

Usage area

Depending on where the equipment is to be utilised, the use of our products needs to be checked in advance for each project, taking into account the relevant technical regulations. We would specifically point out that special requirements may exist, depending on the project. They also need to be considered during the planning phase and therefore play a role when selecting products.

The remaining certificates of suitability, e.g. general building supervision permits for the German market, have preferably listed the usage area very specifically – sometimes with a reference to the relevant stipulations, standards and laws.

Depending on the project, it is absolutely possible that other documents or expertise are/is necessary to complete it or the products can also partly be viewed as items of furniture.

We would like to point out that this publication has been prepared with the greatest care. The stipulations, certificates of suitability, test reports or other technical evidence listed in it matched the latest standards at the time when it was prepared on the basis of technical standards known to us. They may of course deviate from the specifications provided in our catalogue because of changes to standards, approval procedures or expertise – or because of the expiry of periods of validity – and should therefore be viewed as non-binding.

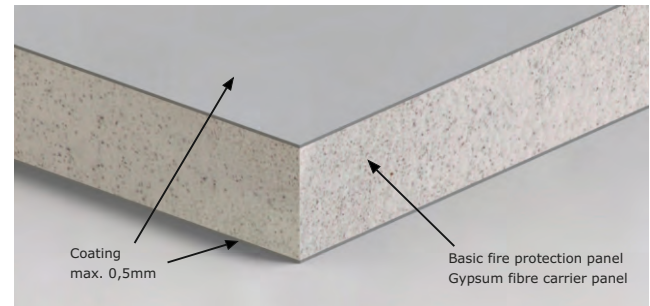
We would like to note that the remaining obligations to be careful must be noted. During any planning work, the local circumstances and any possible special features need to be taken into account. They may make additional surveys or statements or even additional checks necessary. These are normally the responsibility of the customer and should be coordinated with the relevant expert, building authorities or even through additional checks before the project is completed.

The illustrations and examples of drawings may represent discrepancies from the certified product designs. These deviations are usually based on experts' reports or individual certificates for particular projects. However, their admissibility must be checked separately in each case, as some of the project-related certificates can only be used for the special individual case, taking into account the particular situation.

The discrepancy (tolerance) for the systems amounts to no more than +/- 5 mm, depending on the type and design for production purposes, because of screw caps, and this does not represent a defect. The heat loss details relate to values determined mathematically and practical experiments with load resistance.

A minor change in the fire protection materials is viewed as a non-essential discrepancy and has therefore been confirmed and checked e.g. by the German Institute for Structural Engineering or in surveys. The "Basic Fire Prevention Panels, Non-Combustible" specification is based on the German

Circuit Systems Guideline Usage, the statement by the Building Ministers' Meeting on 5 November 2008 and the information from the German Regulatory Framework on Technical Building Stipulations (p. 52).



The items listed on these pages represent a selection of our range, which is normally based on the underlying permit or a permit in the application, extension or supplementary procedures and the scope of testing. If requested, we can provide many other sizes and designs that can be adapted to your project. All the data and specifications used in this publication may be changed and/or adapted at any time without any prior notice or justification by Celsion Brandschutzsysteme GmbH or its contractually associated partners or subsidiaries. We do not assume any liability that the content is correct, complete or tallies with the statutory provisions in each country. The additional European requirements in particular, which are sometimes needed e.g. for sustainability, must be checked separately for each project and, if necessary, the proof of this must be requested in advance when selecting products.

Our price information applies both without installation or assembly and the statutory rate of value-added tax must be added to the prices.

Additional costs may be incurred for notification on the phone, bringing the system into the building etc. In these cases, project-related quotations should be requested. The duplication and reproduction of this publication or sharing it are only permissible with our approval in writing. We would like to point out that additional requirements based on the current illustrated price list or the latest Celsion technical documents or those resulting from the information in the setup and operating instructions must be taken into account. The General Terms and Conditions of Business and the website, which are available at www.celsion.de, must be noted. Current issues or building law information is published here.

If you have any questions, please contact us on the phone or by e-mail. We trust that you will enjoy reading our new main catalogue.

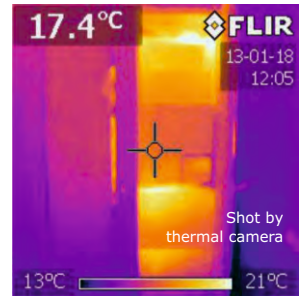
Calculating excess temperatures in fire protection cabinets - Adapted on the basis of DIN EN 61439-1 Supplementary Sheet 2

1. Calculating excess temperatures for permanent operations

Calculating excess temperatures in the air in fire protection cabinets that are operated permanently and during a fire takes place approximately according to DIN EN 61439-1 Supplementary Sheet 2 (VDE 0660-600-1 Supplementary Sheet 2) (Low-voltage Switchgear Combinations – Part 1: General Specifications; Supplementary Sheet 2: Processes to Prove the Warming of Low-Voltage Switchgear Combinations through Calculations (IEC/TR 60890:2014)). The calculations here are only approximate.

Extrapolation

Extrapolation is understood to be determining usually mathematical behaviour beyond the proven area. It can also be called a projection (approximate extrapolation).



The goal = determining the suitability of a fire protection cabinet to accommodate an electrical unit (creating functional integrity using freely configurable cabinets).

Conditions for approximate calculations

The following details are required from customers before making this kind of calculation:

1. The fire protection cabinet that is desired (cabinet type and size), citing the fire resistance time (30, 60, 90 minutes)
2. The desired type of installation (free-standing, wall attachment or in a niche)
3. The thermal power loss from the unit when operating normally and in a fire
4. Which ambient temperature is common at the place where the unit should be installed?
5. How many partition walls exist in the cabinet or are planned (horizontal bulkheads, shelves)? Does the second interior cabinet have active ventilation or not?
6. Does the cabinet, which may already exist, have ventilation openings or it is enclosed on all sides?
What are the cross-section and type of the ventilation openings?

Determining the warming of air within the cabinet during normal operations

Once we have all the necessary details, we perform an approximate calculation of the inner temperature on this basis, taking into account all the circumstances and how they interact (cabinet properties, depending on the type and series, ambient temperature, thermal power loss in the unit when operating normally, the number of openings in the ventilation system or the fan etc.).

According to the information in DIN EN 61439-1 Supplementary Sheet 2 (Low-Voltage Switchgear Combinations – Part 1: General Specifications; Supplementary Sheet 2: Processes to Prove the Warming of Low-Voltage Switchgear Combinations through Calculations (IEC/TR 60890:2014)), the interior area temperature may not exceed 35°C during normal operations. It should also be noted that the information in DIN EN 61439-1 Supplementary Sheet 2 only applies in a fire to a limited degree.

Please note the statement by the DKE (German Commission for Electrical Engineering) on 27 June 2003 on this matter

...The requirements in Section 6.1 of DIN EN 60439-1 (VDE 0660 Part 500):2000-08 related to ambient temperature and air humidity are normal ambient conditions during normal operations outside the switchgear combination, where the manufacturer has to guarantee the functions of the switchgear combination if there is no additional agreement. All the decisions taken in this standard, including the threshold excess temperatures, relate to these normal operating conditions.

Section 6.2 of DIN EN 60439-1 (VDE 0660 Part 500) determines that any differing conditions may and must be agreed. Operating switchgear combinations in fire conditions, as in your case, represents this kind of special operating condition. In a departure from the normal design of a switch cabinet, functional integrity in these conditions is only required for a closely restricted period (DIN 4102-12:30/60/90 minutes) in this connection. The threshold excess temperatures cited in VDE 0660 Part 500 are therefore only applicable to this operating situation to a limited degree. However, they must also be followed for fire protection distribution boards during normal operations without any effects of a fire, as these distribution boards are also fully covered by the usage area of this standard..."

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2. Calculating excess temperatures during a fire without any ventilation openings

Calculating excess temperatures in the air in fire protection cabinets that are operated permanently and during a fire takes place approximately according to DIN EN 61439-1 Supplementary Sheet 2 (VDE 0660-600-1 Supplementary Sheet 2) (Low-Voltage Switchgear Combinations – Part 1: General Specifications; Supplementary Sheet 2: Processes to Prove the Warming of Low-Voltage Switchgear Combinations through Calculations (IEC/TR 60890:2014)).

Changed conditions

Thermal power loss in a fire

Using the approximate calculations at 2/3 of the height of the increase in temperature in a cabinet in a fire, two things firstly need to be considered in relation to the thermal power loss in the electrical unit.

The thermal power loss specified by the customer for the unit needing to be enclosed normally acts as the basis for the calculations.

However, this is different for electrical units that are “on stand-by” – e.g. fire alarm units or voice alarm units. They are not triggered until a fire breaks out and only develop their full thermal power loss after being activated.

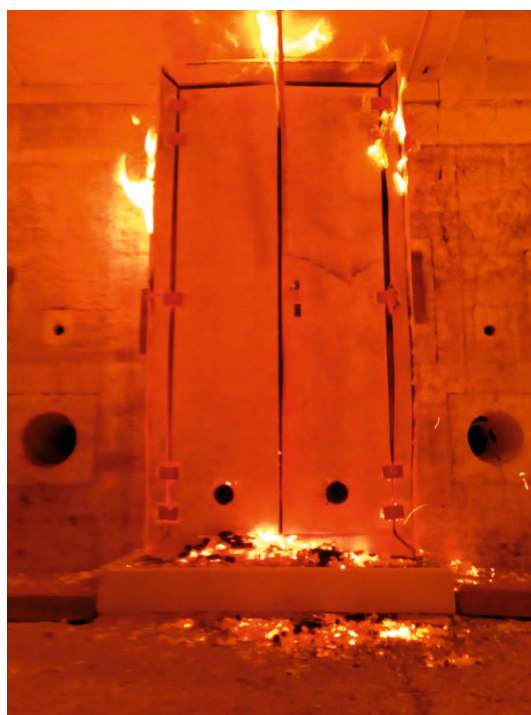
The value after the activation of the unit is therefore used as the basis for calculating the temperature increase in a fire.

Ventilation systems/fans in a fire

If the fire protection cabinet has a ventilation system or a fan, changed conditions apply to the calculation here too.

Our fire protection cabinets are equipped with ventilation systems that switch off automatically in a fire. The heat loss from the electrical unit can no longer make its way outwards and this, in turn, increases the temperature in the cabinet.

A cabinet without any ventilation openings therefore acts as the calculation basis in a fire.



Determining the temperature increase within the cabinet in a fire

The approximate calculation of the temperature increase in a fire is made on the basis of the changed conditions. These are added to the starting figure (calculated interior temperature during normal operations).

According to German working groups for testing and assessing the functional integrity of electric distribution boards (fire from outside), the temperature increase in a fire should not exceed 40 K. Installations may continue to function up to 75°C for a short time, e.g. according to EN 12101-10.

Depending on the calculation results, an assessment must be made on whether the cabinet is suitable or has to be adapted. Changes may involve, for example:

- Expanding the ventilation system or installing a ventilation system/fan
- Reducing the ambient temperature (changing the position where it is located)
- Enlarging the volume of the cabinet