

DESIGO™ I/O COMPACT

## I/O Compact Unit

## PTK1.30V01

for connection to automation stations with P-Bus

I/O compact unit with integrated signal converters to provide the basic functions "signalling, measuring, switching, and positioning", combined in one unit and designed for the most common applications in the HVAC field with a focus on ventilating and air conditioning:

- Twelve status inputs for potential-free contacts
- Four measured value inputs LG-Ni 1000 for temperatures
- Two measured value inputs for DC 0...10 V signals
- Eight switching outputs, potential-free, for AC/DC 24...250 V
- Four modulating positioning outputs, DC 0...10 V
- Extension of functions through interfacing with the same or other types of I/O compact units
- Can also be used with individual modules of the I/O module system

### Use

In applications where the basic I/O functions "signalling, measuring, switching, and positioning" are required in the form of a certain I/O point mix and where the functions shall be provided by a compact unit to facilitate handling.

Major fields of use of I/O Compact:

- **Standardised systems** for pre-engineered and proven solutions in all areas of HVAC
- **Customised OEM solutions** based on HVAC specifications

## Functions

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- General
- P-bus connection facility for establishing connections to automation stations (three-wire serial process data bus)
  - Power supply for electronic circuitry integrated in the AC 24 V power supply circuit
  - LED for indicating the presence of operating voltage
  - Addressing the I/O functions on the hardware side by means of built-in address switches
- Status inputs
- Twelve status inputs to acquire signals via potential-free status contacts, e.g. from:
    - Switching devices, such as thermostats, pressurestats, etc.
    - Manual switches
    - Auxiliary contacts of contactors
    - Units of other manufacture
    - Existing product ranges
  - Conversion of status signals from the plant to the P-bus status signal for the automation station
- Note*
- Impulse contacts are not suitable for use as status contacts.
- Measured value inputs  
LG-Ni 1000
- Four inputs for the connection of temperature detectors LG-Ni 1000, e.g. for the following measuring variables:
    - Room temperatures
    - Temperatures in air ducts
    - Temperatures in pipes
    - Outside temperatures
    - Window pane temperatures
  - Measuring range  $-50...+150\text{ °C}$
  - Measured value conversion and linearization of the continuous detector measuring signals from the plant to digital P-bus signals for handling by the automation station
  - Facility for readjusting the detector's calibration via the automation station in the case of special measuring conditions
  - Detection of interruptions or short-circuits at the detector
- Measured value inputs  
DC 0..10 V
- Two inputs for DC 0...10 V measuring signals, e.g. from the following signal sources:
    - Active Siemens detectors for humidity, pressure, differential pressure, and frost protection
    - Actuators with position checkback signal
    - Measuring converters of other manufacture
  - Connection of other systems via the DC 0...10 V signal when there is no PROFIBUS, e.g. for the transmission of:
    - Compensating variables
    - Set values
  - Measured value conversion of the analog DC 0...10 V measuring signals from the plant to digital P-bus signals for handling by the automation station
  - Detection of interruptions at the detector

Switching outputs  
AC/DC 24...250 V

- Eight potential-free relay outputs for control voltages of AC/DC 24...250 V:
  - Six outputs with N.O. contacts (one common potential supply line for two contacts)
  - Two changeover contacts (with separate potential supply line)
- For the control of the following units and devices in the HVAC field, low voltage or mains voltage operated:
  - Power contactors (three-phase)
  - Motors (single-phase)
  - Burner, chillers and heat pumps (looping)
  - Solenoid valves
  - Semiconductor relays
  - Signalling devices (optical or audible)
  - Units of other manufacture
  - Damper and valve actuators
- Depending on the type of unit to be switched, the switching channels can be combined to provide the following switching actions:
  - Two-position
  - Three-position
  - Stepped switching or selection
- Signal conversion of the automation station's on/off and open/close signals routed via the P-bus to the respective commands for the plant
- LEDs for indication of the control outputs' switching statuses:
  - LEDs lit when relays are energised
  - The respective contact positions and connections between the terminals are given under "Diagrams"
- Drop out of relays when operation is faulty:
  - In the event of faulty data transmission when there is no error-free P-bus telegram from the automation station within 4 seconds
  - In the event the AC 24 V operating voltage at the automation station fails. When power returns, the relays remain de-energised until the next valid telegram calls for another status

Positioning outputs  
DC 0...10 V

- Four modulating positioning outputs DC 0...10 V, for the control of units having a DC 0...10 V input, such as:
  - Air damper or valve actuators
  - Modulating/three-position converters
  - Analog indicating and logging units
- Connection of other systems via the DC 0...10 V output signal when there is no PROFIBUS, for example for the transmission of:
  - Compensating variables
  - Set values
- Conversion of the digital P-bus signals from the automation station to continuous DC 0...10 V positioning signals for the plant
- LEDs for the output signals; the light intensity increases as the signal gets stronger
- Behaviour when operation is faulty:

In the event of faulty data transmission, that is, when there is no error-free P-bus telegram from the automation station within 4 seconds, the following statuses can be predefined via the automation station:

  - The output assumes the value of 0, also in the event no preselection has been made (default value)
  - The output assumes a predefined value of between DC 0...10 V
  - The output maintains the value transmitted last

In the event the AC 24 V operating voltage at the I/O compact unit fails, the output signal always assumes the value of 0. When power returns, the signal maintains the value of 0 until the next valid telegram calls for another value.

## Type summary

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	I/O compact unit	<b>PTK1.30 V01</b>
<b>Delivery</b>	The unit is supplied complete with two mounting brackets for wall mounting.	
<b>Accessories</b>	Labelling forms, A4 format, for plant-specific labelling (200 sheets)	<b>PTP1.50</b>
	Mounting brackets for wall mounting (spare parts)	<b>4 104 8016 0</b>

## Equipment combinations

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Automation stations Basically, the I/O compact units can be connected to all types of Siemens automation stations if they have a P-bus connection facility and if they support the I/O functions on the software side. These are for example:

Unit	Type	Data sheet
Universal process unit	<b>PRU2</b>	N8212
Universal process unit	<b>PRU10.64</b>	N8211
Standard process unit	<b>RWP80</b>	N8221

I/O Compact Extension of functions through interfacing with the same type or other types of compact units:

Unit	Type	Data sheet
I O Compact with the basic functions "signalling, measuring, switching, and positioning"	<b>PTK1.30 V01</b>	N8181
I/O Compact with the functions "measuring and switching"	<b>PTK1.23 V02</b>	N8282

I/O modules Complementing I/O compact units by functions that can only be provided by separate I/O modules, such as counting functions, manual control, etc., or to "fill" otherwise missing I/O points:

Unit groups	Range	Summary
I/O modules	<b>PTM1..</b>	N8100

Field devices All units of the Siemens product ranges can be connected provided their signals are compatible with the module inputs and outputs. It is also possible to use products of other manufacture if their signals are compatible and if they satisfy the safety requirement.

## Technical design

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### General

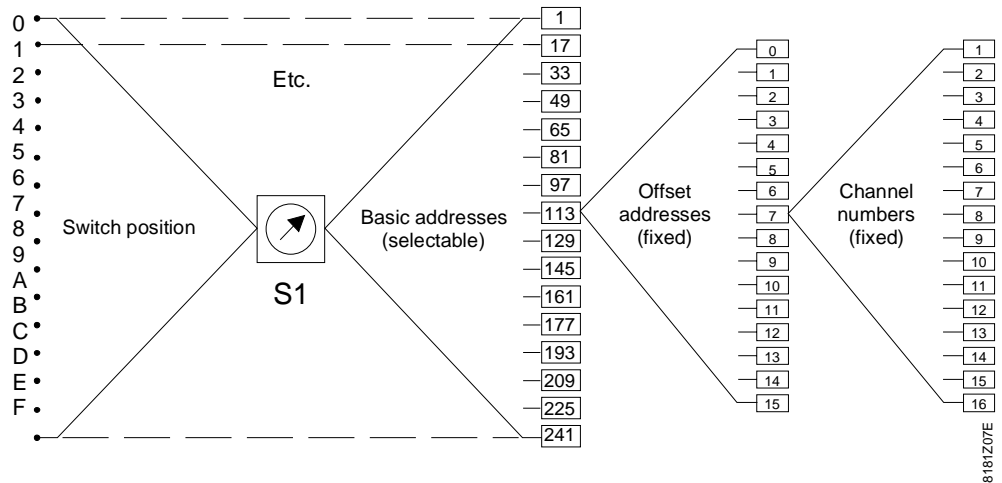
Operating voltage AC 24 V The I/O compact unit operates on AC 24 V supplied via its connection terminals (safety extra low voltage (SELV) to EN 60730). The operating voltage is required:

- At the unit, only for indication of operation (the electronic circuit is powered via the P-bus)
- To power the analog DC 0...10 V positioning outputs and to generate the contact currents for the status contacts
- In the case of extensions with individual modules, for powering them, depending on the type. In that case, the I/O compact unit passes the AC 24 V operating voltage via the I/O bar to the I/O modules

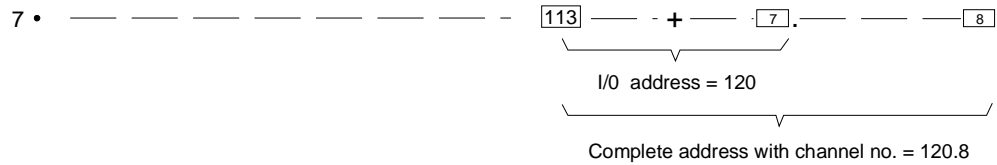
Operating voltage DC 24 V	<p>The operating and reference voltage (DC 24 V) from the automation station via the P-bus is required:</p> <ul style="list-style-type: none"> <li>• To power the electronic circuits and to operate the relays of switching and positioning outputs</li> <li>• For additional modules</li> <li>• As a reference voltage for the digital P-bus signals</li> </ul>
Switching voltages	<p>The voltages at the switching and positioning outputs to be switched by the relays - be it mains voltage or low voltage - must be fed to the respective connection terminals. All relay contacts are potential-free.</p>
P-bus	<p>The signal flow between I/O Compact and automation station is via the P-bus. The latter consists of three wires:</p> <ul style="list-style-type: none"> <li>– Data line</li> <li>– Clock line for synchronisation</li> <li>– Reference line as a reference potential for the data line and the clock line</li> </ul> <p>The "fourth" line for operating the P-bus is the system neutral (G0). It is not incorporated in the P-bus as the connection is already established via the AC 24 V operating voltage.</p>
<i>Note</i>	<p>For a detailed description of the P-bus, refer to data sheet N8022, "Process Bus".</p>
Interrogation cycle	<p>The interrogation cycle is 0.5 seconds at a transmission rate of 62.5 kBaud. This means that each I/O compact unit is addressed at an interval of 0.5 seconds. Within this period of time, the automation station transmits all commands to the outputs of the compact unit and the actual values from a plant are interrogated at the inputs.</p>
Reliability of transmission	<p>Faulty transmission will be detected and not accepted. For this purpose, the I/O compact unit provides the functions "CRC" (Cyclic Redundancy Check) and "Listening in" (comparing the data on the P-bus line with the required data).</p> <p>An I/O compact unit must be addressed by an error-free telegram at least every 4 seconds. If this is not the case, the outputs will be set to predetermined values (refer to the subsection below, "Behaviour in the event of faulty operation" under "Reliability of system").</p>
Addressing	<p>The complete address for an I/O channel, i.e., to access an I/O function at the I/O compact unit, is comprised of:</p> <ul style="list-style-type: none"> <li>• <b>Basic address</b> (BA): adjustable with the address switch from 1...241, in sixteen steps at increments of 16 (e.g. 16, 32, 48, etc.). This addresses the unit to itself. Thus, if several I/O compact units are connected to the same P-bus, the same basic address may be assigned only once.</li> <li>• <b>Offset address</b>: one of several pre-assigned addresses of 0 to theoretically 15; usually one offset address for each of the basic functions "signalling, measuring, counting, switching, and positioning". The offset address is added to the basic address, thus forming the I/O address that appears as the module address on the address plugs of the separate I/O modules.</li> <li>• <b>Channel number</b> (subaddress): used to address one of several similar I/O functions in the unit (as with the multiple modules of the I/O module system). The channel numbers are also pre-assigned and are in the range of 1 to theoretically 16.</li> </ul>
<i>Note</i>	<p>In this unit, all I/O channels contain only one I/O point, i.e., the channel number and the I/O point are identical.</p>

The illustration below shows an addressing example with the assignment and relationship of address switch position, basic address, offset address and channel number. Also refer to "Connection diagram" under "Diagrams".

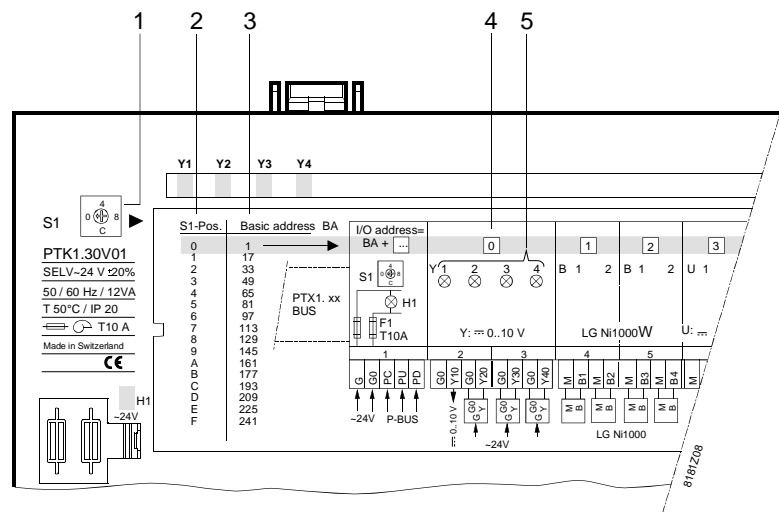
### Addressing principle



### Example



### Addressing at the unit



- 1 Switch for setting the basic addresses
- 2 Address switch positions from 0...F
- 3 Assigned basic addresses from 1...241
- 4 Offset addresses from 0...5
- 5 I/O points, e.g. from 1...4

### Addresses not used

Addresses that, within a basic address range, are not used by the I/O compact unit, are available for addressing additional I/O modules that are required. With this unit, only the offset addresses 0...5 are used. But to address an extension module, the basic address set on the I/O compact unit must be added to the free address in the range 6...15. For example, free address 7 and basic address 48 gives address plug number 55 at the I/O module.

## Reliability of system

- Switch-on behaviour:  
After switching on the operating voltage at the automation station and the I/O compact unit:
  - After 0.5 seconds, the I/O functions are ready to receive a telegram
  - After 2 seconds, the analog inputs (e.g. DC 0...10 V) are stable, and
  - The analog outputs are stable 2 seconds after receipt of the first telegram
- Behaviour in the event of faulty operation:
  - In the event of faulty data transmission (P-bus), that is, when there is no error-free telegram within 4 seconds, the analog outputs will assume the emergency positioning value and the relays drop out
  - In the event the AC 24 V operating voltage at the I/O units fails, the analog output signals will assume the value of 0 and the relays maintain their previous status. When power returns, these statuses will be maintained until the next valid telegram transmits other values
  - If the AC 24 V operating voltage at the automation station fails, the analog outputs and the relays behave as if data transmission was faulty
- Protection from false wiring:
  - The low voltage inputs and outputs are protected against false wiring (AC 24 V)
  - Interchanging the connections G and G0 for the AC 24 V operating voltage does not damage the units
- Short-circuit protection:
  - The low voltage outputs are protected against short-circuits
- Connection and disconnection under voltage:
  - Does not damage the units
- Connection of field devices and other systems:
  - Field devices such as detectors, converters, actuators, etc., that are connected to the low voltage side, and connections to other systems must be in compliance with the requirements for **safety extra-low voltage (SELV)** or **protection by extra-low voltage (PELV)** to HD 384

## Extension with I/O modules

I/O compact units can be enhanced or extended through the use of separate modules of the I/O module system. In terms of functions and process, there is no difference between the modular units within a compact unit and their counterparts in separate modules. The automation station does not "know" whether an I/O function is accommodated in a compact unit or in a separate I/O module.

## Status inputs

- The status inputs are designed for maintained contacts only. Impulse contacts are not suitable
- Parallel or series connection of several status contacts is possible. For permissible resistances, refer to "Technical data"

## Measured value inputs

### LG-Ni 1000

- To compensate for the line resistance, the measuring circuit is calibrated such that a resistance of 1 Ohm is taken into account
- Overall balancing of the plant (detectors plus lines plus I/O function part) is possible via the automation station and is done on the software side, e.g. during commissioning or when doing service work
- Interruptions or short-circuits at the detectors are detected and the respective signal is passed to the automation station

### DC 0...10 V

- An active detector or signal source that is not connected is detected and reported

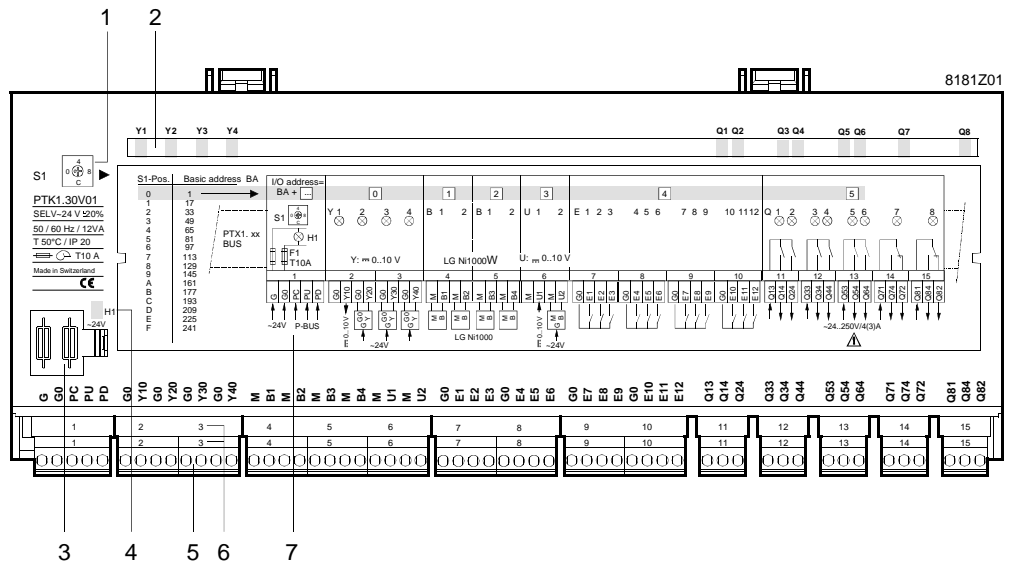
## Switching outputs

- Low voltage and mains voltage at different groups of contacts on one and the same unit are permitted
- Different phases of breaking voltage on one and the same unit are also permitted

<b>Positioning outputs</b>	In the event the automation station fails, the last value can be maintained at the DC 0...10 V output, if required, or it can assume another preselected value of between DC 0...10 V (default value = 0 V).
<i>Note</i>	With the PRU... automation station, this function is supported with software version V 5.0 or higher.
<b>Mechanical design</b>	
Casing	Plastic casing designed for control panel mounting. Shape and design are similar to the I/O modules. The casing accommodates the electronic components for the I/O converter functions, the P-bus connection facility and the supply line for the AC 24 V operating voltage. The unit is supplied complete with two mounting brackets for wall mounting.
Mounting choices	There is a number of mounting choices available, depending on the application (also refer to "Dimensions"): <ul style="list-style-type: none"> <li>• With the mounting brackets without the I/O bars</li> <li>• With the mounting brackets on top hat rails (EN 50 022-35x7.5) that are already fitted, without the I/O bars</li> <li>• When extending the I/O compact unit by I/O modules on the left: with the mounting brackets, a piece of I/O bar and top hat rail for the electrical connections and to mechanically secure the I/O modules</li> <li>• When extending the I/O compact unit by I/O modules on the right: with an uninterrupted piece of I/O bar and an uninterrupted top hat rail, but without the mounting brackets</li> </ul>
<i>Note</i>	When an I/O compact unit is powered from the I/O bar via a separate module supply block or a second I/O compact unit, no voltages may be picked up from the supply terminals of the I/O compact unit (AC 24 V operating voltage and P-bus).
Connection terminals and coding	The connection terminals are arranged in a row at the bottom of the casing. They consist of individual screw terminal blocks for each I/O function and the power supply. Each can be plugged in and removed. This facilitates replacements and measurements on open lines to the field devices without disconnecting the wires. Low voltage plugs and sockets are mechanically coded against those carrying mains voltage, thus eliminating incorrect wiring and damage. Also, N.O. contacts and changeover contacts of relay outputs are differently coded. In addition, plugs and associated sockets carry the same consecutive number.
Contacting the I/O bar	Electrical contact from the underside of the casing to the I/O bar is made exactly the way it is with the module supply block (PTX1.01) to the I/O modules.
Setting, display and service elements	The following setting, display and service elements are located on the unit front: <ul style="list-style-type: none"> <li>• The address switch for the basic address (S1) which is adjusted with the help of a screwdriver</li> <li>• An LED for indicating the AC 24 V operating voltage in the power supply section (H1)</li> <li>• LEDs for indicating the switching and positioning commands, located above the respective connection terminals</li> <li>• Two microfuses for the AC 24 V operating voltage, located under a protective cover</li> </ul>



Front view with factory designations



- 1 Address switch (16 positions)
- 2 Display of switching and positioning commands
- 3 Fuses for the AC 24 V operating voltage
- 4 LED for the operating voltage
- 5 Plug-in type screw terminal blocks
- 6 Mechanical coding and numbering of plugs and sockets
- 7 Labelling field with factory markings

#### Unit-specific labelling

The unit-specific labelling on the unit front comprises:

- The type field with the relevant information
- The terminal markings in compliance with the I/O functions (e.g. M, B1)
- The consecutive numbering of the plug-in type terminals and their sockets
- A wiring diagram of all I/O functions showing the basic connection facilities and an addressing diagram
- The markings of the LEDs and of the address switch with the setting diagram

#### Project-specific labelling

Project-specific labelling can be made on an individual basis or, in the case of customer-specific standard applications, repetitively.

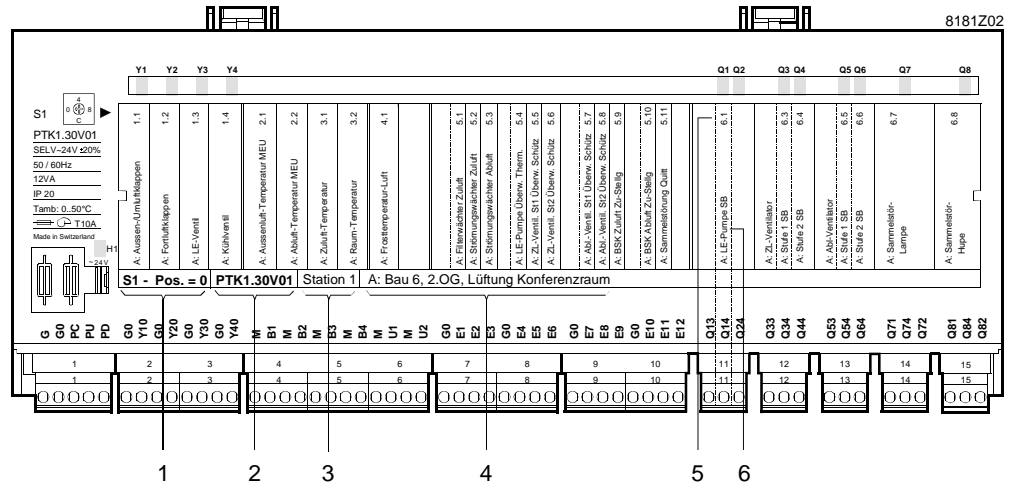
The labelling is made with the help of the system software for planning and plant configuration and is printed out on forms consisting of a number of perforated labels. The printed label is then inserted in the recess on the unit front and takes the place of the printed connection diagram.

The project-specific labelling consists of:

- Higher unique information:
  - Address switch position for the basic address, e.g. position 0 for basic address 1
  - Type of I/O compact unit, here PTK1.30V01
  - Station number of the associated automation station, e.g. station 1
  - Plant index and plant designation in clear text for the respective building sector, e.g. A: "Building 6, 2nd floor, ventilation conference room"
- Information on each I/O point:
  - I/O address (consisting of basic address and offset address) including channel number (subaddress), e.g. 1.4
  - I/O function in clear text, e.g. cooling valve

This project-specific information is in line with the terminal markings and the LEDs, if present.

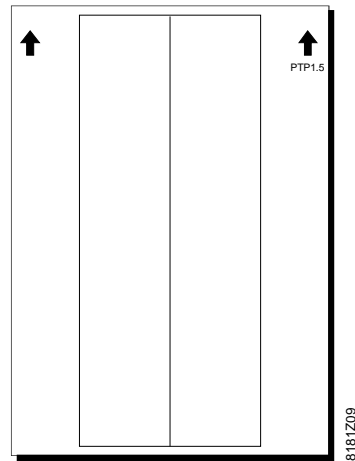
Front view with project-specific labelling



- 1 Basic address (in agreement with address switch position S1)
- 2 Type of I/O compact unit
- 3 Assignment to automation station
- 4 Name of building sector and plant
- 5 I/O address including channel number (subaddress)
- 6 I/O function

Labelling form PTP1.5

Labelling form in A4 format for printing by means of the PC program tool.



### Engineering notes



Document Z8102, "Basic Data of I/O Module System" contains system-related engineering know-how that can also be applied to the I/O compact units. Before proceeding to the following text, please make sure to read the relevant sections of that document while paying special attention to the information relating to safety.

Correct use

Within an overall system, the I/O compact unit must always be used for the applications specified. Consideration must be given to unit-specific characteristics and to the conditions described under "Use", "Engineering notes" and "Technical data" of this document.



The sections below identified by a warning sign contain additional requirements and limitations relevant to safety. They must be strictly observed to assure the safety of people and objects.

## General

### Operating voltage AC 24 V

The I/O compact units and associated automation station **must always be operated on safety extra low voltage** (SELV) or **protection by extra-low voltage to HD 384**.

### Sizing the transformer

The transformer must be sized based on the total power consumption of the following units:

- Automation station(s)
- I/O compact units
- I/O modules
- Connected field devices operating on AC 24 V (e.g. actuators, active detectors, converters)

### Coupling of inputs and outputs

The inputs and outputs **are not galvanically separated** from the module's electronic circuits - with the exception of the switching outputs provided with a relay and the signalling module for mains voltage.

### Field devices and interfaces for low voltage

Field devices and lines to other systems that are connected to the low voltage inputs and outputs must meet the requirements for **safety extra low voltage** (SELV) or **protection by extra-low voltage** to HD 384.

### Wiring of field devices operating on AC 24 V

The system potential (G) and, partly, the system neutral (G0) are not available at the connection terminals of the I/O functions. So the field devices must be connected via external terminal blocks (refer to "Diagrams").

### Laying the cables

The cables to the field devices can be laid with no shielding, together with other cables (including AC 3 x 400 V power lines), e.g. in cable ducts.

### AC 24 V wiring

To avoid voltage drops, I/O compact units and I/O module groups that are not connected to the AC 24 V operating voltage via the common I/O bar must be connected to the AC 24 V transformer in a **starlike** manner (refer to document Z8102, "Basics of I/O Module System").

### P-bus wiring

I/O compact units and I/O module groups that do not communicate via the P-bus on a common I/O bar must be connected to the automation station in the form of a **loop** (refer to document Z8102, "Basics of I/O Module System").

### Extension with I/O modules

When adding I/O modules to I/O compact units, there is no power supply block (PTX1.1.01) required. The electrical connections between the units are made via a piece of I/O bar (also refer to "Fitting notes" and "Dimensions").

### Note

If an I/O compact unit is powered from the I/O bar via a separate module supply block or a second I/O compact unit, no voltages must be picked up from the power supply terminals of the I/O compact unit (AC 24 V operating voltage and P-bus).


## Function-specific conditions

### Status signals

Only **potential-free** status contacts may be connected to the status inputs.


### Type of status contacts

The status inputs are designed for use with **maintained contacts**. Impulse contacts are not permitted.

Status contacts per input	A minimum of three status contacts can be connected to one status input, either in parallel or in series. The number of status contacts connected to an input is dependent upon the line resistance and the contacts' transfer resistance (refer to "Technical data").
Signal lines	<p>If several status contacts are to be connected to separate inputs - including different modules - they can be connected to the same common return line G0 (system neutral) of a status input, thus reducing the number of wires. The respective signalling modules must be arranged <b>on the same I/O bar</b>.</p> <p>For the requirements in terms of cable lengths, cross-sectional areas and the number of status contacts, refer to section 8.9 of document Z8102, "Basics of I/O Module System".</p>
 Fusing of switch outputs	The breaking voltage fed via the relays must be fused, refer to "Technical data".
Switching voltages	<ul style="list-style-type: none"> <li>• Low voltage and mains voltage at the different switching outputs of the same unit are permitted</li> <li>• Different mains voltage phases at the switching outputs of the same unit are permitted</li> <li>• There is a total of six outputs with N.O. contacts. Every pair of them has one common potential supply line (refer to "Diagrams")</li> </ul>
Switching frequency	For applications requiring great switching frequencies, consideration must be given to the life expectancy of the relay contacts (refer to "Technical data").

## Fitting notes

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Arrangement and connection of units	<p>Depending on the type of application, size of plant and space available, there are different variants available (also refer to "Dimensions"):</p> <ul style="list-style-type: none"> <li>• One or several I/O compact units, secured to the mounting brackets supplied with them, with no I/O bar</li> <li>• One or several I/O compact units mounted on an uninterrupted piece of I/O bar and top hat rail</li> <li>• Several I/O compact units mounted above one another on separate I/O bars and top hat rails</li> </ul> <p>Extension with I/O modules:</p> <ul style="list-style-type: none"> <li>• Direct mechanical and electrical connection to the I/O compact unit by means of a common I/O bar</li> <li>• Connection of separate I/O modules to the I/O compact unit requires an additional module supply block (PTX1.01) on the I/O module bar</li> </ul>
Note	For wiring of these variants, refer to "Engineering notes".
 Connecting terminals	For connecting, use only the inserted, plug-in <b>original connecting terminals</b> .
Mounting instructions	The I/O compact unit is supplied complete with mounting instructions

## Commissioning notes

- Check wiring to make certain it is in compliance with the plant's connection diagram
- The permissible cable lengths and cross-sectional areas must be in agreement with the information given in document Z8102, "Basics of I/O Module System" and with the data given in the data sheets of the field devices
- Check the connections made to the terminals. The numbers on the plugs and sockets must agree
- Addressing: refer to "Technical design"
- The LED for AC 24 V operating voltage (H 1) must be lit, or else check the respective fuses

## Technical data

### General data

⚠ Power supply	Operating voltage	AC 24 V ± 20 %	
	Safety extra-low voltage SELV or protection by extra-low voltage PELV to	HD 384	
	Requirements on transformer to	EN 60 742	
	Secondary fusing (externally)	10 A, slow	
	Frequency	50 Hz or 60 Hz	
	Power consumption	12 VA	
	Load units per automation station	13 (12.5 mA each)	
	Unit fuses for AC 24 V (internally)	10 A, slow	
	Perm. loading on terminals G0 and M	Total per unit On one terminal	6 A (150 VA) max. 2 A
	Protection standard	Degree of protection of casing	IP 20 to EN 60 529
Ambient conditions	Transport and storage	IEC 721-3-2	
	Climatic conditions	class 2K3	
	Temperature range	-25 °C...+70 °C	
	Humidity	<95 % r.h.	
	Mechanical conditions	class 2M2	
	Operation	IEC 721-3-3	
CE conformity	Climatic conditions	class 3K5	
	Temperature range	-5 °C...+50 °C	
	Humidity	<95 % r.h.	
Product standards	In compliance with EC directives		
	Electromagnetic compatibility	89/336/EEC	
	Low voltage guideline	73/23/EEC	
Electromagnetic compatibility	Automatic electrical controls for household and similar use	EN 60 730	
	Energy Management Equipment	UL 916	
Connection terminals	Emissions	EN 50 081-1	
	Immunity	EN 61 000-6-2	
Weight	Terminals for wires of	0.5 mm dia. min. 2 x 1.5 mm <sup>2</sup> max. or 1 x 2.5 mm <sup>2</sup>	
	Without packaging	0.9 kg	
Dimensions	Refer to "Dimensions"		
Note	For information on cable lengths and cross-sectional areas for the connection of field devices, refer to document Z8102, "Basics of I/O Module System".		

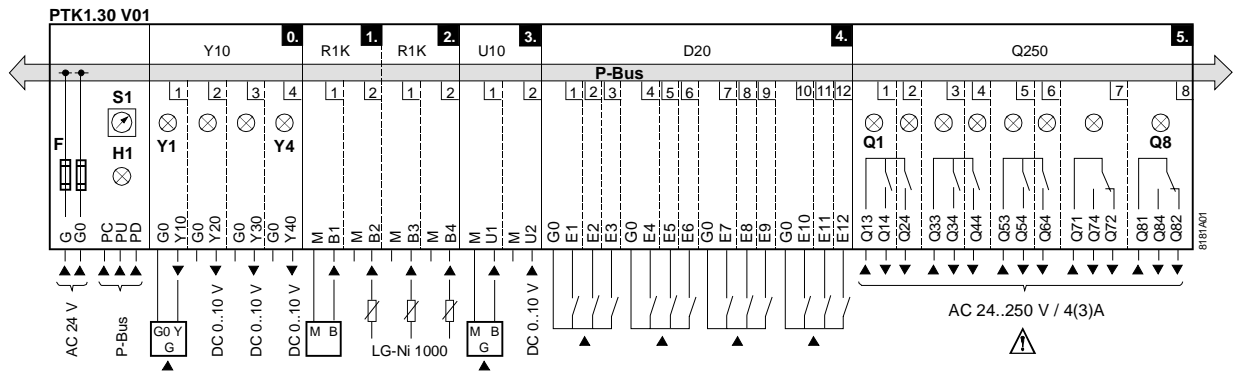
## Inputs

Status inputs (E1...E12)	Number of status inputs	12
	Contact sensing	
	Voltage	DC 32 V
	Current	8 mA
	Requirements on status contacts	
	Status signal	potential-free
	Type of contact	maintained contact only
	Insulation	for safety extra low voltage (SELV) to EN 60730
	Perm. resistance when contacts are closed	100 Ω max.
	contacts are open	50 kΩ max.
Measured value inputs LG-Ni 1000 (B1...B4)	Number of measured value inputs	4
	Measured value input for	LG-Ni 1000
	Measured value range	-50...+150 °C
	Detector current	2.1 ...2.7 mA
	Resolution of converter	0.05 K
	Compensation of detector line	1 Ω
Measured value inputs DC 0...10 V (U1, U2)	Number of measured value inputs	2
	Measured value input for	DC 0...10 V
	Overrange	11.30 V
	Underrange	-1.30 V
	Input current	0.1 mA max.
	Resolution	3.125 mV
	Perm. input voltage	DC 20 V max.

## Outputs

⚠ Switching outputs AC 24...250 V (Q13...Q82)	Number of switching outputs (n.o. contacts)	6	.
	Number of switching outputs (change-over contacts)	2	.
	External fusing of mains line		.
	Fuse, slow	max. 10 A	.
	Circuit-breaker (c.b.)	max. 13 A	.
	Tripping characteristics (c.b.)	B, C, D as per EN 60898	.
	Contact data		.
	Switching voltage	max. AC/DC 250 V min. AC 24 V min. DC 5 V	.
	AC current load	max. 4 A (res.), 3 A (ind.) min. 5 mA at AC 250 V min. 20 mA at AC 24 V	.
	DC current load	max. 4 A at DC 24 V (res.) max. 0.5 A at DC 24 V L/R = 20 ms max. 0.1 A at DC 250 V (res.) min. 0.1 A at DC 5V	.
	Switch-on current	max. 10 A (1 s)	.
	Lifetime of relay contacts at AC 250 V	guide values	.
	at 0.1 A (res.)	2 x 10 <sup>7</sup> operations	.
	at 0.5 A (res.)	4 x 10 <sup>6</sup> operations (n.o. contacts) 2 x 10 <sup>6</sup> operations (change-over cont.)	.
	at 4 A (res.)	3 x 10 <sup>5</sup> operations (n.o. contacts) 1 x 10 <sup>5</sup> operations (change-over cont.)	.
	Red. faktor for ind. loads (cos phi = 0,6)	0.85	.
Insulation strenght	Between relay outputs and system electronics (reinforced insulation)	AC 3750 V, as per EN 60 730-1	.
	Between adjacent relay contacts (reinforced insulation)	AC 3750 V, as per EN 60730-1	.
			.
Positioning outputs DC 0...10 V (Y10...Y40)	Number of positioning outputs	4	
	Output signal	DC 0...10 V (1 mA max.)	
	Overrange	DC 10.66 V	
	Resolution	10.4 mV	

Connection diagram

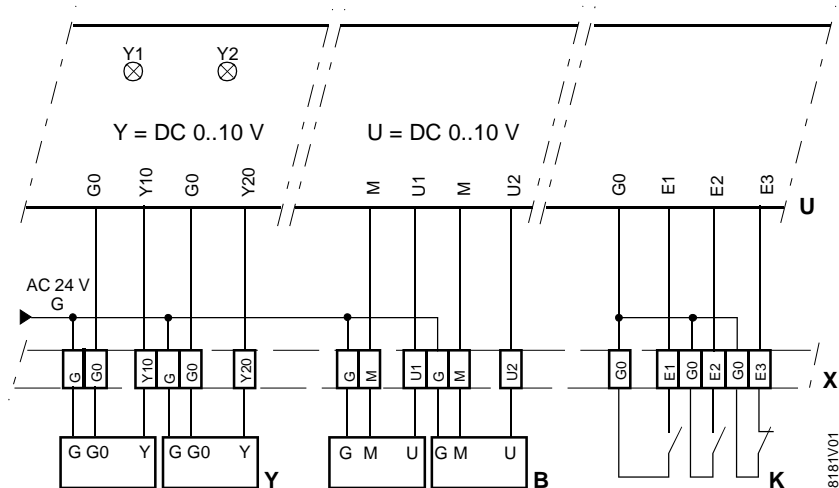


- F** Microfuses, 10 A slow
- H1** LED for AC 24 V operating voltage
- Q1...Q8** LEDs for the switching outputs
- S1** Address switch for setting the basic address in steps of 16 from 1 to 241
- Y1...Y4** LEDs for the modulating DC 0...10 V positioning outputs
- 0...5** Offset addresses
- 1...12** I/O points, assigned to the offset addresses

Connection terminals:

- G** System potential AC 24 V
- G0** System neutral
- PD** Data line, bi-directional
- PU** Reference voltage DC 24 V
- PC** Clock line for data transmission
- B1...B4** Measured value inputs for LG-Ni 1000 temperature detectors
- E1...E12** Status inputs for potential-free status contacts
- Q13...Q64** Switching outputs with N.O. contacts
- Q71...Q82** Switching outputs with changeover contacts
- U1, U2** Measured value inputs for DC 0...10 V measuring signals
- Y10...Y40** Positioning outputs with DC 0...10 V signals

External wiring of G and G0 for field devices



- B** Detector, active, with DC 0...10 V output
- K** Status contacts, potential-free
- U** I/O compact unit
- Y** Regulating units with DC 0...10 V control
- X** Control panel terminal blocks

**Dimensions**

