TEHNIČKO VELEUČILIŠTE U ZAGREBU
POLYTECHNICUM ZAGRABIENSE
www.tvz.hr
Vrbik 8a, 10000 Zagreb

Customer:	**University od Applied Science** **Vrbik 8a, 10000 Zagreb** **Croatia**
End customer:	**University od Applied Science** **Konavoska ulica 2, 10000 Zagreb** **Croatia**
Object:	**Electrical engineering department** **Konavoska ulica 2, 1000 Zagreb** **Croatia**
Project phase:	**Main project**

Project name:	**DATA CENTER COOLING**

Approved:	**mr.sc. Davor Gadže, dipl.ing.el.**
Checked:	**Tomislav Špoljarić, dipl.ing.el.**
Drawn:	**Matea Musladin, bacc.ing.el.**

Project number:	**PIEP-21/22**
Project date:	**10.2021.**
Revision:	**R0**
Revision date:	**05.10.2021.**

1. Sadržaj

2. Konstrukcijski zadatak

Tehničko veleučilište u Zagrebu

Elektrotehnički odjel
Specijalistički stručni studij elektrotehnike

Projektiranje i izvođenje elektrotehničkih postrojenja: konstrukcijski zadatak

STUDENT: **Matea Musladin**

JMBAG: **0023105047**

Zadatak**: Projekt razvoda energije pumpne stanice za potrebe hlađenja podatkovnog centra**

Za potrebe hlađenja podatkovnog centra potrebno je u okviru konstrukcijskih vježbi izraditi tehničku dokumentaciju do razine izvedbenog projekta za upravljanje i nadzor pumpi. Pumpe služe za dopremanje hladne vode u rashladne jedinice koje se nalaze u prostorijama sa serverima. Postrojenje se sastoji od ukupno šest pumpi koje su podijeljene u dvije grupe od kojih svaka grupa radi 12 sati dnevno. Postrojenje pumpne stanice sastoji se od tri dijela: prostorije sa pumpama (*pump room*), prostorije sa razdjelnim ormarom (*MCC room*) i hodnika (*corridor*).

U potrebno je izraditi do za razvod energije prema opisu. Projekt treba sadržavati:

1. Projektni zadatak;
2. Crtanu dokumetaciju:
   - strujne sheme razvoda i osnovnih krugova upravljanja,
   - priključni plan kabela,
   - prijedlog rasporeda - dispoziciju opreme u razvodnom ormaru,
   - popis opreme;
3. Tekstualnu dokumentaciju:
   - proračun presjeka kabela prema dopustivom padu napona,
   - nužne proračune i izbor elemenata:
     - Proračun instaliranih i vršnih snaga,
     - Proračun padova napona,
     - Provjera zaštitnih elemenata prema izboru kabela,
     - Proračun kratkog spoja,
     - Proračun hlađenja/ventilacije razvoda.

Podaci postrojenja - **potrošači**:

- Postrojenje se sastoji od ukupno šest pumpi koje su podijeljene u dvije grupe od kojih svaka grupa radi 12 sati dnevno. Pumpe su raspoređene u grupe na slijedeći način:
  - **1. grupa** - tri pumpe nazivnih snaga **4kW, 15kW i 22kW**,
  - **2. grupa** - tri pumpe nazivnih snaga **4kW, 15kW i 22kW**.
  - Način upravljanja pumpi je slijedeći:
    - pumpe nazivnih snaga **4kW - DOL** pomoću sklopnika
    - pumpe nazivnih snaga **15kW** - uređaj za meki zalet (**soft-starter**)
    - pumpe nazivnih snaga **22kW** - **pretvarač frekvencije i napona**.
- U sklopu cjevovoda nalaze se ventili za zaustavljanje protoka vode kojima je potrebno upravljati zbog mogućeg servisiranja pumpi.
  Ugrađeno je sveukupno 12 ventila, odnosno dva ventila po pumpi (jedan na ulazu, a drugi na izlazu pumpe).
- U prostorije pumpne stanice potrebno je predvidjeti:
  - soba sa pumpama**:**
    - **2×3p i 2×5p servisne priključnice,**
    - **tipkalo za isklop napajanja u nuždi;**
  - soba sa razdjelnim ormarom:
    - **1×3p i 1×5p servisne priključnice,**
    - **klima uređaj,**
    - **tipkalo za isklop napajanja u nuždi;**
  - hodnik:
    - **2×3p i 2×5p servisne priključnice.**
- **Kabelske trase**:
  - Udaljenost glavnog napojnog kabela iz transformatorske stanice je **50m.**
  - Udaljenosti kabelskih trasa prema ostalim potrošačima predvidjeti iz dispozicije.
  - Sve kabele potrebne za napajanje opreme izvan razdjelnog ormara potrebno je položiti u kabelske police označene na tlocrtu postrojenja (**PK200** i **PK100**). Kabelske police nalaze se na visini **+4,50m** od poda, ukupna visina postrojenja iznosi 5,00m, a sve ostale dimenzije prikazane su na tlocrtu postrojenja.

Podaci postrojenja - pomoćna potrošnja i **sustav zaštite od indirektnog dodira**:

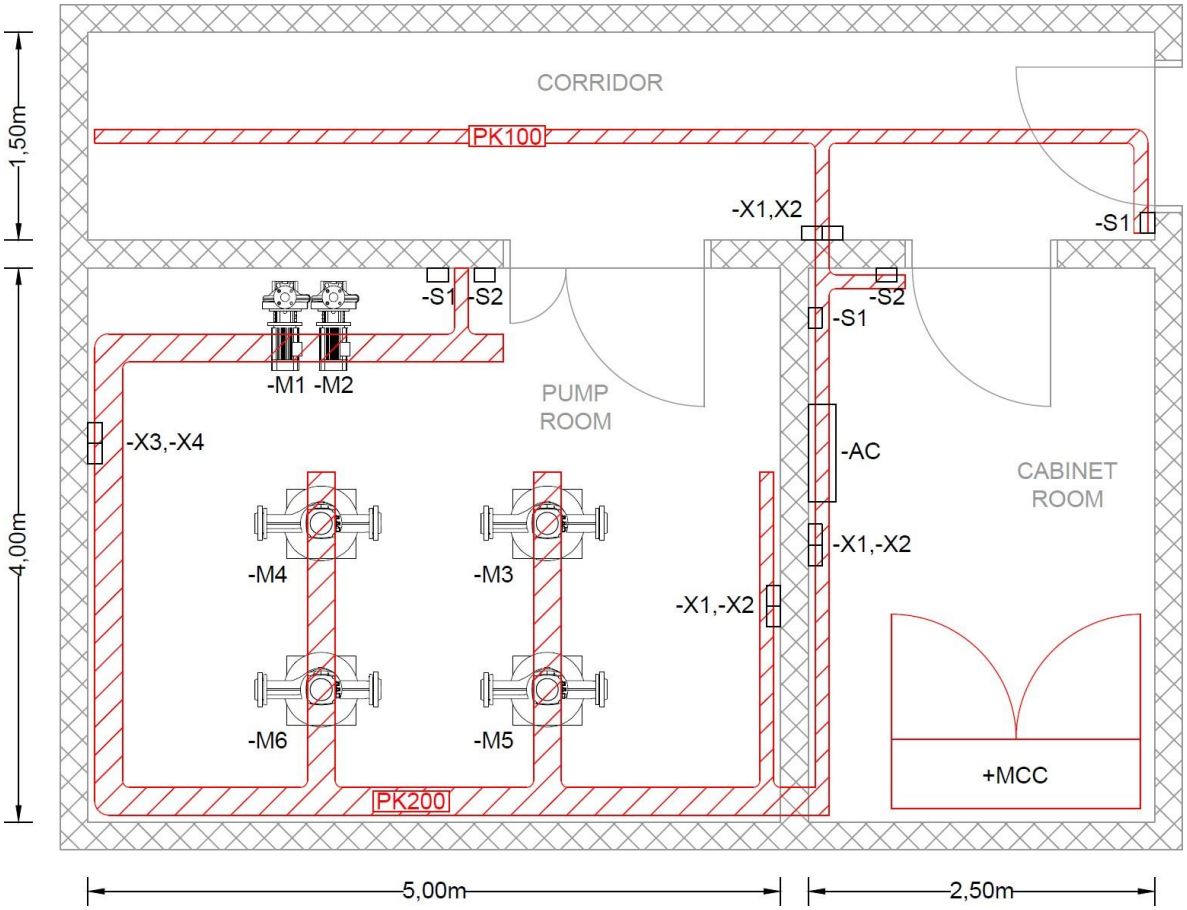
- Sustav zaštite unutar razdjelnika je **TN-S**, a naponske razine unutar razdjelnika su:
  - glavno napajanje: **400VAC, 50HZ,**
  - izmjenični upravljački napon: **230VAC, 50Hz,**
  - istosmjerni upravljački napon: **24VDC** (u sklopu istosmjernog upravljačkog napona predvidjeti UPS uređaj).

Upravljački i nadzorni sustav postrojenja sastoji se od slijedećih uređaja:

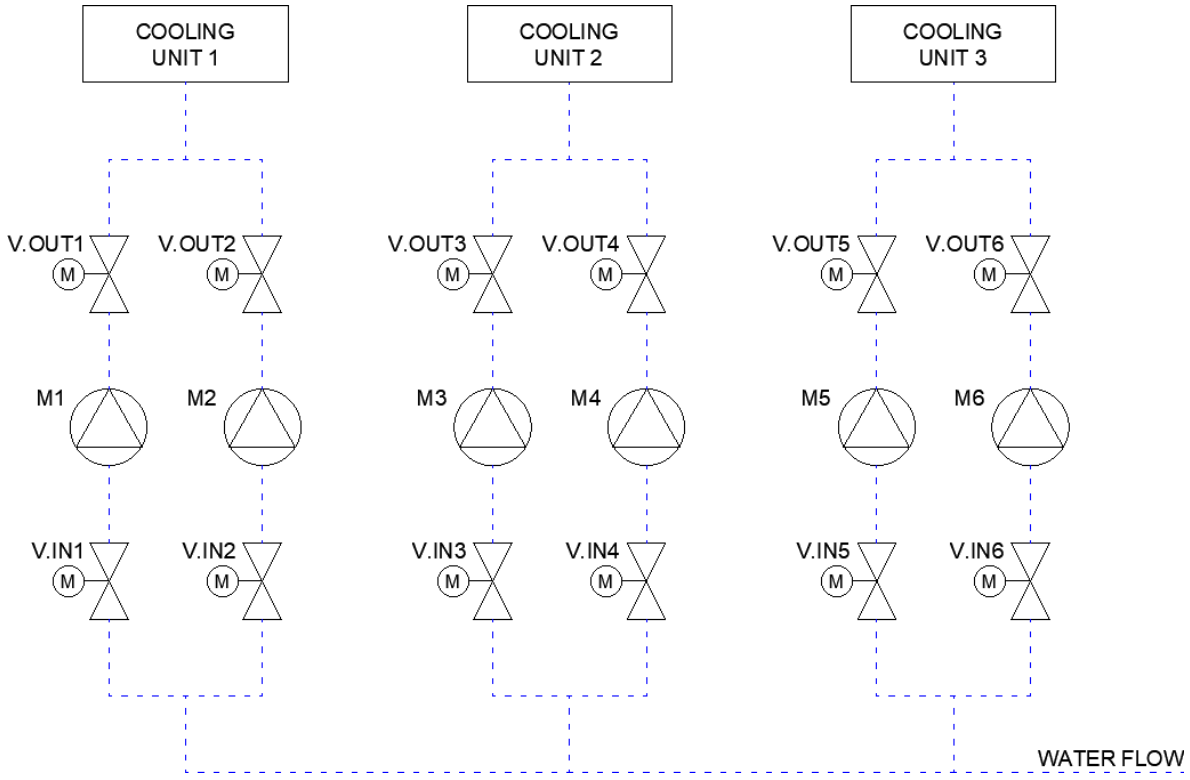
- **PLC - CPU, DI, DQ, AI,** proizvođača **Siemens,**
- **nadzor mrežnog napajanja - PAC 3200,** proizvođača **Siemens,**
- **grafičko sučelje - HMI,** proizvođača **Siemens,**
- uređaji upravljačkog i nadzornog sustava i pretvarači frekvencije i napona međusobno su povezani pomoću komunikacijskog potokola **Profinet** u mrežu.

Zagreb, 28. 10. 2020.

Nastavnik:
Tomislav Špoljarić, d.i.e., v. pred.



Slika 1. – Tlocrt postrojenja



Slika 2. – P&ID dijagram postrojenja

3. Proračun potrošnje

PRORAČUN VRŠNIH VRIJEDNOSTI SNAGA I STRUJA

3.1. Proračun elektromotora

$$P_{el} = \sqrt{3} * U_n * I_n * \cos\varphi = \sqrt{3} * 400 * 8.5 * 0.8 = 4.711\ kW$$

$$S_{el} = \sqrt{3} * U_n * I_n = \sqrt{3} * 400 * 8.5 = 5.888\ kVA$$

$$Q_{el} = \sqrt{S_{el}^2 - P_{el}^2} = \sqrt{5.888^2 - 4.711^2} = 3.532\ kVAr$$

3.2. Prikaz ukupne potrošnje po razdjelnicima

Razdjelnik	potrošač	Nazivni napon [V]	Snaga [kW]			Faktor snage	Struja [A]		
			L1	L2	L3		L1	L2	L3
=CST	**=PS+MCC**	**400**	**15,68**	**15,08**	**15,08**	**-**	**80,25**	**77,5**	**77,5**
=PS+MCC	=PR-M1	400	1,57	1,57	1,57	0,8	8,5	8,5	8,5
	=PR-M2	400	1,57	1,57	1,57	0,8	8,5	8,5	8,5
	=PR-M3	400	5,56	5,56	5,56	0,86	28	28	28
	=PR-M4	400	5,56	5,56	5,56	0,86	28	28	28
	=PR-M5	400	7,95	7,95	7,95	0,84	41	41	41
	=PR-M6	400	7,95	7,95	7,95	0,84	41	41	41
	=CR-H1	230	0,15	0	0	0,95	0,69	0	0
	=PR-H1	230	0,3	0	0	0,95	1,37	0	0
	=CO-H1	230	0,15	0	0	0,95	0,69	0	0

4. Proračun padova napona

Jednofazni pad napona:

$$\Delta U_{1F,\%} = \frac{2 * P * l}{U_{1F,n}^2 * s * \varkappa} * 100\%$$

Trofazni pad napona:

$$\Delta U_{3F,\%} = \frac{P * l}{U_{3F,n}^2 * s * \varkappa} * 100\%$$

Gdje je:

$\varkappa$=50

$U_{1F,n}$=230V

$U_{3F,n}$=400V

Razdjelnik	Potrošač	Nazivni napon [V]	Snaga [kW]	Duljina trase [m]	Spec. vodljivost kabela [Sm/mm^2]	presjek kabela [mm^2]	Pad napona na kabelu [%]	Ukupni pad napona [%]	Uvjet ispunjen Δu≤5%
=CTS	=PS+MCC	400	15,68	50	50	70	0,85	0,85	**DA**
=PS+MCC	=PR-M1	400	4,71	30	50	2,5	0,71	1,55	**DA**
	=PR-M2	400	4,71	30	50	2,5	0,71	1,55	**DA**
	=PR-M3	400	16,68	20	50	4	1,04	1,89	**DA**
	=PR-M4	400	16,68	25	50	4	1,30	2,15	**DA**
	=PR-M5	400	23,85	20	50	16	0,37	1,22	**DA**
	=PR-M6	400	23,85	25	50	16	0,47	1,31	**DA**
	=CR-H1	230	0,15	15	50	1,5	0,11	0,96	**DA**
	=PR-H1	230	0,3	20	50	1,5	0,30	1,15	**DA**
	=CO-H1	230	0,15	20	50	1,5	0,15	1,00	**DA**

5. Proračun struja kratkog spoja

Jednofazni (minimalni) kratki spoj:

$$I_{KS,m} = 0{,}8 * \frac{0.8 * U_{1F,n}}{2 * \sqrt{(2 * R_{uk} + R_0)^2 + (2 * X_{uk} + X_0)^2}}$$

Trofazni (maksimalan) kratki spoj:

$$I_{KS,M} = 1{,}1 * \frac{U_{3F,n}}{\sqrt{R_{uk}^2 * X_{uk}^2}}$$

Gdje je:

$R_{uk,WM1} = R_{M1} + R_{W2} + R_{W1}$

$X_{uk,WM1} = X_{M1} + X_{W2} + X_{W1}$

$X_L = 2\pi * f * L$

Razdjelnik	Potrošač	Nazivni napon [V]	Snaga [kW]	Duljina trase [m]	Presjek [mm^2]	Pogonska struja IB [A]	Zaštitni element		Nazivna struja zaštitnog elementa In/Ir [A]	Prekidna moć zaštitnog elementa Isc [A]	Trenutna isklopna struja zaštitnog elementa IscB [A]	Specifični r, l po		Otpor kabela		Ukupni otpor trase		Iksmax	Iksmin	Uvjet 1: Iksmax < Isc	Uvjet 2: IscB < Iksmin
							Proizvođač	Tip				Rk (Ω/km)	Lk (mH/km)	Rk (Ω)	Xk (Ω)	R (Ω)	X (Ω)				
=CTS	=PS+MCC	400	15,68	50	70	80,25	*Schrack*	*MC116131*	140	25000	1400	0,268	0,28	0,0134	0,004396	0,0134	0,004396	18013,22	7205,286	DA	DA
=PS+MCC	=PR-M1	400	4,71	30	2,5	8,5	*Eaton*	*PKZM0-10*	10	150000	155	7,41	0,349	0,2223	0,003288	0,2357	0,007684	1077,214	430,8854	DA	DA
	=PR-M2	400	4,71	30	2,5	8,5	*Eaton*	*PKZM0-10*	10	150000	155	7,41	0,349	0,2223	0,003288	0,2357	0,007684	1077,214	430,8854	DA	DA
	=PR-M3	400	16,68	20	4	28	*Eaton*	*PKZM0-32*	30	150000	496	4,61	0,348	0,0922	0,002185	0,1056	0,006581	2400,968	960,387	DA	DA
	=PR-M4	400	16,68	25	4	28	*Eaton*	*PKZM0-32*	30	150000	496	4,61	0,348	0,11525	0,002732	0,12865	0,007128	1971,59	788,6362	DA	DA
	=PR-M5	400	23,85	20	16	41	*ABB*	*OFAF000H63*	63	120000	500	1,15	0,294	0,023	0,001846	0,0364	0,006242	6878,545	2751,418	DA	DA
	=PR-M6	400	23,85	25	16	41	*ABB*	*OFAF000H63*	63	120000	500	1,15	0,294	0,02875	0,002308	0,04215	0,006704	5952,093	2380,837	DA	DA
	=CR-H1	230	0,15	15	1,5	0,69	*Schrack*	*BM617106*	6	6000	30	12,1	0,375	0,1815	0,001766	0,1949	0,006162	374,5425	272,3945	DA	DA
	=PR-H1	230	0,3	20	1,5	1,37	*Schrack*	*BM617106*	6	6000	30	12,1	0,375	0,242	0,002355	0,2554	0,006751	285,8626	207,9001	DA	DA
	=CO-H1	230	0,15	20	1,5	0,69	*Schrack*	*BM617106*	6	6000	30	12,1	0,375	0,242	0,002355	0,2554	0,006751	285,8626	207,9001	DA	DA

6. Provjera zašite kabela

Uvjet 1: $I_p \leq I_n \leq I_z$

Uvjet 2: $I_2 \leq 1.45 * I_z$

Razdjelnik	Potrošač	Nazivni napon [V]	Snaga [kW]	Duljina trase [m]	Pogonska struja Ip [A]	Nazivna struja zaštitnog elementa In/Ir [A]	Brza isklopna struja I2 [A]	Presjek [mm^2]	Strujna podnosivost kabela		Uvjet 1 Ip ≤ In ≤ Iz	Uvjet 2 I2 ≤ 1.45*Iz
									Trajna Iz [A]	30min max 1.45*Iz [A]		
=CTS	=PS+MCC	400	15,68	50	80,25	140	175	70	199	288,55	DA	DA
=PS+MCC	=PR-M1	400	4,71	30	8,5	10	12,5	2,5	25	36,25	DA	DA
	=PR-M2	400	4,71	30	8,5	10	12,5	2,5	25	36,25	DA	DA
	=PR-M3	400	16,68	20	28	30	37,5	4	34	49,3	DA	DA
	=PR-M4	400	16,68	25	28	30	37,5	4	34	49,3	DA	DA
	=PR-M5	400	23,85	20	41	63	61,5	16	79	114,55	DA	DA
	=PR-M6	400	23,85	25	41	63	61,5	16	79	114,55	DA	DA
	=CR-H1	230	0,15	15	0,69	6	7,5	1,5	19,5	28,275	DA	DA
	=PR-H1	230	0,3	20	1,37	6	7,5	1,5	19,5	28,275	DA	DA
	=CO-H1	230	0,15	20	0,69	6	7,5	1,5	19,5	28,275	DA	DA

TEHNIČKO VELEUČILIŠTE U ZAGREBU
POLYTECHNICUM ZAGRABIENSE
www.tvz.hr
Vrbik 8a, 10000 Zagreb

Customer: University of Applied Science
Vrbik 8a, 10000 Zagreb
Croatia

End customer: University of Applied Science
Konavoska 2, 10000 Zagreb
Croatia

Object: Electrical engineering department
Konavoska 2, 10000 Zagreb
Croatia

Project name: DATA CENTER COOLING

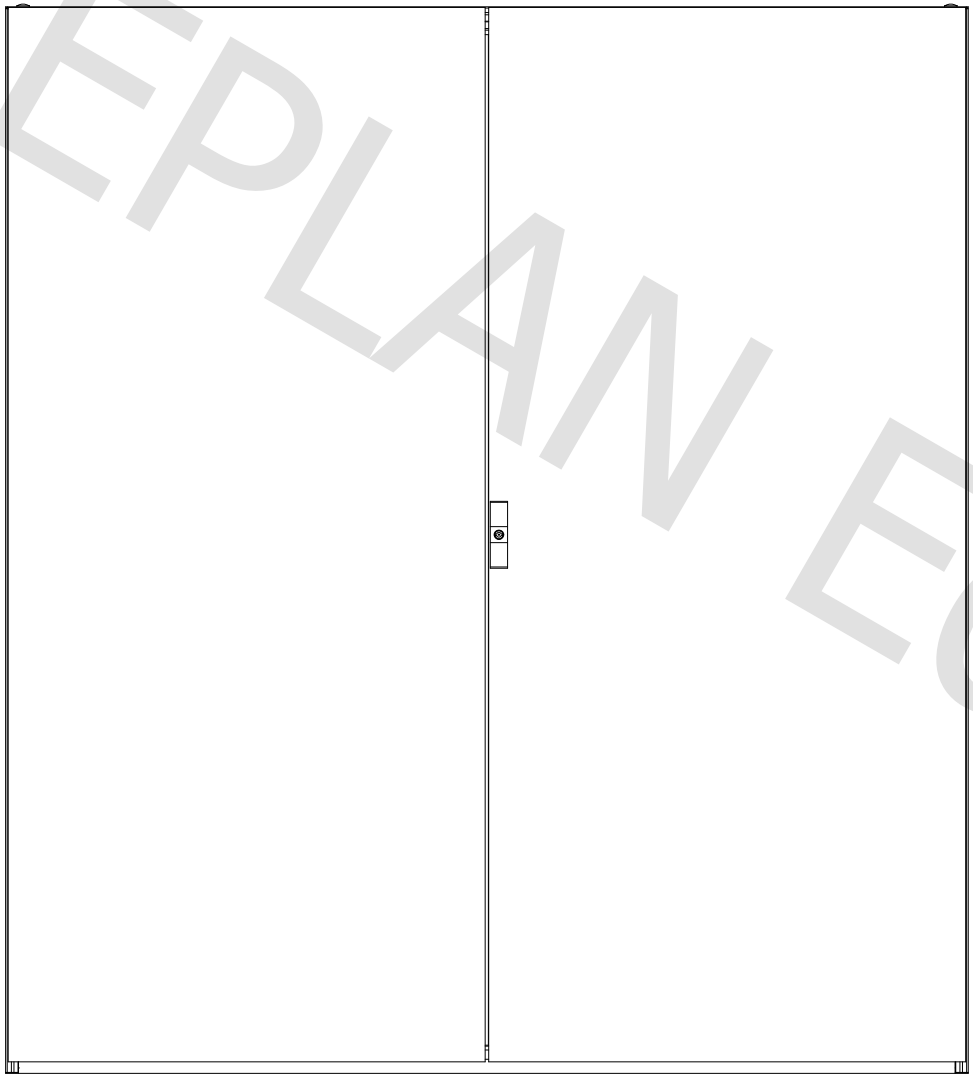
Cabinet name: **MCC**
Cabinet description: **Motor control cabinet**

Drawn: Matea Musladin, bacc.ing.el
Checked: Tomislav Špoljarić, dip.ing. el
Approved: mr. sc. Davor Gadže, dipl.ing.el
Number of page: 31

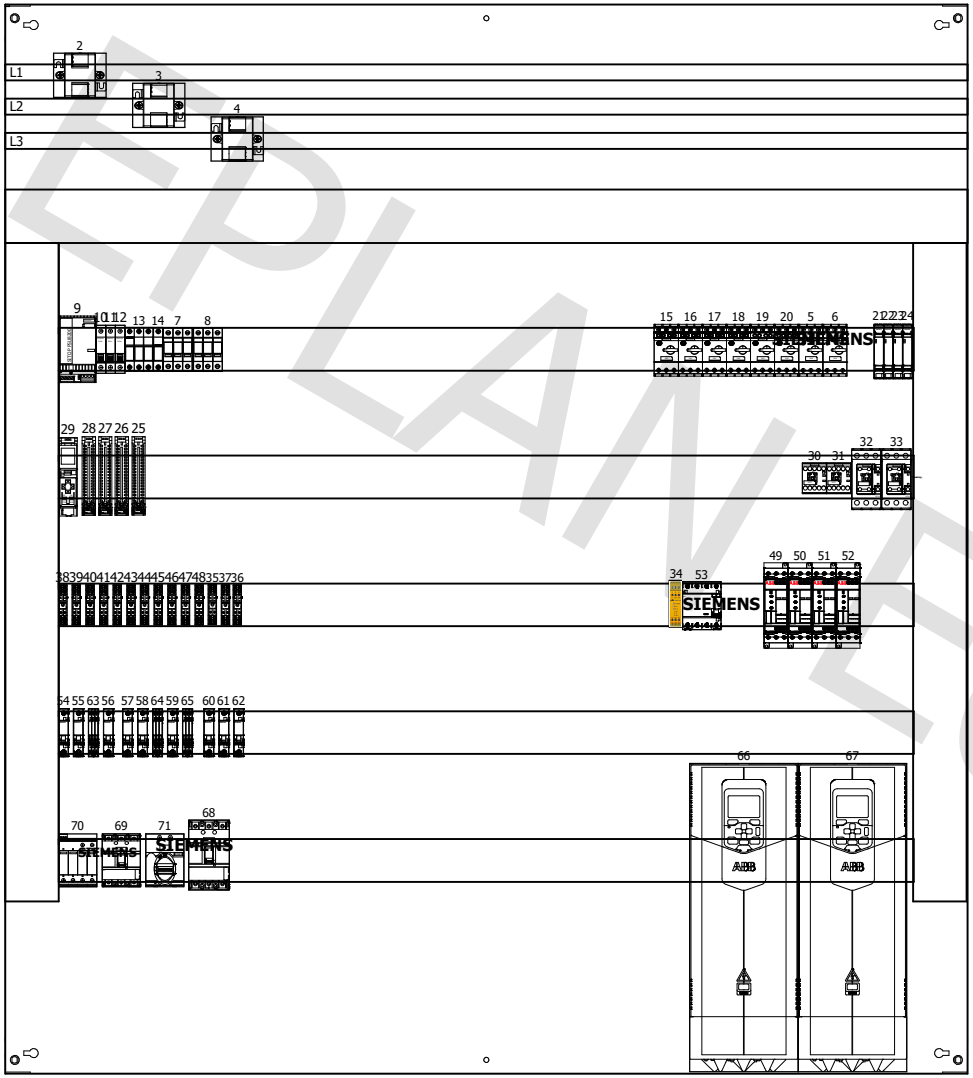
Project number: PIEP-21/22
Project date: 15.11.2021
Revision: R0
Revision date: 05.01.2021.

Supply voltage: 400VAC, 50Hz
Control voltage: 230VAC, 50Hz; 24VDC
Rated current: 16 A
Rated short circuit current: 10 kA

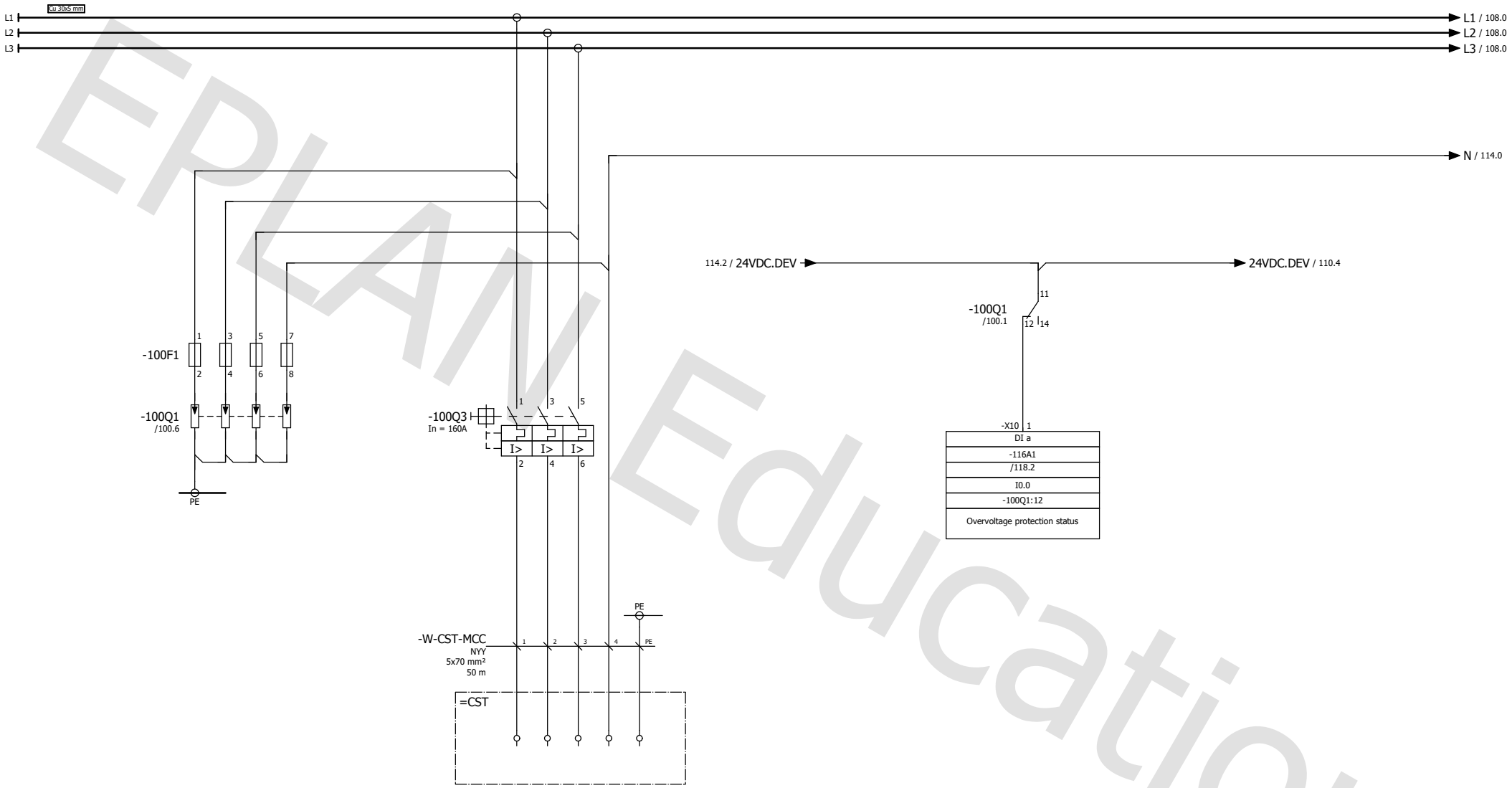
Table of contents



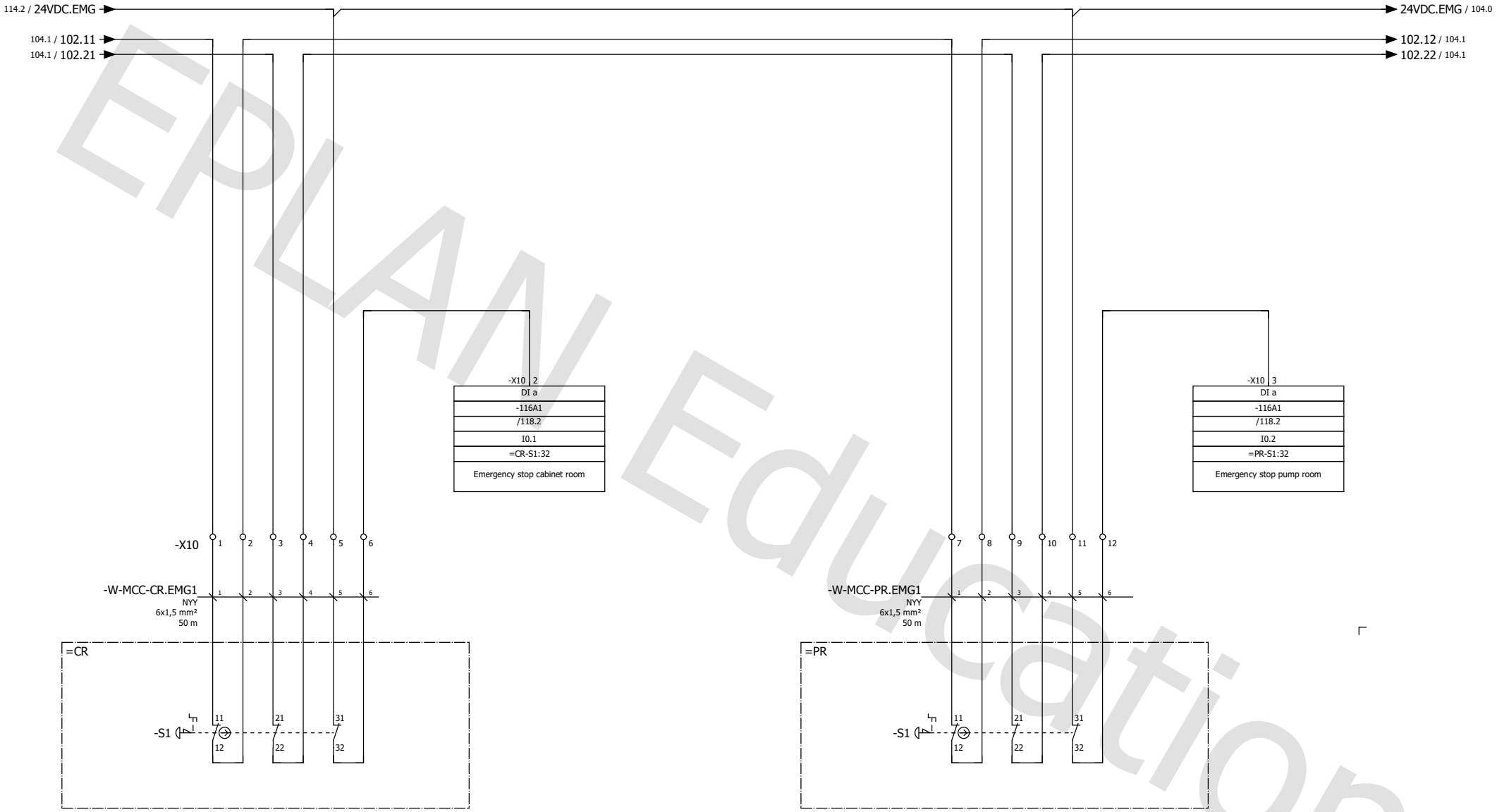
Project no.: PIEP-21/22 | Revision: R0 | Revision date: 05.01.2021.	TVZ TEHNIČKO VELEUČILIŠTE U ZAGREBU POLYTECHNICUM ZAGRABIENSE www.tvz.hr Vrbik 8a, 10000 Zagreb	Customer: University of Applied Science Vrbik 8a, 10000 Zagreb	Project name: DATA CENTER COOLING	Cabinet: +MCC
Drawn: Matea Musladin, bacc.ing.el				Plant: =PS
Checked: Tomislav Špoljarić, dip.ing. el	Page description: **Panel layout - cabinet external view**	End customer: University of Applied Science Konavoska 2, 10000 Zagreb	Object: Electrical engineering department Konavoska 2, 10000 Zagreb	Page: 50
Approved: mr. sc. Davor Gadže, dipl.ing.el				Follow: 52



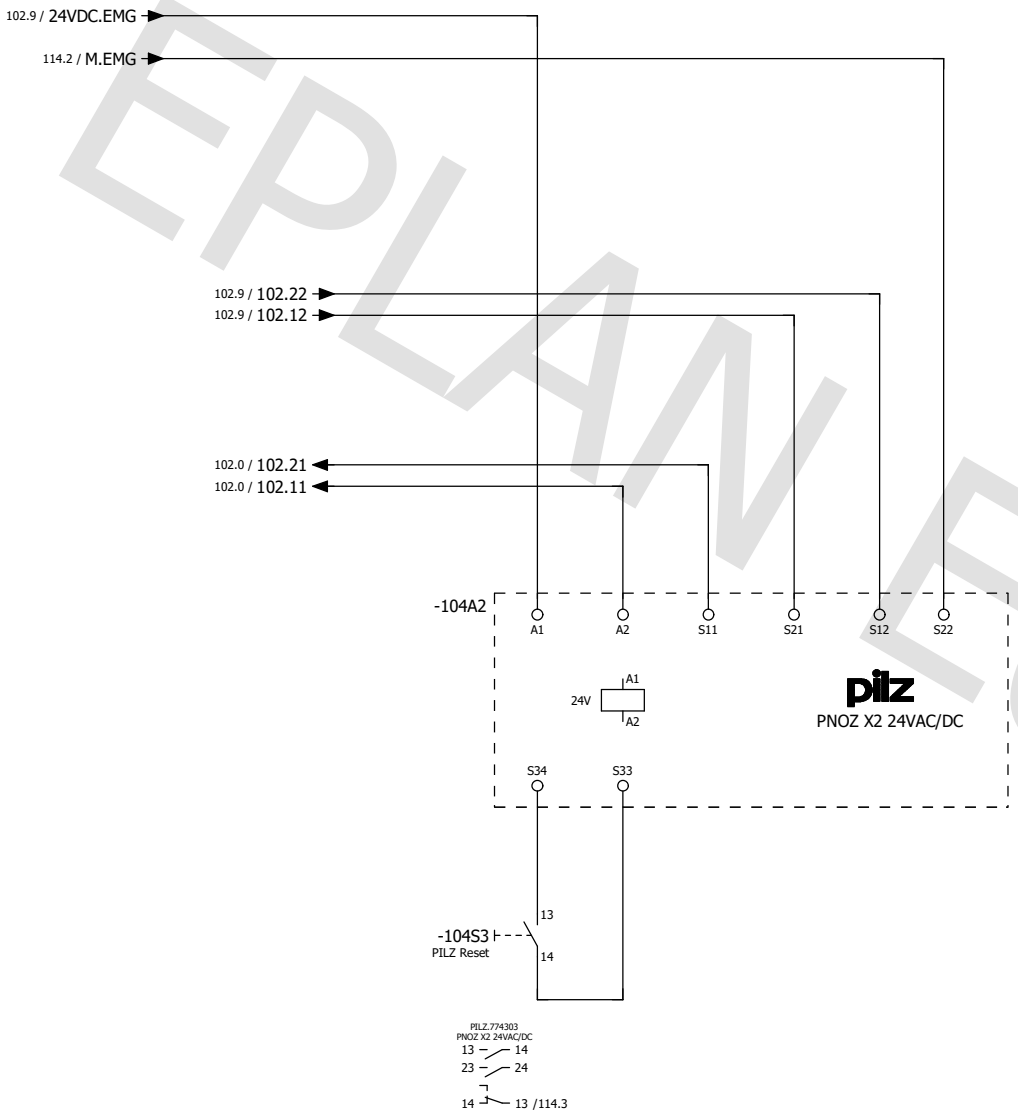
Project no.: PIEP-21/22 Revision: R0 Revision date: 05.01.2021.	TVZ TEHNIČKO VELEUČILIŠTE U ZAGREBU POLYTECHNICUM ZAGRABIENSE	Customer: University of Applied Science Vrbik 8a, 10000 Zagreb	Project name: DATA CENTER COOLING	Cabinet: +MCC
Drawn: Matea Musladin, bacc.ing.el				Plant: =PS
Checked: Tomislav Špoljarić, dip.ing. el	Page description: **Panel layout - mounting panel - internal view**	End customer: University of Applied Science Konavoska 2, 10000 Zagreb	Object: Electrical engineering department Konavoska 2, 10000 Zagreb	Page: 52
Approved: mr. sc. Davor Gadže, dipl.ing.el				Follow: 100



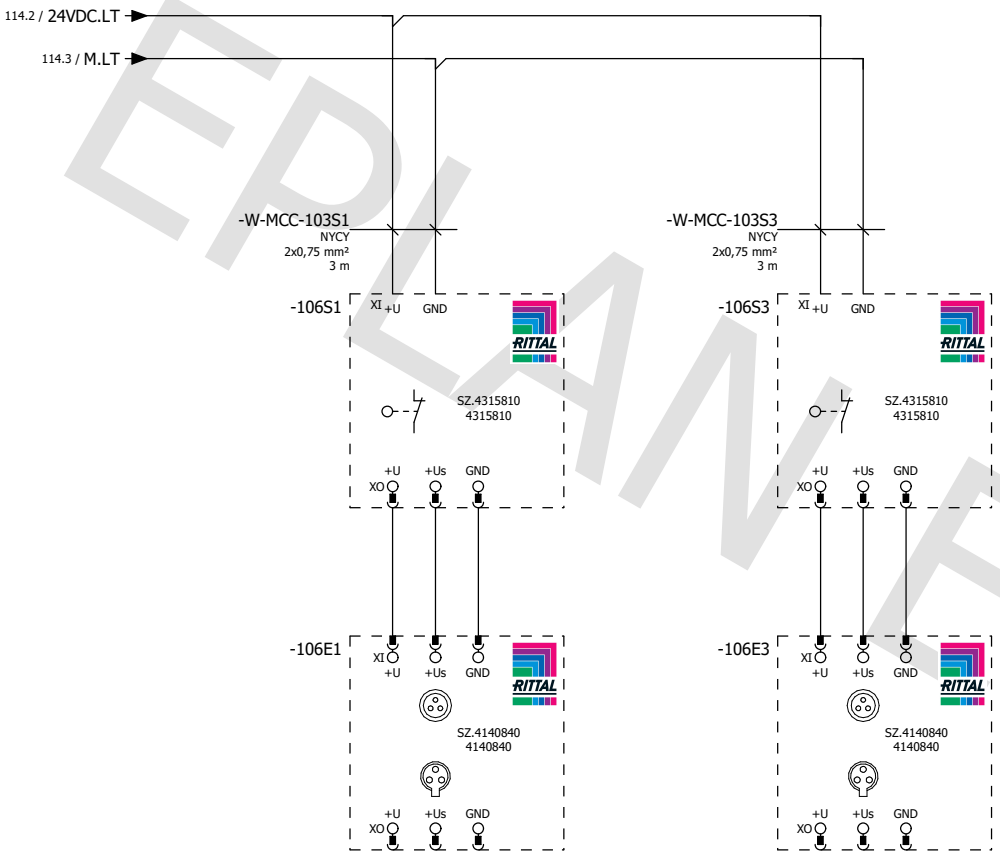
Project no.: PIEP-21/22 Revision: R0 Revision date: 05.01.2021.	TVZ TEHNIČKO VELEUČILIŠTE U ZAGREBU POLYTECHNICUM ZAGRABIENSE	Customer: University of Applied Science Vrbik 8a, 10000 Zagreb	Project name: DATA CENTER COOLING	Cabinet: +MCC
Drawn: Matea Musladin, bacc.ing.el				Plant: =PS
Checked: Tomislav Špoljarić, dip.ing. el	Page description: **Incoming power supply**	End customer: University of Applied Science Konavoska 2, 10000 Zagreb	Object: Electrical engineering department Konavoska 2, 10000 Zagreb	Page: 100
Approved: mr. sc. Davor Gadže, dipl.ing.el				Follow: 102



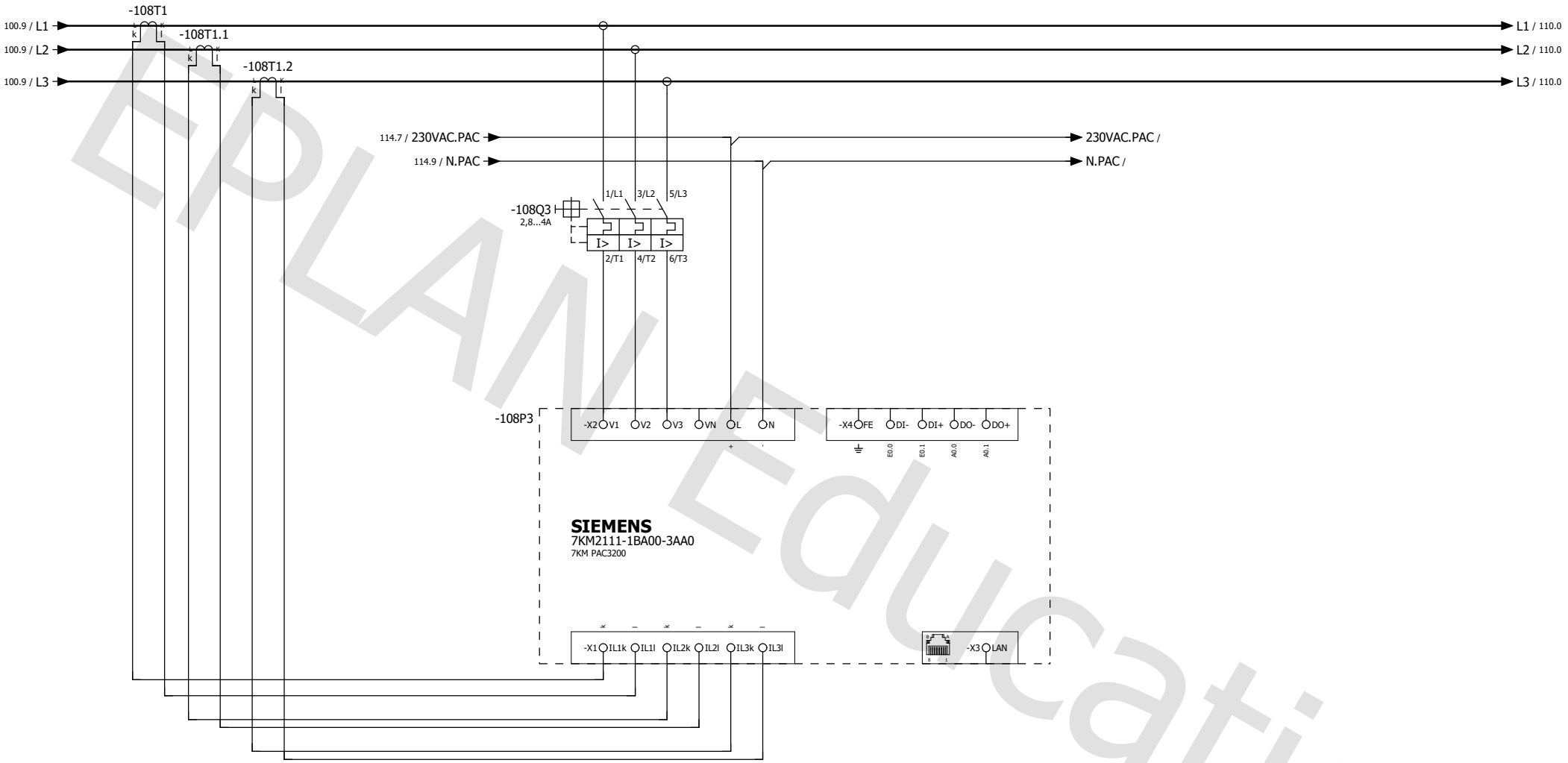
Project no.: PIEP-21/22	Revision: R0	Revision date: 05.01.2021.	TVZ TEHNIČKO VELEUČILIŠTE U ZAGREBU POLYTECHNICUM ZAGRABIENSE	Customer: University of Applied Science Vrbik 8a, 10000 Zagreb	Project name: DATA CENTER COOLING	Cabinet: +MCC
Drawn: Matea Musladin, bacc.ing.el						Plant: =PS
Checked: Tomislav Špoljarić, dip.ing. el			Page description: **Emergency stop**	End customer: University of Applied Science Konavoska 2, 10000 Zagreb	Object: Electrical engineering department Konavoska 2, 10000 Zagreb	Page: 102
Approved: mr. sc. Davor Gadže, dipl.ing.el						Follow: 104



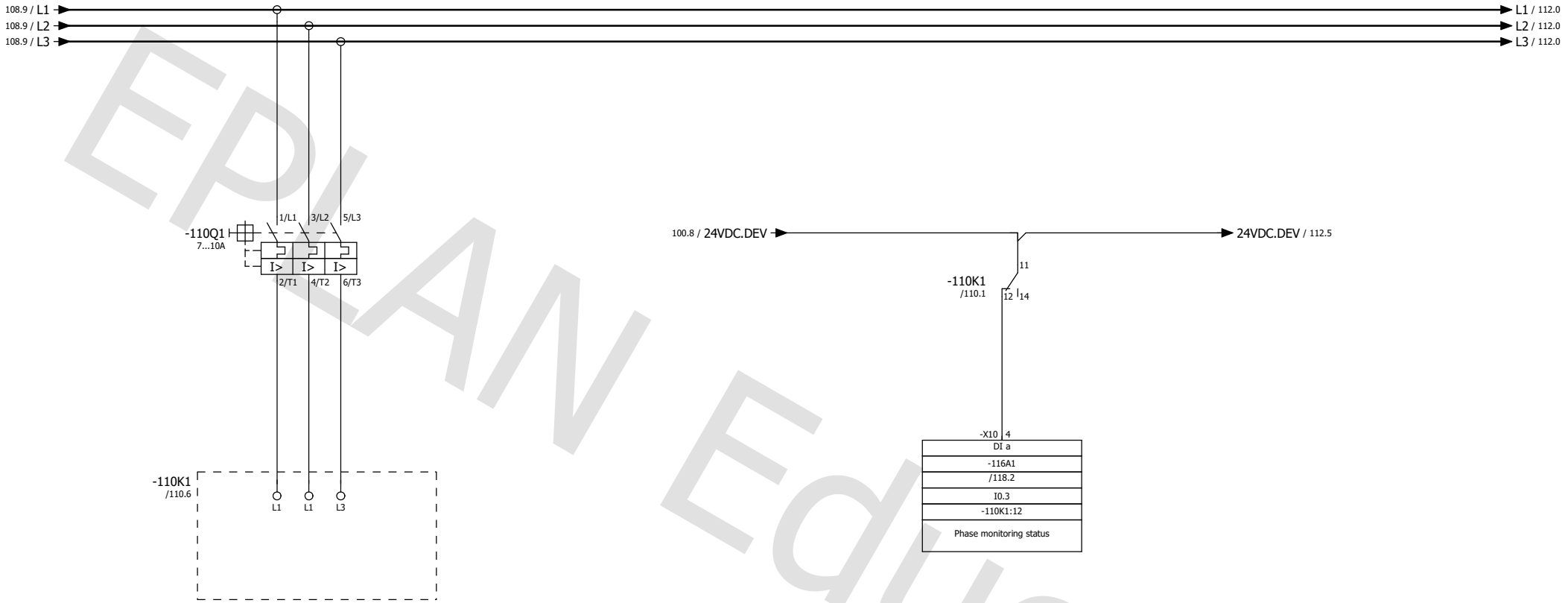
Project no.: PIEP-21/22 Revision: R0 Revision date: 05.01.2021.	TVZ TEHNIČKO VELEUČILIŠTE U ZAGREBU POLYTECHNICUM ZAGRABIENSE	Customer: University of Applied Science Vrbik 8a, 10000 Zagreb	Project name: DATA CENTER COOLING	Cabinet: +MCC
Drawn: Matea Musladin, bacc.ing.el				Plant: =PS
Checked: Tomislav Špoljarić, dip.ing. el	Page description: **Emergency stop relay**	End customer: University of Applied Science Konavoska 2, 10000 Zagreb	Object: Electrical engineering department Konavoska 2, 10000 Zagreb	Page: 104
Approved: mr. sc. Davor Gadže, dipl.ing.el				Follow: 106



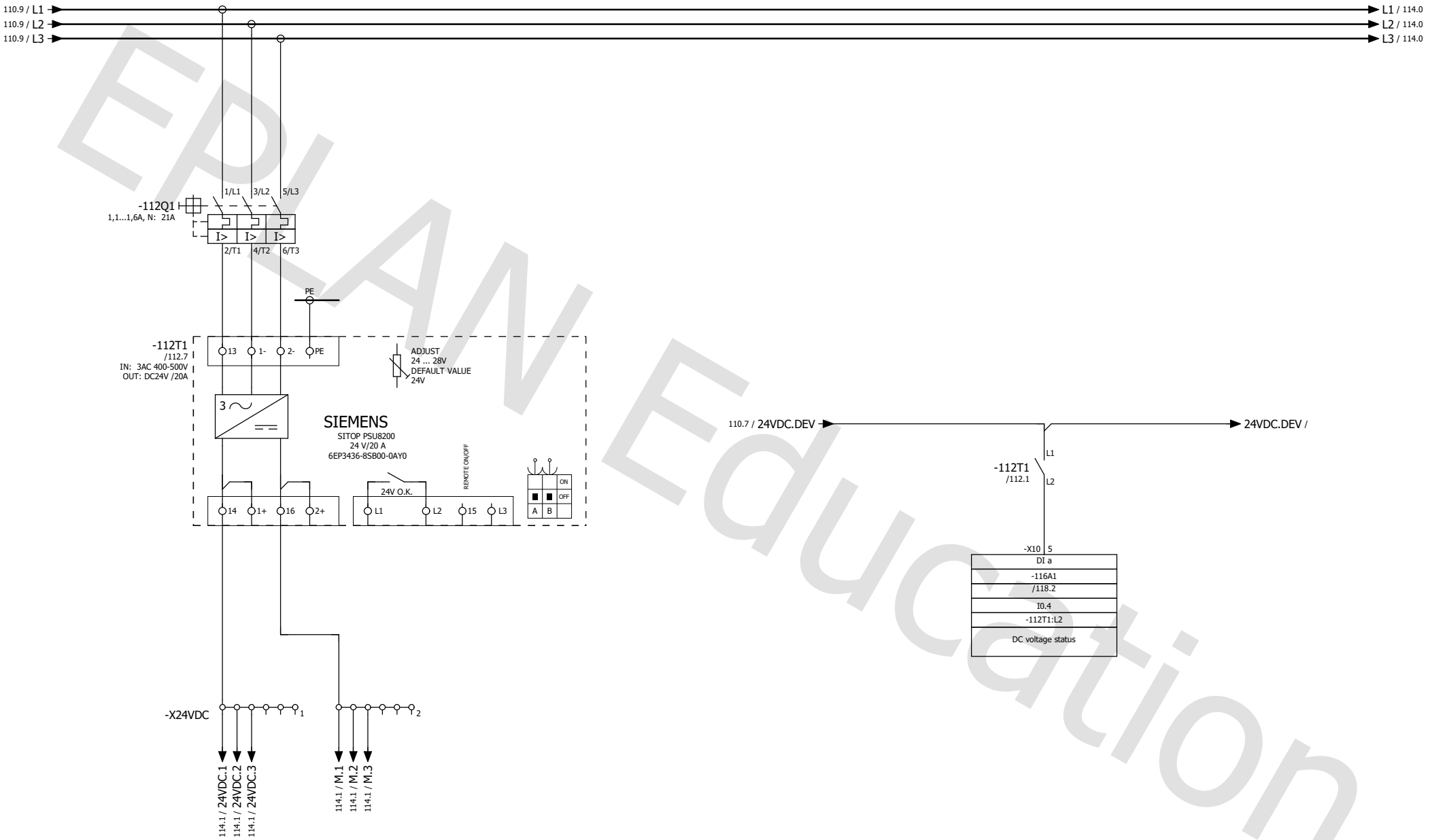
Project no.: PIEP-21/22	Revision: R0	Revision date: 05.01.2021.	TVZ TEHNIČKO VELEUČILIŠTE U ZAGREBU POLYTECHNICUM ZAGRABIENSE	Customer: University of Applied Science Vrbik 8a, 10000 Zagreb	Project name: DATA CENTER COOLING	Cabinet: +MCC
Drawn: Matea Musladin, bacc.ing.el						Plant: =PS
Checked: Tomislav Špoljarić, dip.ing. el			Page description: **Cabinet illumination**	End customer: University of Applied Science Konavoska 2, 10000 Zagreb	Object: Electrical engineering department Konavoska 2, 10000 Zagreb	Page: 106
Approved: mr. sc. Davor Gadže, dipl.ing.el						Follow: 108



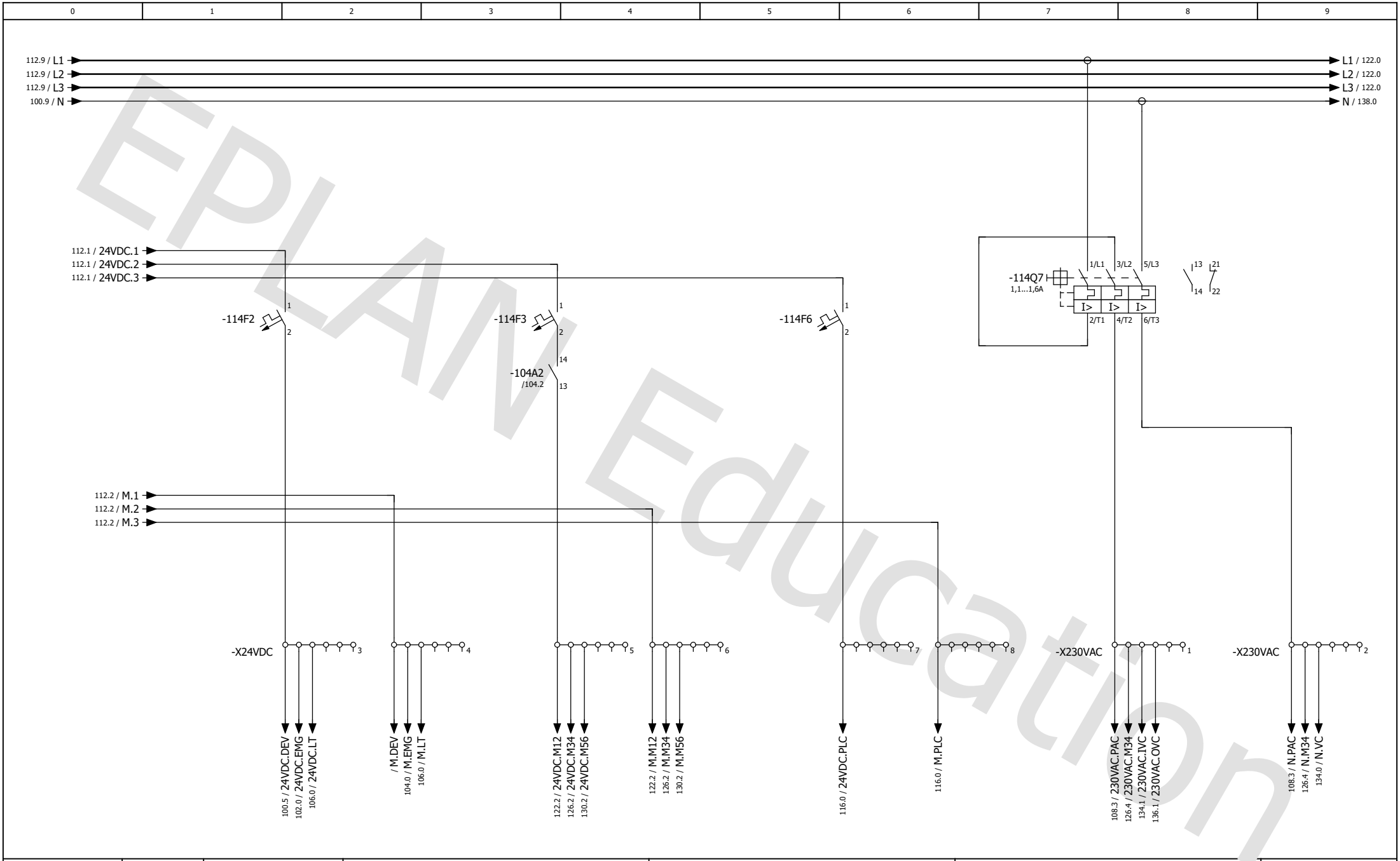
Project no.: PIEP-21/22	Revision: R0	Revision date: 05.01.2021.	TVZ TEHNIČKO VELEUČILIŠTE U ZAGREBU POLYTECHNICUM ZAGRABIENSE	Customer: University of Applied Science Vrbik 8a, 10000 Zagreb	Project name: DATA CENTER COOLING	Cabinet: +MCC
Drawn: Matea Musladin, bacc.ing.el						Plant: =PS
Checked: Tomislav Špoljarić, dip.ing. el			Page description: **Power monitorning**	End customer: University of Applied Science Konavoska 2, 10000 Zagreb	Object: Electrical engineering department Konavoska 2, 10000 Zagreb	Page: 108
Approved: mr. sc. Davor Gadže, dipl.ing.el						Follow: 110



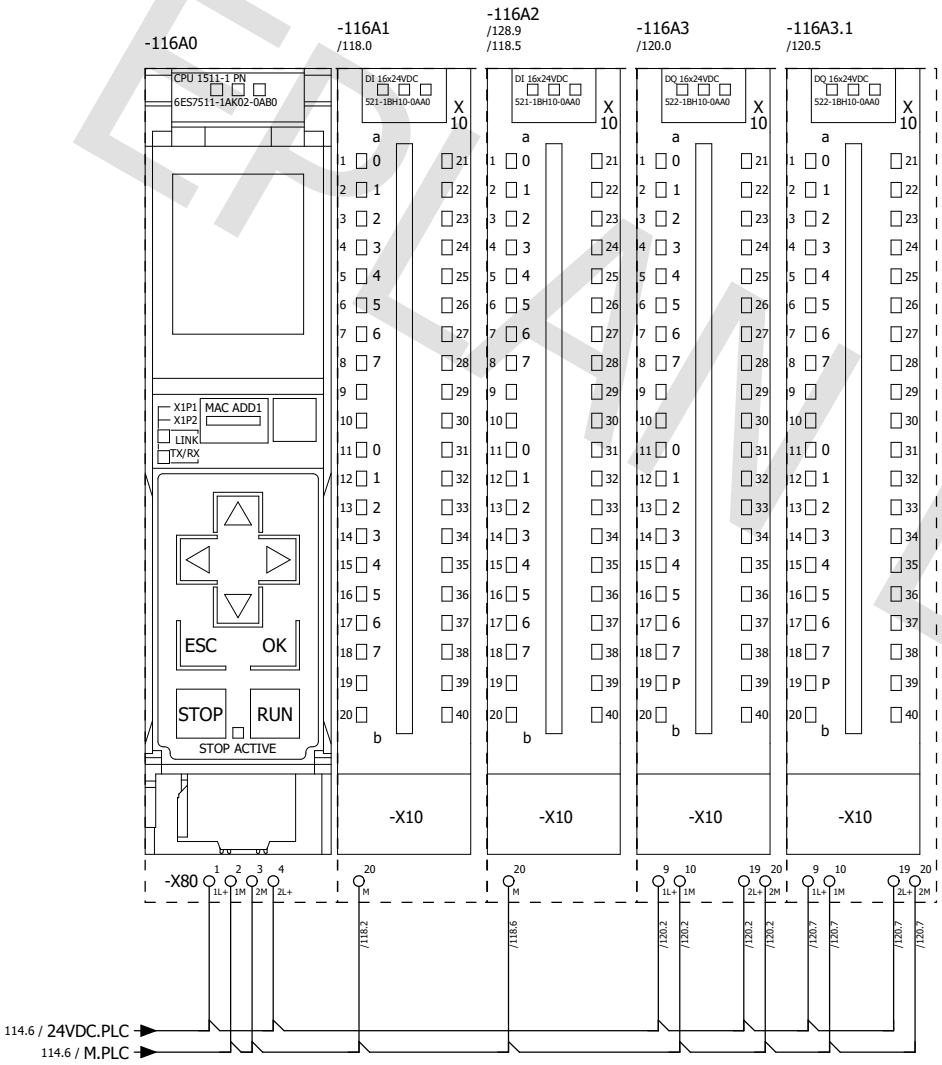
Project no.: PIEP-21/22 | Revision: R0 | Revision date: 05.01.2021.	TVZ TEHNIČKO VELEUČILIŠTE U ZAGREBU POLYTECHNICUM ZAGRABIENSE www.tvz.hr Vrbik 8a, 10000 Zagreb	Customer: University of Applied Science Vrbik 8a, 10000 Zagreb	Project name: DATA CENTER COOLING	Cabinet: +MCC
Drawn: Matea Musladin, bacc.ing.el				Plant: =PS
Checked: Tomislav Špoljarić, dip.ing. el	Page description: **Phase monitorning**	End customer: University of Applied Science Konavoska 2, 10000 Zagreb	Object: Electrical engineering department Konavoska 2, 10000 Zagreb	Page: 110
Approved: mr. sc. Davor Gadže, dipl.ing.el				Follow: 112



Project no.: PIEP-21/22	Revision: R0	Revision date: 05.01.2021.	TVZ TEHNIČKO VELEUČILIŠTE U ZAGREBU POLYTECHNICUM ZAGRABIENSE	Customer: University of Applied Science Vrbik 8a, 10000 Zagreb	Project name: DATA CENTER COOLING	Cabinet: +MCC
Drawn: Matea Musladin, bacc.ing.el						Plant: =PS
Checked: Tomislav Špoljarić, dip.ing. el			Page description: **Control voltage (230VAC/24VDC)**	End customer: University of Applied Science Konavoska 2, 10000 Zagreb	Object: Electrical engineering department Konavoska 2, 10000 Zagreb	Page: 112
Approved: mr. sc. Davor Gadže, dipl.ing.el						Follow: 114



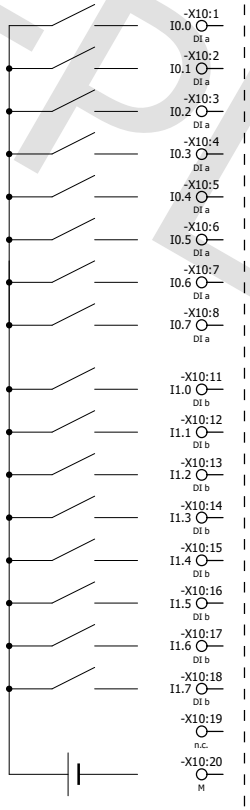
Project no.: PIEP-21/22 Revision: R0 Revision date: 05.01.2021.	TVZ TEHNIČKO VELEUČILIŠTE U ZAGREBU POLYTECHNICUM ZAGRABIENSE	Customer: University of Applied Science Vrbik 8a, 10000 Zagreb	Project name: DATA CENTER COOLING	Cabinet: +MCC
Drawn: Matea Musladin, bacc.ing.el				Plant: =PS
Checked: Tomislav Špoljarić, dip.ing. el	Page description: **Control voltage distribution (230VAC&24VDC)**	End customer: University of Applied Science Konavoska 2, 10000 Zagreb	Object: Electrical engineering department Konavoska 2, 10000 Zagreb	Page: 114
Approved: mr. sc. Davor Gadže, dipl.ing.el				Follow: 116



Project no.: PIEP-21/22	Revision: R0	Revision date: 05.01.2021.	TVZ TEHNIČKO VELEUČILIŠTE U ZAGREBU POLYTECHNICUM ZAGRABIENSE	Customer: University of Applied Science Vrbik 8a, 10000 Zagreb	Project name: DATA CENTER COOLING	Cabinet: +MCC
Drawn: Matea Musladin, bacc.ing.el						Plant: =PS
Checked: Tomislav Špoljarić, dip.ing. el			Page description: **PLC power supply**	End customer: University of Applied Science Konavoska 2, 10000 Zagreb	Object: Electrical engineering department Konavoska 2, 10000 Zagreb	Page: 116
Approved: mr. sc. Davor Gadže, dipl.ing.el						Follow: 118

-116A1
/116.1

S7-1500 SIEMENS
DI 16x24VDC BA

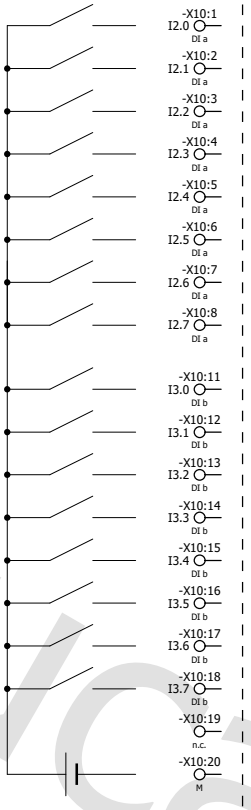


/100.6	-100Q1:12	Overvoltage protection status
/102.3	=CR-S1:32	Emergency stop cabinet room
/102.8	=PR-S1:32	Emergency stop pump room
/110.6	-110K1:12	Phase monitoring status
/112.7	-112T1:L2	DC voltage status
/122.6	-122Q1:14	Protection status M1
/122.7	-122K5:14	Run status M1
/122.8	-122K2:14	Motor temperature status M1
/124.7	-124Q1:14	Protection status M2
/124.8	-124K5:14	Run status M2
/124.9	-124K2:14	Motor temperature status M2
/126.7	-126Q1:14	Protection status M3
/126.8	-126K5:14	Run status M3
/126.9	-126K2:14	Motor temperature status M3
/128.7	-128Q1:14	Protection status M4
/128.8	-128K5:14	Run status M4
/116.1		

6ES7521-1BH10-0AA0

-116A2
/116.2

S7-1500 SIEMENS
DI 16x24VDC BA



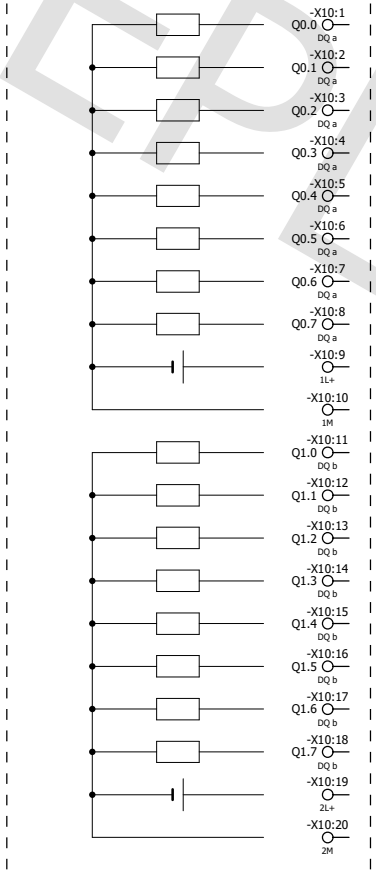
/128.9	-128K2:14	Motor temperature status M4
/116.2		

6ES7521-1BH10-0AA0

Project no.: PIEP-21/22 | Revision: R0 | Revision date: 05.01.2021.	TVZ TEHNIČKO VELEUČILIŠTE U ZAGREBU POLYTECHNICUM ZAGRABIENSE	Customer: University of Applied Science Vrbik 8a, 10000 Zagreb	Project name: DATA CENTER COOLING	Cabinet: +MCC
Drawn: Matea Musladin, bacc.ing.el				Plant: =PS
Checked: Tomislav Špoljarić, dip.ing. el	Page description: **PLC digital input module**	End customer: University of Applied Science Konavoska 2, 10000 Zagreb	Object: Electrical engineering department Konavoska 2, 10000 Zagreb	Page: 118
Approved: mr. sc. Davor Gadže, dipl.ing.el				Follow: 120

-116A3
/116.3

S7-1500 SIEMENS
DQ 16x24VDC/0.5A BA

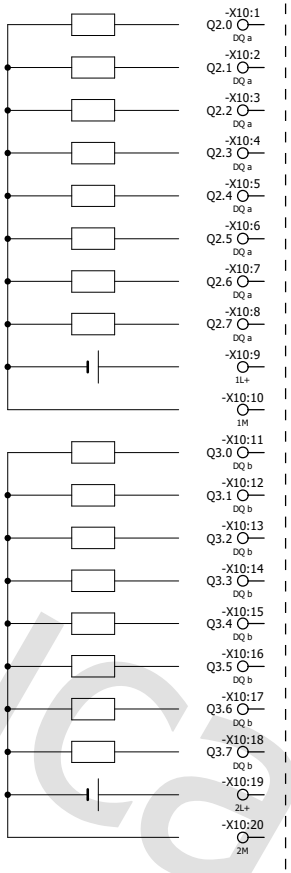


/122.5	-122K5:A1	Run motor M1
/124.6	-124K5:A1	Run motor M2
/126.7	-126K6:A1	Run motor M3
/128.7	-128K6:A1	Run motor M4
/134.1	-134K1:A1	Control input valve V.IN1
/134.2	-134K2:A1	Control input valve V.IN2
/134.3	-134K3:A1	Control input valve V.IN3
/134.4	-134K4:A1	Control input valve V.IN4
/116.3		
/116.3		
/134.6	-134K6:A1	Control input valve V.IN5
/134.7	-134K7:A1	Control input valve V.IN6
/136.1	-136K1:A1	Control input valve V.OUT1
/136.2	-136K2:A1	Control input valve V.OUT2
/136.3	-136K3:A1	Control input valve V.OUT3
/136.4	-136K4:A1	Control input valve V.OUT4
/136.6	-136K6:A1	Control input valve V.OUT5
/136.7	-136K7:A1	Control input valve V.OUT6
/116.3		
/116.3		

6ES7522-1BH10-0AA0

-116A3.1
/116.3

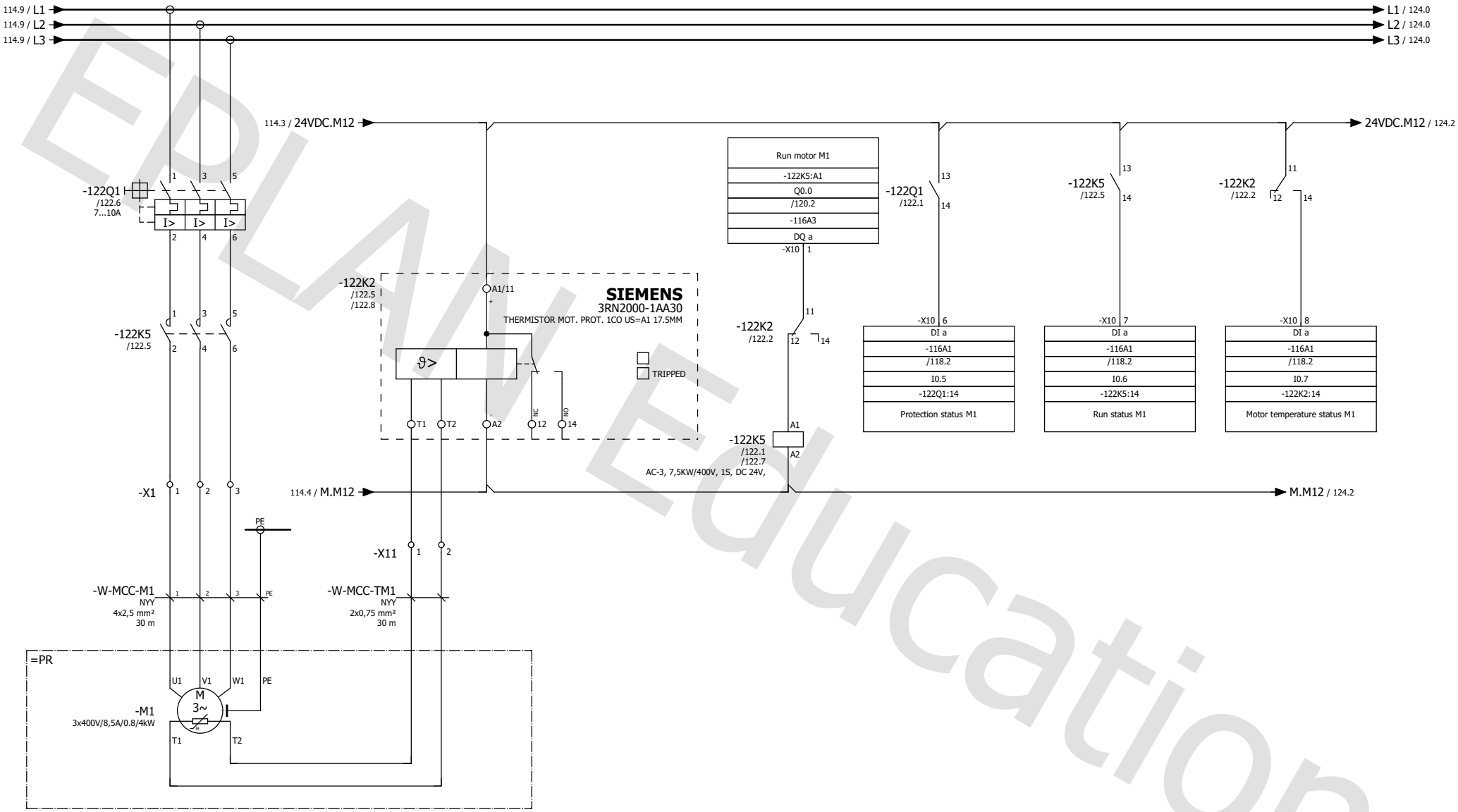
S7-1500 SIEMENS
DQ 16x24VDC/0.5A BA



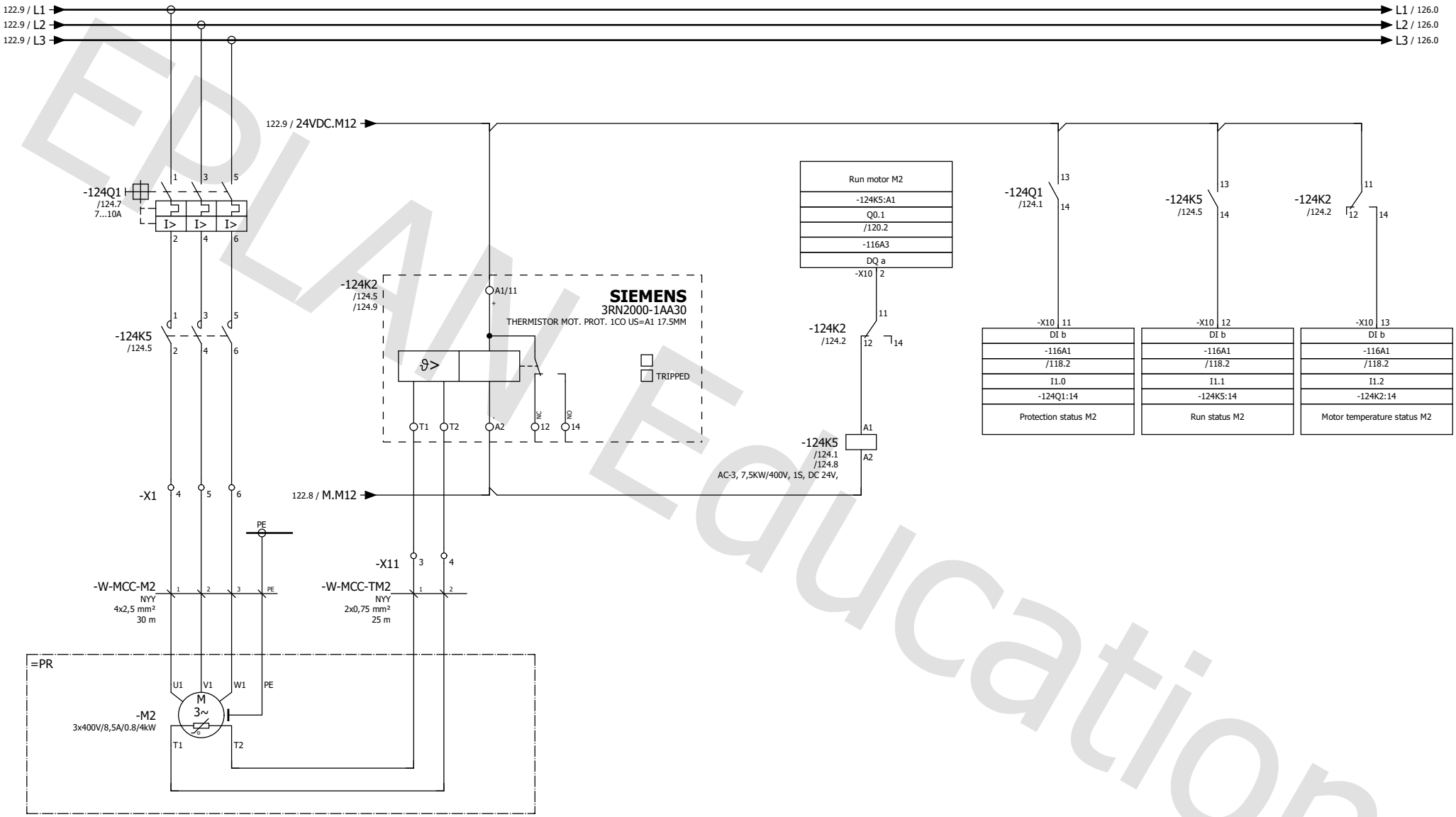
/116.3	
/116.3	
/116.4	
/116.4	

6ES7522-1BH10-0AA0

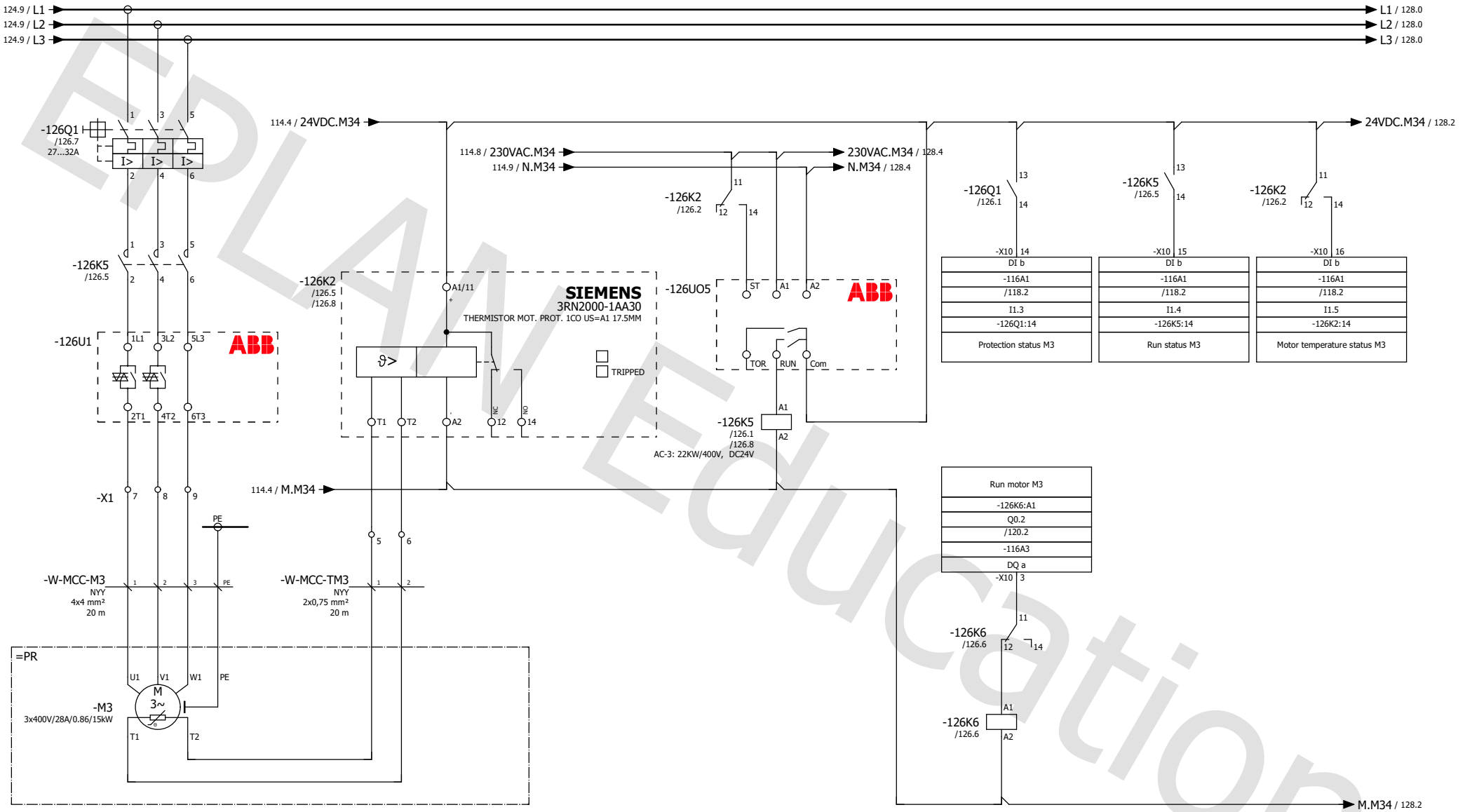
Project no.: PIEP-21/22 | Revision: R0 | Revision date: 05.01.2021.	TVZ TEHNIČKO VELEUČILIŠTE U ZAGREBU POLYTECHNICUM ZAGRABIENSE www.tvz.hr Vrbik 8a, 10000 Zagreb	Customer: University of Applied Science Vrbik 8a, 10000 Zagreb	Project name: DATA CENTER COOLING	Cabinet: +MCC
Drawn: Matea Musladin, bacc.ing.el				Plant: =PS
Checked: Tomislav Špoljarić, dip.ing. el	Page description: **PLC digital output module**	End customer: University of Applied Science Konavoska 2, 10000 Zagreb	Object: Electrical engineering department Konavoska 2, 10000 Zagreb	Page: 120
Approved: mr. sc. Davor Gadže, dipl.ing.el				Follow: 122



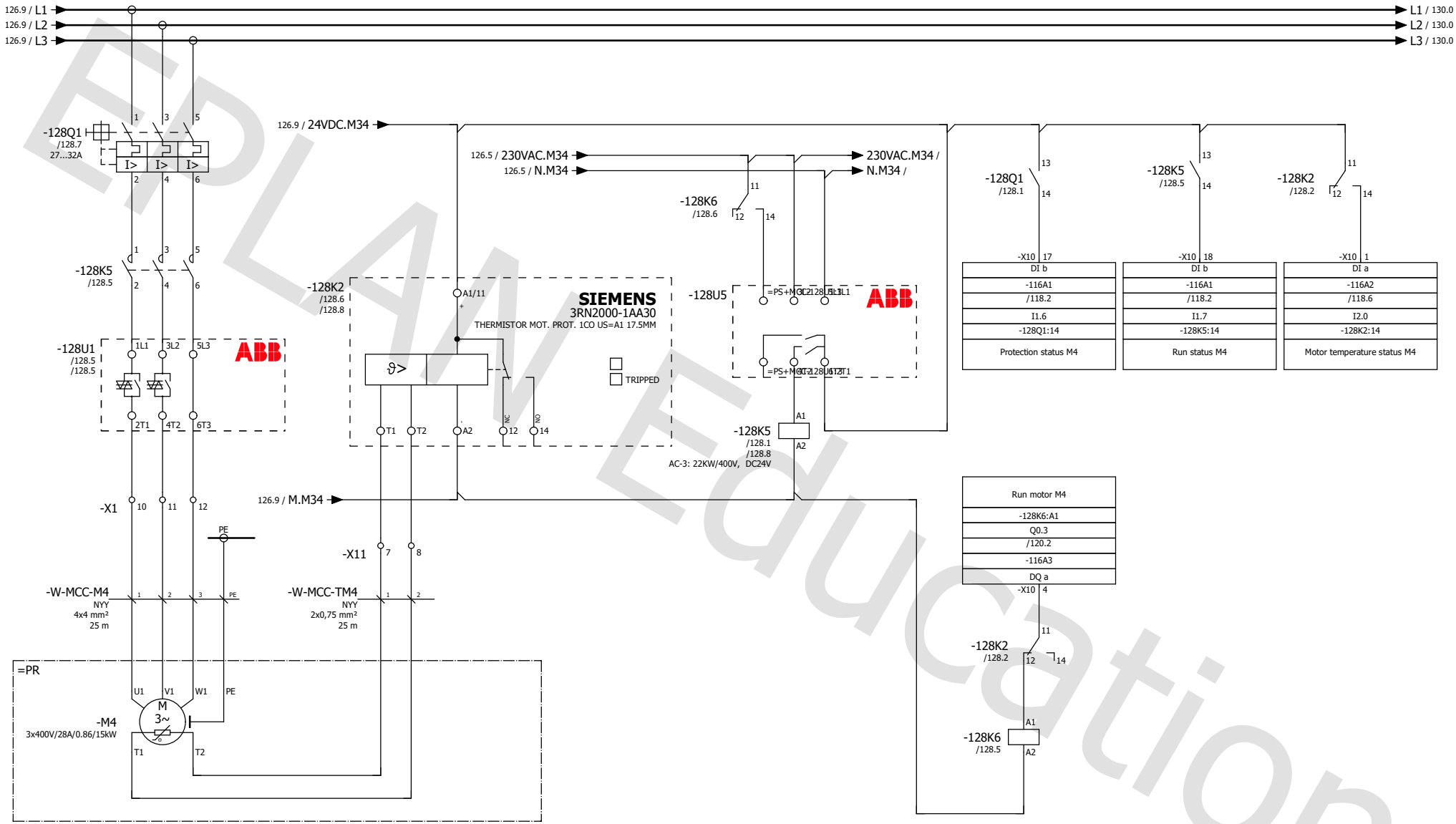
Project no.: PIEP-21/22	Revision: R0	Revision date: 05.01.2021.	TVZ TEHNIČKO VELEUČILIŠTE U ZAGREBU POLYTECHNICUM ZAGRABIENSE	Customer: University of Applied Science Vrbik 8a, 10000 Zagreb	Project name: DATA CENTER COOLING	Cabinet: +MCC
Drawn: Matea Musladin, bacc.ing.el						Plant: =PS
Checked: Tomislav Špoljarić, dip.ing. el			Page description: **Water pump 1**	End customer: University of Applied Science Konavoska 2, 10000 Zagreb	Object: Electrical engineering department Konavoska 2, 10000 Zagreb	Page: 122
Approved: mr. sc. Davor Gadže, dipl.ing.el						Follow: 124



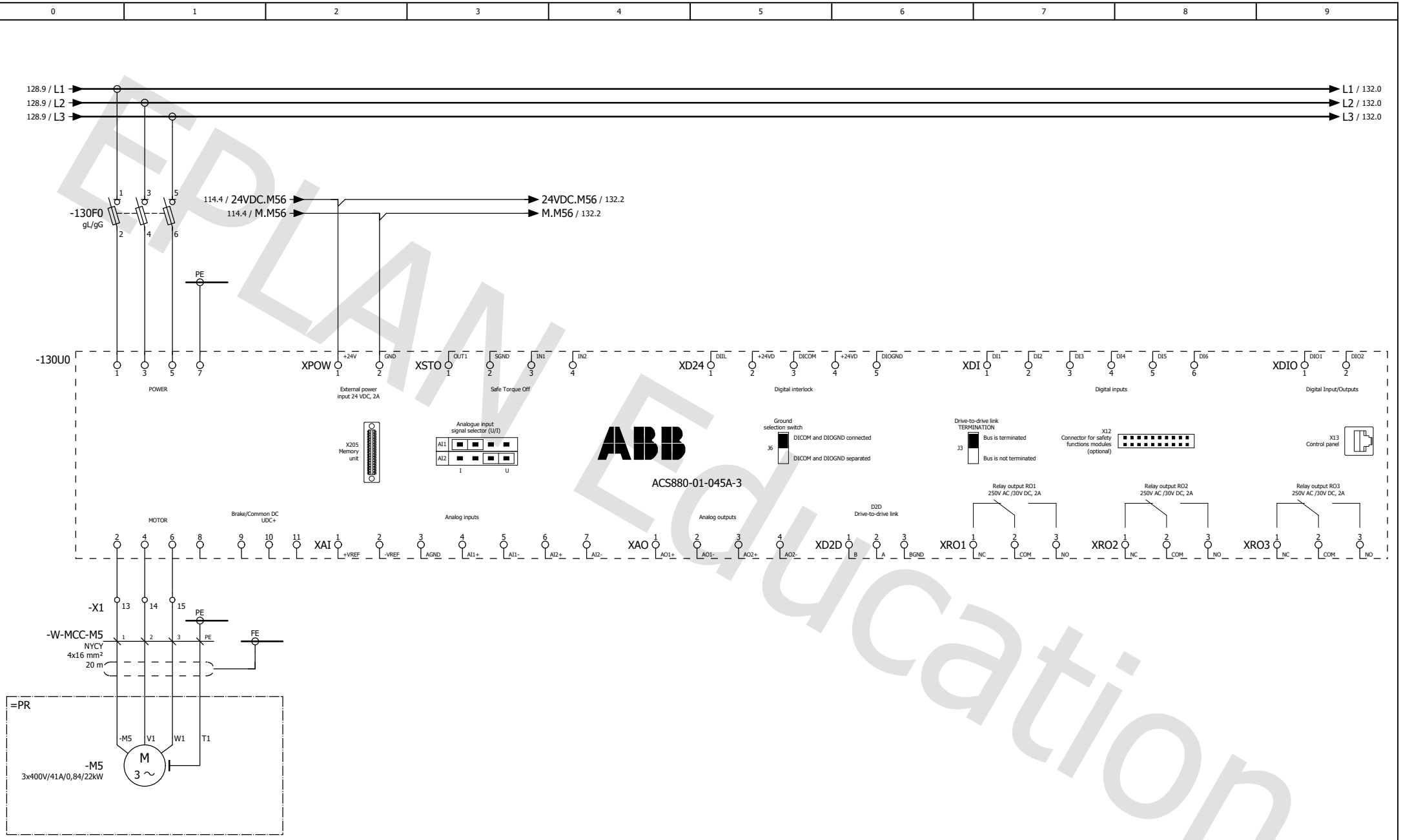
Project no.: PIEP-21/22	Revision: R0	Revision date: 05.01.2021.	TVZ TEHNIČKO VELEUČILIŠTE U ZAGREBU POLYTECHNICUM ZAGRABIENSE	Customer: University of Applied Science Vrbik 8a, 10000 Zagreb	Project name: DATA CENTER COOLING	Cabinet: +MCC
Drawn: Matea Musladin, bacc.ing.el						Plant: =PS
Checked: Tomislav Špoljarić, dip.ing. el			Page description: **Water pump 2**	End customer: University of Applied Science Konavoska 2, 10000 Zagreb	Object: Electrical engineering department Konavoska 2, 10000 Zagreb	Page: 124
Approved: mr. sc. Davor Gadže, dipl.ing.el						Follow: 126



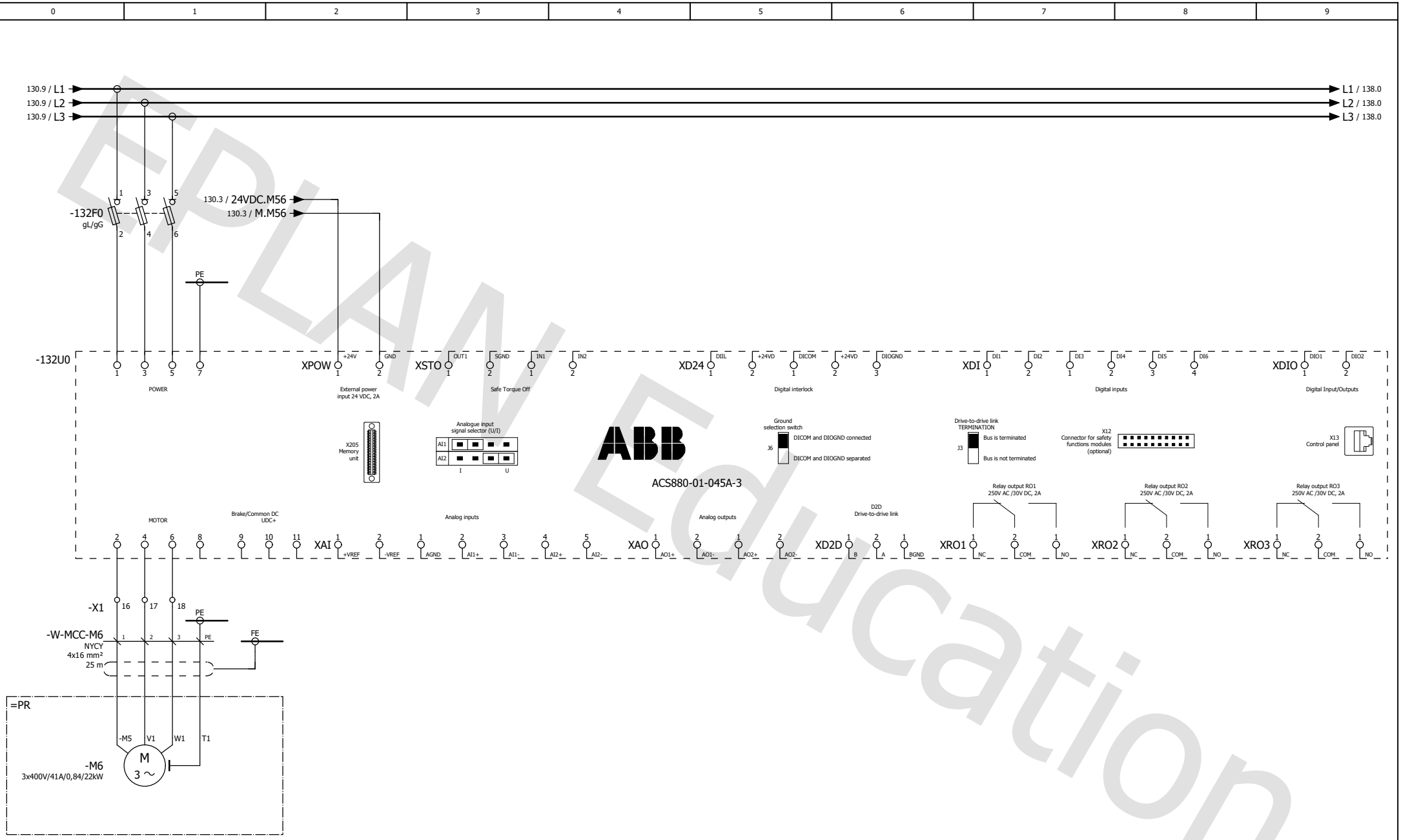
Project no.: PIEP-21/22	Revision: R0	Revision date: 05.01.2021.	TVZ TEHNIČKO VELEUČILIŠTE U ZAGREBU POLYTECHNICUM ZAGRABIENSE	Customer: University of Applied Science Vrbik 8a, 10000 Zagreb	Project name: DATA CENTER COOLING	Cabinet: +MCC
Drawn: Matea Musladin, bacc.ing.el						Plant: =PS
Checked: Tomislav Špoljarić, dip.ing. el			Page description: **Water pump 3**	End customer: University of Applied Science Konavoska 2, 10000 Zagreb	Object: Electrical engineering department Konavoska 2, 10000 Zagreb	Page: 126
Approved: mr. sc. Davor Gadže, dipl.ing.el						Follow: 128



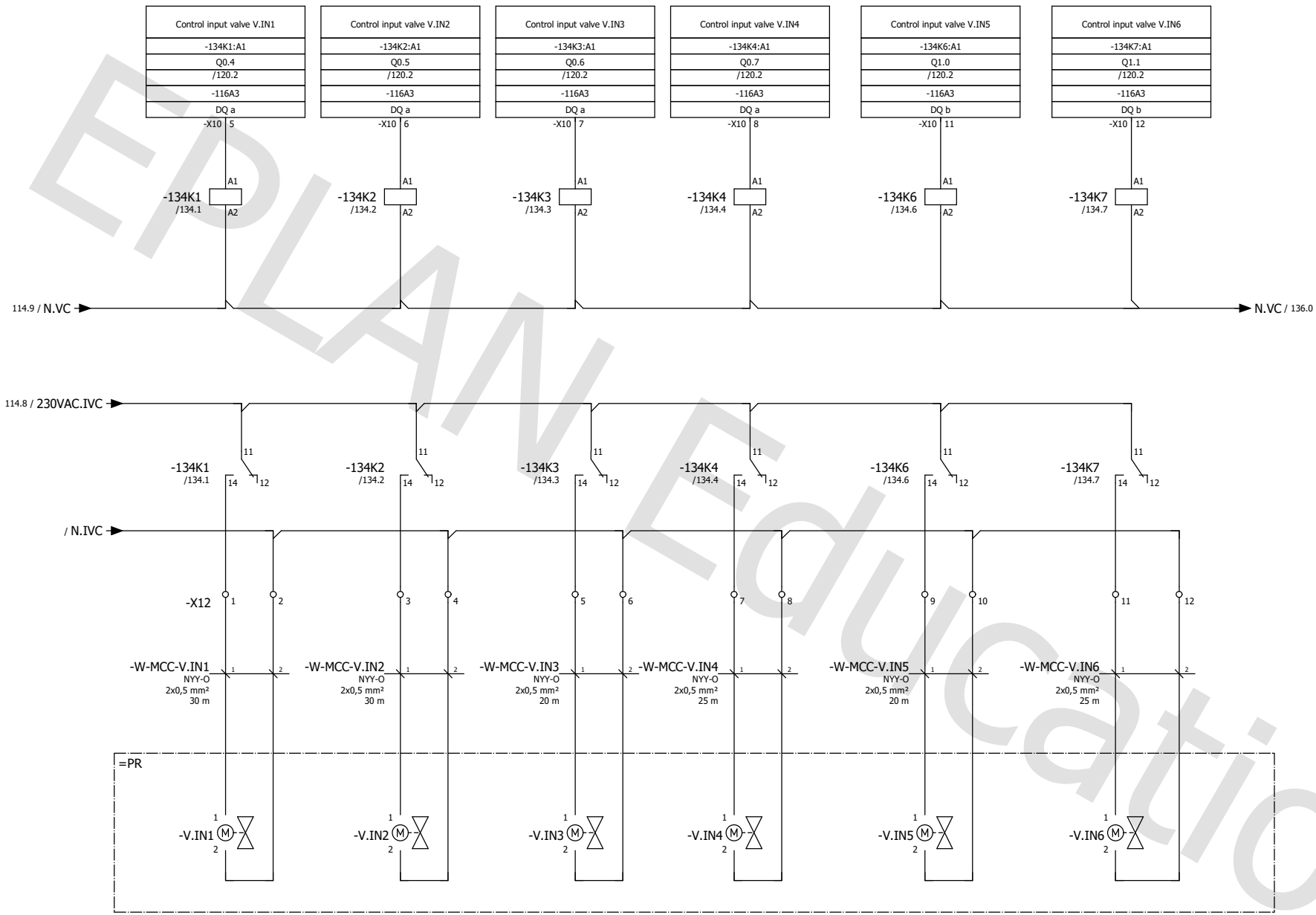
Project no.: PIEP-21/22	Revision: R0	Revision date: 05.01.2021.	TVZ TEHNIČKO VELEUČILIŠTE U ZAGREBU POLYTECHNICUM ZAGRABIENSE	Customer: University of Applied Science Vrbik 8a, 10000 Zagreb	Project name: DATA CENTER COOLING	Cabinet: +MCC
Drawn: Matea Musladin, bacc.ing.el						Plant: =PS
Checked: Tomislav Špoljarić, dip.ing. el			Page description: **Water pump 4**	End customer: University of Applied Science Konavoska 2, 10000 Zagreb	Object: Electrical engineering department Konavoska 2, 10000 Zagreb	Page: 128
Approved: mr. sc. Davor Gadže, dipl.ing.el						Follow: 130



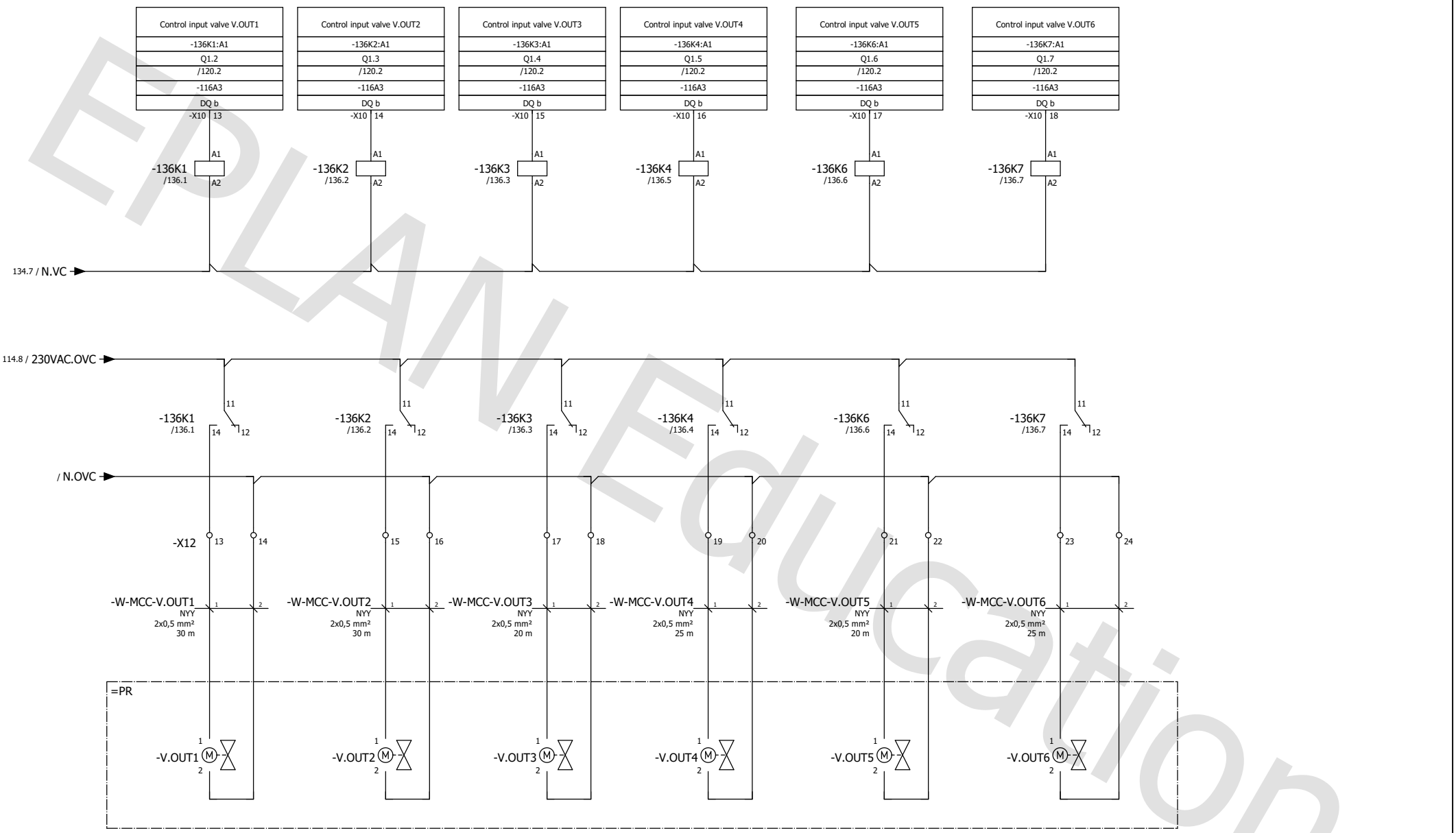
Project no.: PIEP-21/22	Revision: R0	Revision date: 05.01.2021.	TVZ TEHNIČKO VELEUČILIŠTE U ZAGREBU POLYTECHNICUM ZAGRABIENSE	Customer: University of Applied Science Vrbik 8a, 10000 Zagreb	Project name: DATA CENTER COOLING	Cabinet: +MCC
Drawn: Matea Musladin, bacc.ing.el						Plant: =PS
Checked: Tomislav Špoljarić, dip.ing. el			Page description: **Water pump 5**	End customer: University of Applied Science Konavoska 2, 10000 Zagreb	Object: Electrical engineering department Konavoska 2, 10000 Zagreb	Page: 130
Approved: mr. sc. Davor Gadže, dipl.ing.el						Follow: 132



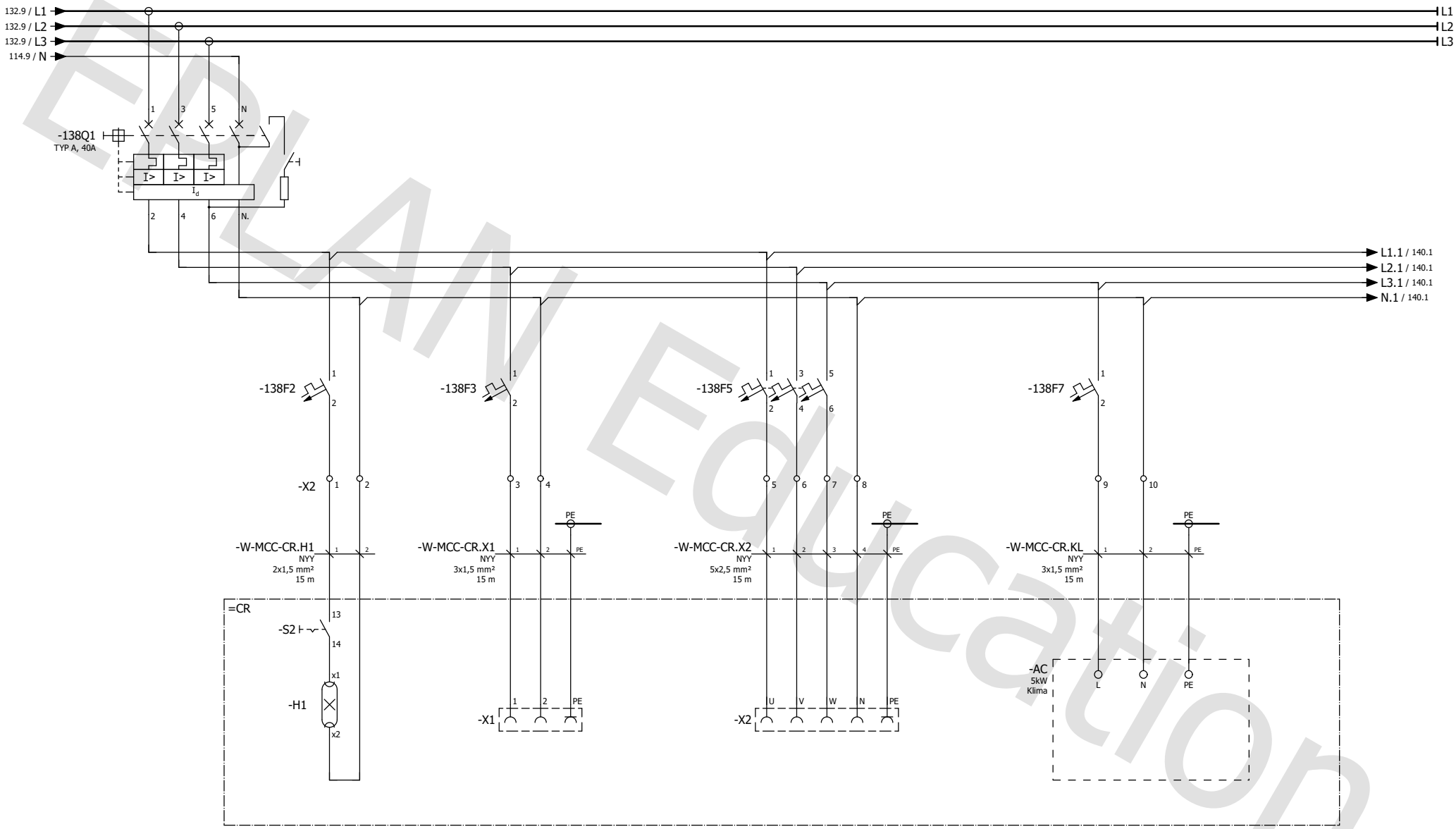
Project no.: PIEP-21/22	Revision: R0	Revision date: 05.01.2021.	TVZ TEHNIČKO VELEUČILIŠTE U ZAGREBU POLYTECHNICUM ZAGRABIENSE	Customer: University of Applied Science Vrbik 8a, 10000 Zagreb	Project name: DATA CENTER COOLING	Cabinet: +MCC
Drawn: Matea Musladin, bacc.ing.el						Plant: =PS
Checked: Tomislav Špoljarić, dip.ing. el			Page description: **Water pump 6**	End customer: University of Applied Science Konavoska 2, 10000 Zagreb	Object: Electrical engineering department Konavoska 2, 10000 Zagreb	Page: 132
Approved: mr. sc. Davor Gadže, dipl.ing.el						Follow: 134



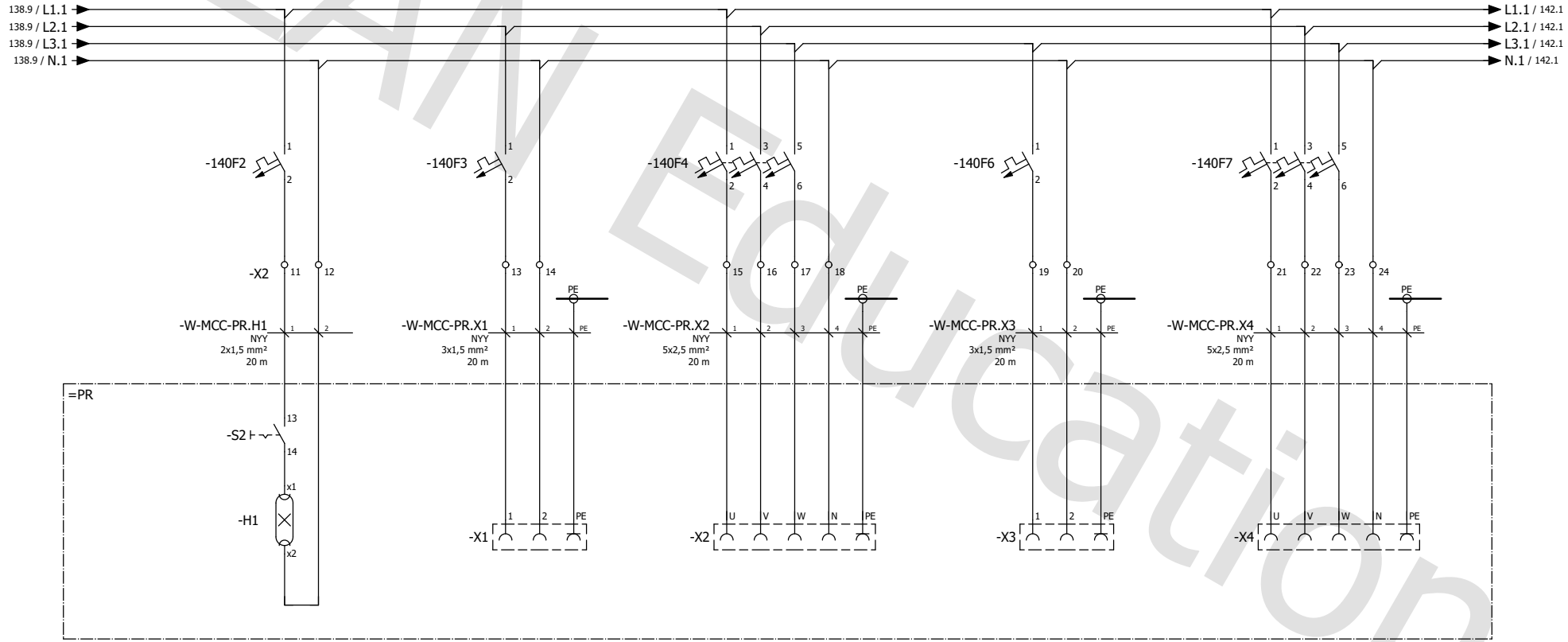
Project no.: PIEP-21/22 Revision: R0 Revision date: 05.01.2021.	TVZ TEHNIČKO VELEUČILIŠTE U ZAGREBU POLYTECHNICUM ZAGRABIENSE	Customer: University of Applied Science Vrbik 8a, 10000 Zagreb	Project name: DATA CENTER COOLING	Cabinet: +MCC
Drawn: Matea Musladin, bacc.ing.el				Plant: =PS
Checked: Tomislav Špoljarić, dip.ing. el	Page description: **Input valve control**	End customer: University of Applied Science Konavoska 2, 10000 Zagreb	Object: Electrical engineering department Konavoska 2, 10000 Zagreb	Page: 134
Approved: mr. sc. Davor Gadže, dipl.ing.el				Follow: 136



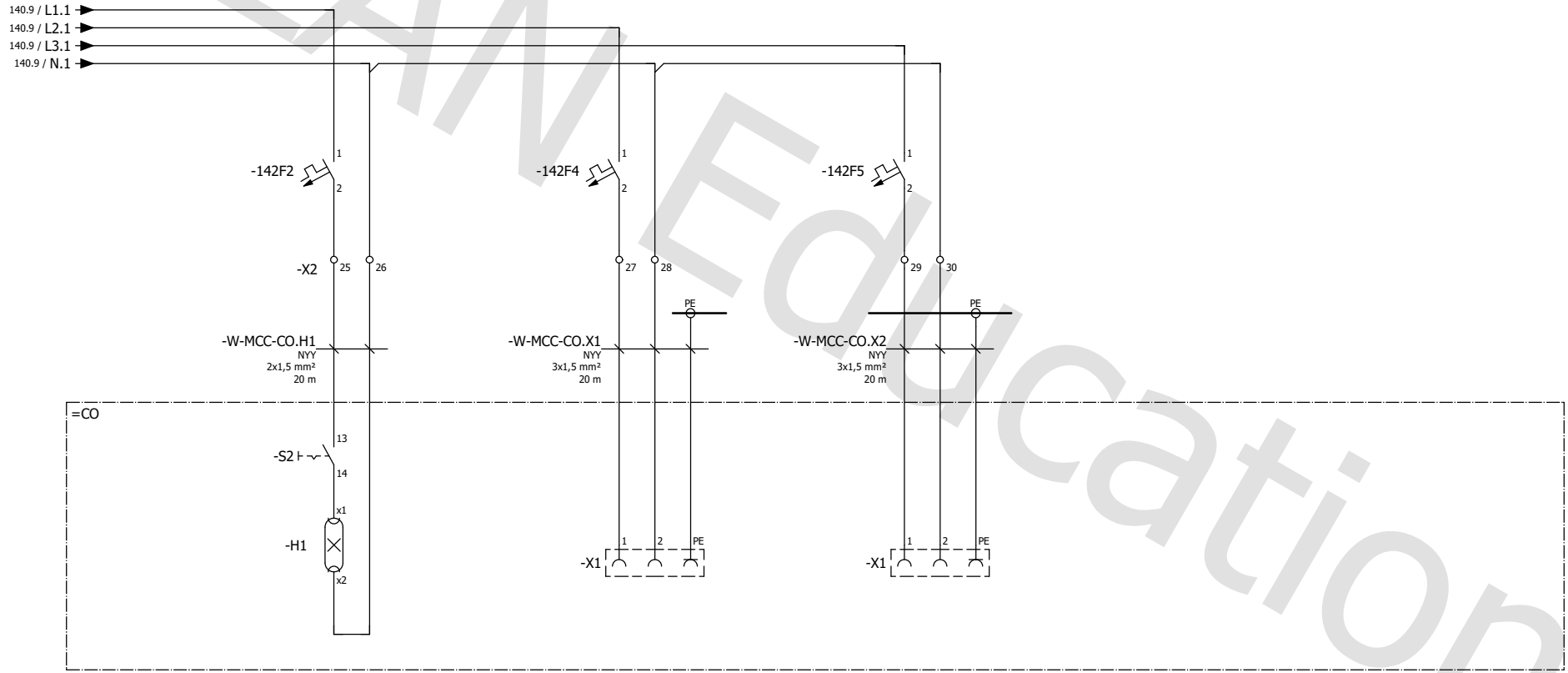
Project no.: PIEP-21/22 | Revision: R0 | Revision date: 05.01.2021.	TVZ TEHNIČKO VELEUČILIŠTE U ZAGREBU POLYTECHNICUM ZAGRABIENSE	Customer: University of Applied Science Vrbik 8a, 10000 Zagreb	Project name: DATA CENTER COOLING	Cabinet: +MCC
Drawn: Matea Musladin, bacc.ing.el				Plant: =PS
Checked: Tomislav Špoljarić, dip.ing. el	Page description: **Output valve control**	End customer: University of Applied Science Konavoska 2, 10000 Zagreb	Object: Electrical engineering department Konavoska 2, 10000 Zagreb	Page: 136
Approved: mr. sc. Davor Gadže, dipl.ing.el				Follow: 138



Project no.: PIEP-21/22	Revision: R0	Revision date: 05.01.2021.	TVZ TEHNIČKO VELEUČILIŠTE U ZAGREBU POLYTECHNICUM ZAGRABIENSE	Customer: University of Applied Science Vrbik 8a, 10000 Zagreb	Project name: DATA CENTER COOLING	Cabinet: +MCC
Drawn: Matea Musladin, bacc.ing.el						Plant: =PS
Checked: Tomislav Špoljarić, dip.ing. el			Page description: **Light and socket (cabinet room)**	End customer: University of Applied Science Konavoska 2, 10000 Zagreb	Object: Electrical engineering department Konavoska 2, 10000 Zagreb	Page: 138
Approved: mr. sc. Davor Gadže, dipl.ing.el						Follow: 140



Project no.: PIEP-21/22	Revision: R0	Revision date: 05.01.2021.	TVZ TEHNIČKO VELEUČILIŠTE U ZAGREBU POLYTECHNICUM ZAGRABIENSE	Customer: University of Applied Science Vrbik 8a, 10000 Zagreb	Project name: DATA CENTER COOLING	Cabinet: +MCC
Drawn: Matea Musladin, bacc.ing.el						Plant: =PS
Checked: Tomislav Špoljarić, dip.ing. el			Page description: **Light and socket (pump room)**	End customer: University of Applied Science Konavoska 2, 10000 Zagreb	Object: Electrical engineering department Konavoska 2, 10000 Zagreb	Page: 140
Approved: mr. sc. Davor Gadže, dipl.ing.el						Follow: 142



Project no.: PIEP-21/22 Revision: R0 Revision date: 05.01.2021.	TVZ TEHNIČKO VELEUČILIŠTE U ZAGREBU POLYTECHNICUM ZAGRABIENSE	Customer: University of Applied Science Vrbik 8a, 10000 Zagreb	Project name: DATA CENTER COOLING	Cabinet: +MCC
Drawn: Matea Musladin, bacc.ing.el				Plant: =PS
Checked: Tomislav Špoljarić, dip.ing. el	Page description: **Light and socket (corridor)**	End customer: University of Applied Science Konavoska 2, 10000 Zagreb	Object: Electrical engineering department Konavoska 2, 10000 Zagreb	Page: 142
Approved: mr. sc. Davor Gadže, dipl.ing.el				Follow: 152

Part list

Device tag	Part description	Part number	Manufacturer	Quantity	Page
-104A2	24V AC/DC	PNOZ X2 24VAC/DC	PILZ	1	/104.2
-116A0	SIMATIC S7-1500, CPU 1511-1 PN, CENTRAL PROCESSING UNIT WITH WORKING MEMORY 150 KB FOR PROGRAM AND 1 MB FOR DATA, 1. INTERFACE:	6ES7511-1AK02-0AB0	SIE	1	/116.0
-116A1	SIMATIC S7-1500, DIGITAL INPUT MODULE, DI 16xDC 24V BA, 16 CHANNELS IN GROUPS OF 16/ INPUT DELAY TYP. 3.2MS/ INPUT TYPE 3 (IEC 61131) INCL.	6ES7521-1BH10-0AA0	SIE	1	/116.1
-116A2	SIMATIC S7-1500, DIGITAL INPUT MODULE, DI 16xDC 24V BA, 16 CHANNELS IN GROUPS OF 16/ INPUT DELAY TYP. 3.2MS/ INPUT TYPE 3 (IEC 61131) INCL.	6ES7521-1BH10-0AA0	SIE	1	/116.2
-116A3	SIMATIC S7-1500, DIGITAL OUTPUT MODULE, DQ 16 X 24VDC/0.5A BA/ 16 CHANNELS IN GROUPS OF 8, 4 A PER GROUP/ INCL. FRONT CONNECTOR PUSH-IN	6ES7522-1BH10-0AA0	SIE	1	/116.3
-116A3.1	SIMATIC S7-1500, DIGITAL OUTPUT MODULE, DQ 16 X 24VDC/0.5A BA/ 16 CHANNELS IN GROUPS OF 8, 4 A PER GROUP/ INCL. FRONT CONNECTOR PUSH-IN	6ES7522-1BH10-0AA0	SIE	1	/116.3
-106E1		SZ.4140840	RIT	1	/106.1
-106E3		SZ.4140840	RIT	1	/106.3
-100F1	Fuse Carrier 3 pole, 32A, 10x38	IS506103--	SCHR	1	/100.1
	Fuse Carrier 1 pole, 32A, 10x38	IS506101--	SCHR	1	/100.2
-100F1	Cylindrical fuse link 10x38, 25A, characteristic gG, 400V AC	ISZ10025--	SCHR	4	/100.1;/100.2
-114F2	CIRCUIT BREAKER 240V 14KA, 1-POLE, C, 10A, D=70MM ACC. TO UL 489, SAME POLARITY	5SJ4110-7HG40	SIE	1	/114.2
-114F3	CIRCUIT BREAKER 240V 14KA, 1-POLE, C, 10A, D=70MM ACC. TO UL 489, SAME POLARITY	5SJ4110-7HG40	SIE	1	/114.3
-114F6	CIRCUIT BREAKER 240V 14KA, 1-POLE, C, 10A, D=70MM ACC. TO UL 489, SAME POLARITY	5SJ4110-7HG40	SIE	1	/114.6
-130F0	Holder for cylindrical fuse links 32A 690V 3-polig	SI311130--	SCHR	1	/130.0
-130F0	Cylindrical fuse link 10x38, 32A, characteristic gG, 400V AC	ISZ10032--	SCHR	3	/130.0
-132F0	Holder for cylindrical fuse links 32A 690V 3-polig	SI311130--	SCHR	1	/132.0
-132F0	Cylindrical fuse link 10x38, 32A, characteristic gG, 400V AC	ISZ10032--	SCHR	3	/132.0
-138F2	Miniature circuit breaker 230/400 V 25kA, 1-pole, B, 10 A for precounter area	5SY7110-6KK13	SIE	1	/138.2
-138F3	Circuit breaker 230/400 V D=70 mm 25 kA according to EN 60947-2, 1P, C16	5SY8116-7	SIE	1	/138.3
-138F5	Miniature circuit breaker 400 V D=70 mm 25 kA according to EN 60947-2, 3P, C25	5SY8325-7	SIE	1	/138.5
-138F7	Circuit breaker 230/400 V D=70 mm 25 kA according to EN 60947-2, 1P, C16	5SY8116-7	SIE	1	/138.7
-140F2	Miniature circuit breaker 230/400 V 25kA, 1-pole, B, 10 A for precounter area	5SY7110-6KK13	SIE	1	/140.2
-140F3	Circuit breaker 230/400 V D=70 mm 25 kA according to EN 60947-2, 1P, C16	5SY8116-7	SIE	1	/140.3
-140F4	Miniature circuit breaker 400 V D=70 mm 25 kA according to EN 60947-2, 3P, C25	5SY8325-7	SIE	1	/140.4
-140F6	Circuit breaker 230/400 V D=70 mm 25 kA according to EN 60947-2, 1P, C16	5SY8116-7	SIE	1	/140.6
-140F7	Miniature circuit breaker 400 V D=70 mm 25 kA according to EN 60947-2, 3P, C25	5SY8325-7	SIE	1	/140.7
-142F2	Miniature circuit breaker 230/400 V 25kA, 1-pole, B, 10 A for precounter area	5SY7110-6KK13	SIE	1	/142.2
-142F4	Circuit breaker 230/400 V D=70 mm 25 kA according to EN 60947-2, 1P, C16	5SY8116-7	SIE	1	/142.4
-142F5	Circuit breaker 230/400 V D=70 mm 25 kA according to EN 60947-2, 1P, C16	5SY8116-7	SIE	1	/142.5
-110K1		RM35TF30	SE	1	/110.1
-122K2	Thermistor motor prot. relay Compact evaluation unit 17.5 mm enclosure Screw terminals 1 CO contact US = 24 V AC/DC Auto RESET Suitable for bimetal switches	3RN2000-1AA30	SIE	1	/122.2
-122K5	CONTACTOR, AC-3, 7.5KW/400V, 1NO, DC 24V, 3-POLE, SZ S00 SCREW TERMINAL .	3RT2018-1BB41	SIE	1	/122.5
-124K2	Thermistor motor prot. relay Compact evaluation unit 17.5 mm enclosure Screw terminals 1 CO contact US = 24 V AC/DC Auto RESET Suitable for bimetal switches	3RN2000-1AA30	SIE	1	/124.2
-124K5	CONTACTOR, AC-3, 7.5KW/400V, 1NO, DC 24V, 3-POLE, SZ S00 SCREW TERMINAL .	3RT2018-1BB41	SIE	1	/124.5
-126K2	Thermistor motor prot. relay Compact evaluation unit 17.5 mm enclosure Screw terminals 1 CO contact US = 24 V AC/DC Auto RESET Suitable for bimetal switches	3RN2000-1AA30	SIE	1	/126.2

Part list

Device tag	Part description	Part number	Manufacturer	Quantity	Page
-126K5	COUPL. CONT., AC3:22KW/400V, 1NO+1NC, 24 V DC, W. VARISTOR, 3-POLE, SIZE S2, SCREW TERMINALS SUITABLE FOR 2A PLC OUTPUTS	3RT2036-1KB40	SIE	1	/126.5
-126K6	The CR-PSS socket is from the CR-P (pcb) relay range. The standard socket is suitable for CR-P relays with 1 or 2 c/o (SPDT) output contacts. The socket has screw	CR-PSS	ABB	1	/126.6
-128K2	Thermistor motor prot. relay Compact evaluation unit 17.5 mm enclosure Screw terminals 1 CO contact US = 24 V AC/DC Auto RESET Suitable for bimetal switches	3RN2000-1AA30	SIE	1	/128.2
-128K5	COUPL. CONT., AC3:22KW/400V, 1NO+1NC, 24 V DC, W. VARISTOR, 3-POLE, SIZE S2, SCREW TERMINALS SUITABLE FOR 2A PLC OUTPUTS	3RT2036-1KB40	SIE	1	/128.5
-128K6	The CR-PSS socket is from the CR-P (pcb) relay range. The standard socket is suitable for CR-P relays with 1 or 2 c/o (SPDT) output contacts. The socket has screw	CR-PSS	ABB	1	/128.6
-134K1	The CR-PSS socket is from the CR-P (pcb) relay range. The standard socket is suitable for CR-P relays with 1 or 2 c/o (SPDT) output contacts. The socket has screw	CR-PSS	ABB	1	/134.1
-134K2	The CR-PSS socket is from the CR-P (pcb) relay range. The standard socket is suitable for CR-P relays with 1 or 2 c/o (SPDT) output contacts. The socket has screw	CR-PSS	ABB	1	/134.2
-134K3	The CR-PSS socket is from the CR-P (pcb) relay range. The standard socket is suitable for CR-P relays with 1 or 2 c/o (SPDT) output contacts. The socket has screw	CR-PSS	ABB	1	/134.3
-134K4	The CR-PSS socket is from the CR-P (pcb) relay range. The standard socket is suitable for CR-P relays with 1 or 2 c/o (SPDT) output contacts. The socket has screw	CR-PSS	ABB	1	/134.4
-134K6	The CR-PSS socket is from the CR-P (pcb) relay range. The standard socket is suitable for CR-P relays with 1 or 2 c/o (SPDT) output contacts. The socket has screw	CR-PSS	ABB	1	/134.6
-134K7	The CR-PSS socket is from the CR-P (pcb) relay range. The standard socket is suitable for CR-P relays with 1 or 2 c/o (SPDT) output contacts. The socket has screw	CR-PSS	ABB	1	/134.7
-136K1	The CR-PSS socket is from the CR-P (pcb) relay range. The standard socket is suitable for CR-P relays with 1 or 2 c/o (SPDT) output contacts. The socket has screw	CR-PSS	ABB	1	/136.1
-136K2	The CR-PSS socket is from the CR-P (pcb) relay range. The standard socket is suitable for CR-P relays with 1 or 2 c/o (SPDT) output contacts. The socket has screw	CR-PSS	ABB	1	/136.2
-136K3	The CR-PSS socket is from the CR-P (pcb) relay range. The standard socket is suitable for CR-P relays with 1 or 2 c/o (SPDT) output contacts. The socket has screw	CR-PSS	ABB	1	/136.3
-136K4	The CR-PSS socket is from the CR-P (pcb) relay range. The standard socket is suitable for CR-P relays with 1 or 2 c/o (SPDT) output contacts. The socket has screw	CR-PSS	ABB	1	/136.4
-136K6	The CR-PSS socket is from the CR-P (pcb) relay range. The standard socket is suitable for CR-P relays with 1 or 2 c/o (SPDT) output contacts. The socket has screw	CR-PSS	ABB	1	/136.6
-136K7	The CR-PSS socket is from the CR-P (pcb) relay range. The standard socket is suitable for CR-P relays with 1 or 2 c/o (SPDT) output contacts. The socket has screw	CR-PSS	ABB	1	/136.7
-50M0				0	/50.0
-52M0				0	/52.0
-108P3	SENTRON, measuring device, 7KM PAC3200, LCD, L-L: 500 V, L-N: 289 V, 5 A, 3-phase, Modbus TCP, optional Modbus RTU / PROFINET / PROFIBUS, apparent/	7KM2111-1BA00-3AA0	SIE	1	/108.3
-100Q1	SURGE ARRESTER TYPE 2 REQUIREMENT CATEGORY C, UC 350V PLUG-IN PROTECTION BLOCKS 4POLE, 3+1 CIRCUIT FOR TN-S AND TT SYSTEMS W. REMOTE	5SD7464-1	SIE	1	/100.1
-100Q3	CIRCUIT BREAKER 3VA1 IEC FRAME 160 BREAKING CAPACITY CLASS N ICU=25KA 415 V 3-POLE, LINE PROTECTION TM210, FTFM, IN=160A OVERLOAD	3VA1116-3ED32-0AA0	SIE	2	/52.1;/100.3
-100Q3	FRONT MOUNTED ROTARY OPERATOR STANDARD WITH DOOR INTERLOCKING IEC IP30/40 ACCESSORY FOR: 3VA1 100/160	3VA9157-0EK21	SIE	1	/100.3
-100Q3	TERMINAL COVER BROADENED 3 POLE 1 PCS. ACCESSORY FOR: 3VA1 100/160	3VA9111-0WG30	SIE	2	/100.3
-108Q3	CIRCUIT-BREAKER SZ S00, FOR MOTOR PROTECTION, CLASS 10, A-RELEASE 2.8...4A, N-RELEASE 52A, SCREW CONNECTION, STANDARD SW. CAPACITY, W.	3RV2011-1EA15	SIE	1	/108.3
-110Q1	CIRCUIT-BREAKER SZ S00, FOR MOTOR PROTECTION, CLASS 10, A-RELEASE 7...10A, N-RELEASE 130A, SCREW CONNECTION, STANDARD SW. CAPACITY W.	3RV2011-1JA15	SIE	1	/110.1
-112Q1	CIRCUIT-BREAKER SZ S00, FOR MOTOR PROTECTION, CLASS 10, A-REL.1.1...1.6A, N-RELEASE 21A, SCREW CONNECTION, STANDARD SW. CAPACITY, W.	3RV2011-1AA15	SIE	1	/112.1
-114Q7	CIRCUIT-BREAKER SZ S00, FOR MOTOR PROTECTION, CLASS 10, A-REL.1.1...1.6A, N-RELEASE 21A, SCREW CONNECTION, STANDARD SW. CAPACITY, W.	3RV2011-1AA15	SIE	1	/114.7
-122Q1	CIRCUIT-BREAKER SZ S0, FOR MOTOR PROTECTION, CLASS 10, A-REL. 7...10A, N-REL. 130A SCREW CONNECTION, STANDARD SW. CAPACITY W. TRANSVERSE	3RV2021-1JA15	SIE	1	/122.1
-124Q1	CIRCUIT-BREAKER SZ S0, FOR MOTOR PROTECTION, CLASS 10, A-REL. 7...10A, N-REL. 130A SCREW CONNECTION, STANDARD SW. CAPACITY W. TRANSVERSE	3RV2021-1JA15	SIE	1	/124.1
-126Q1	Circuit breaker size S0 for motor protection, CLASS 10 A-release 27...32 A N-release 400 A screw terminal Standard switching capacity	3RV2021-4EA10	SIE	1	/126.1
-128Q1	Circuit breaker size S0 for motor protection, CLASS 10 A-release 27...32 A N-release 400 A screw terminal Standard switching capacity	3RV2021-4EA10	SIE	1	/128.1
-138Q1	Residual current operated circuit breaker, 4-pole, type A, In: 40 A, 30 mA, Un AC: 400 V	5SV3344-6	SIE	1	/138.1
-106S1		SZ.4315810	RIT	1	/106.1
-106S3		SZ.4315810	RIT	1	/106.3
-108T1	current transformer 400/5 A, 5 VA CL 1.0	4NC5325-2CE21	SIE	1	/108.1

Part list

Device tag	Part description	Part number	Manufacturer	Quantity	Page
-108T1.1	current transformer 400/5 A, 5 VA CL 1.0	4NC5325-2CE21	SIE	1	/108.1
-108T1.2	current transformer 400/5 A, 5 VA CL 1.0	4NC5325-2CE21	SIE	1	/108.1
-112T1	SITOP PSU8200 24 V/20 A STABILIZED POWER SUPPLY INPUT: 3 400-500 V AC OUTPUT: 24 V/20 A DC	6EP3436-8SB00-0AY0	SIE	1	/112.1
-126U1	Softstarter PSR30-600-70 for max 600V main voltage and 100-240V 50/60Hz control supply voltage	PSR30-600-70	ABB	1	/126.1
-128U1	Softstarter PSR30-600-70 for max 600V main voltage and 100-240V 50/60Hz control supply voltage	PSR30-600-70	ABB	1	/128.1
-128U5	Softstarter PSR30-600-70 for max 600V main voltage and 100-240V 50/60Hz control supply voltage	PSR30-600-70	ABB	1	/128.5
-130U0		ACS880-01-045A-3	ABB	1	/130.0
-132U0		ACS880-01-045A-3	ABB	1	/132.0
-126UO5	Softstarter PSR30-600-70 for max 600V main voltage and 100-240V 50/60Hz control supply voltage	PSR30-600-70	ABB	1	/126.5
-XYZ		SE.5846500	RIT	2	/52.0;/100.0

Cable overview

Cable name	Source	Target	Cable type	Wires	Cross-section [mm²]	Length [m]	Page
-W-CST-MCC		-100Q3	NYY	5	70	50	/100.3
-W-MCC-103S1	-106S1	-106S3	NYCY	2	0,75	3	/106.1
-W-MCC-103S3			NYCY	2	0,75	3	/106.3
-W-MCC-CO.H1	-X2	=CO-S2	NYY	2	1,5	20	/142.2
-W-MCC-CO.X1	-X2	=CO-X1	NYY	3	1,5	20	/142.3
-W-MCC-CO.X2	-X2	=CO-X1	NYY	3	1,5	20	/142.5
-W-MCC-CR.EMG1	-X10	=CR-S1	NYY	6	1,5	50	/102.1
-W-MCC-CR.H1	-X2	=CR-S2	NYY	2	1,5	15	/138.2
-W-MCC-CR.KL	-X2		NYY	3	1,5	15	/138.7
-W-MCC-CR.X1	-X2	=CR-X1	NYY	3	1,5	15	/138.3
-W-MCC-CR.X2	-X2	=CR-X2	NYY	5	2,5	15	/138.5
-W-MCC-M1	-X1	=PR-M1	NYY	4	2,5	30	/122.1
-W-MCC-M2	-X1	=PR-M2	NYY	4	2,5	30	/124.1
-W-MCC-M3	-X1	=PR-M3	NYY	4	4	20	/126.1
-W-MCC-M4	-X1	=PR-M4	NYY	4	4	25	/128.1
-W-MCC-M5	-X1	=PR-M5	NYCY	4	16	20	/130.0
-W-MCC-M6	-X1	=PR-M6	NYCY	4	16	25	/132.0
-W-MCC-PR.EMG1	-X10	=PR-S1	NYY	6	1,5	50	/102.6
-W-MCC-PR.H1	-X2	=PR-S2	NYY	2	1,5	20	/140.2
-W-MCC-PR.X1	-X2	=PR-X1	NYY	3	1,5	20	/140.3
-W-MCC-PR.X2	-X2	=PR-X2	NYY	5	2,5	20	/140.4
-W-MCC-PR.X3	-X2	=PR-X3	NYY	3	1,5	20	/140.6
-W-MCC-PR.X4	-X2	=PR-X4	NYY	5	2,5	20	/140.7
-W-MCC-TM1	-X11	=PR-M1	NYY	2	0,75	30	/122.2
-W-MCC-TM2	-X11	=PR-M2	NYY	2	0,75	25	/124.2
-W-MCC-TM3		=PR-M3	NYY	2	0,75	20	/126.2
-W-MCC-TM4	-X11	=PR-M4	NYY	2	0,75	25	/128.2
-W-MCC-V.IN1	-X12		NYY-O	2	0,5	30	/134.1
-W-MCC-V.IN2	-X12		NYY-O	2	0,5	30	/134.2
-W-MCC-V.IN3	-X12		NYY-O	2	0,5	20	/134.3
-W-MCC-V.IN4	-X12		NYY-O	2	0,5	25	/134.4
-W-MCC-V.IN5	-X12		NYY-O	2	0,5	20	/134.5
-W-MCC-V.IN6	-X12		NYY-O	2	0,5	25	/134.7
-W-MCC-V.OUT1	-X12		NYY	2	0,5	30	/136.1
-W-MCC-V.OUT2	-X12		NYY	2	0,5	30	/136.2
-W-MCC-V.OUT3	-X12		NYY	2	0,5	20	/136.3

Cable overview

Cable name	Source	Target	Cable type	Wires	Cross-section [mm²]	Length [m]	Page
-W-MCC-V.OUT4	-X12		NYY	2	0,5	25	/136.4
-W-MCC-V.OUT5	-X12		NYY	2	0,5	20	/136.6
-W-MCC-V.OUT6	-X12		NYY	2	0,5	25	/136.7