

# 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 operation 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 eries, 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

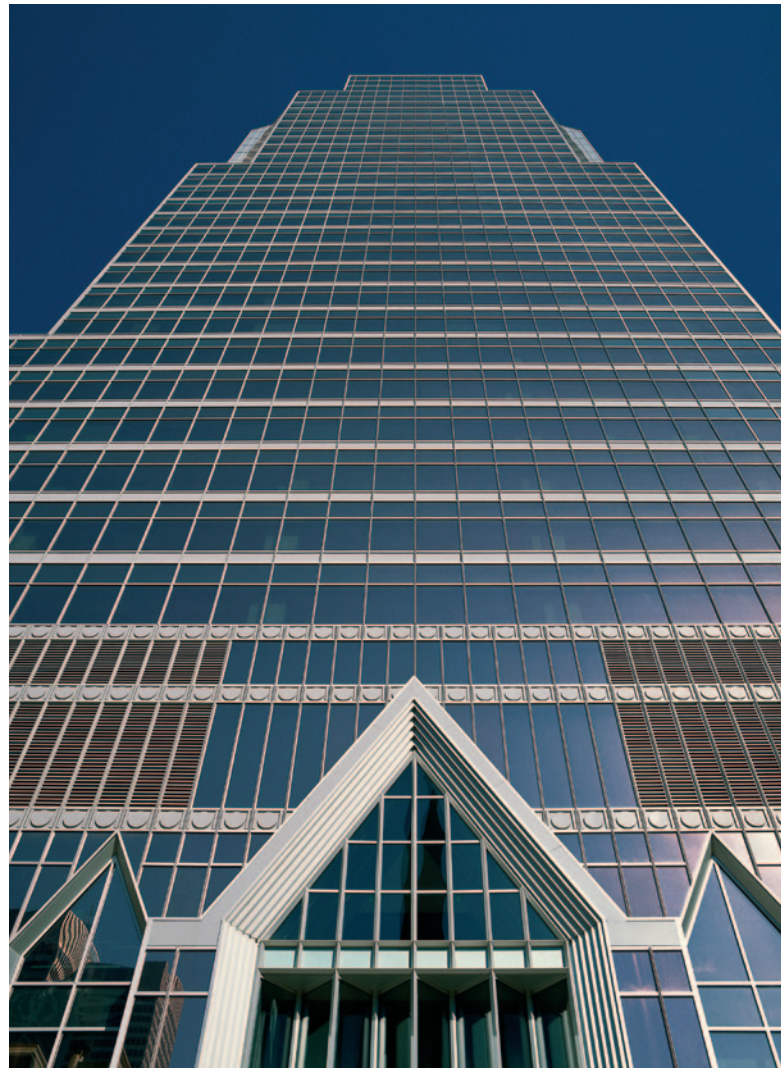
The requirements involved in automated cash handling have risen dramatically over the past few years. Here are the main causes:

- Growing variety of security features
- Increasing complexity of banknote design
- Rising processing volumes
- Cash center measures to optimize processes and increase productivity
- Simultaneous processing of different denominations and series within a single run

All of these factors make for unprecedented levels of productivity, 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 trendsetting processing system, G&D was backed by many years of experience across the entire cash cycle – from banknote paper production 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 authentication 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, series, 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.

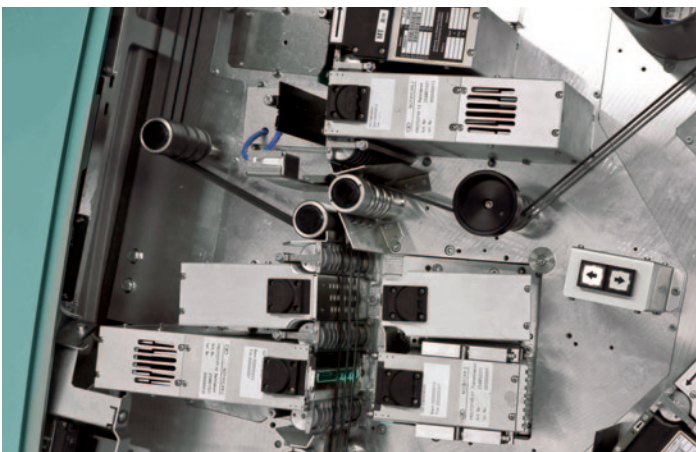
## Sensor section and sensors

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 custom-specific sensors.

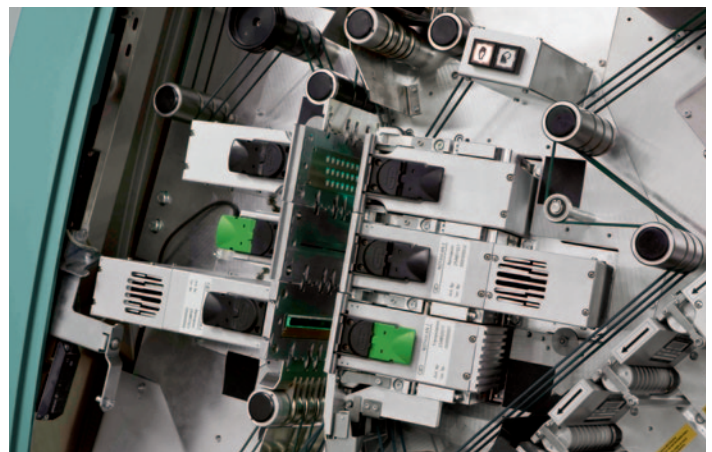
The standard sensor section is equipped with a round belt transport system (left image), permitting full-face measurement on both sides of the banknote. The round belt system treats the banknotes with extreme care and provides reliable transport even for banknotes of very poor quality.

A “belt-free sensor section” option (right image) transports the banknotes through the NotaScan Image and the NotaScan Profile 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 Image and NotaScan Profile sensors can be opened and closed at the push of a button. A special cleaning light is activated when the NotaScan Image is open. This renders soiling visible to make targeted cleaning easier.



NotaScan Image with round belt banknote transport



NotaScan Image with belt-free banknote transport



## NotaScan® Image

The color cameras on the NotaScan Image 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 mm<sup>2</sup> (125 dpi) applies to the processing speeds of 22 and 33 banknotes per second. 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 Image 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
  - Comparison of serial numbers on each individual banknote for the detection of composed banknotes
  - Recording and logging
  - Comparison with search list

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

## NotaScan® Profile

The NotaScan Profile 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 mm<sup>2</sup>.

- 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 NotaScan Profile)

## 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
- NotaScan Ink for detection of advanced infrared properties
- Possible integration of buyer-supplied detectors (BSD)

# 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. Empty reels are indicated on the operator screen.

## Bundling and packing (optional)

The automatic on-line bundling system 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.

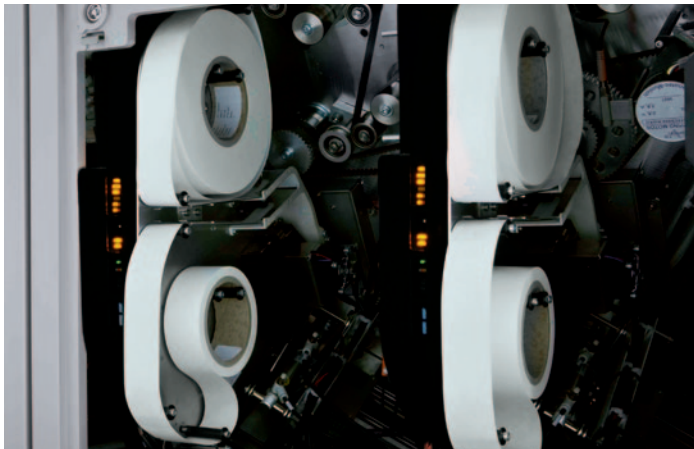
- Automatic adjustment to bundle height, which is dependent on banknote quality
- Collision-free transfer of bundles to conveyor belt, even in systems with 20 output stackers
- Transparent film for unlimited visual control of bundles from all sides
- Retrofitting of bundler function possible on site

## Packing system

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

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.



Dual supply bander (DSB)



Bundler delivery module





- Full accessibility: the conveyor belt can be shifted for unhindered access to banknote transport and 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



Large delivery module (LDM)

# Ergonomics and ease of operation

## Ergonomics

All aspects of the BPS M7 are designed with ergonomics in mind. Intuitive and fatigue-free operation enables optimum productivity. All operating controls are easy to reach and support clear operator guidance.

### Operator interface

- 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
  - Closing for individual modules at the push of a button or centrally via touchscreen
- Each stacker has a separate operator panel, 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.

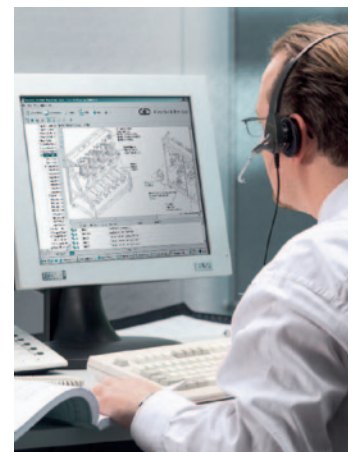
The electronic spare parts catalog is updated at regular intervals and delivered on CD. This provides a simple, interactive process for identifying and ordering spare parts using three-dimensional exploded views.



Tilting touchscreen



Operating manual



Service support line



# 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 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:

- Compass VMS®: Vault Management System for cash centers to manage vault stocks and customer accounts, deposit processing and balancing, and header card processing
- BPS Connect: Processing support for production and reporting, e.g. balancing of deposits incl. preparation and reconciliation with header card processing. BPS Connect also provides dashboard displays for accumulated processing volumes

# 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 at the push of a button for 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)



Large continuous feeder (LCF)



Automatic module cover

# Essential improvements at a glance



## Applications

Tailor-made customization

## Performance

Productivity gains

## Sensor technology

New generation of fitness sorting

## Ease of use

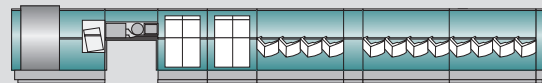
More complex products, less specialized staff

- |  |   |   |  |
|--|---|---|--|
| <ul style="list-style-type: none"> <li>➊ Enhanced thickness detector (NotaScan Profile)</li> <li>➋ Enhanced high-resolution image sensor (NotaScan Image)</li> <li>➌ Graphical band printing</li> <li>➍ On-line shredder monitoring</li> </ul> | <ul style="list-style-type: none"> <li>➎ Increased speed (22 or 33 BN/s)</li> <li>➏ Large Continuous Feeder (LCF)</li> <li>➐ Dual Supply Bander (DSB)</li> <li>➑ Automated covers (open/close)</li> </ul> | <ul style="list-style-type: none"> <li>➒ Enhanced thickness detector (NotaScan Profile)</li> <li>➓ Enhanced high-resolution image sensor (NotaScan Image)</li> <li>➔ Sensor dust suction</li> </ul> | <ul style="list-style-type: none"> <li>➕ Sensor dust suction</li> <li>➖ Large Continuous Feeder (LCF)</li> <li>➗ Touchscreen</li> <li>➘ Automated covers (open/close)</li> </ul> |
|--|---|---|--|

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



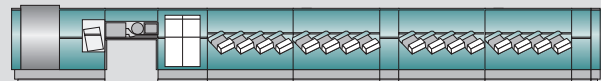
BPS M7-16LL-33



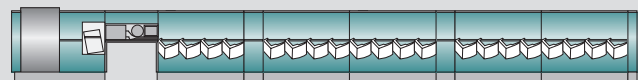
BPS M7-4SB  
BPS M7-4SB-33



BPS M7-18LSB

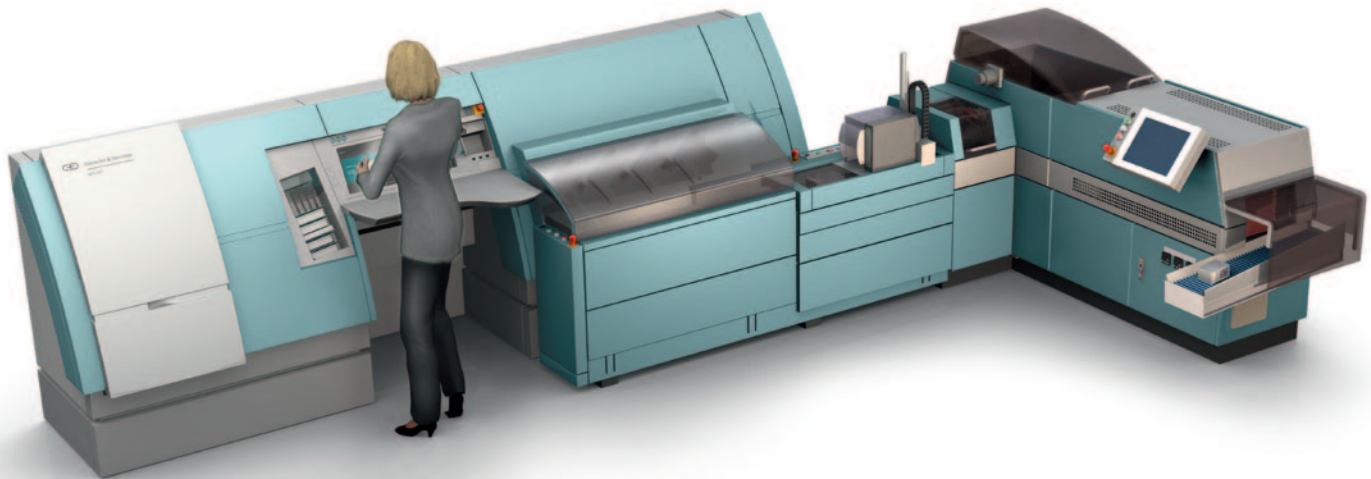


BPS M7-20-33





# Integrated solution: BPS M7 with NotaPack<sup>®</sup> packing system



## Technical Data

### Dimensions in mm (L/W/H)

- BPS M7-2SB:  
3,493 x 1,010 x 1,221
  - BPS M7-4S:  
4,093 x 1,063 x 1,221
  - BPS M7-18LSB:  
9,258 x 1,010 x 1,221
- (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 service conditions)

### 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: 4.1 kW
- Dust suction: 1.0 kW  
(approx.)

### Ambient requirements

- Ambient temperature:  
15–30 °C (continuous operation)
- Relative air humidity:  
30–80%

### Noise emission at workstation

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

### Footprint (BPS M7-4SB)

Approx. 25 m<sup>2</sup>  
(incl. traffic area)

### Certifications

- CE labeling
- GS mark for “tested safety”





## Giesecke & Devrient

Giesecke & Devrient GmbH

Prinzregentenstrasse 159

P.O. Box 80 07 29

81607 Munich

GERMANY

Phone: +49 (0) 89 41 19-0

Fax: +49 (0) 89 41 19-85 20

[www.gi-de.com](http://www.gi-de.com)

[gd.sales@gi-de.com](mailto:gd.sales@gi-de.com)

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