



VISIONIK®

EcuBPS

BPS1.ECU

Basic unit, without cards

Communications device for VISONIK systems featuring the following:

- **Basic unit with motherboard, power supply, and tool interface**
- **Plug-in program and communication cards**
- **Connections for SDLC, local printer, modem, or Ethernet**
- **Operation and display via BAccess, operating cards, terminal, or PC**

The EcuBPS is based on the VISONIK BPS.

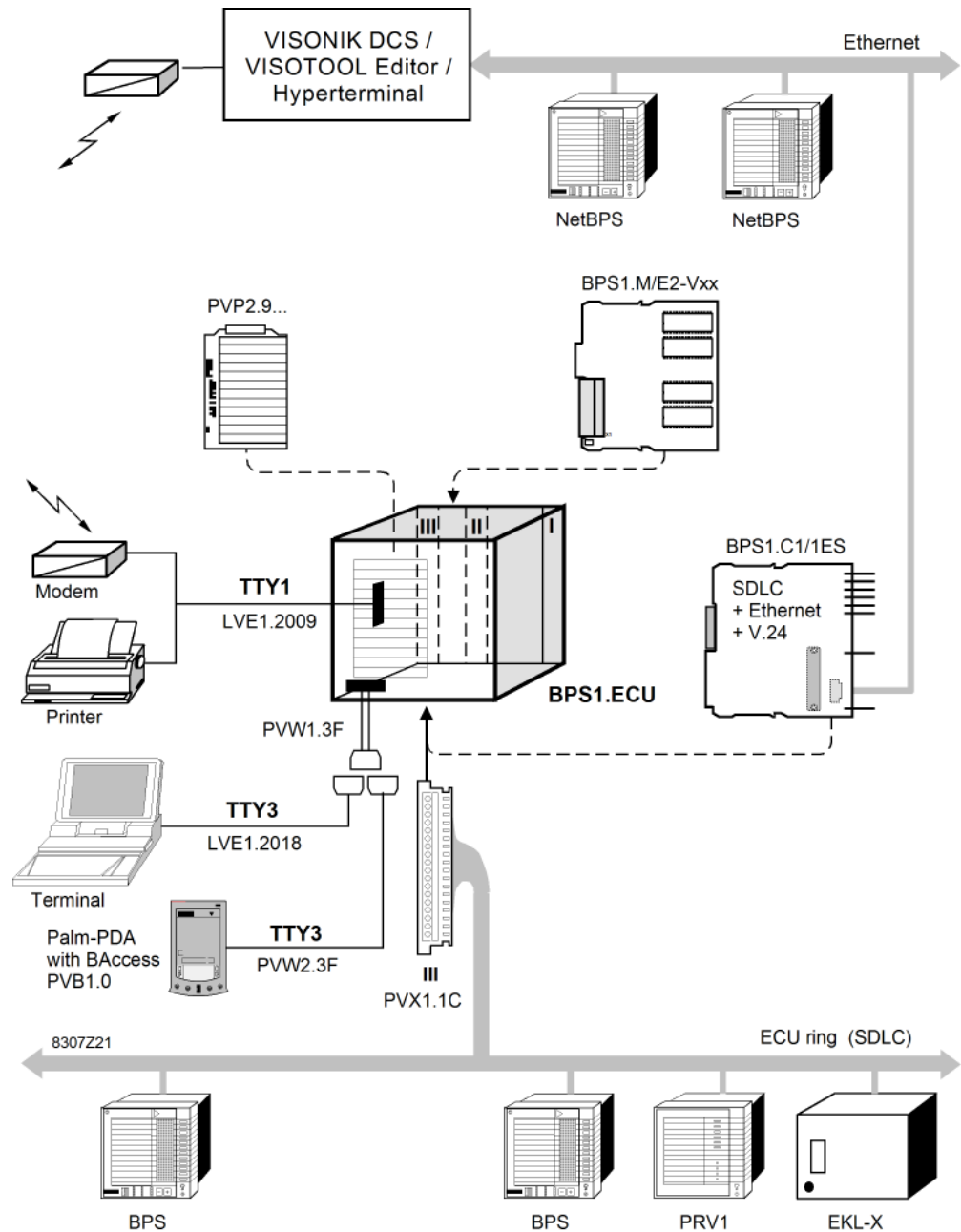
Use

Section	<p>The EcuBPS is used for separate SDLC rings. On the SDLC ring, it is used as a ring master and Enhanced Communication Unit (ECU) for the process stations on the ring. EcuBPS communications tasks are:</p> <ul style="list-style-type: none"> • Forwarding data of individual process stations to device on or outside the ring such as a shared printer or the superposed Data and Communication Server (DCS). • Reception of partner data outside the ring and forwarding of that data to the individual process stations such as operation from DCS or teleterminal. <p>Connections to the superposed DCS via telephony, V.24 connection without modem, or Ethernet connection are possible.</p>
Note	Field busses or field devices cannot be operated on the EcuBPS.
VISIONIK system family	The EcuBPS can be used in VISONIK systems from DCS V2x12.

System overview

Structure and devices

The following illustration shows the EcuBPS in the VISONIK system and provides an overview of the pins and connections and accessories:



Explanations
(illustration)

These are the partner devices and restrictions of the EcuBPS in the VISONIK system:

- Max. **34** process stations (BPS, PRV1, EKL-X) on an SDLC ring of the EcuBPS.
- BAccess, Hyperterminal or VISOTOOL Editor on PC for local operation on TTY3 **or** remote operation via Ethernet.

Alternative connections on TTY1:

- Local printer for messages from all process stations in the ring.
- Modem to connect to partner stations outside of the ring.
- Two possible telephony partners:
 - Partner 1: VISONIK Data and Communication Server (DCS) V20 or higher.
 - Partner 2: Teleprinter **or** teleterminal **or** Tele-PS.

Connection to a superposed DCS:

- via modem on TTY1 (Operating mode as Tele ECU).
- via Ethernet. (Operating mode as Net ECU).

Notes on the Net ECU connection mode

In the Net ECU operating mode process stations on Ethernet (Net BPS) can exchange COLBAS data with the Ecu BPS as well as with process stations in the ring.

In the Net ECU operating mode telephony connections are not possible.

Type summary

Basic unit

Designation

BPS housing with ECU motherboard and tool interface TTY3.

Type

BPS1.ECU

Ordering

Each basic unit accommodates an ECU motherboard and a power supply. Terminal block I is added. The unit is supplied for flush panel mounting without base plate required for wall mounting/control cabinet integration.

The EcuBPS requires a program card and one of the following communication cards. Order the required program and communication cards as well as the accessories separately-delivery occurs separately.

Cards

Designation

COM1 communication card for SDLC
+ Ethernet
+ V.24 on TTY1.

Type

BPS1.C1/1ES

Program card with system software.

BPS1.M/E2-Vxx *)

*) The version designation /Vxx is a part of the ASN number and must be indicated on ordering; for example BPS1.M/E2-V20 (/Vxx corresponds to the current version).

Accessories

Designation

Terminal block III for SDLC and field telephone (4 items)

Type

PVX1.1C

Base plate for wall mounting (10 items)

PRM1.1W

SDLC ring terminating resistor (10 items)

PVR1.180

Modem cable with D-sub plug 25-pin, int/ext, RXD/TXD straight.

LVE1.2009

Adapter with D-sub plug 25-pin/int. on tool interface TTY3 on the unit front.

PVW1.3F

Tool connection cable for BAccess

PVW2.3F

Operating cards	Designation	Type
	POPcard operation (service cards VISONIK BPS) in German.	PVP2.9D
	POPcard operation (service cards VISONIK BPS) in English.	PVP2.9E
	Preprinted POPcards for project cards, paper (250 sheets)	PUP1.1
	Preprinted POPcards for project cards, plastic (100 sheets)	PUP2.1
	Card holder (100 items)	PUP1.2

BAccess	Designation	Type
	BAccess licence for operating the EcuBPS with a PDA (Palm).	PVB1.0

Functions

ECU functions The EcuBPS has three main communication functions:

Function	Description
Routing	Forwarding of data (telegrams) from the individual process stations to, e.g., a DCS or printer.
Telephony	Automatic dialling to the configured partner.
Ring master	Taking over the master function on the relevant SDLC ring.

Refer to the EcuBPS basic documentation CM2P8307en for more information on the functions.

Operation and display The dialog containing the unit's functions from operating cards and associated displays and operating buttons is described in section "Mechanical design".

Service and diagnostic functions The EcuBPS supports service and diagnostic functions as follows:

- Tool connection on the unit front for commissioning, subsequent configuration changes, and service.
- Service and diagnostic cards for service (same cards as for VISONIK BPS).

Function reliability The unit's response with regard to function reliability and system safety is described in section "Technical design".

Equipment combinations

Cards Only one of the following cards can be inserted in the BPS1.ECU basic unit at a time. The program card is always required. The communication card required depends on the planned application. The system overview in this document as well as the respective communication cards' data sheets provide help for selection.

Card	Type	Data sheet
Program card	BPS1.M/E2-Vxx	N8317
Communication card COM1	BPS1.C1/1ES	N8313

Partner stations The system overview in this data sheet shows the type of partner station able to communicate with the EcuBPS.
The final composition and number of partners depends on the project.

Technical design

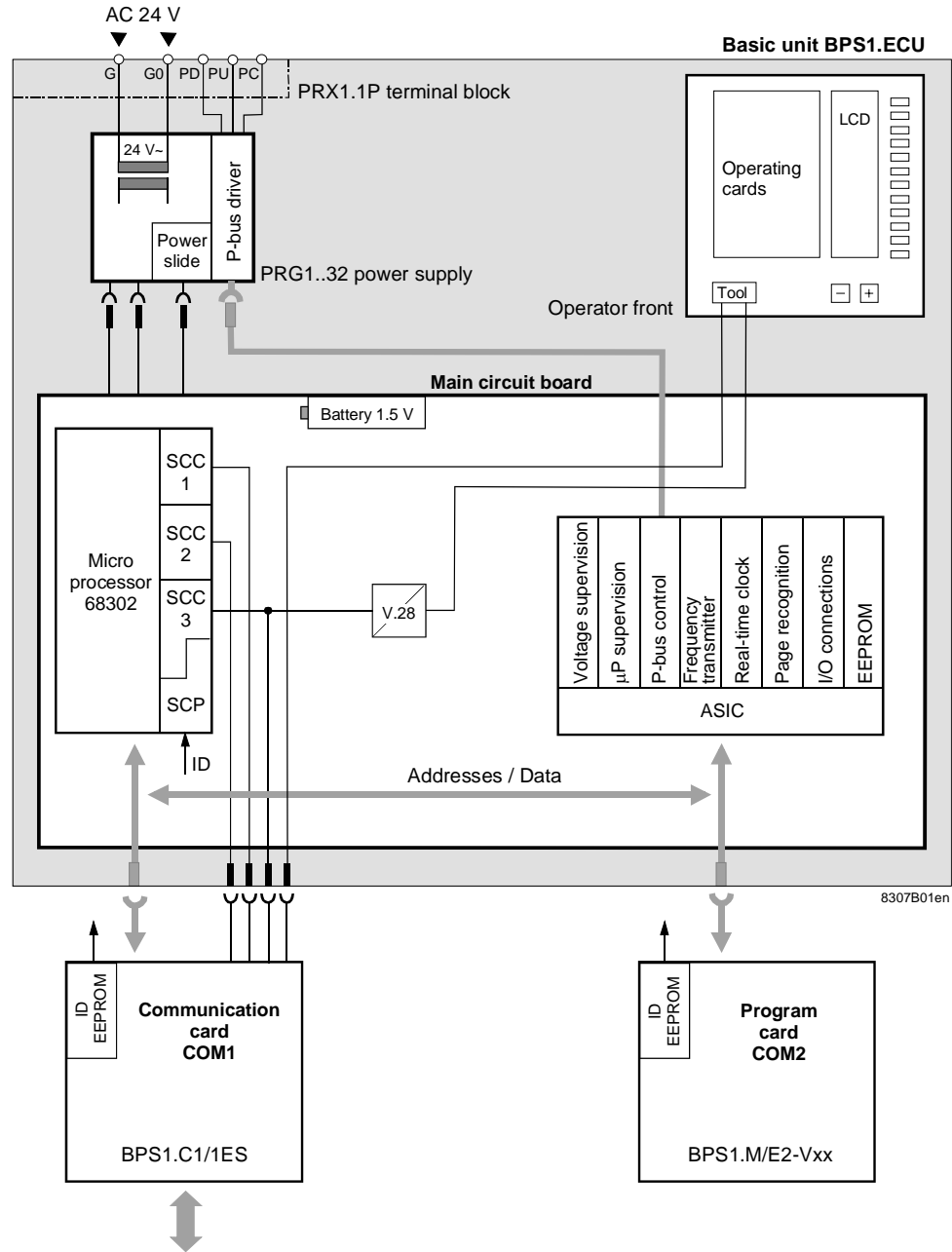
Operating voltage AC 24 V The EcuBPS uses AC 24 V safety extra-low voltage "SELV" or protection by extra-low voltage "PELV" as per HD 384.

System reliability Measures pertaining to functional and system safety of the EcuBPS:

Type	Properties
System clock	The system clock is independent of the processor and integrated in ASIC (real-time clock). In the event of operating voltage failure, a battery continues to supply the clock.
Switch-on response	Following activation of the supply voltage, the EcuBPS is ready for operation after 5 seconds.
Data storage in the event of voltage failure	The following functions are maintained for at least 60 days by means of a battery in the case of a voltage failure: <ul style="list-style-type: none"> – Time and date. – Microprocessor supervision (watchdog). – Page recognition of the operating cards. – Configuration and process data
Processor supervision	The microprocessor's operation is supervised via a watchdog. If the microprocessor is blocked by any event, the supervision function triggers a restart of the processor system (software reset).
Response in the event of faulty operation	In the case of low voltage or voltage failure, the EcuBPS processor system executes a controlled reset. The communications lines become passive, i.e., all sending functions are deactivated. After operating voltage restoration, a restart with defined runup takes place in which the EcuBPS assumes the function of the vice-master in the SDLC ring.
EcuBPS failure	The process stations continue to run autonomously on the SDLC ring. One of these process stations (must be a BPS) can assume the role of vice-master without communication to the superposed Data and Communication Server.
Response without program card	Without program card, the EcuBPS does not issue commands to the COM1 cards via the communications lines.
Response without COM1card	Neither telephony nor Ethernet connection, nor SDLC are activated.
Removing the electronics unit	Do not remove the electronics unit from the housing while voltage is applied. If you must do so, however, construction and switching technology measures are designed to prevent data loss or damages to the unit's electronics.

System architecture

The following illustration shows the basic unit with power supply and main circuit board as well as the possible cards:



Elements of the main circuit board

The elements on the main circuit board are:

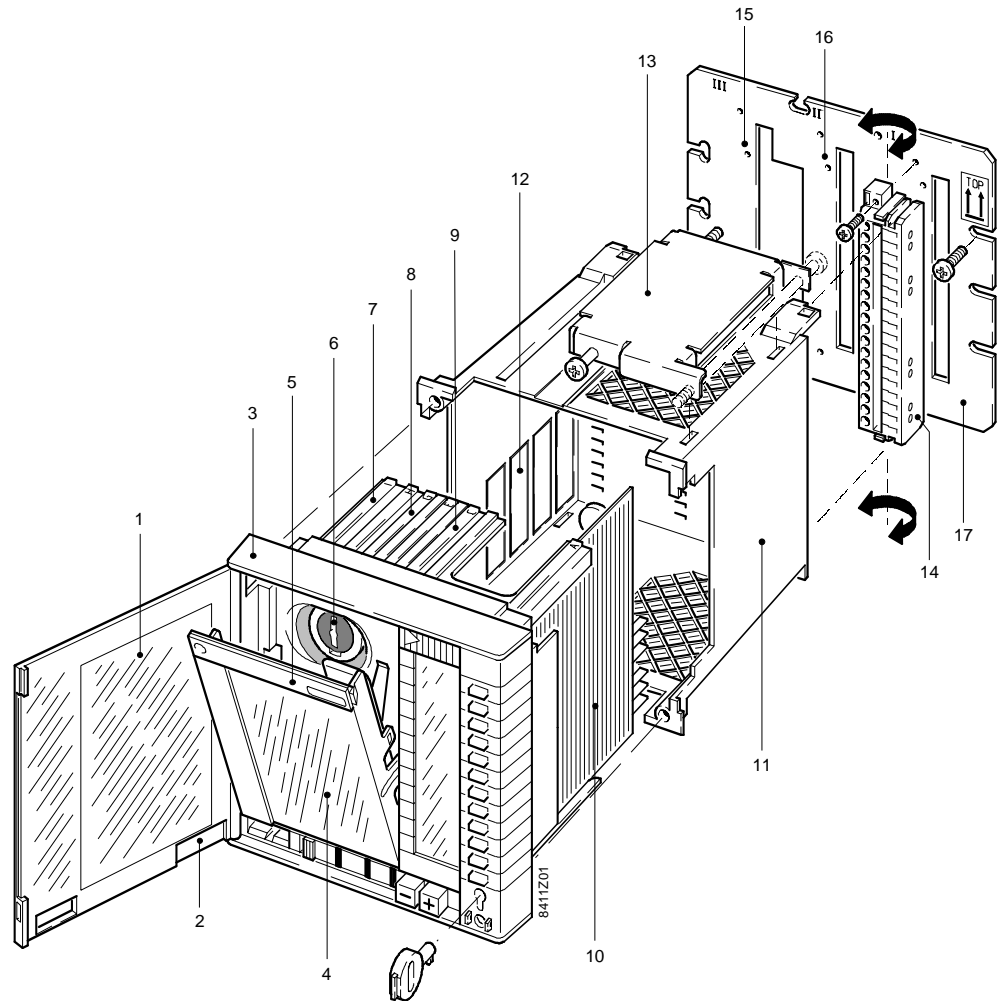
Element	Meaning
MC 68302	16/32 bit microprocessor (16 data lines, 32 bit internal processing) with integrated SCC and SPC communication blocks. Runs the system software and the communication programs. Controls the LCD displays and the external communication ports.
SCC 1..3	Serial communication controller with direct memory access (DMA).
SCP	Serial communications port: This port also helps identify the cards and their versions (ID).
ASIC	Application-Specific Integrated Circuit: Checks and controls the periphery.

Note

The EcuBPS does not support P-bus control and P-bus drivers.

Front view

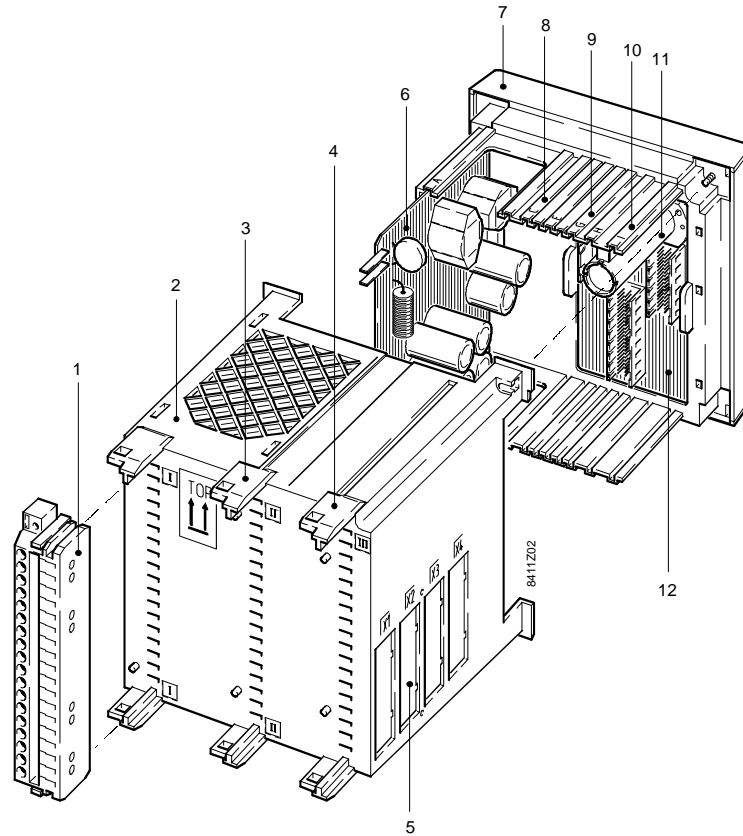
The following illustration shows the mechanical structure of the basic unit consisting of electronics unit, housing, and terminal block as well as an optional base plate for wall mounting:



- 1 Transparent front cover with slots for cover card
- 2 Removable insert for tool connection on closed front cover
- 3 Electronics unit
- 4 Swing-out compartment
- 5 System label
- 6 Battery compartment for batteries of type Mignon 1.5 V
- 7 Slot "I" for COM1 communication cards
- 8 Slot "G" for program card
- 9 Slot "C" for COM2 communication cards (not used with EcuBPS)
- 10 Power supply, slot "A"
- 11 Housing
- 12 Recess for side plugs on the COM1 communication card
- 13 Mounting bracket for housing, top or bottom
- 14 Terminal block for power supply, terminal slot I, snap-on holders
(Terminal blocks are turned by 180° on flush panel mounting = ex-factory)
- 15 Terminal slot for COM1 communication card (optional)
- 16 Terminal slot for COM2 communication card (optional, not used with EcuBPS)
- 17 Base plate PRM1.1W for wall mounting (separate accessory)

Rear view

The following picture shows the mechanical structure from the rear:



- 1 PRX1.1P terminal block for power supply, terminal slot I
- 2 Housing
- 3 Terminal slot II for COM2 communication cards (not used with EcuBPS)
- 4 Terminal slot III for COM1 communication cards
- 5 Break-off recesses for connecting plug and displays for COM1 communication cards
- 6 Power supply, slot "A"
- 7 Electronics unit
- 8 Slot "C" for COM2 communication cards (not used with EcuBPS)
- 9 Slot "G" for program card
- 10 Slot "I" for COM1 communication cards
- 11 Battery compartment
- 12 Main circuit board with plug connections for the cards

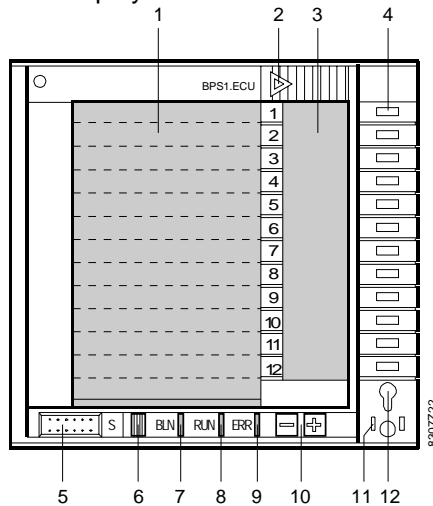
Basic concept

The unit has been designed for control cabinet front panel mounting or wall mounting in the cabinet by means of an additional base plate. Elements and features:

Element	Feature
Housing	Plastic housing with standard dimensions as per DIN 43 700.
Electronics unit	Two screws in the corners for attaching it to the housing and sealing facility to prevent unauthorised removal. The unit consists of: <ul style="list-style-type: none"> – Operating and display front. Cover can be opened with key only. – Main circuit board and power supply insert. – Sots for program and communication cards.
Terminal blocks	Can be snapped on the rear wall of the housing at three predefined locations. The EcuBPS only uses two of these locations: Terminal block I for power supply, and terminal block III for the communication card. The terminal blocks can be turned by 180° for wall mounting.

Operating and display elements

The illustration below shows the front of the EcuBPS and the respective operating and display elements:



- 1 Compartment for operating cards
- 2 Slider to open the cassette
- 3 12 line, four characters LCD display
- 4 Operating buttons to retrieve and save parameters
- 5 Plug connection for tool cable with V.24/V.28 interface for BAccess, PC tool
- 6 Slider to reset the operating system
(any position, activation through position change)
- 7 Operating display for communication on the BLN bus/SDLC ring (orange, flashing)
- 8 Operating display for EcuBPS with two functions:
Normal operation (green). If the program card is missing or during RESET (red)
- 9 Common fault indicator (red), if programmed
- 10 +/- buttons to change parameters and settings
- 11 Option to seal the electronics unit
- 12 Keyhole to open the front cover

Operating concept

The prime operating elements of the units are the double-sided, preprinted operating cards (POPcards) in the compartment:

- Standard service cards for the VISONIK BPS.
- Plant-specific cards for the process stations on the ECU ring.
- Project-specific cards for ECU functions.

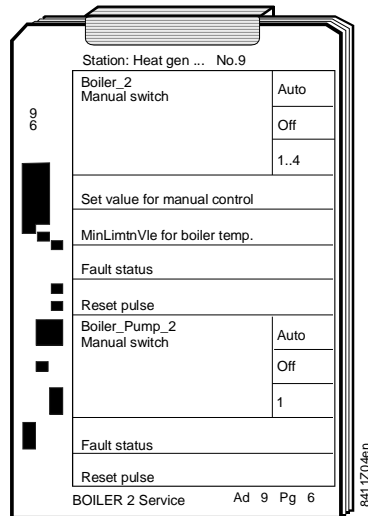
Operation includes the following elements and functions:

Element	Function
Operating card	One operating card contains a maximum of 12 lines, whereby specific displays and operating buttons are assigned to each line. Each operating card has an individual, optical black-and-white code.
Operating card reader	The topmost card is decoded and read by the operating card reader when the card is inserted in the compartment. Speed and type of insertion of the operating cards are irrelevant.
Display	The EcuBPS links the operating card information to the system functions or the plant operating program; the operating card contents are then displayed accordingly.
Operating buttons	The assigned buttons can be used to change the displayed values and run the associated functions.

The operating card contents are created during engineering with the aid of a software tool, printed on perforated pre-prints, and summarised to form an operating card set (POPcard set).

Operating cards

Sample for an operating card set with plant-specific, preprinted operating card:



If a plant-specific operating card is inserted in a station on the ECU ring, the card automatically opens a connection to the station and all associated plants can be operated from the EcuBPS.

Service and diagnostic cards

The accessories also include service and diagnostic cards for service. Both format and structure are the same as for the plant-specific operating cards. The service cards are available in German and English; see the respective product range overview.

Engineering notes



The following documents and references contain fundamental engineering information on the EcuBPS and the system level. Carefully study these documents before proceeding to the sections below and pay special attention to all safety-related information:

- Data sheets on the cards according to "Equipment combinations" in this data sheet.
- Data sheets on the periphery used system- or plant-specifically with the EcuBPS.

Intended use

Use the EcuBPS only for applications as described in the brief description on the title page (bold print) and the section "Use". Observe all conditions and restrictions imposed as per the sections "Engineering notes" and "Technical data" in this data sheet.




Sections marked with a warning as shown to the left contain technical safety requirements and restrictions. Observe all of these warnings as they relate immediately to the protection of personnel and equipment.

AC 24 V operating voltage



Operate the EcuBPS as well as other connected units only on safety extra-low voltage (SELV) or protection by extra-low voltage (PELV) as per HD 384.

Transformer sizing	The transformer output for the EcuBPS is listed in section "Technical data". In the case of central supply, size the transformer output for operating voltage for the entirety of the connected units of a plant. These are: <ul style="list-style-type: none"> – Process station(s) – I/O modules requiring AC 24 V via the P-bus in addition to power. – Field devices with AC 24 V operating voltage, e.g., actuators, active sensors, transducers, etc.
Case studies	The documentation on basics P8307 "EcuBPS" contains typical examples for the EcuBPS including communication partner configuration.

Mounting notes

Space requirements	Observe both mounting depth and side distance for flush panel mounting or mounting inside the cabinet. Remember to include space requirements for COM1 communication card connections on the side; see "Dimensions".
	Do not touch electrical contacts and components on the open unit; electrostatic discharges may destroy sensitive components.
Mounting instructions	The basic unit is delivered with mounting instructions.

Commissioning notes

	Observe all country-specific safety regulations to prevent injuries and equipment damages.
Battery	The battery is inserted in the unit upon delivery, but separated from the electrical circuit with an isolating strip expanding at the upper compartment corner. After opening the compartment, pull off the strip from the closed battery compartment.
Front card	The cover card for VISONIK inserted in the front has four symbols at the right margin explaining basic information (unit type, software version, time, and date). This information is displayed when the program card is inserted and the front door is closed.
 Service cards	<p>Prior to using the service cards, read "Important safety notes" in document B8301 "Building Process Station User's Guide".</p> <p>When the service cards are inserted, you can check and conduct the following via the displays and operating buttons:</p> <ul style="list-style-type: none"> • Test of the EcuBPS (error messages, etc.) • Clock setting and adjustments <p>These service functions are available only if a program card is inserted. However, the program card does not need to be configured for this purpose.</p>

Local operation	<p>The EcuBPS can locally be operated in three ways:</p> <ul style="list-style-type: none"> • With PCA (Palm) operation (BAccess). • Directly at the operator front via service cards. • By using the software programs "VISOTOOL Editor" or "New VISOTOOL Editor" via the tool plug at the front of the unit.
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Maintenance notes

Battery life	<p>The battery life is at least 4 years.</p> <p>The battery status is monitored and insufficient load is indicated via the collective error display (if the front cover is closed and if programmed).</p> <p>Insufficient load does not impair the EcuBPS functions provided sufficient operating voltage is applied.</p>
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Technical data

General data

⚠ Supply	Operating voltage	AC 24 V ± 20 %
	Safety extra-low voltage "SELV" or protection by extra-low voltage "PELV" as per	HD 384
	Transformer sizing as per	EN 60 742
	Secondary fusing (external)	10 A max. slow
	Frequency	50 Hz / 60 Hz
	Power consumption	10 VA

Function data	Microprocessor	
	MC 68302	16/32 bit
	CPU frequency	24 MHz
	Time basis (real-time clock)	
	Time resolution	1 sec
	Time deviation per month	max. 100 sec
	Backup on voltage failure	
	Battery type	1.5 V (Mignon)
Standard IEC size	LR 6	
Battery life during normal operation	min. 4 years	
Battery life during backup operation	min. 60 days	

Protection of housing	IP protection as per EN 60 529	
	Flush panel mounting	IP40
	Wall mounting	IP20
	Degree of protection as per EN 60 950	
Protection against electric shock	III	

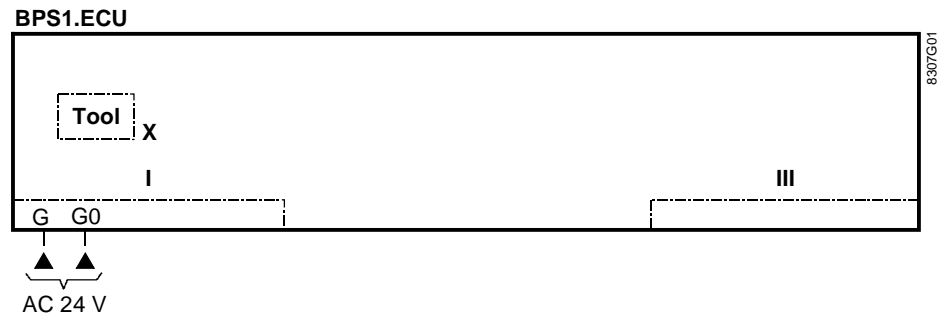
Environmental conditions	Transport	IEC 721-3-2
	Climatic conditions	class 2K3
	Temperature	-25 °C...+70 °C
	Humidity	<95 % r.h.
	Mechanical conditions	class 2M2
	Operation	IEC 721-3-3
	Climatic conditions	class 3K5
	Temperature	-5 °C...+50 °C
	Humidity (non-condensing)	< 95 % r.h.
	Mechanical conditions	class 3M2

Connection terminals	For connecting wires of	min. 0.5 mm dia. to max. 2x1.5 mm ² or 1x2.5 mm ²
Standards	Product standards	
	Safety of information technology equipment	EN 60 950
	Electromagnetic compatibility (EMC)	
	Emissions	EN 50 081-1
	Immunity	EN 50 082-2
Weight and dimensions	CE -conformity	
	Electromagnetic compatibility	89/336/EEC
	Weight without packaging and cards	1.15 kg
	Dimensions	see "Dimensions"
	Bus interfaces	
Tool plug on unit front	Tool interface	
	Signal definition	V.24 as per CCITT
	Signal level	V.28 as per CCITT
	Supported signals	RXD and TXD
	Format	
	Start bit	1
	Data bit	7 or 8
	Stop bit	1 or 2
	Parity	none, odd, even and force
	Baud rates	300 baud to 19.2 kilobaud
	SDLC ring	Only with optional communication card COM1
Data for SDLC ring connection		data sheet N8313
SDLC ring description		data sheet N8024
Ethernet	Only with optional communication card COM1	type BPS1.C1/1ES
	Data for Ethernet connection	data sheet N8313
Communication cards	The technical data for the communication cards and the respective interfaces are available in the following data sheets: N8313 "Communication cards COM1, Ethernet"	

Diagrams

Internal diagram

Diagram for basic unit without cards:



- I** **Terminal block I:** PRX1.1P
 AC 24 V operating voltage:
- G** System potential
- G0** System neutral
- III** Terminal block III (optional)
 for COM1 communication cards
- X** **Tool connection**
 on the front, with interface V.24/V.28 for PC (via tool adapter)

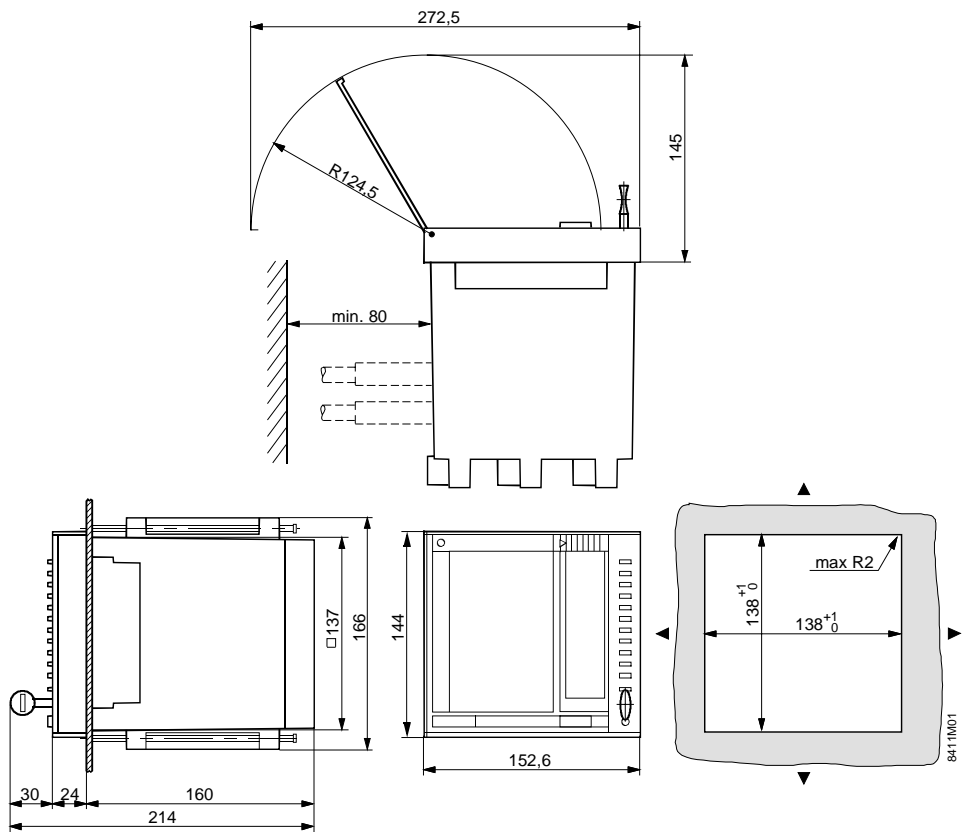
Internal diagrams for optional cards

Refer to the respective data sheets ("Technical data") as described above for the internal diagrams of the communication cards.

Dimensions

Flush panel mounting
(dimensions in mm)

Standard mounting as per DIN 43 700 (138x138 mm):



Minimum distance to the next recess: Top and bottom: 40 mm; vertical: 80 mm

Wall mounting
(dimensions in mm)

Base plate PRM1.1W is required for wall mounting:

