SYSTEM COMPONENTS

# UNICONT

MODULES

3 YEARS WARRANTY @ NIVELCO – WHERE ELSE?

NIVELCO

SYSTEM COMPONENTS

# MULTIFUNCTIONAL CURRENT CONTROLLED SWITCH MODULES

## MAIN FEATURES

- *4–20 mA input*
- *Relay output*
- *Rail mountable*
- *Intrinsically safe Associated Apparatus*

## APPLICATIONS

- *Galvanic isolated limit switch*
- *Power supply for transmitters*
- *Cable state monitoring*

## GENERAL DESCRIPTION

The members of the **UNICONT PKK-312** series are 4–20 mA current controlled limit switches featuring galvanic isolation and also available as an intrinsically safe associated apparatus. The input 4–20 mA signals can be transferred from passive or active outputs of 2- or 4-wire transmitters.

The value of the input signal will be compared in the unit with the set (taught) value and the state of the galvanically isolated relay changes in accordance with the comparison mode programmed.

The double throw output relay can be programmed for the following functions:

- Limit switch (high or low fail safe)
- ON-OFF control with selectable switching difference
- Monitoring of discontinuity or short-circuit of the cable
- Window comparison operation mode with energised or de-energised relay state

The **UNICONT PKK-312-8 Ex** is a special version, designed to operate with **NIVELCO's** Ex rated, DC powered 2-wire **NIVOSWITCH** vibrating fork level switches, as an intrinsically safe power supply and amplifier unit. Without doing any programming the galvanic isolated limit switch is able to perform relay switching signal based on the monitoring of the vibrating fork's output current changes between the freely vibrating and the immersed states.

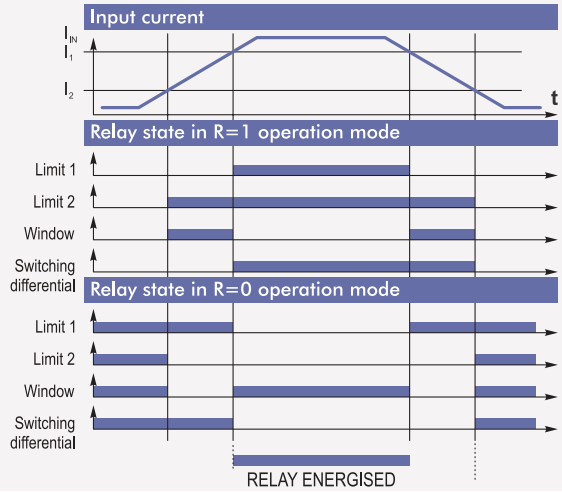
## TECHNICAL DATA

| Type | | PKK–312–☐ |
|---|---|---|
| Nominal input current range | | 1–22 mA |
| Accuracy of switching level / threshold level | | ± 0.1 mA |
| Discontinuity threshold / low limit value fault current | | 3.7 mA |
| Short circuit threshold / high limit value fault current | | 22 mA |
| Input impedance | | 10 Ω |
| Input overload capability | | max 100 mA (permanent) |
| Switching delay | | 0.1 s; 1 s; 2 s; 5 s (selectable) |
| Output | Relay | 1 x SPDT |
| | Rating | 250 V AC, 8 A, AC1 |
| Electrical connection | | max. 2.5 mm² (AWG14) twisted, or max. 4 mm² (AWG12) solid wire |
| Mounting | | EN 60715 rail |
| Module width | | 2-modules (36 mm / 1.42 inch) |
| Ingress protection | | IP20 |
| Mass | | ≈ 0.21 kg (0.45 lbs) |

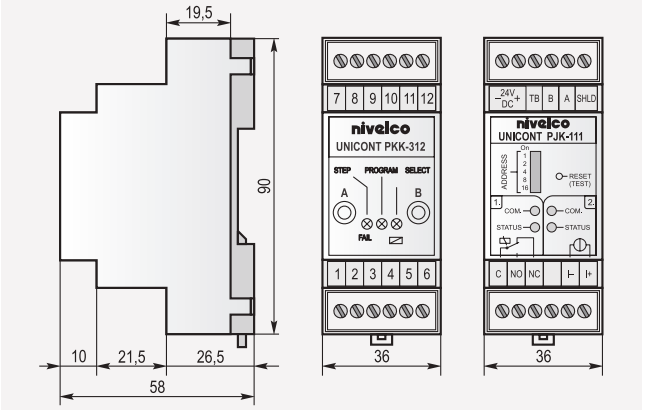
| Type | Standard version | | | | Explosion-proof version | | | |
|---|---|---|---|---|---|---|---|---|
| | PKK-312-1 | PKK-312-2 | PKK-312-3 | PKK-312-4 | PKK-312-5Ex | PKK-312-6Ex | PKK-312-7Ex | PKK-312-8Ex |
| Power supply | 230V AC ±10% 50…60 Hz | 110V AC ±10% 50…60 Hz | 24V AC ±10% 50…60 Hz | 24V AC ±10%, 50…60 Hz, 24V DC ±15% | 230V AC ±10% 50…60 Hz | 110V AC ±10% 50…60 Hz | 24V AC ±10%, 50…60 Hz, 24V DC ±15% | |
| Power consumption | < 2.7 VA | | | <2.5 W | < 2.5 VA | | < 2.5 VA / < 2.5 W | |
| Switching levels | 2 values in the range of 1–22 mA | | | | 2 values in the range of 1–22 mA | | | 10.5 mA; 12.5 mA |
| Ex marking | – | | | | ⟨Ex⟩ II (1) G [EEx ia] IIB | | ⟨Ex⟩ II (1) G [EEx ia] IIC | |
| Intrinsically safe data | – | | | | $U_0$<28.4 V; $I_0$<140 mA; $P_0$<1.1 W; $L_0$<6 mH; $C_0$<50 nF | | $U_0$<28.4 V; $I_0$<80 mA; $P_0$<0.6 W; $L_0$<4 mH; $C_0$<50 nF | |
| Output load capability | $U_0$ = 30 V $I_{MAX}$ = 70 mA $U_{OUT}$ min = 16 V | | | $U_0$=24 V $I_{MAX}$ = 80 mA $U_{OUT}$ min = 23 V | at 22 mA $U_{OUT}$ ≈ 12 V | | at 22 mA $U_{OUT}$ ≈ 15 V | – |
| Electrical protection | Class II. | | | Class III. | Class II. | | Class III. | |
| Ambient temperature | –10 °C ... +55 °C (+14 °F ... +131 °F) | | | | | | | |

## RELAY OPERATION

Relay operating modes can be programmed by the press buttons on the front panel and considering the indications of the bicolour LED's.
One of the most important parameters is the operating mode of the relay "R". If R = 1 the output relay will be energised when the input current is over the value set by teaching. If R = 0 the output relay will be de-energised when the current value is over the value set by teaching.
By the help of this parameter the characteristic (normal or reverse) of the ON–OFF control can be decided e.g. depending on the need for emptying or filling in connection with level control as well as heating or cooling control if used for temperature control.

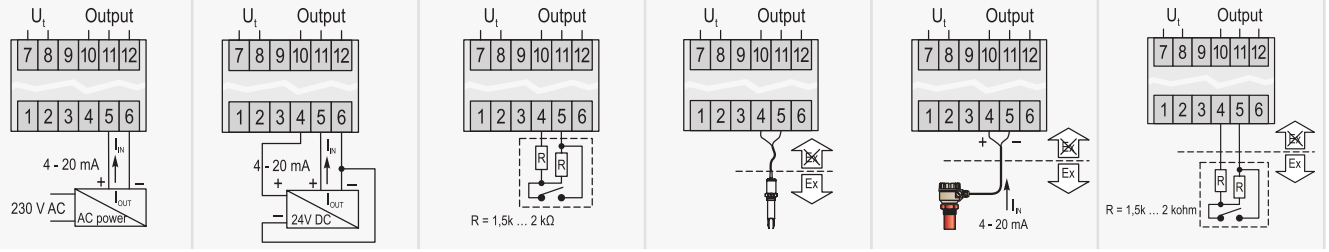



## DIMENSIONS



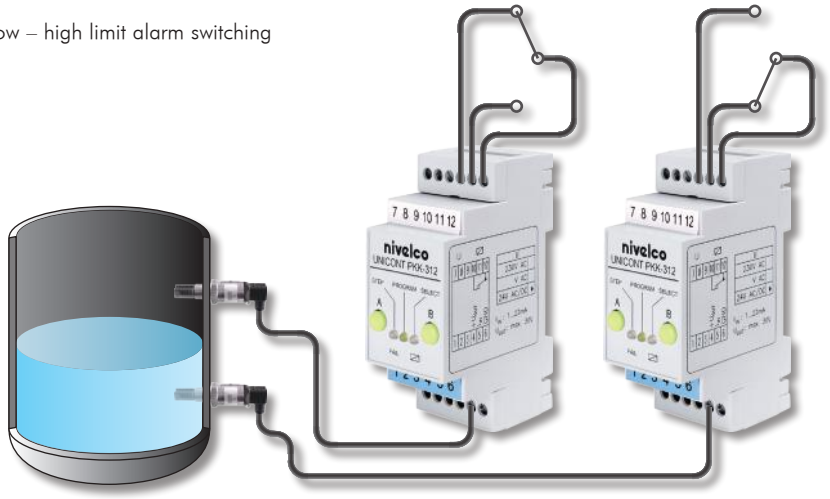

## WIRING

| Wiring standard models | | | Wiring Ex certified models | | |
|---|---|---|---|---|---|
| PKK-312-1 ⋮ PKK-312-4 | PKK-312-1 ⋮ PKK-312-4 | PKK-312-1 ⋮ PKK-312-4 | PKK-312-8 Ex | PKK-312-7 Ex | PKK-312-5 Ex<br>PKK-312-7 Ex |
| 4-wire active transmitter (eg.: EchoTREK STA-46☐) | 4-wire active transmitter (eg.: MICROSONAR UTS-211) | monitoring a passive dry contact | NIVOSWITCH Ex vibrating fork | 2-wire Ex transmitter (eg.: EchoTREK SEA-380-6 Ex) | monitoring Ex type passive switch and cable discontinuity |




## APPLICATION EXAMPLE

Low – high limit alarm switching




## ORDER CODES

UNICONT PKK – 312 – ■ Ex(1)

| Power supply / Ex | Code |
|---|---|
| 230 V AC | 1 |
| 110 V AC | 2 |
| 24 V AC | 3 |
| 24 V AC/DC | 4 |
| 230 V AC / Ex | 5 |
| 110 V AC / Ex | 6 |
| 24 V AC/DC / Ex | 7 |
| 24 V AC/DC / Ex | 8(2) |

(1) *The order code of an Ex version should end in "Ex"*
(2) *For DC powered, 2-wire **NIVOSWITCH Ex** vibrating forks*

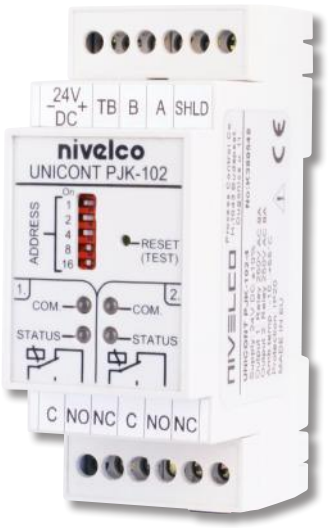
# UNICONT PJK UNIVERSAL INTERFACE MODULES

## MAIN FEATURES

- *RS 485 input*
- *HART or MODBUS protocol*
- *Output:*
  - *2x relay output*
  - *2x current output*
  - *Mixed: relay and current output*
- *Rail mountable*

## APPLICATIONS

- *Universal Interface Module:*
  - *For PLC process control systems*
  - *For automated process control systems operating on RS485*
  - *Expanding module for MultiCONT*




## GENERAL DESCRIPTION

The members of the **UNICONT PJK-100** series are universal interface modules which can be controlled via RS485 line, and (depending on type) provides relay(s) and/or 4–20 mA current output(s). The DIP switch in the front panel of the module is for setting the address.

The Universal Interface Modules can be widely used as system components in the following applications:

- Expanding the MultiCONT devices with relay or current outputs
- Peripheral unit of PLC process control systems
- Peripheral unit of PC automated process control systems

The **UNICONT PJK-100** universal interface modules provide essential solution if the number of relays or current outputs of the **MultiCONT** is not enough in a system. The device can be used also as a peripheral unit for PLC or PC controlled process control systems communicating via MODBUS protocol. The sum of relays in the **UNICONT PJK-100** extension modules and the **MultiCONT** must not exceed 64, and the sum of analogue outputs (4–20 mA) must not exceed 16. There is a special module with both relay and current output in the variety of the **UNICONT PJK-100** series. The maximal number of these modules may be 32. The programming of the **UNICONT PJK** modules can be done via HART or MODBUS protocol with the help of the central unit of the communication network, which can be a process control computer or a **MultiCONT** device. The switches in the front panel of the module is only for setting the address.

## TECHNICAL DATA

| Type | PJK-1-□□-4 |
|---|---|
| Power supply | 24 V DC ±10% |
| Power consumption | 10 mA + ($N_{relay}$ x 11 mA + $N_{currentgenerator}$ x 25 mA) ±10% |
| Ambient temperature | – 20 °C … + 50 °C |
| Electrical connection | max. 2.5 mm² (AWG14) twisted, or max. 4 mm² (AWG12) solid wire |
| Electrical protection | Class III. |
| Mounting | EN 60715 rail |
| Module width | 2-modules (36 mm / 1.42 inch) |
| Ingress protection | IP20 |
| Mass | 0.11 kg (0.24 lbs) |

## MODULE SERVICES

**Common services of the units**

- Operating time count
- Monitoring communication cycle time-out (communication watchdog)

| Services of the units with relay output | Services of the units with current output |
|---|---|
| ■ Static or impulse output<br>■ Selectable impulse default state<br>■ Detection of coil break (error indication)<br>■ Counting the number of relay's energised state<br>■ Counting number of switching cycles<br>■ Life-time (max. numbers of switching cycles) monitoring | ■ Monitoring correct operation of current generator (error indication)<br>■ Can be calibrated by the user<br>■ Low or high error current |

## OUTPUTS

| Type | | PJK-102-4 | PJK-111-4 | PJK-110-4 | PJK-120-4 |
|---|---|---|---|---|---|
| Output units | | 2 relays | 1 relay + 1 current output | 1 current output | 2 current outputs |
| Relay | Relay | SPDT | | – | |
| | Rating | 250 V AC, 8 A, AC1 | | – | |
| | Insulation voltage | 2500 V 50 Hz | | – | |
| | Electrical / mechanical lifespan | $10^5$ / 2 x $10^6$ switching | | – | |
| | Impulse width in pulse mode | 0.1 … 25.5 s | | – | |
| | Electrical protection | Class II. | | – | |
| Current generator | Linear range | – | | 3.601 mA … 21.999 mA | |
| | Error indication | – | | ≤ 3.6 mA, or ≥ 22 mA | |
| | Resolution | – | | 14 bit | |
| | Accuracy | – | | 40 µA | |
| | Temperature dependence | – | | max. 15 µA / 10 °C | |

## ORDER CODES

UNICONT PJK 1■■–4

| Current output | Code |
|---|---|
| None | 0 |
| 1x 4–20 mA | 1 |
| 2x 4–20 mA | 2 |

| Relay output | Code |
|---|---|
| None | 0 |
| 1x SPDT | 1 |
| 2x SPDT | 2 |

# UNICONT PGK INTRINSICALLY SAFE ISOLATOR POWER SUPPLY

## MAIN FEATURES

- *Intrinsically safe isolation*
- *Power supply for transmitters*
- *20 – 35 V DC supply voltage*
- *4-20 mA, HART communication*
- *Up to 1 μA transmission accuracy*
- *Rail mountable*

## APPLICATIONS

- *For high precision transmitters*
- *For transmitters operating in hazardous applications*
- *For certified measurement instruments*
- *For 2-wire 4–20 mA transmitters*

## GENERAL DESCRIPTION

The **UNICONT PGK-301** intrinsically safe isolator and power supply modules are suitable for providing power supply for transmitters operating in hazardous applications, isolating the input, output and supply voltage galvanically. Moreover the device perform high accuracy signal transmission with 4-20 mA or HART communication between Ex and non-Ex areas.

The **UNICONT PGK-301** intrinsically safe isolators perform signal transmission to the non-Ex Zone with microprocessor controlled digital signal processing, which provides transmission accuracy up to 1 μA. This is a special demand in case of certified, high precision (for example magnetostrictive) transmitters. If fast conversion speed is necessary, the high speed types are the ideal choices. The number of connectable transmitters is determined by the intrinsically safe limit data.

## TECHNICAL DATA

| Type | | High precision | | High speed | |
|---|---|---|---|---|---|
| | | PGK-301-A Ex | PGK-301-B Ex | PGK-301-C Ex | PGK-301-D Ex |
| Input | | 4–20 mA | | | |
| Output | Normal operation | 4–20 mA | | | |
| | Current error | 3.6 mA: $I_{IN}$=3.6 mA or $I_{IN}$>24 mA | | | |
| Protection | | Input, output, power supply: 125 mA fuse | | | |
| Loop resistance | | 300 – 1000 Ω/24 V DC | | | |
| Communication | | – | HART | – | HART |
| Power supply | | 20-35 V DC | | | |
| Power supply indication | | Green LED | | | |
| Power supply for transmitters | | 23 V DC galvanically isolated | | | |
| Galvanic isolation | | > 2 kV | | | |
| Power consumption | | Max. 2.2 W | | | |
| Transmission accuracy (at +20 °C / +68 °F) | | 1 μA + 0.01% reading error (typically max. 2.5 μA) | | 8 μA + 0.1% reading error (typically max. 20 μA) | |
| Response time | | 100 msec | | 5 msec | |
| Temperature dependence | | < 1 μA/ °C | | | |
| Ambient temperature | | - 20 °C ... + 60 °C (- 4°F ... +140 °F) | | | |
| Electrical connection | | Terminal, wire cross section: 0.5 – 2.5 mm² (AWG20 - AWG14) | | | |
| Electrical protection | | Class III. | | | |
| Mounting | | EN 60715 rail, module width: 22.5 mm (0.88 inch) | | | |
| Mass | | 0.25 kg (0.55 lbs) | | | |

## SPECIAL DATA FOR Ex CERTIFIED MODELS

| Protection type | | Ex ia | |
|---|---|---|---|
| Ex marking | ATEX | ⟨Ex⟩ II (1) G [Ex ia Ga] IIC | ⟨Ex⟩II (1) G [Ex ia Ga] IIB |
| | IEC Ex (1) | [Ex ia Ga] IIC | [Ex ia Ga] IIB |
| Intrinsically safe data | | $L_0$= 2 mH $C_0$= 60 nF | $L_0$= 9 mH $C_0$= 450 nF |
| | | $U_0$=26 V $I_0$=94 mA $P_0$=0.65 W | |
| | | Um= 253 V AC | |

*(1) Need of IEC is to be specified with order*

## ORDER CODES

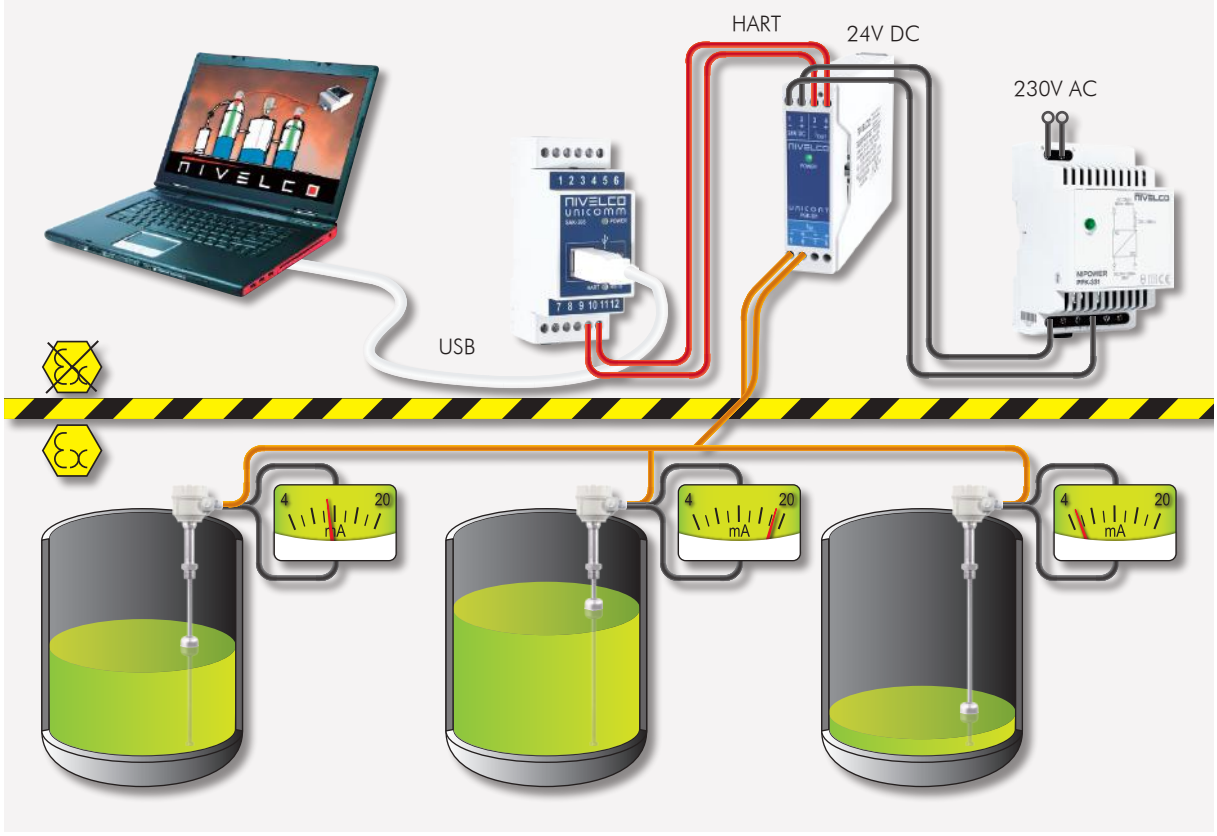
UNICONT PGK–301– ■ Ex

| Type / Output | Code |
|---|---|
| High precision / 4–20 mA | A |
| High precision / 4–20 mA +HART | B |
| High speed / 4–20 mA | C |
| High speed / 4–20 mA + HART | D |

www.nivelco.com

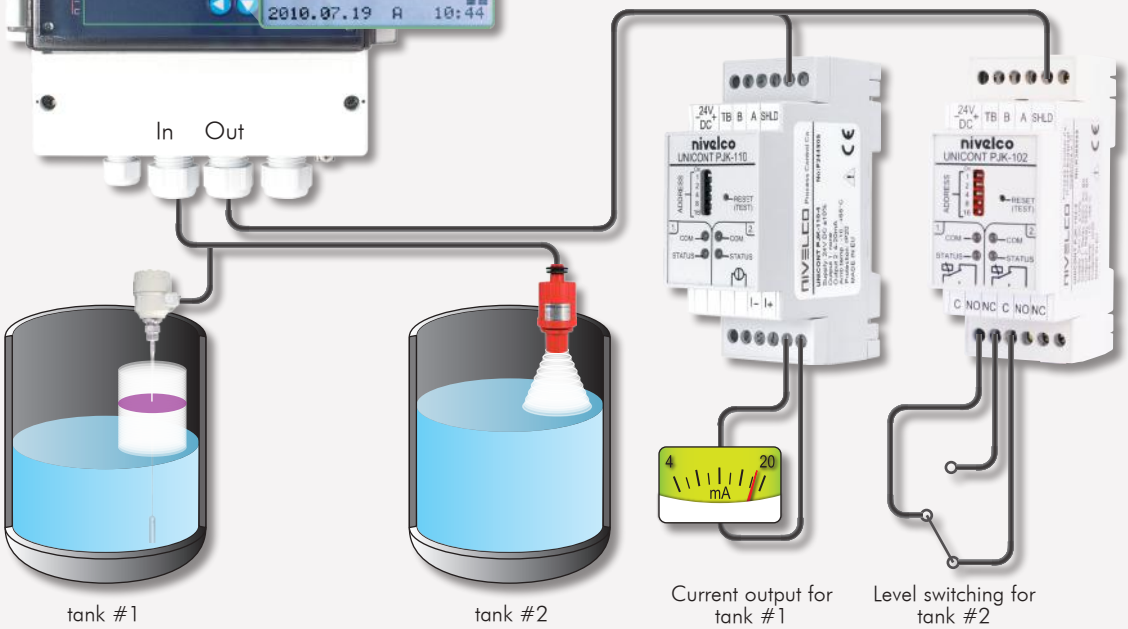
pk30g15a0601b

## UNICONT PGK INTRINSICALLY SAFE ISOLATOR POWER SUPPLY MODULES




## UNICONT PJK UNIVERSAL INTERFACE MODULES

The **MultiCONT** device can be extended with max. 32 **UNICONT** Universal Interface Modules. These modules should be distinguished with different "Short Addresses". The communication loop cannot contain two or more modules with the same Short Addresses. Setting is possible with the switches on the front panel of the module (0…31).




**NIVELCO PROCESS CONTROL CO.**
H-1043 BUDAPEST, DUGONICS U. 11.
TEL.: (36-1) 889-0100 ▪ FAX: (36-1) 889-0200
E-mail: sales@nivelco.com http://www.nivelco.com

Nivelco reserves the right to change technical data without notice!

www.nivelco.com