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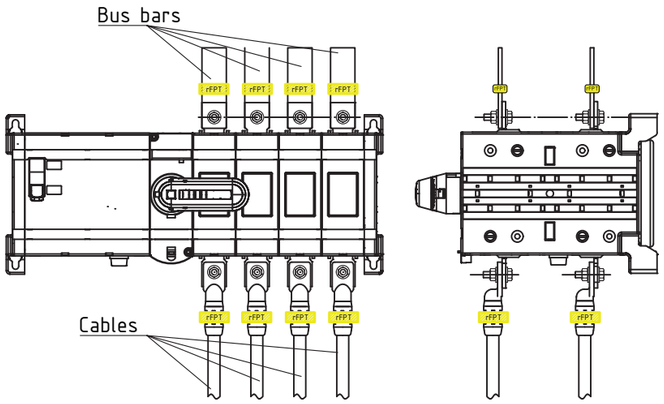
ALBUM OF STANDARD SOLUTIONS:

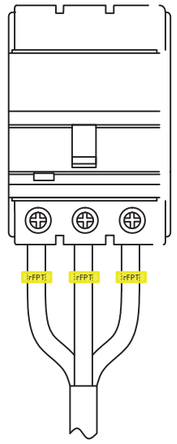
Fire Prevention and Overheating monitoring system

FIPRES

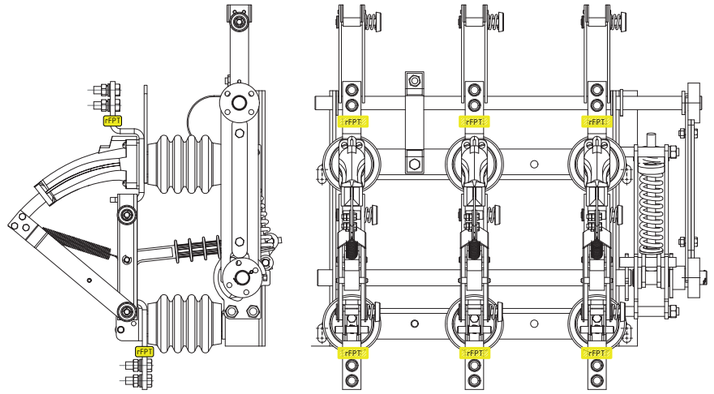
Installation rFPT on a switcher



Installation rFPT on a CB

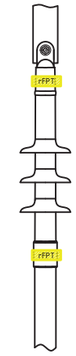


Installation rFPT on a self-blast circuit breaker

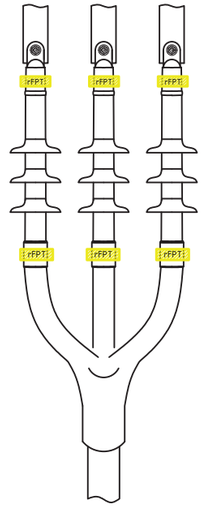


Installation rFPT on a heat shrinkable termination

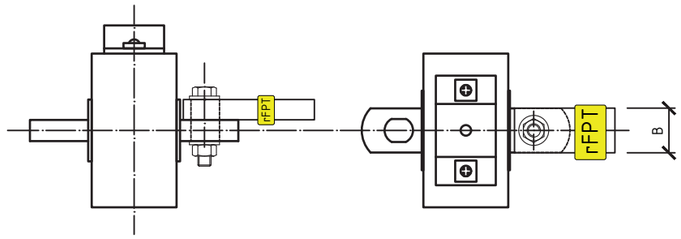
single phase



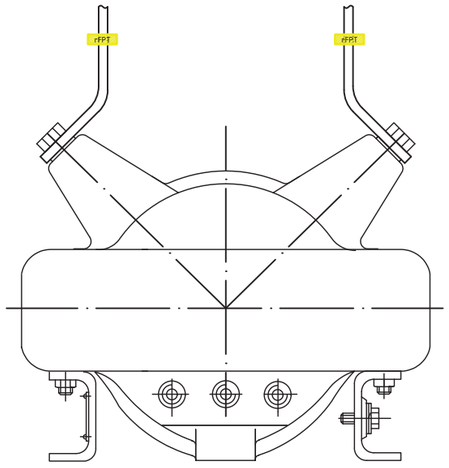
3-phase



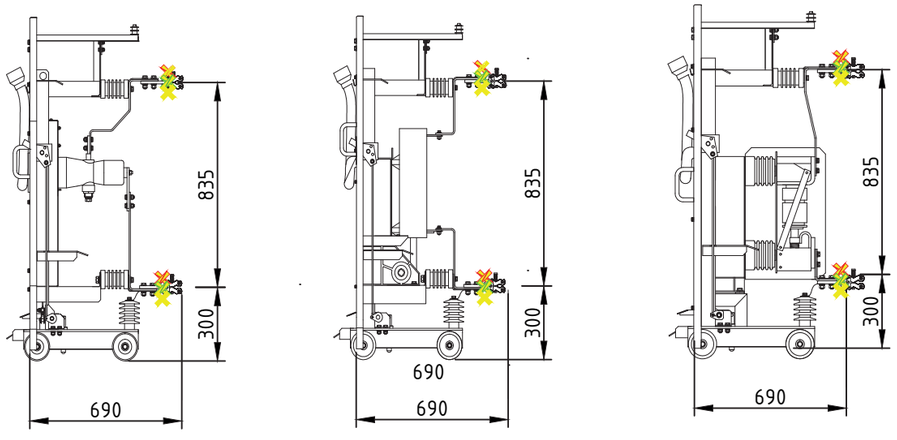
Installation rFPT on a current transformer



Installation rFPT on a voltage transformer



Installation rFPT on drawout circuit breakers:



Notes:

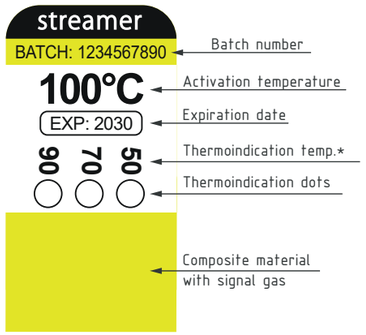
rFPT rFPT – remote Fire Prevention Thermolabel

List of compatibility of rFPT and FPA

Volume of electrical panel, m^3	FPC 220 FPC 220 (M1) FPC 220 (GSM)	rFPT 0.1	rFPT 0.3	rFPT 1	rFPT XL	FPA 24/0.1	FPA 24/0.3	FPA 24/1	FPA 24(4S)
up to 0.1	✓	✓	✓	✓	✓	✓	✓	✓	✓
0.11 – 0.3	✓	×	✓	✓	✓	×	✓	✓	✓
0.31 – 1	✓	×	×	✓	✓	×	×	✓	✓
1.01 – 3	✓	×	×	×	✓	×	×	×	✓

✓ – recommended solution
✓ – acceptable solution
× – inadmissible solution

	rFPT 0.1	rFPT 0.3	rFPT 1	rFPT XL
Length, mm	50	80	138	210
Width, mm	20	20	20	35
Thickness,mm	1,75	1,75	1,75	1,75
Weight,g	1,1	2,2	4,3	11,0
Conductor cross-section, mm2	<10	10-35	35-120	>120



*When the contact/cable is heated above the thermoindication temperature, the dot irreversibly changes its color to black

1. rFPT is recommended to be installed:
-on wiring near connection points;
-on the terminal and bolted connections of the control wiring
-on electric buses in contact points;
-on terminal boxes;
-on the housing of electrical apparatus, etc.

2. rFPT is attached in such a way that its surface is wrapped around the protected element, with gluing the final part of the sticker onto the sticker body itself (gluing it into a ring).

3. In order to avoid damage to rFPT, it is not allowed to press it strongly during the installation process, as well as to peel it off when being installed.

4. When sticking rFPT, ensure that it fits snugly to the protected element.

5. rFPT must be glued in such a way that the thermoindication dots are located on a visible angle.

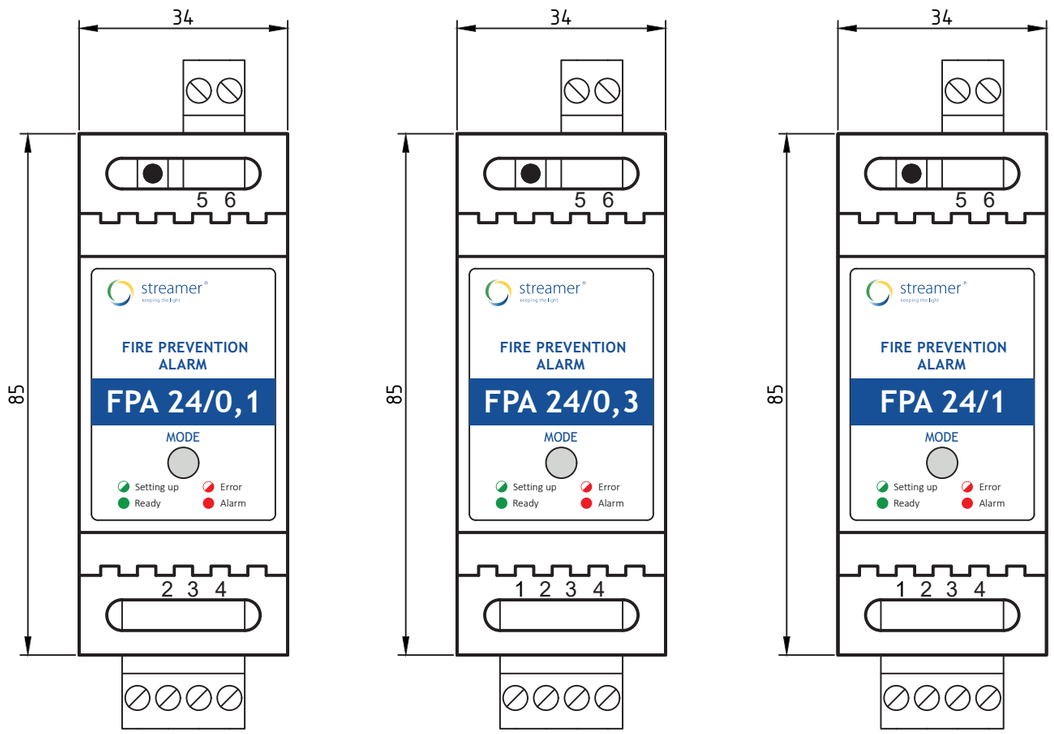
6. rFPT are available in various sizes depending on the volume of the switchgear they are used in. Products are intended to be used only together with Fire Prevention Alarm (FPA)

7. rFPT are nonrestorable items and shall be replaced once triggered

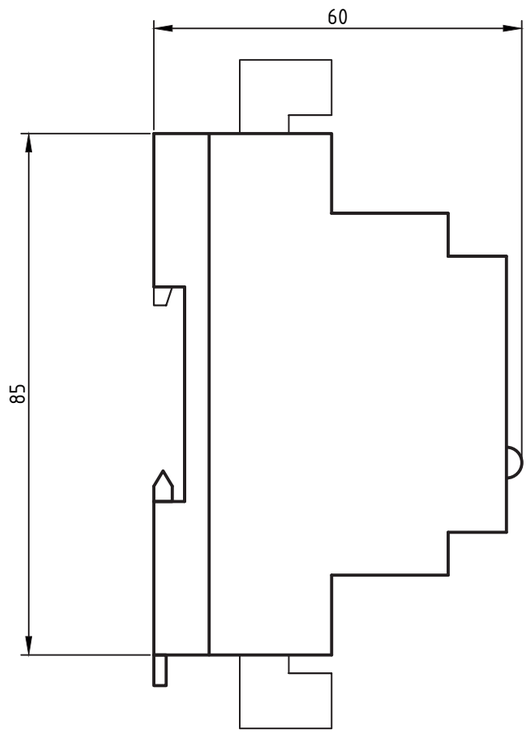
8. Acceptable temperature range for operation (-60°C to +50°C)

9. Validity period of rFPT is 10 years

Fire Prevention Alarm
FPA 24/0.1(/0.3/1)



#	Item name	Mass, kg
1	FPA 24/0.1	0,065
2	FPA 24/0.3	0,065
3	FPA 24/1	0,065



Contacts specification	
1	RS-485 (A)
2	RS-485 (B)
3	power supply 24V (-)
4	power supply 24V (+)
5	D1 of dry contact output
6	D2 of dry contact output

1. FPA sensor is installed in the object of protection together with the rFPT (in the same volume). In the volume of the protected object, one FPA is installed. If possible, the FPA sensor should be placed in close proximity to the accumulation sites of the installed rFPT. Preferably, the FPA is mounted in the upper part of the protected switchgear compartment so that its optical indicators are accessible for visual inspection.

2. The FPA is mounted on a galvanized steel or aluminum DIN rail of TN35 type in accordance with IEC 60715. During the installation work, ensure that the mounted elements of the sensor do not damage vital elements.

3. For communication lines and power supply of FPA sensors it is allowed to use combined cable of U / UTP, FTP or STP type according to ISO / IEC 11801 or separate cables with copper conductors with a section of not less than 0.125 mm2 When using multiwire cables, cable lugs should be used. It is allowed to use cables with non-twisted conductors with a communication line length of only up to 50 m. The sensor terminal block of power supply is designed for connecting conductors with a cross section of up to 0.5 mm2

4. When using a twisted pair cable, it is recommended to comply with the following scheme of the color coding:
- blue + white-blue - 24V power supply "-"
- orange + white-orange - 24V supply "+"
- green - RS-485 (A)
- white-green - RS-485 (B)

5. The FPA sensor, which is the farthest from the control unit, should be equipped with a terminating resistor.

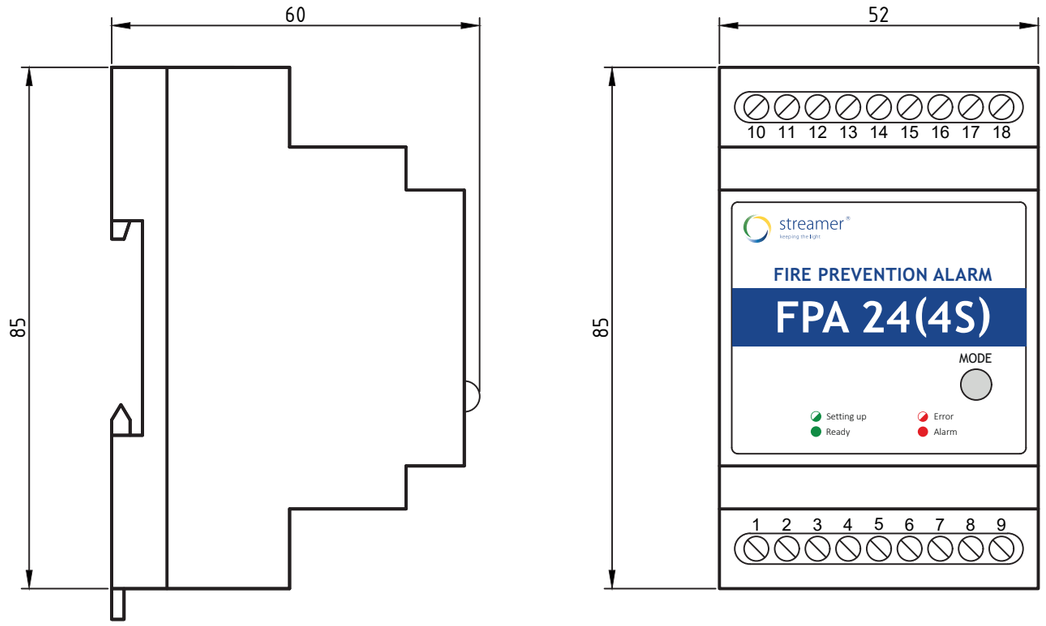
6. Use RS-485 repeater in case of the required length of the communication line exceeds 700 meters.

7. The normal mode of the system operation is a standby mode (READY). Any other modes (ERROR or ALARM) require intervention by the duty or maintenance personnel.
In standby mode, the FPC monitors the status of the sensors at a predetermined frequency (the polling period is from 100 to 500 ms). If the FPA sensor detects a signal gas or products of thermal insulation destruction in a controlled volume, it switches to the alarm mode and generates an alarm message to be transmitted to the FPC or external system via RS-485 or/and discrete output.

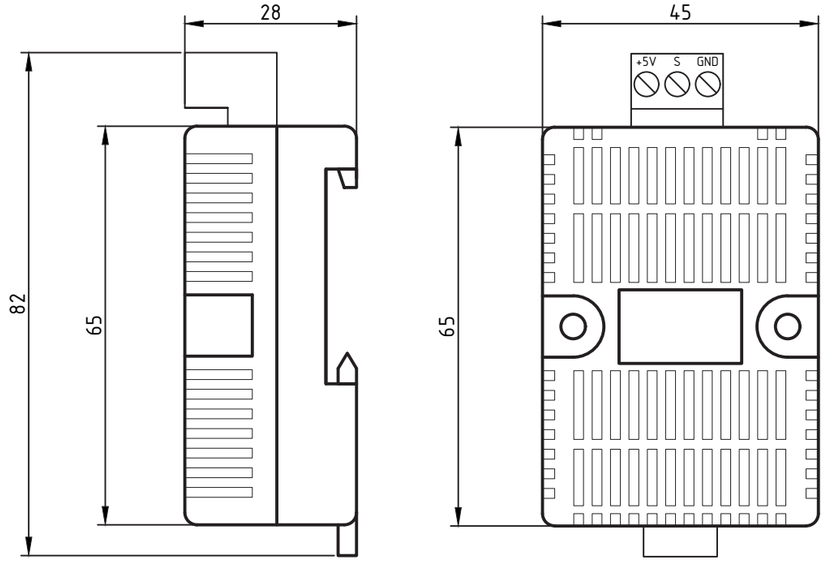
FPA provides the following indication in various modes of operation:
READY: optical indicator glows of green
ALARM: optical indicator glows of red
ERROR: optical indicator flashes of red with a flashing characteristic of 500/500 ms
SETTING UP (self-calibration): optical indicator flashes of green with a frequency of 500/500 ms
PROGRAMMING MODE - depending on the current programming stage, the optical indicator display is only red.

In “READY” and “ALARM” modes, optical indicator intermittent flashes once a 50 ms indicating a connectivity with master device via RS-485.

Fire Prevention Alarm with 4 corded sensor
FPA 24(4S)



corded sensor for FPA 24(4S)



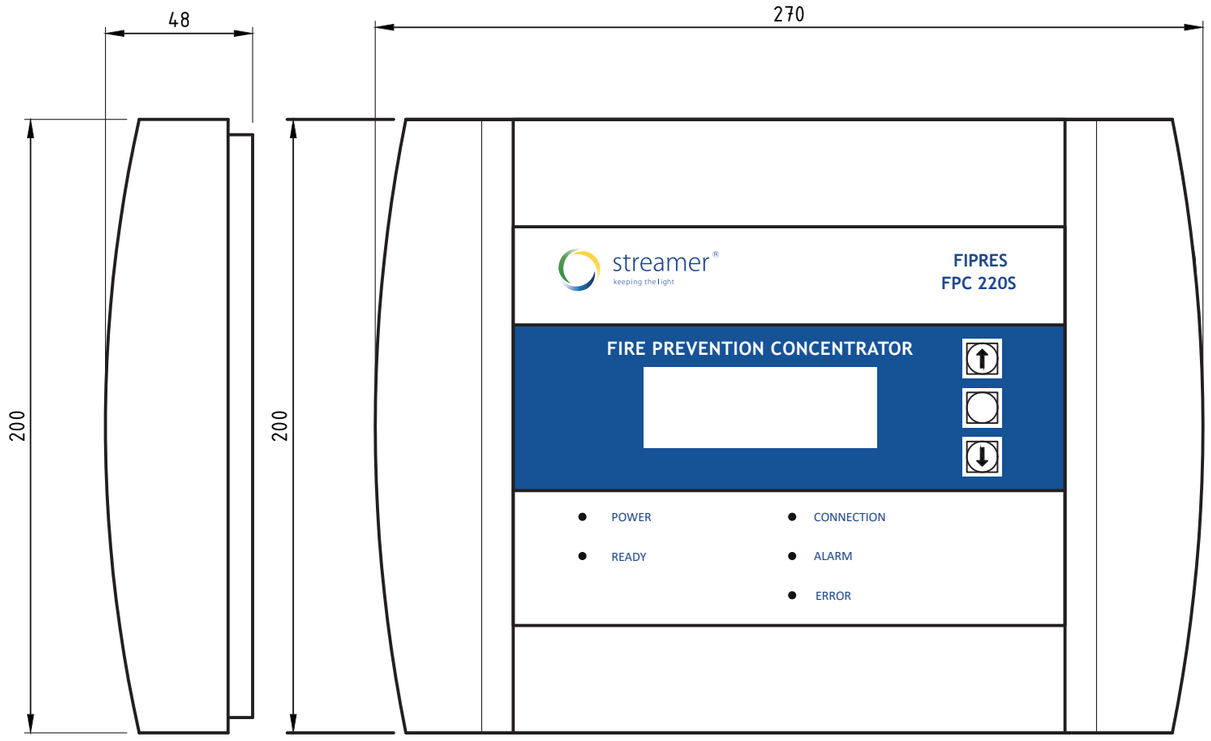
Contacts specification	
1,2,3	Corded sensor 1 (– , Signal, +)
4,5,6	Corded sensor 2 (– , Signal, +)
7,8,9	Corded sensor 3 (– , Signal, +)
10,11,12	Corded sensor 4 (– , Signal, +)
13,14	Dry contact output
15,18	power supply 24V DC (+, –)
16,17	RS-485 (A, B)

#	Item name	Mass, kg
1	FPA 24(4S)	0,095

1. Corded sensors are installed in controlled volume (switchgear compartment). The FPA24(4S) is installed in a controlled volume or in close proximity to it so that the length of the communication line between the FPA and the corded sensor does not exceed 7 m.

2. FPA and corded sensors are mounted on a standard DIN rail of type TN35 in accordance with IEC 60715.

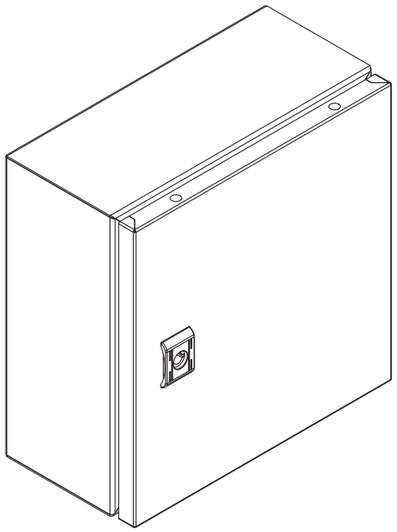
Fire Prevention Concentrator
FPC

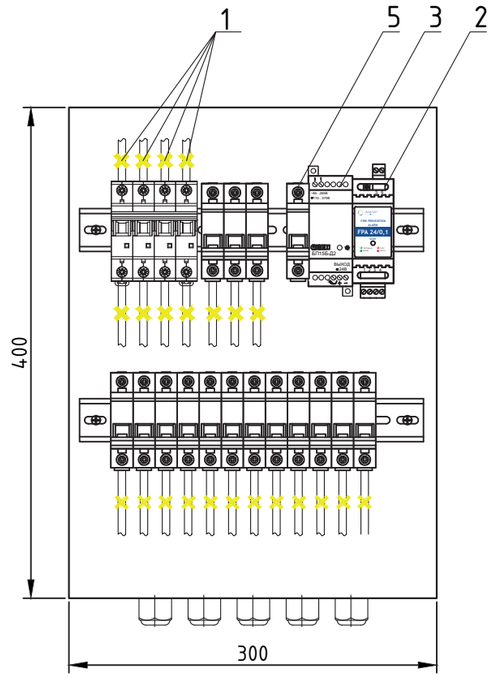


#	Item name
1	FPC 220S
2	FPC 220S GSM

1. FPC is intended for signals receiving from FPA, controlling status of connection, events log keeping, transmitting data to external systems or SCADA
2. FPC 220S GSM is able to send SMS with event notification (Alarm, Fault, Switching on/off) to selected cell-number
3. FPC 220S has 2 discrete outputs for sending Alarm and Fault signals to external system and an additional module of RS-485 in case of using FPC as a slave device

Electrical panel (0.4 kV) with up to 0.1 m^3 volume





BOM

#	Name	Description	Qty
1	rFPT 100/0.1	remote Fire Prevention Thermolabel	23
2	FPA 24/0.1	Fire Prevention Alarm	1
3	Овен БП15Б-Д2-24 (БП15)	Voltage converter 24V DC, 10W	1
4	FPC 220	Fire Prevention Concentrator	1
5	C6, 6A, 4.5kA	Miniature circuit breaker	1
6	NHXH FE180/E90 2x1.5	power cable	
7	F/UTP Cat5e 4x2x0,5	UTP-cable	
8	DIN-rail	according to EN 60715 m.	0.5

1. FPA sensor is installed in the object of protection together with the rFPT (in the same volume). In the volume of the protected object, one FPA is installed. If possible, the FPA sensor should be placed in close proximity to the accumulation sites of the installed rFPT. Preferably, the FPA is mounted in the upper part of the protected switchgear compartment so that its optical indicators are accessible for visual inspection.

2. The FPA is mounted on a galvanized steel or aluminum DIN rail of TN35 type in accordance with IEC 60715. During the installation work, ensure that the mounted elements of the sensor do not damage vital elements.

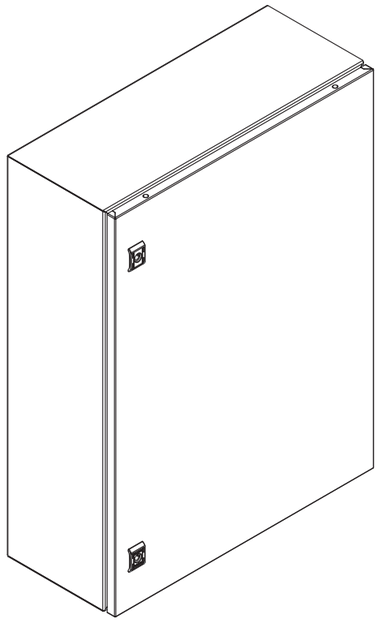
3. For communication lines and power supply of FPA sensors it is allowed to use combined cable of U / UTP, FTP or STP type according to ISO / IEC 11801 or separate cables with copper conductors with a section of not less than 0.125 mm^2. When using multiwire cables, cable lugs should be used. It is allowed to use cables with non-twisted conductors with a communication line length of only up to 50 m.

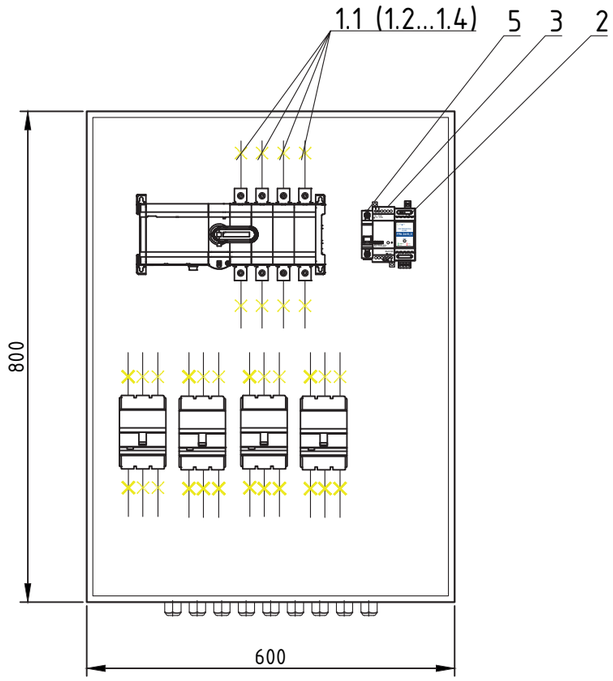
4. A terminal block of power supply for FPA is designed for connecting conductors with a cross section of up to 0.5 mm^2.

5. When using a twisted pair cable, it is recommended to comply with the following scheme of the color coding:
- blue + white-blue - 24V power supply "-"
- orange + white-orange - 24V supply "+"
- green - RS-485 (A)
- white-green - RS-485 (B)

6. Voltage converter recommended characteristics:
Input: 110-220V AC
Output: 24V DC
Rated power: based on the fact that FPA24/0.1/0.3/1 consumes 1W, FPA(4S) with 4 corded sensors consumes 5W

Electrical panel (0.4 kV) with up to 0.3 m^3 volume





1. FPA sensor is installed in the object of protection together with the rFPT (in the same volume). In the volume of the protected object, one FPA is installed. If possible, the FPA sensor should be placed in close proximity to the accumulation sites of the installed rFPT. Preferably, the FPA is mounted in the upper part of the protected switchgear compartment so that its optical indicators are accessible for visual inspection.

2. The FPA is mounted on a galvanized steel or aluminum DIN rail of TN35 type in accordance with IEC 60715. During the installation work, ensure that the mounted elements of the sensor do not damage vital elements.

3. For communication lines and power supply of FPA sensors it is allowed to use combined cable of U / UTP, FTP or STP type according to ISO / IEC 11801 or separate cables with copper conductors with a section of not less than 0.125 mm^2. When using multiwire cables, cable lugs should be used. It is allowed to use cables with non-twisted conductors with a communication line length of only up to 50 m.

4. A terminal block of power supply for FPA is designed for connecting conductors with a cross section of up to 0.5 mm^2.

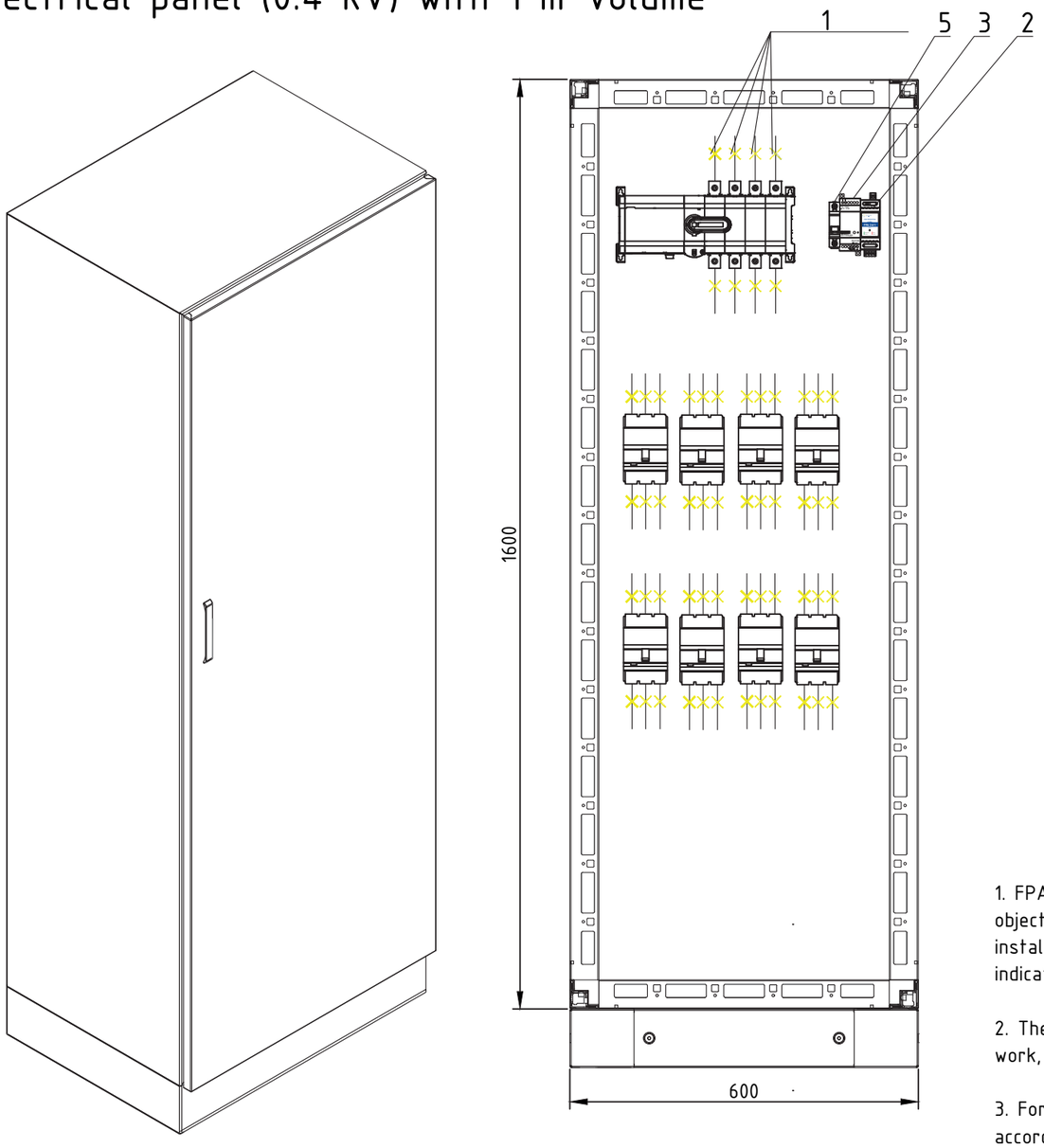
5. When using a twisted pair cable, it is recommended to comply with the following scheme of the color coding:
- blue + white-blue - 24V power supply "-"
- orange + white-orange - 24V supply "+"
- green - RS-485 (A)
- white-green - RS-485 (B)

6. Voltage converter recommended characteristics:
Input: 110-220V AC
Output: 24V DC
Rated power: based on the fact that FPA24/0.1/0.3/1 consumes 1W, FPA(4S) with 4 corded sensors consumes 5W

BOM

#	Name	Description	Qty
1	rFPT 100/0.3	remote Fire Prevention Thermolabel	32
2	FPA 24/0.3	Fire Prevention Alarm	1
3	Овен БП15Б-Д2-24 (БП15)	Voltage converter 24V DC, 10W	1
4	FPC 220S	Fire Prevention Concentrator	1
5	C6, 6A, 4.5kA	Miniature circuit breaker	1
6	NHXH FE180/E90 2x1.5	power cable	
7	F/UTP Cat5e 4x2x0,5	UTP-cable	
8	DIN-rail	according to EN 60715 m.	0.5

Electrical panel (0.4 kV) with 1 m^3 volume



BOM

#	Name	Description	Qty
1	rFPT 100/1	remote Fire Prevention Thermolabel	56
2	FPA 24/1	Fire Prevention Alarm	1
3	Овен БП15Б-Д2-24 (БП15)	Voltage converter 24V DC, 10W	1
4	FPC 220S	Fire Prevention Concentrator	1
5	C6, 6A, 4.5kA	Miniature circuit breaker	1
6	NHXH FE180/E90 2x1.5	power cable	
7	F/UTP Cat5e 4x2x0,5	UTP-cable	
8	DIN-rail	according to EN 60715 m.	0.5

1. FPA sensor is installed in the object of protection together with the rFPT (in the same volume). In the volume of the protected object, one FPA is installed. If possible, the FPA sensor should be placed in close proximity to the accumulation sites of the installed rFPT. Preferably, the FPA is mounted in the upper part of the protected switchgear compartment so that its optical indicators are accessible for visual inspection.

2. The FPA is mounted on a galvanized steel or aluminum DIN rail of TN35 type in accordance with IEC 60715. During the installation work, ensure that the mounted elements of the sensor do not damage vital elements.

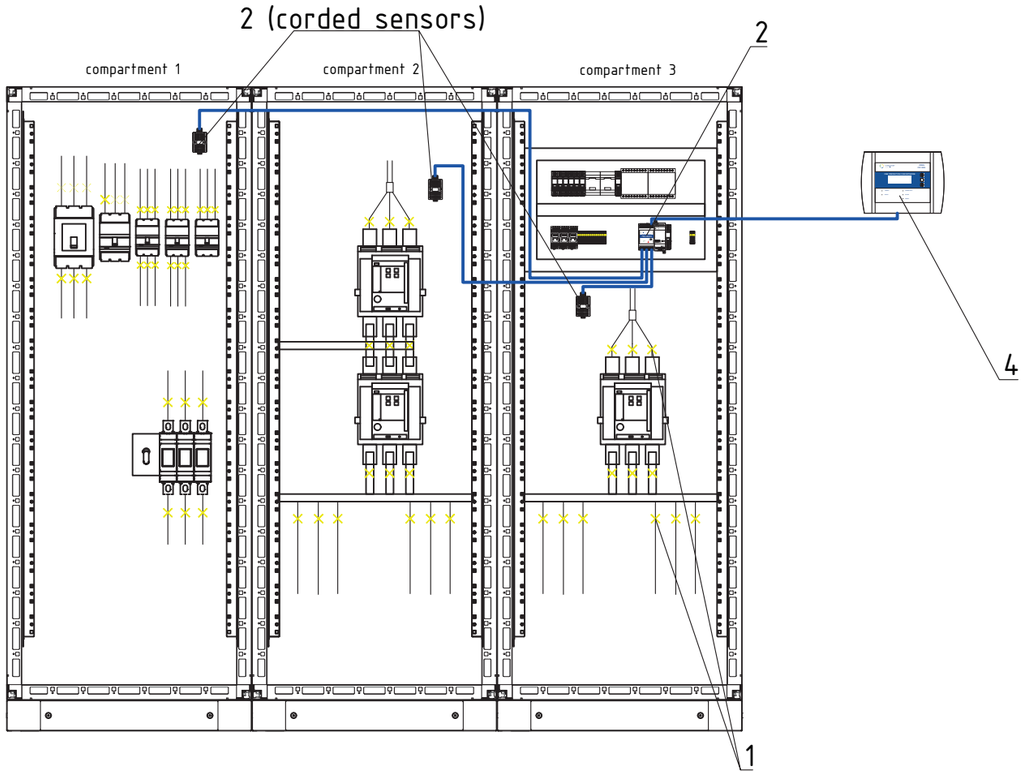
3. For communication lines and power supply of FPA sensors it is allowed to use combined cable of U / UTP, FTP or STP type according to ISO / IEC 11801 or separate cables with copper conductors with a section of not less than 0.125 mm^2. When using multiwire cables, cable lugs should be used. It is allowed to use cables with non-twisted conductors with a communication line length of only up to 50 m.

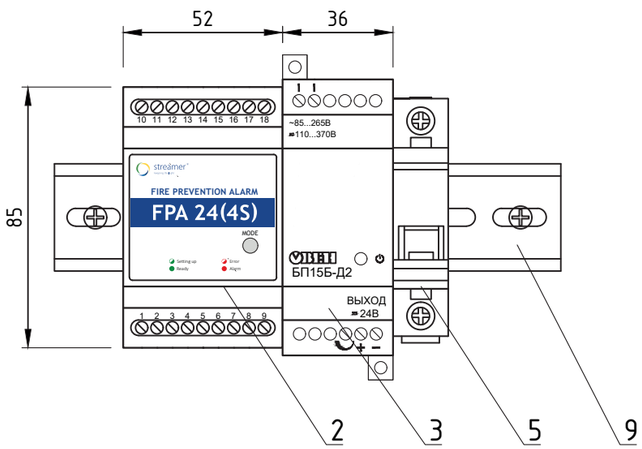
4. A terminal block of power supply for FPA is designed for connecting conductors with a cross section of up to 0.5 mm^2.

5. When using a twisted pair cable, it is recommended to comply with the following scheme of the color coding:
- blue + white-blue - 24V power supply "-"
- orange + white-orange - 24V supply "+"
- green - RS-485 (A)
- white-green - RS-485 (B)

6. Voltage converter recommended characteristics:
Input: 110-220V AC
Output: 24V DC
Rated power: based on the fact that FPA24/0.1/0.3/1 consumes 1W, FPA(4S) with 4 corded sensors consumes 5W

Low voltage distribution switchboard 0.4 kV

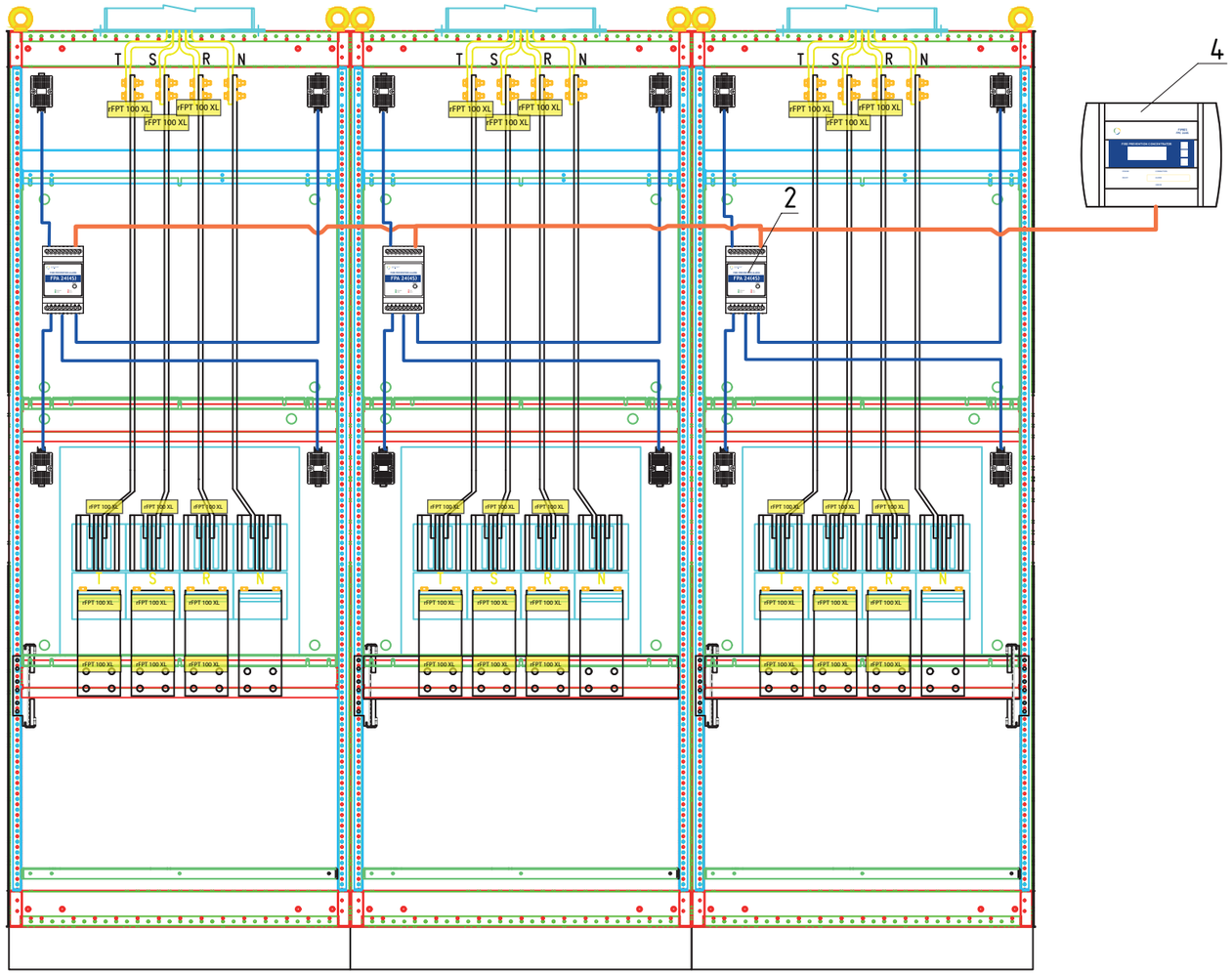




BOM

#	Name	Description	Qty
1	rFPT 100/XL	remote Fire Prevention Thermolabel	57
2	FPA 24(4S)	Fire Prevention Alarm	1
3	Овен БП15Б-Д2-24 (БП15)	Voltage converter 24V DC, 10W	1
4	FPC 220S	Fire Prevention Concentrator	1
5	C6, 6A, 4.5kA	Miniature circuit breaker	1
6	NHXH FE180/E90 2x1.5	power cable	
7	F/UTP Cat5e 4x2x0,5	UTP-cable	
8	DIN-rail	according to EN 60715 m.	0.5

Distributor board 0.4 kV without internal partitions

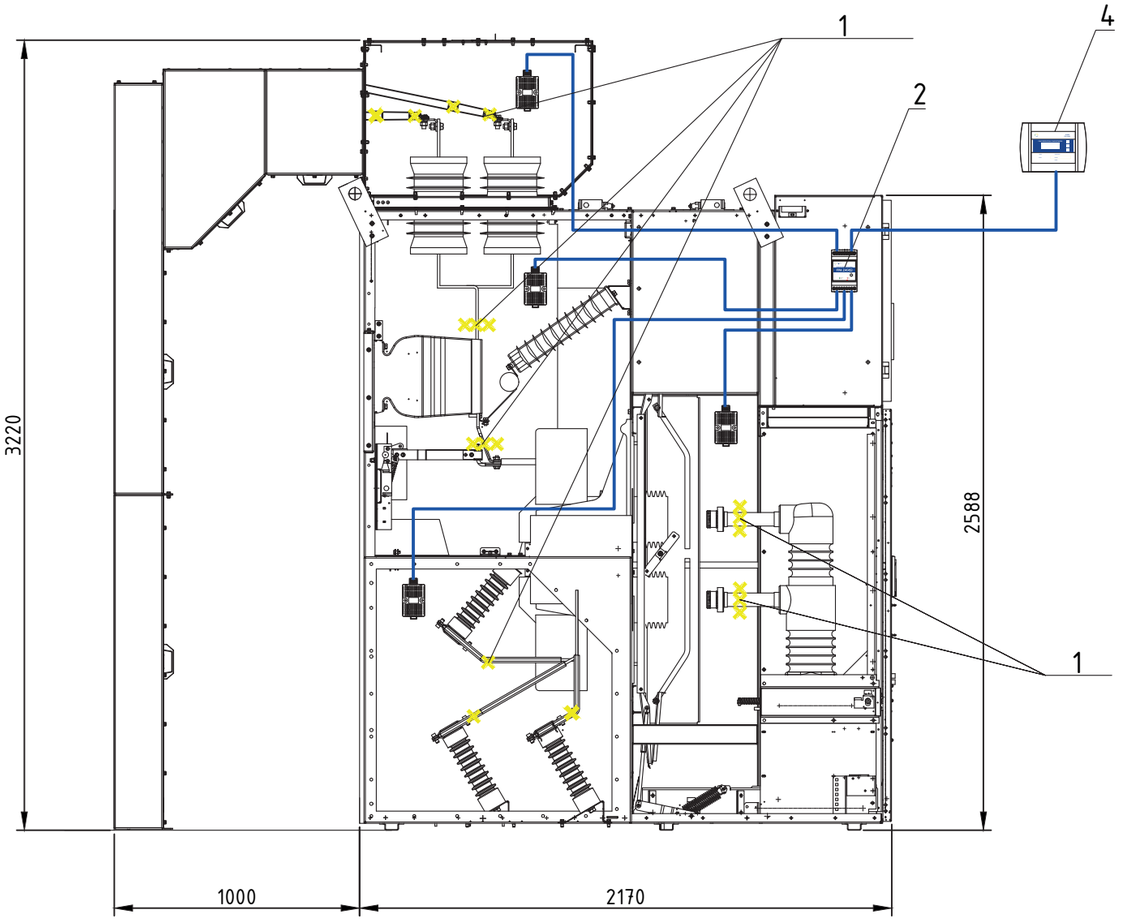


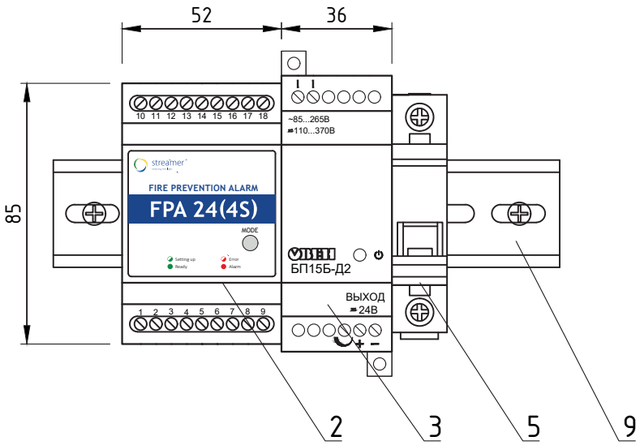
BOM

#	Name	Description	Qty
1	rFPT 100/XL	remote Fire Prevention Thermolabel	36
2	FPA 24(4S)	Fire Prevention Alarm	3
3	Овен БП15Б-Д2-24 (БП15)	Voltage converter 24V DC, 10W	1
4	FPC 220S	Fire Prevention Concentrator	1
5	C6, 6A, 4.5kA	Miniature circuit breaker	1
6	NHXH FE180/E90 2x1.5	power cable	
7	F/UTP Cat5e 4x2x0,5	UTP-cable	
8	Spiral wrap hose for cable		
9	DIN-rail	according to EN 60715 m.	0.5

For the case with merged compartments without internal partitions it's neccessary to use FPA 24(4S).
It's very important to place corded sensors near to the spots of rFPTs.
It's also needed to consider that due to the spread of gas from bottom to top, FPA can be triggered in an adjacent compartment.

Switchgear 20 (35) kV

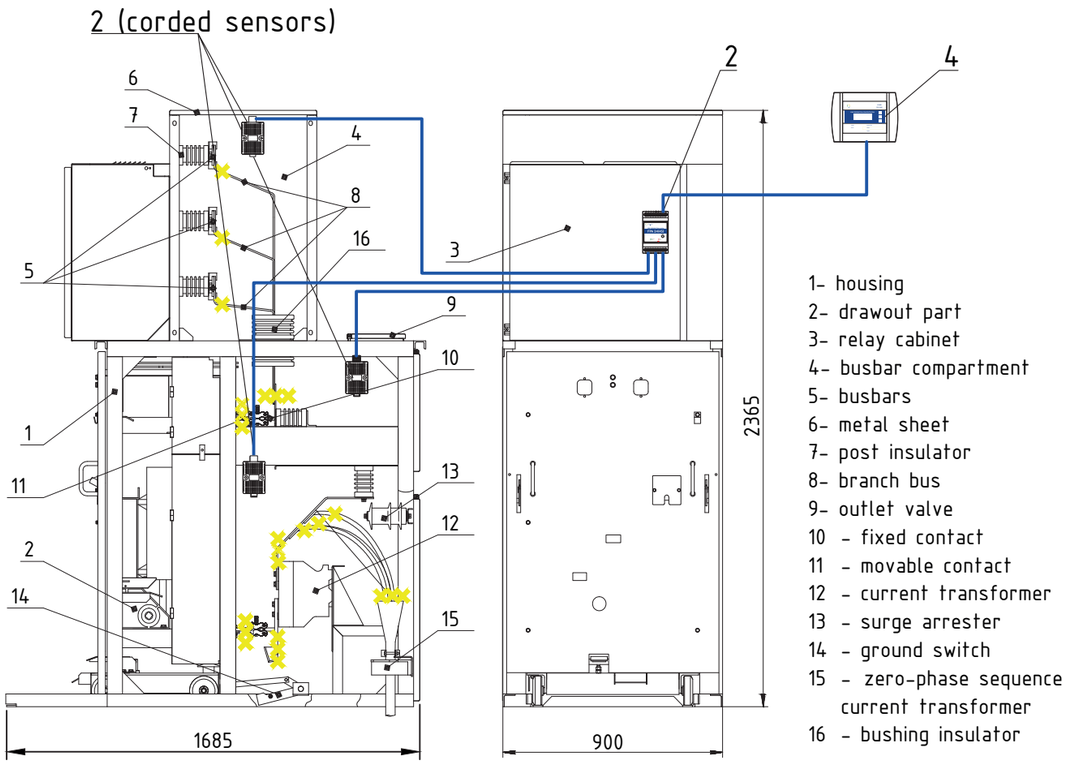




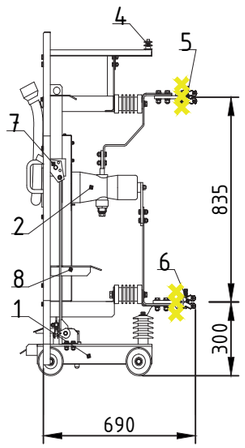
BOM

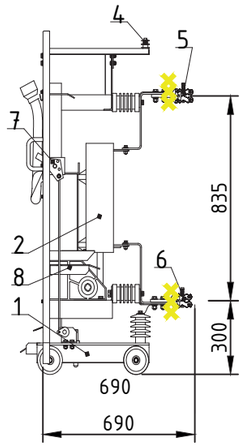
#	Name	Description	Qty
1	rFPT 100/XL	remote Fire Prevention Thermolabel	21
2	FPA 24(4S)	Fire Prevention Alarm	1
3	Овен БП15Б-Д2-24 (БП15)	Voltage converter 24V DC, 10W	1
4	FPC 220S	Fire Prevention Concentrator	1
5	C6, 6A, 4.5kA	Miniature circuit breaker	1
6	NHXH FE180/E90 2x1.5	power cable	
7	F/UTP Cat5e 4x2x0,5	UTP-cable	
8	Spiral wrap hose for cable		
9	DIN-rail	according to EN 60715 m.	0.5

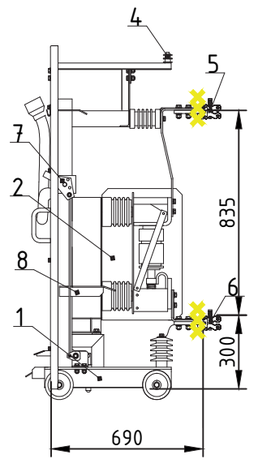
Switchgear 6(10) kV



1- housing
2- drawout part
3- relay cabinet
4- busbar compartment
5- busbars
6- metal sheet
7- post insulator
8- branch bus
9- outlet valve
10 - fixed contact
11 - movable contact
12 - current transformer
13 - surge arrester
14 - ground switch
15 - zero-phase sequence current transformer
16 - bushing insulator







BOM

#	Name	Description	Qty
1	rFPT 100/XL	remote Fire Prevention Thermolabel	24
2	FPA 24(4S)	Fire Prevention Alarm	1
3	Овен БП15Б-Д2-24 (БП15)	Voltage converter 24V DC, 10W	1
4	FPC 220	Fire Prevention Concentrator	1
5	C6, 6A, 4.5kA	Miniature circuit breaker	1
6	NHXH FE180/E90 2x1.5	power cable	
7	F/UTP Cat5e 4x2x0,5	UTP-cable	
8	Spiral wrap hose for cable		
9	DIN-rail	according to EN 60715 m.	0.5

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