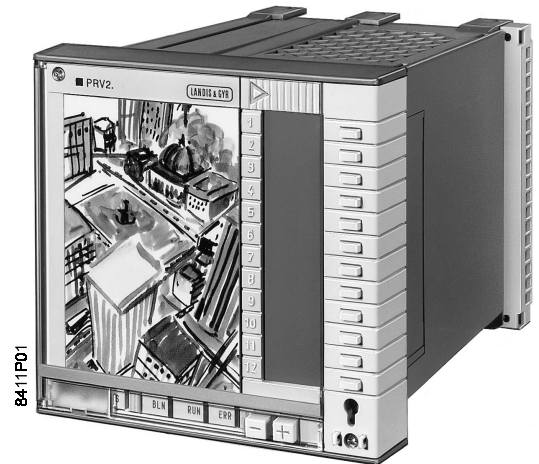


Process Units

Basic units, without cards

PRV2...



Process units for building management systems with P-bus (process bus) to connect separate I/O modules. Three versions (PRV2.32, PRV2.64, PRV2.128) for the differing loads resulting from the number of connectable I/O units. Variation without P-bus connection (PRV2.00) for use only as FLN Master or as a gateway to link different networks.

The process units' specific functionality is derived from the program and communication cards used for the VISONIK or UNIGYR systems.

Use

Process units of the PRV2... type series are used for regulation, control, and monitoring tasks in the VISONIK and UNIGYR building management systems with focus on the HVAC sector. The units are basic units that, when applied with the respective cards, can be used in the above mentioned Landis & Staefa system families.

The field of application in the HVAC sector comprises the following:

- Heat generation and distribution, including district heat
- Air handling and distribution
- Air conditioning
- Master function to coordinate TECs (Terminal Equipment Controllers)
- Superposed coordination and optimisation of FLN devices (Floor Level Network)

The process units can, if equipped with the associated cards, be operated autonomously (stand-alone), peer-to-peer or as master devices (e.g., for Floor Level Networks).

The PRV2... type series comprises four units to cover various requirements on plant size and specialities. The units' appearance and design is the same for all four types.

Process unit PRV2.32 for VISONIK and for UNIGYR from version 6	Unit with P-bus to connect I/O modules that serve as interfaces to the plant, with 32 load units for small and simple plants. Communication in a linked system via BLN and/or FLN bus with additional cards; refer to "Equipment combinations".
Process unit PRV2.64 for VISONIK / UNIGYR	Same as PRV2.32, but with 64 load units for mid-size and increasingly complex plants.
Process unit PRV2.128 for VISONIK and for UNIGYR from version 6	Same as PRV2.32 and PRV2.64, but with two P-bus connections for 64 load units each; for large and highly complex plants.
Process unit PRV2.00 for VISONIK / UNIGYR	This version without P-bus is used as CFE controller (Communication Front End). When equipped with the relevant card, this unit serves as <ul style="list-style-type: none"> • the FLN master (Floor Level Network) or as • a gateway, i.e., as an interface to interlink systems or networks.

Functions

Basic functions

The basic functions of the process units are:

- processing plant-specific processes in program cards
- data traffic with the I/O modules via P-bus; not applicable with PRV2.00
- power supply for the I/O modules via P-bus; not applicable with PRV2.00
- communications control within the linked system (with the associated card only)
- operation and display

Application functions

The PRV2... process units only provide infrastructure to accommodate and process system and application-specific functions in the program cards. The functions required for the plant processes and communication on the FLN (Floor Level Network) and BLN (Building Level Network) are contained in the cards. These cards have been described in the associated data sheets; refer to "Equipment combinations".

Display and operating functions

The display and operating functions are described in the chapter "Mechanical design".

Functional safety

Please refer to the chapter "Technical design" for specifications on functional and system safety.

Type summary

Process unit without P-bus connection	PRV2.00
Process unit with P-bus connection for 32 load units	PRV2.32
Process unit with P-bus connection for 64 load units	PRV2.64
Process unit with P-bus connection for 128 load units	PRV2.128

Note

Please refer to chapter "Use" for information on the field of application of the process unit types in VISONIK and UNIGYR.

Delivery

The process unit is delivered for flush panel mounting. If you prefer wall mounting, you must order the required baseplate; refer to "Accessories". The card compartment contains a plastic bag with backup key, three labels for the system families, and a sealing plate.

The process unit is delivered without program card. You must separately order the program card as well as all optional communication cards; refer to "Equipment combinations".

Accessories (separate)

Baseplate for wall mounting in electrical control cabinet	PRM1.1W
Tool cable	PRW1.7U28
Tool adapter	PRW1.0U28

Accessories that cannot be used for all system families are listed in the respective product range overviews. For example: service cards and instructions for plant operators as well as service and diagnostic cards for service technicians.

Equipment combinations

Cards

Card	Type	Data sheet
Program card for UNIGYR	PAA2.4HVA	8263
Communication card for UNIGYR	PEC1...	8275
Program card for VISONIK	PVA3...	8317
Communication card COM1 for VISONIK	PVC1...	8311
Communication card COM2 for VISONIK	PVC2...	8312

BLN and FLN bus participants

Refer to the system overview and the technical data sheets on the various communication cards to determine which devices are able to communicate via the respective card with the process unit in a linked system (see above table).

I/O modules

The following I/O modules can be connected to the process units via the P-bus:

Unit	Type	Data sheet
<ul style="list-style-type: none"> I/O modules with the basic functions: measuring, counting, signalling, switching, positioning 	PTM1...	8111...8171
<ul style="list-style-type: none"> I/O compact units with several basic functions in one housing 	PTK1...	818...
<ul style="list-style-type: none"> Interface modules to connect equipment to the supplier's bus 	PTM5...	866...

Note

The program card used in the process unit must support the respective I/O module's functions in terms of software in order to connect the I/O modules.

Technical design

Operating voltage AC 24 V

The process unit is operated on safety extra-low voltage (SELV) or protection extra-low voltage (PELV) of AC 24 V as per HD 384.

P-bus and addressing of I/O modules

Data exchange with the I/O modules occurs via a three-core P-bus. Refer to data sheet 8022 for a more detailed description of the Process bus (P-bus). I/O modules on the same P-bus are assigned a unique address within the numbers 1 through max. 255. The addresses are set by using address plugs (I/O modules) or address switches (basic addresses for I/O compact units). Refer to data sheet 8021 "Basic data of I/O Module System" for additional information.

Power supply for the I/O modules via the P-bus

The process units with P-bus connection supply the connected I/O modules via the P-bus with DC 23 V. A process unit's load imposed by the I/O module is indicated by the number of load units per 12.5 mA. The maximum load of the various process unit types is listed in the "Technical data" chapter.

The PRV2.128 unit has been designed for 128 load units, i.e., for a large number of I/O modules. This unit contains two P-bus connections at 64 load units each.

System architecture

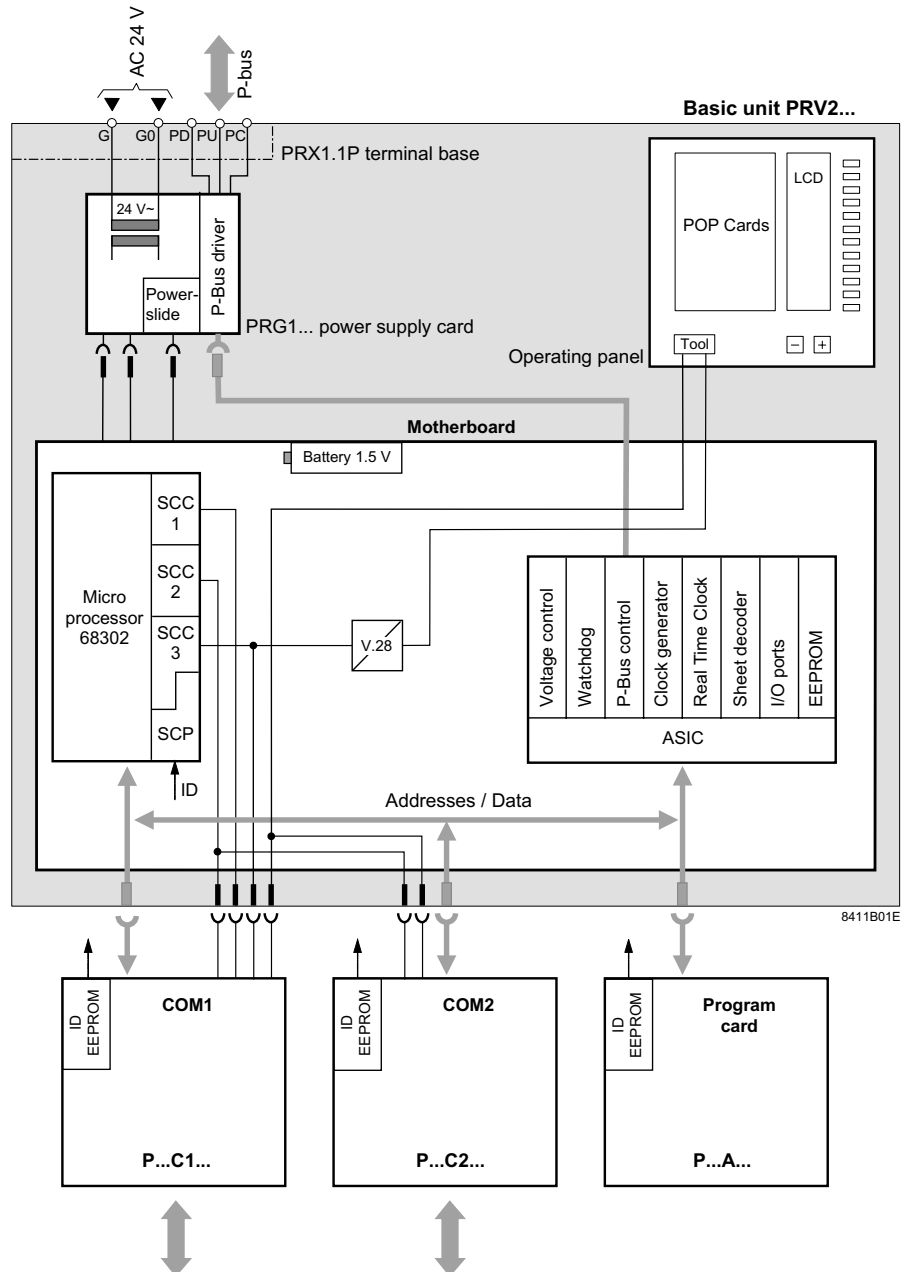
The operating system software as well as the application programs are processed by a 16/32 bit microprocessor (16 data lines, 32 bit for process internal processing).

The following functions are integrated in the microprocessor:

- three serial communications controllers SCC 1...3 with direct memory access (DMA)
- one serial communication port SCP 1 (also used to verify cards and the respective versions)
- control of the LCD display
- control of the external communication interfaces

The peripheral functions are performed by an ASIC (Application Specific Integrated Circuit). Refer to the diagram below.

Diagram



- | | |
|---------------------|---|
| PRV2.00 | Process unit without P-bus connection |
| PRV2.32 / 64 | Process unit with P-bus connection |
| PRV2.128 | Process unit with two P-bus connections |
| P...A... | Program cards |
| P..C...1 | COM1 communication cards |
| P...C...2 | COM2 communication cards or cards for customer-specific bus systems |

Operating card reader	The operating card reader decodes the optical black and white codes on the operating cards. In the course of a project, the code pattern is simultaneously printed with the entire application-specific operating card contents. When inserting the operating cards, speed and consistency are non-critical; the reading process can even be interrupted for any period of time.
Plant operating program	The program card contains the regulation, control, and supervisory functions for the plant operating program. We provide several system variations that must be configured in dependence of the plant. For that reason, these cards are not contained in the basic unit; refer to "Equipment combinations".
System safety	
<i>System clock</i>	Processor-independent real time clock integrated in ASIC for the system clock. In the event of a power failure, a battery provides the required backup supply.
<i>Switch-on response</i>	The process unit is ready for operation after 5 seconds.
<i>Data retention in the event of a power failure</i>	The following functions are maintained by batteries for at least 60 days in the event of a power failure: <ul style="list-style-type: none"> - time and date - microprocessor supervision (Watchdog) - page recognition of the operating cards - application programs, configuration and process data
<i>Processor monitoring</i>	The microprocessor is monitored by a supervisory circuit (watchdog). If the microprocessor is blocked by any event, the watchdog initiates a restart of the processor system (software reset).
<i>Behaviour in the event of faulty operation</i>	In the event of low voltage or power failure, the processor system conducts a controlled function interruption (reset). The P-bus and any communication lines are disabled, i.e., all sending functions are shut down. Following restoration of power, a defined restart will occur to ensure that the plant will again operate under normal conditions. In the event of a process unit failure, all connected I/O modules are disabled.
<i>Behaviour without program card</i>	If the process unit does not contain a program card, no commands will be issued via the P-bus or any other COM card communication lines.
<i>Removing the electronics while connected to voltage</i>	Principally, avoid removing the unit from the housing while power is applied. However, if you do so, no important data can be lost due to the unit's technical design; also, the unit's electronic circuits will not be damaged.
<i>Short-circuit strength</i>	The P-bus is short-circuit proof.
<i>Protection against faulty wiring</i>	Interchanging the P-bus lines does not cause any damage to the unit. Also, mistakenly applied AC 2 V voltage to the P-bus connection terminals will not result in product damage.

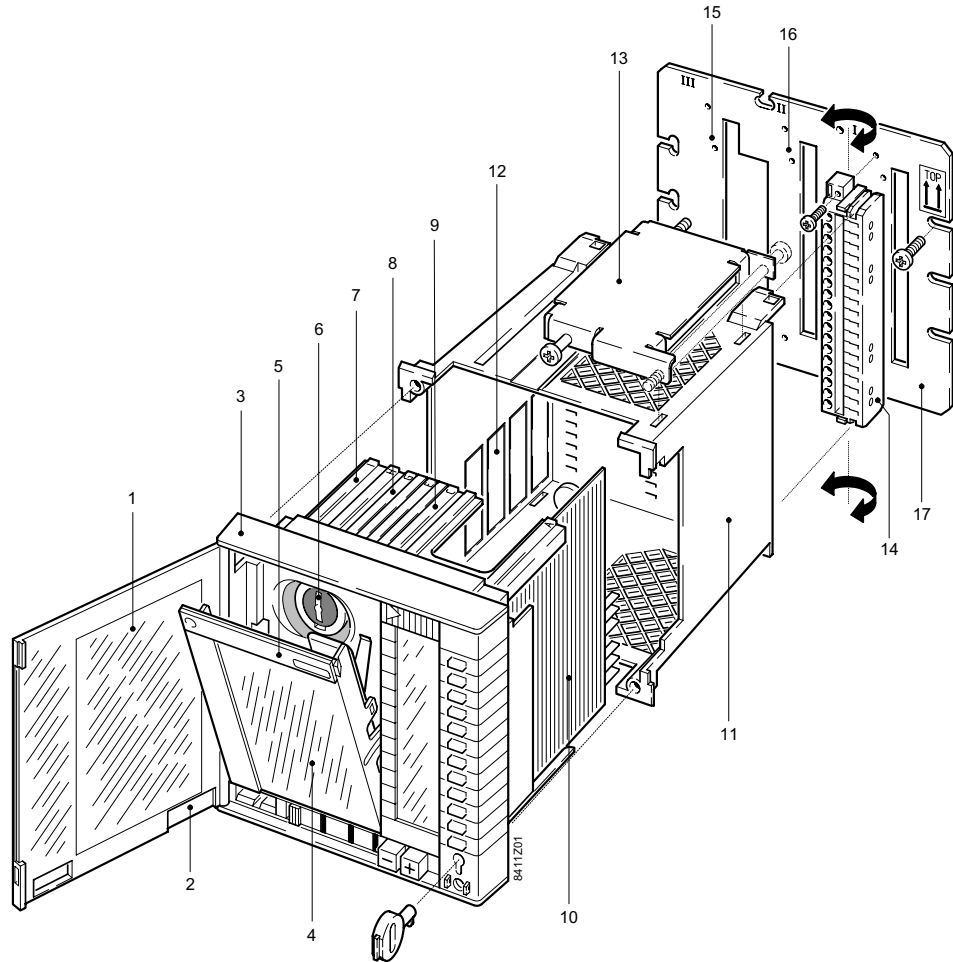
Mechanical design

Basic concept	Control panel unit in a plastic housing with the standard dimensions as per DIN 43 700 for flush panel mounting or for wall mounting in the electrical control cabinet with additional baseplate. The process unit comprises the plug-in electronics unit and a housing with snap-on terminal block.
Electronics unit	Plug-in electronics unit with operating and display front panel and a transparent front cover that can only be opened with a key. The unit is secured to the housing with two screws and can be sealed to prevent unauthorised access. In addition to the power supply, the unit contains three slots for system-specific cards. A neutral label is attached to the operating card compartment to enable label exchange for the system families. The labels are available as accessory items.

Housing

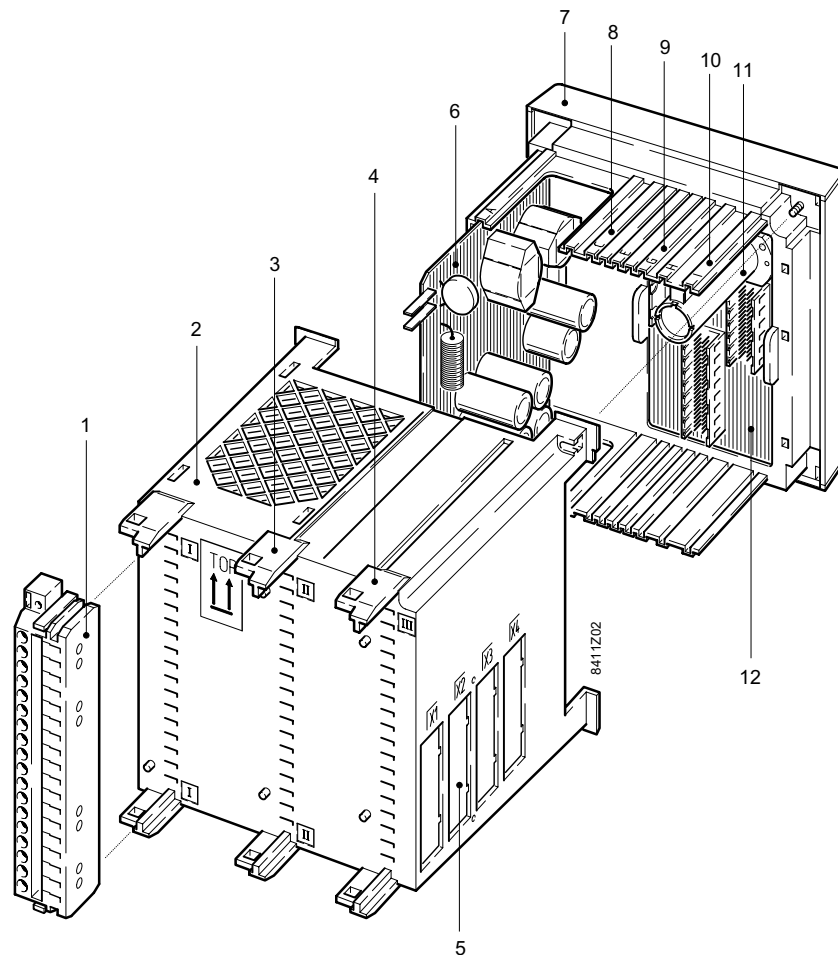
The terminal block for power supply and P-bus is snapped to the rear of the unit. Two additional terminal slots are provided for system-specific cards. The terminal blocks can be turned by 180° for wall mounting.

Front explosion view



- 1 Transparent front cover with chase for the cover card
- 2 Removable insert for tool connection with closed front cover
- 3 Electronics unit
- 4 Compartment; opened
- 5 Exchangeable system label
- 6 Battery compartment for Mignon 1,5 V
- 7 Slot "I" for COM1 communication cards
- 8 Slot "G" for program cards
- 9 Slot "C" for COM2 communication cards
- 10 Power supply with P-bus connection; slot "A"
- 11 Housing
- 12 Openings for lateral connections on the COM1 communication card
- 13 Fastening bracket for housing; on top and bottom
- 14 Terminal block for power supply; terminal slot I, snap-on brackets
(Terminal blocks are turned 180° for flush panel mounting = as supplied)
- 15 Terminal slot for COM1 communication card (option)
- 16 Terminal slot for COM2 communication card (option)
- 17 Baseplate PRM1.1W for wall mounting (separate accessory)

Rear explosion view



- | | |
|----|--|
| 1 | Terminal block PRX1.1P (PVX1.2P for PRV2.128) for power supply card
Terminal slot I |
| 2 | Housing |
| 3 | Terminal slot II for COM2 communication cards |
| 4 | Terminal slot III for COM1 communication cards |
| 5 | Knockout openings for connection plugs and LEDs for COM1 communication cards |
| 6 | Power supply card with P-bus connection; slot "A" |
| 7 | Electronics unit |
| 9 | Slot "G" for program cards |
| 8 | Slot "C" for COM2 communication cards |
| 10 | Slot "I" for COM1 communication cards |
| 11 | Battery compartment |
| 12 | Motherboard with card connectors |

Operating concept

The set of operating cards (Popcards) with plant-specific printed pages for one or several plant elements represents the core of the operating concept. A swing-out compartment accommodates the Popcards and the reserve space of the compartment contains the separate service card as well as the service instructions.

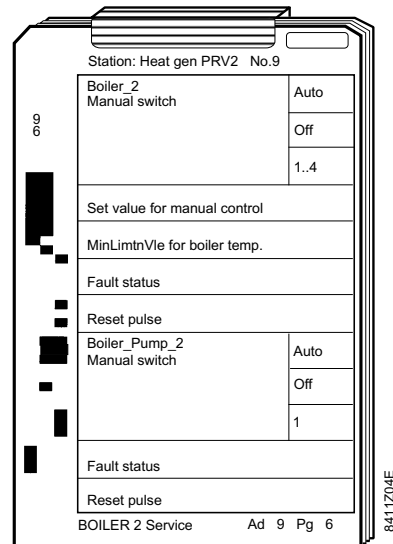
One operating card provides a maximum of 12 lines; each line has LEDs and operating buttons as for example, the service card illustrated below.

The operating pages are optically encoded and the topmost page is read upon insertion in the compartment. Subsequently, the page's contents are linked to the application program resulting in displays related to the contents of the inserted page. The displayed values and settings can be changed by actuating the associated operating buttons. As a result, the plant functions can be displayed page by page on the operating interface (front of the unit).

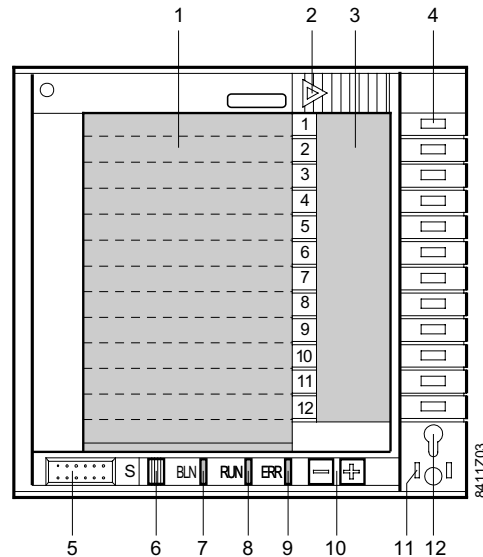
The operating card contents are created in the course of a project via a software tool, printed on perforated forms, and compiled to form the operating card set (Popcard Set).

Operating cards
(Popcards)

Example for a user-specific, printed Popcard



Front view with
operating and display
elements







- 1 Operating card compartment
- 2 Slider to open the compartment
- 3 LCD display, 12 lines for 4 characters each
- 4 Operating buttons to call up and save parameters
- 5 Connector for tool cable with V.24/V.28 for PC tool and RS-485 interfaces for BLN and FLN networks
- 6 *Slide switch function for UNIGYR:*
Position S = Write access locked by INSIGHT or further process units via BLN bus
Position BLN display = Read/write access released via BLN bus
- 6 *Slide switch function for VISONIK:*
RESET switch for the operating system (any position; RESET activation by changing the switch position)
- 7 Operating display to communicate via BLN bus (flashing, orange)
- 8 Operating display for process unit with dual function:
Normal operation (green), missing program card or during reset (red)
- 9 Common fault indication (red)
- 10 +/- buttons to change parameters and settings
- 11 Sealing facility for the electronics unit
- 12 Keyhole to open the front cover

Service instructions
(UNIGYR only)

The service instructions provide information on the operating and display elements as well as the service functions of the process unit used within a system family. They explain the use and handling of service cards and are accommodated in the reserve space of the compartment behind the operating cards. The following two illustrations show two pages of the service instructions (60% scale). Service instructions are not part of the general accessories; they are specially produced for the respective system families (UNIGYR for the below illustrations).

Service instruction
pages (UNIGYR only)

Contents		Safety Instructions	
	Page		
Safety Instructions	3	These Service Instructions relate to the service cards of the	
Abbreviations	4	PWP1.9EN Service Set (Card text in English)	
Symbols	5	 Before using the service cards, read the service instructions.	
Process Unit Construction	7	They contain important information for your personal safety and the safety of your plant!	
LOC/REM Switch and LED Indicators	8	 WARNING ! Nonobservance may lead to personal injury or material damage!	
Service Cards	10	 If you have questions about Service Cards or some function, please contact Landis & Gyr Service.	
Enter Page Number	11	 Training information is available from the Landis & Gyr location nearest you.	
Short Form Instructions	12		
CLOCK/OPERATION Card Page 248	13		
SYSTEM-SERVICE, Card Page 249	16		
I/O-MODULE, Card Page 246	18		
Error Signals and Supplementary Information	22		
I/O-Module Type Code, Card Page 246	27		
2	CM2B8221E	CM2B8221E	3

8221Z04E

Service and diagnostic
cards

Service cards for the plant operator as well as service and diagnostic cards for service technicians are part of the system-specific accessories. Format and layout of the cards is similar to the plant-specific operating cards. This documentation and additional materials are listed in the product range overview of the respective system family.

Engineering notes



The documents and hints below contain basic engineering information on the process unit and the respective system level. Carefully read these documents and pay special attention to all safety information contained before proceeding to the next section:


- "Basic data of I/O Module System", data sheet 8102
- "Process Bus" (P-bus), data sheet 8022
- Data sheets on cards and peripheral devices that are used in the process unit (system and plant-specific); refer to "Equipment combinations" in this data sheet.

Proper use

The PRV2 process unit must, in an entire system, only be used for applications as described in the brief description on the title page (bold print) as well as in the sections "Use", "Engineering notes", and "Technical data" in this data sheet. Additionally, observe all conditions and restrictions as listed in the sections "Engineering notes" and "Technical data" in this data sheet.



The sections marked by the warning sign (left) contain safety-related requirements and restrictions. Observe these warnings to avoid injuries and product damages.

 Operating voltage
AC 24 V

The process unit, the connected I/O modules as well as other devices in the linked system must only be operated on **safety extra-low voltage (SELV)** or **protection extra-low voltage (PELV)** as per HD 384.


Transformer sizing

If a central supply is used, the size of the transformer must be determined based on the total power consumption of all connected units. These are:



- process unit(s)
- I/O modules that require AC 24 V in addition to the P-bus supply
- field devices with AC 24 V operating voltage, e.g., actuators, active sensors and detectors, converters, etc.

Load units of I/O modules	Process units with P-bus connection supply DC 23 V to the connected I/O modules via the P-bus. The load units of I/O modules are contained in data sheet 8102 "Basic Data of I/O Module System" and/or the data sheets of the respective I/O modules; refer to "Equipment combinations". The maximum number of load units for the process units is listed under "Technical data" in this data sheet.
P-bus connections for PRV2.128	When using this process unit with two P-bus connections, the number of load units from the connected I/O modules should be equally distributed to the two P-bus connections.
P-bus interface	The P-bus interface is not galvanically separated from the unit's electronics.

Mounting notes

Space requirements	When flush panel mounting or wall mounting, the required installation depth and lateral clearance must be observed. Additionally, take into account the minimum clearance when using the COM1 communication card with lateral connectors; refer to "Dimensions".
 Avoid touching any electrical contacts and components on the open unit; electrostatic discharges may destroy sensitive components.	
Labelling	The process unit is delivered with a blank compartment label. This label can be replaced with one of the system family labels which are delivered as accessory items.
Mounting instructions	The process unit is delivered with mounting instructions.

Commissioning notes

 Observe country-specific safety regulations to avoid injuries and product damages.	
Battery	The battery is inserted upon delivery, but separated from the electrical circuit by an isolating tape. After opening the compartment, the strip of tape can be pulled off the closed battery compartment.
Front card	With VISONIK, the cover card inserted in the front cover contains four symbols on the right edge with basic information (unit type, software version, time, and date). These symbols are displayed when a program card is inserted and the front cover is closed. In the case of UNIGYR, the cover card is the same, but without the symbols (by turning over the VISONIK cover card).
I/O module addresses	The process unit can only talk to the I/O modules if the address plugs are inserted or if the proper addresses are set and if they match the addresses configured in the software.
 Service card (UNIGYR)	Read all hints and notes in the service instructions prior to using the service card. Using the service card of the service set, the following tests and manipulations can be accomplished via the unit displays and operating buttons: <ul style="list-style-type: none"> • process unit test (error messages, setting and changing time) • interrogating values and statuses on the I/O modules' inputs and outputs • changing statuses and positioning values at the switching and positioning outputs of the I/O modules
Note	These service functions can be used only if a program card is inserted; however, the card does not need to be configured for this purpose alone.

On-site plant operation

On-site, the process unit can be operated in two ways:

- directly at the operator front via the plant-specific operating cards (not service cards)
- with the PC program tool which must be connected to the tool plug on the unit front.

Maintenance notes

Battery life

The battery life is at least four years. The battery is monitored and the common fault indicator lights up (front cover closed) if insufficient load is detected. The fault signal line displays the number of the service operating card page that is used to determine if the battery's load is good or bad. (With VISONIK, the message only appears if signalisation has previously been programmed!). Insufficient load does not impair the process unit's functions if operating voltage is applied.

Technical data



Power supply

Operating voltage	AC 24 V ± 20 %
Safety extra-low voltage "SELV" or protection extra-low voltage "PELV" as per Transformer requirements as per	HD 384 EN 60 742
Secondary fusing (external)	10 A max. slow
Frequency	50 Hz / 60 Hz
Power consumption (* at max. P-bus load)	
PRV2.00 (VISONIK / UNIGYR)	10 VA
PRV2.32 * (VISONIK / UNIGYR from version 6)	30 VA *
PRV2.64 * (VISONIK / UNIGYR)	55 VA *
PRV2.128 * (VISONIK / UNIGYR from version 6)	100 VA *
P-bus power supply in the process unit	
Load units at 12.5 mA	
PRV2.32 (VISONIK / UNIGYR from version 6)	32
PRV2.64 (VISONIK / UNIGYR)	64
PRV2.128 (VISONIK / UNIGYR from version 6)	128 (2x64)

Microprocessor

MC 68302	16/32 Bit
Clock frequency CPU	16 MHz

Real time clock

Resolution	1 sec
Deviation per month	max. 100 sec

Power failure: Backup supply

Battery type	1.5 V (Mignon)
IEC standard size	LR 6
Battery life for normal operation	min. 4 years
Battery life for backup operation	min. 60 days

P-bus

Interrogation cycle at I/O modules	0.5 s
Rate of transmission	62.5 kBaud
Signal level	DC +23 V and 0 /-5 V
Permissible line length, with special action measures	50 m max. 200 m
minimum cross-sectional area	3 x 0.75 mm ²
detailed information in data sheet	8022 "Process Bus"

Tool plug on the unit front

Tool interface:	
Signal definition	V.24 as per CCITT
Signal level	V.28 as per CCITT
Supported signals	RXD and TXD
Transfer format	
Start bit	1
Data bit	7 or 8
Stop bit	1 or 2
Parity	none, odd, even, and force
Baud rates	300 to 38.4 kBaud (VISONIK only to 19.2kBaud)

BLN and FLN interfaces

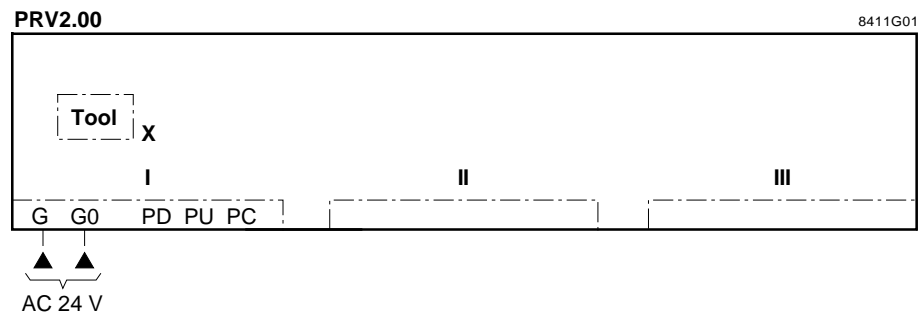
Only with communication cards (options) (connection via terminals and tool connector for service)	see data sheets 8311 and 8312 (VISONIK) as well as 8481 (UNIGYR)
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Degree of protection	Protection against electrical shock	III as per EN 60 950
IP protection class	Housing	
	Flush panel mounting	IP40 as per EN 60 529
	Wall mounting	IP20 as per EN 60 529
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.
CE -Conformity	In accordance with the directives of the European Union	
	Electromagnetic compatibility	89/336/EEC
Product standards	Safety of information technology equipment	EN 60 950
Electromagnetic compatibility (EMC)	Emissions	EN 50 081-1
	Immunity	EN 50 082-2
Connection terminals	Terminals for wires	min. 0.5 mm Ø max. 2x1.5 mm ² or 1x2.5 mm ²
Weight	Without packaging and cards	1.15 kg
Dimensions	Refer to "Dimensions"	
Note	Technical data on program and communication cards are contained in the respective data sheets; refer to "Equipment combinations".	

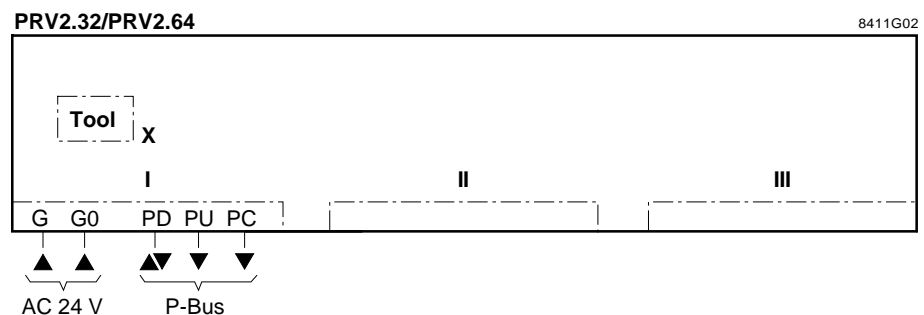
Diagrams

Connection diagrams

Process unit PRV2.00,
without P-bus
connection



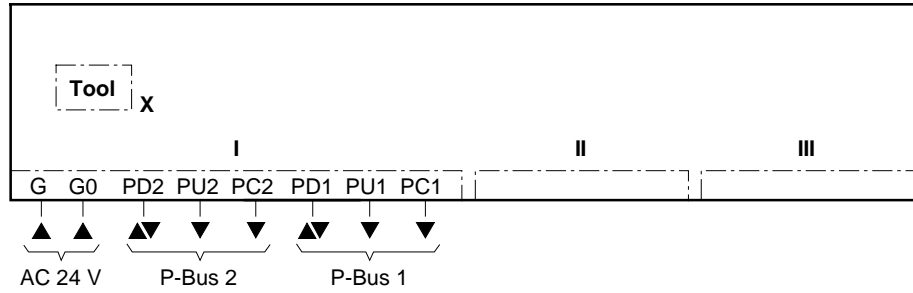
Process units PRV2.32
and PRV2.64, with
P-bus connection



Process unit PRV2.128
with P-bus connections

PRV2.128

8411G03



I Terminal block I PRX1.1P (PVX1.2P for PRV2.128)

Operating voltage **AC 24 V**:

- G System potential
- G0 System neutral

P-bus (Process bus):

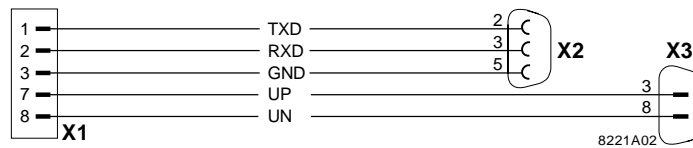
- PC, PC1, PC2 Synchronisation line
- PD, PD1, PD2 Bi-directional data line
- PU, PU1, PU2 Operating voltage DC 23 V (against G0)

II Terminal block II (Option)
for COM2 communication cards or other cards

III Terminal block III (Option)
for COM1 communication cards

X Tool connector
on the unit front, with V.24/V.28 interface for Tool PC (via tool adapter) and RS-485 interface for BLN (Building Level Network) and FLN (Floor Level Network)

Tool connection cable
PRW1.7U28

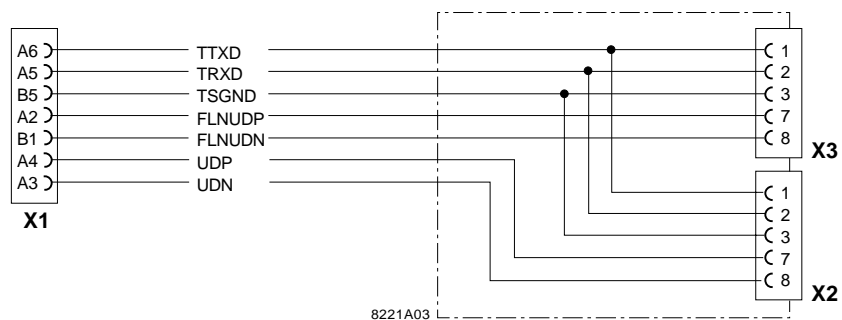


X1 Connection to PRW1.0U28 tool adapter and for TECs
(Terminal Equipment Controller), RJ45 ISDN plug

X2 Tool connector (V.24/V.28), D-Sub 9-pin interface

X3 Connection to BLN and FLN bus (RS-485), D-Sub 9-pin plug

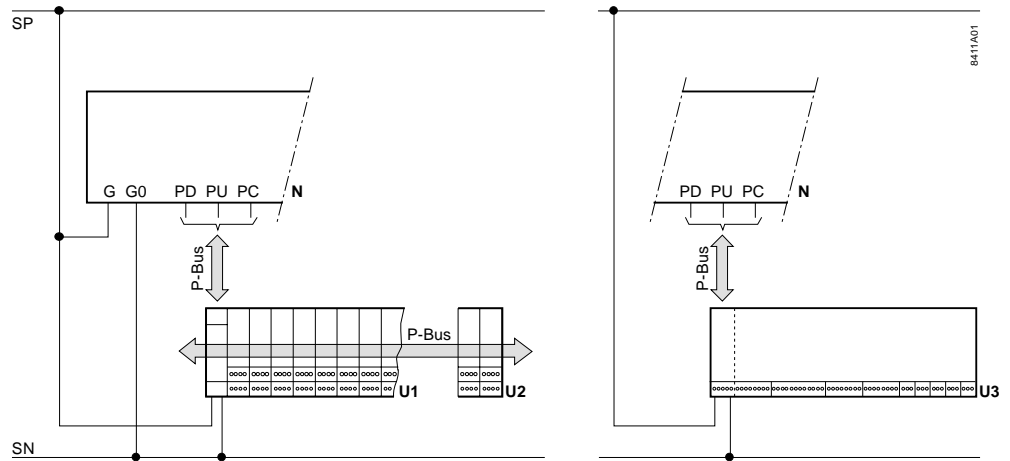
Tool adapter
PRW1.0U28



X1 Connection to tool plug on process unit front (ribbon cable connector)

X2 Connection to PC tool and BLN bus (Building Level Network), RJ45 connector

X3 Connection to PC tool and FLN bus (Floor Level Network), RJ45 connector



- N** Process unit with P-bus connection (PRV2.32, PRV2.64, PRV2.128)
- U1** I/O modules PTM1...
- U2** Interface modules PTM52...
- U3** I/O compact units PTK1...
- SP** System potential of the operating voltage AC 24 V
- SN** System neutral

Note

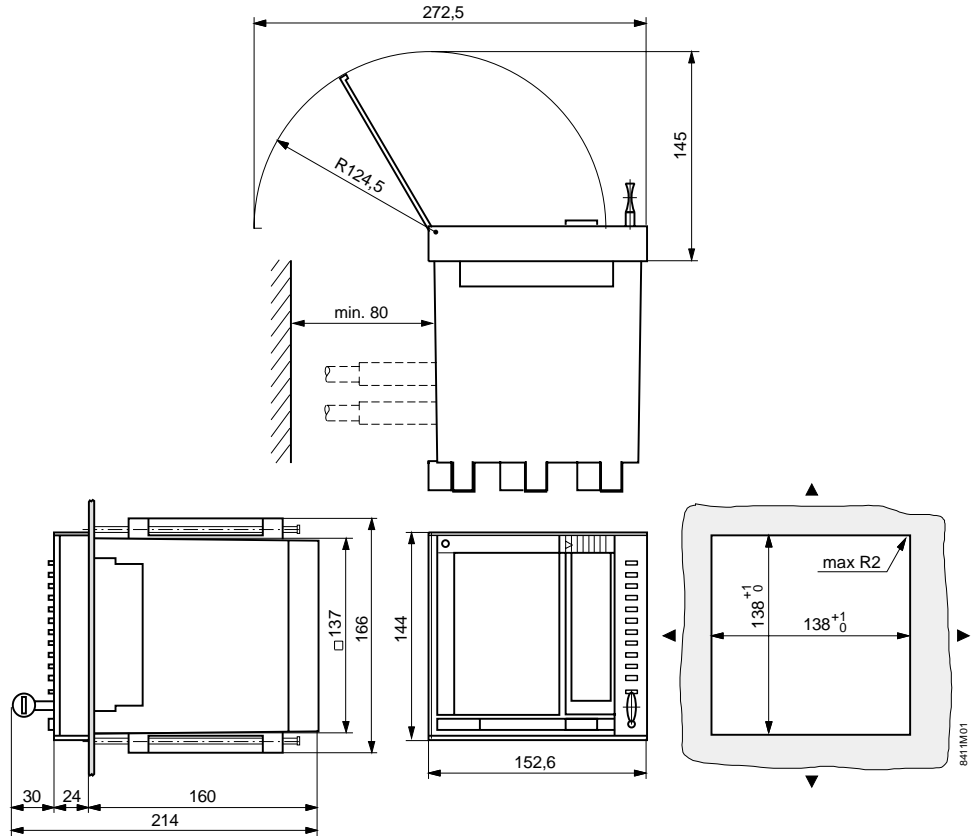
A prerequisite to connect I/O modules to the P-bus is that the respective process unit must support the functions of the connected units in terms of software. Refer to the data sheets on I/O modules or interface modules.

All other connection options, via the communication cards and special bus cards, are contained in the respective data sheets; refer to "Equipment combinations".

Dimensions

Flush panel mounting

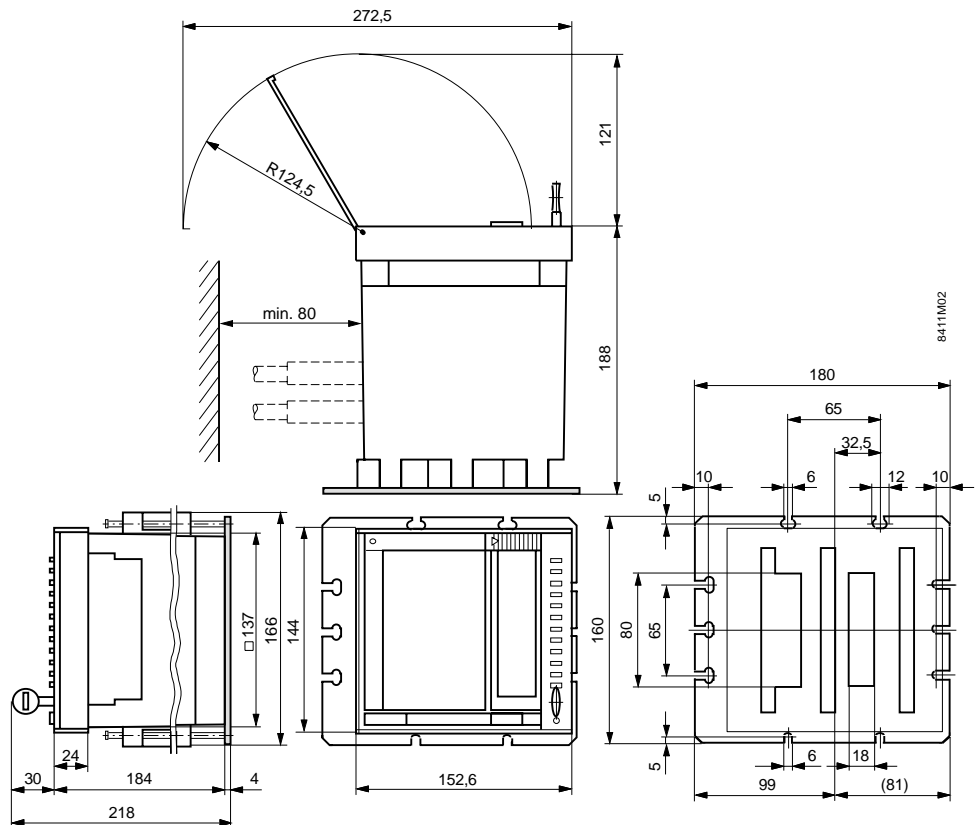
Standard cut-out as per DIN 43 700 (138x138 mm)



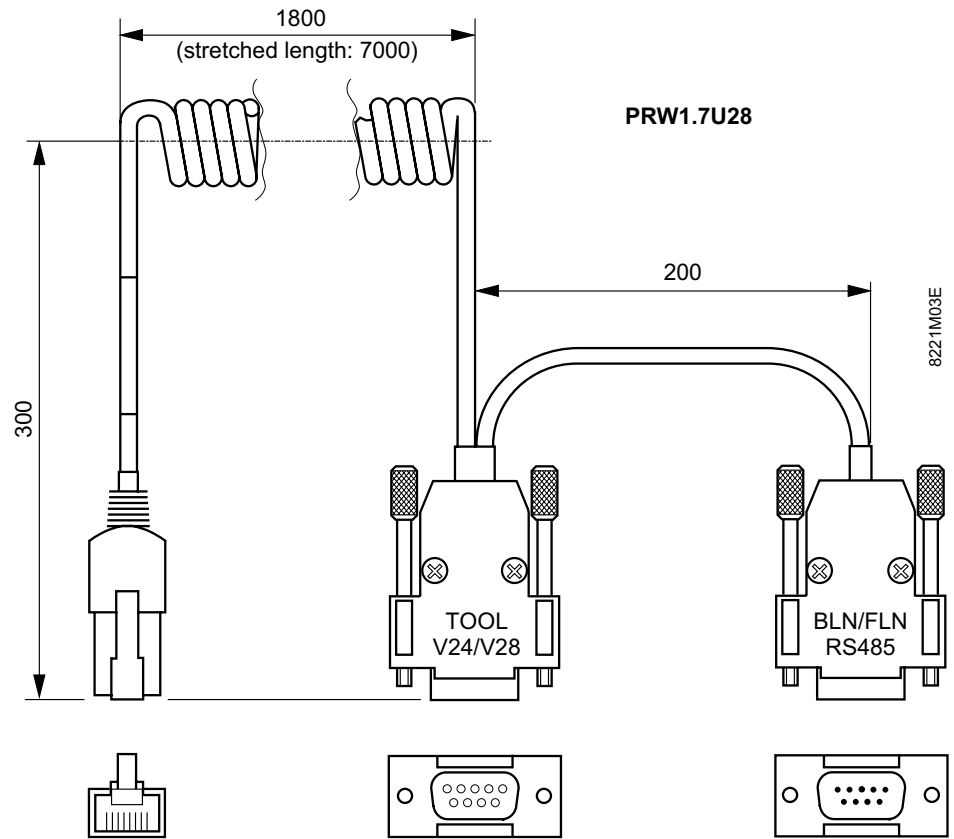
Minimum clearance to the next cut-out: 40mm at top and bottom; 80mm laterally

Wall mounting

The PRM1.1W baseplate is required for wall mounting



Tool connection cable



Tool adapter

