

BPS® M7

A new dimension of performance



Giesecke & Devrient
Creating Confidence.



Milestone in banknote processing

The BPS M7 adds a modular, high-performance banknote processing system to the product portfolio of Giesecke & Devrient (G&D). The BPS M7, based on the proven BPS 1000, is the new generation raising the benchmark for banknote processing in professional cash centers.

With a throughput of up to 120,000 banknotes per hour – i.e. 2,000 banknotes per minute! – the BPS M7 is setting new standards in terms of productivity. As with all G&D products, premium balancing accuracy and the easiest opera-

tion are a matter of course. The use of state-of-the-art sensor systems ensures reproducible evaluation of fitness for circulation. And the compact, fully automated NotaPack® packing solution lowers processing costs and ensures secure output of the processed banknotes.

Thanks to its modular construction, the BPS M7 can be configured for a variety of customer requirements in central banks, commercial banks, cash-in-transit companies, and casinos. It provides between 2 and 20 stackers, allowing a high degree of flexibility for optimum configuration.

An investment in the BPS M7 is a future-proof decision. The system can be integrated into existing infrastructures and workflows and expanded at any time to keep pace with changing business requirements.

Two processing options

The BPS M7 offers two banknote processing options.

Single-denomination:

- Sorting of all orientations and output of fit banknotes as banded packages and, optionally, as bundles
- Output or on-line destruction of unfit banknotes

Multiple-denomination:

- Deposit processing in one run with denomination and fitness sorting
- Even in the case of countries with over 50 different series, the BPS M7 can detect all banknotes in all four orientations in a single run – including comprehensive authentication and fitness sorting
- Header cards* enable processing of even small deposits with maximum productivity and secure accounting



* The header card technology used in this product has been licensed by Currency Systems International, Inc., of Irving, Texas on the basis of US Patent No. 5917930 and additional patents in other countries.

Even greater performance for the automated cash cycle

The requirements involved in automated cash handling have risen dramatically over the past few years. Here are the main causes:

- Growing variety of different security features
- Continually increasing complexity in banknote design
- Rising processing volumes
- Diversified measures for process optimization and increased productivity in the cash center
- Simultaneous processing of different denominations and series within a single run.

All of these factors make for unprecedented levels of complexity, which the BPS M7 easily masters with its state-of-the-art technology. This means completely new performance standards for banknote processing.

In its development of this trend-setting processing system, G&D was backed by many years of experience across the entire cash cycle – from banknote paper pro-

duction to banknote destruction. It has thus been possible to reach a further milestone in currency processing: The BPS M7 offers superior performance not only in terms of productivity and throughput, but also with regard to authenticity detection and fitness evaluation.

The result is a marked gain in quality, cost efficiency, and security.



State-of-the-art sensors for reliable banknote evaluation

All G&D banknote processing systems consistently use the same sensors or measurement principles. These high-quality sensors guarantee reproducible results and lasting durability. In implementing its sensor adaptations, G&D draws on years of experience with banknotes from over 100 countries. We optimize sorting so that all potential counterfeits known at the time of adaptation are detected and ensure that fitness inspection is aligned with human perception to as great an extent as possible. The system links every sensor's evaluations to reliable sorting decisions.

G&D sensors are recognized worldwide as the standard for banknote processing. Self-testing and integrated, sensor-

specific adjustment and calibration options enable evaluation of the following properties with minimal reject rates:

- Classification by denomination, emission, and orientation
- Authentication at all security levels
- Fitness evaluation for banknote circulation

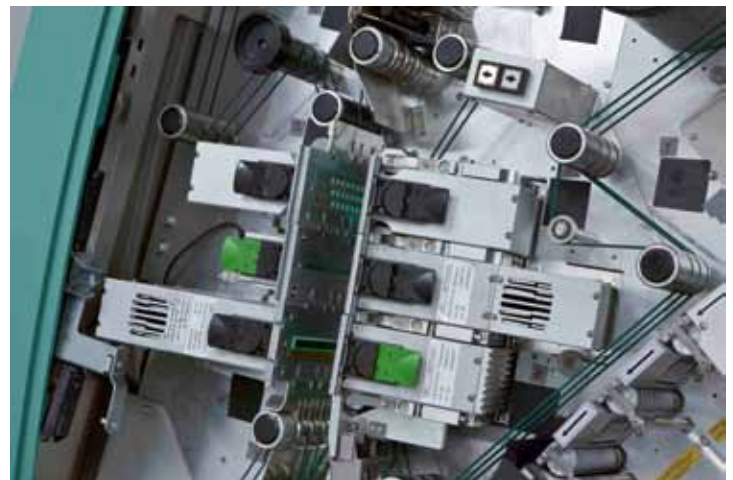
Adaptation tools allow highly flexible system adjustment in line with the features and properties of each national currency or individual banknote series, whether the substrate is paper or polymer and independent of the design. Alignment with calibrated reference media and the high stability of the sensors enable reproducible results without machine-specific adjustment.

Sensor section and sensors

The BPS M7 has 12 sensor stations, 8 of which are double-sided, and enables flexible sensor implementation for tailored solutions, as well as the integration of customer-specific sensors.

The standard sensor section is equipped with an end-to-end round-belt transport system (left image), permitting full-face measurement on both sides of the banknote. The round-belt system treats the banknotes with extreme care and provides reliable transport even for banknotes of very poor quality.

A "beltless sensor section" option (right image) transports the banknotes through the





NotaScan 2 and the DIS 2 thickness sensors without belts. This enables unobstructed full-face measurement of their optical transmission and thickness properties. G&D recommends this option for banknotes in good condition. It can be retrofitted on site.

To enable user-friendly cleaning of the measuring heads, the NotaScan 2 and DIS 2 sensors can be opened and closed at the push of a button. A special cleaning light is activated when the NotaScan 2 is open. This renders soiling visible to make targeted cleaning easier.

NotaScan® 2

The color cameras on the NotaScan 2 allow full-face measurement of both sides of the banknote in the red, green, blue, and infrared spectrum (RGB + IR). The transmission is also measured.

The resolution of 0.2 x 0.2 mm² (125 dpi) is the same for all processing speeds in the BPS M7. Self-testing and automatic white balance based on integrated, full-face reference elements ensure the long-term consistency of measurements. It is not necessary to process specially selected banknotes or test media before starting the shift.

NotaScan 2 is the core component of the sensor system and is used for optical evaluation of banknote authenticity and fitness.

- Banknote classification
 - Denomination, series, orientation
 - Format
- Authentication
 - Infrared properties
 - Watermarks
- Fitness evaluation
 - Optically variable devices (OVDs), such as LEAD® and other foil applications
 - Holes, tears and missing parts
 - Differentiation between missing corners and dog-ears (optional)
 - Degree of soiling
 - Stains, graffiti
 - Wear properties of printing ink
- Serial number detection
 - Recording and logging
 - Comparison with search list
 - Comparison of banknote serial numbers
 - Comparison of serial numbers on each individual banknote

(More detailed information can be found in our separate brochure for the NotaScan 2)

DIS 2

The DIS 2 thickness sensor recognizes double and multiple items, tape, and tears. It uses 24 tracks to measure the thickness or, more precisely, local grammage of banknotes at a spatial resolution of 2.0 x 3.4 mm².

- Counting accuracy
 - Detection of double and multiple items with unprecedented accuracy
- Authentication
 - Micro-perforations
- Fitness evaluation
 - Tape
 - Tears, holes
 - Optional: limpness

(More detailed information can be found in our separate brochure for the DIS 2)

Additional optional sensors

- Sensors to detect fluorescence/phosphorescence in printing ink and presence of optical brighteners in paper
- Sensor for magnetic properties
- Sensor for electrical conductivity
- Special sensors for G&D high-security features
- Possible integration of buyer-supplied detectors (BSDs)



Stacker 5 € 100

0012



High performance and ease of operation at every process step



Banding

Each stacker has an automatic on-line bander using a PE-coated, 40-mm-wide paper band to wrap packages of 100 banknotes. These can be printed with up to 80 characters or graphical elements such as the customer logo. The band is printed right before use to ensure that a direct reference to the processing data is established.

Dual supply bander

The dual supply bander (DSB) can be filled with two full band reels and automatically switches from an empty to a full reel. This enables the system to continue working without interruption and maintains maximum productivity.

Bundling and packing (optional)

The automatic on-line bundling wraps 10, or optionally 5, banded banknote packages in transparent PE film. This can be 75 to 106 mm wide, depending on the banknote format, and enables secure transport of the banknotes to a fully automated packing system or further manual processing point.

Advantages of on-line bundling:

- No additional space requirements thanks to complete integration in output module
- Bundling reliability:
 - Secure placement of packages within output channel

- Automatic adjustment to bundle height, which is dependent on banknote quality
- Collision-free transfer of bundles to conveyer belt, even in systems with 20 output stackers
- Transparent film for unlimited visual control of bundles from all sides
- Retrofitting of bundler function possible on site

Packing system

The NotaPack takes the bundle from the BPS M7 and packs it in a transparent and tamperproof shrink-wrap. The compact system boasts an energy-saving design tailored specifically to packing banknotes.

- Full accessibility: the conveyer belt can be horizontally shifted for unhindered access to banknote transport and the BPS M7 stackers
- The bundles can be labeled with processing data (optional)
- Up to four BPS M7 machines can be connected to one NotaPack
- An unlimited number of denominations can be packed simultaneously, even if these have different formats



(More detailed information can be found in our separate brochure for the NotaPack)



Output of loose banknotes (optional)

The large delivery module (LDM) has two independent output sections that can each hold more than 2,000 loose banknotes. These can be used to collect banknotes for a second sorting run, for example, or to stack loose banknotes for filling cash dispensers. The banknotes can be removed easily and securely with the removable cartridges.

On-line shredder (optional)

Unfit banknotes can be destroyed on-line using the shredder module, with highly accurate counting ensured. The shreds are disposed of by external suction systems such as the DAG II or the BDS 400, including briquetting.

Reliable destruction:

- Shredder rate of up to 100% without any reductions in throughput
- Highly durable hard metal shredder blades
- Mechanical precision of shredder blades results in clean cutting and low energy consumption
- Each banknote is completely destroyed in less than 30 milliseconds with a longitudinal cut and cross-tear (security level 4 in accordance with DIN/EN 32757-1)

Highest counting accuracy:

- Redundant counting and recording of destroyed banknotes: even if the power supply fails or control system components malfunction, clear reconstruction is possible to identify which and how many banknotes were actually destroyed
- The shredder display shows the number of destroyed banknotes – even during a power failure
- A light curtain records all shredder signals during the destruction procedure to document them in the event of transport disturbance or operator intervention



Ergonomics and ease of operation

Ergonomics

All aspects of the BPS M7 design take account of ergonomics. Intuitive and fatigue-free operation enables optimum productivity. All operating controls are easy to reach and support clear operator guidance.

Operator screen

- Brilliant 15" TFT touchscreen
- Electrically adjustable for optimum viewing angle
- Graphical user interface

Dust vacuuming (optional)

The suction unit removes and filters dust from the system

- Dust is vacuumed directly where it accumulates during processing, so less dust is released, adverse health effects are minimized and the machine stays clean
- Sensors stay cleaner longer
- Integrated vacuum hose simplifies cleaning of the sensor section

Operation

- Ergonomic filling of the singler
- Automated singler cover reduces noise and prevents dust escaping
- Pneumatic operation of module covers:
 - Automatic opening of individual module covers guides operator
 - No exertion required for manual opening of covers
 - Automatic closing at the push of a button
- Each functional unit has a separate operator keyboard, e.g. to refill consumables
- Ergonomically optimized position for seated or standing operation with optional base

Documentation and training

The BPS M7 operating manuals provide a clear description of all key system functions and detailed information on system handling. G&D offers structured training courses based on this documentation to quickly familiarize operators with the system.

The detailed service manuals support the field engineers in maintenance, diagnosis, and repair work.

The electronic spare parts catalog is updated at regular intervals and delivered on CD. This provides a simple, interactive process for identifying and ordering spare parts using three-dimensional exploded views.



Highest security – from input to output

User administration

User administration takes place centrally and can also be performed on a separate PC, independent of the machine.

- User groups and user rights can be set and changed by the customer and are stored on the chip card
- Each user is identified by a personalized chip card and PIN
- This also supports user administration on different machines when passwords or PINs are changed
- The chip card authorizes operation of several machines, even at different sites
- For certain tasks, such as recovery from a jam in the shredder area, a second operator may be required to log on (dual control principle)

Redundancy

Redundant storage of all data related to counting and accounting provides maximum security against data loss.

This includes:

- Integrated, uninterruptible direct-current power supply to protect against mains failure
- Oracle® database system with secure transaction design and backup function
- Battery-buffered RAM in the decentralized control computers
- Data recovery following component failure on the basis of redundant records
- Redundant hard disks (RAID-1) with recovery of all data after hard disk failure

Single-source architecture

The programs, adaptations and all corresponding configuration parameters are stored at just one place in the system and distributed at start-up. This ensures that all systems behave identically and means that software updates only need to be loaded at one location.

Authentication (optional)

Authentication generates a unique signature for all stored information (message authentication code; MAC). A secret

DES key known only to the customer enables detection of unauthorized changes or manipulation of the following data types:

- Executable programs and count-related configuration parameters
- Deposit-related processing data
- Accounting-related reports and log data, in connection with the PC Verification Station (PCVS,) if applicable

Network

The BPS M7 can be connected directly to the customer's IT system to transfer electronic reports. Windows® XP and the Oracle® database provide the platform for flexible and secure data transmission. In addition, G&D offers comprehensive software solutions for currency processing.

- The Compass^{CM}® cash center management system for deposit accounting and efficient control of cash processing and management
- The Management Information System (MIS) for system-wide recording and analysis of banknote processing at a central location, including identification of changes in banknote quality and optimization potential in processing (business intelligence)



Continuous banknote feeding for increased productivity

Workflow optimization

The operating area between the singler and the reject compartment is designed so that all controls can be easily reached.

- Around 4,000 banknotes can be fed into the machine per load – a volume large enough for a processing time of up to 120 seconds at top speed. The operator can perform other tasks on the machine during this time
- The input level is always within the optimum ergonomic range since the collecting plate moves downward as soon as banknotes are inserted

- Singler compartment opens and closes automatically, reducing noise and vacuuming dust from the machine without any impact on the operator's health

Advantages of the Large Continuous Feeder (LCF)

- Continuous reloading and uninterrupted singling
- High singling speed of 22 or 33 banknotes per second
- Very large feeding compartment: stack height of up to 550 mm corresponds to capacity for approximately 4,000 banknotes
- Banknotes of all quality levels and formats (even mixed) are singled

- Minimal reject rate thanks to adaptive guide elements and parallel banknote alignment
- Efficient and ergonomic processing with
 - Optimum positioning of input level
 - Separate feeding of rejected banknotes for the rerun
 - Parallel feeding with further deposits
- Automatic opening and closing of singler cover
- Use of header cards for continuous, efficient processing of smaller deposits (optional)



Essential improvements at a glance



Applications

Tailor-made customization

- 2 Enhanced thickness detector (DIS 2)
- 3 Enhanced high-resolution image sensor (NotaScan® 2)
- 8 Graphical band printing
- 10 On-line shredder monitoring

Performance

Productivity gains

- 1 Increased speed (22 or 33 BN/s)
- 5 Large Continuous Feeder (LCF)
- 7 Dual Supply Bander (DSB)
- 9 Automated covers (open/close)

Sensor Technology

New generation of fitness sorting

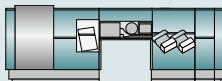
- 2 Enhanced thickness detector (DIS 2)
- 3 Enhanced high-resolution image sensor (NotaScan® 2)
- 4 Sensor dust suction

Ease of Use

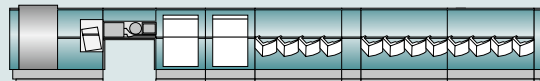
More complex products for less specialized staff

- 4 Sensor dust suction
- 5 Large Continuous Feeder (LCF)
- 6 Touchscreen
- 9 Automated covers (open/close)

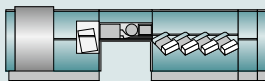
BPS M7-2SB
BPS M7-2SB-33



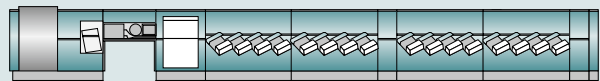
BPS M7-16LL-33



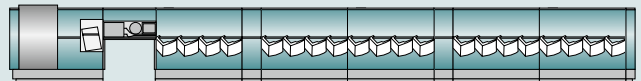
BPS M7-4SB
BPS M7-4SB-33



BPS M7-18LSB



BPS M7-20-33





Technical Data

Dimensions in mm (L/B/H)

- BPS M7-2SB: 3,493 x 1,010 x 1,156
- BPS M7-4S: 4,093 x 1,063 x 1,156
- BPS M7-18LSB: 9,258 x 1,010 x 1,156
(Can be disassembled into modules for transport)

Weight (approx.)

- BPS M7-2SB: 1,000 kg
- BPS M7-4S: 1,050 kg
- BPS M7-18LSB: 2,860 kg

BN formats accepted

- Length: 100–180 mm
- Width: 60–90 mm

Maximum throughput

- BPS M7-22: 80,000 BN/h (22.2 BN/s)
- BPS M7-33: 120,000 BN/h (33.3 BN/s)

System availability

Typically > 96% (depending on maintenance contract)

Power supply (integrated)

- 230 V/400 V, 50/60 Hz
- 120 V/208 V, 50/60 Hz

Power consumption

- BPS M7-4S-22: 2.8 kW (at 50% shredder rate)
- BPS M7-4S-33: 3.7 kW (at 50% shredder rate)
- LVM.S pneumatic module: 4.5 kW
- Dust suction: 1.0 kW (approx.)

Ambient requirements

- Ambient temperature: 18–30°C (continuous operation)
- Relative air humidity: 40–80%

Noise emission at workstation

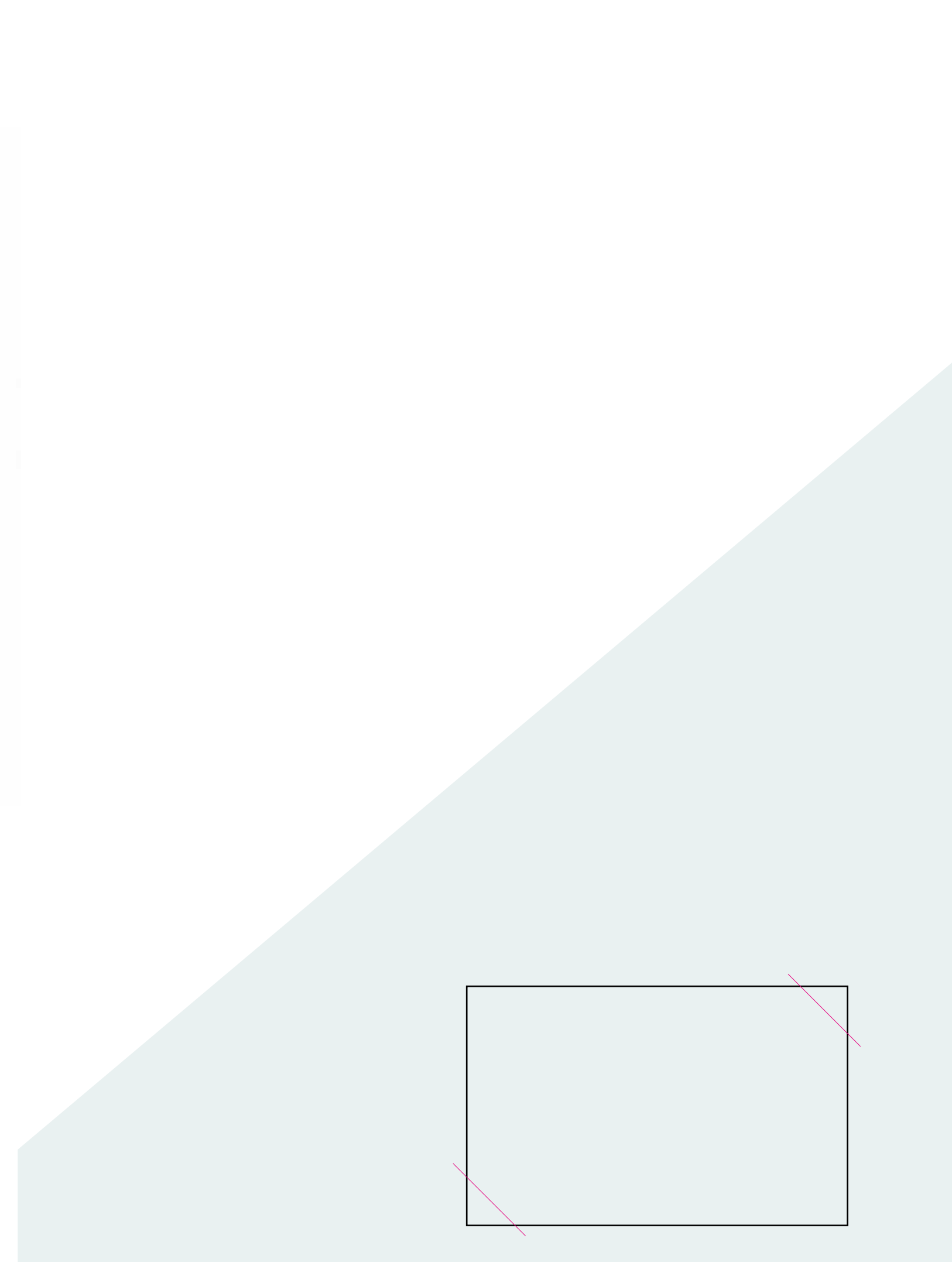
- BPS M7-22: 64–71 dB(A)
- BPS M7-33: 64–75 dB(A)

Footprint (BPS M7-4SB)

Approx. 25 m²

Certifications

- CE labeling
- GS mark for "tested safety"





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