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-power in control

CE

DATA SHEET

Insulation amplifiers, DC/DC amplifiers
TDG-210DG

- Conversion of measuring signal
- Suppression of negative input signals
- Aux. voltage: 57.7...440 V AC or 24...220 V DC

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1. Data sheet

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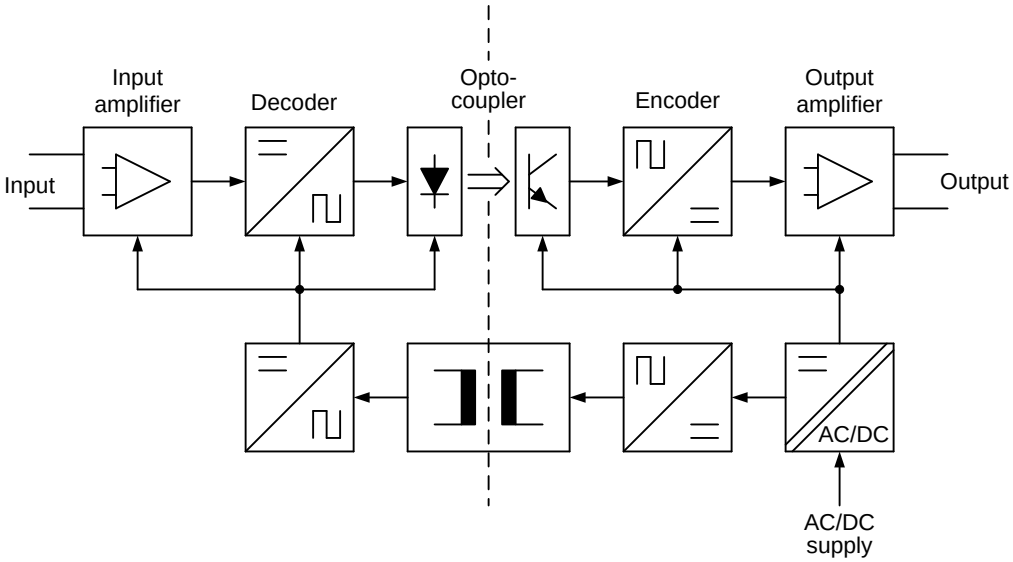
1.1 Contents

1.1.1 Application

TDG-210DG is a CE-marked DC/DC amplifier with galvanic separation between input and output. It is typically used for:

- **Converting one type of DC signal into another DC signal**
  (E.g. from -10...0...10 mA into 4...20 mA)
- **Converting potentiometer input into a DC signal**
  (E.g. from 0...1 k□ into 0...10 V)
- **Separating a number of earthing points**
  If a cable is connected to earth at more than one point, a measuring error may develop or noise problems may arise if the earth potentials of these vary.
- **Galvanic separation of current signals**
  As measuring equipment connected to the current output of a transducer is connected in series, simultaneous earthing of more than one input of connected measuring equipment will result in short-circuit of the input of intermediate measuring units.
- **Conversion of measuring signal**
  If increasing output is requested at decreasing input, this may be achieved by means of the insulation amplifier, at the same time providing galvanic separation between the 2 measuring circuits.
  (E.g. from 10...0 V DC into 0...5 mA).
- **Adaptation of measuring range**
  The input may be suppressed, i.e. only a part of the range is used.
  (E.g. from 10...20 mA to 0...10 V DC.
- **Separation of measuring circuits**
  In case of remote transmission of a DC signal - typically a 4...20 mA signal to a number of measuring points situated well away from each other - separation into galvanically separated measuring circuits is often requested to isolate a possible fault and confine this to the faulty circuit.
- **Measuring of DC shunts**
  The potential of a DC measuring shunt (0...60 mV) is sometimes high when compared to earth. A leakage between the measuring cable and earth will result in a measuring error. The galvanic separation at the same time provides protection against accidental contact to the high potential.
- **Measuring of DC voltages**
  Especially when measuring high DC voltages, galvanic separation between input and output is an absolute necessity for safety purposes and due to differences in the potentials of input and output.
  TDG-210DG is available for measuring of voltages up to 500 V DC.
- **Adjustment**
  TDG can be ordered as a special product to meet requirement in the application such as wish of slow reaction time, “dead” measuring range or limitation of the output. Two potmeters on the front make it possible to adjust the delay (P302) from 0.5...10 sec. or 0.1...1 sec and output range from 50 % to 150 % (P303).

1.1.2 Construction



TDG-210DG requires auxiliary voltage and is fed through a transformer or a 24/48/110/220 V DC inverter. The secondary voltage is rectified and fed to the encoder and output amplifier shown to the right of the galvanic interface. The input amplifier and the decoder are fed through a DC/DC inverter. The input signal is amplified and is, through optocouplers, transmitted to the output amplifier.

This measuring method combines high accuracy of measurement with long-term stability.

Standard input and output may be set by means of jumpers, whereas special input is factory-calibrated.

1.1.3 Technical specifications

Current input	Standard	0...1 mA	0.2...1 mA	0...0.5...1 mA	-1...0...1 mA
	Standard	0...5 mA	1...5 mA	0...2.5...5 mA	-5...0...5 mA
	Standard	0...10 mA	2...10 mA	0...5...10 mA	-10...0...10 mA
	Standard	0...20 mA	4...20 mA	0...10...20 mA	-20...0...20 mA
	Special - min.	0...0.1 mA	0.02...0.1 mA	0...0.05...0.1 mA	-0.1...0...0.1 mA
	Special - max. [1]	0...50 mA	10...50 mA	0...25...50 mA	-50...0...50 mA
	Load	0...1 V voltage drop for all current inputs			
Voltage input	Standard	0...1 V	0.2...1 V	0...0.5...1 V	-1...0...1 V
	Standard	0...10 V	2...10 V	0...5...10 V	-10...0...10 V
	Special - min.	0...60 mV	12...60 mV	0...30...60 mV	-60...0...60 mV
	Special - max. [1]	0...400 V	80...400 V	0...200...400 V	-400...0...400 V
	Load	0...0.1 mA input current for all voltage inputs (10 kΩ/V)			
Potentiometer, input		0…50 Ω/10 kΩ			
Current output	Standard	(See standard current inputs above)			
	Load	Max. 15 V/±15 V above output			
	Overload	Max. 200 % output current			
	Protection	Protected against open output (max. 25 V)			
Voltage output	Standard	(See standard voltage inputs above)			
	Load	Max. 20 mA/±20 mA from output			
	Overload	Max. 150 % output voltage			
	Protection	Protected against short-circuited output (max. 45 mA)			
Output (general)	Ripple	Max. 0.5 % P-P to IEC 688			
	Response time	Max. <10 ms to IEC 688			
	Characteristic	(See back page[1])			
Insulation	Test voltage	2500 V AC – 50 Hz - 1 min.: between input/output/aux. voltage			
	Operating voltage	600 V AC – 50 Hz - 850 V DC: between input/output/aux. voltage			
Auxiliary voltage	V AC ±20 % 45...65 Hz	57.7-63.5-100-110-120-127-220-240-380-400-415-440 V AC (3.5 VA)			

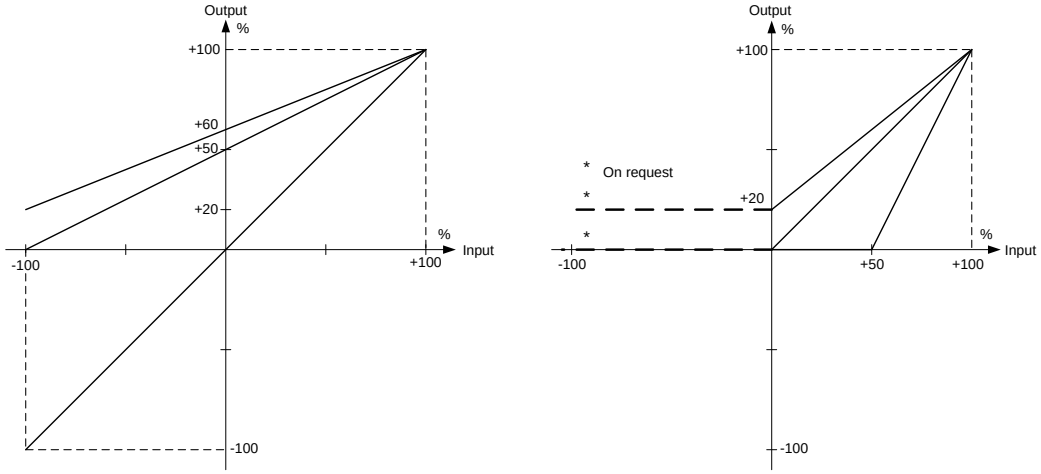
	V DC -20/+30 %	24-48-110-220 V DC (2.5 W) DC/DC inverter built in
Environments	Temperature	-10...55°C (nominal) -25...70°C (operating), -40...70°C (storage)
	Climate	Class HSE to DIN 40040
	EMC	To EN 50081-1/2, EN 50082-1/2, SS4361503 (PL4), IEC 255-22-1 (class 3)
	Protection	Front: IP53. Terminals: IP20 to IEC 529
Accuracy	Input/output	Class 0.5 % (-10...15...30...55°C) to IEC 688
Drift	Temperature	Typ. 0.15 % per 10°C, max. 0.2 % per 10°C
	Load/output	Max. 0.1 % for max. variation of output load
	Auxiliary voltage	Max. 0.1 % per 10 % variation of auxiliary voltage
Connection	Screw terminals	Multi-stranded: Max. 2.5 mm². Single-stranded: Max. 4 mm²
Materials	Flammability	All plastic materials self-extinguishing to UL94 (V0)

1) Further ranges within the stated minimum and maximum ranges available on request.

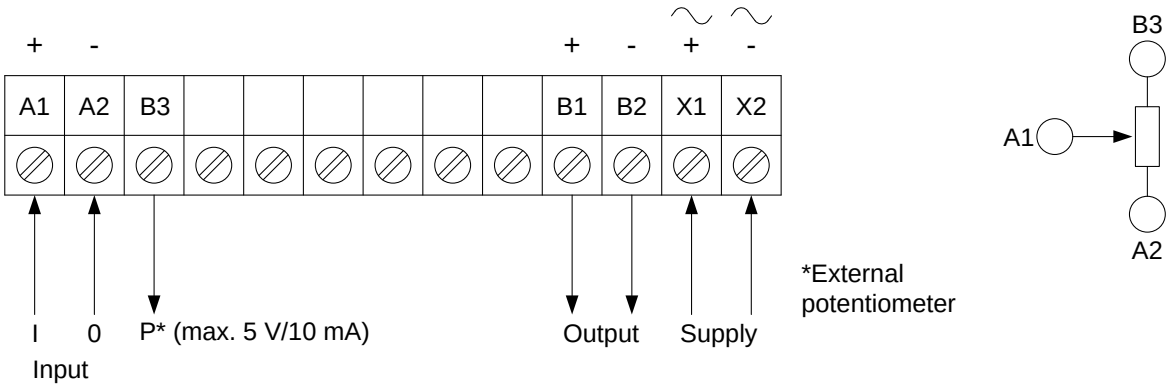
1.1.4 Available variants

Type	Variant no.	Description	Item no.	Note
TDG-210DG/2	01	Galvanic insulation DC/DC amplifier, customised, AC voltage aux. supply	2962880720-01	-
TDG-210DG/2	01	Galvanic insulation DC/DC amplifier, customised, DC voltage aux. supply	2962880730-01	-

1.1.5 Output characteristics

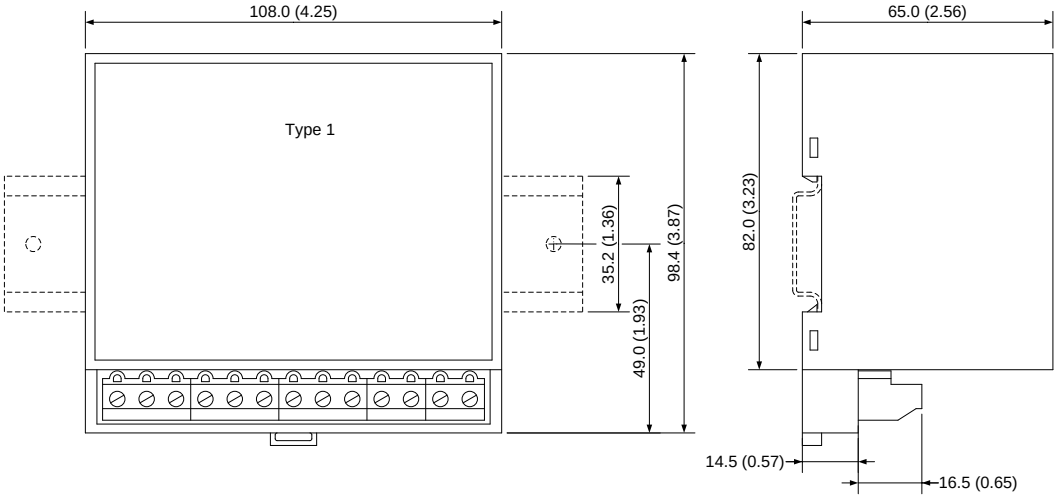


1.1.6 Connections



1.1.7 Dimensions

All dimensions in mm (inches)



TDG-210DG: Weight: approx. 0.370 kg

1.1.8 Order specifications

Variants

Mandatory information					
Item no.	**Type**	**Variant no.**	**Input**	**Output**	**Aux. voltage**

Example:

Mandatory information					
Item no.	**Type**	**Variant no.**	**Input**	**Output**	**Aux. voltage**
2962880730	TDG-210DG/2	01	-10...0...10 V_{dc}	4...20 mA	24 V_{dc}

1.1.9 Disclaimer

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