

P20 TRANSDUCER OF TEMPERATURE AND STANDARD SIGNALS

FEATURES:

PD14
Programmer

eCon



- Full galvanic isolation of the input, output and supply.
- Matching of analog signals in automation systems.
- Fully configurable through the PD14 programmer. By means of the programmer, one can change the input type, measurement averaging time and rescaling the analog output according to the output individual characteristic.
- Small dimensions.
- 0.2 accuracy class.

INPUTS:

DC

-20...20
mA

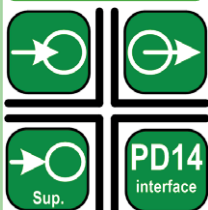
-10...10
V

OUTPUTS:

0/4...20
mA

0...10
V

GALVANIC ISOLATION:

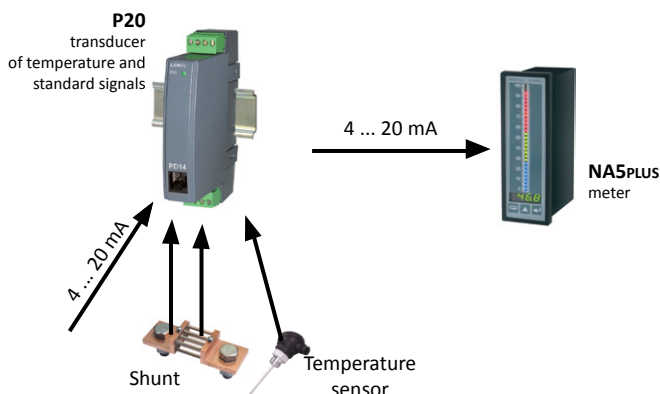


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EXAMPLE OF APPLICATION



INPUTS

Input	Measurement range*	Parameters	Error
Current: -20...20 mA	0...20 mA 4...20 mA 0...5 mA -20...20 mA	Resistance: 12 Ω ± 1%	Conversion class: 0.2 *
Voltage: -10...10 V	0...10 V 0...5 V -10...10 V -5...5 V	Resistance: > 1 MΩ	
Voltage d.c. [mV]	0...60 mV -60...60 mV -150...150 mV 0...150 mV		
Pt 100	-200...850 °C		
Pt250			
Pt500			
Pt1000			
Thermocouple J type	-200...1200 °C		
Thermocouple K type	-200...1370 °C		
Thermocouple S type	0...1760 °C		
Thermocouple N type	-200...1200 °C		
Resistance	0...4000 Ω		

* for detailed measurement ranges see table 1

OUTPUTS

Output kind	Load resistance	Remarks
0/4...20 mA	$R_{load} \leq 500 \Omega$	Conversion class: 0.2
0...10 V	$R_{load} \geq 500 \Omega$	

EXTERNAL FEATURES

Weight	< 0.125 kg	
Overall dimensions	22.5 x 120 x 100 mm	
Protection grade (acc. to EN 60529)	for housing: IP40	for terminals: IP20
Fixing	on a DIN rail 35 mm	acc. to EN 60715

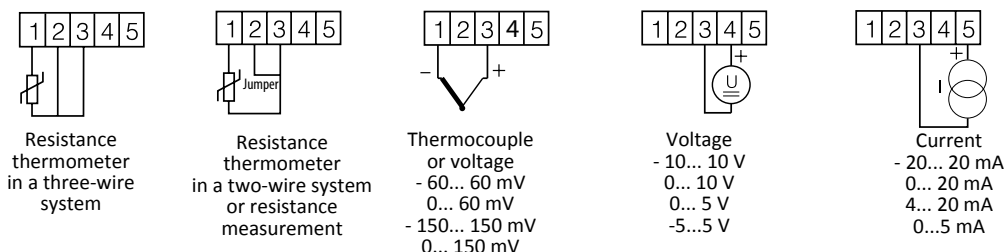
RATED OPERATION CONDITIONS

Supply voltage	85...253 V d.c./a.c. (45...65Hz) lub 20...85 V d.c., 20...65 V a.c. (45...65 Hz)	Power consumption: < 2 VA
Temperature	ambient: -20...23...55°C	storage: -25...85°C
Relative humidity	< 95%	inadmissible condensation
Working position	any	
Preheating time	10 min	
Averaging time	range: d.c. current [mA], d.c. voltage [V] ≥ 0.1 s	other ranges ≥ 0.3 s

SAFETY AND COMPATIBILITY REQUIREMENTS

Electromagnetic compatibility	noise immunity	acc. to EN 61000-6-2
	noise emissions	acc. to EN 61000-6-4
Isolation between circuits	basic	acc. to EN 61010-1
Pollution level	2	
Installation category	III	
Maximal phase-to-earth voltage	for supply circuits: 300 V	
	for input: 50 V	
	for output: 50 V	
Altitude above sea level	< 2000 m	

CONNECTION DIAGRAMS



ORDERING

P20 ORDERING CODE:

P20 -	X	X	XX	XX	X
Analog output:					
current 0...20 mA	1				
current 4...20 mA	2				
voltage 0...10 V	3				
Supply:					
85...253 V a.c./d.c.	1				
20...85 V d.c., 20...65 V a.c.	2				
Kind of input:					
write the code from table 1	XX				
Version:					
standard				00	
custom-made*				XX	
Acceptance tests:					
without extra requirements				8	
with an extra quality inspection certificate				7	
with test certificate				4	
acc. to customer's request*				X	

* - after agreeing with the manufacturer

Order example:

The code **P20 - 1-1-04-00-7** means:

- P20** - transducer of temperature and standard signals
- 1** - with current analog output: 0... 20 mA
- 1** - voltage supply 85... 253 V a.c./d.c.
- 04** - Pt100 output signal on the 0...400°C range
- 00** - standard version
- 7** - with an extra quality inspection certificate

TABLE 1. INPUT SIGNALS P20

Type of sensor/input [Unit]	Range	Code	Type of sensor/input [Unit]	Range	Code
Pt100 [°C]	-200...850	01	TC of K type [°C]	-200...1370	36
	0...850	02		0...1200	37
	0...600	03		0...1000	38
	0...400	04		0...800	39
	0...200	05		0...600	40
	-200...200	06		0...400 ¹	41
	-100...100 ¹	07		-200...200 ¹	42
Pt250 [°C]	-200...850	08	TC of S type [°C]	0...1760	43
	0...850	09		0...1600	44
	0...600	10		0...1400 ¹	45
	0...400	11		0...1200 ¹	46
	0...200	12		0...1000 ¹	47
	-200...200	13	TC of N type [°C]	-200...1200	48
	-100...100	14		0...1200	49
Pt500 [°C]	-200...850	15		0...1000	50
	0...850	16		0...800	51
	0...600	17		0...600 ¹	52
	0...400	18		0...400 ¹	53
	0...200	19		-200...200 ¹	54
	-200...200	20	Voltage d.c. [V]	0...10	55
	-100...100	21		0...5	56
Pt1000 [°C]	-200...850	22		-10...10	57
	0...850	23		-5...5	58
	0...600	24	Voltage d.c. [mV]	0...60	59
	0...400	25		-60...60	60
	0...200	26		0...150	61
	-200...200	27		-150...150	62
	-100...100	28		0...20	63
TC of J type [°C]	-200...1200	29	Current d.c. [mA]	4...20	64
	0...1200	30		0...5	65
	0...1000	31		-20...20	66
	0...800	32	Resistance [Ω]	0...400	67
	0...600	33		0...4000	68
	0...400 ¹	34		Custom-made	XX
	-200...200 ¹	35			

¹Accuracy class 0.5

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P20Z TRANSDUCER OF RMS CURRENT OR VOLTAGE

INPUTS:

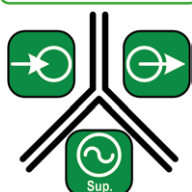


- Continuous conversion of RMS current or voltage without constant component.
- Standard d.c. current or d.c. voltage output signal.
- Small dimensions
- 0.2 accuracy class

OUTPUTS:



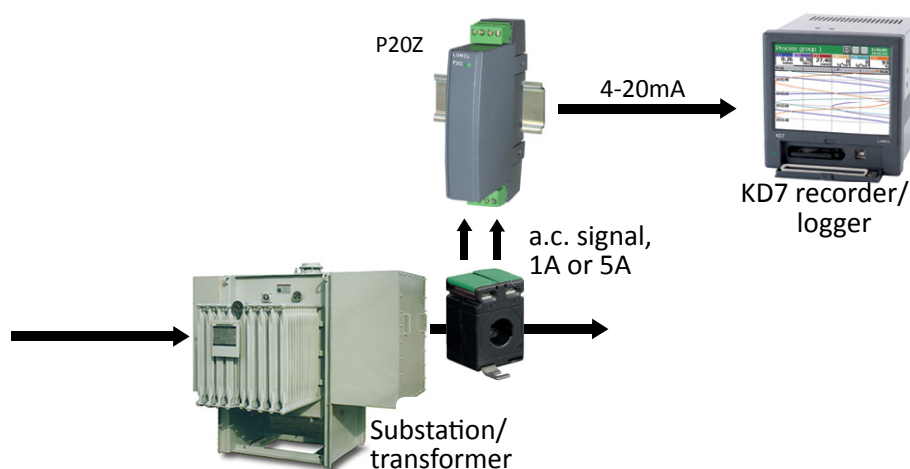
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EXAMPLE OF APPLICATION



Measurement and archiving of the a.c current.
Measured data are retransmitted to the recorder/data logger.

INPUTS

Input:	Frequency of the input signal	Input signal min..max value	Short duration overload (5s)	Admissible peak factor
Voltage	45..65..500Hz	0..0.01..1.2 Un	2 Un (max. 1000V)	2
Current		0..0.01..1.2 In	10 In	

MEASURING RANGES

Input kind	Measuring range	Accuracy class
Voltage	60, 100, 150, 250, 400, 500, 600 V a.c.	Accuracy class: 0.2
Current	1A (X/1 A a.c.), 5A (X/5 A a.c.)	Additional errors: In multiplication of the class index (k): • from ambient temperature change: <0.5 k/10K • external magnetic field: <1 k • frequency of the input signal: <1 k/100 Hz

OUTPUTS

Output kind	Properties	Remarks
0..5 mA	$R_{load} \leq 2000 \Omega$	Response time: 0.3 sec
0..20 mA	$R_{load} \leq 500 \Omega$	
4..20 mA		
0..10 V	$R_{load} \geq 500 \Omega$	

P20Z TRANSDUCER OF RMS CURRENT OR VOLTAGE

EXTERNAL FEATURES

Weight	0.125 kg	
Dimensions	22.5 x 120 x 100 mm	
Protection grade (acc. to EN 60529)	ensured by the housing: IP50	from the terminal cover: IP20
Fixing	on a 35 mm rail	
Maximal wire section	2.5 mm ² for execution with screw socket-plug terminals	1.5mm ² for execution with inseparable socket terminals

RATED OPERATING CONDITIONS

Supply voltage	85...253 V a.c., 90...300 V d.c. or 20...40 V a.c., 20...60 V d.c.	power consumption: 4 VA
Temperature	ambient: -20...+55°C	storage: -25...+85°C
Relative humidity	≤ 95%	inadmissible condensation
Operating position	any	
External magnetic field	0...40...400 A/m	
Transducer preheating time	15 min	

SAFETY AND COMPATIBILITY REQUIREMENTS

Electromagnetic compatibility	Noise immunity	acc. to EN 61000-6-2
	Noise emissions	acc. to EN 61000-6-4
Isolation ensured by the housing	double	acc. to EN 61010-1
Isolation between circuits	basic	
Pollution grade	2	
Installation category	for operating voltages in relation to the ground up to 300V: III for operating voltages in relation to the ground up to 600V: II	
Altitude above sea level	<2000 m	

CONNECTION DIAGRAMS

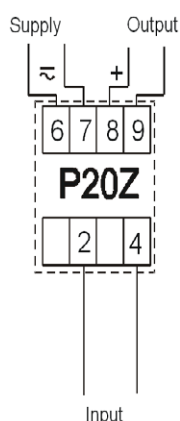


Fig.1 Direct measurement of voltage

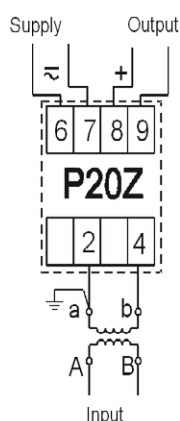


Fig.2 Indirect measurement of voltage by means of a voltage transformer

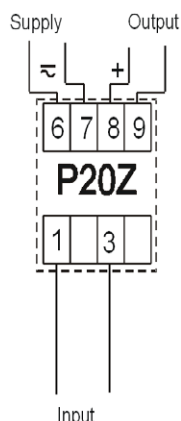


Fig.3 Direct measurement of current

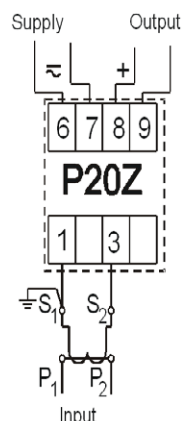


Fig.4 Indirect measurement of current by means of a current transformer

ORDERING

TABLE 1. ORDERING CODES:

	P20Z -	XX	X	X	X	XX	X
Input range:							
0..60 V	01						
0..100 V	02						
0..150 V	03						
0..250 V	04						
0..400 V	05						
0..500 V	06						
0..600 V	07						
0..1 A	08						
0..5 A	09						
Output range:							
0.5 mA						1	
0..20mA						2	
4..20 mA						3	
0..10 V						4	
Supply:							
85...253 V a.c., 90...300 V d.c.						1	
20...40 V a.c., 20...60 V d.c.						2	
Kind of terminals:							
inseparable with screws						1	
socket-plug with screws						2	
Version:							
standard						00	
custom-made*						XX	
Acceptance tests:							
without extra requirements							8
with an extra quality inspection certificate							7
acc. to customer's request*							X

* - after agreeing with the manufacturer

Order example:

The code **P20Z - 09 3 1 1 00 8** means:

- P20Z** - transducer of RMS current or voltage
- 09** - input signal 5A (X/5A)
- 3** - output signal 4..20mA
- 1** - supply voltage: 85...253 V a.c., 90...300 V d.c.
- 1** - with inseparable screw terminals
- 00** - standard execution version
- 8** - without extra requirements

SEE ALSO:



Free LPConfig software for easy programming of LUMEL's products. Available on our website



PD14 programmer - unit for programming LUMEL's products, with USB connection, LPCon compatible.



Programmable digital meter of d.c. current and d.c. voltage N30H.

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P20G SEPARATOR

FEATURES:

PD14
compatible

eCon

$Y=a*x+b$
Individual
characteristic



- Full galvanic isolation of the input, output and supply.
- Matching of analog signals in automation systems.
- Fully configurable through the PD14 programmer. By means of the programmer, one can change the input type, output type, measurement averaging time and recalibrate the analog output according to the output individual characteristic.
- Small dimensions.
- 0.2 accuracy class.

INPUTS:

DC

-20...20
mA

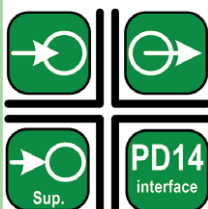
-10...10
V

OUTPUTS:

-20...20
mA

-10...10
V

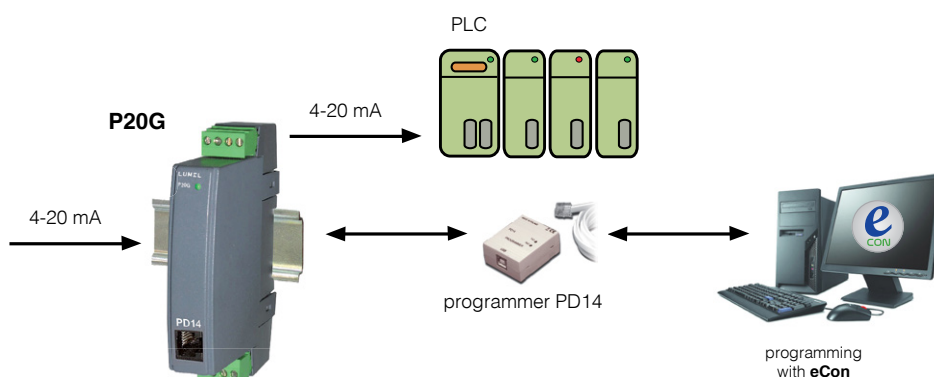
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EXAMPLE OF APPLICATION



Separation between PLC analog inputs

INPUTS

Input:	Measuring range:	Parameters	Overloads	Error
Current: -20...20 mA	-20...20 mA; -5...5 mA; 0...20 mA 0...5 mA 4...20 mA	Resistance: $12 \Omega \pm 1\%$	Short duration over- load: $5 I_n$ Sustained overload $1.1 I_n$	Conversion class: 0.2
Voltage: -10...10 V	-10...10 V; -5...5 V -1...1 V 0...10 V 0...5 V 0...1 V	Resistance: $> 1 M\Omega$	Short duration over- load: $5 U_n$ Sustained overload $1.2 U_n$	

OUTPUTS

Output kind	Properties	Remarks
-20...20 mA	$R_{load} \leq 500 \Omega$	Conversion class: 0.2
-10...10 V	$R_{load} \geq 500 \Omega$	

EXTERNAL FEATURES

Weight	< 0.125 kg	
Dimensions	22.5 x 120 x 100 mm	
Protection grade (acc. to EN 60529)	ensured by the housing: IP 40	from the terminal side: IP 20
Fixing	on a 35 mm rail	acc. to EN 60715

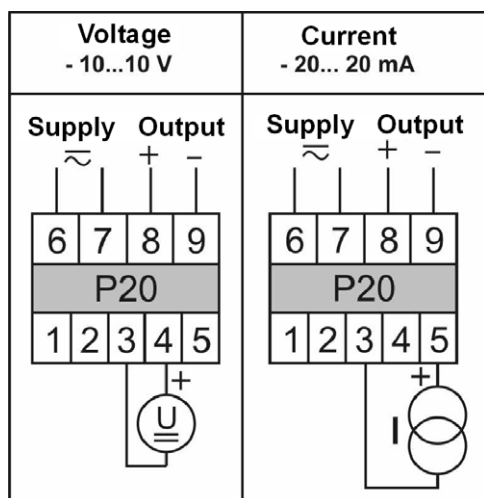
RATED OPERATING CONDITIONS

Supply voltage	85...253 V d.c./a.c. (45...65 Hz) or 20...85 V d.c., 20...65 V a.c. (45...65 Hz)	power consumption: < 2 VA
Temperature	ambient: -20...23...55°C	storage: -25...85°C
Relative humidity	≤ 95%	inadmissible condensation
Operating position	any	
Preheating time	10 min	
Averaging time of the measurement	≥ 0.1 s	
Response time of the separator	≥ 0.1 s	

SAFETY AND COMPATIBILITY REQUIREMENTS

Electromagnetic compatibility	Noise immunity	acc. to EN 61000-6-2
	Noise emissions	acc. to EN 61000-6-4
Isolation between circuits	supply - input 2.21kV a.c./ 3.1kV d.c. supply - outputs 2.21 kV a.c./3.1kV d.c. input - output 1.35kV a.c./ 2.0 kV d.c.	acc. to EN 61010-1
Pollution grade	2	
Installation category	III	
Maximal phase-to-earth operating voltage	for the supply circuit: 300 V (version: 230 V)	
	for the measuring input: 50 V	
	for the output: 50 V	
Altitude above sea level	< 2000 m	

CONNECTION DIAGRAMS



Electrical connection diagram of the P20G separator

ORDERING

TABLE 1. ORDERING CODES:

P20G -	XX	XX	X	XX	X	X
Input:						
kind of programmed input: see table 2	XX					
Output:						
kind of programmed output: see table 2		XX				
Supply:						
85...253 V a.c./d.c.			1			
20...85 V d.c., 20...65 V a.c.			2			
Version:						
standard				00		
non-standard settings				NS		
custom-made*				XX		
Language:						
Polish					P	
English					E	
other*					X	
Acceptance tests:						
without extra quality inspection requirements						0
with an extra quality inspection certificate						1
acc. to customer's request*						X

TABLE 2. CODING OF THE P20G SEPARATOR KIND OF INPUT AND OUTPUT

Range	Input code	Output code
0...1 V	01	01**
0...5 V	02	02
0...10 V	03	03
±1 V	04	04**
±5 V	05	05
±10 V	06	06
0...5 mA	07	07**
0...20 mA	08	08
±5 mA	09	09**
±20 mA	10	10
4...20 mA	11	11
Custom-made version*	XX	XX

* - after agreeing with the manufacturer

** - conversion class > 0,2

Order example:

The code **P20G - 08 06 1 00 E 1** means:

P20G - Separator of analog signals (U d.c. and I d.c.)

08 - kind of programmed input: 0...20 mA

06 - kind of programmed output: ±10 V

1 - supply voltage: 85...253 V a.c./d.c.

00 - standard version

E - English language

1 - with an extra quality inspection requirements

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P20H PROGRAMMABLE TRANSDUCER OF DC CURRENT OR VOLTAGE

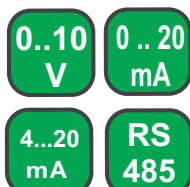
FEATURES:



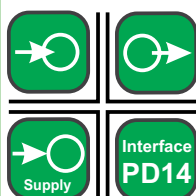
INPUTS:



OUTPUTS:



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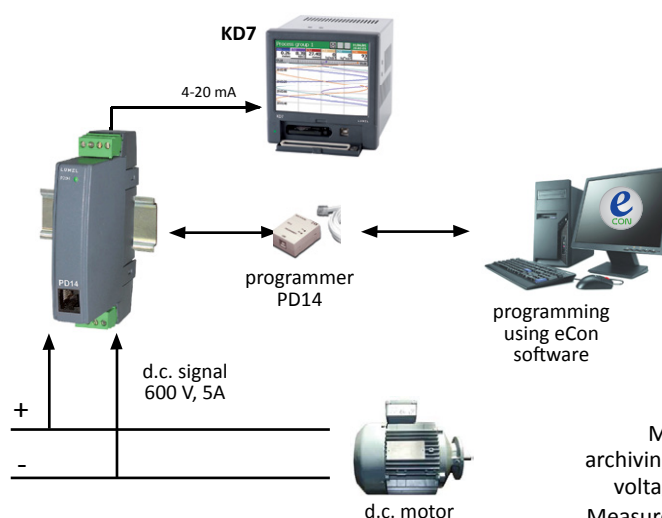
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- Continuous conversion of high current or high voltage signals.
- Standard d.c. current or d.c. voltage output signal.
- Small dimensions.
- 0.2 accuracy class.
- Fully programmable parameters:
 - measurement averaging time,
 - conversion characteristic,
 - preservation of the output signal at overflows,
 - RS-485 transmission parameters.

EXAMPLE OF APPLICATION



Measurement and archiving of d.c. motor current/voltage work parameters. Measured data are transmitted to the recorder/data logger.

INPUTS

Measuring ranges	Parameters	Overloads	Error
<u>-1...100</u> ...110 V d.c.	input resistance > 2 MΩ	Short duration overload (1s): 2 Un (< 1000V), 10 In Sustained overload: 150% Un (only for Un = 400 V and ±400 V), 120% Un (for other Un), 120% In	Basic error (at manufacturer's settings): ± (0.2% of range) Additional error from ambient temperature changes: ± (50% of the basic error/10K)
<u>-2...250</u> ...275 V d.c.			
-5...400...600 V d.c.			
-120... <u>-100...100</u> ...120 V d.c.			
-300... <u>-250...250</u> ...300 V d.c.			
-600... <u>-400...400</u> ...600 V d.c.			
-1.2... <u>-1...1</u> ...1.2 A d.c.	input resistance 10 mΩ ±10%		
-6... <u>-5...5</u> ...6 A d.c.	input resistance 2 mΩ ±10%		

OUTPUTS

Output kind	Properties	Remarks
0...20...22 mA	$R_{load} \leq 500 \Omega$	Resolution: 0.01% of the range
4...20...22 mA		
0...10...11 V	$R_{load} \geq 500 \Omega$	

DIGITAL INTERFACE

Interface type	Transmission protocol	Modes	Baud rates
RS-485	MODBUS RTU	8N2, 8E1, 8O1, 8N1	4.8, 9.6, 19.2 kbit/s

EXTERNAL FEATURES

Weight	< 0.125 kg	
Dimensions	22.5 x 120 x 100 mm	
Protection grade (acc. to EN 60529)	ensured by the housing: IP 40	from the terminal side: IP 20
Fixing	on a 35 mm rail	acc. to EN 60715

RATED OPERATING CONDITIONS

Supply	85..253 V a.c. 40..400 Hz; 90..300 V d.c. 20..40 V a.c. 40..400 Hz; 20..60 V d.c.	power consumption: < 3 VA
Temperature	ambient: -20...23...60°C	storage: -25...85°C
Relative humidity	< 95%	inadmissible vapour condensation
Operating position	any	
Preheating time	15 min	
Averaging time of the measurement	≥ 0.1 s	1 second set by default

SAFETY AND COMPATIBILITY REQUIREMENTS

Electromagnetic compatibility	Noise immunity	acc. to EN 61000-6-2
	Noise emissions	acc. to EN 61000-6-4
Galvanic isolation	between supply and measuring input 3.2 kV d.c. between supply and output 2 kV d.c. measuring input and output 3.2 kV d.c.	acc. to EN 61010-1
Pollution grade	2	
Installation category	III (for the 400 V option - category II)	
Maximal phase-to-earth operating voltage	for the supply circuit: 300 V	
	for the measuring input: 600 V cat. II (300 V - cat. III)	
	for the programming input: 50 V	
	for the output: 50 V	
Altitude above sea level	< 2000 m	

CONNECTION DIAGRAMS

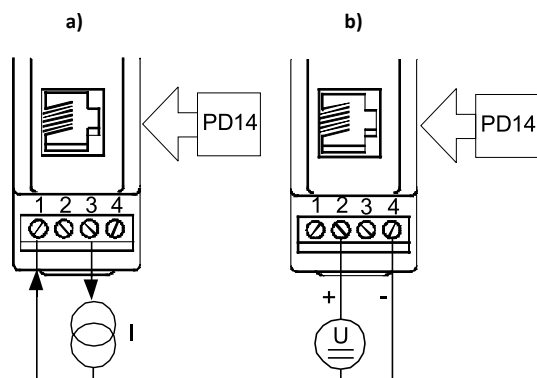


Fig. 1. Electrical connections of P20H transducer inputs.
a) current, b) voltage

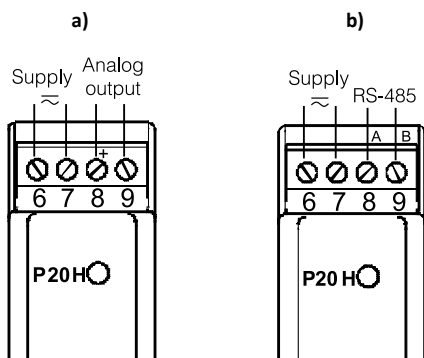


Fig. 2. Electrical connections of the P20H transducer supply and output.
a) with analog output, b) with RS-485 interface.

ORDERING

ORDERING CODES:

P20H -	X	X	X	XX	X	X
Input signal:						
+/- 100 V	1					
+/- 250 V	2					
+/- 400 V	3					
+/- 1 A	4					
+/- 5 A	5					
0..100 V	6					
0..250 V	7					
0..400 V	8					
Output:						
0..20 mA	1					
4..20 mA	2					
0..10 V	3					
RS-485	4					
Supply:						
85..253 V a.c. 40..400 Hz; 90..300 V d.c.	1					
20..40 V a.c. 40..400 Hz; 20..60 V d.c.	2					
Version:						
standard				00		
non-standard settings				NS		
custom-made*				XX		
Language:						
Polish					P	
English					E	
other*					X	
Acceptance tests:						
without extra quality inspection requirements						0
with an extra quality inspection certificate						1
acc. to customer's request						X

* - after agreeing with the manufacturer

Order example:

The code **P20H - 6 1 1 00 E 0** means:

- P20H** - transducer of d.c. current or d.c. voltage signals
- 6** - input signal: 0..100 V d.c.
- 1** - output signal: 0..20 mA
- 1** - supply voltage: 85..253 V a.c. 40..400 Hz; 90..300 V d.c.
- 00** - standard version
- E** - English language
- 0** - without extra quality inspection requirements

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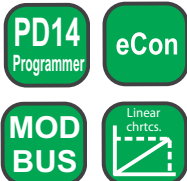
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Fax: +48 68 32 54 091
e-mail: export@lumel.com.pl

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P21Z PROGRAMMABLE TRANSDUCER OF AC CURRENT, AC VOLTAGE AND FREQUENCY

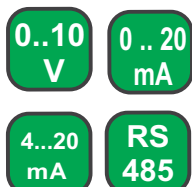
FEATURES:



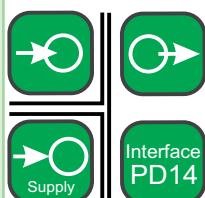
INPUTS:



OUTPUTS:



GALVANIC ISOLATION:



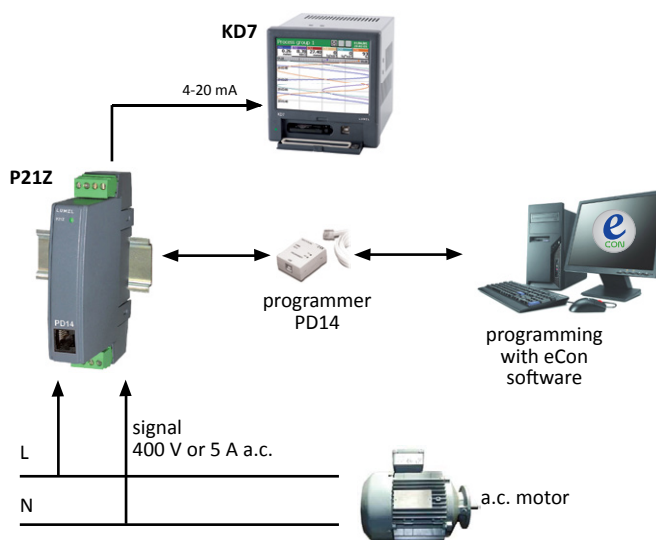
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- Continuous conversion of AC current, AC voltage without DC component and frequency.
- Standard DC current or DC voltage output signal or RS-485 interface with Modbus protocol.
- Compact dimensions.
- 0.2 accuracy class.
- Fully programmable parameters by PD14 programmer and free e-Con program:
 - measurement averaging time,
 - conversion characteristic,
 - preservation of the output signal at overflows,
 - RS-485 transmission parameters.

EXAMPLE OF APPLICATION



Measurement and archiving of a.c. motor current/voltage work parameters.
Measured data are transmitted to the recorder/data logger.

OUTPUTS

Measuring ranges	Parameters	Overloads	Error
0...1...100...130 V a.c.	input resistance > 2 MΩ	Short duration overload (1s): 2 Un (< 1000V), 10 In Sustained overload: 150% Un (only for Un = 400 V and ± 400 V), 120% Un (for other Un), 120% In	Basic error (at manufacturer's settings): ± (0.2% of range) Additional error from ambient temperature changes: ± (50% of the basic error/10K) ± 0.2% of range
0...2,5...250...325 V a.c.			
0...4...400...600 V a.c.			
0...0,01...1,0...1,3 A a.c.	input resistance 10 mΩ ±10%		
0...0,05...5,0...6,3 A a.c.	input resistance 2 mΩ ±10%		
20...500 Hz (in voltage range 24...480)	input resistance > 2 MΩ		

OUTPUTS

Output kind	Properties	Remarks
0...20...22 mA	$R_{load} \leq 250 \Omega$	Resolution: 0.01% of the range
4...20...22 mA		
0...10...11 V	$R_{load} \geq 500 \Omega$	

DIGITAL INTERFACE

Interface type	Transmission protocol	Modes	Baud rates
RS-485	MODBUS RTU	8N2, 8E1, 8O1, 8N1	4.8, 9.6, 19.2 kbit/s

EXTERNAL FEATURES

Weight	< 0.125 kg	
Dimensions	22.5 x 120 x 100 mm	
Protection grade (acc. to EN 60529)	ensured by the housing: IP 40	from the terminal side: IP 20
Fixing	on a 35 mm rail	acc. to EN 60715

RATED OPERATING CONDITIONS

Supply	85..253 V a.c. 40..400 Hz; 90..300 V d.c. 20..40 V a.c. 40..400 Hz; 20..60 V d.c.	power consumption: < 3 VA
Temperature	ambient: -20...23...60°C	storage: -25...85°C
Relative humidity	< 95%	inadmissible vapour condensation
Operating position	any	
Preheating time	15 min	
Averaging time of the measurement	≥ 0.5 s	1 second set by default

SAFETY AND COMPATIBILITY REQUIREMENTS

Electromagnetic compatibility	Noise immunity	acc. to EN 61000-6-2
	Noise emissions	acc. to EN 61000-6-4
Isolation between circuits	basic	acc. to EN 61010-1
Pollution grade	2	
Installation category	III (for the 400 V option - category II)	
Maximal phase-to-earth operating voltage	for the supply circuit: 300 V	
	for the measuring input: 600 V cat. II (300 V - cat. III)	
	for the programming input: 50 V	
Altitude above sea level	< 2000 m	

CONNECTION DIAGRAMS

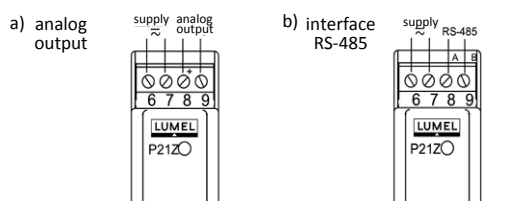


Fig. 1. Electrical connections of P21Z transducer: analog output and supply.

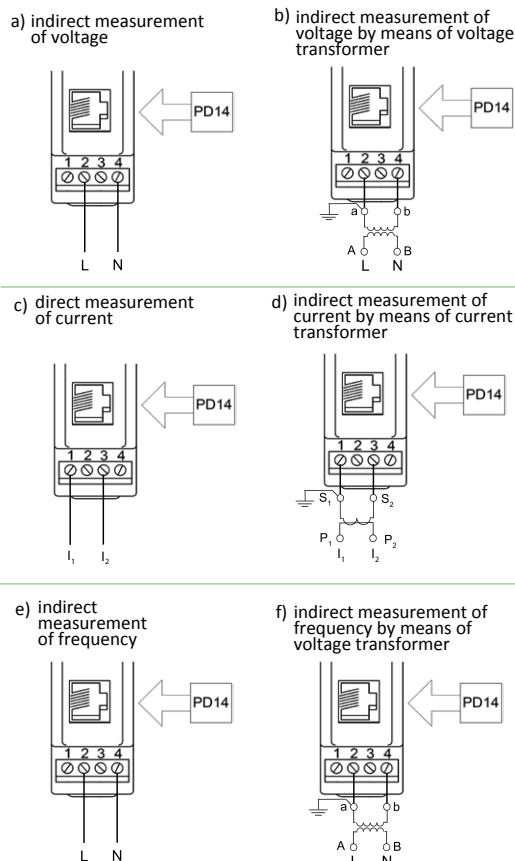


Fig. 2. Electrical connections of P21Z transducer inputs.

ORDERING

ORDERING CODES:

P21Z -	X	X	X	XX	X	X
Input signal:						
100 V a.c.	1					
250 V a.c.	2					
400 V a.c.	3					
1 A a.c.	4					
5 A a.c.	5					
frequency 20...500 Hz	6					
Output:						
0...20 mA	1					
4...20 mA	2					
0...10 V	3					
RS-485	4					
Supply:						
85..253 V a.c. 40..400 Hz; 90..300 V d.c.	1					
20..40 V a.c. 40..400 Hz; 20..60 V d.c.	2					
Version:						
standard				00		
non-standard settings				NS		
custom-made*				XX		
Language:						
Polish					P	
English					E	
other*					X	
Acceptance tests:						
without extra quality inspection requirements					0	
with an extra quality inspection certificate					1	
acc. to customer's request					X	

* - after agreeing with the manufacturer

Order example:

The code **P21Z - 1 1 1 00 E 0** means:

- P21Z** - transducer of a.c. current or a.c. voltage signals
- 1** - input signal: 1...100 V a.c.
- 1** - output signal: 0...20 mA
- 1** - supply voltage: 85..253 V a.c. 40..400 Hz; 90..300 V d.c.
- 00** - standard version
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