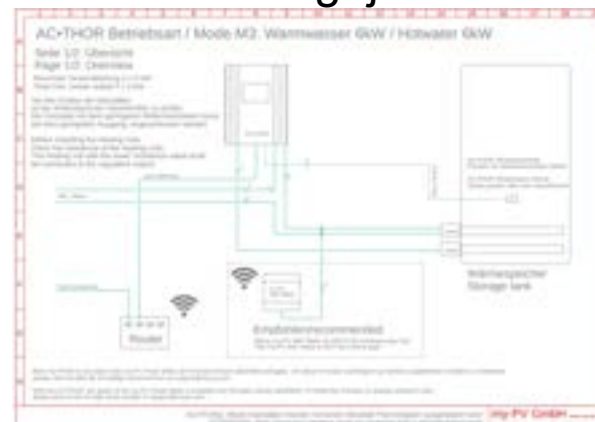
M1: jedan grijač



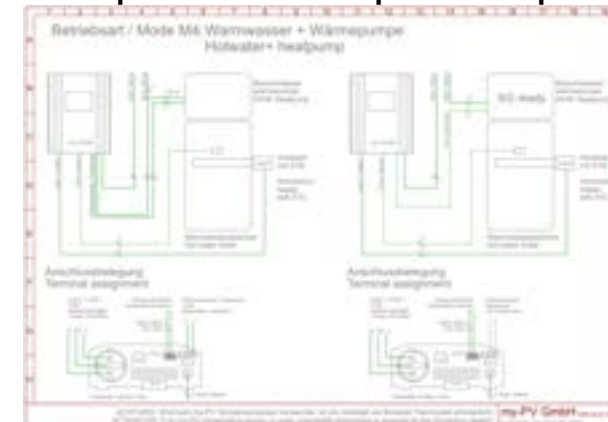
M2: dva grijača



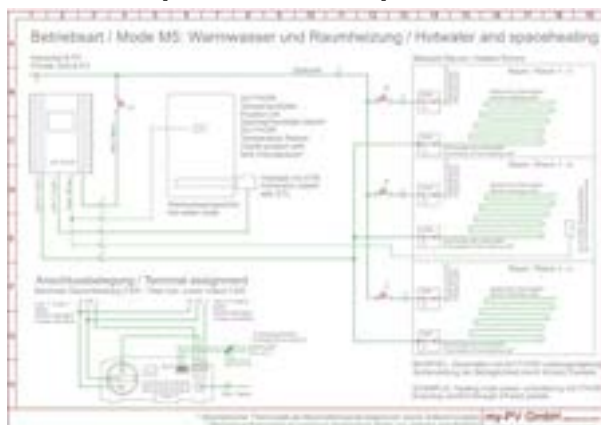
M3: dva grijača



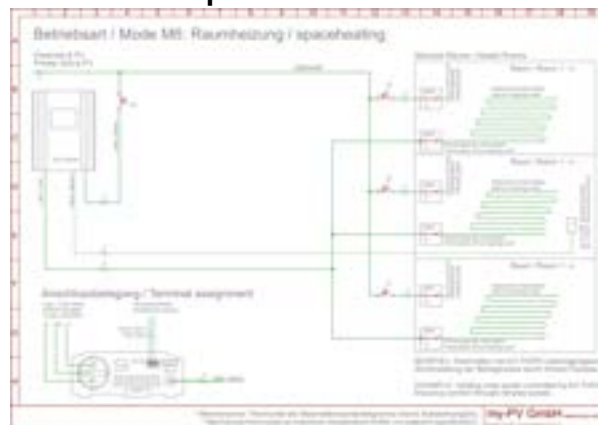
M4: topla voda i toplinska pumpa



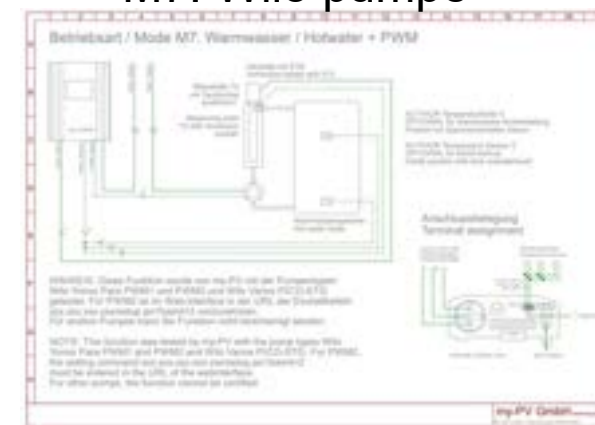
M5: topla voda i prostor



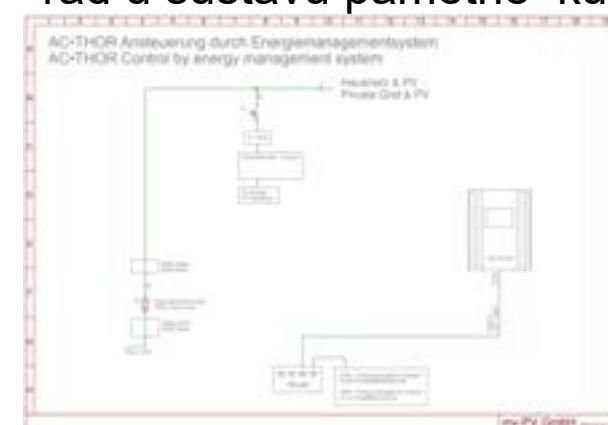
M6: dva prostora



M7: Wilo pumpe

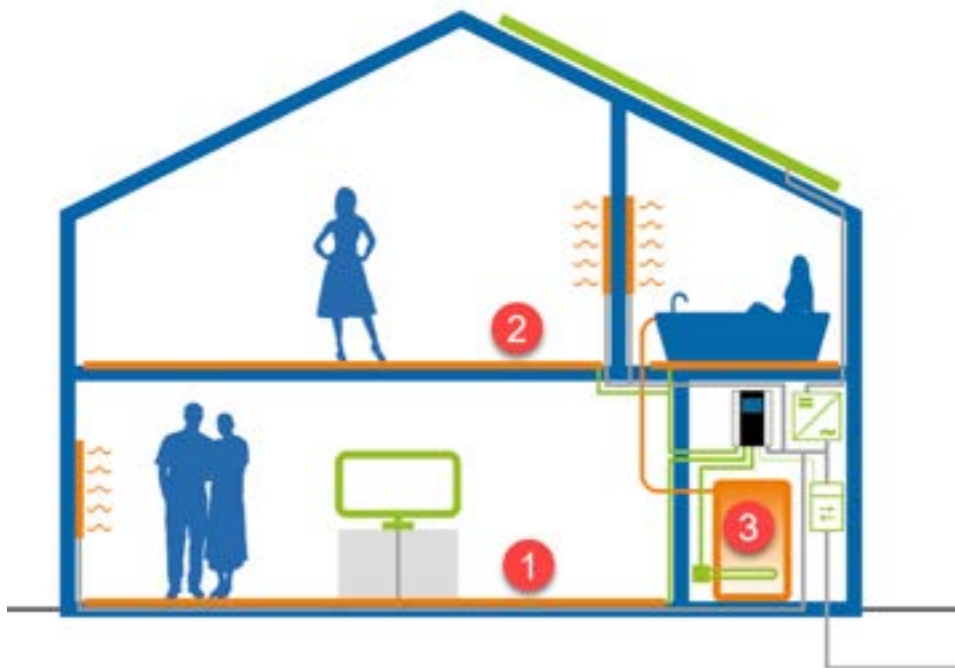


rad u sustavu pametne kuće



■ izvedba s trofaznim napajanjem: AC THOR 9s

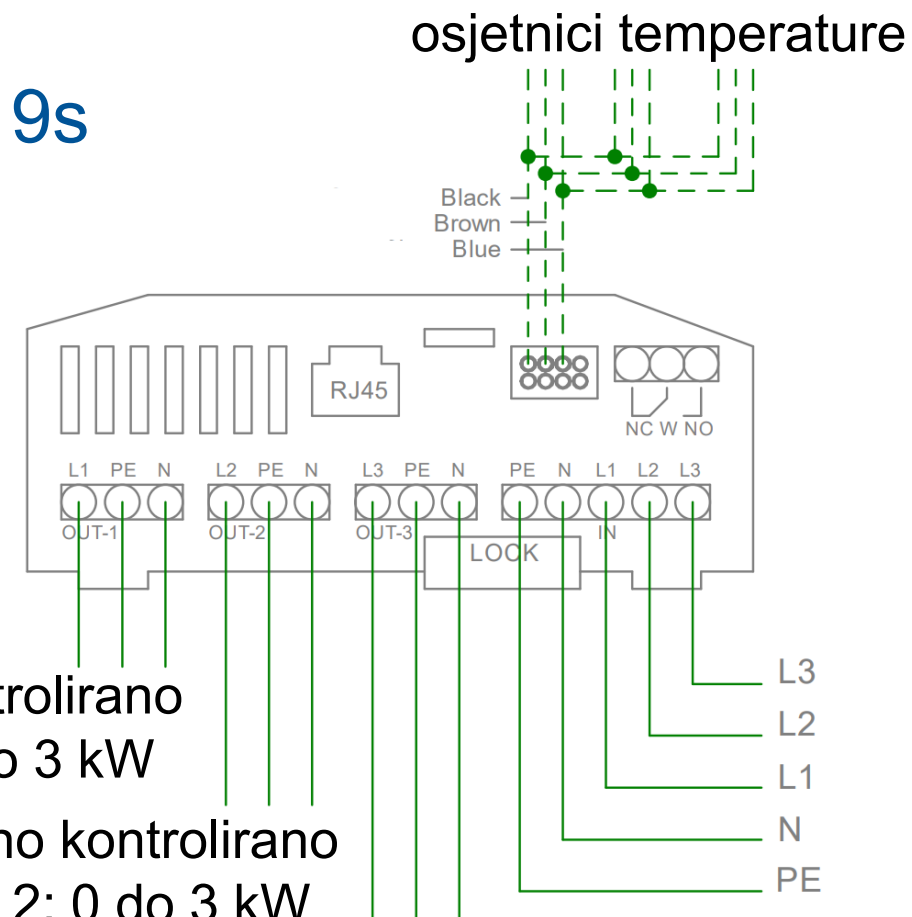
■ kontrolirana snaga je 3 x 3 kW grijača



linearno kontrolirano
trošilo 1: 0 do 3 kW

linearno kontrolirano
trošilo 2: 0 do 3 kW

linearno kontrolirano
trošilo 3: 0 do 3 kW

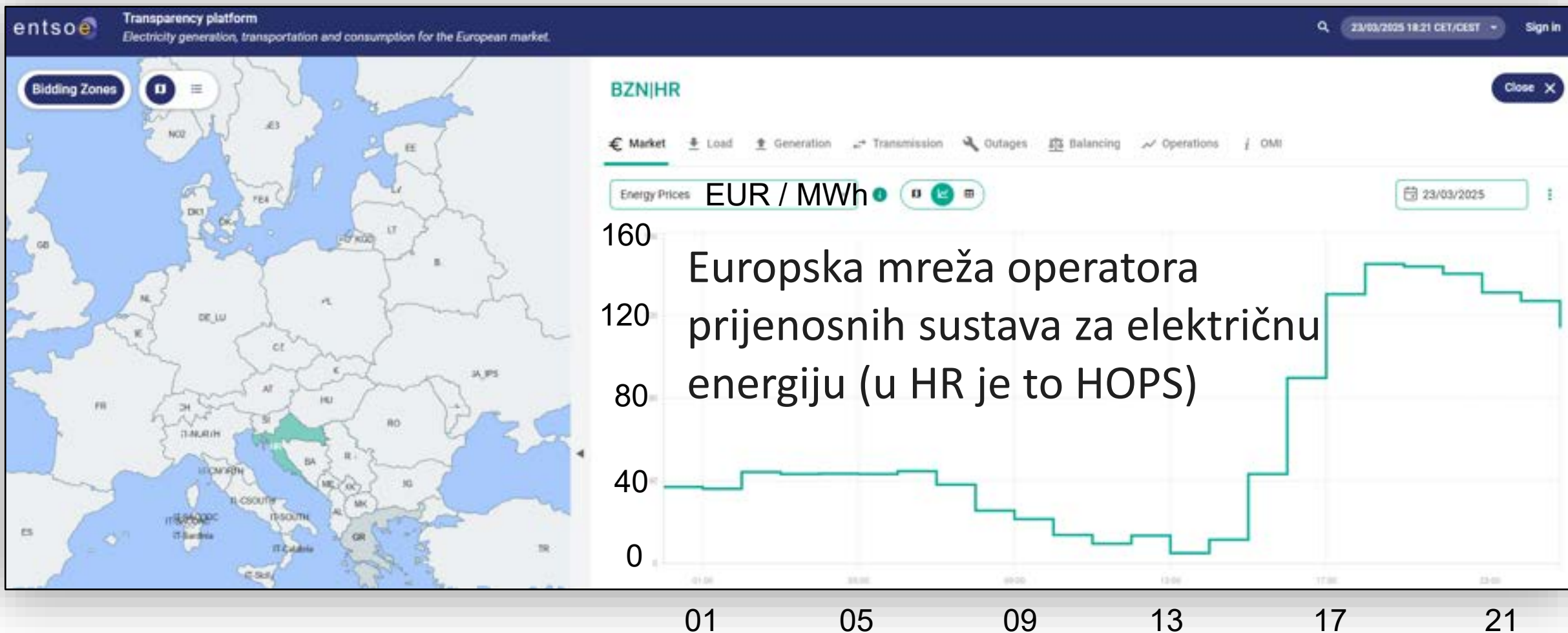


Priprema za dinamičku cijenu energije

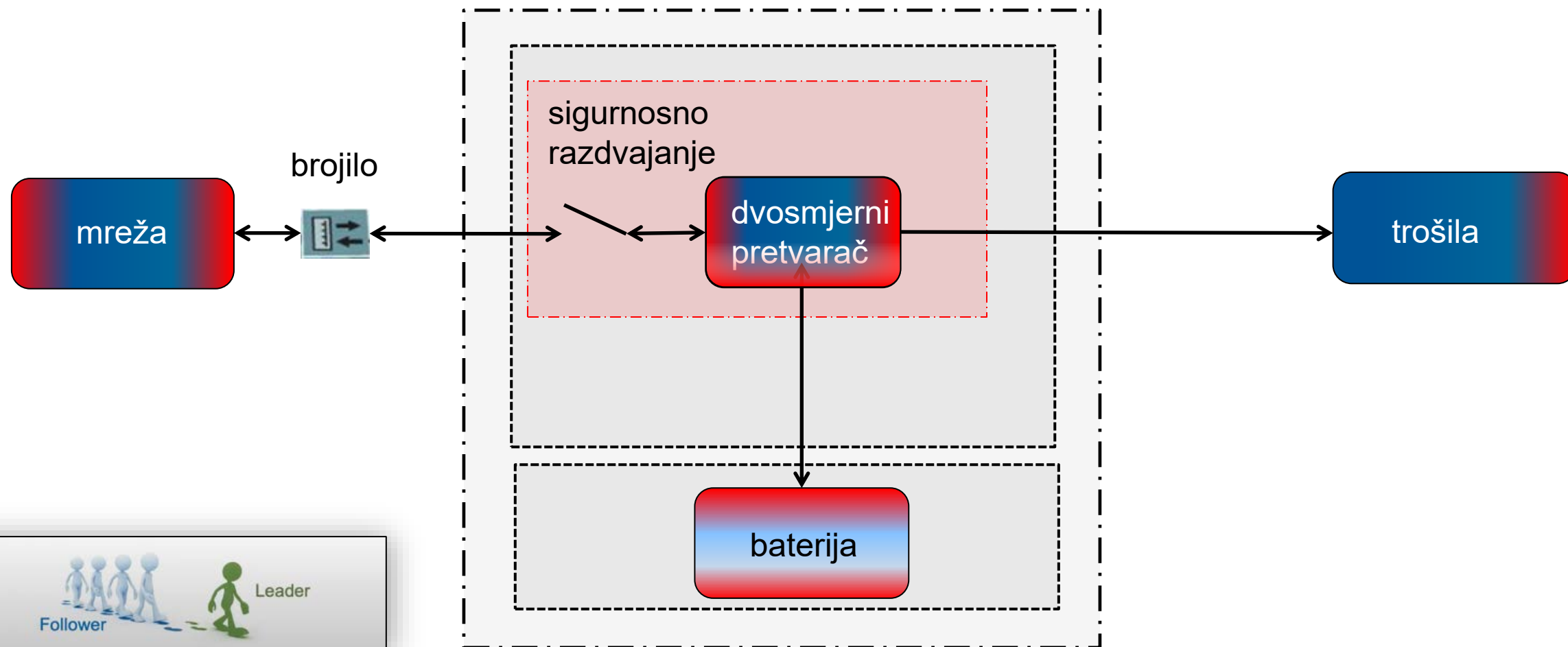
Dinamička cijena energije

■ <https://newtransparency.entsoe.eu/market/energyPrices>

ENTSO-E, the European Network of Transmission System Operators for Electricity, is the association for the cooperation of the European transmission system operators (TSOs). The 39 member TSOs, representing 35 countries, are responsible for the secure and coordinated operation of Europe's electricity system, the largest interconnected electrical grid in the world. In addition to its core, historical role in technical cooperation, ENTSO-E is also the common voice of TSOs.



Pohrana mrežne energije za odgođeno korištenje



Običan i „pametan” FN SUSTAV

- „Običan” baterijski sustav ne vodi računa o cijeni energije
- Za „pametan” sustav vrijedi: **kupi jeftino, koristi ili prodaj dok je skupo**
 - bateriju punim:
 - besplatno iz FN modula
 - iz mreže dok je kupovna cijena niska
 - bateriju praznim:
 - u vlastita trošila dok je kupovna cijena visoka
 - ili prodajem u mrežu dok je prodajna cijena visoka

Što mora znati „pametan” sustav?

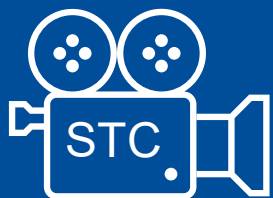
(koji uvažava dinamičke cijene energije)

- cijenu kWh preko ENTSO-E sučelja ili cijene tarifa u danu
- naknade distributera energije
- trošak ciklusa baterije
- predviđanje potrošnje (iz povijesti)
- predviđanje proizvodnje (iz lokacije, iz povijesti i iz vremenske prognoze)

Algoritam *Dynamic ESS* (Victron Energy) sve to uzima u obzir!

MEGONK V1

Maketa
Električno
GOtovo
Neovisne
Kuće



SCHRACK TRENING CENTAR



18 srednjih škola je spremno:

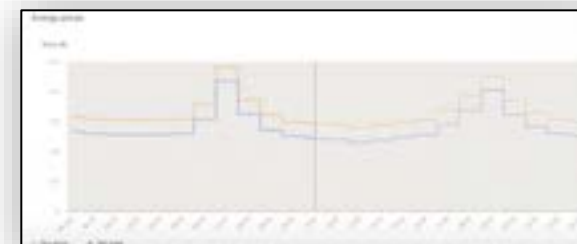
Srednja škola Ludbreg
Industrijsko obrtnička škola Sisak,
Elektrostrojarska škola Varaždin
Strukovna škola Đurđevac
Industrijsko obrtnička škola Slavonski Brod
Srednja škola za elektrotehniku i računalstvo Rijeka
Elektroindustrijska i obrtnička škola Rijeka
Tehničko veleučilište u Zagrebu
Srednja strukovna škola Knin
Elektrotehnička i ekonomska škola Nova Gradiška
Strukovna škola Vice Vlatkovića, Zadar
Srednja škola Dugo Selo
Elektrotehnička i prometna škola Osijek
Obrtna tehnička škola Split
Tehnička škola Županja
Elektrostrojarska obrtnička škola Zagreb
Tehnička škola Daruvar
Srednja škola Konjščina.

*Get Ready. **Get Schrack.***

Zašto želim baš to?

Zato jer želim:

- upravljati troškom za energiju
- biti što više samodostatan
- imati besprekidno napajanje za bitna trošila
- prodavati energiju kada je cijena visoka
- pomagati stabilnosti sustava
- doprinosti ideji održivosti



SIGURNOSNA RASVJETA



Get Ready.
Get Schrack.



SIGURNOSNE SVJETILJKE

- svjetiljke s baterijom
- za označavanje smjera evakuacije
- za osvjetljavanje evakuacijskog puta



K2



K3



K4



K5



K6



K8

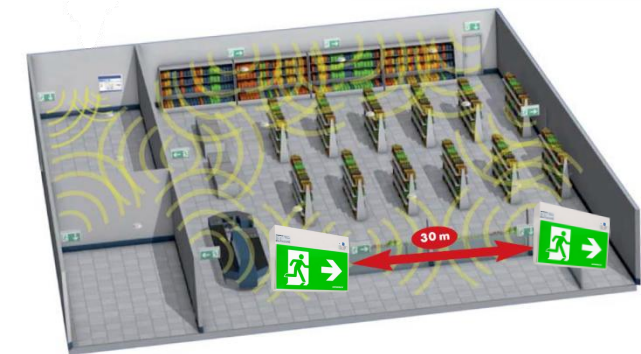
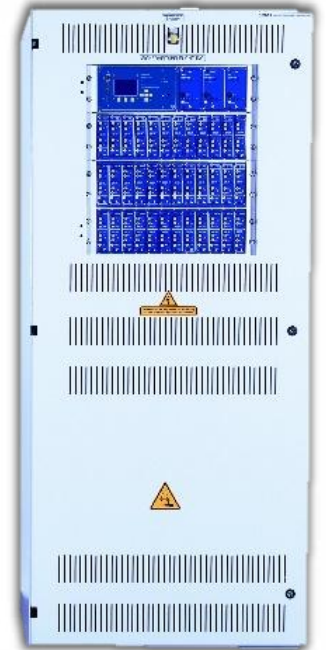


K9

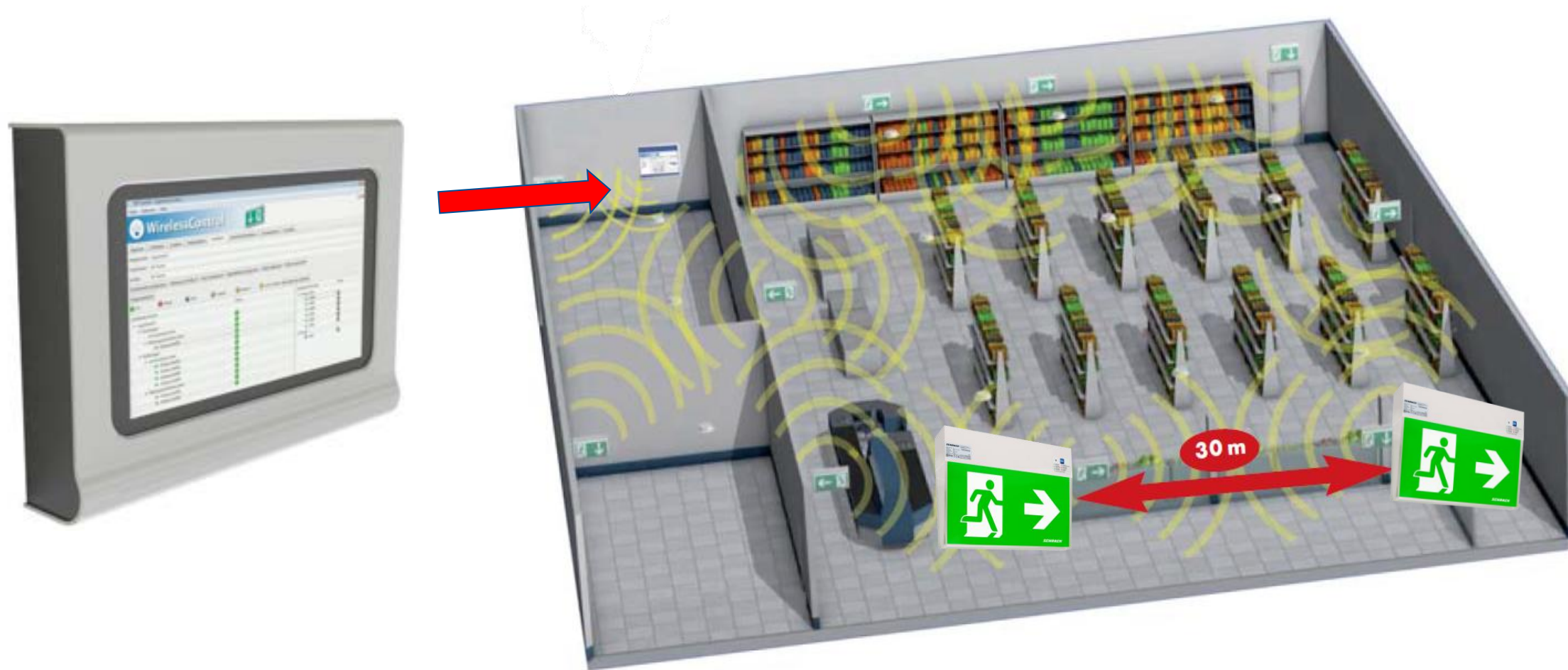
SUSTAVI SIGURNOSNE RASVJETE

■ Izvedbe:

- s centralnim baterijskim napajanjem
- s bežičnim nadzorom svjetiljki s vlastitim baterijama
- 24 V sustav- SECURO



BEŽIČNI SUSTAV UPRAVLJANJA SIGURNOSNOM RASVJETOM

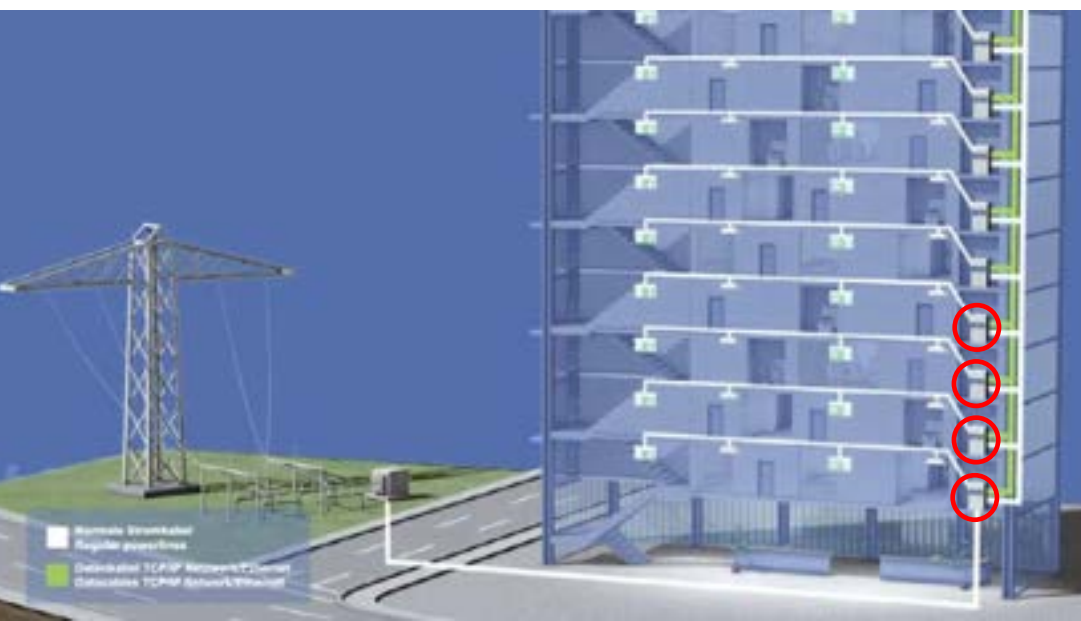
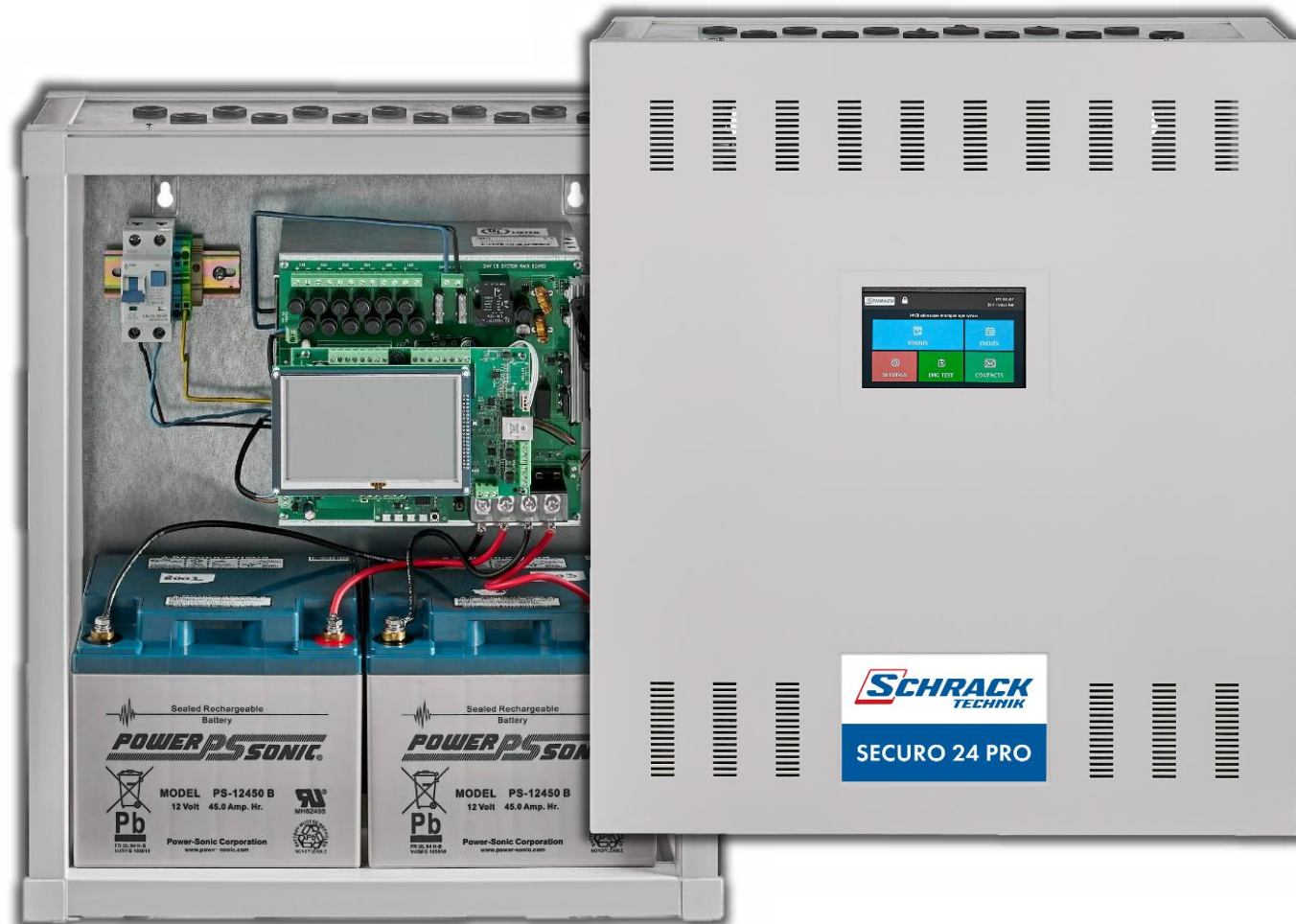


24V SUSTAV

- mali napon, mali rizik strujnog udara
- 3 h autonomije s 4 baterije
- kompaktna izvedba
- jedna centrala po požarnom sektoru
- izlazi do 3 A, ožičenje 2,5 mm², 90 m

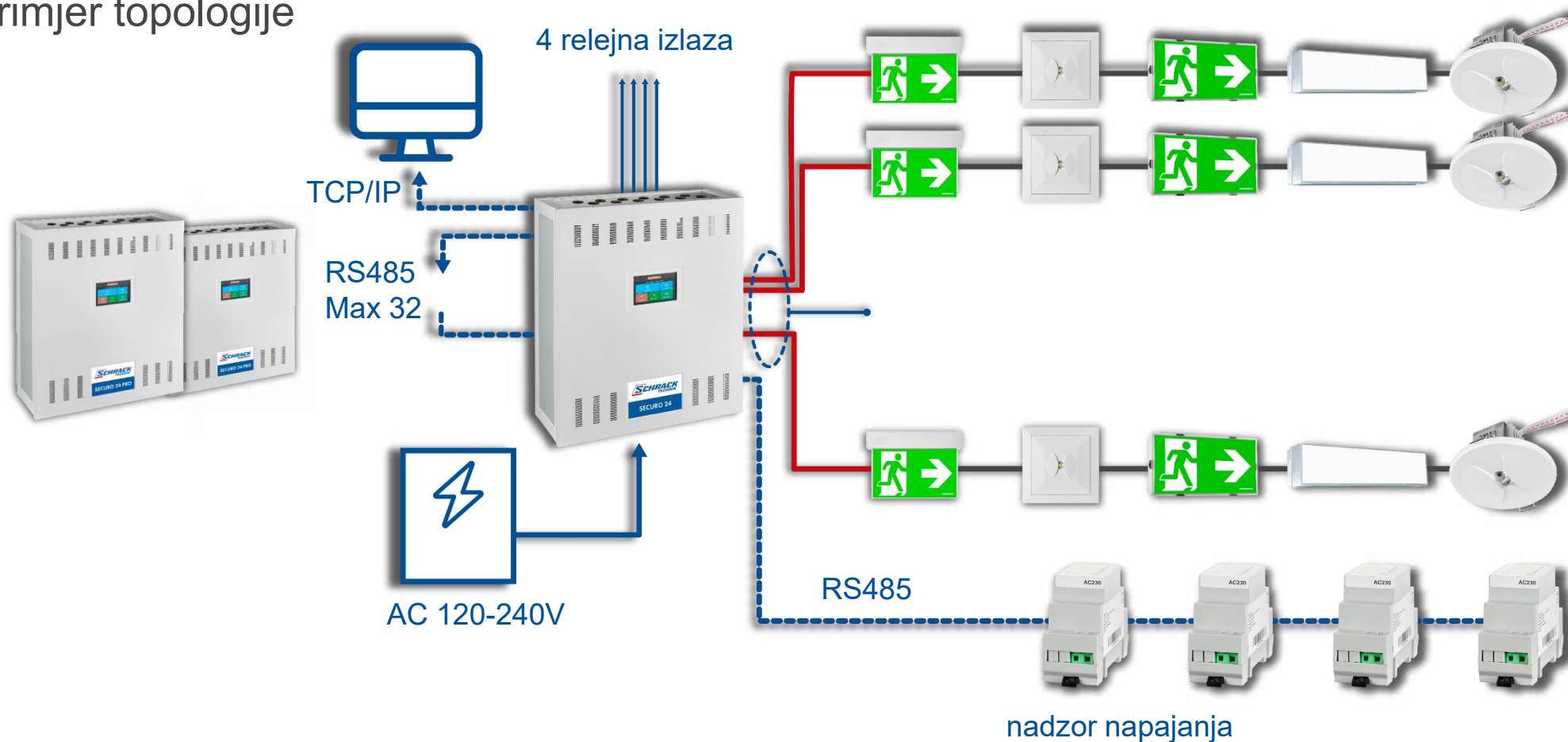
SECURO
24 PRO

SCHRACK
TECHNIK



24V SUSTAV

Primjer topologije



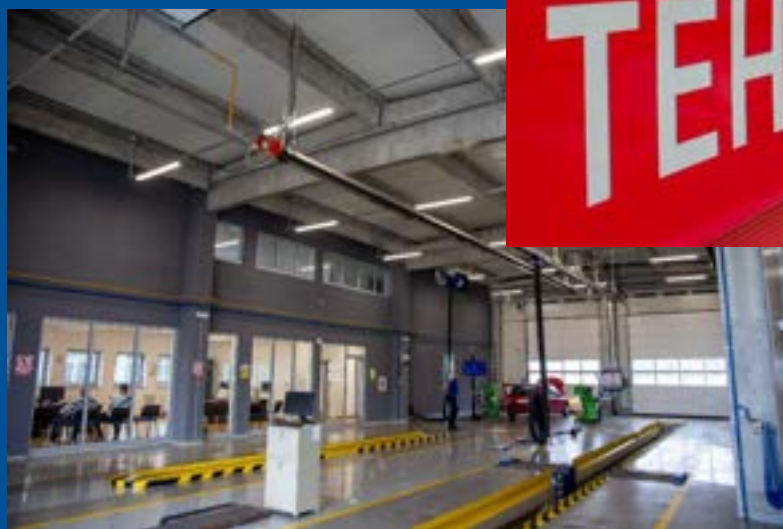
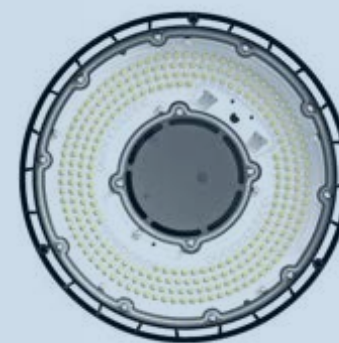
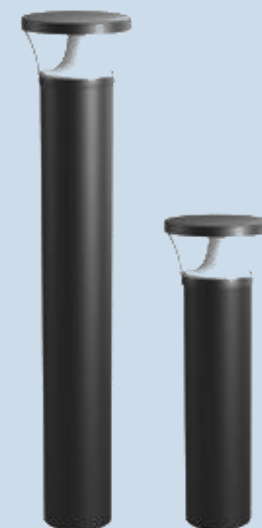
SECURO
24 PRO

RASVJETA

SCHRACK
TECHNIK



NOVO!



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KATALOZI



INDUSTRIJSKA RASVJETA TRINITY

VODOTIJSNE SVJETILJKE



DEVO PRO II



DEVO PRO II sa
senzorom



DEVO PRO II sa panik modulom

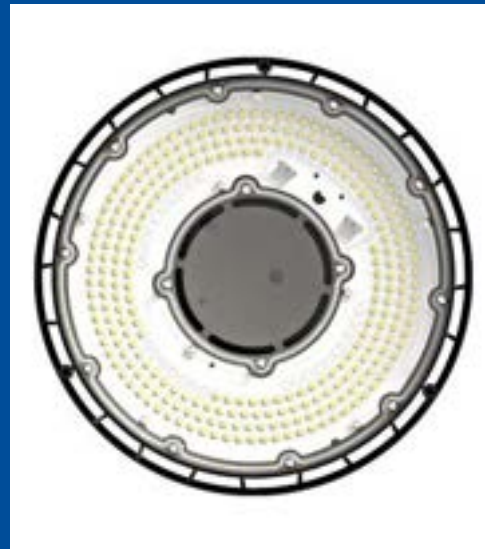


DEVO PRO II Farmer



DEVO PRO II AIR

INDUSTRIJSKA RASVJETA TRINITY



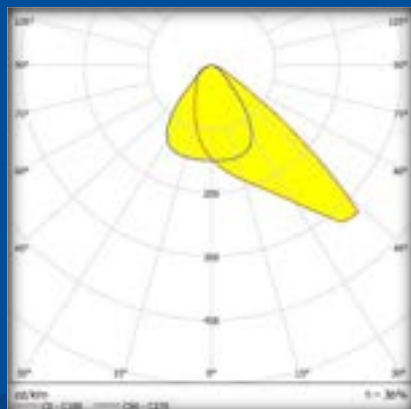
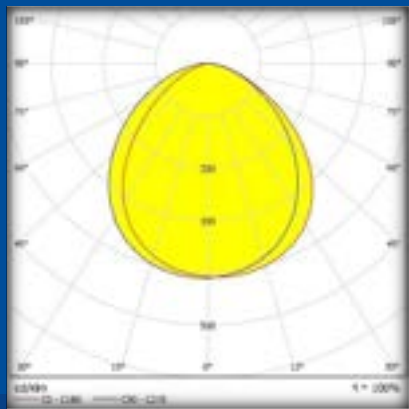
ARKTUR ECO III –
150 W i 200 W, DALI



VANJSKA RASVJETA TRINITY

CAPRI LED BASIC

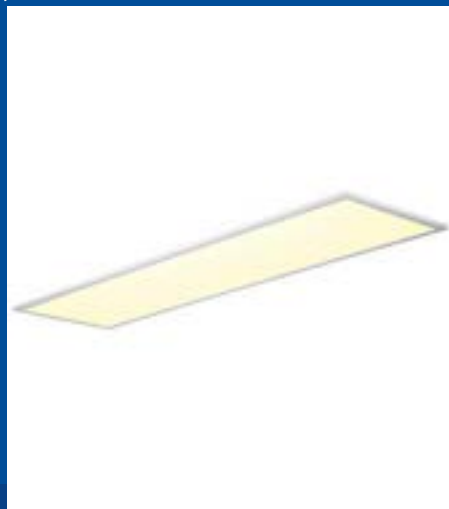
- sa senzorom: 30 W i 50 W
- 3000 K i 4000 K
- simetrična i asimetrična optika
- podesiva snaga:
50-80-100 W / 100-150-200 W



UNUTARNJA RASVJETA TRINITY

LANO BL LED

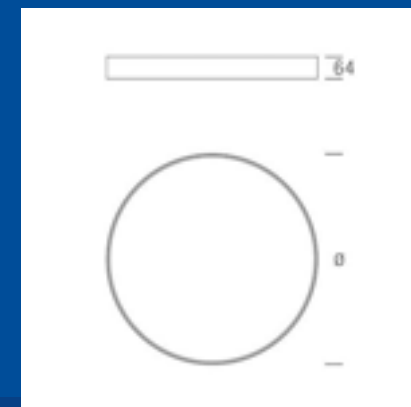
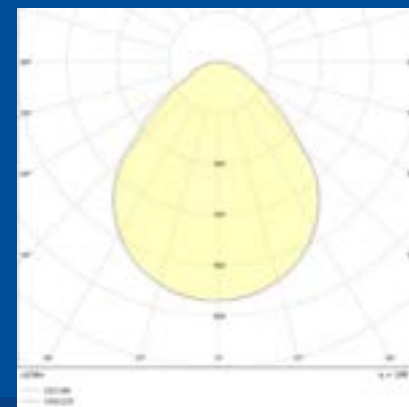
- 33 W i 40 W
- 3000 K / 4000 K
- M600 i M1200
- opal i MPRM (UGR<19)
- pribor: on/off driver, DALI-2 driver, EM 3h



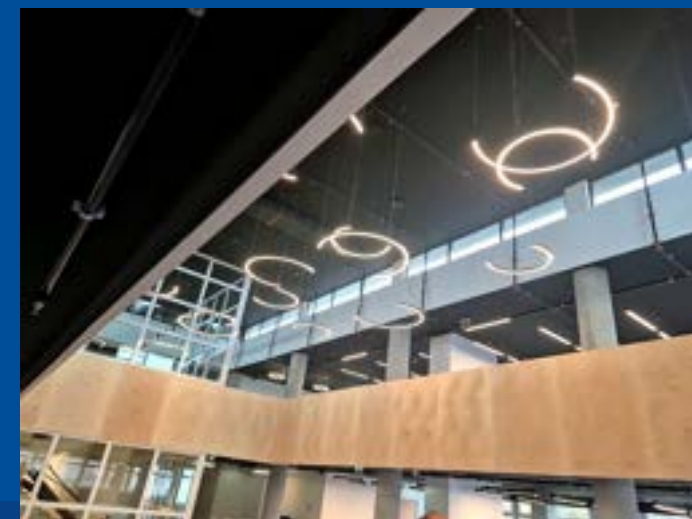
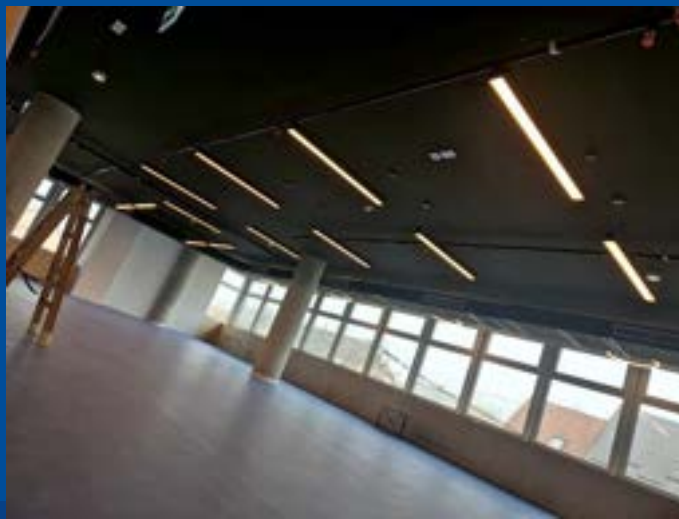
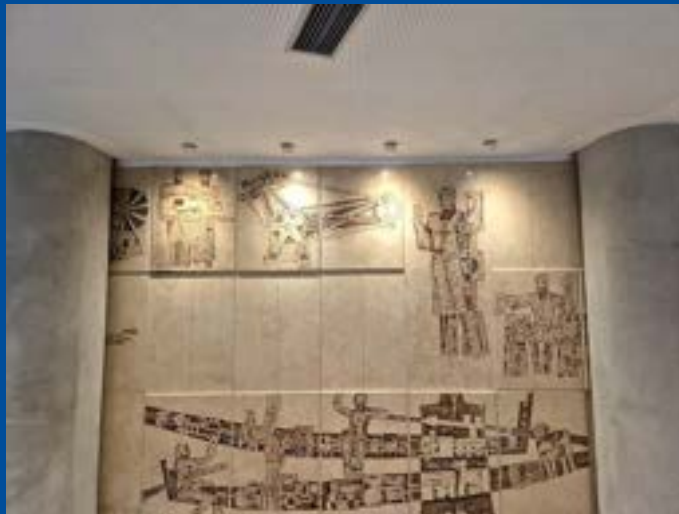
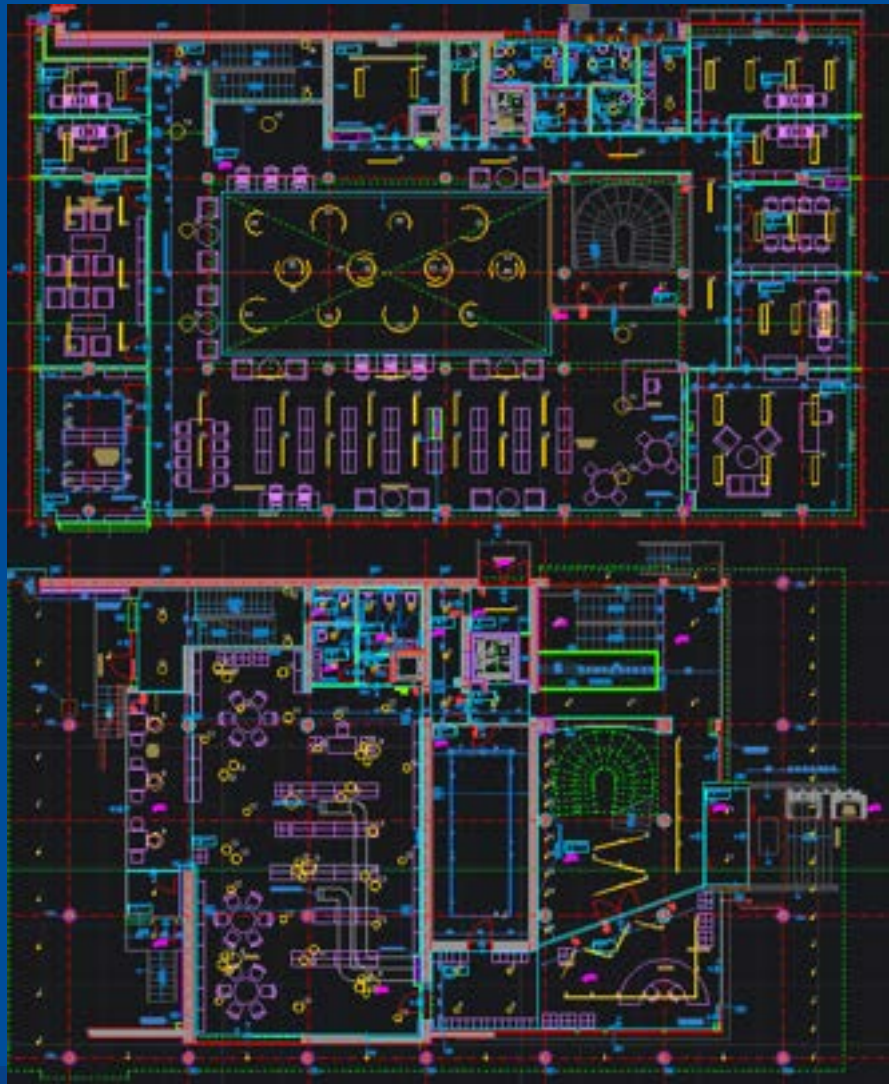
UREDSKA RASVJETA TRINITY

NOVIA R

- 320, 450 i 600 mm promjera
- 3000 K / 4000 K
- Snaga 10 W – 55 W
- bijela i crna boja kućišta
- DALI dimabilna
- UGR <19



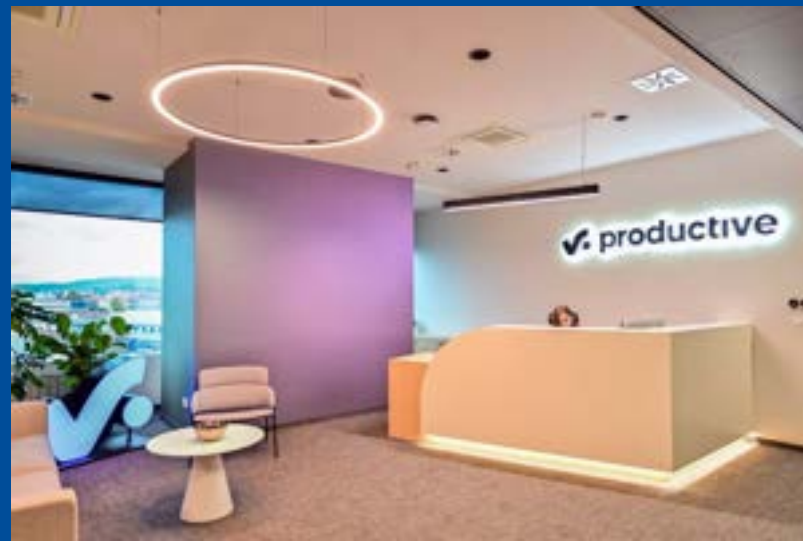
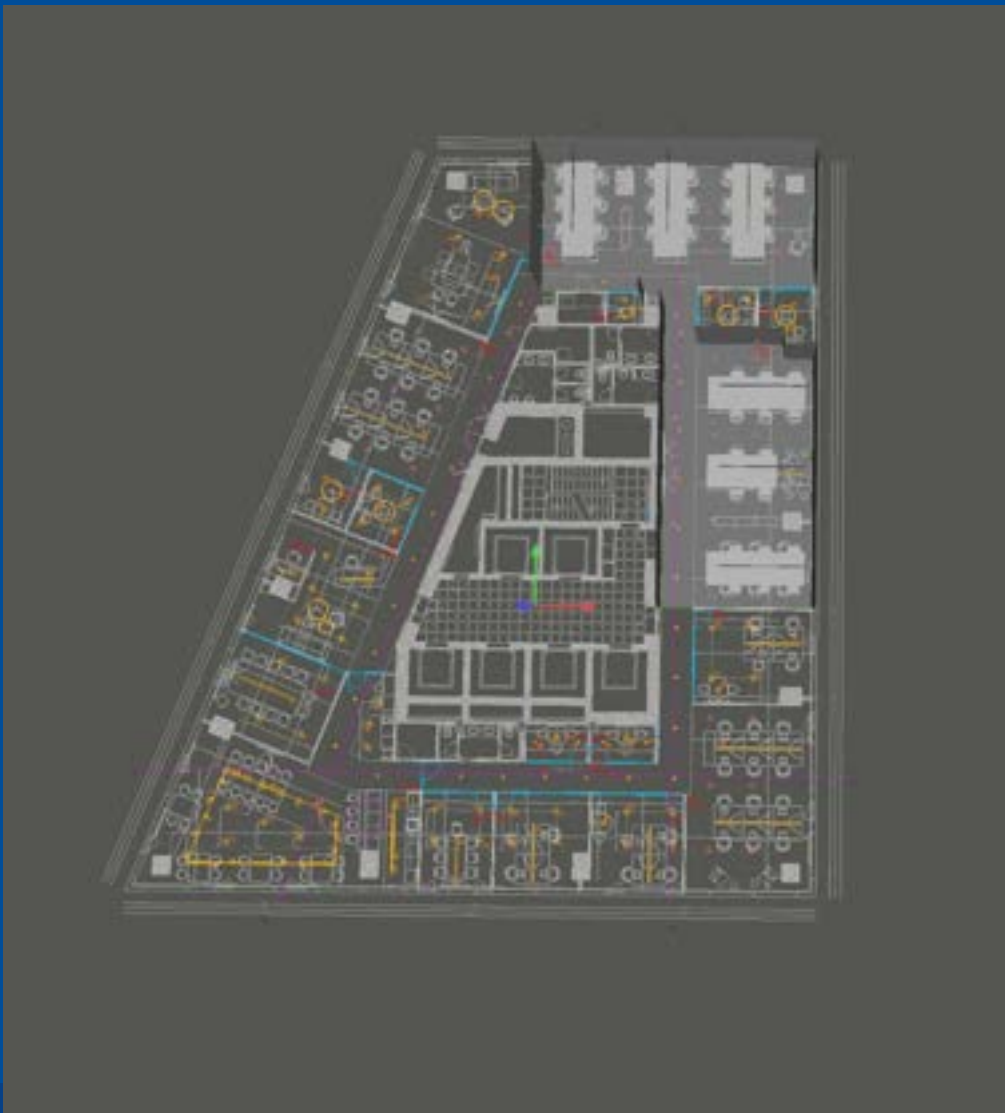
GRADSKA KNJIŽNICA SISAK



ORBICO BEAUTY CENTAR



PRODUCTIVE UREDI



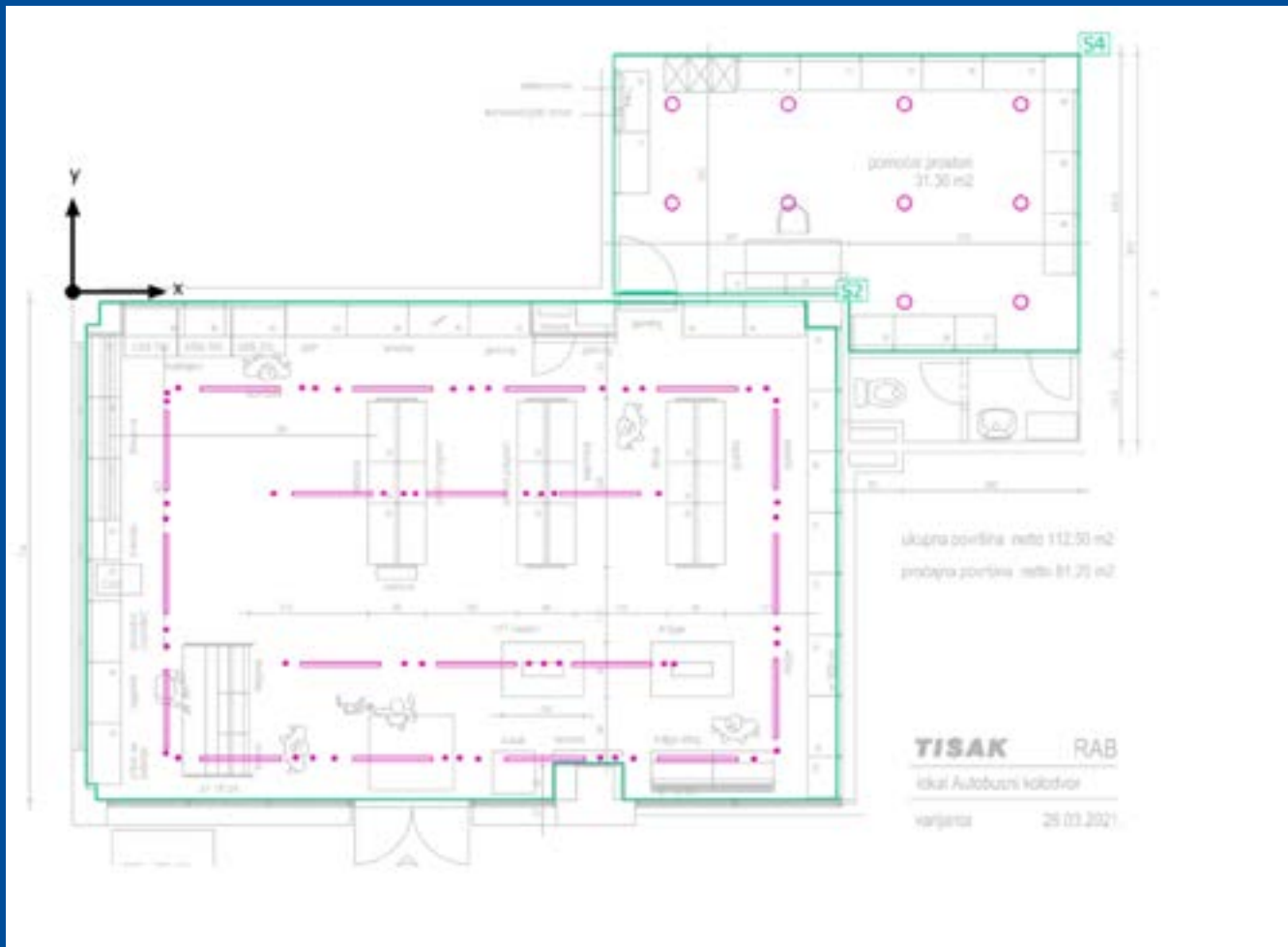
TRGOVINE CROMARIS



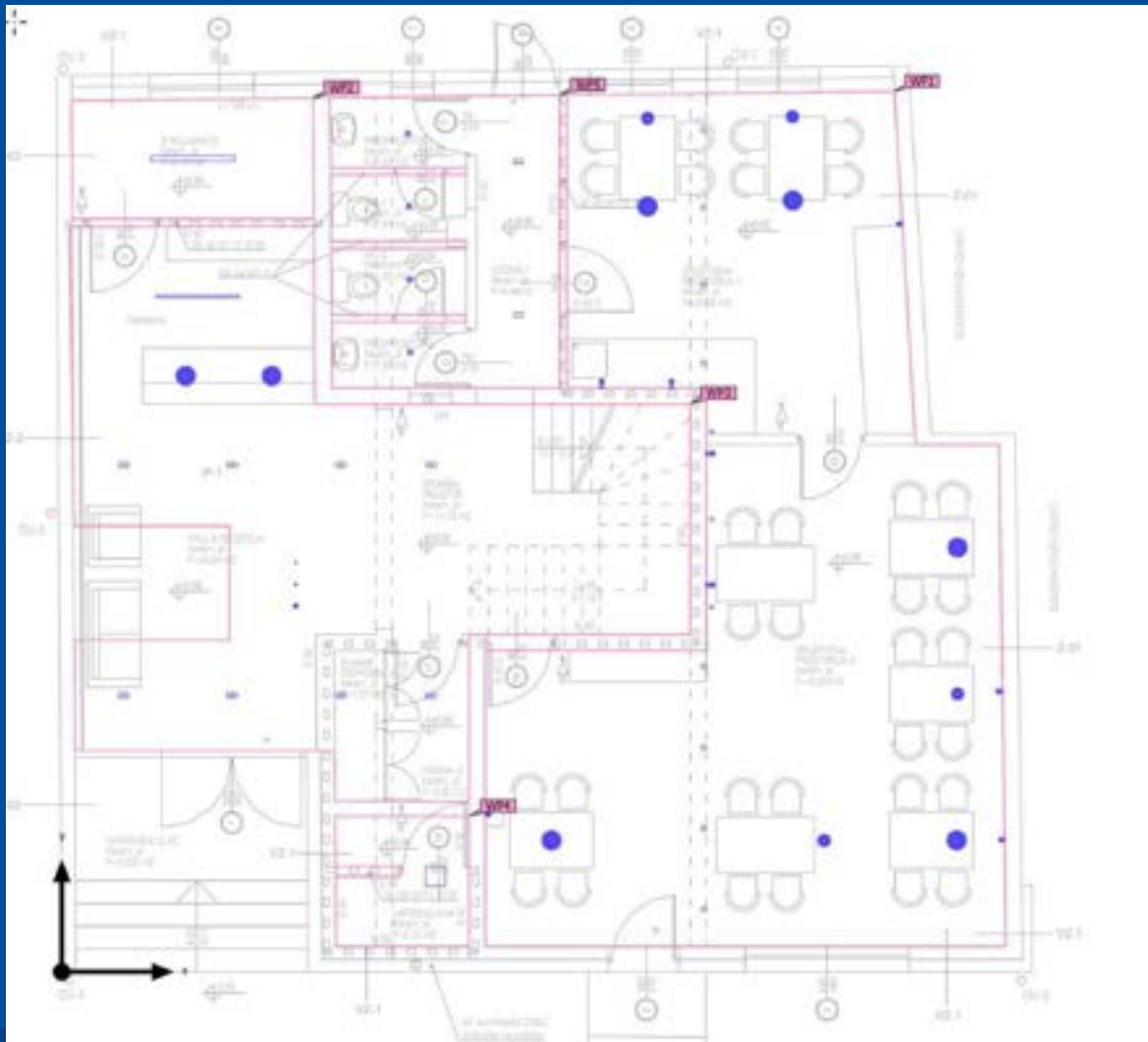
ABOVE ACADEMY



TRGOVINE TISAK



SOBE ZA NAJAM ALJMAŠ



KABLIIRANJE SVJETLOVODOM

M. Gašparac

NOVO!



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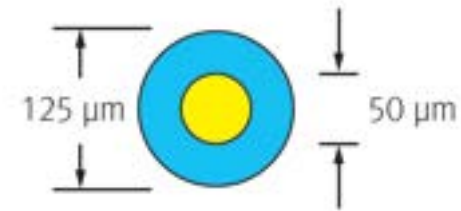
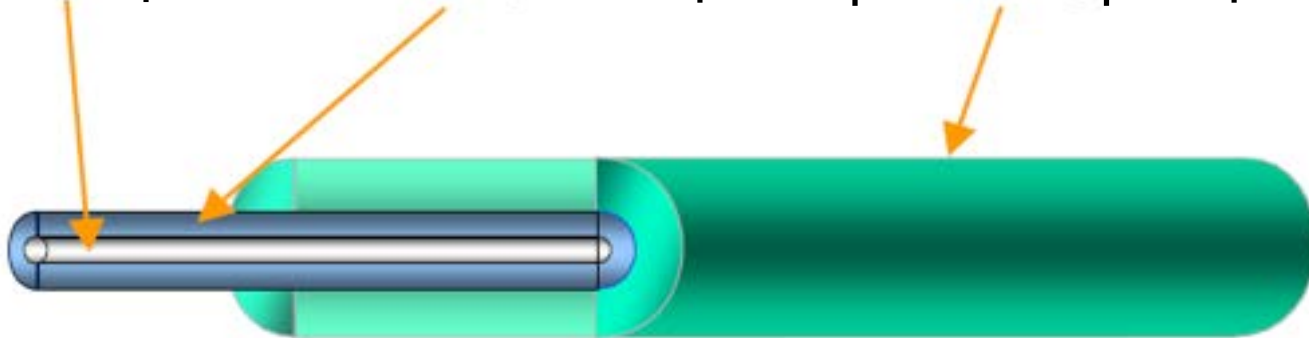
IZGLED OPTIČKOG VLAKNA SM/MM

staklena jezgra

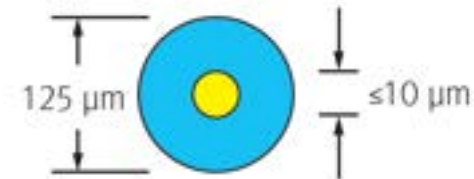
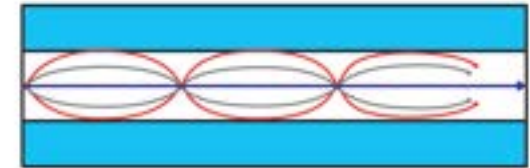
50 ili 9 μm

zaštitni omotač 125 μm

primarni sloj 250 μm



više modno vlakno (MM)

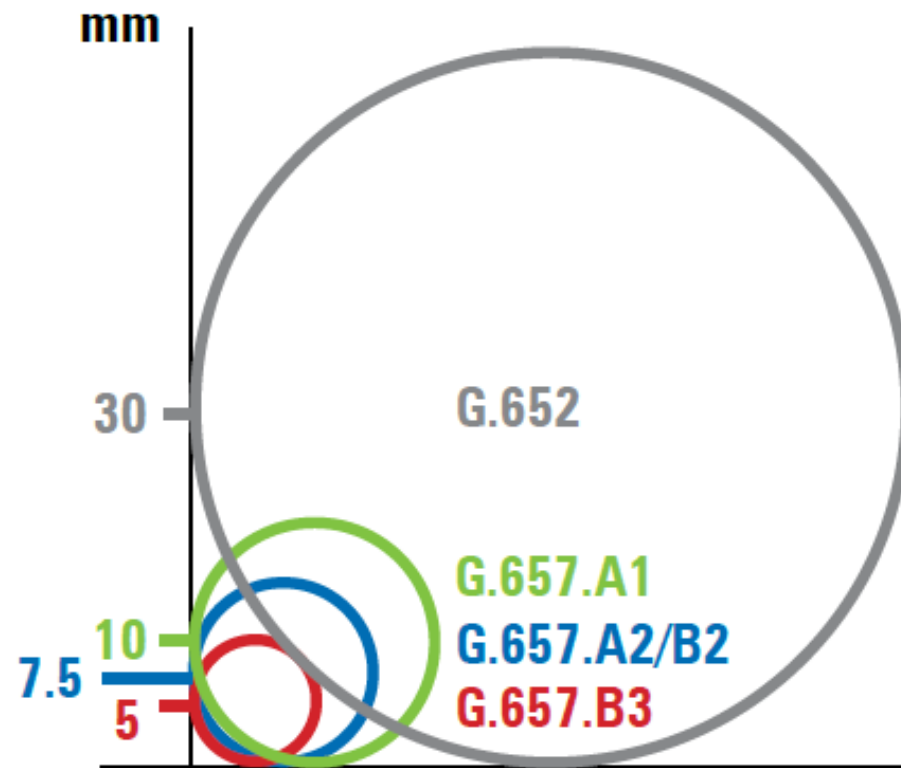


jedno modno vlakno (SM)



Optička vlakna za kućne instalacije

- jednomodno (singlemode) vlakno
- dosadašnja norma: ITU.T G.652
- zahtjevi za stanove su vrlo mali polumjeri savijanja
- nova norma: ITU.T G.657
- podnorme: 657.A1, -A2/B2, -B3



Optičke spojnice (konektori) za kućne instalacije

■ PC ... Physical Contact

■ dugo u uporabi

■ UPC ... Ultra Physical Contact

■ poboljšani PC

■ najviše u uporabi kod MM i SM

■ APC ... Angled Physical Contact

■ uporaba samo u jednomodnoj (singlemode) tehnologiji



Ultra Physical Contact Connector



Angled Physical Contact Connector

PC vs. APC utikači

■ Razlike između PC i APC spoja

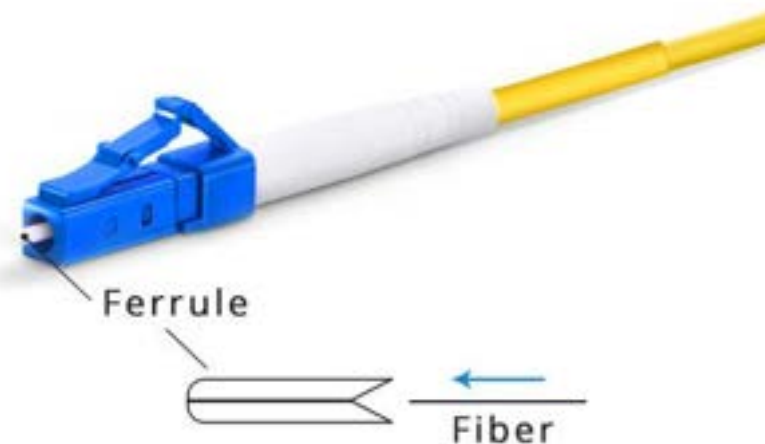
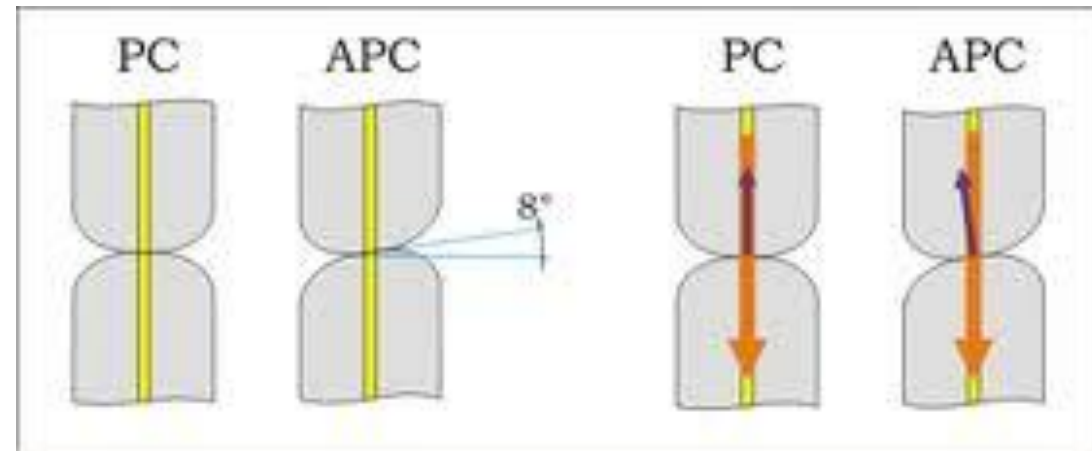
PC... Physical Contact (fizički kontakt)

Konektori vrše pritisak jedan na drugi kad su spojeni.

Ferula je polirana pod kutem 90°

APC... Angled Physical Contact (fizički kontakt pod kuter

Ferula je polirana pod kutem od 8° - 12° . To poboljšava rezultate pri gubicima zbog povrata signala (tzv. return loss)



Optičke spojnice i utikači za kućne instalacije

■ LC/APC ili SC/APC

- samo za jednomodna (singlemode) vlakna
- ferula (vrh spojnice) brušen pod kutom 8°
- manje gušenje -> veći prijenos podataka
- zelene boje (APC)
- plave boje (PC)



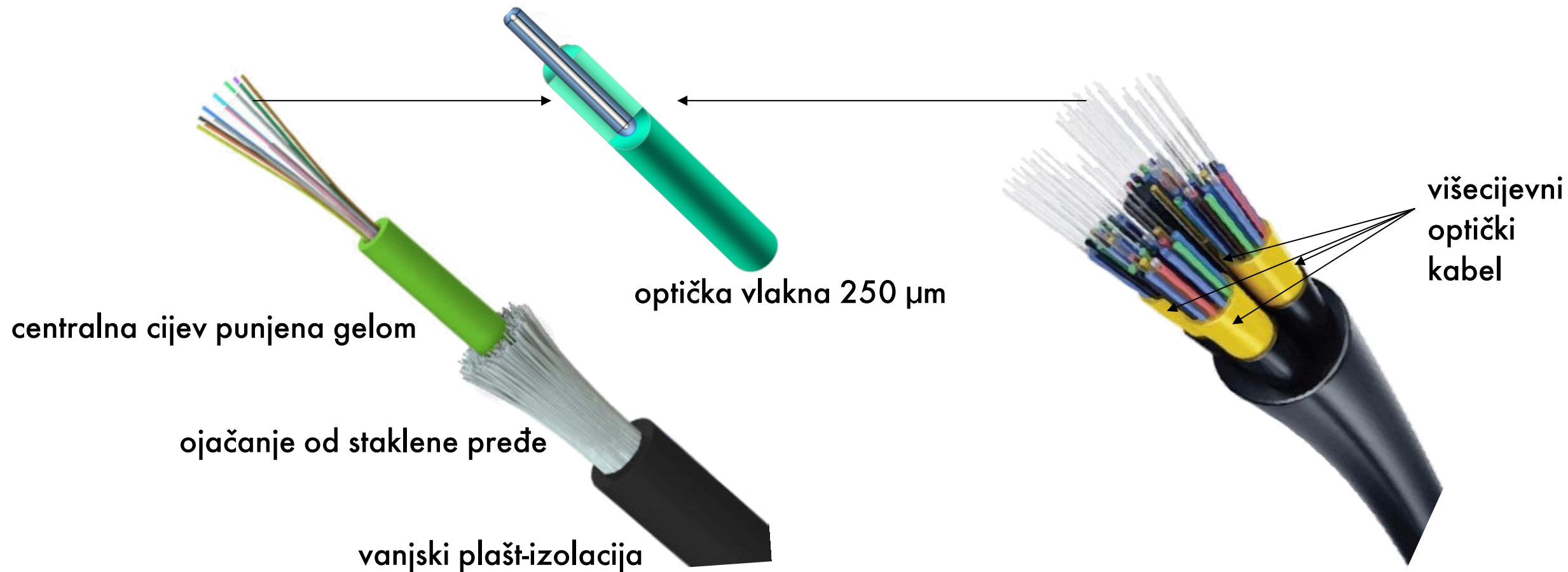
PC



APC



Konstrukcija optičkog kabela



Optički instalacijski kablei

■ Optički kablei za unutarnju instalaciju

LSOH vanjska izolacija (Dca i B2ca)

1250 i 3000N vlačna sila

SM (OS2) i MM (OM3, OM4 i OM5)

od 4 do 48 vlakana

■ Optički kablei za vanjsku instalaciju

PE vanjska izolacija

Sa i bez metalne zaštite

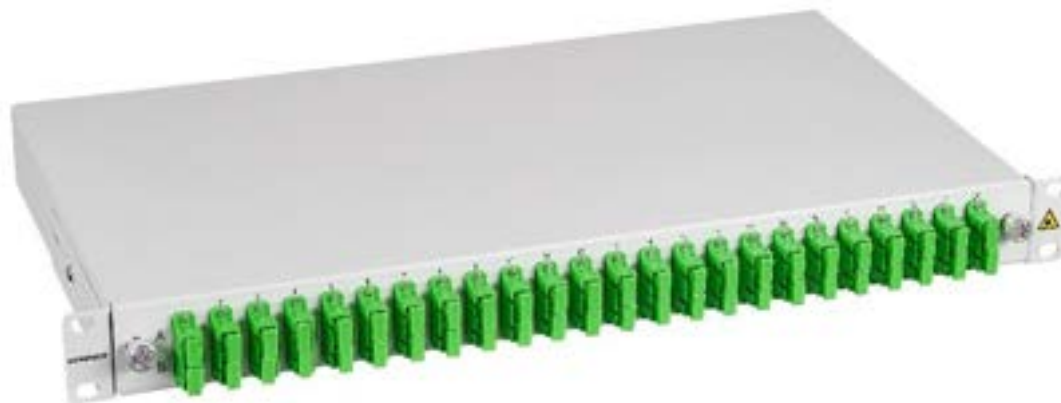
3000N vlačna sila

SM (OS2) i MM (OM3, OM4)



Optički razdjelnici 19"

- 4 – 48 vlakana
- LC/APC i SC/APC za SM OS2
- LC, SC, ST/FC za MM (OM3, OM4 i OM5) i SM OS2
- 19"
- 1U
- Class C



Optički razdjelnici za DIN šinu

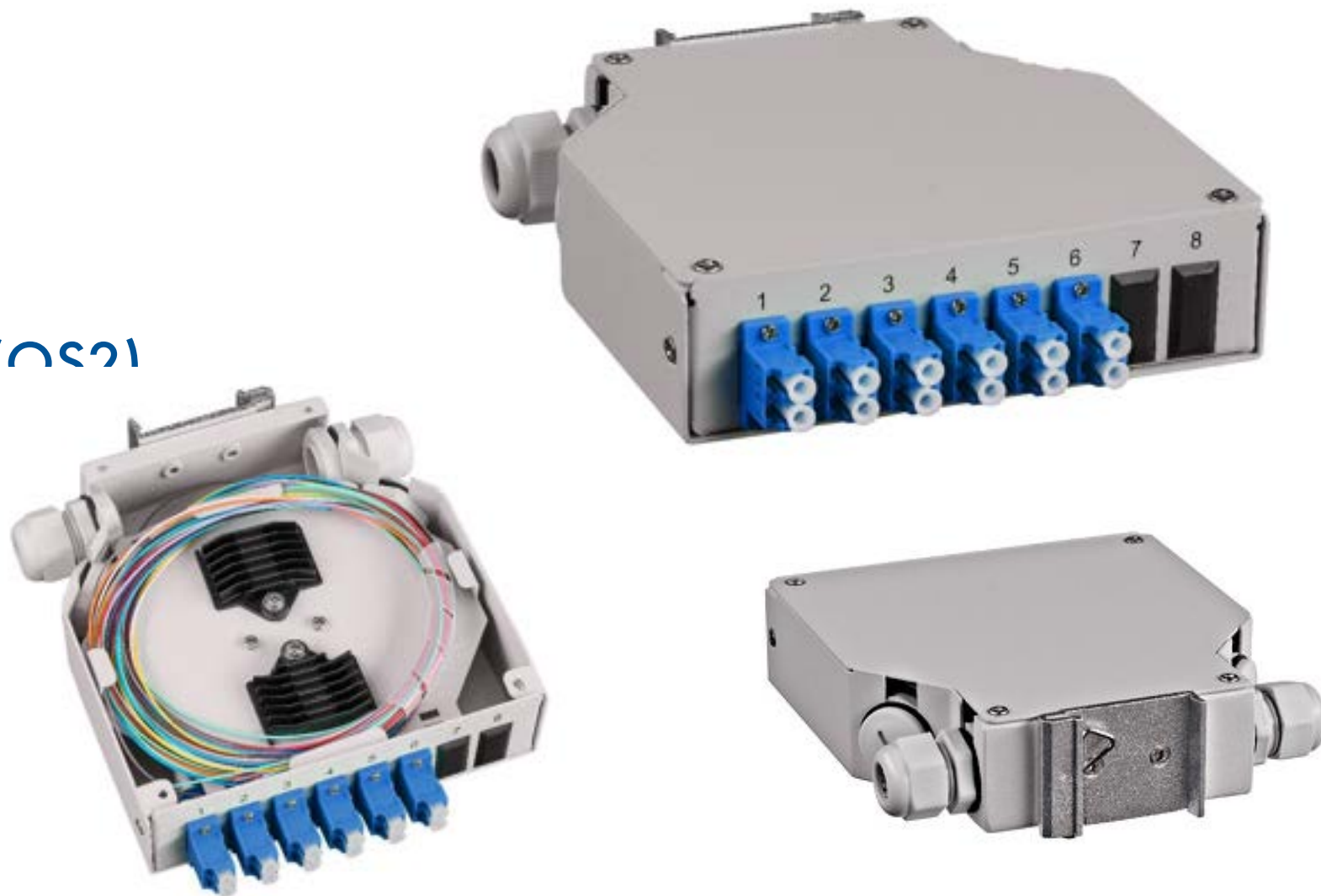
■ 4, 8 i 12 vlakana

■ LC i SC

■ MM (OM3 i OM4) i SM (OS2)

■ učvršćenje na DIN šinu

■ RAL7035



FTTH (optičko vlakno u stanove)

■ **NOVO!**

■ FTTH zidne priključnice, Š80xV28xD80mm RAL9010:
uključeno 4xSC/APC ili 4xLC/APC 8°, OS2
G657.A2, adaptera i 4x optičkih završetaka

■ zidna i DIN montaža

■ pribor: adapteri SC/APC, LC/APC, optički završeci, ...

■ **NOVO!**

■ rollerbox komplet za kućnu instalaciju



FTTH (optičko vlakno u stanove)

- FTTH kućišta za vanjsku montažu na zid ili stup
- Š200xV235xD67mm, prazna do 12 ili 24 vlakna
- za montažu 12x LC-Dx, SC-Sx ili E-2000®-Sx
- IP54, RAL7035
- mogućnost montaže na stup



Optički prespojni kablei

■ Za spoj s aktivnom opremom (opt. konverteri)

■ LC-DX, SC-DX, ST, FC, E2000 za MM i SM

■ LC/APC-DX, SC/APC-DX samo za SM

■ duljine od 0,5m do 20m

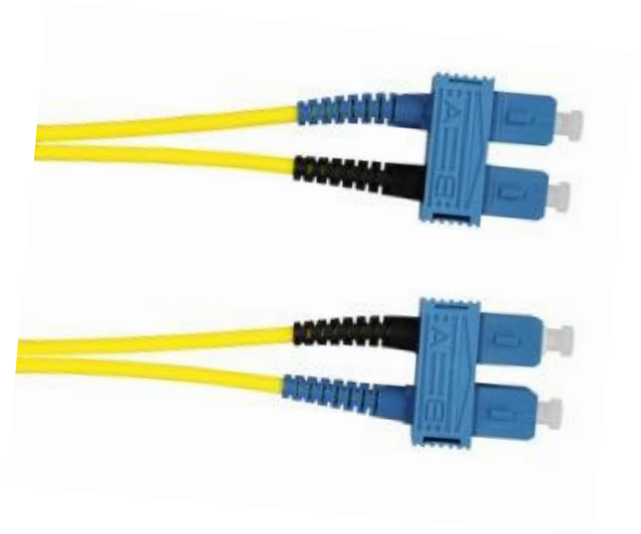
■ MM (OM3, OM4 i OM5), SM (OS2)



APC



PC

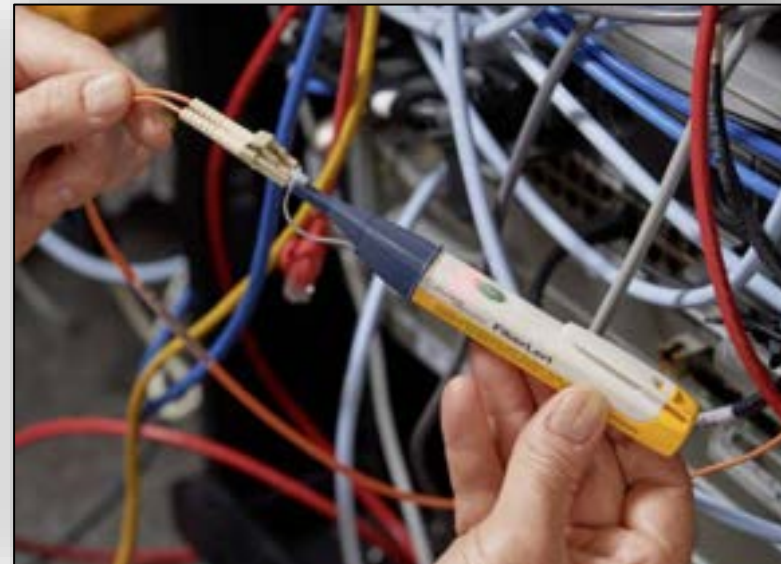


NOVI KATALOG – svjetlovodi za uredske sustave

- K-NT2-HR25
- na hrvatskom jeziku
- norme i osnove optičkog kabliranja (15 stranica)



Je li svjetlovod aktivan?



Je li utikač čist?



Nova serija serverskih ormara DST

- prednja vrata perforirana jednostruka, zadnja perforirana dvostruka
- najveća nosivost 1.200 kg
- nadogradivo do maks. 1.500kg
- RAL9005 crna
- visine 42 i 47U
- dubine 800, 1000 i 1200mm



ELEKTRIČNE INSTALACIJE PRIRUČNIK

NOVO!



Get Ready.
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SCHRACK
TECHNIK

1
Uvod u
električne
instalacije

2
Električni
vodovi

6
Razdjelnici

9
Električne instalacije
u poslovnim, industrijskim
i prostorima ugroženim
eksplozivnim smjesama

12
Provjeravanje
električnih instalacija

13
Električna
rasvjeta

14
LED rasvjetne trake,
polja, lanci i pločice

15
Električne instalacije
sunčanih elektrana

3
Sklopni
aparati

7
Izvedbe instalacija
i priključak na
električnu mrežu

10
Upravljački
sustavi

4
Zaštita
električnih
instalacija

8
Električne instalacije
u stambenim i
sličnim prostorima

11
Sustav za zaštitu
od djelovanja munje

5
Zaštitne mjere
kod primjene
električne energije

1. izdanje

- ispravljeno
- 710 stranica
- besplatan
- bez AI !
- 6.000 sati za Vas



2. izdanje

- novi recenzent
- nova poglavlja
- sve u pripremi!

ZA ONE KOJI ŽELE ZNATI VIŠE

SCHRACK
TECHNIK



Schrack training center Schrack FORUM

NOVO!

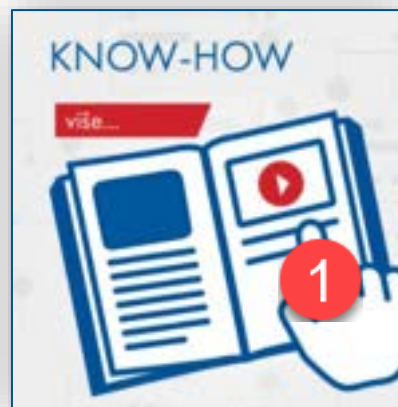
*Get Ready.
Get Schrack.*



STC: SCHRACK TRAINING CENTER



SCHRACK
TECHNIK



SCHRACK PLATFORMA ZA DIJELJENJE ZNANJA.
PRIDRUŽITE NAM SE.

2

SCHRACK
TECHNIK TRAINING
CENTER

STC

VIDEOZAPISI

OBJAVE

3

4

Učilo MEGONK V1

Maketa
Električno
GOtovo
Neovisne
Kuće

Ožujak 2024

Get Ready.
Get Schrack.



Orion XS pretvarač između alternatora i LFP baterije



Ožujak 2024.

SCHRACK
TECHNIK

Za olovne baterije alternator je tehnički
prikladan. Logična je želja u sustavima
na plovilu pri zamjeni olovne baterije
opće namijenjene s LFP baterijom zadržati
postojeći alternator motora plovila. Što
će se dogoditi ako postojeći alternator
spojimo na LFP bateriju, smije li se to
uopće i na što treba posebno obratiti
pažnju...

Get Ready. Get Schrack.

Get Ready. **Get Schrack.**

SCHRACK FORUM

NOVO!



Kategorija

● Pitanja i odgovori

Pitanja i odgovori Schrack Technik

- Ormari & kućišta
- Oprema za ugradnju u ormare/kućišta
- Upravljanje i regulacija
- Zgradarstvo i KNX
- Sigurnosna rasvjeta, UPS i CO senzori
- IT tehnologija i SAT sustavi
- Instalacija i montaža
- Kabeli i vodiči
- Rasvjeta
- Fotonapon i pohrana energije
- Elektromobilnost

● Schrack Design

Schrack Design je alat za projektiranje i cjelovito dokumentiranje elektro razdjelnika. prema važećim normama HRN EN 61439-1, -2, -3 i IEC 890 + A1.

● Pokažite nam svoje Schrack rješenje

Pohvalite se pričom o svom projektu, realiziranim s našom opremom! Dodajte fotografije i opišite sustav kojim se ponosite. Možda upravo netko drugi treba vaše iskustvo. Možda vi tražite nešto što je već riješeno, provjerite ovdje!



Početak rada

kategorije ▶

oznake ▶

Kategorije

Zadnje

Nepročitano (1)

Nepročitano

Moje objave

☰ Tema

🔒 📌 Dobrodošli na Schrack Technik Forum! 🇸🇮

● Obavijesti 0 glasova



Drago nam je što ste nam se pridružili. Schrack Technik Forum Forum za elektrotehniku na hrvatskom jeziku Evo nekoliko stvari koje možete učiniti za početak: 🗣️ Predstavite se dodavanjem svoje slike i i... pročitaj više



📝 Razlika između Predložaka i Asistenta 4

● Schrack Design schrack-design , 2 glasa

Koja je osnovna razlika između Predložaka i Asistenta u SCHRACK DESIGNU verzija 6.0?

posljednji posjet

Get Ready. Get Schrack.

HVALA NA PAŽNJI!!





ELEKTRIČNE INSTALACIJE



■ „Ispravljeno” 1. izdanje

■ U pripremi 2. izdanje:

- formule
- elektromobilnost
- recenzija projektanta



1
Uvod u
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instalacije

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Električne instalacije
sunčanih elektrana

Dodaci
Popis literature
Pregled kataloga

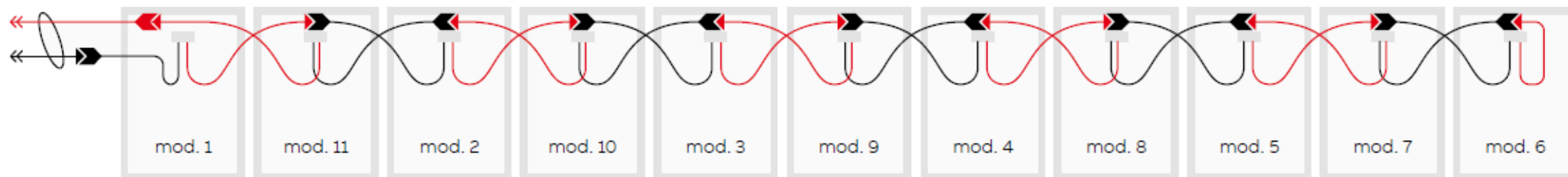
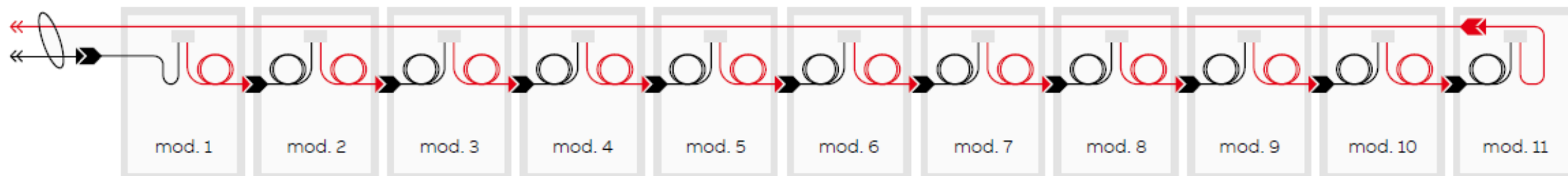


ELEKTRIČNE INSTALACIJE PRIRUČNIK



Zgodna izvedba – ako je moguća!

spojna mjesta na putu vodi!



spojna mjesta na najvišem mjestu!