Thank you for choosing NIVELCO product. We are sure that you will be satisfied throughout its use.

2. TECHNICAL DATA

UNICONT PKK-312 CURRENT CONTROLLED SWITCH

1. APPLICATION

UNICONT PKK-312- series is a 4-20 mA, current controlled switch the relay of which would switch over at currents (taught to the unit), depending on the limit, switching difference or window comparator modes selected by programming. Fault condition monitoring can be switched on or off and it can be selected that the relay should be energised or de-energised when detecting failure. Failure may be represented by discontinuity of cable/lower value fault current.

The unit is suitable for powering all NIVELCO made 2-wire (4-20 mA) transducers.

Some models of this series meet requirements for intrinsically safe operation. UNICONT PKK-312-8 Ex unit is able without

UNICONT PKK-312-8 Ex unit is able without any further programming to monitor current levels of the DC powered, 2-wire NIVOSWITCH Ex vibration fork both in damped and in vibrating modes as well as to control relay output.

2.2 SPECIAL DATA

.1 G	ENERAL DATA	F		
TYP	E	PKK-312-🗖		
Nominal input current range		1 22 mA		
Acc	uracy of switching level/threshold level	± 0.1 mA		
Discontinuity threshold/Lower value fault current		3.7 mA		
Sho curr	rt circuit threshold/Upper value fault ent	22 mA		
Input impedance		10 Ω		
Input overload capability		maximum 100 mA (permanent)		
Damping		0,1 s; 1 s; 2 s; 5 s selectable		
	– Output	1 piece SPDT		
ay	– Rating	250 V AC, 8 A, AC1		
Rel	 Insulation strength 	4000 V 50 Hz		
	 Electrical / Mechanical life time 	10 ⁵ / 2 x 10 ⁶ switching		
Elec	ctrical connection	max. 2,5 mm ² twisted or maximum 4 mm ² single cable		
Mechanical connection		DIN EN 50022-35 rail mounted		
Ingr	ess protection	IP 20		
Mas	s	≈ 0.21 kg		



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CE

	EX APPROVED MODELS					ORDINARY MODELS			
TÍPUS	PKK-312-5 Ex	PKK-312-6 Ex	PKK-312-9 Ex	PKK-312-7 Ex	PKK-312-8 Ex	PKK-312-1	PKK-312-2	PKK-312-3	PKK-312-4
Power supply range	230 V AC ± 10% 5060 Hz	110 V AC ± 10% 5060 Hz	24 V AC ± 10% 5060 Hz	24 V AC ± 10 24 V D	0%, 50…60 Hz, C ±15%	230 V AC ± 10% 5060 Hz	110 V AC ± 10% 5060 Hz	24 V AC ± 10% 5060 Hz	24 V AC±10%, 5060 Hz, 24 V DC ± 15%
Power consumption		< 2.5 VA		< 2,5 VA	< 2.5 W		< 2.7 VA		<2.5 W
Switching levels		2 values in the rar	nge of 1 22 mA		10.5 mA; 12.5 mA	5 mA 2 values in the range of 1 22 mA			2 mA
Ex protection mark	E	🖉 II (1) G [EEx ia] I	B	⟨ _{€2} ⟩ II (1) (G [EEx ia] IIC	-			
Intrinsically safe maximum values	$U_0 < 28.4 \text{ V}; I_0 < 140 \text{ mA}; P_0 < 1.1 \text{ W};$ $L_0 < 6 \text{ mH}; C_0 < 50 \text{ nF}$		< 1.1 W;	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	I _T = 22 mA when U _{OUT} ≈ 12 V			I _T =22 mA when U _{OUT} ≈ 15 V	-	U ₀ = 30 V I _{MAX} = 70 mA U _{OUT min} = 16 V		16 V	U ₀ =24 V I _{MAX} = 80 mA U _{OUT min} = 23 V
Protection class	is Class II		Class III		Class II Class III		Class III		
Ambient temp.	-10 °C +55 °			С			-1	0 °C +55 °C	

2.3 ACCESSORIES

- User's Manual
- Certificate of Warranty
- Declaration of Conformity

2.4 DIMENSIONS





2.5 ORDER CODE

Ρ	Κ	Κ	-	3	1	2	-	Ex*
						_		

Powering / Ex		Cod	E	
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*	*	***
24 V AC	Ex	9**	**	

Ex models should be marked with Ex For DC powered, 2-wire NIVOSWITCH Ex vibrating fork of

NIVELCO Approval pending

3. INSTALLATION

UNICONT PKK-312- should be mounted on DIN EN 50022-35 rail.

NOTE!

Prior to the installation make sure that the input current values can be provided by the loop of the application. If not, teaching of the current values has to be carried out before installation and wiring. (See Point 5 "Teaching current value of tripping point")

4. WIRING 4.1 EX MODELS

PKK-312-8 Ex with NIVOSWITCH Ex vibrating fork	PKK-312-7 Ex with 2-wire Ex transmitter (e.g. EchoTREK SEA-380-6 Ex)	PKK-312-5 Ex PKK-312-7 Ex for monitoring of Ex passive switch and cable	
		U ₁₀₀ 7 8 9 101112 1 2 3 4 5 6 R = 1.5 k 2 k	

4.2 ORDINARY MODELS

PKK-312-1 PKK-312-4 with 4-wire active transmitter (e.g. EchoTREK STA-360)	PKK-312-1 PKK-312-4 with 4 wire active transmitter (e.g. MICROSONAR UTS-211)	PKK-312-1 PKK-312-4 for monitoring of passive switch	
		U ₁₄₀ 7 8 9 10 11 12 7 8 9 10 11 12 1 2 3 4 5 6 R = 1.5 k 2 k	

5. INSTALLATION AND SETTING UP

After 3 s from power up the unit begins to work with the signals as per table of WORKING STATUS.

WORKING STATUS								
LED	Indication	Interpretation						
Ι	GREEN	Relay energised R=1						
	RED	Relay de-energised R=0						
(322201)	SIMULTANOUS RED BLINKING OF BOTH LED	Memory failure, Relay state sustained						
FAIL (STEP)	GREEN	No cable fault/No fault current. No cable monitoring						
	RED	Cable fault, or. fault current						

The state of the relay in accordance with the operation mode and depending on the input current will be as shown on the left hand diagram. Operation with delayed switching is demonstrated on the right hand diagram.



State of the relay depending on the input current



CAUTION!

If on power up of a unit, set for switching differential, the value of the current will be between the two tripping points, the relay would always remain de-energised irrespectively of the relay operation mode (R = 1 or R = 0) programmed before.

Depending on the actual task, programming of the unit may be needed which involves setting of the Operating Mode with the possibilities as below

PKK-312-8 Ex unit can be used without any programming for the powering and remote switching function of the Nivelco made DC powered, 2-wire NIVOSWITCH Ex vibrating fork. Tripping point current values of 10,5 and 12,5 mA and switching differential operating mode can not be changed!

Setting possibilities:

 Relay operating mode 	(Default: R = 1)
 Monitoring of cable discontinuity 	(Default: NONE
 Monitoring of cable short circuit 	(Default: NONE)
 Damping 	(Default: 0.1 s)
 Return to default 	
A PKK-312-1PKK-312-7 Ex	
Setting possibilities:	
 Selection of comparison type 	(Default: Switching difference)
 Teaching current value 	(Default: 10,5 mA and 12,5 mA)
 Relay operating mode 	(Default: R=1)
 Monitoring of cable discontinuity 	(Default: NONE)
 Monitoring of cable short circuit 	(Default: NONE)
 Damping 	(Default: 0,1 s)
 Return to default 	

PROGRAMMING

Programming involves setting of operating mode and teaching of the input current.

Programming / viewing operating mode

Programming can be entered by pressing key A (for about 5s) till the LED PROGRAM lights up. While in programming mode by short pressing of key A the adjustment columns as per the table below can be accessed step by step. indicated by the relevant LED STEP. Being in the desired column the required raw can be selected by short pressing of key B indicated by the relevant LED SELECT. After performing adjustment needed, programming mode can be quit by pressing key A (for about 5 s) till the LED PROGRAM goes off.

PROGRAMMING / VIEWING OPERATING MODE									
Ente	Enter programming mode: press key A (for about 5 s) till the LED PROGRAM lights up								
Adjustme	Adjustment raw								
GREEN	state of the LED SELECT,								
Relay operation mode	Comparat or operation mode	Cable short circuit */ monitoring lower current	Cable discontinuity */ monitoring upper current	Switching dely	selected by short pressing of key B				
R = 1	R = 1 Limit value ON, r 1. be		ON, relay should be activated	0,1 s	GREEN				
R = 0	R = 0 Limit value 2. ON, relay should be released ON, relay should be released ON, relay should be released 1 s								
-	Switch. diff NO NO 2 s								
	Window 5 s RED BLINKING								
Quit	Quit programming mode: press key A (for about 5 s) till the LED PROGRAM goes off.								

Cable monitoring can only be applied with Ex certified 2-wire units.

AUTOMATIC QUITTING PROGRAMMING MODE

The unit will operate during programming in accordance with the previous parameters entered in the last completed programming. The new modified parameters will only be effective after quitting programming mode.

Having left the transmitter in programming mode, it would after 30 s automatically quit programming mode. Since this represents uncompleted programming, the performed modification would not be effective.

RELAY TEST

Proper operation of the relay can be tested by pressing key **B** for about 5 s as a consequence of which the state of the relay and colour of the LED (e.g. from green to red) would be changed. Releasing the key the relay and LED would return to the previous position.

RETURN TO DEFAULT

Programming would be returned to default if keys A and B are pressed before/during power up.

TEACHING CURRENT VALUE OF TRIPPING POINT

Teaching input currents represents saving of I_N current values for switching point 1 and switching point 2 prevailing between terminals (as per right hand drawing) at the moment of the teaching.

Necessary current values can be provided by one of the arrangements or by the circuit of the actual application on site.

If the input current will be provided by the circuit of the actual application its value have not to be known.



Arrangements for teaching input currents

To perform teaching, keys **A** and **B** should be pressed simultaneously for about 5 s until teaching mode has been entered, indicated by the blinking of LED **PROGRAM**. Releasing key **B**, or **A** (*only one of them*) the momentary current value will be assigned to switching point 1 or 2. Also releasing the other key, teaching will be completed, indicated by the going off of LED **PROGRAM**. Having taught the first current value, the other one can also be taught without quitting teaching mode, whereas the key already released should be pressed again (for about 5 s) and the other key released.

TEACHING								
	Position of key A	Position of key B	STEP LED	PROGR. LED	SELECT LED			
Entering teaching mode	KEEP PRE	SSED > 5 s	OFF		OFF			
Teaching current value for point 1	KEEP PRESSED	RELEASE	OFF	blinking	GREEN if SUCCESSFUL RED blinking if FAILED			
Quitting teaching mode	RELEASE	-	According to WORKING STATUS	OFF	According to WORKING STATUS			
Entering teaching mode KEEP PRESS		SSED > 5 s	OFF		OFF			
Teaching current value for point 2	RELEASE	KEEP PRESSED	GREEN if SUCCESSFUL RED blinking if FAILED	blinking	OFF			
Quitting teaching mode	-	RELEASE	According to WORKING STATUS	OFF	According to WORKING STATUS			

6. MAINTENANCE AND REPAIR

The unit does not require regular maintenance. All repairs will be carried out at the manufacturer's premises.

Humidity: maximum 98%

7. STORAGE

Temperature: -30 °C ... +60 °C

8. WARRANTY

All Nivelco products are warranted free of defects in materials or workmanship for a period of two years from the date of purchase, as indicated in the Certificate of Warranty.