



5.41 Electric fire alarm system

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Annexes
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Technical requirements for planning & design operations, installations, inspections, takeovers and functional tests of the electric fire alarm system

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The latest updated version of this ITS is available on <http://cts.skoda-auto.com/>; the Company is not obliged to inform its business partners of ITS updates.

Therefore, all parties are strongly recommended to check this ITS regularly. These documents enter into force on the date of their latest update. The ITS wording relevant in terms of contracts and agreements already signed is that in force at the time of issuing the purchase/service order concerned

Note: In the event of any discrepancies among the Czech, English and German versions of this ITS, the Czech version shall prevail. The Czech version is available on <http://cts.skoda-auto.com/>.

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First edition

- 1.
- 2.
- 3.



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1. Introductory information

This Internal technical Standard lays down basic technical requirements for planning & design operations, installations, inspections, takeovers and coordinated functional tests of electric fire alarm systems across all ŠKODA AUTO a.s. plants.

The electric fire alarm system (EPS) is the most extensively used fire safety system at ŠA; in line with HZS ŠA's operations, the fire alarm system is responsible for fast detection and extinguishment of fires on individual sites. Other fire safety systems are controlled or monitored by the EPS. In compliance with ITS 2.11 No. 3.1 d., the EPS is installed on all newly planned and/or reconstructed sites.

Any operations within this system (planning & design, installations, functional tests) shall therefore be performed to ensure that the operation of the integral EPS system is not impaired and that the existing levels of fire safety in terms of protecting both people and assets remain unchanged, with minimum impact of the aforesaid operations on the Company's production operations.

1.1 Key terms and abbreviations

| | |
|--------|---|
| ITS | Internal Technical Standard |
| EPS | Electronic fire alarm system |
| ČSN | Czech national standard |
| EN | European standard |
| HZS ŠA | ŠKODA AUTO Fire Department |
| PPB | Fire protection planning |
| PBŘ | Fire safety solution |
| PBS | Fire safety of buildings and structures |
| SOZ | Automatic venting system |
| SHZ | Stationary fire extinguishing system |
| PÚ | Fire protection section |
| OPPO | Fire protection service area |
| KTPO | Key fire protection vault |
| PD | Project documentation |
| SV | List of deliverables |

1.2 Relevant legislation, European directives, decrees and standards

- Act No. 183/2006 Coll., Building and Construction Act ... § 156 paragraph 2;
- Act No. 22/1997 Coll., Technical Requirements for Products and Amendments to Selected Items of Legislation;
- Act No. 133/1985 Coll., Fire Protection Act as amended;
- Decree No. 268/2009 Coll., Technical Requirements for Buildings & Structures as amended by Decree No. 20/2012 Coll., ... § 8 paragraph 1 b);
- Decree No. 23/2008 Coll., Technical Terms & Conditions for Fire Safety of Buildings and Structures as amended by Decree No. 268/2010 Coll.;
- Decree č 221/2014 Coll. that amends Decree No. 246/2001 Coll. Fire Safety Terms & Conditions and Government-Coordinated Fire Protection Supervision (Fire Prevention Decree);



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- Decree No. 499/2006 Coll. Building & Structures Documentation;
- ČSN 33 2000-4-41 ed.3 Low Voltage Electrical Installations – Part 4-41: Safety Protection Measures – Electrical Current Injury Protection;
- ČSN 33 2000-5-51 Low Voltage Electrical Installations – Part 5-51: Selection and Construction of Electrical Systems – General Regulations;
- ČSN 33 2000-5-52 ed.2 Low Voltage Electrical Installations – Part 5-52: Selection and Construction of Electrical Systems – Electrical Wiring;
- ČSN 33 2000-5-54 ed.3 Low Voltage Electrical Installations – Part 5-54: Selection and Construction of Electrical Systems – Earthing and Protective Conductors;
- ČSN 34 2710 Electrical Fire Alarm Systems - Planning & Design, Installations, Use, Operation, Checks, Servicing and Maintenance;
- ČSN 34 2300 ed.2 Indoor Electronic Wiring Installation Regulations;
- ČSN 33 2000-5-1 ed.2 Low Voltage Electrical Installations – Part 1: Key Aspects, Key Characteristics, Definitions;
- ČSN 33 2000-2130 ed.3 Low Voltage Electrical Installations – Indoor Electrical Wiring;
- ČSN 73 0875 Terms & Conditions for Designing Electric Fire Alarm As Part of Fire Safety Solutions;
- ČSN 73 0848 Fire Safety of Buildings & Structures – Cabling;
- ČSN 73 0804 Fire Safety of Buildings & Structures - Production Sites;
- ČSN 73 0802 Fire Safety of Buildings & Structures - Non-Production Sites;
- ČSN 73 0845 Fire Safety of Buildings & Structures – Warehouses;
- ČSN 73 0831 Fire Safety of Buildings & Structures - Fire Evacuation Areas;
- ČSN 73 0810 Fire Safety of Buildings & Structures - Shared Provisions;
- ČSN 73 08xx Fire Safety of Buildings & Structures - other related fire safety standards;
- ČSN EN 54-xx European standards adopted for electric fire alarm systems (e.g. ČSN EN 54-2 deals with EPS control centres);
- ČSN 01 3495 Drawings in the Building Industry – Drawings for Fire Safety of Buildings & Structures.

1.3 Project Documentation supplier requirements

The Project Documentation shall be produced by means of agreed ŠA compatible technologies (as specified for the individual projects):

- LITES
- SCHRACK SECONET

Both these systems meet relevant requirements for industrial applications (integrated line of elements for all types of contexts/environments that may occur at ŠKODA AUTO, optimum system functionality in terms of building an extensive, full-fledged system, ability to ensure control and monitoring of related systems, and other aspects).

In the event of planning a new independent site, the project (plan) for the selection of the technology supplier will be drafted using both technologies referred to above (PD up to the level of building permission documentation and a list of deliverables for the system supplier selection (tendering process). In the event of planning building modifications on a site that is already fitted with an EPS (i.e. additional equipment), the existing system shall be respected.

The PD supplier shall attend project inspection days as necessary, communicate with the PBR planner, the planner of the civil engineering part of the project, the LV planner and, last but not least, with FIO/3x. The EPS planner shall attend the EPS functional test and the coordinated functional test. Across all stages of the PD production, the PD supplier shall comply with legislation, decrees and standards relevant to these operations.

1.3.1 Key requirements for planning & design work and the PD.

The content and scope of the project documentation shall include all items required under relevant legislation and standards (Decree No. 499/2006 sb., Documentation for Buildings & Structures, and Act No. 183/2006 Coll., Zone Planning and the Building & Construction Rules – Building & Construction Act). Further, the PD supplier shall observe the requirements specified in this ITS and the PBR requirements.



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The final version of the project documentation is subject to final approval by FIO/3x, and all comments arising in the process of project management and approval by FIO/3x shall be taken into account and responded to.

All documentation items to be taken over by the FIO Department shall be provided in both printed and electronic form. The electronic documentation shall be delivered on a data carrier (CD, DVD etc., if necessary, subject to prior agreement with FIO/3x, sent via the eBOX app) properly identified in terms of contents:

- Textual part in .doc(x) and .pdf
- Calculations, list of deliverables etc. in .xls(x) and .pdf
- Drawings in .dwg and .pdf

The PD across all planning and design stages, as well as all correspondence items and communications between the Client (ŠA) and the Contractor shall be in Czech.

The drawings part in .dwg shall be produced in layers (individual trades/systems shall be colour- and layer-differentiated). The PD shall include individual block diagrams of circular, controlled lines and all linked items.

Failure to comply with the above may be a reason for not taking the deliverables over and for contractual penalties arising from such failed takeover.

1.3.2 List of deliverables

The list of project deliverables ("SV") in .xls(x) shall be delivered in 2 forms:

- With unit prices stated by the planner (for the sake of indicative project cost levels)
- "Blind" list (without unit prices) prepared for the project contractor tendering process

The "blind" SV shall include "as-built documentation": this item will be part of the project contractor deliverables.

The list of deliverables shall take the form of formulas to ensure that it is always complete and can be automatically calculated by entering unit prices into the respective fields.

In the event of a project of building a new independent site (according to project requirements by FIO/3x) the SV for the tendering process shall always be produced using both aforementioned technologies. To-be-built documentation

Shall be produced in compliance with Decree No. 499/2006 sb. – according to Annex No. 6 thereto.

The documentation shall be delivered in printed form: in 6 copies (colour drawings and drawing annexes), and in electronic form: in .pdf as specified in 1.3.1.

All copies shall be delivered to the person in charge at the FIO/3x Department that will then distribute the PD within ŠA as necessary.

The scope of the EPS project documentation is mainly based on ČSN 73 0875 Art. 4 and ČSN 34 2710 Art. 7, and includes a Technical Report, programming sheets for the EPS master control panel(s) and a drawings part (layouts, ground plans including all EPS items and block diagrams for individual control lines and all items linked to the EPS system, cross-section drawings where applicable).

The documentation shall include information about the person responsible for drafting the project documentation; that is why the user is provided with authenticated (ČKIT stamped) print-outs.

1.3.4 As-built documentation

Shall be produced in compliance with Decree No. 499/2006 sb. – according to Annex No. 7 thereto.

The documentation shall be delivered in printed form: in 6 copies (colour drawings and drawing annexes), and in electronic form: in .pdf and .dwg on a data carrier as specified in 1.3.1.

All copies shall be delivered to the person in charge at the FIO/3x Department that will then distribute the PD within ŠA as necessary.

If the cabling is led through fire-stopping structures, the PD to be delivered shall include a "fire-stopping seals documentation" (at the supplier's cost).



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1.4 Project contractor requirements

The Contractor shall have valid manufacturer certificates for the required EPS systems (all systems specified below):

- LITES
- SCHRACK SECONET

The installation work contractor shall meet all qualification and other requirements under relevant legislation, standards and the documentation provided by the system manufacturer, and shall comply with the staff training requirements laid down by the system manufacturer. When installing the deliverable products and systems, the contractor shall perform all installation workflows as required and shall comply with installation requirements laid down by individual manufacturers and the approved to-be-built project documentation. Persons to perform the installation work shall meet OHS requirements and provide work-at-height/tower climbing work licences (in installations above production equipment already in place the installation routes may be at height of up to 20m). High-lift platform workers shall be properly licensed for this type of work.

The contractor to install the system shall be responsible for the installed system's conformity with the project documentation. If any changes become necessary during the installation, such changes shall be demonstrably approved by the planner/designer of the deliverable work and by FIO/3x and shall be added to the as-built documentation.

The project contractor shall provide the Client with a written ES certificate of conformity, test reports, measurement reports, certificates for products used in the project implementation that are on the government-specified list of products which need to be assessed in terms of conformity with technical regulations under Government Resolution No. 163/2002 Coll. as amended (with changes: 312/2005 Coll., 215/2016 Coll.), in connection with Act No. 22/1997 Coll., Technical Requirements for Products and Amendments to Selected Items of Legislation

For the sake of proper project completion and handover for use, the contractor shall provide a valid, up-to-date and FIO/3x-approved as-built documentation under paragraph 1.3.3., including all relevant tests, without defects and uncompleted work.

The minimum warranty period required for the system is 10 years after delivery of the complete project.

The EPS system supplier shall meet the legislative requirements under Act No. 455/1991 Coll. "Trade Licensing Act". This trade is a licensed one, i.e. the core line of business is subject to special qualification requirements. In the respective legislation, this line of business is specified in Annex 3 under "Providing technical services to protect assets and persons"

All meetings, interactions and inspection days, as well as all correspondence items and communications between the Client (ŠA) and the Contractor shall be in Czech.

2. EPS technology

2.1 Key EPS design-work requirements

The EPS project documentation shall be produced in compliance with relevant legislation (see chapter 1.1), PBR, ITS 2.11 and this ITS, the External Impacts Report produced by an expert committee of the party responsible for producing the construction part of the PD.

The design of on-site EPS elements and their covers shall be part of the EPS project documentation, including, where applicable, measures to eliminate negative external impacts (such as maintenance more frequent than as required under relevant legislation).

Special attention shall be paid to ambient temperatures and humidity, the presence of corrosive substances and pollutants, dust, mechanical strain and vibrations, electromagnetic, electrostatic and ionisation impacts and, primarily, the character of processed and/or stored materials.



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2.2 Requirements for EPS installations at ŠA plants

2.2.1 EPS elements

2.2.1.1 Key EPS elements

Required under relevant legislation.

- Individual sites and premises shall be fitted with safety systems in compliance with ČSN 34 2710 Art. 6.5; smoke and thermal spot alarm locations are laid down in Art. 6.5.1 - areas dimensioned according to tab. 1 and tab. 2 (flat ceilings without beams), in premises with beams according to tab. 3, under platforms according to tab. 4.
- The fire detector design shall reflect factors limiting the operation of the detectors (ČSN 34 2710 Art. 6.5.1). The impact of ventilation systems is reflected by reducing the guarded area, using a conversion/reduction factor (see table I.1 in Annex I to ČSN 34 2710). Elimination of false alarms in compliance with ČSN 342710 Annex A.
- Safety measures on suspended ceilings, if required, to comply with ČSN 73 0875 Art. 4.2.5 and ČSN 34 2710 Annex I.1.2; double flooring to be designed under ČSN 73 0875 Art.4.2.6 and ČSN 34 2710 Annex I.1.2, shelters and ramps that are used for storage of flammable materials or whose depth is over 3m to comply with ČSN 73 0875 Art. 4.2.8.

2.2.1.2 EPS-specific requirements

Arise from experience and from long-standing use of an EPS system at ŠA production plants that is compliant with relevant legislation

- The EPS is always a single-level solution - all EPS statuses are displayed at the HZS ŠKODA AUTO control centre using a graphic add-on (PC), and HZS responds immediately after alarm activation. All EPS functions can be controlled from the graphic add-on, and HZS's access to sites is addressed already at the stage of producing the PD for individual trades - it is therefore not necessary to use OPPO or KTPO – unless its use arises from the fire safety solution (PBR) concerned or some other circumstances.
- Special detectors are preferred in ŠA's production and storage halls - air intake systems with air intake piping on the ceiling. The purpose is to minimise collisions with other equipment and technologies. Detector maintenance is performed in system monitoring units that shall be located to be easily accessible. The design of the air intake piping and the configuration of the monitoring system shall comply with the manufacturer's instructions and ČSN 34 2710 Art. 6.4.1.1 and Art. 6.5.3 and Annex I.3 to this standard. The air intake system shall come with relevant technical measures to prevent water from getting into the air intake system in the event of mechanical damage to the sprinkler head (the air intake piping shall be fitted with a three-way valve for cleaning, if necessary. On sites posing a risk of explosion (EX areas) the piping shall be fitted with an anti-detonation unit and all accessories necessary to ensure safe operation on such sites). The sensitivity level under ČSN EN 54-20 (classes A - C) reflects the type of the air intake piping and the configuration of the monitoring unit, and is selected to ensure timely detection of fire while minimising false alarms (ČSN 73 0875 Art. 4.1.1 and Art. 4.1.3). Although the detectors in question make it possible to cover extensive areas, the supplier is required to respect the maximum permissible size of the detection zone (1,500 m²) under ČSN 34 2710 Art. 6.2.3 a).

If the SOZ system is required to be controlled by the EPS system section by section, the areas protected by the individual air intake systems shall "copy" the areas of the individual SOZ sections.

- Air intake systems are also preferred in storage premises where the top storage line is over 7.5 m and where fire detectors are installed on shelves in compliance with ČSN 34 2710 Annex K (spot detectors have not proven to be satisfactory in terms of system operation and maintenance). In automated tower warehouses, if technologically possible, the air intake system monitoring units should be placed outside the operating area of the warehouse (e.g. on the outside warehouse fencing) so that it is possible to perform maintenance operations on the EPS while the warehouse is in operation. The on-shelf air intake system is installed according to the aforementioned Annex K to ČSN 34 2710 and according to the system manufacturer's instructions to prevent its damage by the warehouse operation. It can be installed both horizontally and vertically, on condition that the horizontal safeguarding area does not exceed 26 m.



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- Administrative premises (offices, conference rooms, archives, etc.), dressing rooms and corridors shall be fitted with optical smoke detectors (designed under ČSN 34 2710 Art. 6.5.1 and ČSN 73 0875 Art. 4.1.1 and Art. 4.1.3). These detectors can also be installed in built-in cabinets and under landings in production halls, on condition that the production process does not pose the risk of smoke leaks in such locations.
- Premises where smoke or steam may occur in the course of ordinary operation (kitchenettes, maintenance premises where welding operations take place, in production halls frequented by vehicles without functional catalytic converters, in vestibules to which smoke and dust get from outdoor areas, etc.) shall be fitted with thermal and multifunction detectors (designed under ČSN 34 2710 Art. 6.5.1 and ČSN 73 0875 Art. 4.1.1 and Art. 4.1.3). Suitably set multifunction detectors (to eliminate false alarms) are also preferred in production halls where the EPS controls linked systems that have an impact on production operations.
Large premises are fitted with linear sensors (ADW535, ALARMWIRE and PROTECTOWIRE) whose design is based on the conditions set for thermal detectors.
- In technology areas where Stage 1 of possible fires is expected to take the form of a dark smoke (VZT machinery rooms, LV distribution points, installation premises, lift engine rooms and wells, handling areas etc.) the preferred solutions include ionisation smoke detectors or optical smoke detectors with extended smoke indication characteristics based on the blue-light principle (designed under ČSN 34 2710 Art. 6.5.1 and ČSN 73 0875 Art. 4.1.1 and Art. 4.1.3).
- Linear smoke detectors designed under ČSN 34 2710 Art. 6.4.1.2 are preferred in high-ceiling premises where the smoke may expand over a large area before being detected. Detectors are designed under Art. 6.5.2.1 and under Annex I.2.
The use of this type of detector in halls is limited by the need to safeguard the space under the hall ceiling that is penetrable by the detector beam and the requirements for access to the detector for maintenance and inspection purposes (footbridges and ladders).
- Pursuant to ČSN 34 2710 Art. 6.4.3, all shelters specified in the PBŘ shall be fitted with flame detectors. Their application shall reflect ambient impacts under Art. 6.4.3.1 and Art. 6.5.4.1 of the aforementioned standard. These flame detectors shall feature a heating system to eliminate impacts of misted-up or ice-coated ambient objects, if any.
- To increase fire safety, sites may be fitted with thermal cameras interconnected with the EPS via relay exit points under ČSN 34 2710 Art. 14 – it is necessary to monitor the ALARM and FAILURE statuses in each thermal camera.
- Button detectors shall be installed on hydrant cabinets under ITS 2.11 Chapter 4.5.1.1 and under ČSN 73 0875 Art. 4.3.3 and ČSN 34 2710 Art. 6.5.6, as well as exit points to open areas and on escape routes. The maximum distance between two button detectors on an escape route is 60 m, button detectors are located in the field of vision of the escaping persons, 1.2 - 1.5 m above ground level and max. 3m from exits, on any side.
- Pursuant to ČSN 73 0875 Art. 4.3.2 and 4.10.1, the requirements for monitored EPS components are laid down in the Fire Safety Solution.
Monitored components include exit points from all types of the SHZ system (stationary sprinkler system, INERGEN, water mist, CO₂, aerosol SHZ, OxyReduct, air-foam extinguishers, etc.), the SOZ system (individual smoke sections), closure of fire stopping elements on conveyors, VZT fire flap statuses. Further, the EPS shall sense Level 2 critical gas concentrations and aggregate failures of the gas detector system – the exit points from these systems shall be connected to the EPS system via EPS entry and entry/exit elements, and the "failure" and "EPS back-up supply failure" statuses shall be sensed in the same way. Also sensed are statuses of fire safety-relevant technological equipment (e.g. HFO filling, etc.).
- Since the required EPS system will be fully-addressable and will feature a computer add-on, it is not necessary to install fire alarm lights. Fire alarm lights are installed only in locations required by HZS ŠA for better visibility during interventions.

2.2.2 Controlled EPS components

Pursuant to ČSN 73 0875 Art. 4.9, the requirements for controlled EPS components, including the required logical links and sequences, are laid down in the On-Site Fire Safety Solution. The entire EPS system shall be programmed to reflect these requirements.



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In all cases where in the event of a false alarm an EPS exit point might stop the production process and thus cause substantial damage to ŠA, the system control is designed under ČSN 73 0875 Art. 4.9.1 - the intervention is launched based on activation of two detectors in PÚ (applies to automatic detectors; button detectors always activate linked systems upon a response by one detector). Where a massive smoke leak may exceptionally occur during the production process (e.g. driers in the paint shop), the intervention shall be designed to have multiple dependency on assessing two fire-relevant physical parameters - such as a combination of smoke & thermal detectors or smoke & flame detectors.

All equipment items shall be controlled directly (ČSN 73 0875 Art. 4.9.4), not via software of other devices, unless the reliability of such solution has been demonstrably proven (evidence-based reliability study).

For all follow-up operations, the linked equipment is provided with a "handover point" - a fire-resistant terminal box connected with the exit point for the linked equipment. The handover point shall be marked with a notice and identified in the PD. Cables between this handover point and the linked equipment shall be supplied by the linked-equipment supplier. This solution is based on the presumption that the EPS Technician does not have access to third-party equipment that is outside their scope of authority. Any deviations from the aforesaid solution shall be discussed and approved by FIO/3x. The same applies to the monitoring of fire safety equipment by the EPS system.

Monitoring equipment required to enable follow-up operations shall be fitted with a terminal member to eliminate the risk of stopping the production process due to a broken cable (e.g. SHZ operation – in response to fire)

Under ČSN 73 0875 Art. 4.8.5, the EPS commissioning shall be preceded by an EPS takeover to include an equipment functionality test and a coordinated functional test (see separate chapters 3.1 and 3.3).

2.2.3 EPS - overall design

All wiring shall be designed and installed in compliance with Decree No. 23/2008 Coll., (Annex 2), Decree č. 268/2011 Coll. and related standards – ČSN 34 2710 Art. 8.3 and Annex C, ČSN 73 0875 Art. 4.11, ČSN 73 0848 and under ČSN for the respective type of site (ČSN 73 0802 Art. 12.9.1 and ČSN 73 0804 Art. 13.10.1 in this particular case).

All equipment to be used shall meet the following standards (besides the fire safety ČSN standards already referred to above):

- ČSN 33 2000-4 Low Voltage Electrical Installations – Part 4-41: Protective Measures to Ensure Safety – Electrical Injury Protection
- ČSN 34 2300 Regulations for Indoor Electronic Communication Wiring
- ČSN 73 6005 Technological Equipment Layout

Cables to be used for the EPS wiring - alarm lines: JY(St)Y (red shell - designed for EPS), installed in low-voltage cable trays (see ITS 5.40), cable protectors and VR20/EC Univolt pipes (or some other cables of demonstrably comparable characteristics approved by FIO/3x).

- The circular line shall not be interrupted between the individual elements. If joints are inevitable, they will be done in cable joint boxes: min. coverage IP 55, halogen-free design, appropriate size, visible "EPS" marking with control centre No. and circular line No. (soldered joint, all cables to be connected, including the shielding). Joint boxes shall only be installed in easy-to-access locations and shall be part of the EPS PD.
- The detector connection configuration shall (if possible) include a cable reserve to eliminate the necessity to relay the entire route in the event of damage/undesired shift; inside the detector, the solution shall prevent contact between the cable shielding and the line conductors or the building shell, using a shrinkable sleeve.

The wiring for controlled and monitored components shall comply with Decree 23 Technical Terms & Conditions for Fire Safety of Buildings and Structures (primarily Annex No. 2 to Decree č. 23/2008 Coll.) and the related Decree č. 268/2011 Coll., as well as the requirements of the ČSN standards referred to at the beginning of this chapter. The cables to be used shall comply with this Decree and shall be installed under ITS 5.40 Art. 3.2.2.1 Fire-Resistant Routes (fire-responsive routes).



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Where it is difficult to ensure proper functionality of cable routes on hall structures (installation of fire-resistant trays on structures that do not have the required fire resistance), the contractor shall use a solution designed to ensure that the controlled component concerned is activated when the wire to the controlled component gets broken or short circuited (solution under ČSN 73 0875 Art. 4.11.3 a), b)) - not recommended for production-stopping exit points).

The same method shall be applied to all EPS wires on protected escape routes (the alarm line wires shall be installed in pipes cast in the ceiling concrete or installed the same way as the wiring for controlled components).

When installing cables in the paint shops, samples of the cables to be used shall be tested for impacts of substances in terms of the risk of craters that may occur in the paint shop lab (only cables with "negative" test report results are allowed). This test is mainly necessary for fire-responsive cables whose insulation often contains silicon. Only "silicon-free" cables are allowed.

Cable pass-through openings in walls between PÚs shall be sealed with fire seals (part of the EPS installation (delivery)).

Pipes, equipment and wirings shall be installed in compliance with ČSN 33 2000-1, ČSN 33 2000-4-41, TNI 33 2000-5-51, ČSN 33 2000-5-52, ČSN 33 2000-5-54, ČSN 33 2130, ČSN 34 2710, ČSN EN 50565-1, ČSN 73 0875 and all related standards plus the manufacturer's technical requirements.

- The wiring shall be arranged and marked to be easy-to-identify in checks, tests or repairs.
- All wires, fitting boxes and devices shall be positioned to ensure that can be checked (electrically) at any time.
- Terminals in boxes shall be accessible at all times.
- Wires shall be laid and installed in an easy-to-survey manner, and the routes shall be as short as possible, with minimum crossing points.
- Wires shall be laid vertically and horizontally straight to make the walls as unobstructed as possible. If there are more than one circuits in a single room, the boxes and wires of the same circuit shall be placed at the same height.
- Cable pass-through openings in structural elements of buildings shall be sealed to ensure that the fire resistance of the structural elements concerned is not impaired. Where cables go through a fire-stopping structure, the pass-through opening shall be sealed with a fire plug whose fire resistance is at least the same as that of the fire-stopping structure concerned. In other cases cable pass-through openings shall only be sealed if such need arises from differences in the character of the neighbouring premises concerned or some other special project requirements. Cable pass-through seals are not part of this project solution (see requirements for other trades).
- Power circuit wires shall not be placed in a shared pipe, cord or cable and shall not share the same attachment points with communication wires. A shared pipe, cavity or cable can only be used for wires of both circuits if all such wires are insulated for the highest voltage and if they do not interfere with each other.

In places where EPS cables are laid parallel with other distribution lines the minimum distance shall be 20 cm; this distance can be reduced to 6 cm where the parallel stretch is less than 5 m long and to 1 cm at line crossing points (under ČSN 33-2000-5-52).

- EPS master control panels shall be connected to an independent 6A fire protection circuit breaker (RPO), using a PRAFIaDur 3x cable (the exact cross section will be calculated and set based on the length of the supply cable) that shall not be interrupted at any point of its route. Circuit breakers shall be visibly identified with a red label reading "EPS device, do not switch off!". The EPS system power supply shall comply with ČSN EN 54-4, and the entire EPS system shall comply with ČSN EN 54 and all related standards.

2.2.4 EPS computer add-on

To visualise EPS statuses, an add-on system called EPS AS 200 is in place at the HZS ŠA control centre. The EPS delivery includes integration and graphic visualisation of the statuses of the master control panel, fire detectors, sensed and controlled equipment, power supply back-up devices and other EPS equipment and elements.

The delivery shall also include all necessary infrastructures, i.e. cables lines, conversion units, controllers, etc. as far as the connection points.



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The graphic visualisation system and the split to individual bitmaps shall be compatible (integration) with the existing add-on and as required by HZS Škoda Auto a.s.

For a preview of the EPS computer add-on see Annexes No. 1 and No. 2

3. Operations after the EPS installation

3.1 Functional tests of the EPS

Pre-commissioning EPS tests (including the graphic add-on).

The tests shall be conducted by the organisation to supply the EPS technology; towards this end, the organisation shall provide demonstrably trained fitters or a group of fitters provided by the manufacturer. The tests shall be performed under ČSN 34 2710 Art. 9.2.

The takeover meeting will be called by the person responsible for the project implementation at the FIO/33 Department, after receiving the as-built PD. The EPS takeover report with the technology functionality test will be completed by the EPS Test Technician (FIO/33).

The commissioning is conditional upon approval by authorised institutions (HZS with local jurisdiction) under ČSN 34 2710 Art. 10.2 and insurers' requirements, if any (see Art. 10.3 ČSN 34 2710 – third-party approval).

3.2 Initial EPS electricity inspection

After completing the installation, the contractor shall perform the initial electricity inspection of the EPS system as an integral part of the system installation.

3.3 Coordinated functional tests of the EPS

If any controlled and monitored equipment is connected to the EPS system, the contractor shall perform coordinated functional tests of the entire system and draft a coordinated functional test report.

The coordinate tests shall include a check of operations performed by the EPS master control panel exit points and a check of the linked equipment (ČSN 73 0875 Art. 4.8.9.)

The following methodology is required for coordinated functional tests on ŠKODA AUTO a.s. sites:

- The tests are conducted in compliance with ČSN 73 0875 Art. 4.8 and related standards
- The tests are coordinated by the PBR designer/planner and are attended by test technicians responsible for all connected controlled and additional equipment items; the EPS Test Technician is responsible for the technical aspects of the test
- Prior to the coordinate test and in sufficient advance, each supplier of EPS-linked equipment shall provide an equipment functionality certificate, including a document to confirm that the link(s) to the EPS system has been tested (to be provided to the PBR maker)
- After providing all documents and certificates for the EPS-linked equipment, the Fire Specialist (PBR maker) shall produce a functional-test plan and send it, in sufficient advance, to all parties involved
- The coordinated functional test plan shall be used as the basis for setting the test date
- The coordinated functional test shall be attended by the PBR maker and all test technicians responsible for the linked equipment and EPS Test Technicians
- The coordinated functional test report shall be drafted by the PBR maker who is also coordinates the test

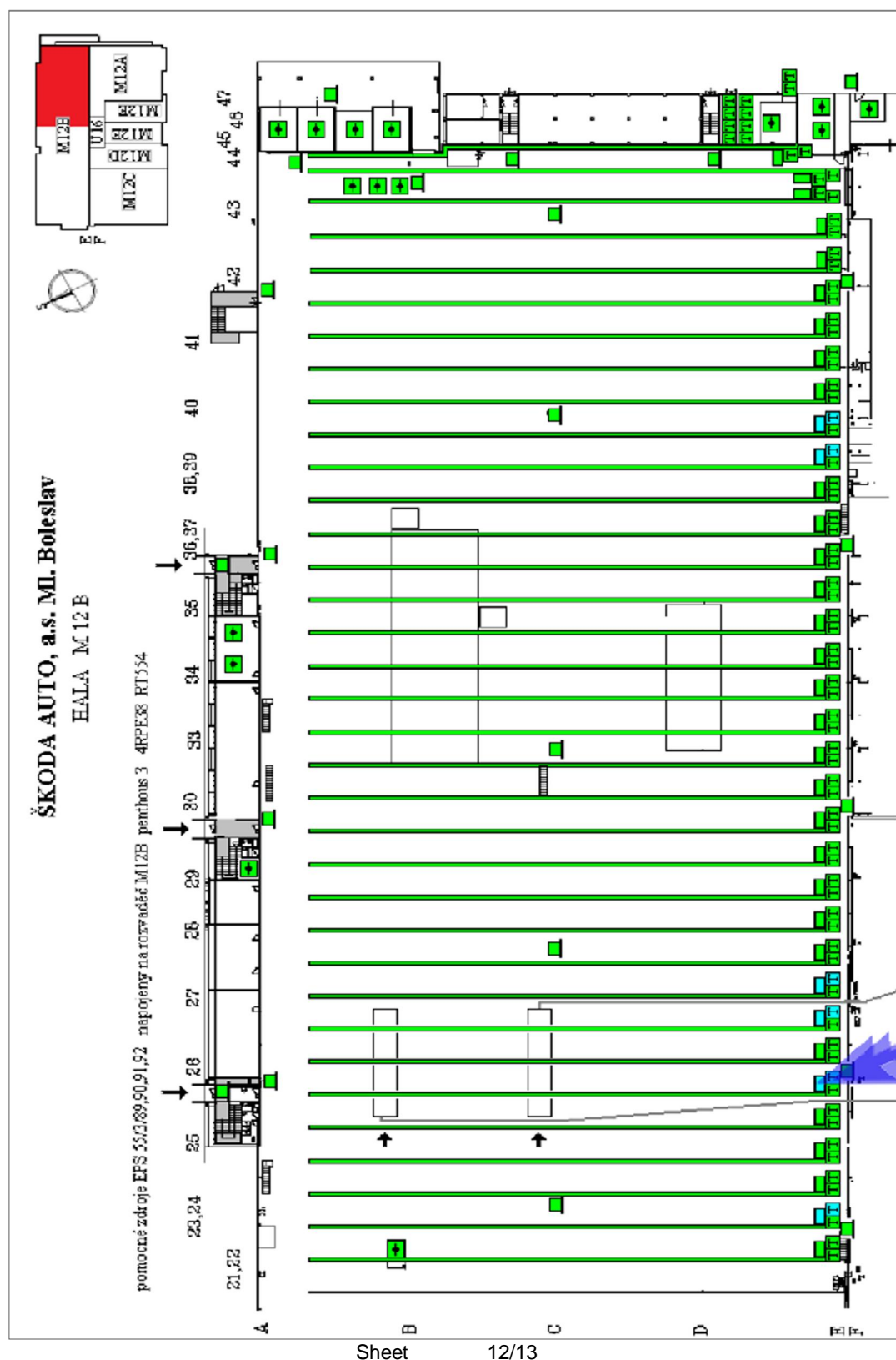
After completing the coordinated functional tests, no changes (SW, HW) shall be made to the EPS system that might have any impact on the operation of the EPS system and/or the controlled and monitored equipment. If any SW or HW changes are made, the whole test shall be repeated, including in the event that it is not possible to check correct functionality of any of the controlled equipment items during the functional test.



5.41 Electric fire alarm system

Amended: 2019-02-01

4. Annex No. 1 – Demo: EPS add-on at the HZS ŠA control centre – Hall M12B





5.41 Electric fire alarm system

Amended: 2019-02-01

5. Annex No. 2 – Demo: EPS add-on at the HZS ŠA control centre – Hall C/530

