



## User manual

# CONEX CONTROL UNIT



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## 1. INTRODUCTION - GENERAL

This documentation functions as a Customer Manual that concerns the CONEX Control Unit. It contains basic technical data, operation description for a customer, installation, maintenance and service instructions. It also contains prohibited functions and activities that may never be performed by operators. The documentation is handed over to a customer together with the control unit, and serves as instruction documentation while the system is handed over to the customer.

The documentation can also be handed over to a customer before delivery of the control unit, the customer can get familiar with its functions, space requirements, installation manner, input and output signals from the control unit to a superior control system, signalization, etc. in advance.

The CONEX Control Unit is an electronic system delivered by the RSBP spol. s r.o. company (further only RSBP), and it is an integral part of technological systems, offered by this company as well that function as a protection against explosion or fire (HRD systems, paint booth fire protection systems and so on).

## 2. BASIC TECHNICAL DATA

### 2.1. GENERAL

The CONEX Control Unit is made as a compact (two-zone) version, or in four, six, and eight-zone versions. A zone is always one technological unit or section that the control unit is able to monitor and protect against explosion or fire.

All produced control unit versions have a common basis that is derived from the two-zone version. Multiple zone control units differ from the two-zone one in details only (more protected zones, more output relays, bigger battery, more control elements for zones, larger sizes), and are practically only its multiplications. All differences of individual versions are specified in this documentation with their appropriate explanations.

### 2.2. POWER SUPPLY

The control unit can be supplied by AC power from 100 to 240V with the frequency of 50 to 60Hz (the internal power supply will thus automatically cover power systems used in Europe and on the American continent). The power supply cable must be protected at the source by one-pole circuit breaker  $I_n = 10A$  with B or C characteristic. A three-lead cable with a minimum diameter  $3 \times 1.5\text{mm}^2$  is suggested for the control unit electrical supply. The condition is that one of the three leads will have green-yellow color ("PE" potential – protective lead), and the second of the three leads will have light blue color ("N" potential – middle lead). The third lead may not have colors of the remaining two, and can be black, brown or gray ("L" potential – phase lead). The supply cable does not have to be shielded. Any commonly used cable types can be used (for example CYKY 3Cx1.5, CMSM 3Cx1.5, Öflex 3G1.5 or their equivalents).

It is recommended to install a protective ferrite (type FEC 9.0) on the power supply cable to protect against electromagnetic interference (EMC). This ferrite is installed as close as possible to the inlet of the power cable to the control panel.

A third grade overvoltage protection (class D) in combination with a HF filter against electromagnetic noise effects (EMC) is installed in the control unit. A customer should have the power supply equipped by first (class B) and second grade (class C) overvoltage protection.

The power supply at the customer must meet the emergency power supply conditions (back-up by UPS, two independent supplies, etc.) or in case of power failure the power must be resupplied within 4 hours. At the same time the control unit power supply must be designed so it cannot be switched off by this control unit directly or indirectly (through contacts of its output relays).

Possible failure of the power supply is handled by an internal back-up accumulator (two batteries) with the minimum back-up time of 4 hours of operation. The most unfavorable case has been considered; the back-up time can be longer in individual cases, depending on the configuration of connected appliances. In case of power failure that is longer than 4 hours the back-up accumulator can be run down, in this case the control unit will switch itself off, and proper function of the control unit and the system is not guaranteed.

### 2.3. DETECTION LINE CABLES

The cables from the control unit to detectors are affected by undesirable effects of electro-magnetic disturbances (EMC) the most.

Therefore, for the connection of active detectors requiring power (Detex, Lumex, etc.), they are designed exclusively by HELUKABEL, specifically the types PAAR-TRONIC-CY 2x2x0.75mm<sup>2</sup> for detection lines with the length up to 150m (the detection line length is the distance between a control unit and the last detector on the detection line).

For the connection of non-demand passive detectors (manual call points, temperature detectors, etc.), only HELUKABEL cables are designed exclusively for PA-TRONIC-CY 1x2x0.75 mm<sup>2</sup> cables for detecting lines up to 150 m (length of the detection line is the distance between the switchboard and the last detector in the detection line). It is a special high-resistance cable against electromagnetic interference (EMC). It is shielded with twisted pairs of veins.

It is recommended to install a protective ferrite (type FEC 9.0) on each cable for the detection line facing the control panel to protect against electromagnetic interference (EMC). This ferrite is installed as close as possible to the cable entry to the control unit.

### 2.4. ACTIVATION LINE CABLES

Cables from the control unit to the actuators (HRD bottles, electromagnetic valves, etc.) on the activation line may be adversely affected by the electromagnetic interference (EMC) side effects. That's why HELUKABEL PAAR-TRONIC-CY cables are designed for their connection. The cross section is given by the length of the activation line (the length of the activation line is the distance between the control panel and the last action element in the activation line). It is a special high-

resistance cable against electromagnetic interference (EMC). It is shielded with twisted twisted pairs of veins.

- For the activation line length to 50m is used HELUKABEL PAAR-TRONIC-CY 1x2x0,75 mm<sup>2</sup>
- For the activation line length to 150m is used HELUKABEL PAAR-TRONIC-CY 1x2x0,75 mm<sup>2</sup>

It is recommended to install a protective ferrite (type FEC 9.0) on each cable for the activation line facing the control panel to protect against electromagnetic interference (EMC). This ferrite is installed as close as possible to the cable entry to the control unit.

## 2.5. OUTPUT RELAY AND INPUT SIGNAL CABLES

The cable for the output relay and input signals (the output relay and input signals are described below) is a standard multiple lead copper cable or cables (shielding is not necessary, but cannot hurt), profile depends on the length and power system, number of leads depend on the number of signals. Possible questions can be discussed with RSBP.

The HELUKABEL PAAR-TRONIC-CY 1x2x1.5 mm<sup>2</sup> cable is used for the connection of external signaling (optical, acoustic or combined optical-acoustic signaling) for lines up to 150 m (line length is the distance between the panel and the last element in this line).

The HELUKABEL PAAR-TRONIC-CY 1x2x0.75 mm<sup>2</sup> cable is used to connect the input signals (input signals are described below) for lines up to 150 m (line length is the distance between the panel and the last element in this line).

It is recommended to install a protective ferrite (type FEC 9.0) on each of the above cable facing the control panel to protect against electromagnetic interference (EMC). This ferrite is installed as close as possible to the cable entry to the control unit.

## 2.6. GROUNDING OF CONTROL UNIT

The control unit is grounded with a yellow-green grounding conductor "PE" in the power supply cable harness. The control unit is also equipped with a grounding terminal "PE", which is used for mounting on the grounding system of an object or technology at the location of the switchboard. All metal parts of the control panel (mounting plate, front panel, steel panel, cabinet door) are connected to the earthing terminal "PE". The yellow-green single-core CYA 6mm<sup>2</sup> wire or equivalent is used to support the switchboard.

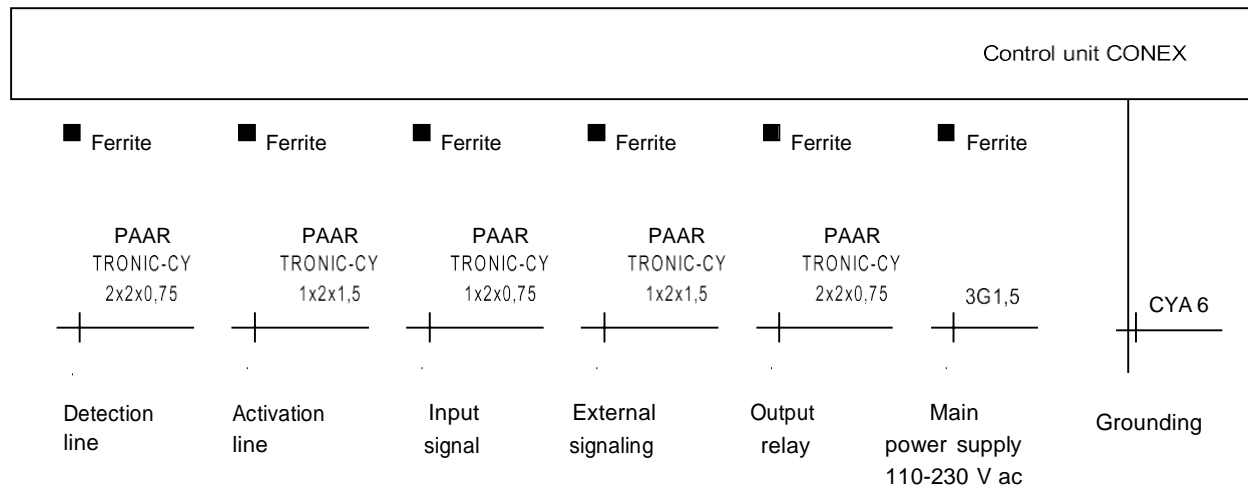
## 2.7. INPUT SIGNALS

The control unit is equipped by clamps, to which input signals can be brought (when the clamps are clamped together for example by a relay contact, the signal is active). In practice these signals can be used to signal low amount of extinguishing agent, decrease in extinguishing agent pressure, remote setting of the appropriate zone or other defined zones to the service mode, possibly for other functions. We recommend consulting of these input signals with RSBP.

**2.8. SUMMARY TABLE OF TECHNICAL DATA**

Source voltage	100 to 240Vac
Frequency of source voltage	50 to 60Hz
Power supply circuit breaker	In = 10A (B or C characteristic)
Supply cable	3C x 1.5mm <sup>2</sup> (maximum 3C x 1.5mm <sup>2</sup> )
Power consumption	100mA to 2,5A (according to load, mode, etc.)
Protection	IP65
Reaction time (response time) - maximum	3ms
Reaction time (response time) - SW adjustable	1 to 240s
Working temperature of surroundings	-10 to 50°C (limited by accumulator)
Relay outputs (one contact NO/NC per relay)	250Vac or 30Vdc/10A
Number of relays – two-zone version	6 units
Number of relays – four-zone version	12 units
Number of relays – six-zone version	18 units
Number of relays – eight-zone version	24 units
Bus	CAN (250 kbps)
Recording of events	to internal memory (1024 events)
Signalization	Color LED diodes on front panel
Visualization	LCD display (160 x 128 pixels)
Control	Buttons and controllers on the front panel
Parameter settings	Through specialized software
Dimensions - two-zone version (H x W x D)	316 x 355 x 167mm
Dimensions - multiple-zone version (H x W x D)	600 x 700 x 240mm

**2.9. SYNCHRONOUS WIRING DIAGRAMS OF AN ELECTRICAL SWITCHBOARD (ONLY ORIENTATIVE)**



### 3. OUTPUT RELAYS

The control unit is equipped by programmable output relays for communication with a customer superior control system. Given signals can be used for optical or acoustic signalization of control unit function states to a control center, for a fire department, switching off or blocking of a follow-up technology, etc.

Relay functions are not firmly set; they are assigned by programming using specialized software. The relays are potential-less, with NC/NO switching contacts. Thus they allow passing on signals on the levels Log 0 or Log 1, which is often advantageous for safety circuits. Protection of the contact common pole is by a cylinder fuse 3.15A (normal characteristic). Relay contact loading is 30Vdc/10A.

The control unit in the two-zone version contains 6 output relays, four-zone version 12 output relays, the CONEX control unit in six-zone version contains 18 output relays, and the control unit in eight-zone version contains 24 output relays.

Each relay can be programmed using specialized software to simple functions like ALARM, FAULT, SERVICE, OFF, RUN, PREALARM, BATTERY and POWER. Additionally, it is possible to create combinations of these functions, time relationships, etc. – of course this will require a consultation or technical help from RSBP.

Remark: In most applications only summary signals “ALARM” and “FAULT” are used, in some also the signal “ALARM” and “FAULT”, in some additional signal “SERVICE”, Sometimes division of these signals according to individual zones is required.

#### 3.1. “ALARM” SIGNAL

The “ALARM” signal is activated at the moment when the control unit reacts to fire or explosion, and sends an impulse to its action element to suppress or eliminate it (the relay delay is about 10ms against the signal on the activation line, which is practically negligible for real applications).

The “ALARM” signal can be set dependently and summarily for more zones at the same time or independently and separately for each zone.

#### 3.2. “FAULT” SIGNAL

The “FAULT” signal is activated at the moment of any defined defect or combination of these defects. These defects include for example detection circuit defects (short circuit, circuit interruption, parameters out of set range), activation circuit defects (short circuit, circuit interruption, parameters out of set range), etc.

The “FAULT” signal can be set dependently and summarily for more zones at the same time or independently and separately for each zone.

Remark: The exact specification of a fault or combination of faults can be found only on the control unit display.

### 3.3. "SERVICE" SIGNAL

The "SERVICE" signal is activated at the moment of putting a control unit zone or zones to the service mode. The placing into the service mode can be performed by a turn switch with the key of the appropriate zone placed on the control unit cover, control buttons and display located on the control unit cover, or using specialized software. Operators should place zones into the service mode exclusively by the turn switch with the key.

The "SERVICE" signal can be set dependently and summarily for more zones at the same time or independently and separately for each zone.

### 3.4. "OFF" SIGNAL

The "OFF" signal includes the sum of the "ALARM", "SERVICE", and "FAULT" signals. Thus it is active in cases when a zone or zones of the control unit are not able to perform their activities correctly by having a defect, being in the service mode, or if there was an alarm already with an appropriate reaction (suppression or prevention of explosion or fire).

The "OFF" signal can be set dependently and summarily for more zones at the same time or independently and separately for each zone.

Remark: Negation of the "OFF" signal tells us that a zone or zones (depending on the setting of software) are ready for reaction (suppression or prevention of explosion or fire) – in other word on the "ON" mode.

### 3.5. "RUN" SIGNAL

The "RUN" signal is activated at the moment of placing a zone or zones to the "Active" status, or it means the state when no defect was found by the control unit at the appropriate detection line. Placement into the "Active" or "Deactivated" status is done using specialized software. Under normal operation a zone or zones are set to the "Active" mode. Then the above mentioned signal does not have practically any meaning for a customer or his superior system (a customer cannot influence this setting during normal operation).

The "RUN" signal can be set dependently and summarily for more zones at the same time or independently and separately for each zone.

### 3.6. "PREALARM" SIGNAL

The "PREALARM" signal is activated at the moment of so called prealarm. This is the state when there are detection lines set on two zones of the control unit (for safety reasons) in a specialrelationship "2 of 2", or when an alarm signal on a detection line lasts more than a preset time interval. In order to achieve reaction to a fire or explosion and sending of an impulse to the activation line to suppress or prevent these events, we need both detection lines to react in the first case or the alarm signal on a detection line that lasted the required time interval in the second case.



If there is detection on one detection line only in the first case or of the reading of time goes on until the end of the required time interval in the second case than this state is called prealarm – on the control unit the signal “PREALARM” is indicated and activated. At this moment the control unit does not send an impulse to the activation line to suppress or prevent fire or explosion. Only during concurrent detection on the second detection line in the first case or after elapsing of the set time interval of alarm signalization on a detection line in the second case the control unit goes to the “ALARM” mode, and sends an impulse to the activation line to suppress or prevent fire or explosion.

### 3.7. SIGNALS „BATTERY AND POWER“

The "BATTERY" signal is activated at the time of battery failure. This can be due to a drop in internal battery voltage below 18.5 V, damage to the internal wiring between internal batteries and PCB, or a failure in the circuitry of the battery on the circuit board. The control panel is only active on the mains power supply when this signal is activated. When activating this signal, the customer should contact the RSBP or its authorized representative.

The "POWER" signal is activated at the time of a power failure from the power supply. This can be due to a power supply failure, a power supply circuit breaker or a damaged circuit breaker, a damaged supply cable, or a fault on the internal power circuits of the control panel. The control panel is only running on the internal battery when this signal is activated. When activating this signal, the customer can try to eliminate the causes of a power failure (power supply, circuit breaker, cable). If the signal is still active then the customer should contact RSBP or its authorized representative.

## 4. INSTALLATION AND DISASSEMBLY

The control unit in the compact version (two-zone) is supplied as a plastic box with IP65 protection and transparent hinged front cover. An aluminum panel with a display and other control and signalization elements (display buttons, turn controllers and LED diodes) is located under the front cover. There is an independently removable cover of the terminal section at the bottom of the plastic box. Screws of the terminal section cover are provided with a seal, and a customer cannot access this section. The plastic box dimensions are: 316 x 355 x 167mm (H x W x D), it is installed using three attachment bolts or screws to a wall, construction, girders, etc. A space and knock-out spaces for cables and installation of grommets are situated under the control unit; the cables can also be brought out through knock-out holes in the back wall of the control unit.

Control units in four, six and eight zone versions are supplied in a steel wall distribution box with IP65 protection with a transparent hinged front cover installed on the door. An aluminum panel with a display and other control and signalization elements (display buttons, turn controllers and LED diodes) is located under the front cover in a door cutout. Distribution box door bolts are provided with a seal, and a customer cannot access this section. The distribution box dimensions are: 600 x 700 x 240mm (H x W x D), it is installed using four attachment bolts or screws to a wall, construction, girders, etc. A space to bring out cables and install grommets is situated under the control unit.

Control units in four, six and eight-zone versions can also be supplied in custom design, for example installed into a distribution box with a display and other control and signalization elements (display buttons, turn controllers and LED diodes) located in its door. In these cases technical parameters and installation methods depend on each specific version.

The following principles are valid for installation of all control unit types:

- A control unit must be installed in the height approx. 170cm – upper edge (for easy operation)
- An access space with the minimum length of 80 cm must be left in front of the control unit.
- The access space may not be filled either permanently or temporarily
- The control unit installation space must be equipped by lighting
- Harmful effects (vibrations, smoke, dust and gases) may not occur in the control unit installation space
- The temperature in the control unit installation space must be in the range -10°C to 50°C
- There must be a functioning electrical socket 230V/50Hz near the control unit to connect installation tools, PC, etc.

The control unit does not pollute environment during its proper function, and does not emit harmful substances or electromagnetic radiation higher than accepted limits. It is harmless from the ecological point of view.

Disassembly and liquidation of control units is performed exclusively by RSBP or its authorized representative. During this they proceed according to the laws concerning electric waste; the internal accumulator (that is installed in the control unit) is ecologically liquidated, other parts are ecologically liquidated as well or recycled.

## **5. MAINTENANCE**

The control unit maintenance that is performed by a customer lies only in visual control for cleanliness, mechanical damage and integrity of the control unit and cables. In case of any damage or breach of integrity of the control unit and cables RSBP or its authorized representative must be contacted. Customers or other entities cannot perform any other maintenance than specified above.

## **6. SERVICE**

Complete control unit service is performed by RSBP or its authorized representative in regular half year intervals. Customers or any other entities cannot perform any control unit service.

## **7. OPERATION**

The control unit that is connected to a complete system for suppression or prevention of fire or explosion can work automatically and without human intervention. Operators cannot and are not authorized to change control unit parameters set by RSBP or its authorized representative.

Operators can place appropriate zones or the whole control unit to the service mode and back to the operational mode, monitor control unit function states, control unit fault states, display control unit records, service intervals, actually measured values, etc. All these operational regimes and operator procedures are specified below.

A graphical LCD display, LED diodes, user buttons on the display and turn switches with keys are used for communication of operators with the control unit. All these components are located on the aluminum panel under the hinged front control unit cover. Operators can open the front cover and operate the appropriate components as needed. LCD display and LED diodes are visible and readable through the closed front cover.

All operator interventions to the control unit should be demonstrably recorded to the technological system Book of Operations, including dates, names, and operator signatures.


Operators must be demonstrably instructed in the control unit operation by RSBP or its authorized representative. Uninstructed personnel are expressly forbidden to operate the control unit.

## 7.1. OPERATIONAL MODE

A customer accepts the control unit from the contractor in operational mode – a zone or appropriate zones are set to the operational mode and tested for correct operation, checked that there is no defect, and the system controlled by the control unit is ready for suppression or prevention of fire or explosion. No operator intervention is needed, the system works automatically.

In case of OPERATIONAL MODE the control unit display looks as follows:



Actual date, time, manufacturer's logo and icon  are indicated symbolizing the status "Control unit is in the operational mode".

A green LED diode marked with  is on in the left upper corner.

## 7.2. SERVICE MODE

A customer can place any zone (also individually) to the service mode – the appropriate zone thus indicates a possible occurrence of fire or explosion, but in no case there is reaction of the system and suppression or prevention of the event. This can be utilized during long-term shut-down of the protected technology, cleaning of the protected technology, etc.



During the service mode a given zone is not protected against explosion or fire. However, other zones that are in the operational regime are able to react properly and in the event of fire or explosion to suppress or prevent it.

Placement of a zone to the service mode is done by switching the turn switch of the appropriate zone over from the position ON to the position OFF. To perform this manipulation a key needs to be inserted into the switch, which is a safety feature (unauthorized personnel cannot perform the manipulation). Placement of the zone back to the operational mode is done by switching the turn switch of the appropriate zone over from the position OFF to the position ON.



In case of SERVICE MODE the control unit display looks as follows:



Actual date, time, manufacturer's logo and icons  and  are indicated symbolizing the status "At least one control unit zone is in the service mode".





A green LED diode marked  is on in the left upper corner.

A yellow LED diode marked  is on in the left upper corner.

During operations a situation can occur, when in the zone that is in the service mode an alarm is indicated – there is no reaction of the control unit to the alarm (for example if an infrared detector of the switched-off zone is exposed to day or other light during cleaning).

In this case the control unit display looks as follows:




Actual date, time, and icons  and , are indicated symbolizing the statuses "At least one control unit zone is in the service mode", and "Alarm signalization" – icon  at the same time. The icon  "Prealarm signalization" may or may not be indicated.


The internal control unit horn does not sound any acoustic signal. The blinking sign "ZONE 1" indicates the place the alarm comes from.

A green LED diode marked  is on in the left upper corner.

A yellow LED diode marked  is on in the left upper corner.

A red LED diode marked  is on in the left bottom corner.

A red LED diode marked  may or may not be on in the left bottom corner.

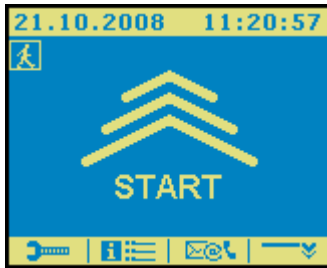
If this state occurs, operators must, before the zone that is in the service mode, and from where the alarm is indicated, returns back to the operational mode, reset it by the  button. If the control unit display does not change after this reset, and the alarm signalization continues, the defect is more serious, the control unit may not be placed into the operational regime, and RSBP or authorized representative workers must be contacted.


### 7.3. SAFE START MODE

The control unit will set itself to the safety start mode automatically during switching of a zone from the operational to the service mode or vice versa, after reset, and after the main power comes back on. During this mode it tests its internal circuits and switching-on of the activation lines is blocked. All other

control unit features are fully functional. This regime last about 4 seconds and disappears automatically. If it does not, RSBP or its authorized representative workers need to be contacted.

In case of SAFE START MODE the control unit display looks as follows:



Actual date, time, and icon  and the sign "START" are indicated symbolizing the status "Safe start mode".

LED diodes in the upper and lower left corners of the display can be on according to situation.

#### 7.4. ALARM AND PREALARM SIGNALIZATION



If a control unit zone is in the operational mode, and if there is signalization of explosion or fire on the detection line of this protected zone, the control unit will evaluate this state and will consequently send an impulse to the appropriate activation line – and the event is suppressed or prevented. This state is called ALARM.

During reaction to the ALARM state in one zone other zones (if they are in the operational mode) are still able to suppress or prevent explosion or fire if these events are indicated on the appropriate zones.

The term "PREALARM" is explained above.

In case of PREALARM SIGNALIZATION the control unit display looks as follows:



Actual date, time, and the icons  and , are indicated symbolizing the status "Prealarm signalization".

The blinking sign "ZONE 1" indicates the place the prealarm comes from.




A green LED diode marked  is on in the left upper corner.

A red LED diode marked  is on in the left bottom corner.

If this situation occurs, the control unit waits for the given time interval, whether the signalization of alarm on the detection line lasts, or whether the alarm signalization occurs on the paired detection line (setting "2 of 2") as well. If it happens the control unit will automatically switch over to the "Alarm signalization" mode and adequately reacts to the fire and explosion. If it does not occur the control unit switches back over to the operational mode.

In case of ALARM SIGNALIZATION the control unit display looks as follows:




Actual date, time, and the icons  and  are indicated symbolizing the status “Alarm signalization”. The “Prealarm signalization” state may or may not be indicated – icon , if this state precedes the alarm signalization.


The blinking sign “ZONE 1” indicates the place the alarm comes from. The internal control unit horn sounds continuous acoustic signal.


A green LED diode marked  is on in the left upper corner.

A red LED diode marked  is on in the left bottom corner.

A red LED diode marked  may or may not be on in the left bottom corner.

If this situation occurs the control unit will send an impulse to the appropriate activation line – and the explosion or fire is suppressed or prevented. It is likely that the given activation line will get into the fault state afterwards (in case of HRD system there will be an interruption of electrical circuit). Thus the zone will not be protected against explosion or fire any longer, and operators will need to contact RSBP or its authorized representative.

The internal control unit horn sounds continuous acoustic signal during alarm signalization. Operators can switch this signal off by the button . A repeated push of this button will renew the acoustic signal; another push switches it off, and so on.

Switching off the internal control unit horn is indicated by the icon  on the display.

## 7.5. FAULT SIGNALIZATION

If there is any defect on detection or activation lines the control unit will evaluate this status as non-standard (fault).

During indication of this fault type in one zone other zones (if they are in the operational mode) are still able to suppress or prevent explosion or fire if these events are indicated on the appropriate zones.

In case of FAULT SIGNALIZATION the control unit display looks as follows:



Actual date, time, and the icons  and , are indicated symbolizing the status “Fault signalization”. Other icons may or may not be indicated.


The blinking sign “ZONE 1” indicates the place the fault comes from.


The internal control unit horn sounds interrupted acoustic signal.

A green LED diode marked  is on in the left upper corner.

A yellow LED diode marked  is on in the left upper corner.

Other LED diodes may or may not be on.

The internal control unit horn sounds interrupted acoustic signal during fault signalization. Operators can switch this signal off by the button . A repeated push of this button will renew the acoustic signal; another push switches it off, and so on.

Switching off the internal control unit horn is indicated by the icon  on the display.

Operators can reset the fault by pressing the button  if this type of fault is indicated. If, even after this reset, the fault signalization lasts, the given zone is not protected against explosion of fire any longer, and operators need to contact RSBP or its authorized representative.

Operators can get directly to the screen ZONE CARD (see below) by pressing the button , where they can find the exact type of the fault.

## 7.6. THE “ZONE CARD” SCREEN

This screen indicates measured data (detection line supply voltage, detection line resistance, and activation line resistance) for each zone separately. Beyond this there are icons with fault types in detection or activation lines, again for each zone individually.

This information can be important for example for a phone communication with RSBP or its authorized representative, when a customer can localize the fault type more exactly.








The control unit ZONE CARD screen looks as follows:





0mA and 48mA – actual supply currents for detection lines 1 and 2

65535R and 4700 R – actual resistances of detection lines 1 and 2

860R and 4R – actual resistances of activation lines 1 and 2

-  - The appropriate control unit zone is in the operational mode
-  - Signalization of alarm or prealarm on the appropriate zone
-  - Signalization of a summary fault of the appropriate zone (for exact description see other icons)
-  - The fault “Supply voltage of the appropriate detection line is out of the set range”
-  - The fault “Ground connection of a detection line”
-  - The fault “Short on a detection line”
-  - The fault “Disconnection on a detection line”

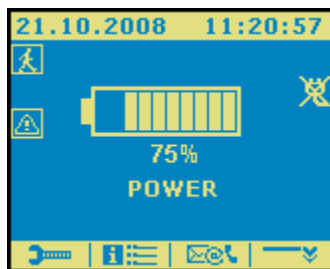
-  - The fault "Ground connection or short of an activation line"
-  - The fault "Disconnection on an activation line"

Remark: For illustration the screen picture shows all icons, in reality all of them may not be indicated - only the ones that describe a given situation.

## 7.7. OTHER TYPES OF FAULTS

The control unit can evaluate and indicate also other types of faults (not only detection and activation line ones). Other types of faults may include electricity supply failure, battery failure, integrity failure, and horn failure. These indications disappear automatically when the faults disappear.

After the power failure the control unit display looks as follows:



Actual date, time, and the icons ,  and  are indicated symbolizing the status "Power supply failure".

The indicator shows the remaining internal accumulator capacity.

The internal control unit horn sounds interrupted acoustic signal.

A green LED diode marked  is on in the left upper corner.

A yellow LED diode marked  is on in the left upper corner. A

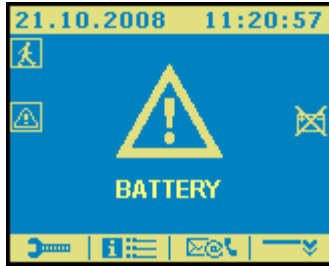
yellow LED diode marked  is on in the left bottom corner.

If this situation occurs operators should be able to renew the control unit power supply. In case of power failure that is longer than 4 hours the internal back-up accumulator can be exhausted, in this case the control unit will switch itself off, and proper function of the control unit and the system is not guaranteed.

If operators are not able to secure the power supply within 4 hours, or if this fault is active even after the power is back on, they have to switch the control unit off from running on the internal accumulator only, in order not to run the accumulator down (this operation is described below), and contact RSBP or its authorized representative. The system is not protected against explosion or fire when the control unit is switched off.



During the internal accumulator failure the control unit display looks as follows:



Actual date, time, and the icons , , and , are indicated symbolizing the status "Internal accumulator failure".

The internal control unit horn sounds interrupted acoustic signal.

A green LED diode marked  is on in the left upper corner.

A yellow LED diode marked  is on in the left upper corner.

A yellow LED diode marked  is on in the left bottom corner.

If this situation occurs operators should contact RSBP or its authorized representative. The back-up power supply is in fault, which can cause that the system is not or will be not protected against explosion or fire.

During the integrity failure the control unit display looks as follows:



Actual date, time, and the icons , , and  and the Integrity sign are indicated symbolizing the status "Integrity failure".

The internal control unit horn sounds interrupted acoustic signal.

Then the address or a description of the faulty component is indicated (if possible).

If this situation occurs operators should contact RSBP or its authorized representative. The control unit is faulty (wrong configuration, missing component), which can cause that the system is not protected against explosion or fire.

During the external horn circuit (signalization) defect the control unit display looks as follows:




Actual date, time, and the icons , , and  and the BUZZER sign are indicated symbolizing the status "External horn circuit (signalization) defect".


The internal control unit horn sounds interrupted acoustic signal.

If this situation occurs operators should contact RSBP or its authorized representative. A defect of the external horn (signalization) does not have any influence on the proper function of the system that reacts to fire or explosion, but the external acoustic horn (and possibly the acoustic signalization) does not work.

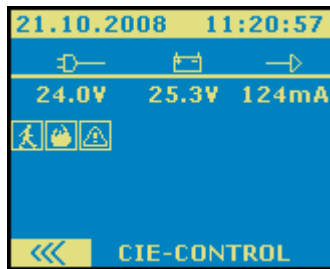
Remark: The external signalization (optical or acoustic) is not used in some applications.

The internal control unit horn sounds interrupted acoustic signal during signalization of these defects. Operators can switch this signal off by the button . A repeated push of this button will renew the acoustic signal; another push switches it off, and so on.

Switching off the internal control unit horn is indicated by the icon  on the display.

Operators can get directly to the CONTROL CARD screen (see below) by pressing the button , where they can find additional information to the given fault.

The control unit CONTROL CARD screen looks as follows:



24.0V – actual voltage transformed from the external power supply

25.3V – actual voltage supplied by the internal accumulator

124mA – the value of current consumed at a given moment from main power supply

Other icons have the same meanings like in the ZONE CARD screen.

Remark: For illustration the screen picture shows all icons, in reality all of them may not be indicated - only the ones that describe a given situation.

## 7.8. SERVICE INTERVAL

The control unit works with the real time and calendar, and the data about the last service and the future planned one are stored in its internal memory. This information cannot be changed by operators; however, it can be invoked and displayed any time on the screen (see below). When the date of the planned service comes about, the screen shows notification information about this activity.

During the display of service interval the control unit screen looks as follows:









08/2009 – the date of the planned service

This is only an information screen; the control unit can work without any limitations (if it is in the operational mode, and no other defect is reported), and theoretically even after the date of the future planned service. However, operators should contact RSBP or its authorized representative with the request to perform the regular service of the control unit and the system, since the control unit and the whole system must be serviced in regular time intervals.

## 7.9. CONTROL ELEMENTS ON THE DISPLAY (BUTTONS)

Control elements (user display buttons) can be found on the aluminum panel under the hinged front cover of the control unit. These buttons are used to control the control unit functions, and are described below.

-  The reset button – used for resetting of faults, alarms, etc.
-  The internal horn button – used to switch off (or back on) the control unit acoustic signal
-  The return button – used to return one level back in the display menu
-  The confirm button – used to confirm an operation
-  The move button – used to move around the menu
-  The universal buttons – used to control an actual operation that is displayed above the button on the display

## 7.10. FUNCTIONS COUPLED WITH THE UNIVERSAL DISPLAY BUTTONS

The icons of actual operations that can be controlled by the universal buttons are located at the bottom part of the control unit display (see above). They are described below.



The appearance of the display bottom section in the operational mode



The icon to enter the “Service mode”

The control unit can be placed in the service mode by pressing this button (however, this is only allowed to the RSBP or authorized representative employees). This operation is forbidden to operators, since the collision with the turn switch with key position could occur (the disagreement between the mode set by pressing of the button and the mode set by the turn switch).

Operators can place zones to the service mode exclusively by switching the turn switch of the appropriate zone over from the position ON to the position OFF. To perform this manipulation a key needs to be inserted into the switch, which is a safety feature (unauthorized personnel cannot perform the manipulation). Placement of the zone back to the operational mode is done exclusively by switching the turn switch of the appropriate zone over from the position OFF to the position ON.



The icon to enter the regime “Recording of events”

The control unit is equipped by the internal processor with memory that enables automatic archiving of all events that were recorded and evaluated by the control unit, including date and time when they happened (faults, power failures, service modes, alarms, etc.). The memory capacity is 1024 events. These records are used for backward analysis of events. Operators can display them in sequence; however, they cannot change or delete them.

In the contacts regime the bottom section of the control unit display displays the auxiliary menu of contacts that are related to service data (contacts to RSBP or its authorized representative – email, phone, and web pages).

#### The icons of the auxiliary contact menu



The data about the last service and about the future planned service is shown



The contact for RSBP or its authorized representative (to perform service) is shown



The contact for RSBP or its authorized representative (to perform service) is shown



The icon to access the regime “Internal control unit menu”

### 7.11. THE INTERNAL CONTROL UNIT MENU

In this menu it is possible to manage control unit functions created by operators. A direct access to the control card screen and the zone card screen are enabled, as well as switching off the control unit, while it is operating on the internal accumulator (batteries), and also the immediate reset of the control unit.

The control unit Internal menu screen looks as follows:



This icon allows the direct access to the Control card screen



This icon allows the direct access to the Zone card screen



This icon allows the direct access to the Zone card screen



This icon enables switching off the control unit while running on the internal accumulator (batteries) – see below.

## 7.12. SWITCHING OFF THE CONTROL UNIT WHILE RUNNING ON THE INTERNAL ACCUMULATOR

This function is the most important one for operators among control unit internal functions. If the control unit is running only on the internal accumulator (during external power failure) for longer than 4 hours, it can run the accumulator down. Therefore it is necessary for operators to switch off the control unit if this situation occurs the way specified above.

Similarly during a long-term planned shut-down of the control unit, the main power of the control unit needs to be switched off, and then, using the above specified procedure, the control unit needs to be switched off from running on the internal accumulator.

If the control unit is powered in the standard way (there is no external power failure, and the internal accumulator is OK) the control unit cannot be switched off by the method specified above.

The system is not protected against explosion or fire when the control unit is switched off.

After this switch off the control unit activates itself automatically after the main power comes back on.

## 8. FORBIDDEN ACTIVITIES

The control unit can be operated or maintained only by persons that were demonstrably instructed for these activities. These persons must be physically and psychically capable to perform these activities, and may not be under influence of alcohol or drugs.

Operators must record all these activities performed with the control unit and the whole system for protection against explosion or fire in the technological system Book of Operations, including dates, names and signatures.

Operators, other customer workers and other subjects may not perform the following forbidden activities with the control unit:

- Remove or damage control unit seals
- Unscrew the terminal section cover
- Unscrew the aluminum panel with the display
- Mechanically damage the control unit in any way
- Mechanically damage the electric cables coming out of the control unit in any way
- Place the control unit into the service mode without reason
- Switch off the control unit without reason