EN

Z190
ADDER / SUBTRACTOR TWO INPUTS WITH GALVANIC SEPARATION

GENERAL CHARACTERISTICS

- two independent inputs programmable via dip switches for current signals 0 - 20 mA and 4 - 20 mA with active and passive connection or voltage signals 0 - 5 V, 1 - 5 V, 0 - 10 V and 2 - 10 V;
- output programmable via dip switches for current signals 0 - 20 mA and 4 - 20 mA with active and passive connection or voltage signals 0 - 5 V, 1 - 5 V, 0 - 10 V and 2 - 10 V;
- power supply on front panel indicator.
- 3 point insulation (power supply / input / output): 1500Vac.

TECHNICAL SPECIFICATIONS

Power supply:	19 - 40 Vdc, 19 - 28 Vac 50 - 60Hz, max 2.5W.			
Inputs:	Two independent inputs each programmable for: - 0 - 20 mA and 4 - 20 mA current with active connection (loop power supply approximately 20 Vdc not stabilized) or passive connection (input impedance 100 ohm). - 0 - 5 V, 1 - 5 V, 0 - 10 V and 2 - 10 V voltage (input impedance > 500 Kohm)			
Output:	Programmable for: - 0-20 mA and 4-20 mA current signals with active connection (loop impedance < 600 ohm) or passive connection. - 0 - 5 V, 1 - 5 V, 0 - 10 V and 2 - 10 V voltage signals (load impedance > 2 Kohm).			
Environmental conditions:	Temperature: 0..50°C, Humidity min: 30%, max: 90% a 40°C non condensing (also see section ***Installation instructions***).			
Errors referred to max measuring range:	Calibration 0,2%	Thermal Coeff. 0,02%/°C	Linearity 0,05%	EMI 0,3%
Protection for outputs/power supply:	against impulsive over-voltages 400W/ms.			
Norms: CE	Complying equipments with prescriptions : EN50081-2 (electromagnetic emission, industrial environnement) EN50082-2 (electromagnetic immunity, industrial environnement) EN61010-1 (safety)			

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HOW TO INSTALL

Z190 module is designed to be mounted on a DIN 46277 bar, in vertical position.
To obtain an optimal working and duration, it is necessary to assure an adeguate ventilation to modules, avoiding to place raceways or other objects that can close abat-vents.
Avoid to mount modules over deviced that generate heat; we suggest to mount devices in the lower side of the panel.

HEAVY WORKING CONDITIONS:

Heavy working conditions are:

- *High power voltage a (> 30Vdc / > 26 Vac).*
- *Input sensor feeded.*
- *Use of output in impressed current.*

When modules are put side by side it s possible that it is **necessary to separate them at least 5 mm** in the following cases:

- Upper board temperature higher than 45°C and at least one of the heavy working conditions verified.
- Upper board temperature higher than 35°C and at least two of the heavy working temperature verified.

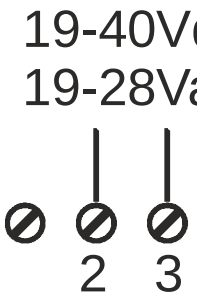
ELECTRICAL CONNECTIONS

We recommand to use shielded cables to do signals connection; monitor must be connected to a preferential ground for devices. Besides it is a good rool avoid to pass wires near power installation cables like inverters, motors, induction furnaces etc.

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ELECTRICAL CONNECTIONS

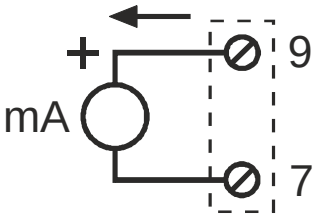
POWER SUPPLY



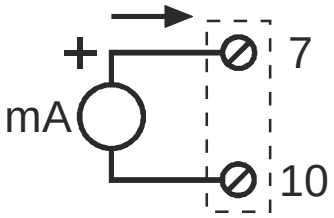
Power voltage must be in a range from 19 to 40 Vdc (indifferent polarity), from 19 to 28 Vac; see also section ***INSTALLATION NORMS.***
Upper limits must not be exceeded, if it happen there could be damages for module.
It is necessary to protect power source from possible module's failure by fuse correctly dimentioned.

INPUT 1 : Connections and arrangement of DIP-switch

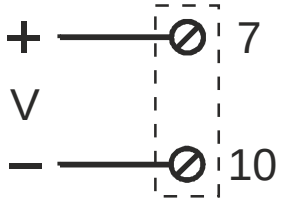
Current
Active input



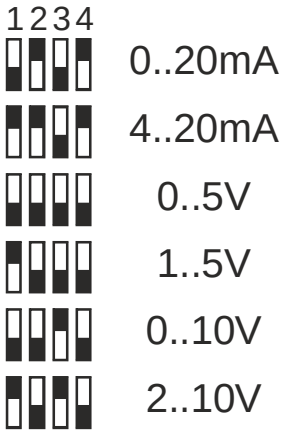
Current
Passive input



Voltage

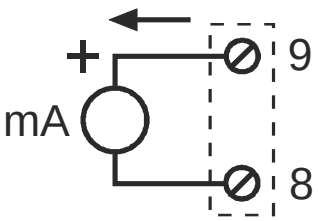


DIP-SWITCH SW1

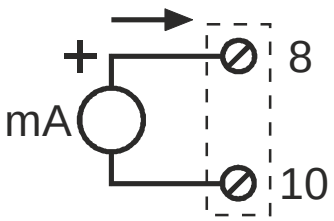


INPUT 2 : Connections and arrangement of DIP-switch

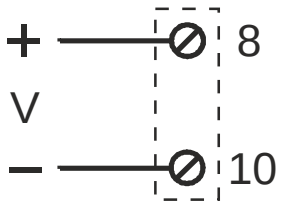
Current
Active input



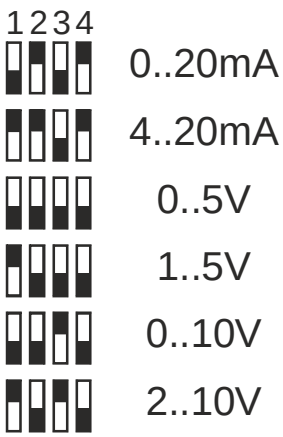
Current
Passive input



Voltage



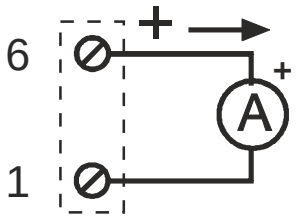
DIP-SWITCH SW3



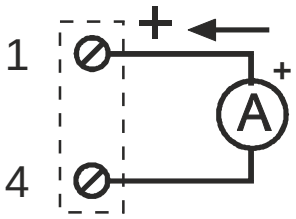
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OUTPUT : Connections and arrangement of DIP-switch

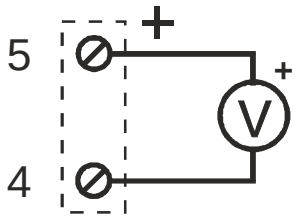
Current
Active Output



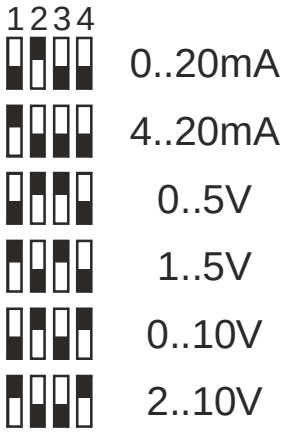
Current
Passive Output



Voltage



DIP-SWITCH SW4



IMPORTANT NOTES - INPUTS / OUTPUT in CURRENT :

For the current input or output the **ACTIVE** connection must be used when the input or output loop is powered directly from the Z190 module; the **PASSIVE** connection must be used if the current loop power supply comes from the outside.
The Z190 module can drive a maximum load of 600 ohm on the loop, with loop power supply protected against short circuits.
The Z190 module **CAN DRIVE ONLY TWO LOOPS SIMULTANEOUSLY**, so if the active connection is used for both input, it cannot be used for the output whereas if the active connection is used for the output, it can be used only for one input.

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DEVICE SET AS ADDER OR SUBTRACTOR :

Device can do the sum of two signals :

INPUT 1 + INPUT 2

or the difference of two signals :

INPUT 1 - INPUT 2

Set DIP-switches SW2 to do sum or subtraction as the following table.

DIP-SWITCH SW2	
1 2 3 	IN1 + IN2
	IN1 - IN2

If there is no different indication device is shipped configurated for the sum of two signals having the same value.

SUM OF INPUT WITH DIFFERENT IMPORTANCE :

Most significant input will be INPUT 1, the less inportant one will be INPUT 2.
Procedure to do device's calibration :

1. Connect a tester (10Vdc full scale) between 12 (+) and 10 (-) clamps, a signal generator between 7 (+) and 10 (-) clamps set to give a signal equal to full scale.
2. Move trimmer "SPAN IN1" till on the tester will appare the voltage given by the following formula :

$$V = 10 * \frac{FS1}{FS1 + FS2}$$

(FS1 and FS2 are the full scale in engineering units for inputs IN1 e IN2).

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3 Connect a tester (10Vdc full scale) between 11 (+) and 10 (-) clamps, a signal generator between 8 (+) and 10 (-) clamps set to give a signal equal to full scale.

4 Move trimmer "SPAN IN2" till on the tester will appare the voltage given by the following formula:

$$V = 10 * \frac{FS2}{FS1 + FS2}$$

(FS1 and FS2 are the full scale in engineering units for inputs IN1 e IN2).

Example: sum between two signals 4-20mA corresponding to two flow 150l/h and 50l/h.
At input IN1 will be assigned signal 150 l/h and at input IN2 will be assigned signal 50 l/h.
Connect a generator between 7 and 10 clamps and generate a current 20 mA, connect a tester between 12 and 10 clamps and regulate trimmer "SPAN IN1" till you read the following voltage :

$$V = 10 * \frac{150}{150 + 50} = 7{,}5 \text{ Volt}$$

Connect a generator between 8 and 10 clamps and generate a current 20 mA, , connect a tester between 11 and 10 clamps and regulate trimmer "SPAN IN2" till you read the following voltage :

$$V = 10 * \frac{50}{150 + 50} = 2{,}5 \text{ Volt}$$

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DIFFERENCE BETWEEN INPUTS WITH DIFFERENT SIGNIFICANCE:

Most significant input will be INPUT 1, the less inportant one will be INPUT 2.
Procedure to do device's calibration :

1 Connect a tester (10Vdc full scale) between 12 (+) and 10 (-) clamps, a signal generator between 7 (+) and 10 (-) clamps set to give a signal equal to full scale.

2 Move trimmer "SPAN IN1" till on the tester will appare the voltage 5 Volt.

3 Connect a tester (10Vdc full scale) between 11 (+) and 10 (-) clamps, a signal generator between 8 (+) and 10 (-) clamps set to give a signal equal to full scale.

4 Move trimmer "SPAN IN2" till on the tester will appare the voltage given by the following formula:

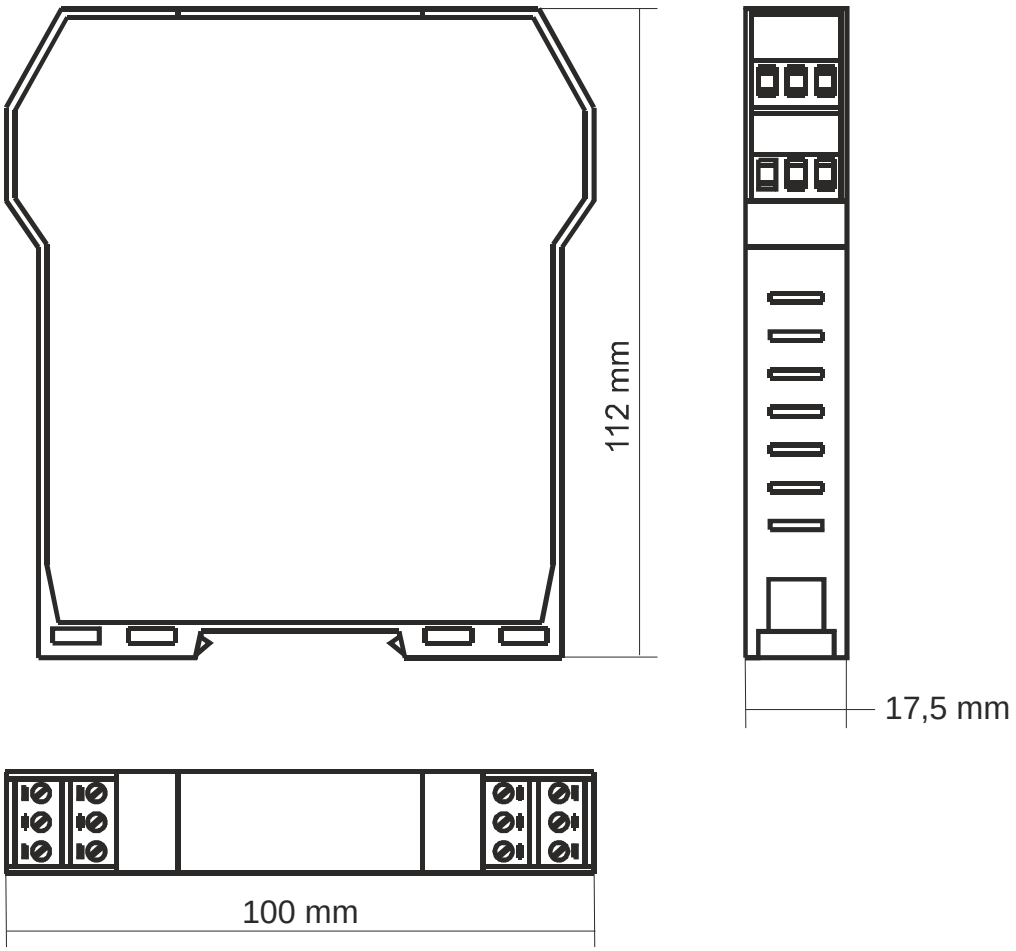
$$V = 5 * \frac{FS2}{FS1}$$

(FS1 and FS2 are the full scale in engineering units for inputs IN1 e IN2).

Example: difference between two 4-20mA signals corresponding to two pressure 10 bar and 4 bar.
At input IN1 will be assigned signal 10 bar, and at input IN2 will be assigned signal 4 bar.
Connect a generator between 7 and 10 clamps and generate a current 20 mA, connect a tester between 12 and 10 clamps and regulate trimmer "SPAN IN1" till you read the voltage 5 Volt.
Connect a generator between 8 and 10 clamps and generate a current 20 mA, , connect a tester between 11 and 10 clamps and regulate trimmer "SPAN IN2" till you read the following voltage :

$$V = 5 * \frac{4}{10} = 2 \text{ Volt}$$

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