

CERTIFIED VANDALISM PROTECTION FOR OUTDOOR CABINETS

FORCED ENTRY PROTECTION DETERS BREAK-INS TO ENSURE UNINTERRUPTED OPERATION OF CRITICAL ELECTRONIC COMPONENTS AND CABLE JUNCTION NODES. ADDITIONAL FEATURES OF OUTDOOR CABINETS SUCH AS SPECIAL SURFACE COATINGS ALLOW FOR EASY REMOVAL OF PAINT AND PLACARDS TO ENSURE LASTING ESTHETIC APPEAL.



Outdoor electronics cabinets are used in a wide range of applications. They house electronics and cable nodes of internet and telecommunication networks and control anything from traffic lights and railway safety systems to mission critical radar defense technology. In addition to harsh environmental conditions such as rain, heat, dust and snow, outdoor cabinets are frequently installed in public areas and subject to attack and abuse.

WHY IS VANDALISM RESISTANCE IMPORTANT FOR OUTDOOR CABINETS?

Vandalism and unauthorized access into the outdoor cabinet may result in serious problems when crucial safety, control and communication functions are interrupted because of theft or damage to valuable electronics and elaborate wiring inside the cabinets.

WHAT IS THE MOST SUITABLE LEVEL OF PROTECTION?

Elements to be considered when selecting the most suitable level of vandalism protection for an outdoor enclosure include the type of application, the environment and the impact of forced entries on critical systems. To aid in the selection process, it is helpful to define resistance levels based on risk factors.

The European standard EN 1627-1630 provides standardized test methods to ensure that outdoor cabinets reliably meet the specific protection levels of their respective resistance class.

These European standards were approved in December 2010 and adopted by the CEN member countries as national standards without alteration. In Germany, for example, these standards were adopted as national standards as DIN EN 1627-1630:2011-09 in September 2011, replacing the 12 year-old previous standard DIN ENV 1627:1999-04 ff.

The standards cover more than just outdoor cabinets and include testing and rating of resistance of door sets, windows, curtain walling, grilles and shutters against forced entry. Similar to previous standards, the new standards are structured in four sections:

- EN 1627:2011 defines the requirements and provides the classification of different levels of resistance classes.
- The additional three standards EN 1628, EN 1629 and EN 1630 describe testing methodology to determine resistance under static loading, dynamic loading and for manual burglary attempts.

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The new standards reflect state-of-the-art technology and current testing standards for forced entry resistant components such as locks or safety glass as well as improvements in testing methods for better reproduction of test results.

EN 1627 defines seven resistance classes (RC): RC 1 N, RC 2 N, RC 2, RC 3, RC 4, RC 5, RC 6. The higher the number, the higher the resistance level and better the protection. The new resistance classes RC 1 N and RC 2 N were created to specify the mechanical resistance of products such as windows and glass doors against prying while allowing the use of normal glass without resistance properties.

With the exception of resistance class 1, which requires more rigorous testing methods than in the old standard, the remaining resistance classes (RC 2 to RC 6) are comparable to previously established resistance classes WK 2 to WK 6 (WK from the German word "Widerstandsklasse"). Table 1 serves as cross reference for resistance classes.

In order to receive an RC certification, outdoor cabinets are submitted to an actual break-in attempt, using the specific sets

of tools and skills of the person outlined for each respective resistance class. Only if the outdoor cabinet successfully withstands the break-in attempts it receives the certification proving that it will provide the desired protection. To describe each protection level, the standard defines

- The type of intruder and his knowledge about the resistance of the outdoor cabinet
- His level of concern about the time it takes to force his entry into the cabinet and noise that he generates while breaking into the cabinet
- His knowledge about the likely rewards when succeeding in getting access into the cabinet and
- The level of risk he is willing to take

With increasing levels of resistance/protection, an intruder may become more experienced and committed, using more powerful tools.

The following table provides a description of the intruder personality and the tool sets for each of the resistance classes.

Resistance Class per EN 1627:2011-09	Resistance Class per DIN V ENV 1627:1999-04	Intruder Type	Tools
RC 1 N		Casual burglar who takes advantage of opportunities. Has no specific information on the level of resistance offered by the construction. Is concerned with both time and noise. No specific knowledge of the likely rewards is anticipated. The level of risk the burglar is willing to take is low.	Physical force such as kicking, jumping, shoulder slams, lifting up and tearing out. Primarily vandalism.
RC 2 N	1627:1999-04	Casual burglar who takes advantage of opportunities. Has little knowledge of the likely level of resistance. Is concerned with both time and noise. No specific knowledge of the likely rewards is anticipated. The level of risk the burglar is willing to take is low.	Simple tools e.g. screwdrivers, pliers, wedges or small handsaw.
RC 2	WK 2	Casual burglar who takes advantage of opportunities. Has little knowledge of the likely level of resistance. Is concerned with both time and noise. No specific knowledge of the likely rewards is anticipated. The level of risk the burglar is willing to take is low.	Simple tools e.g. screwdrivers, pliers, wedges or small handsaw.
RC 3	WK 3	The burglar typically attempts to take advantage of opportunities. Has some knowledge of the likely level of resistance concerned with both time and noise. No specific knowledge of the likely rewards is anticipated. The level of risk the burglar is willing to take is medium.	Additional screwdriver, crow bar and hand tools such as small hammer, pin punches and a mechanical drilling tool.
RC 4	WK 4	Practiced burglar. Is likely to be resolute in his efforts to gain entry. Is less concerned with the level of noise he produces. The burglar anticipates a reasonable reward. Is prepared to take a greater risk.	Additional heavy hammer, axe, chisels and portable battery powered drill.
RC 5	WK 5	Experienced burglar. Is resolute in his efforts to gain entry and is well organised. He also has little concern for the level of noise he generates. Anticipates a reasonable reward. Is prepared to take a high level of risk.	Electric tools such as electric drill, jig saw or sabre saw and an angle grinder with a disc of max. 125 mm diameter.
RC 6	WK 6	Experienced burglar. Is resolute in his efforts to gain entry and is very well organised. Has no concern for the level of noise he generates. Anticipates a good level of reward.	Heavy-duty electric tools, such as heavy-duty drill, jig saw or sabre saw, angle grinder with a disc of max. 230 mm diameter and spalling hammer.

Table 1: Cross reference of resistance classes EN 1627:2011-09 vs. EN 1627:1999-04

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High levels of protection are required when trying to prevent burglars from breaking into a house that are motivated to steal valuables. Outdoor cabinets typically don't contain any items that are valuable to intruders. The main threat to outdoor cabinets is vandalism. The resistance class RC 2 describes the most common intruder personality and tools used to damage outdoor cabinets and provides suitable vandalism protection. RC 2 certified outdoor cabinets provide the level of assurance to reliably protect against vandalism and support uninterrupted performance of systems housed in the cabinet.

HOW IS THE VANDALISM RESISTANCE ACHIEVED?

To provide effective protection against forced entry, RC 2 certified cabinets are built with well thought design that includes the use of robust materials throughout the entire structure, assembly screws which are only accessible from the inside, concealed hinges, multi-point door locking systems with robust, RC 2 certified handles and lock cylinders.

IN WHICH COUNTRIES DO THE STANDARDS EN 1627-1630 APPLY?

EN 1627-1630 were issued as European standards by the European Committee for Standardization, CEN (Comité Européen de Normalisation). The CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. The CEN member countries are Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and the United Kingdom.

In the U.S., Telcordia GR-487 is the de facto standard for testing outdoor cabinets. Developed by the traditional Bell System, it provides a wide range of performance-based tests with an à la carte list of testing procedures including security / alarms, firearms resistance, surface finish, metallic materials, polymeric materials, lifting details, bonding & grounding, AC power, exposure to high temperatures, thermal shock, water & dust intrusion, acoustical noise, fire resistance, corrosion resistance, shock and vibration and seismic resistance.

Most relevant to vandalism protection are the sections of Telcordia GR-487 concerning security (R3-60 / R3-66...), impact resistance (R3-199) and firearms resistance (R3-200 or CR3-201). Users should refer to specific sections of the standard as they apply to their installation. Requiring that an outdoor cabinet meet Telcordia GR-487 in its entirety is expensive and typically not required.

In China, the standard YD/T 1537-2006 "Generic Requirements for Telecommunications System Outdoor Cabinets" evolved from the Telcordia GR-487 standard and is specifically targeted to outdoor cabinets.

Another standard applicable to outdoor cabinets is GA/T 73-2015 that defines the burglar-resistance of mechanical locks and classifies them into two security levels, based on the resistance time against damage by drilling, sawing, prying, pulling and striking.

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