

Catalogue 2022

Switchboards and control technology for
photovoltaic power plants

 **A-Z TRADERS** s.r.o.
www.a-ztraders.cz



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1. Introduction

This document was created to provide customers with a comprehensive overview of the product portfolio of A-Z TRADERS s.r.o.

We would like to emphasize at the outset that our company is open to the possibility of producing new one types of switchboards or modification of existing switchboards so that they can be complied with specific needs and requirements of our business partners. Specific requirements of this type, however, it is necessary to condition the collection of at least tens of pieces per month.

1.1 Types of switchboards

Switchboards from the A-Z TRADERS s.r.o. portfolio is divided into three groups:

1. AC
2. DC
3. Combined

1.2 System and production process

Each switchboard is designed in accordance with technical standards IEC EN. Switchboards are certified according to standards IEC 61439-1 ed.2, IEC 61439-2 ed2. and IEC 61439-3.

The switchboards are provided with a type of plate with a serial number and parameters according to standards, including the CE marking. **These parameters must always be included in the audit report! If this is not the case, the assembly company or the audit technician is exposed to the threat of punishment of the authorities' state administration and supervision (CTIA, TÍČR - Technical Inspection of the Czech Republic).**

The switchboards are wired by machine-bent conductors, which ensures high precision and quality thanks to the elimination of the human factor. Each individual switchboard is visually inspected, electrically tested and packed in separate boxes and packages with clear type marking, including a QR code used for unambiguous evidence.

Cooperation with design offices, state authorities and other institutions

We are open to cooperation with the designers of our customers. If you are interested, we will be happy to provide diagrams and all documentation for our products. Our goal is to set up a mutually beneficial cooperation that will lead to maximum satisfaction for you and for your customers.

We always actively consult with the producers (EATON, BMR, ELKO EP) and with state supervisory authorities (TIČR), connection and selection of components that make up our switchboards. Our products are always in accordance with the conditions of individual distributions.

In cooperation with A-Z TRADERS s.r.o. you get a reliable business partner. We actively monitor legislation, market news and connection conditions to keep up with our products that they could always respond well in advance to any changes in the market.

1.3 Quick orientation in switchboards and their applications

Below you will find the most common switchboard assemblies with a simple description of the functionality which are used in the most common sets of photovoltaic power plants.

Assemblies for inverters GoodWe GW4K-ET to GW10K-ET

A) Battery storage systems / without backup circuits

- **R-FVE-DC1** or **R-FVE-DC2** for securing panel chains from the roof of a building
- **R-FVE-M4** for photovoltaic converter input protection - including AC surge arrester

B) Battery storage systems / selected backup circuits

- **R-FVE-DC1** or **R-FVE-DC2** for securing panel chains from the roof of a building
- **R-FVE-M4** for photovoltaic converter input protection - including AC surge arrester
- **R-FVE-M5+P3F** for securing the backup output including protector and 4P switches

C) Battery storage systems / backed up two sockets and possibly one selected circuit

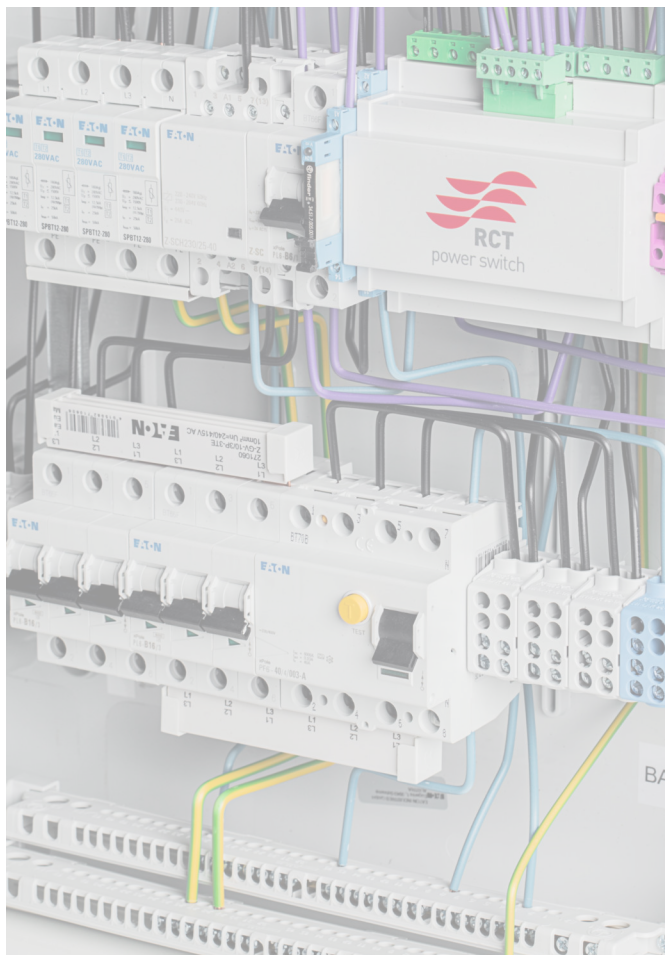
- **R-FVE-DC1** or **R-FVE-DC2** for securing panel chains from the roof of a building
- **R-FVE-M4** for photovoltaic converter input protection - including AC surge arrester
- **R-FVE-Z3** for securing DIN sockets - 2 pcs + spare circuit breaker, including protector

D) Battery storage systems / backed up two sockets and possibly one selected circuit

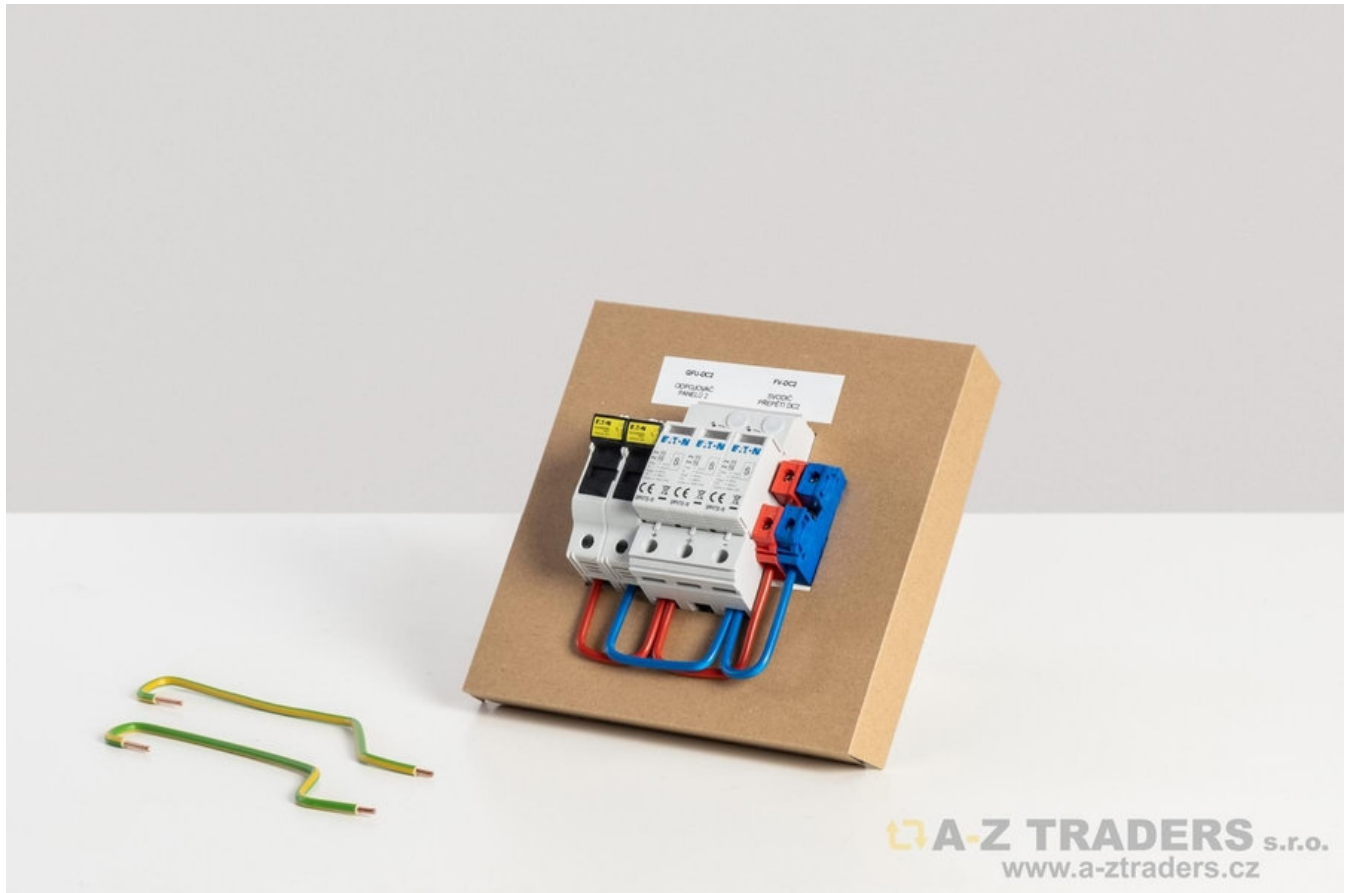
- **R-FVE-A1** or **R-FVE-A2** for securing chains from the roof of a building, including a circuit breaker and 4P switches to manually switch backups (either the whole house or its selected parts)
- **R-FVE-B1** for inverter protection, common decay point, main switch and crisis HDO

E) Battery storage systems / full back up – automatic

- **R-FVE-DC1 IKA** or **R-FVE-DC2 IKA** for securing panel chains from the roof of the building
- **R-FVE-GW25**, **R-FVE-GW32** and **R-FVE-GW40** (according to the size of the main circuit breaker) automatic outage switching of the house or its part between standard operation from the network and backup. New to buy **switchboard R-FVE-D1**, where there is no need to solve main circuit breaker size. Can be used up to 40A circuit breaker in column + there is a B16 / 3 fuse for boiler. In combination with switchboard R-FVE-E2, where A-Z router is directly fitted, you will solve the surplus to DHW in 2 switchboards!



2. DC switchboards + DC box



DC switchboards can be ordered with wire T2 EATON **SPPVT2-10-2 + PE** or T1 + T2 EATON **SPPVT12-10-2 + PE**. The difference between the price of one chain T2 and T1 + T2 is in the order of hundred crowns without VAT. It's under consideration of each customer, which way he goes. We will of course be happy to advise you on your choice.

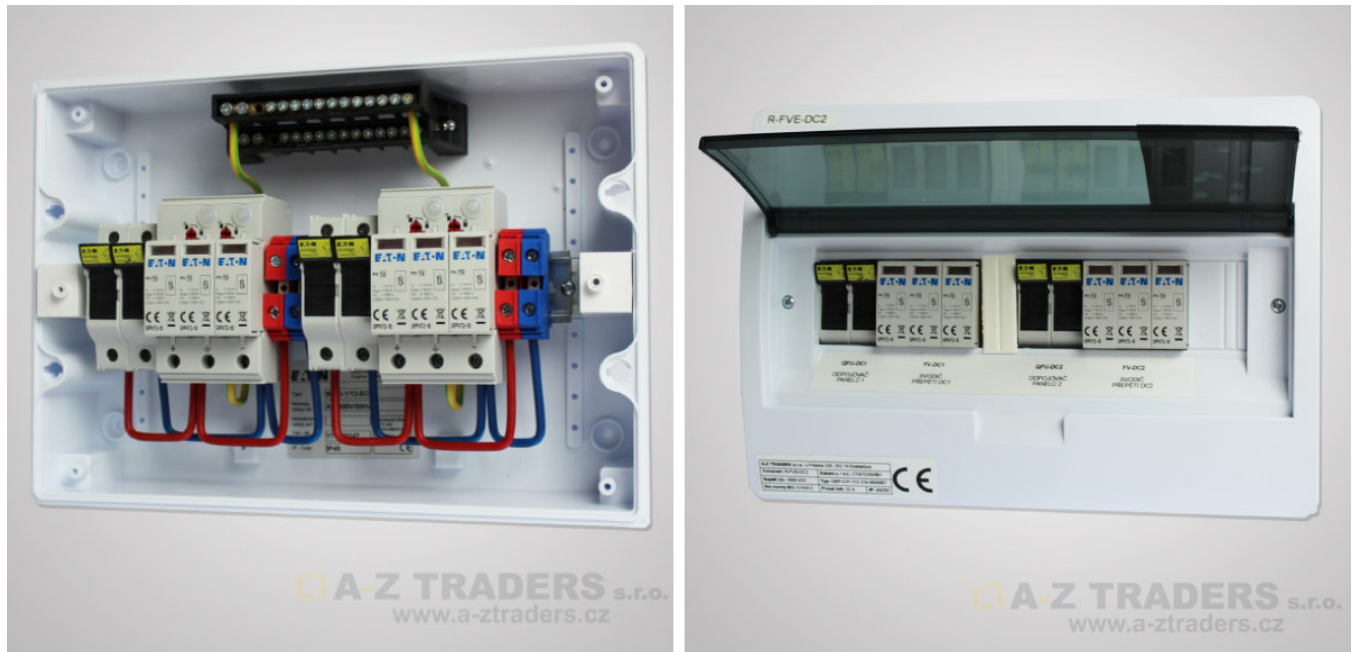
Each DC switchboard can be ordered with one or two chains. We have also introduced the possibility ordering the so - called BOX (wiring, RSA terminals, fuse switch - disconnectors and gPV + fuses yellow-green jumpers to the switchboard on the PE bridge in a separate box). This can be extended DC switchboards for another chain without having to keep in stock switchboards with one and two strings.

BOX T1+T2 - List of components

Code	Producer	Product	Description	Number of pieces
177256	EATON	SPPVT12-10-2+PE	Surge arrester T1 + T2 (I + II, B + C), photovoltaic applications 1000V DC, max. short circuit current 1000A	1
2625085	EATON/ETI/OEZ	CH10x38 gPV 15A/1000V DC	Ultra-fast cylindrical fuse for photovoltaics, (UL standard), 10x38mm, 1100V DC, 15A	2
CHPV2U	EATON	CHPV2U	Fuse switch-disconnector, photovoltaic applications, 2-pole, 1000V AC / 30A, C10 (10x38mm)	1

2.1 R-FVE-DC

(R-FVE-DC1, R-FVE-DC2, R-FVE-DC1T1 a R-FVE-DC2T1)



DC switchboard designed for wall assembling, IP40 / 20 serving as input switchboard from photovoltaic panels (for the inverter) for the entire portfolio of photovoltaic power plants. Especially when using other switchboards also EATON BC-O-1/12-ECO.

Its advantage is the small size, the ability to “stack” with other AC switchboards side by side or under each other, it makes the possibility to install them in a space where can be problematic to find enough free space.

The switchboard is equipped with a DC surge arrester with fuse switch-disconnectors, including gPV fuses to protect the DC input to the inverter.

Suitable to combine with switchboards for the alternating part of the installation installed in switchboards EATON **BC-O-1/12-ECO**.

List of main components:

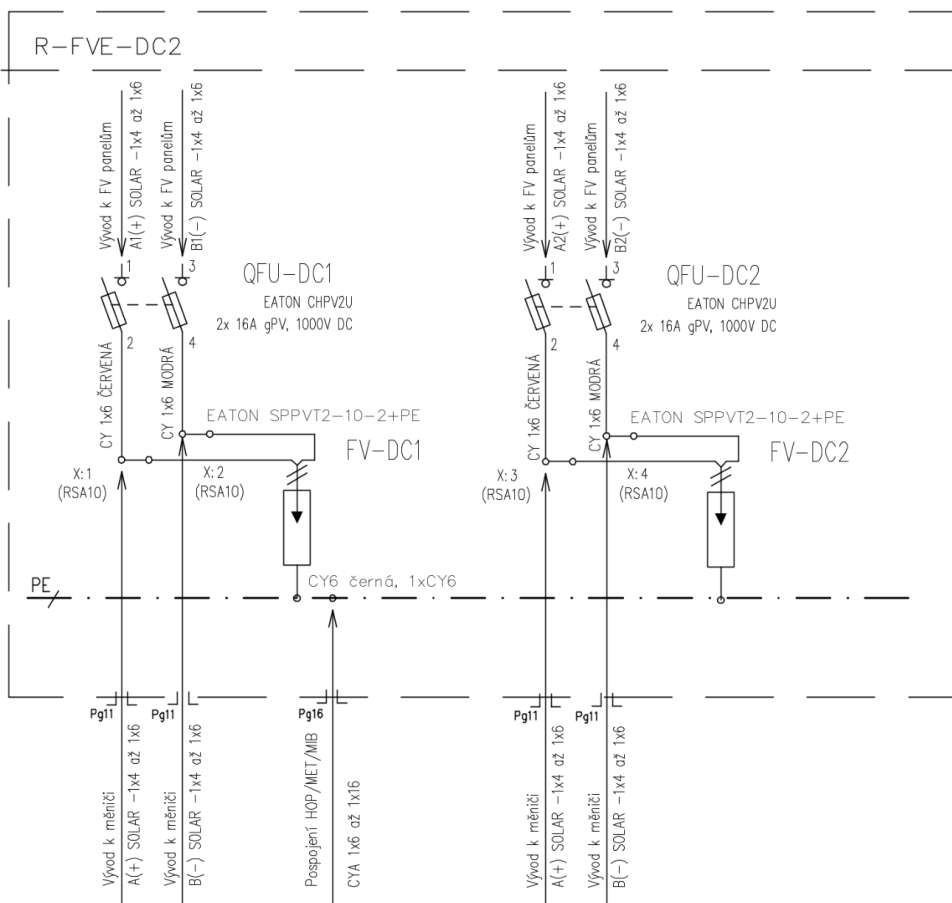
Switchboard EATON **BC-O-1/12-ECO**, surge arrester EATON **SPPVT12-10-2 + PE** or EATON **SPPV2T2-10-2 + PE**. Fuse switch-disconnectors EATON **CHPV2U** including fuses gPV EATON **PV-15A10F**.

You will find a detailed list of components in the documentation tab, together with the diagrams and all documentation.

R-FVE-DC – Soupis komponent a schéma

Code	Producer	Product	Description	Number of pieces
280347	EATON	BC-O-1/12-ECO	Flush-mounted switchboard, transparent plastic. door, 1 row, 12 modules	1
176090	EATON	SPPVT2-10-2+PE	Surge arrester T2 (II, C), photovoltaic applications 1000V DC, max. short circuit. current 160A	2
2625085	EATON/ETI/OEZ	CH10x38 gPV 15A/1000V DC	Ultra-fast cylindrical fuse for photovoltaics, (UL standard), 10x38mm, 1100V DC, 15A	4
CHPV2U	EATON	CHPV2U	Fuse switch-disconnector, photovoltaic applications, 2-pole, 1000V AC / 30A, C10 (10x38mm)	2

R-FVE-DC2 – Diagram



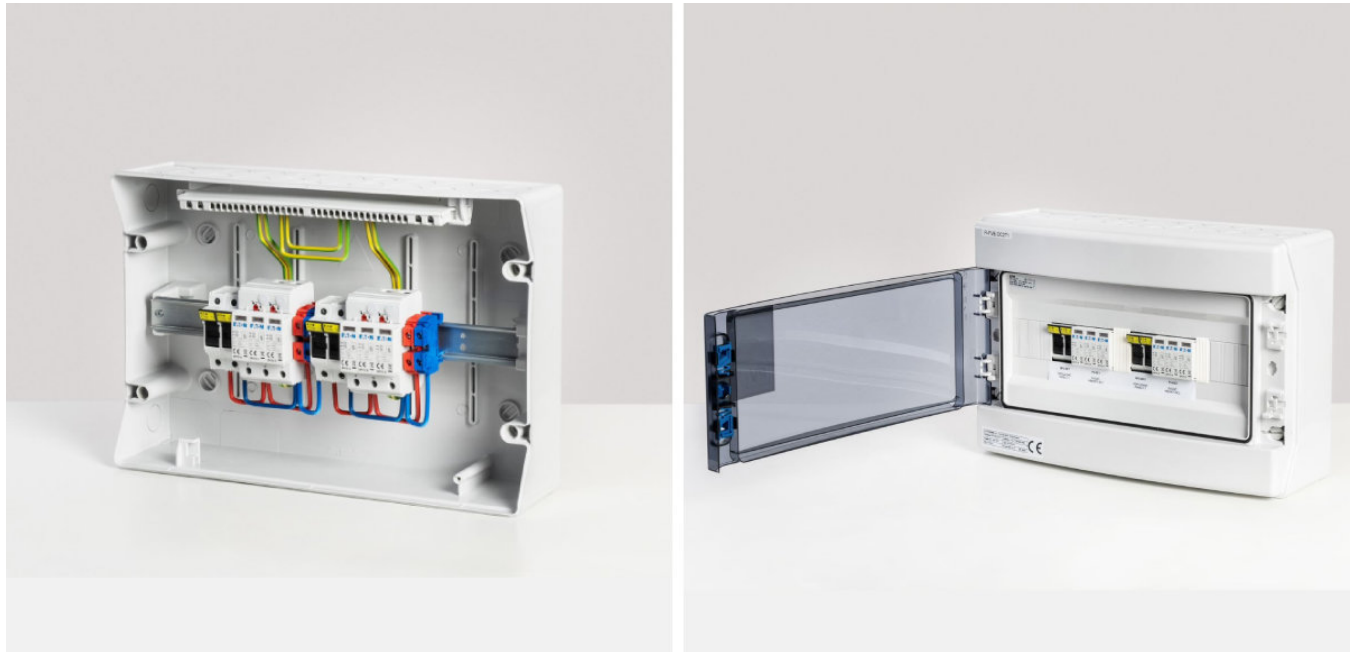
Typ: R-FVE-DC2

Výrobce: A-Z TRADERS s.r.o.
U Potoka 320, 25219 Drahelčice
IČ: 07462522
IP 40/20
Napětí: 1000V DC
Proud: 32A

Plastová rozvodnice s dvěma
BC-O-1/12-ECO
krytí IP40/IP20
1 x 12 modulů

2.2 R-FVE-DC IKA

(*R-FVE-DC1 IKA, R-FVE-DC2 IKA, R-FVE-DC1T1 IKA and R-FVE-DC2T1 IKA*)



DC switchboard designed for wall assembling, IP65 serving as input switchboard from photovoltaic panels (for the inverter) for the entire portfolio of photovoltaic power plants. Especially when you are using other switchboards also EATON **IKA**.

The switchboard is equipped with a DC surge arrester with fuse switch-disconnectors, including gPV fuses to protect the DC input to the inverter.

Suitable to combine with switchboards for the alternating part of the installation installed in switchboards EATON **IKA**.

List of main components:

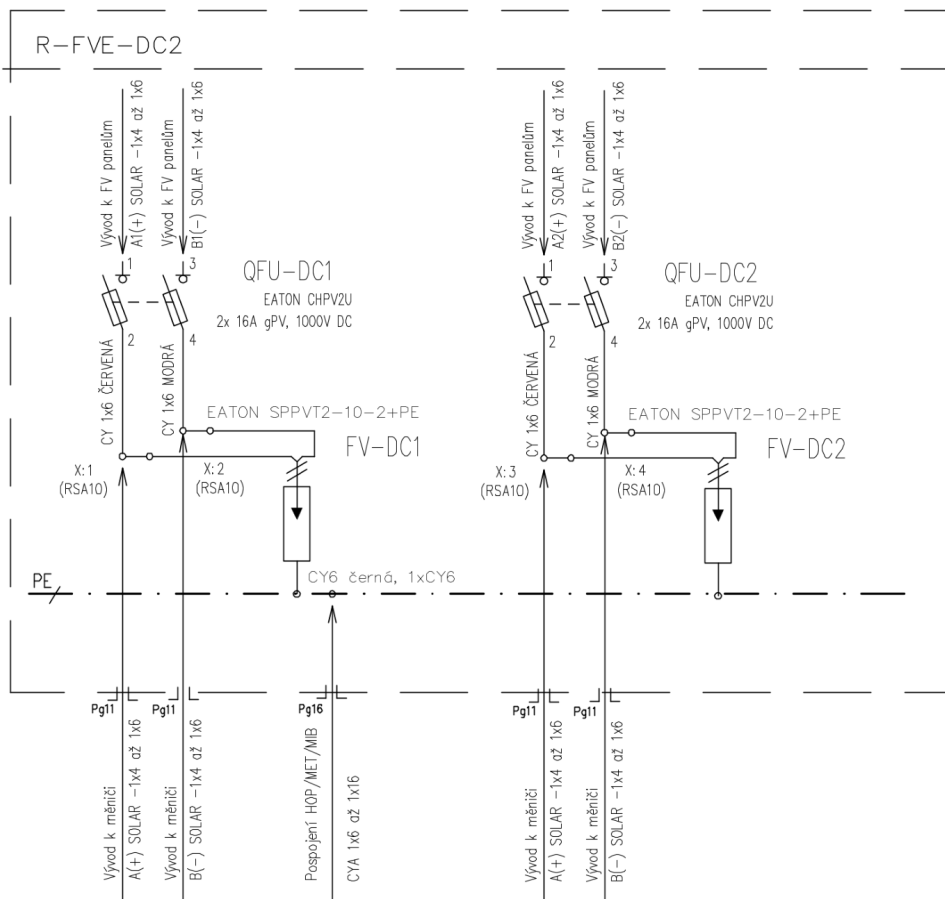
Switchboard EATON **IKA-1/18-ST**, surge arrester EATON **SPPVT12-10-2 + PE** or EATON **SPPVT2-10-2 + PE**. Fuse switch-disconnectors EATON **CHPV2U** including fuses gPV EATON **PV- 15A10F**

You will find a detailed list of components in the documentation tab, together with the diagrams and all documentation.

R-FVE-DC2 IKA - protection class I + II - List of components

Code	Producer	Product	Description	Number of pieces
174200	EATON	IKA-1/18-ST	IP65 flush-mounted switchboard, transparent door, 1 row, 18 modules	1
177256	EATON	SPPVT2-10-2+PE	Surge arrester T2 (II, C), photovoltaic applications 1000V DC, max. short circuit. current 160A	2
2625085	EATON/ETI/OEZ	CH10x38 gPV 15A/1000V DC	Ultra-fast cylindrical fuse for photovoltaics, (UL standard), 10x38mm, 1100V DC, 15A	4
CHPV2U	EATON	CHPV2U	Fuse switch-disconnector, photovoltaic applications, 2-pole, 1000V AC / 30A, C10 (10x38mm)	2

R-FVE-DC2 IKA - protection class I + II - diagram



Typ: R-FVE-DC2

Výrobce: A-Z TRADERS s.r.o.
 U Potoka 320, 25219 Drahelčice
 IČ: 07462522
 IP 40/20
 Napětí: 1000V DC
 Proud: 32A

Plastová rozvodnice s dveřmi
 BC-0-1/12-ECO
 krytí IP40/IP20
 1 x 12 modulů

2.3 R-FVE-BAT100



DC switchboard designed for wall assembling, IP40 / 20 serving as battery protection (at the inverter) for single-phase photovoltaic power plants (typically GoodWe 3648-EM and 3648D-ES inverter). So, to secure the battery input.

Its advantage is the small size, the ability to “stack” with other AC switchboards side by side or under each other, it makes the possibility to install them in a space where can be problematic to find enough free space.

The switchboard is equipped with a fuse switch - disconnecter, including a 100A fuse to protect the input from batteries.

Suitable to combine with switchboards for the alternating part of the installation installed in switchboards EATON **BC-O-1/12-ECO**.

Suitable for combination with switchboard R-FVE-DC1, R-FVE-DC2 and R-FVE-H.

List of main components:

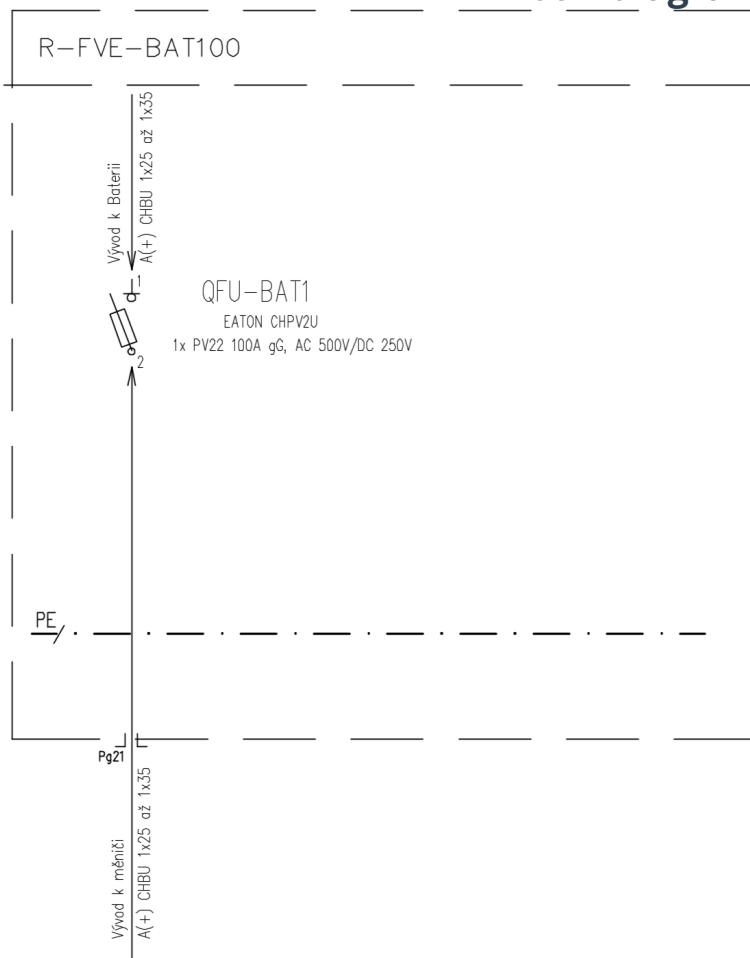
EATON BC-O-1/12-ECO switchboard, fuse switch-disconnector EATON **VLCE22-1P** including fuse EATON **PV22 100A gG**.

You will find a detailed list of components in the documentation tab, together with the diagrams and all documentation.

R-FVE-BAT100 – List of components

Code	Producer	Product	Description	Number of pieces
280347	EATON	IKA-1/18-ST	IP65 flush - mounted switchboard, transparent door, 2 rows, 26	1
6756	EATON/ETI/OEZ	SPPVT2-10-2+PE	Cylindrical fuse GG 500V AC 100A C22 (22.2x58mm)	1
192380	EATON	VLCE22-1P	Fuse switch-disconnector for cylindrical fuses C22 up to 100A	1

R-FVE-BAT100 – diagram



Typ: R-FVE-BAT100
 Výrobce: A-Z TRADERS s.r.o.
 U Potoka 320, 25219 Drahelčice
 IČ: 07462522
 IP 40/20
 Napětí: 60V DC
 Proud: 100A

Plastová rozvodnice s dveřmi
 BC-0-1/12-ECO
 krytí IP40/IP20
 1 x 12 modulů

2.4 R-FVE-BAT20



DC switchboard designed for wall assembling, IP40 / 20 serving as battery protection (at the inverter) for single-phase photovoltaic power plants (typically GoodWe 3648-EM and 3648D-ES inverter). So, to secure the battery input.

Its advantage is the small size, the ability to “stack” with other AC switchboards side by side or under each other, it makes the possibility to install them in a space where can be problematic to find enough free space.

The switchboard is equipped with a fuse switch - disconnecter, including a 20A gPV fuse to protect the input from batteries.

Suitable to combine with switchboards for the alternating part of the installation installed in switchboards EATON **BC-O-1/12-ECO**

Suitable for combination with switchboard R-FVE-DC1, R-FVE-DC2 and R-FVE-H.

List of main components:

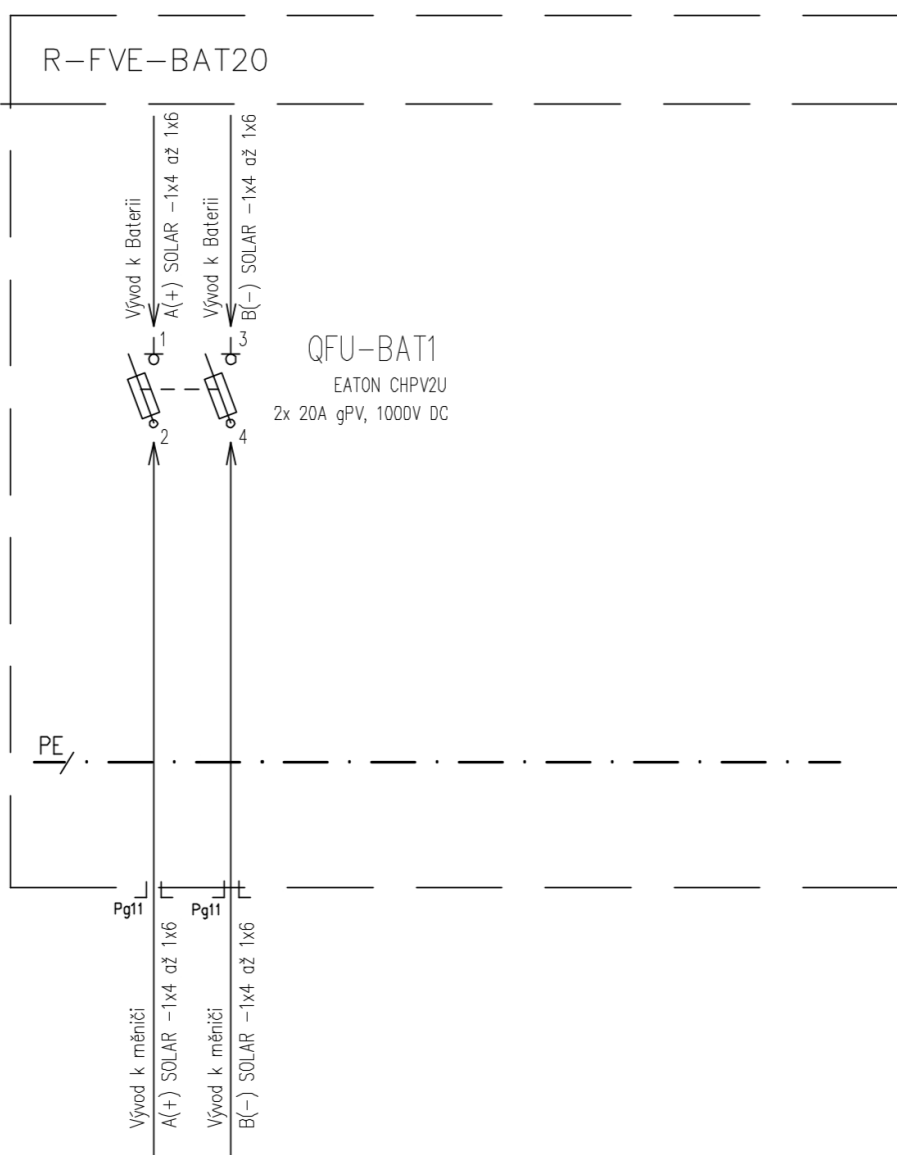
EATON BC-O-1/12-ECO switchboard, EATON **CHPV2U** fuse switch-disconnector, including fuses gPV EATON **PV-20A10F**.

You will find a detailed list of components in the documentation tab, together with the diagrams and all documentation.

R-FVE-BAT20 – List of components

Code	Producer	Product	Description	Number of pieces
280347	EATON	BC-O-1/12-ECO	IP65 flush-mounted switchboard, transparent plastic. door, 1 row	1
CHPV2U	EATON	CHPV2U	Fuse switch-disconnector, photovoltaic applications, 2-pole, 1000V AC / 30A, C10 (10x38mm)	1
2625081	EATON/ETI/OEZ	CH10x38 gPV 20A/1000V DC	Ultra-fast cylindrical fuse for photovoltaics, (UL standard), 10x38mm, 1100V DC, 20A	2

R-FVE-BAT20 – Diagram



Typ: R-FVE-BAT20

Výrobce: A-Z TRADERS s.r.o.
 U Potoka 320, 25219 Drahelčice
 IČ: 07462522
 IP 40/20
 Napětí: 1000V DC
 Proud: 20A

Plastová rozvodnice s dvěma
 BC-0-1/12-ECO
 krytí IP40/IP20
 1 x 12 modulů

3. AC switchboards

3.1 R-FVE-M4



AC switchboard designed for wall assembling, IP40 / 20 serving as input switchboard (for inverters) for three-phase photovoltaic power plants (typically GoodWe inverters 4 to 10K-ET, GoodWe 4 to 10K-ET).

Its advantage is the small size, the ability to “stack” with other AC switchboards side by side or under each other, it makes the possibility to install them in a space where can be problematic to find enough free space.

The switchboard is equipped with an AC surge arrester and a B16 / 3 circuit breaker to protect the inverter input.

Suitable to combine with switchboard R-FVE-DC1, R-FVE, DC2 for one-way part of installation and switchboards R-FVE-M5 + P3F for backup circuits with manual switch (bridging inverter) and R-FVE-Z3 switchgear or switchgear with circuit breaker, sockets and security.

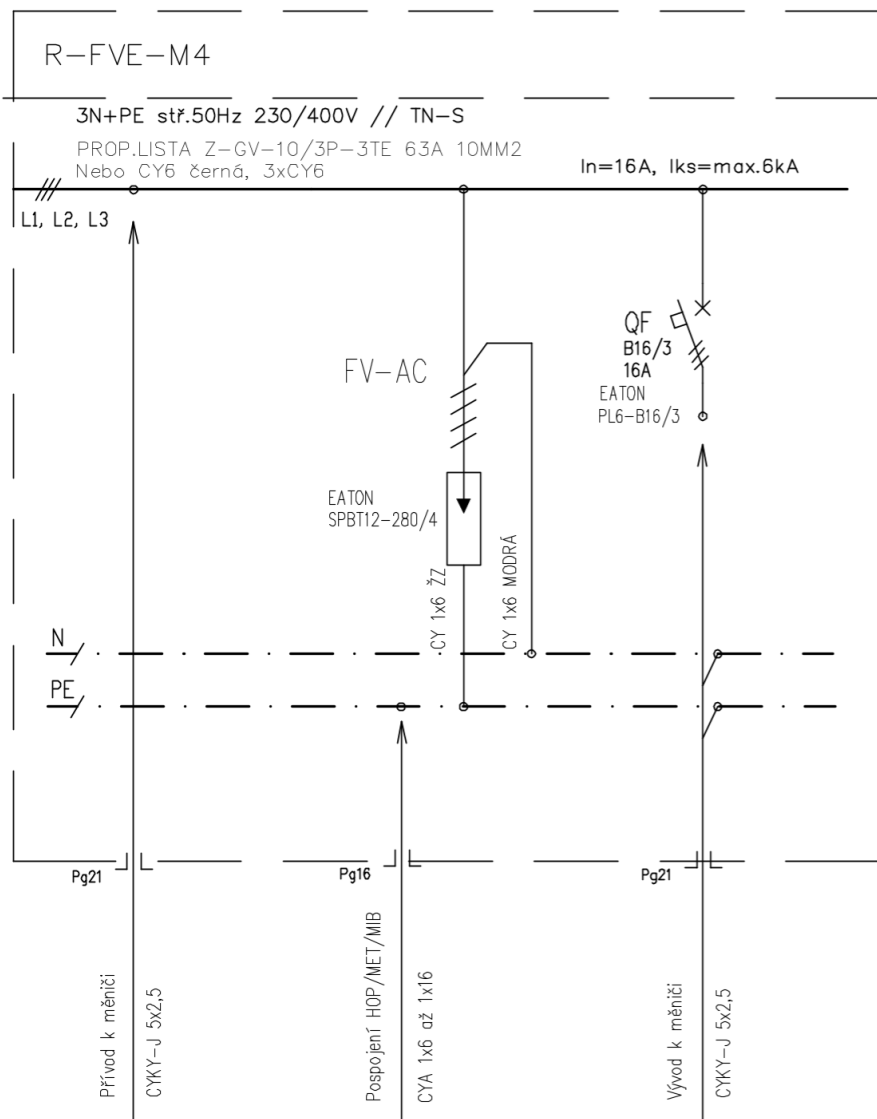
List of main components:

Switchboard EATON **BC-O-1/12-ECO**, surge arrester class T1 + T2 EATON **SPBT12-280 / 4**, circuit breaker EATON **PL6-B16 / 3**.

You will find a detailed list of components in the documentation tab, together with the diagrams and all documentation.

R-FVE-M4 – List of components and diagram

Code	Producer	Product	Description	Number of pieces
280347	EATON	BC-O-1/12-ECO	Flush-mounted switchboard, transparent plastic. door, 1 row, 12 modules	1
158331	EATON	SPBT12-280/4	Surge arrester class T1 + T2 (B + C), 4-pole set for TN-S	1
286589	EATON	PL6-B16/3	Circuit breaker PL6, char B, 3-pole, Icn = 6kA, In = 16A	1



Typ: R-FVE-M4

Výrobce: A-Z TRADERS s.r.o.
U Potoka 320, 25219 Drahelčice
IČ: 07462522
IP 40/20
Napětí: 400/230V AC
Proud: 16A

Plastová rozvodnice s dveřmi
BC-O-1/12-ECO
krytí IP40/IP20
1 x 12 modulů

3.2 R-FVE-M5+P3F



AC switchboard designed for wall assembling, IP40 / 20 serving as an output switchboard (for inverters) for three-phase photovoltaic power plants (typically a GoodWe 4 to 10K-ET inverter) so that to ensure output protection including circuit breaker and switch in case of fault or inverter switched off.

Its advantage is the small size, the ability to “stack” with other AC switchboards side by side or under each other, it makes the possibility to install them in a space where it can be problematic to find enough free space.

The switchboard is equipped with a circuit breaker B16 / 3 to protect the output from the inverter backup, current type A protector with manual four - pole switch for bridging backup one's circuits during service or inverter shutdown.

Suitable to combine with switchboard R-FVE-DC1, R-FVE-DC2 for DC part installation and switchboard R-FVE-M4, which is designed for inverter input.

List of main components:

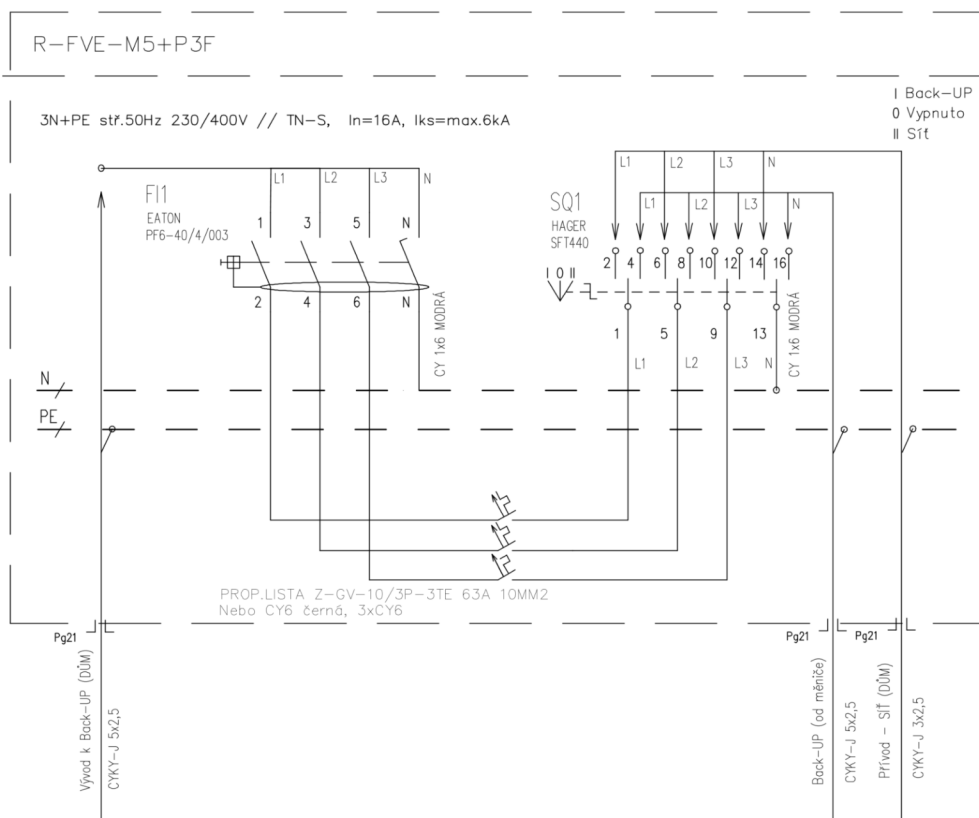
EATON switchboard **BC-O-1/12-ECO**, current protector **EATON PF6-40 / 4/003-A**, circuit breaker **EATON PL6-B16 / 3** and four-position switch **HAGER SFT440**.

You will find a detailed list of components in the documentation tab, together with the diagrams and all documentation.

R-FVE-M5+P3F – List of components

Code	Producer	Product	Description	Number of pieces
280347	EATON	BC-O-1/12-ECO	Flush-mounted switchboard, transparent plastic door, 1 row, 12 modules	1
286589	EATON	PL6-B16/3	Circuit breaker PL6, char B, 3-pole, Icn = 6kA, In = 16A	1
112933	EATON	PF6-40/4/003-A	Protector Ir = 250A, type A, 4-pole, Idn = 0.03A, In = 40A	1
SFT440	HAGER	Network switch SFT440 (I-0-II) 4P/40A	Group switch (I-0-II) 4P / 40A - output contact up	1

R-FVE-M5+P3F – Diagram



Typ: R-FVE-M5+P3F

Výrobce: A-Z TRADERS s.r.o.
Pivcova 945/4, 152 00 Praha 5
IČ: 07462522
IP 40/20
Napětí: 400/230V AC
Proud: 16A

Plastová rozvodnice s dveřmi
BC-O-1/12-ECO
krytí IP40/IP20
1 x 12 modulů

3.3 R-FVE-M5



AC switchboard designed for wall assembling, IP40 / 20 serving as an output switchboard (for inverters) for three-phase photovoltaic power plants (typically a GoodWe 4 to 10K-ET inverter) so that to ensure output protection including a circuit breaker.

Its advantage is the small size, the ability to “stack” with other AC switchboards side by side or under each other, it makes the possibility to install them in a space where can be problematic to find enough free space.

The switchboard is equipped with a circuit breaker B16 / 3 to protect the output from the inverter backup, current type A protector.

Suitable to combine with switchboard R-FVE-DC1, R-FVE-DC2 for DC part installation and switchboard R-FVE-M4, which is designed for inverter input.

List of main components:

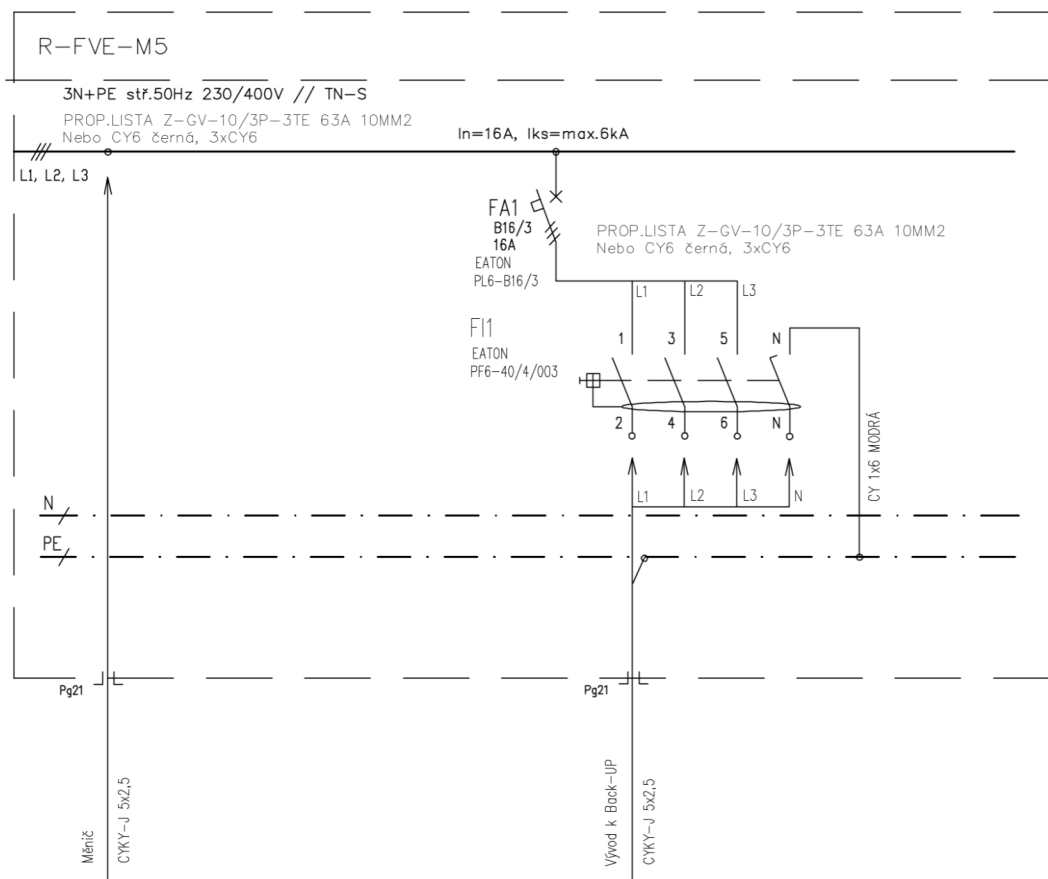
EATON switchboard **BC-O-1/12-ECO**, current protector **EATON PF6-40 / 4/003-A**, circuit breaker EATON **PL6-B16 / 3**.

You will find a detailed list of components in the documentation tab, together with the diagrams and all documentation.

R-FVE-M5 - List of components

Code	Producer	Product	Description	Number of pieces
280347	EATON	BC-O-1/12-ECO	Flush-mounted switchboard, transparent plastic. door, 1 row, 12 modules	1
286589	EATON	PL6-B16/3	Circuit breaker PL6, char B, 3-pole, I _{cn} = 6kA, I _n = 16A	1
112933	EATON	PF6-40/4/003-A	Protector I _r = 250A, type A, 4-pole, I _{dn} = 0.03A, I _n = 40A	1

R-FVE-M5 - Diagram



Typ: R-FVE-M5
 Výrobce: A-Z TRADERS s.r.o.
 U Potoka 320, 25219 Drahelčice
 IČ: 07462522
 IP 40/20
 Napětí: 400/230V AC
 Proud: 16A

Plastová rozvodnice s dveřmi
 BC-O-1/12-ECO
 krytí IP40/IP20
 1 x 12 modulů

3.4 R-FVE-Z3



AC switchboard designed for wall assembling, IP40 / 20 serving as an output switchboard (at the inverter) for three-phase photovoltaic power plants (typically a GoodWe 4 to 10K-ET inverter). Where it is not possible to use selected circuits for backup in the existing switchboard, but it is possible use only sockets and a backup circuit breaker for selected appliances.

Its advantage is the small size, the ability to “stack” with other AC switchboards side by side or under each other, it makes the possibility to install them in a space where can be problematic to find enough free space.

The switchboard is equipped with a B16 / 1 circuit breaker for securing two sockets and one reserve for a separate appliance from the inverter backup and a type A circuit breaker.

Suitable to combine with switchboard R-FVE-DC1, R-FVE-DC2 for DC part installation and switchboard R-FVE-M4, which is designed for inverter input.

List of main components:

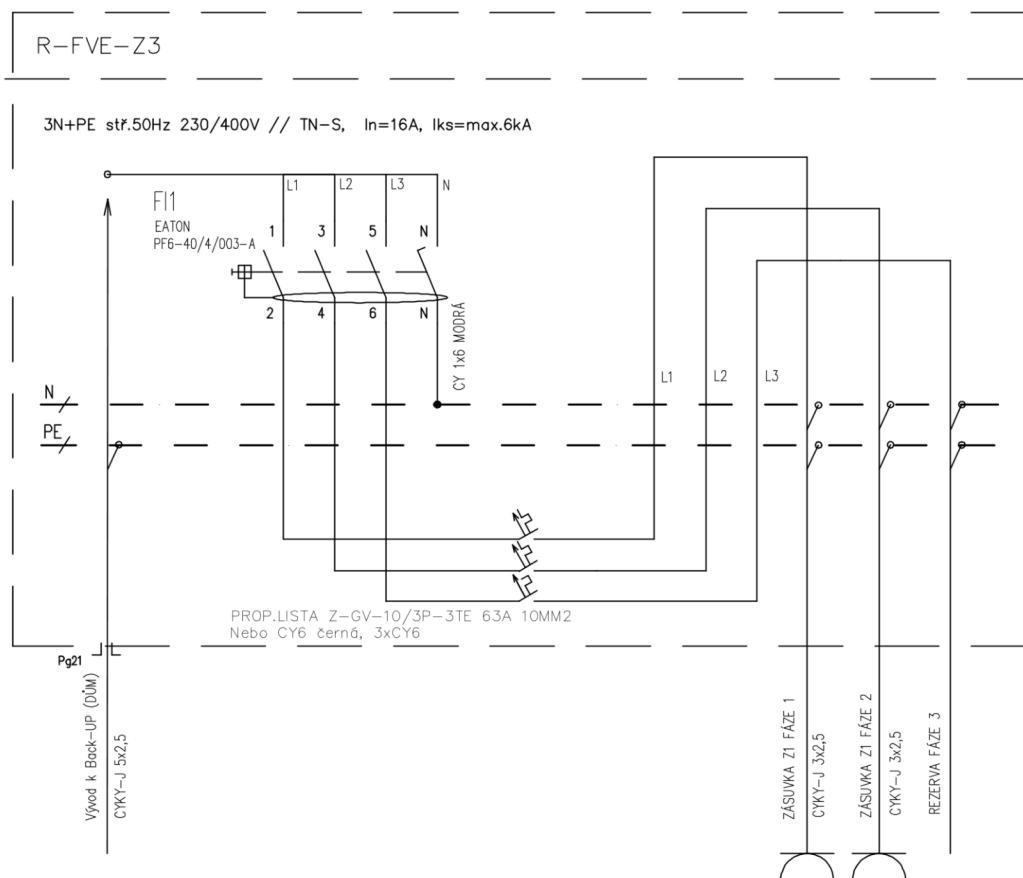
EATON switchboard **BC-O-1/12-ECO**, current protector **EATON PF6-40 / 4/003-A**, circuit breaker **EATON PL6-B16 / 1** and two sockets for DIN rail **EATON Z-SD230-BS**.

You will find a detailed list of components in the documentation tab, together with the diagrams and all documentation.

R-FVE-Z3 – List of components

Code	Producer	Product	Description	Number of pieces
280347	EATON	BC-O-1/12-ECO	Flush-mounted switchboard, transparent plastic. door, 1 row, 12 modules	1
286521	EATON	PL6-B16/3	Circuit breaker PL6, char B, 3-pole, Icn = 6kA, In = 16A	3
112933	EATON	PF6-40/4/003-A	Protector Ir = 250A, type A, 4-pole, Idn = 0.03A, In = 40A	1
266876	EATON	Z-SD230-BS	DIN rail socket with shutters and pin	2

R-FVE-Z3 – Diagram



Typ: R-FVE-Z3

Výrobce: A-Z TRADERS s.r.o.
Pivcova 945/4, 152 00 Praha 5
IČ: 07462522
IP 40/20
Napětí: 400/230V AC
Proud: 16A

Plastová rozvodnice s dveřmi
BC-O-1/12-ECO
krytí IP40/IP20
1 x 12 modulů

3.5 R-TC



AC switchboard designed for wall assembling, IP40 / 20 serving as input switchboard (for heat pumps) for three-phase pump connection (typically IDM).

Its advantage is the small size, the ability to “stack” with other AC switchboards side by side or under each other, it makes the possibility to install them in a space where can be problematic to find enough free space.

The switchboard is equipped with circuit breakers C25 / 3, B13 / 3, B13 / 1 and B16 / 3 to secure access to compressor, heating rod, regulator and socket.

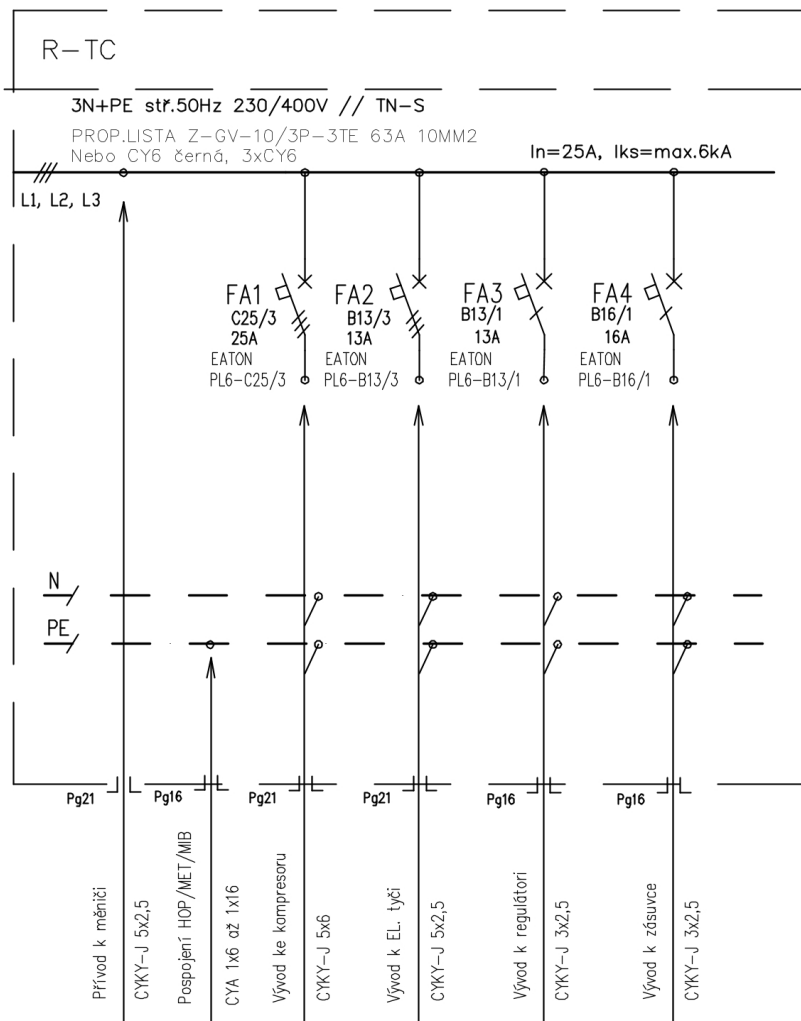
List of main components:

Switchboard EATON **BC-O-1/12-ECO**, circuit breakers EATON **PL6-B25 / 3**, EATON **PL6-B13 / 3**, EATON **PL6- B13/ 1** and EATON **PL6-B16 / 1**.

You will find a detailed list of components in the documentation tab, together with the diagrams and all documentation.

R-TC - List of components

Code	Producer	Product	Description	Number of pieces
280347	EATON	BC-O-+/12-ECO	Flush-mounted switchboard, transparent plastic. door, 1 row, 12 modules	1
286521	EATON	PL6-B16/1	Circuit breaker PL6, char B, 1-pole, Icn = 6kA, In = 16A	1
112933	EATON	PL6-B13/1	Circuit breaker PL6, char B, 1-pole, Icn = 6kA, In = 13A	1
266876	EATON	PL6-B13/3	Circuit breaker PL6, char B, 3-pole, Icn = 6kA, In = 13A	1
266876	EATON	PL6-C25/3	Circuit breaker PL6, char C, 3-pole, Icn = 6kA, In = 25A	1



Typ: R-TC

Výrobce: A-Z TRADERS s.r.o.
U Potoka 320, 25219 Drahelčice
IČ: 07462522
IP 40/20
Napětí: 400/230V AC
Proud: 25A

Plastová rozvodnice s dveřmi
BC-O-1/12-ECO
krytí IP40/IP20
1 x 12 modulů

3.6 R-FVE-GW25

(R-FVE-GW32 a R-FVE-GW40)



AC switchboard designed for wall assembling, IP65 for three-phase photovoltaic power plants (typically GoodWe inverters 4 to 10K-ET).

Its advantage is the automatic switching between standard operation from the network and the backup. It is necessary to check the load in case of power failure. energy to avoid overload because its function switches to the backup of the whole house.

The undeniable advantage is minimal intervention to the customer's switchboard - Smartmeter (inverter measurement), a common breakdown points and all fuses are part of this switchboard. So, all you must do is make a loop between the main switchboard and the location of the technology.

Crisis disconnection of the HDO inverter is also prepared in the switchboard (N0%) and preparation for the deployment of FIRE-SAFETY solutions. Type GW25 is designed for the main circuit breaker in column 25A. GW32 circuit breaker 32A and GW40 circuit breaker B40.

There is a slight time delay (switching of contactors) during switching - ie it is not uninterrupted backup solution

List of main components:

Switchboard EATON **IKA-3/54-ST**, surge arrester class T1 + T2 EATON **SPBT12-280 / 4**, main switch EATON **IS40 / 3**, circuit breaker according to the pole - EATON **PL6-B25 / 3**, inverter

protection and backup circuits 2x EATON **PL6-B20 / 3**, contactor including monitoring relay **ELKO HRN-55** and contactor EATON **Z-SCH230 / 40-40**, fuses for measurement and control, circuit breakers **EATON PL6** and 2 contactors for autonomous switching of the object to backup **Z-SCH230 / 25** + relay for crisis control HDO.

(For GW32, the EATON **PL6-B25 / 3** circuit breaker is used instead of the EATON **PL6-B32 / 3** circuit breaker)

(For GW40, the EATON **PL6-B25 / 3** circuit breaker is used instead of the EATON **PL6-B40 / 3** circuit breaker)

You will find a detailed list of components in the documentation tab, together with the diagrams and all documentation.

R-FVE-GW25 - protection class I + II - List of components

Code	Producer	Product	Description	Number of pieces
174202	EATON	IKA-3/54-ST	IP65 flush-mounted switchboard, transparent plastic. doors, 3 rows, 54 modules	1
158331	EATON	SPBT12-280/4	Surge arrester class T1 + T2 (B + C), 4-pole set for TN-S	1
276272	EATON	IS-40/3	Main switch, 240V, 40A, 3HP	1
286518	EATON	PL6-B6/1	Circuit breaker PL6, char B, 1-pole, Icn = 6kA, In = 6A	2
3722	ELKO EP	HRN-55	Voltage monitoring relay	1
193886	EATON	Z-SCH230/1/25-11	Installation contactor, 230VAC / 50Hz, 1S, 1R, 25A	2
248847	EATON	Z-SCH230/25-40	Installation contactor, 230VAC / 50Hz, 4S, 25A	2
248852	EATON	Z-SCH230/40-40	Installation contactor, 230VAC / 50Hz, 4S, 40A	1
286586	EATON	PL6-B6/3	Circuit breaker PL6, char B, 3-pole, Icn = 6kA, In = 6A	1
286591	EATON	PL6-B25/3	Circuit breaker PL6, char B, 3-pole, Icn = 6kA	1
286590	EATON	PL6-B20/3	Circuit breaker PL6, char B, 3-pole, Icn = 6kA	2

3.7 R-FVE-D1



AC switchboard designed for wall assembling, IP65 used for three-phase photovoltaic operation power plants (typically a GoodWe 4 to 10K-ET inverter).

Its advantage is the automatic switching between standard operation from the network and the backup. It is necessary to check the load in case of power failure. energy to avoid overload because its function switches to the backup of the whole house.

The undeniable advantage is minimal intervention to the customer's switchboard - Smartmeter (inverter measurement) common breakdown point, and all fuses are part of this switchboard. All you must do is make a loop between the main switchboard and the location of the technology. Crisis disconnection of the HDO inverter is also prepared in the switchboard (N0%) **The R-FVE-D1 switchboard is designed for a main circuit breaker in the B40 / 3 circuit breaker.**

There is a slight time delay during switching (contactor switching) - ie it is not without downtime backup solution.

List of main components:

Switchboard EATON **IKA-3/54-ST**, surge arrester class T1 + T2 EATON **SPBT12-280 / 4**, main EATON **IS40 / 3** switch, preparation for boiler protection - EATON **PL6-B16 / 3**, inverter protection and backup circuits 2x EATON **PL6-B20/3**, contactor including monitoring relay **ELKO HRN-55** and contactor EATON **Z-SCH230 / 40-40**, fuses for measurement and control, circuit breakers **EATON PL6** and 2 contactors for autonomous switching of the object to backup **Z-SCH230 / 25** + relay for crisis control HDO.

In combination with the R-FVE-E1 switchboard (R-FVE-E2), where the A-Z Router is located, you can interconnect switchboards with a prepared cable harness and have 2 switchboards complete technology, including regulation to DHW.

You will find a detailed list of components in the documentation tab, together with the diagrams and all documentation.

Switchboard R-FVE-D1 - List of components

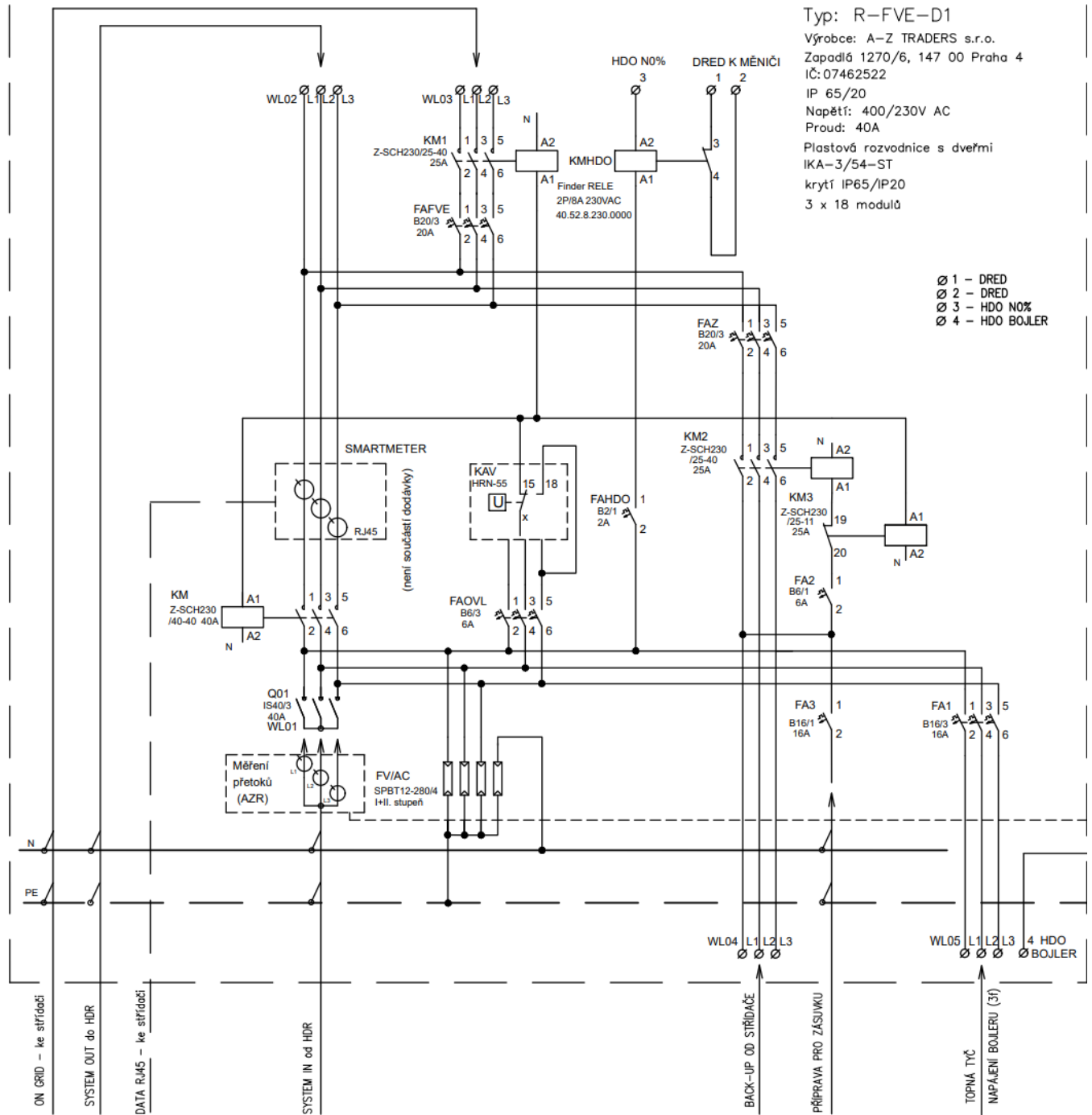
Code	Producer	Product	Description	Number of pieces
174202	EATON	IKA-3/54-ST	IP65 flush-mounted switchboard, transparent plastic. doors, 3 rows, 54 modules	1
158331	EATON	SPBT12-280/4	Surge arrester class T1 + T2 (B + C), 4-pole set for TN-S	1
276272	EATON	IS-40/3	Main switch, 240V, 40A, 3HP	1
286518	EATON	PL6-B6/1	Circuit breaker PL6, characteristic B, 1-pole, I _{cn} = 6kA, I _n = 6A	2
286521	EATON	PL6-B6/1	Circuit breaker PL6, characteristic B, 1-pole, I _{cn} = 6kA, I _n = 16A	1
3722	ELKO EP	HRN-55	Voltage monitoring relay	1
40.52.8.230.0000	FINDER	2P/8A 230VAC 40.52.8.230.0000	Relay 1NC, 1NO	1
193886	EATON	Z-SCH230/25-40	Installation contactor, 230VAC / 50Hz, 1S, 1R, 25A	1
248847	EATON	Z-SCH230/40-40	Installation contactor, 230VAC / 50Hz, 4S, 25A	2
248852	EATON	PL6-B25/3	Installation contactor, 230VAC / 50Hz, 4S, 40A	1
286586	EATON	PL6-B20/3	Circuit breaker PL6, char B, 3-pole, I _{cn} = 6kA, I _n = 6A	1
286589	EATON	PL6-B20/3	Circuit breaker PL6, char B, 3-pole, I _{cn} = 6kA, I _n = 16A	1
286516	EATON	PL6-B20/3	Circuit breaker PL6, char B, 3-pole, I _{cn} = 6kA, I _n = 2A	1
286590	EATON	PL6-B20/3	Circuit breaker PL6, char B, 3-pole, I _{cn} = 6kA, I _n = 20A	2

R-RVE-D1

Typ: R-FVE-D1

Výrobce: A-Z TRADERS s.r.o.
 Zapadlá 1270/6, 147 00 Praha 4
 IČ: 07462522
 IP 65/20
 Napětí: 400/230V AC
 Proud: 40A
 Plastová rozvodnice s dveřmi
 IKA-3/54-ST
 krytí IP65/IP20
 3 x 18 modulů

- Ø 1 - DRED
- Ø 2 - DRED
- Ø 3 - HDO N0%
- Ø 4 - HDO BOJLER



ON GRID - ke střídači

SYSTEM OUT do HDR

DATA R45 - ke střídači

SYSTEM IN od HDR

BACK-UP OD STRIDAČE

PŘÍPRAVA PRO ZÁSUVKU

TOPNÁ TYČ
 NAPÁLENÍ BOJLERU (3f)

3.8 Power-Switch



AC switchboard designed for wall assembling, IP65 used to operate a three-phase backup photovoltaic power plants (**RCT Power storage DC inverters only**).

Its advantage is the automatic switching between standard operation from the network and the backup.

An undeniable advantage is the minimal intervention in the customer's switchboard - RCT Power sensor (inverter measurement) can be placed either in the power switch or in the customer's switchboard.

All fuse is part of this switchboard.

There is a slight time delay during switching (contactor switching and inverter RCT function) - therefore, it is not an outage backup solution.

List of main components:

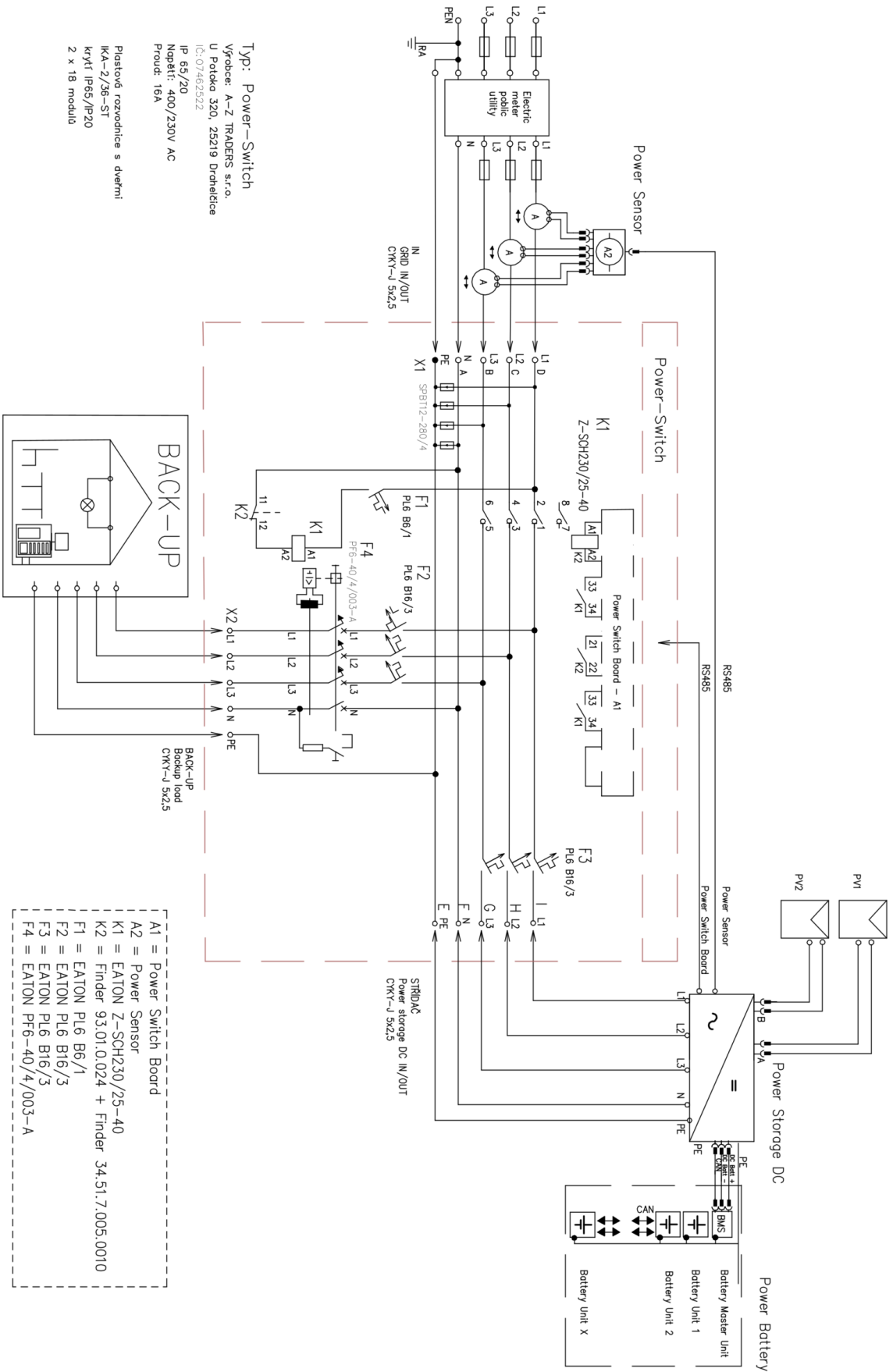
Switchboard EATON **IKA-2/36-ST**, surge arrester class T1 + T2 EATON **SPBT12-280 / 4**, fuse inverters and backup circuits 2x EATON **PL6-B16 / 3**, contactor EATON **Z-SCH230 / 40-40**, fuses for measurement and control, **EATON + RCT** circuit-breakers **Power-switch unit**, Power meter sensor 50A and **3x measuring coils**

You will find a detailed list of components in the documentation tab, together with the diagrams and all documentation.

Power-Switch – List of components

Code	Producer	Product	Description	Number of pieces
174201	EATON	IKA-2/36-ST	IP65 flush-mounted switchboard, transparent plastic. doors, 2 rows, 36 modules	1
158331	EATON	SPBT12-280/4	Surge arrester class T1 + T2 (B + C), 4-pole set for TN-S	1
248847	EATON	Z-SCH230/40-40	Installation contactor, 230V AC / 50Hz, 4S, 25A, 2HP	1
	FINDER	34.51.7.005.0010 + 93.01.0.024	RELAY Finder	1
248862	EATON	Z-SC	Auxiliary contact unit for contactors, 1z1v cont.	1
286518	EATON	PL6-B6/1	Circuit breaker PL6, char B, 1-pole, Icn = 6kA, In = 6A	1
286589	EATON	PL6-B16/3	Circuit breaker PL6, char B, 3-pole, Icn = 6kA, In = 16A	2
112933	EATON	PF6-40/4/003-A	Protector Ir = 250A, type A, 4-pole, Idn = 0.03A, In = 40A	1
	RCT	Power-switch UNIT	Communication unit	1
	RCT	Power-switch sensor 50A	Electricity meter + measuring coils 50A	1

Power-Switch - Diagram



3.9 R-FVE-H



AC switchboard designed for wall assembling, IP40 / 20 serving as input / output switchboard (u inverters) for single-phase photovoltaic power plants (typically GoodWe 3648-EM inverter a 3648D-ES). To ensure the protection of outputs and outputs, including the switch in the case of fault or inverter switched off.

Its advantage is the small size, the ability to “stack” with other AC switchboards side by side or below each other, making it possible to install them in a space where there is a problem with lack of vacancy.

The switchboard is equipped with an AC surge arrester, circuit breaker B16 / 1 to protect the inverter input and output for backup circuits, further manual with two - pole switch for bypassing the backup circuits during service or switching off the inverter.

Suitable to combine with switchboard R-FVE-DC1, R-FVE-DC2 and R-FVE-BAT100 for DC part of the installation and R-FVE-Z1 for output with sockets.

List of main components:

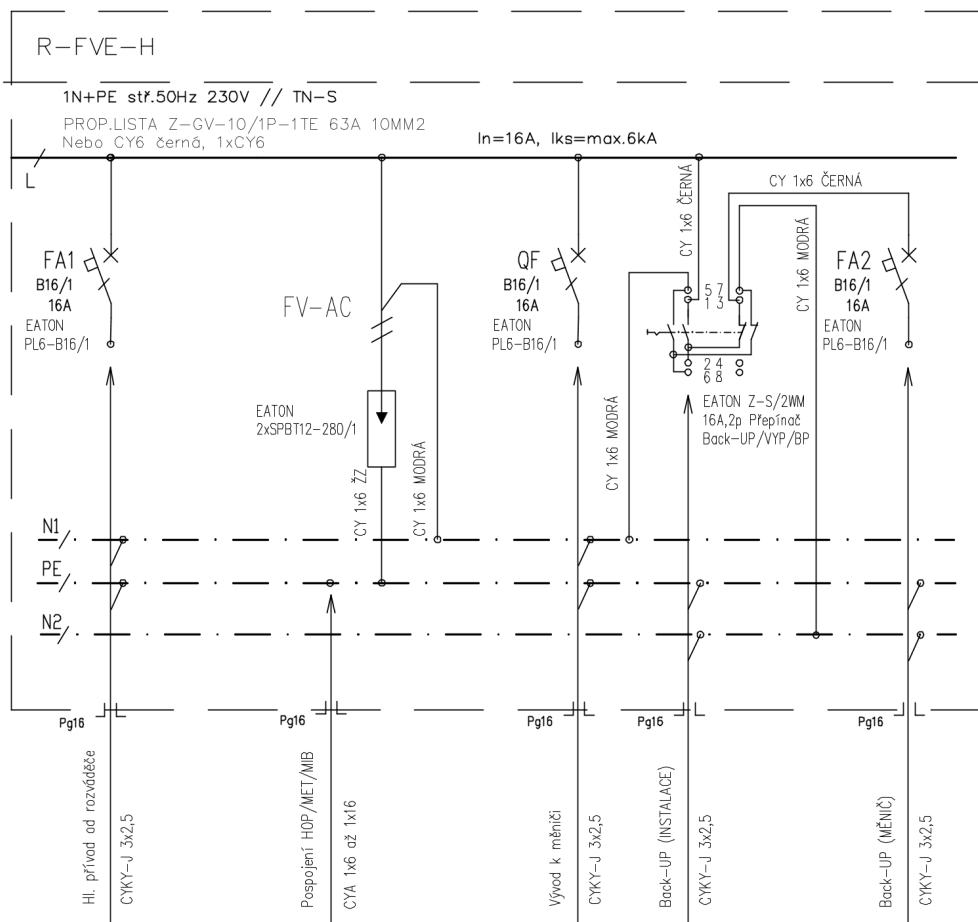
Switchboard EATON **BC-O-1/12-ECO**, surge arrester class T1 + T2 EATON **SPBT12-280 / 2**, circuit breakers EATON **PL6-B16 / 1** and EATON **Z-S / 2WM** switch.

You will find a detailed list of components in the documentation tab, together with the diagrams and all documentation.

R-FVE-H - List of components

Code	Producer	Product	Description	Number of pieces
280347	EATON	BC-O-1/12-ECO	Flush-mounted switchboard, transparent plastic. door, 1 row	1
248346	EATON	Z-S/2WM	Switch 2 switch contacts, 16A	1
158306	EATON	SPBT12-280/1	Surge arrester class T1 + T2 (B + C), 1-pole	2
286521	EATON	PL6-B16/1	Circuit breaker PL6, char B, 1-pole, Icn = 6kA, In = 16A	3

R-FVE-H - Diagram



Typ: R-FVE-H

Výrobce: A-Z TRADERS s.r.o.
 U Potoka 320, 25219 Drahelčice
 IČ: 07462522
 IP 40/20
 Napětí: 230V AC
 Proud: 16A

Plastová rozvodnice s dveřmi
 BC-O-1/12-ECO
 krytí IP40/IP20
 1 x 12 modulů

3.10 R-FVE-M



AC switchboard designed for wall assembling, IP40 / 20 serving as input switchboard (at the inverter) for single - phase photovoltaic power plants (typically GoodWe inverter 1000-XS to 3000-XS a GoodWe series 3000D-NS to 3600D-NS). Its advantage is the small size, the ability to “stack” with other AC switchboards side by side or below each other, making it possible to install them in a space where there is a problem with lack of vacancy.

The switchboard is equipped with an AC surge arrester, circuit breaker B16 / 1 to protect the inverter input.

Suitable to combine with switchboard R-FVE-DC1 and R-FVE-DC2 for DC part installation.

List of main components:

EATON **BC-O-1/12-ECO** switchboard, surge arrester class T1 + T2 EATON **SPBT12-280 / 2** and circuit breakers EATON **PL6-B16 / 1**

You will find a detailed list of components in the documentation tab, together with diagrams and all documentation.

R-FVE-M – List of components

Code	Producer	Product	Description	Number of pieces
280347	EATON	BC-O-1/12-ECO	Flush-mounted switchboard, transparent plastic. door, 1 row	1
158306	EATON	SPBT12-280/1	Surge arrester class T1 + T2 (B + C), 1-pole	2
286521	EATON	PL6-B16/1	Circuit breaker PL6, char B, 1-pole, Icn = 6kA, In = 16A	2

3.11 R-FVE-Z1



AC switchboard designed for wall assembling, IP40 / 20 serving as output switchboard (at the inverter) for single-phase photovoltaic power plants (typically GoodWe 3648-EM and 3648D-ES inverter). Where it is not possible to use selected circuits for backup in the existing switchboard, but it is possible use only sockets and a backup circuit breaker for selected appliances.

Its advantage is the small size, the ability to “stack” with other AC switchboards side by side or below each other, making it possible to install them in a space where there is a problem with lack of vacancy.

The switchboard is equipped with three B16 / 1 circuit breakers for securing two sockets and one reserve for a separate appliance from the inverter backup and a type A circuit breaker.

Suitable to combine with switchboard R-FVE-DC1, R-FVE-DC2 for DC part installation and switchboard R-FVE-M, R-FVE-H, which are designed for inverter input or for input, output and backup circuits with switch.

List of main components:

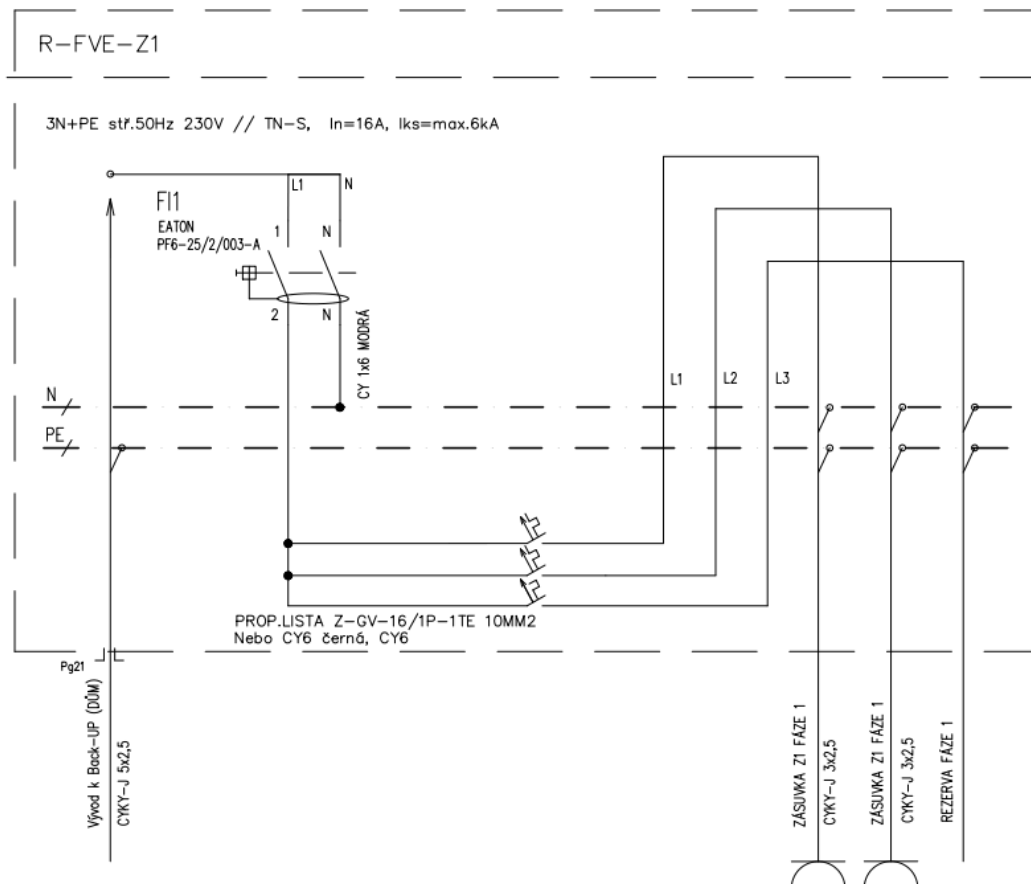
EATON **BC-O-1/12-ECO** switchboard, **EATON PF6-25 / 2/003-A** circuit breaker, 3 circuit breakers EATON **PL6-B16 / 1** and two sockets for DIN rail EATON **Z-SD230-BS**.

You will find a detailed list of components in the documentation tab, together with the diagrams and all documentation.

R-FVE-Z1 – List of components

Code	Producer	Product	Description	Number of pieces
280347	EATON	BC-O-1/12-ECO	Flush-mounted switchboard, transparent plastic. door, 1 row	1
286521	EATON	PL6-B16/1	Circuit breaker PL6, char B, 1-pole, Icn = 6kA, In = 16A	3
112921	EATON	PF6-25/4/003-A	Protector Ir = 250A, type A, 2-pole, Idn = 0.03A, In = 25A	1
266876	EATON	Z-SD230-BS	DIN rail socket with shutters and pin	2

R-FVE-Z1 – Diagram



Typ: R-FVE-Z1

Výrobce: A-Z TRADERS s.r.o.
Pivcova 945/4, 152 00 Praha 5
IČ: 07462522

IP 40/20
Napětí: 230V AC
Proud: 16A

Plastová rozvodnice s dveřmi
BC-O-1/12-ECO
krytí IP40/IP20
1 x 12 modulů

4. 1. Combined switchboards

4.1 R-FVE-C3



AC + DC switchboard designed for wall assembling, IP65 used for three-phase power supply photovoltaic power plants, including a common decomposition site and regulation of DHW control (typically a GoodWe 4 to 10K-DT inverter) including a control unit (A-Z Router Smart / Watrouter). Also, DC part - arresters and fuse switch-disconnectors, including fuses.

Its advantage is a minimal intervention in the customer's switchboard - measurement of regulation from DHW (coils, control unit, or SSR RELAY) common disintegration point and all protection is part of of this switchboard. So just make a loop between main switchboard and location of technology.

Crisis disconnection of the HDO inverter is also prepared in the switchboard (N0%). The R-FVE-C3 switchboard is designed for a main circuit breaker in a maximum pole of 40 A. It also contains DC fuse switch-disconnectors and surge arresters.

List of main components:

Switchboard EATON **IKA-3/54-ST**, surge arrester class T1 + T2 EATON **SPBT12-280 / 4**, main EATON **IS40 / 3** switch, EATON **PL6-B16 / 3** inverter fuse, contactor including monitoring relay **ELKO HRN-55** and contactor EATON **Z-SCH230 / 40-40**, protection for measurement and control, circuit breakers **EATON**

PL6 + relay for crisis HDO control. Surge arrester EATON **SPPVT12-10-2 + PE** or EATON

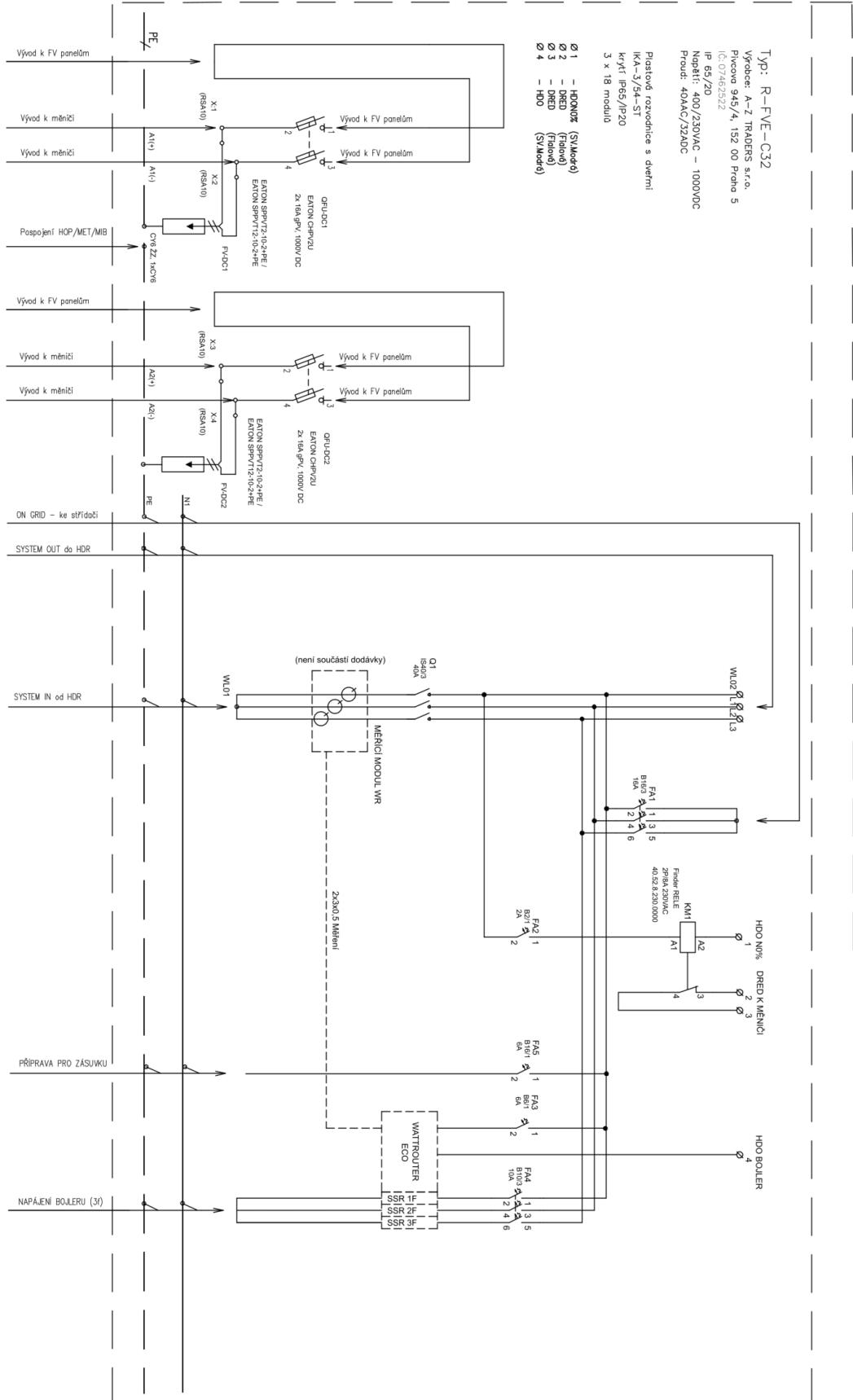
SPPVT2-10-2 + PE. EATON CHPV2U fuse switch-disconnectors including EATON gPV fuses PV-15A10F.

You will find a detailed list of components in the documentation tab, together with the diagrams and all documentation.

R-FVE-C3 - protection class I + II - List of components

Code	Producer	Product	Description	Number of pieces
174202	EATON	IKA-3/54-ST	IP65 flush-mounted switchboard, transparent door, 3 rows, 54 modules	1
158331	EATON	SPBT12-280/4	Surge arrester class T1 + T2 (B + C), 4-pole set for TN-S	1
276272	EATON	IS-40/3	Main switch, 240V, 40A, 3HP	1
40528230 + 95.65	FINDER	2P/8A 230VAC 40.52.8.230.0000	Finder RELAY	1
177256	EATON	SPPVT12-10-2+PE	Surge arrester T1 + T2 (I + II, B + C), photovoltaic applications 1000V DC, max. short circuit current 1000A	1
2625085	EATON/ETI/OEZ	CH10x38 gPV 15A/1000V DC	Ultra-fast cylindrical fuse for photovoltaics, (UL standard), 10x38mm, 1100V DC, 15A	2
CHPV2U	EATON	CHPV2U	Fuse switch-disconnector, photovoltaic applications, 2-pole, 1000V AC / 30A, C10 (10x38mm)	1
286589	EATON	PL6-B16/3	Circuit breaker PL6, char B, 3-pole, Icn = 6kA, In = 16A	1
286587	EATON	PL6-B10/3	Circuit breaker PL6, char B, 1-pole, Icn = 6kA, In = 16A	1
286518	EATON	PL6-B6/1	Circuit breaker PL6, char B, 1-pole, Icn = 6kA, In = 6A	1
286521	EATON	PL6-B16/1	Circuit breaker PL6, char B, 1-pole, Icn = 6kA, In = 16A	1
286516	EATON	PL6-B2/1	Circuit breaker PL6, char B, 1-pole, Icn = 6kA, In = 2A	1

Power-FVE-C3 - Diagram



4.2 R-FVE-C1



AC + DC switchboard designed for wall assembling, IP65 used for single-phase power supply photovoltaic power plants, including a common decomposition site and regulation of DHW control (typically inverter GoodWe 2000 to 3000XS GoodWe 3000D-NS to 3600D-NS including control units (A-Z Router Smart / Watrouter). Also, DC part - arresters and fuse switch-disconnectors including fuses.

Its advantage is a minimal intervention in the customer's switchboard - measurement of regulation from DHW (coil, control unit, or SSR RELAY) common disintegration point and all protection is part of this switchboard. So just make a loop between main switchboard and location of technology. Crisis disconnection of the HDO inverter is also prepared in the switchboard (N0%). The R-FVE-C1 switchboard is designed for a main circuit breaker in a maximum pole of 40 A. It also contains DC fuse switch-disconnectors and surge arresters.

List of main components:

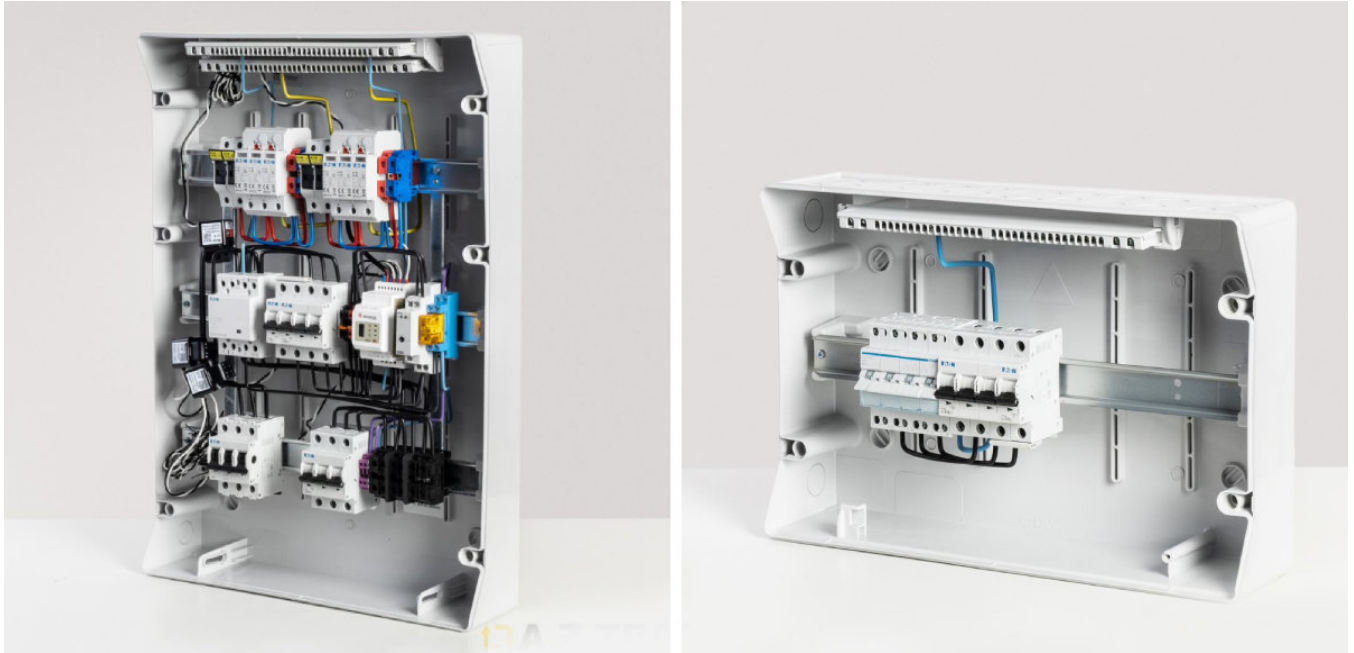
Switchboard EATON **IKA-3/54-ST**, surge arrester class T1 + T2 EATON **SPBT12-280 / 4**, main switch EATON **IS40 / 3**, inverter protection EATON **PL6-B16 / 1**, contactor including monitoring relay **ELKO HRN-55** and contactor EATON **Z-SCH230 / 40-40**, protection for measurement and control, circuit breakers **EATON PL6** + relay for crisis HDO control. Surge arrester EATON **SPPVT12-10-2 + PE** or EATON **SPPVT2-10-2 + PE**. EATON **CHPV2U** fuse switch-disconnectors including EATON gPV fuses **PV-15A10F**.

You will find a detailed list of components in the documentation tab, together with the diagrams and all documentation.

R-FVE-C1 - protection class I + II - List of components

Kód	Producer	Product	Description	Number of pieces
174202	EATON	IKA-3/54-ST	IP65 flush-mounted switchboard, transparent door, 3 rows, 54 modules	1
158331	EATON	SPBT12-280/4	Surge arrester class T1 + T2 (B + C), 4-pole set for TN-S	1
276272	EATON	IS-40/3	Main switch, 240V, 40A, 3HP	1
40528230 + 95.65	FINDER	2P/8A 230V AC 40.52.8.230.0000	RELAY Finder	1
177256	EATON	SPPVT12-10-2+PE	Surge arrester T1 + T2 (I + II, B + C), photovoltaic applications 1000V DC, max. short circuit current 1000A	1
2625085	EATON/ETI/OEZ	CH10x38 gPV 15A/1000V DC	Ultra-fast cylindrical fuse for photovoltaics, (UL standard), 10x38mm, 1100V DC, 15A	2
CHPV2U	EATON	CHPV2U	Fuse switch-disconnector, photovoltaic applications, 2-pole, 1000V AC / 30A, C10 (10x38mm)	1
286521	EATON	PL6-B16/1	Circuit breaker PL6, char B, 1-pole, Icn = 6kA, In = 16A	2
286587	EATON	PL6-B10/1	Circuit breaker PL6, char B, 1-pole, Icn = 6kA, In = 10A	1
286518	EATON	PL6-B6/1	Circuit breaker PL6, char B, 1-pole, Icn = 6kA, In = 6A	1
286516	EATON	PL6-B2/1	Circuit breaker PL6, char B, 1-pole, Icn = 6kA, In = 2A	1

4.3 R-FVE-A40-1 + R-FVE-A40-2



AC + DC switchboards designed for wall assembling, IP65 used for three-phase operation photovoltaic power plants in combination with a switch (typically a GoodWe 4 to 10K-ET inverter). Its advantage is a manual transition from the network and backup. It is necessary to control the load at power failure power to avoid overload after switching the switch because of its function switches the whole house to the inverter backup.

The undeniable advantage is the minimal intervention in customer switchboards - Smartmeter (inverter measurement), common breakdown points and all fuse is part of this switchboard. So just make a loop between the main switchboard and location of technology.

Crisis disconnection of the HDO inverter is also prepared in the switchboard (N0%). The R-FVE-A40-1 switchboard is designed for a main circuit breaker in a maximum pole of 40 A. It contains and DC fuse switch-disconnectors and surge arresters

List of main components:

Switchboard EATON IKA-3/54-ST and **EATON IKA-1/18-ST**, surge arrester class T1 + T2 **EATON SPBT12-280 / 4**, main switch **EATON IS40 / 3**, inverter protection **EATON PL6-B16 / 1**, contactor including monitoring relay **ELKO HRN-55** and contactor **EATON Z-SCH230 / 40-40**, protection for measuring and control, circuit breakers **EATON PL6** + relay for crisis HDO control. **EATON** surge arrester **SPPVT12-10-2 + PE** or **EATON SPPVT2-10-2 + PE**. **EATON CHPV2U** fuse switch-disconnectors including **EATON PV-15A10F gPV** fuses and **HAGER SFT440** four-position switch.

You will find a detailed list of components in the documentation tab, together with the diagrams and all documentation.

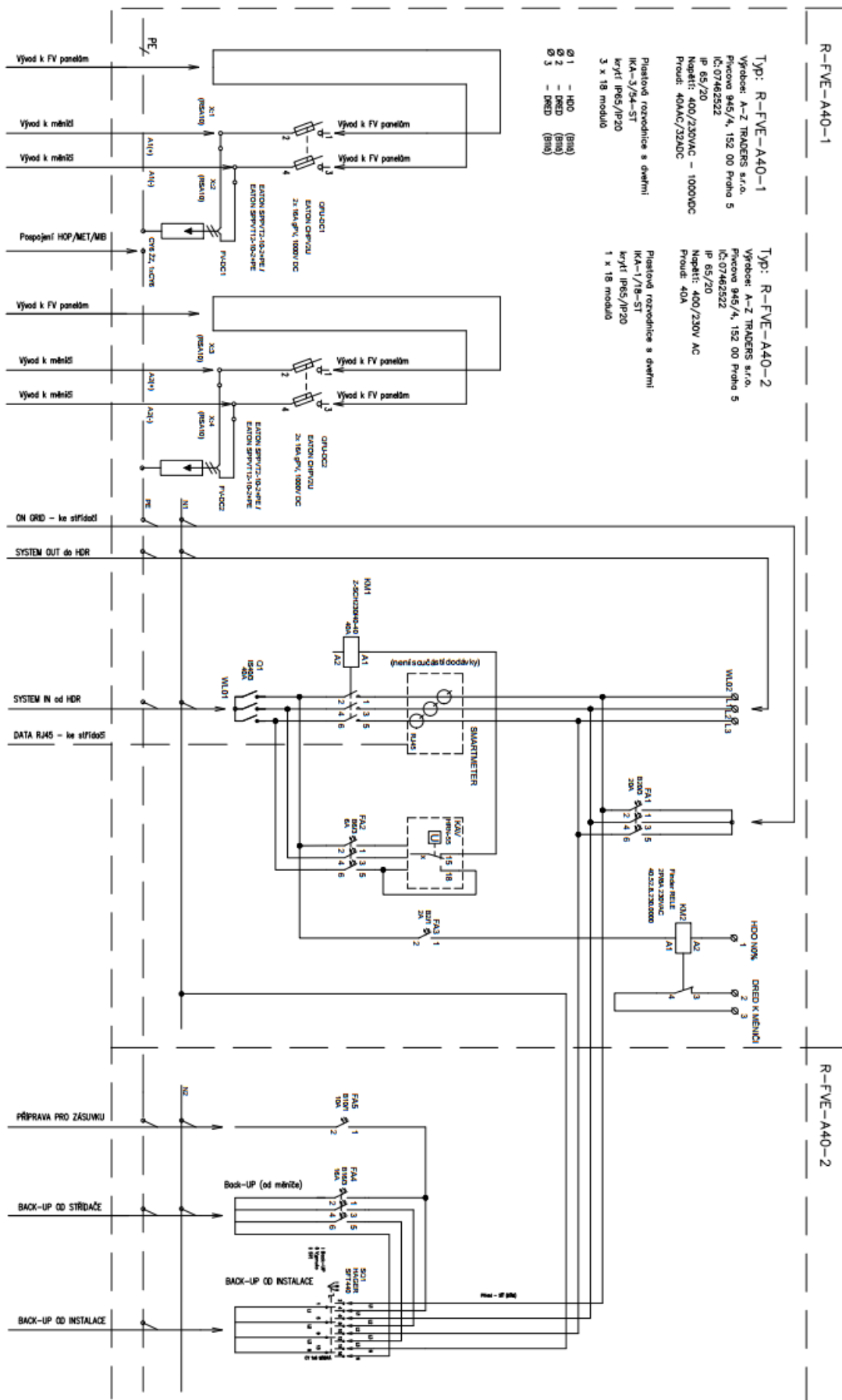
R-FVE-40-1 - protection class I + II - List of components

Code	Producer	Product	Description	Number of products
174202	EATON	IKA-3/54-ST	IP65 flush-mounted switchboard, transparent door, 3 rows, 54 modules	1
158331	EATON	SPBT12-280/4	Surge arrester class T1 + T2 (B + C), 4-pole set for TN-S	1
276272	EATON	IS-40/3	Main switch, 240V, 40A, 3HP	1
3772	ELKO EP	HRN-55	Voltage monitoring relay	1
40528230 + 95.65	FINDER	2P/8A 230VAC 40.52.8.230.0000	Finder RELAY	1
248852	EATON	Z-SCH-230/40-40	Installation contactor, 230VAC / 50Hz, 4S, 40A	1
286590	EATON	PL6-B20/3	Circuit breaker PL6, characteristic B, 3-pole, Icn = 6kA, In = 20A	1
286516	EATON	PL6-B2/1	Circuit breaker PL6, char B, 1-pole, Icn = 6kA, In = 2A	1
177256	EATON	SPPVT12-10-2+PE	Surge arrester T1 + T2 (I + II, B + C), photovoltaic applications 1000V DC, max. short circuit current 1000A	2
2625085	EATON/ETI/OEZ	CH10x38 gPV 15A/1000V DC	Ultra-fast cylindrical fuse for photovoltaics, (UL standard), 10x38mm, 1100V DC, 15A	4
CHPV2U	EATON	CHPV2U	Fuse switch-disconnector, photovoltaic applications, 2-pole, 1000V AC / 30A, C10 (10x38mm)	2

R-FVE-40-2 – List of components

Code	Producer	Product	Description	Number of pieces
174202	EATON	IKA-3/54-ST	IP65 flush-mounted switchboard, transparent door, 3 rows, 54 modules	1
286589	EATON	SPBT12-280/4	Circuit breaker PL6, char B, 3-pole, Icn = 6kA, In = 16A	1
286519	EATON	IS-40/3	Circuit breaker PL6, char B, 1-pole, Icn = 6kA, In = 10A	1
AZT	ELKO EP	HRN-55	Cable harness	1
SFT440	HAGER	Network switch SFT440 (I-0-II) 4P/40A	Group switch (I-0-II) 4P / 40A - output contact up	1

R-FVE-A40-1, (R-FVE-A40-2) - Diagram



4.4R-FVE-A40-1



AC + DC switchboards designed for wall assembling, IP65 used for three-phase operation photovoltaic power plants (typically GoodWe 4 to 10K-ET inverter)

The undeniable advantage is the minimal intervention in the customer 's switchboard - Smartmeter (measurement inverters), a common breakdown points and all fuses are part of this switchgear. Enough thus, to make a loop between the main switchboard and the location of the technology.

It's in the switchboard crisis disconnection of the HDO inverter is also prepared (N0%). The R-FVE-A40-1 switchboard is designed for main circuit breaker in the pole maximum 40 A. It also contains DC fuse switch-disconnectors and arrester surge

List of main components:

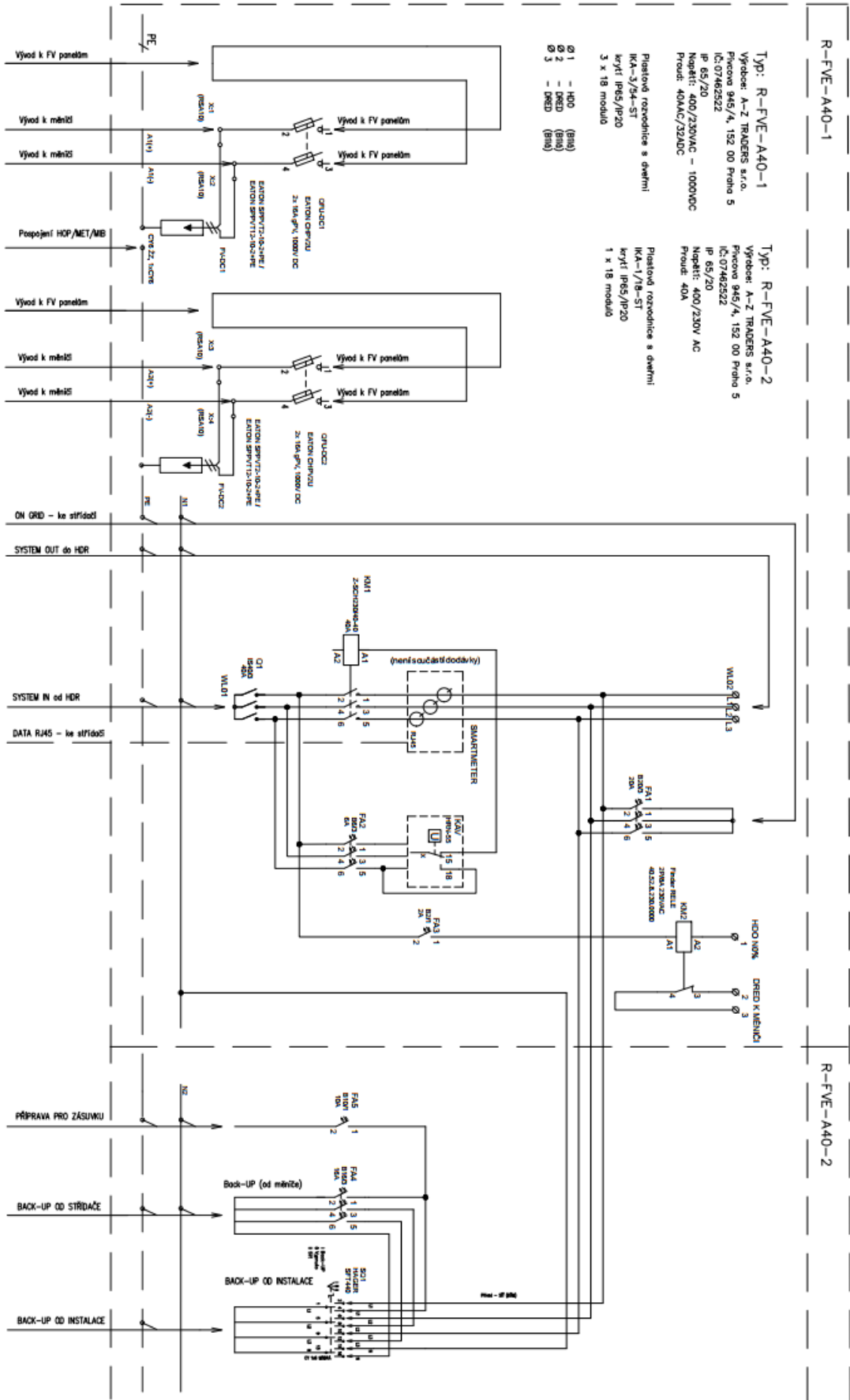
Switchboard EATON **IKA-3/54-ST**, surge arrester class T1 + T2 EATON **SPBT12-280 / 4**, main switch EATON **IS40 / 3**, inverter protection EATON **PL6-B16 / 1**, contactor including monitoring relay **ELKO HRN-55** and contactor EATON **Z-SCH230 / 40-40**, protection for measurement and control, circuit breakers **EATON PL6** + relay for crisis HDO control. Surge arrester EATON **SPPVT12-10-2 + PE** or EATON **SPPVT2-10-2 + PE**. EATON **CHPV2U** fuse switch-disconnectors including EATON gPV fuses **PV-15A10F**.

You will find a detailed list of components in the documentation tab, together with the diagrams and all documentation.

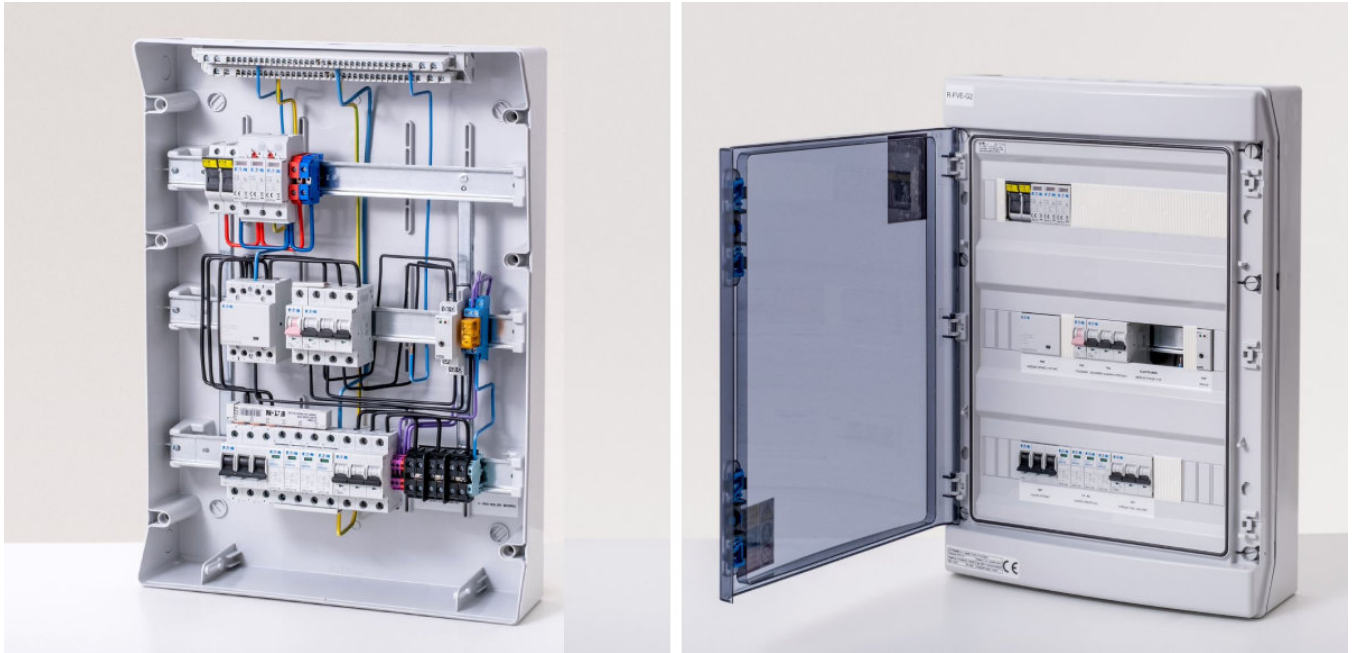
R-FVE-A40-1 - protection class I + II - List of components

Code	Producer	Product	Description	Number of pieces
174202	EATON	IKA-3/54-ST	IP65 flush-mounted switchboard, transparent door, 3 rows, 54 modules	1
158331	EATON	SPBT12-280/4	Surge arrester class T1 + T2 (B + C), 4-pole set for TN-S	1
276272	EATON	IS-40/3	Main switch, 240V, 40A, 3HP	1
3772	ELKO EP	HRN-55	Voltage monitoring relay	1
40528230 + 95.65	FINDER	2P/8A 230VAC 40.52.8.230.0000	RELAY Finder	1
248852	EATON	Z-SCH-230/40-40	Installation contactor, 230VAC / 50Hz, 4S, 40A	1
286586	EATON	PL6-B20/3	Circuit breaker PL6, characteristic B, 3-pole, I _{cn} = 6kA, I _n = 6A	1
286590	EATON	PL6-B20/3	Circuit breaker PL6, characteristic B, 3-pole, I _{cn} = 6kA, I _n = 20A	1
286516	EATON	PL6-B2/1	Circuit breaker PL6, char B, 1-pole, I _{cn} = 6kA, I _n = 2A	1
177256	EATON/ETI/OEZ	SPPVT12-10-2+PE	Surge arrester T1 + T2 (I + II, B + C), photovoltaic applications 1000 V DC, max. short circuit. current 1000A	2
2625085	EATON/ETI/OEZ	CH10x38 gPV 15A/1000V DC	Ultra-fast cylindrical fuse for photovoltaics, (UL standard), 10x38mm, 1100V DC, 15A	4
CHPV2U	EATON	CHPV2U	Fuse switch-disconnector, photovoltaic applications, 2-pole, 1000V AC / 30A, C10 (10x38mm)	2

R-FVE-A40-1 - Diagram



4.5R-FVE-G2



AC + DC switchboards designed for wall assembling, IP65 used for three-phase operation photovoltaic power plants (typically a 4 to 10K Growatt inverter).

The undeniable advantage is the minimal intervention in the customer 's switchboard - Smartmeter (measurement inverters), a common breakdown points and all fuses are part of this switchgear. Enough thus, to make a loop between the main switchboard and the location of the technology.

It's in the switchboard crisis disconnection of the HDO inverter is also prepared (N0%). The R-FVE-A40-1 switchboard is designed for main circuit breaker in the pole maximum 40 A. It also contains DC fuse switch-disconnectors and arrester surge.

List of main components:

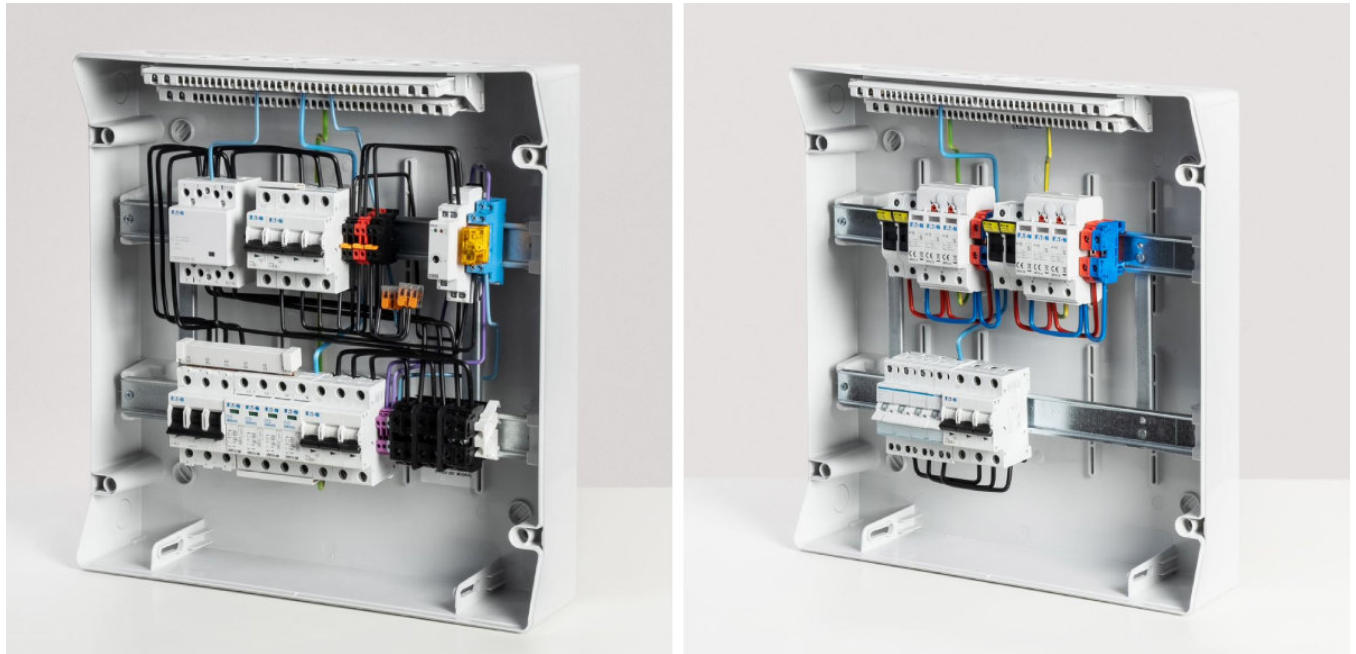
Switchboard EATON **IKA-3/54-ST**, surge arrester class T1 + T2 EATON **SPBT12-280 / 4**, main switch EATON **IS40 / 3**, inverter protection EATON **PL6-B16 / 1**, contactor including monitoring relay **ELKO HRN-55** and contactor EATON **Z-SCH230 / 40-40**, protection for measurement and control, circuit breakers **EATON PL6** + relay for crisis HDO control. Surge arrester EATON **SPPVT12-10-2 + PE** or EATON **SPPVT2-10-2 + PE**. EATON **CHPV2U** fuse switch-disconnectors including EATON gPV fuses **PV-15A10F**.

You will find a detailed list of components in the documentation tab, together with the diagrams and all documentation.

R-FVE-G2 – List of components

Code	Producer	Product	Description	Number of pieces
174202	EATON	IKA-3/54-ST	IP65 flush-mounted switchboard, transparent door, 3 rows, 54 modules	1
158331	EATON	SPBT12-280/4	Surge arrester class T1 + T2 (B + C), 4-pole set for TN-S	1
276272	EATON	IS-40/3	Main switch, 240V, 40A, 3HP	1
3772	ELKO EP	HRN-55	Voltage monitoring relay	1
40528230 + 95.65	FINDER	2P/8A 230VAC 40.52.8.230.0000	RELAY Finder	1
248852	EATON	Z-SCH-230/40-40	Installation contactor, 230VAC / 50Hz, 4S, 40A	1
286586	EATON	PL6-B20/3	Circuit breaker PL6, characteristic B, 3-pole, I _{cn} = 6kA, I _n = 6A	1
286590	EATON	PL6-B20/3	Circuit breaker PL6, characteristic B, 3-pole, I _{cn} = 6kA, I _n = 20A	1
286516	EATON	PL6-B2/1	Circuit breaker PL6, char B, 1-pole, I _{cn} = 6kA, I _n = 2A	1
177256	EATON/ETI/OEZ	SPPVT12-10-2+PE	Surge arrester T1 + T2 (I + II, B + C), photovoltaic applications 1000 V DC, max. short circuit. current 1000A	1
2625085	EATON/ETI/OEZ	CH10x38 gPV 15A/1000V DC	Ultra-fast cylindrical fuse for photovoltaics, (UL standard), 10x38mm, 1100V DC, 15A	2
CHPV2U	EATON	CHPV2U	Fuse switch-disconnector, photovoltaic applications, 2-pole, 1000V AC / 30A, C10 (10x38mm)	1

4.6 R-FVE-B1 + R-FVE-A1 (R-FVE-A2)



AC + DC switchboards designed for wall assembling, IP65 used for three-phase operation photovoltaic power plants in combination with a switch (typically a GoodWe 4 to 10K-ET inverter). Its advantage is a manual transition from the network and backup. It is necessary to control the load at power failure power to avoid overload after switching the switch because of its function switches the whole house to the inverter backup.

The undeniable advantage is the minimal intervention in customer switchboards - Smartmeter (inverter measurement), common breakdown points and all fuse is part of this switchboard. So just make a loop between the main switchboard and location of technology.

Crisis disconnection of the HDO inverter is also prepared in the switchboard (N0%). The R-FVE-B1 switchboard is designed for a main circuit breaker in a maximum pole of 40 A. R-FVE-A1 (A2) also contains DC fuse switch - disconnectors and surge arresters (A1 one for one chain, A2 for two strings). There is a slight time delay (switching of contactors) during switching - it is not uninterrupted backup solution.

List of main components:

Two switchboards EATON **IKA-2/36-ST**, surge arrester class T1 + T2 EATON **SPBT12-280 / 4**, main switch EATON **IS40 / 3**, inverter protection EATON **PL6-B16 / 1**, contactor including monitoring **ELKO HRN-55** relay and EATON **Z-SCH230 / 40-40** contactor, fuses for measurement and control, circuit breakers **EATON PL6** + relay for crisis HDO control. Surge arrester EATON **SPPVT12-10-2 + PE** or EATON **SPPVT2-10-2 + PE**. EATON **CHPV2U**

fuse switch-disconnectors including gPV fuses EATON **PV-15A10F** and four-position switch **HAGER SFT440**.

You will find a detailed list of components in the documentation tab, together with the diagrams and all documentation.

R-FVE-B1 – List of components

Code	Producer	Product	Description	Number of pieces
174201	EATON	IKA-2/36-ST	IP65 flush-mounted switchboard, transparent door, 2 rows, 36 modules	1
158331	EATON	SPBT12-280/4	Surge arrester class T1 + T2 (B + C), 4-pole set for TN-S	1
276272	EATON	IS-40/3	Main switch, 240V, 40A, 3HP	1
3772	ELKO EP	HRN-55	Voltage monitoring relay	1
40528230 + 95.65	FINDER	2P/8A 230VAC 40.52.8.230.0000	RELAY Finder	1
248852	EATON	Z-SCH-230/40-40	Installation contactor, 230VAC / 50Hz, 4S, 40A	1
286586	EATON	PL6-B20/3	Circuit breaker PL6, characteristic B, 3-pole, Icn = 6kA, In = 6A	1
286590	EATON	PL6-B20/3	Circuit breaker PL6, characteristic B, 3-pole, Icn = 6kA, In = 20A	1
286516	EATON	PL6-B2/1	Circuit breaker PL6, char B, 1-pole, Icn = 6kA, In = 2A	1

R-FVE-A1 - protection class I + II - List of components

Code	Producer	Product	Description	Number of pieces
174201	EATON	IKA-2/36-ST	IP65 flush-mounted switchboard, transparent door, 2 rows, 36 modules	1
176090	EATON	SPPVT2-10-2+PE	Surge arrester T2 (II, B), photovoltaic applications 1000V DC, max. short circuit. current 1000A	1
2625085	EATON/ETI/OEZ	CH10x38 gPV 15A/1000V DC	Ultra-fast cylindrical fuse for photovoltaics, (UL standard), 10x38mm, 1100V DC, 15A	2
CHPV2U	EATON	CHPV2U	Fuse switch-disconnector, photovoltaic applications, 2-pole, 1000V AC / 30A, C10 (10x38mm)	1
286589	EATON	PL6-B16/3	Circuit breaker PL6, char B, 3-pole, Icn = 6kA, In = 16A	1
SFT440	HAGER	Network switch SFT440 (I-0-II) 4P/40A	Group switch (I-0-II) 4P / 40A - output contact up	1

5. Regulation

5.1 A-Zrouter SMART



A-Zrouter SMART is an adjustable regulator of self-consumption of photovoltaic power plants. After Proper installation and adjustment of the controller optimizes the consumption of electricity produced your photovoltaic power plant.

The SMART A-Router consists of a DRP-3SM measuring unit installed in the cabinet and wireless control unit DRP-3SL installed on the wall.

Main functions and characteristics:

- Three-phase indirect current measurement
- Three-phase direct voltage measurement
- Independent calculation of current direction and total power for each measured phase
- Independent measurement at each stage increases the control accuracy for asymmetric systems inverters
- The overflow regulation takes place independently in each phase
- The HDO input on the measuring unit together with the settings allows forced closing appliances according to user requirements
- The MODE input allows switching between two device scenarios (settings)
- Integrated real-time module backed up by a lithium battery
- Wireless connection of units speeds up installation and expands placement options

The SMART A-Zrouter set is used to efficiently use energy produced from photovoltaic power plants. It continuously measures the overall energy balance of the building and prevents the flow of energy from the building to the public distribution network, so-called overflow.



Energy overflow is undesirable from the point of view of economics of photovoltaic power plant operation, because it is the energy produced which is the place of efficient use in the household sent to the distribution network free of charge.

However, it is necessary to ensure sufficient storage capacity for the SMART A-Router function itself appliances that store its own overflows for later use (e.g., storage heater DHW, pool heating, etc ...).

The overflow control system itself consists of a measuring unit located in the switchboard (DRP- 3SM) and control units (DRP-3SL) connected in series to the thermal circuit storage appliance.



The mutual communication of the units takes place wirelessly on the frequency 433 MHz, which is for increased reliability two-way, quality data is transmitted several times per second connection and operating states of both units. In case of communication failure, both the units go to the defined safe state.

Furthermore, the unit communicates using WIFI (2.4GHz), with which it is possible to perform all configuration and communication with the cloud via the Internet. The units are removable antennas with a choice of size and shape for possible installations in atypical spaces or in areas with degraded signal transmission.

It is possible to connect a total of up to 3 control units to the measuring unit, which operate in cascading priority mode. The measuring unit contains a user interface where on clear web interface displays current information about the entire system and

measured overflow values. All parameter settings are also implemented via the user interface units, service settings, diagnostics and reading of status information.

The SMART A-Zrouter set is used to efficiently use energy produced from photovoltaic power plants. It continuously measures the overall energy balance of the building and prevents the flow of energy from the building to the public distribution network (so-called overflow).

SMART A-Zrouter optimizes the operation of the photovoltaic power plant and helps with efficiency using unused energy in the building to use e.g. storage tanks DHW heaters, pool heating, etc ...).

Package contents:

- 1x Measuring unit DRP-3SM
- 1x Control unit DRP-3SL
- 1x Antenna 2dBi direct 433MHz (white)
- 1x Antenna 2dBi direct WIFI (black)
- 1x 3dBi angular antenna
- 1x (3x) Current transformer AZC-5050

6. Elektromobility

6.1 A-Z CHARGER CRYSTAL



A-Z CHARGER CRYSTAL is a charging station for electric cars suitable for installation for family houses. The charging station has a function of controlling the charging power according to the current state of the network, current electricity consumption and reserved power in the family house so that the total agreed power input was not exceeded.

A-Z CHARGER CRYSTAL meets the grant conditions of the New Green Savings program.

Easy assembly takes on the order of minutes. Robust design cabinet made of acrylic glass with UV stabilization milled from solid hand-polished material represents high durable combination suitable for outdoor installations.

Thanks to the integrated DC and AC protector, it is not necessary to make changes in the switchboards, which represents time and money savings.

The device includes an **A-ZRouter SMART controller, thanks to which the station is ready after connecting the vehicle immediately direct the produced photovoltaic**

surplus to the charging electric car. The device helps to economically use the electricity produced from the PV plant in households, thus preventing unfavourable overflows into the distribution network.

The programmable user-friendly control unit offers the possibility to define time windows reserved for charging the electric car, the charging station can also be set to charging according to the HDO signal or a combination of both. You will use only for the control itself one button.

A-Z CHARGER CRYSTAL is designed and manufactured in the Czech Republic.



A-Z CHARGER CRYSTAL	Technical specifications
Charging power	Max. 22 kW 3f - according to the possibilities of the car
Cable	Connection max. 5x6 mm ² , max. Cable diameter 19 mm, stranded / non-stranded
Communication	Proprietary 433 MHz - A-Z Connect ecosystem
Circuit breaker	Integrated - combination of type A: 30 mA and type B: 6 mA
Charging cable	Spiral D 75 mm, (5x6 mm ² TPU black), radius of action approx. 5 m
Protection	IP 44
Operating temperature	-20 to +45 °C
Height (mm)	327
Width (mm)	240 (with assembling plate 333)
Depth (mm)	64 (with assembling plate 76)

7. Conclusion, evaluation and recommendations

The switchboards are machine-wired from CY cables with a cross-section of 2.5 to 6 mm². When needs are supplemented by measuring coils.

Each switchboard is inspected visually and mechanically. Switchboards are further measured and tested. Despite these aspects, it is necessary to check each switchboard in terms of meaning tightening of joints, functionality of individual components, etc.

If the joints are damaged or loosened during transport, we cannot carry any liability for such defects. Obligations of each assembly, of any the inspection technician is always properly inspected / measured by the above-mentioned aspects.

Ing. Josef Zika

In Prague on June 6, 2022