Ziegler

Redefine Innovative Metering

Technical Datasheet

ZOT PROP

ELECTRICAL SIGNAL CONVERTER - POWER

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ELECTRICAL SIGNAL CONVERTER - POWER

ZOT PRO P is a programmable signal converter used to measure and co
Current analog output for process control application

Product Features

- **Analog Output (Single or dual)**
  - Isolated analog output which can be set to voltage or current output onsite
- **Measuring Input**
  - AC Voltage/Current input signal, sine wave or distorted wave form
- **Accuracy**
  - Output signal accuracy class 0.2 as per International IEC / EN 60688 Standard
- **Programmable Input/Output**
  - The Transducer can be programmed onsite using front key & display or through programming port (COM) or through RS 485
- **LED Indication**
  - LED indication for power on and output type
  - Current output : Red LED, Voltage output : Green LED
- **Display Module(Optional)**
  - Optional 7 segment LCD display with backlit & keypad. For displaying measured parameter & onsite configuration of Input/output
- **RS485 Communication (Optional)**
  - Optional RS485 communication is available. For reading measured parameter & onsite configuration of input/output

Technical Specifications

Types	
Measured Parameter	Active Power / Reactive Power / Apparent Power / Power Factor / Phase Angle.
Network Type Supported by Power transducer	Single Phase / 3 phase 3 wire Unbalanced / 3 phase 4 wire Unbalanced 3 phase 3 wire balanced / 3 phase 4 wire balanced
Network Type Supported by Power Factor & Phase	Single Phase / (U12 I1) 3 Phase Balanced load (U13 I1) 3 Phase Balanced load / (U23 I1) 3 Phase Balanced load 3 phase 3 wire balanced / 3 Phase 4 wire Balanced load
Nominal Voltage Input (U_N)	
Nominal input Voltage (AC RMS) (PT Secondary range) PT Primary range	 100 V ≤ U_N ≤ 500 VL-L 100V to 692.8 KVL-L
Nominal Frequency F_N	25 Hz to 65 Hz (Optional 400Hz)
Nominal input Voltage burden	< 0.6 VA per phase at U_N

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Overload Capacity	1.2 * U_N continuously, 2 * U_N for 1 second, repeated 10 times at 10 minute intervals (Un maximum 300V with power supply powered from measuring input).
Nominal Current Input (I_N)	
Nominal input Current (AC RMS) (CT Secondary range) CT Primary range	1 A ≤ I_N ≤ 5 A 1 A to 9999 A
Nominal Frequency F_N	25 Hz to 65 Hz (Optional 400 Hz)
Nominal input Current burden	< 0.2 VA per phase at I_N
Overload Capacity	1.2 * I_N continuously 10 * I_N for 3 second, repeated 5 times at 5 minute intervals 50 * I_N for 1 second, repeated 1 times at 1 hour interval (Max 250 A).
Allowed measuring range end values X2 (calibration factor Xc): With single phase AC active/reactive/apparent power With 3-phase AC active/reactive/apparent power (For single phase Rated Power=U_N /√3 x I_N) (For Three phase Rated Power=√3 x U_N x I_N)	 0.30 ≤ (X2/Rated Power) ≤ 1.3 x U_N /√3 x I_N 0.30 ≤ (X2/Rated Power) ≤ 1.3 x √3 x U_N x I_N
Phase Angle & Power Factor measuring Range	Minimum span 20° to Maximum Span 360°
Measuring Output Y (Single or Optional Dual)	
Output type	Load independent DC Voltage , DC Current
Load independent DC output	On site selectable through DIP switches Unipolar 0...20mA / 4...20mA OR 0...10V Bipolar -20mA....0....+20mA OR -10V....0.....+10V
Output burden with DC current output signal	0 ≤ R ≤ 15V/Y2
Output burden with DC voltage output signal	Y2/(2 mA) ≤ R ≤ ∞
Current limit under overload R=0	≤ 1.25 * Y2 with current output ≤ 100 mA with voltage output
Voltage limit under R=∞	< 1.25 * Y2 with voltage output ≤ 30 V with current output
Residual Ripple in Output signal	≤ 1% pk-pk
Response Time	< 750 ms
Auxiliary Power Supply	
AC/DC Auxiliary Supply	60V... 300 VAC-DC ± 5% or 24V...60V VAC-DC ± 10%
AC Auxiliary supply frequency range	40 to 65 Hz
Auxiliary supply consumption 60V...300 VAC-DC 24V.....60 VAC-DC	 ≤ 8VA for Single output ≤ 10VA for dual output ≤ 5VA for Single output ≤ 6VA for dual output
Accuracy (Acc. to IEC / EN 60688)	
Reference Value	Output end Value Y2 (Voltage or Current)
Basic Accuracy for power transducer	0.2*C
Basic Accuracy for Phase Angle & Power Factor transducer	0.5*C
Reference conditions for accuracy	

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For Power Transducer:	
Ambient temperature	23°C +/- 1°C
Pre-conditioning	30 min acc. to IEC / EN 60688
Input Variable	Voltage Rated / Current Rated
Input waveform	Sinusoidal, Form Factor 1.1107
Input signal frequency	50 or 60Hz
Active / Reactive factor	Cos Φ=1 resp. Sin Φ = 1
For Phase Angle & Power Factor Transducer:	
Reference Value For phase angle For power factor	 90° resp. 0.5
Auxiliary supply voltage	At nominal range
Output Load	Rn = 7.5 V / Y2 ± 1% With DC current output signal Rn = Y2 / 1 mA± 1% With DC voltage output signal
Miscellaneous	Acc. to IEC / EN 60688
Additional error	
Temperature influence	± 0.2%/10°C
Influence of variations : As per IEC / EN 60688 standard.	
Output stability	< 30 min
Safety	
Protection Class	II (Protection Isolated, EN 61010)
Protection	IP 40, housing according to EN 60529 IP 20, terminal according to EN 60529
Pollution degree	2
Installation Category	III
Insulation Voltage	1min. (EN 61010-1) 7700V DC, Input versus outer surface 5200V DC, Input versus all other circuits 5200V DC, Auxiliary supply versus outer surface and output 690V DC, Output versus output versus each other versus outer surface
Installation data	
Mechanical Housing	Lexan 940 (polycarbonate) Flammability Class V-0 acc. To UL 94, self extinguishing non dripping, free of halogen Rail mounting / wall mounting
Weight	Approx. 0.4kg
Connection Terminal	
Connection Element	Conventional Screw type terminal with indirect wire pressure
Permissible cross section of the connection lead	≤ 4.0 mm² single wire or 2 x 2.5 mm² fine wire
Environmental	
Operating temperature	0°C...23°C...45°C(usage Group II)
Storage temperature	-40 °C to 70 °C
Relative humidity of annual mean	≤ 75%

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Altitude	2000m max
Ambient Tests	
EN 60 068-2-6	Vibration
Acceleration	± 2 g
Frequency range	10....150...10Hz,
Rate of frequency sweep	1 octave/minute
Number of cycles	10, in each of the three axes
EN 60 068-2-7	Shock
Acceleration	3 x 50g, 3 shocks in each direction
EN 60 068-2-1/-2/-3	Cold, Dry, Damp heat
IEC 1000-4-2/-3/-4/-5/-6 EN 55 011	Electromagnetic compatibility

Basic Accuracy for Phase Angle & Power Factor transducer 0.5*C

Factor C (The highest value applies if calculated C is less than 1,then C=1 applies)

Linear characteristics:

$$C=\frac{1-\frac{Y0}{Y2}}{1-\frac{X0}{X2}} \text{ or } C=1$$

Bent characteristics:

For $X0 \le X \le X1$

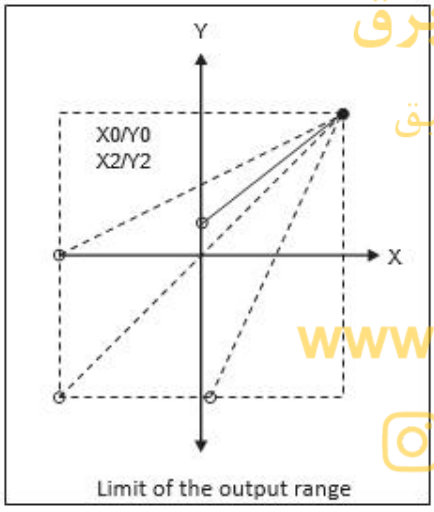
$$C=\frac{Y1-Y0}{X1-X0}\cdot\frac{X2}{Y2} \text{ or } C=1$$

For $X1 \le X \le X2$

$$C=\frac{1-\frac{Y1}{Y2}}{1-\frac{X1}{X2}} \text{ or } C=1$$

Output Characteristics:

Example of setting with Linear Characteristics :



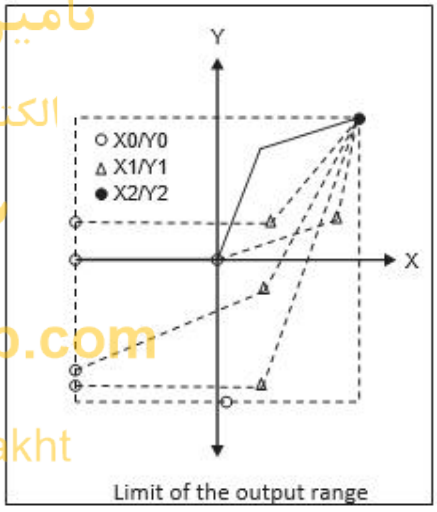
X0 = Start value of input Y0 = Start value of output X1 = Elbow value of input

Y1 = Elbow value of output X2 = End value of input

Y2 = End value of output

Note: End value (Y2) of output cannot be changed onsite.

Example of setting with bent Characteristics:



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LED CONNECTIONS:

ON LED	Aux.supply healthy condition	Green LED continuous ON
O/P1 LED	Output1 voltage selection	Green LED continuous ON
	Output1 current selection	Red LED continuous ON
O/P2 LED	Output2 voltage selection	Green LED continuous ON
	Output2 current selection	Red LED continuous ON

Electrical Connections:

Connection	Terminal details	
Measuring Voltage Input	UL1 UL2 UL3 N	2 5 8 11
Auxilliary Power supply	~ , + ~ , -	13 14
Measuring output - 1	+ -	15 16

Connection	Terminal details	
Measuring Current Input	I1 I1' I2 I2' I3 I3'	1 3 4 6 7 9
Measuring output - 2	+ -	17 18

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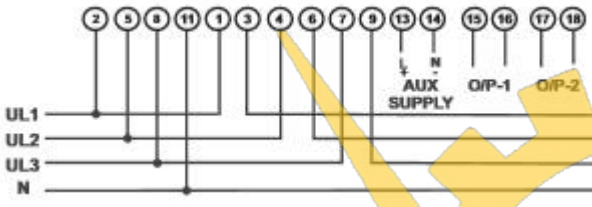
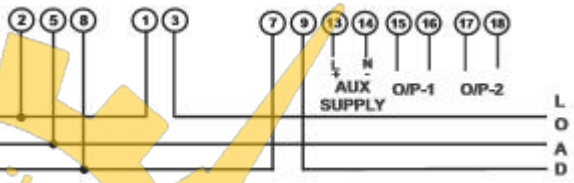
Connection Diagram and Installation

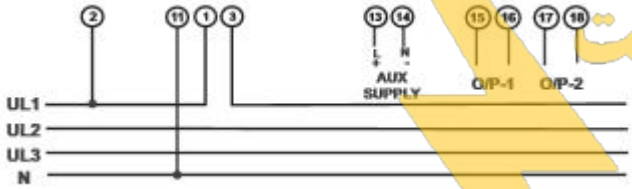
3 PHASE 4 WIRE UNBALANCED LOAD



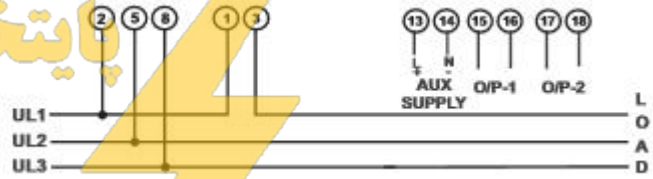
3 PHASE 3 WIRE UNBALANED LOAD



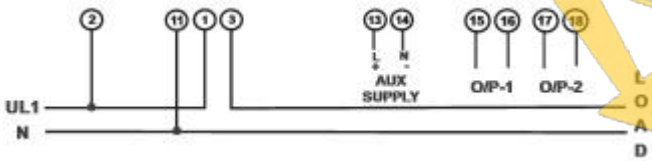
3 PHASE 4 WIRE BALANCED LOAD



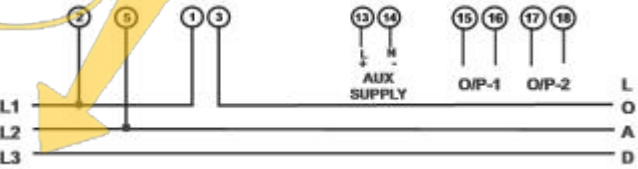
3 PHASE 3 WAIRE BALANCED LOAD



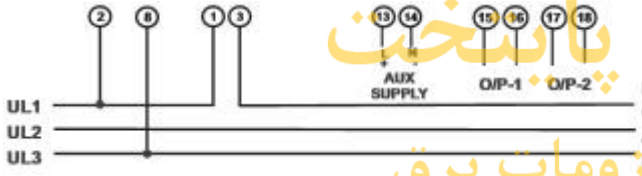
1 PHASE 2 WIRE



U12|1 3 PHASE BALANCED LOAD



U13|1 3 PHASE BALANCED LOAD



U23|1 3 PHASE BALANCED LOAD

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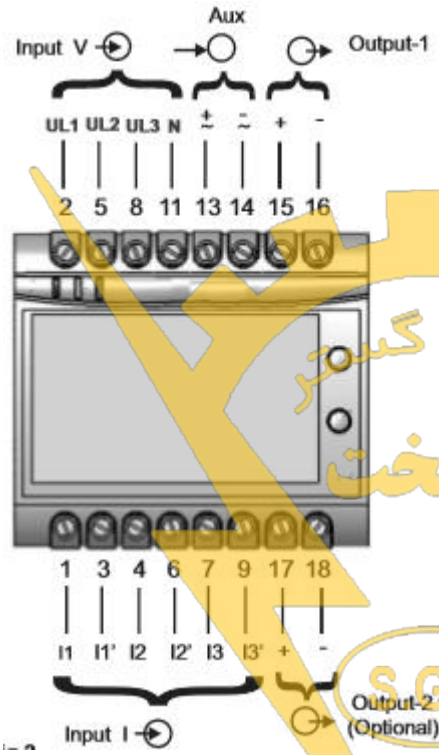
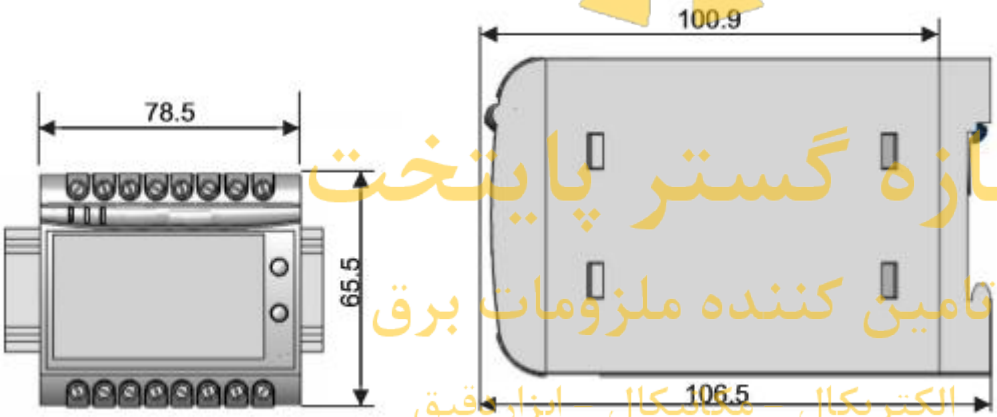


Dimensions



PROGRAMMING

Programming of converter can be done in three ways :

1) Programming Via Front LCD & two keys

2) Programming Via optional RS485(MODBUS) communication port (Device address, PT Ratio, CT Ratio, Password, communication parameter, Output Type & simulation mode can be programmed)

3) Programming Via Programming port available at the front of converters using optional Adapter

Programming Via Programming port (COM): A PC with RS232C interface along with the programming cable and the configuration software are required to Program the converter.

The connections between

PC ⟷ Comm. cable ⟷ ZOT PRO converter

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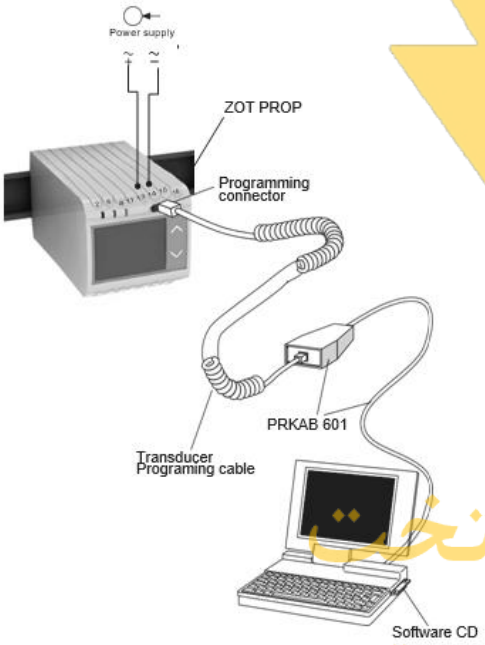
The power supply must be applied to converter before it can be programmed, the Configuration software is supplied on a CD
The programming cable adjusts the signal level and provides the electrical insulation between the PC and ZOT PRO converters
Configuring converter : To configure ZOT PRO converter Input / output one of the three programming methods can be adapted along with mechanical switch setting (DIP switch setting on PCB).

DIP Switch Setting for OUTPUT : Type of output (current or voltage signal) has to be set by DIP switch. For programming of DIP switch the user needs to open the converter housing & set the DIP switch located on PCB to the desired output type Voltage or Current. Output range changing is not possible with DIP switch setting.

Refer table aside for DIP switch setting.

The four pole DIP switch is located on the PCB in the ZOT PRO converter

DIP Switch Setting	Type of Output Signal
	load-independent current
	load-independent voltage



The four pole DIP switch is located on the PCB in the ZOT PROP Transducer

Ordering Information : Standard Version

Sr.No.	Transducer parameter	
1	Input Signal	
	Active Power	
	*Network supported : 3 phase 4 wire unbalanced load	
2	Frequency of Input (50 Hz / 60 Hz)	
3	Auxiliary Supply	

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	High Aux (60V 300V AC-DC)	
	Low Aux (24V 60V AC-DC)	
4	Output 1 (Standard Ranges)	
	Current = -20.....0. 20 mA	
5	Output 2 (Standard Ranges)	
	Voltage = -10.....0... 10V	
6	With Display	
7	Without RS-485	
8	Without programming cable	

Note : End value of output can not be changed onsite.

* Transducer type and network supported are onsite programmable.

Ordering Information :

Optional Version :

Sr.No.	Transducer parameter		(✓)
1	**Input Signal**		
	Active Power		
	Reactive Power		
	Apparent Power		
	***Network supported :**	Single phase	
		3 phase 3 wire unbalanced load	
		3 phase 4 wire unbalanced load	
		3 phase 4 wire balanced load	
		3 phase 3 wire balanced load	
	Power factor/		
	Phase angle		
	***Network supported :**	Single phase/	
		3 phase 4 wire balanced load	
		3 phase 3 wire balanced load	
		(U12I1) 3 phase balanced load	
		(U13I1) 3 phase balanced load	

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	(U23I1) 3 phase balanced load	
2	**Frequency of Input**(50 Hz / 60 Hz)	
3	**Auxiliary Supply**	
	High Aux (60V.....300 VAC-DC	
	Low Aux (24V.....60 VAC-DC	
4	**Output 1**	
	**Current = -20.....20 mA	
	Current = 0..... 20 mA	
	Current = 4..... 20 mA	
	**Voltage = -10..... 10V	
	Voltage = 0..... 10V	
	Optional factory set ranges	
	Current = 0..... 10 mA	
	Current = 0..... 5 mA	
	Current = 0..... 2.5 mA	
	Current = 0..... 1 mA	
	Voltage = 0..... 5V	
	Voltage = 0..... 2.5V	
	Voltage = 0..... 1V	
5	**Output 2**	
	Without output 2	
	**Current = -20.....20 mA	
	Current = 0..... 20 mA	
	Current = 4..... 20 mA	
	**Voltage = -10..... 10V	
	Voltage = 0..... 10V	
	Optional factory set ranges	
	Current = 0..... 10 mA	
	Current = 0..... 5 mA	
	Current = 0..... 2.5 mA	
	Current = 0..... 1 mA	
	Voltage = 0..... 5V	
	Voltage = 0..... 2.5V	
	Voltage = 0..... 1V	
6	**LCD display module**	
	With Display	
	Without Display	

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7	**RS-485 module**	
	With RS-485	
	Without RS-485	
8	**PRKAB 601module**	
	With PRKAB 601	
	Without PRKAB 601	

Optional Version Example:
Reactive Power transducer, 3 phase 3 wire balanced network ,50/60 Hz nominal input signal, High Aux, Output1 = 0…20mA or 0…10V , Output2= 0…10V or 0…20mA,With LCD display module , with RS-485 & with PRKAB 601 cable.

Note: End value of output can not be changed onsite.

* Transducer type and network supported are onsite programmable.

**For apparent power, -20...0....20mA or ,-10....0...10V is not applicable

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