Instruction manual

BC 6587

UNIVERSAL CONTROLLER - TRANSMITTER
wall mounting

Scale: -9999 ÷ 9999
Input (+): 0/4-20 mA
Input (-): 0/4-20 mA

Option
S/N
REP N°

Power supply: 85 ÷ 264 Vac
Installed firmware: R 1.0x

Cod. 28009651 - Rev. A

INDEX

1 GENERAL WARNINGS AND INFORMATION FOR ALL USERS

1.1 WARRANTY

This product is guaranteed for 5 years from the date of purchase for all manufacturing defects.
Please take a look at the terms and conditions described on the warranty certificate at the end of the manual.

1.2 AFTER SALES SERVICE

B&C Electronics offers to all of its customers the following services:

- a free of charge technical assistance over the phone and email for problems regarding installation, calibration and regular maintenance;
- a repairing service in our Carnate (Italy) headquarter for all types of damages, calibration or for a scheduled maintenance.

Please take a look at the technical support data sheet at the end of the manual for more details.

1.3 CE MARKING

This instrument is manufactured according to the following european community directives:

- 2011/65/EU "Restriction of the use of certain hazardous substances in electrical and electronic equipment"

Until 19/04/2016:

- 2006/95/EC "Low Voltage" LV
- 2004/108/EC "Electromagnetic compatibility" EMC

From 20/04/2016:

- 2014/35/EU "Low Voltage" LV
- 2014/30/EU "Electromagnetic compatibility" EMC
- EN 61010-1/2011 "Low Voltage" LV
- EN 61326-1/2013 "Electromagnetic compatibility" EMC
  - Industrial electromagnetic environment
- EN 55011/2009 "Radio-frequency disturbance characteristics"
  - Class A (devices for usage in all establishment other than domestic)
  - Group 1 (Industrial equipment that do not exceed 9kHz)

The CE marking is placed on the packaging and on the S/N label of the instrument.

1.4 SAFETY WARNINGS

It is important to underline the fact that electronic instruments are subject to accidental failure. For this, it is important to take all necessary precautions to avoid damages caused by malfunctions.

Any operation must be performed by authorized and trained staff.

The use of this controller must comply with the parameters described in chapter "Technical data (page 14)", in order to avoid potential damages and a reduction of its operating life.

1.5 MANUAL REVISIONS

This chapter shortly describes the differences between previously released versions of the same manual, so to help users that are already familiar with the product.

Rev. A: first release.

2 PRODUCT OVERVIEW

2.1 FUNCTIONAL PURPOSE OF THE DEVICE

2.1.1 SINGLE MEASURING

The instrument is used when there is a need to add display function, control, alarm and automatic sensor cleaning to a transmitter with 4-20 mA output.

The system for monitoring and control is made of two important parts:

- the controller described in this instruction manual;
- the 0-20 mA or 4-20 mA transmitter connected to a suitable sensor.

The instrument has the necessary electric circuits and firmware to perform the following functions:

- visualization of the measuring in the selectable range from -9999 to 9999, corresponding to the 0-20 mA or 4-20 mA input from an external device;
- it provides the Vdc power to the 4-20 mA loop powered transmitter;
- it will automatically adjust the measuring, if dosing pumps or solenoids are connected to the specific relays;
- it will give an alarm, if the measure goes outside the low/high limit values;
- it provides a dual analog output for recording and acquiring the measuring values;
- it receives a dual external free voltage contacts to activate the alarm or the hold condition;
- it activates a manual/automatic cleaning cycle.

Pumps or valves can be activated directly by the instrument or by external control switches if their power load is not compatible with the instrument's relays.

2.1.2 DIFFERENTIAL MEASURING

In some application it is necessary to measure before and after the process in order to obtain the difference of the two measuring. This unit allows a differential measuring, by using two transmitters featuring the same measuring scale.

The system for monitoring and control the differential measuring is made of 3 important parts:

- the controller described in this instruction manual;
- two 0-20 mA or 4-20 mA transmitters connected to a suitable sensor.

In this case the instrument performs the following functions:

- visualization of the differential measuring between two 0-20 mA or 4-20 mA signals applied to the positive and negative input of the instrument;
- it provides the Vdc power to the 4-20 mA loop powered transmitters;
- it will automatically adjust the measuring, if dosing pumps or solenoids are connected to the specific relays;
- it will give an alarm, if the measure goes outside the low/high limit values;
- it provides a dual analog output for recording and acquiring the measuring values;
- it receives a dual external free voltage contacts that activates the alarm or the hold condition;

- it activates a manual/automatic cleaning cycle.

Pumps or valves can be activated directly by the instrument or by external control switches if their power load is not compatible with the instrument's relays.

2.2 ACCESSORIES

Sensors and accessories for different applications are available, to be ordered separately.

Our web site www.bc-electronics.it contains accessories, upgrades and detailed specifications of each product.

Our staff is always available to help costumers select the most appropriate and suitable solution for their specific needs.

3 INSTRUCTION MANUAL CONTENTS

This chapter describes the manual and gives suggestions to all users on how to read it and use it.

The manual is written according to the following norms:

- UNI 10893 "Instructions for use";
- UNI 10653 "Quality of product technical documentation".

3.1 SYMBOLS

Throughout the manual you may find the following symbols, which are both dictated by a norm or that are simply conventional.

WARNINGS: this symbol is used to warn users that if the instructions are ignored or not correctly followed, damage to the instrument can be caused.

NOTE: this symbol is to invite the user to pay particular attention to a specific section of the manual.

3.2 HOW TO READ THE INSTRUCTION MANUAL

The manual contains all the information needed to acquire full knowledge of the product, to ensure a proper installation, proper use and maintenance in order to achieve the desired result at the time of its choice.

The manual is aimed at staff with appropriate knowledge and experience in the field of measurement and control through the use of sensors and transmitters in the context of industrial plants.

The index of the manual refers the reader to the chapters on aspects that want to learn and develop.

In particular, the first chapters show general topics and allow the user to become familiar with the product and its functional purpose.

The user can then check whether he knows all the elements necessary for the use of the instrument and of the measuring/control.

The instrument has been designed keeping in mind three different levels of use: generic use (end user), control (maintenance staff), installation (plant engineer).

The user normally can read the values on the display.
He will read the parts of the manual regarding the:
-"Users instruction (page 29)".

Maintenance staff could be more interesting in the chapters regarding:
-"Users instruction (page 29)";
-"Users instruction (page 32)";
-"Warranty (page 44)";
-"Repairs (page 44)".

The plant engineer will have to read the chapters and look at the application drawings in order to:
-verify that the technical and functional characteristics are conformed with the plants requirements;
-verify that the environmental and climatic conditions required by the instruments are respected;
-make the correct electrical connections;
-become familiar with the instrument's firmware;
-configure the instrument according to the application;
-run all of the necessary tests before starting the instrument;
-calibrate the instrument once the transmitter is connected.

The data shown in the displays in this manual are only illustrative.

3.2.1 USING THE INSTRUMENT ON THE PLANT

For the generic use, the end user can operate with a locked keyboard (suggested mode and to be set by maintenance staff). By this, he can check the set point parameters without the possibility of changing the configured set points values and the zero/sensitivity calibration.

3.2.2 PLANT MAINTENANCE STAFF

Maintenance staff can select the operating values, by setting the desired parameters of the setup menu and after inserting the password. He can also enable the user's access to calibration, set point and alarm settings.

The location of this set parameters can be seen in the left column of the technical specifications table and they are identified by a letter "S" followed by a number.

The operations that need to be done during the start-up and the periodical tests are the following:

- to disable the calibration of the instrument and of the set points to the user;
- to calibrate the sensors by means of ZERO and SENS keys;
- to set the following parameters:
  - set point 1 and 2 by means of SET1 and SET2 keys
  - set point 1 and 2 hysteresis and delay (ON-OFF)

  - PID parameters
  - min. and max. alarm value
  - alarm delay
  - activate/deactivate logic inputs
  - autoclean parameters
- to modify password to access setup.

3.2.3 INSTRUMENT INSTALLATION

The plant engineer, by inserting the access password and by setting and modifying the configuration parameters, will be able to select the necessary functions required by the plant.

The location of this set parameters can be seen in the right column of the technical specifications table and they are identified by a letter "C" followed by a number.

The operations that need to be done during the instrument installation are the following:

- operating mode (AUTO/MEAS/SIM);
- 0-20 mA o 4-20 mA input;
- single or differential input;
- measuring unit;
- decimal point position in the display;
- lower point of the scale;
- higher point of the scale;
- filter software selection;
- ON-OFF or PID regulation;
- PFM – PWM or 4-20 mA regulation type;
- min/max function (LO/HI) of set point 1 and set point 2;
- associated alarm to the set point time activation;
- alarm relay status activated/deactivated (ACTIVE/NON ACTIVE) in alarm condition;
- outputs scale associated to the input scale;
- analog outputs range 0-20 mA or 4-20 mA;
- hold/alarm function for logic inputs;
- password to access the configuration.

4 SPECIFICATIONS AND TECHNICAL DATA

4.1 FUNCTIONAL SPECIFICATION

Display

The instrument is equipped with a graphic display that shows the values of the measures and messages to the operator in the various stages of use of the unit.

At the top left it is shown the ID number reported to the technical specifications.

In case of inactivity, after 3 minutes the display returns to the main measure.

The brightness and contrast of the screen can be changed. The mode of presentation "reverse" can be chosen.

Keyboard

The instrument has a keyboard with 8 keys which allow access to all functions available.

The functions of the upper part of the keys, are dedicated to the calibration of the zero and sensitivity and the setting of the set point; these actions can be password protected in the setup menu.

For the functions of other buttons, see next paragraphs and chapters.

Measuring unit

The instrument allows the user to select the specific measuring unit (%, NTU, FTU, mg/l, g/l, ppm, uS, mS, pH, mV) or to create a custom one (custom).

Scale

The scale of the instrument can be configured in the range -9999 ÷ 9999, by selecting the lower and the higher values and the decimal point position.

In case of the over/under range the instrument shows the specific message.

At the right top of the display (called "secondary display") the measured value is displayed as a percentage of full scale (0 to 100% IN).

Inputs

The instrument features an input I1 for a transmitter active output or from a two wire current loop transmitter that is powered by the instrument itself.

In addition it is available an input I2 in order to allow a differential measuring between two transmitters with the same measuring scale.

In case of single input current over/under range the instrument shows the specific message.

In case of differential measuring, if one of the two input is in over/under range, the instrument shows the specific message of indeterminate measuring.

Input current measuring

The instrument provides the I1 and I2 input current measuring, in order to allow the check of the correct functioning of the transmitters.

Set points

The instrument has two independent set points which can be programmed across the whole scale to activate the correspondent relay contacts (SPST) or the PID action.

When using the ON/OFF function, the display shows the status of excitement and delayed actuation.

When using the PID action, the display shows the status of actuation.

Thanks to the specific front panel keys SET1 and SET2, setting the set point value is very simple.

A password can be set in order to avoid that other users may change the settings.

For each relay, it is possible to select:

- the ON/OFF or PID action into the configuration menu;
- the type of PID adjustment: FM (proportional to pulse frequency) or WM (pulse width proportional) or addressed directly on the analog outputs;
- the function min (LO) or max (HI);
- the parameters of the selected function in the setup menu.

Alarm

The instrument has an alarm relay, which contact are SPDT type.

The alarm condition can be configured for:

- higher or lower values of the measuring compared to the set ones;
- the presence of the contact on the logic input, coming from an external device (if this function is activated);
- overtime of the SET1 and SET2 activation.

The operator can select the activated/deactivated status of relay corresponding to the alarm condition and the delay function.

The alarm status and the cause that generated it are displayed.

Analog outputs

The instrument has two analog current outputs for PID control or to transmit the value of the main measurement and/or temperature.

The output signal is programmable in 0-20 mA or 4-20 mA.

The outputs are galvanically isolated, and then directly interfaced with a PLC or with data acquisition cards and do not require external power.

Logic inputs

The instrument is equipped with a dual logic input to connect to external dry contacts.

The input function can be activated/deactivated in the setup menu.

Their function can be selected as hold/alarm, which features are described in chapter "Technical data (page 14)", and it is selected in the configuration menu.

The HOLD condition always prevails over the ALARM.

In case of activation of the hold function in the display Messages section "Display (page 28)" will be displayed HOLD status, in case there is a previous alarm condition will be maintained such indication.

Autoclean

The instrument is equipped with a relay with SPDT contacts to connect an external device for the self-cleaning of the sensors.

Into the setup menu, you can:

- enable or disable the automatic/manual cleaning function;
- set the interval of time between two cleaning cycles;
- set the cleaning time;
- set the holding time of measurement after cleaning.

During the cleaning and holding time the instrument retains the last value on the analog output, while the set points and alarm relays are disabled.

Operating mode

The instrument is provided with 3 programmable modes of operation.

Automatic operation (AUTO)

The automatic mode is the normal operation mode of the unit.

Measuring operation (MEAS)

In this operation mode the display indicates only the measure, the analog outputs are active but the control relays are deactivated.

This would be the mode to use if the relays are not being used for alarm or control functions.

The measuring operation mode is useful for start up or for manual operation of disinfection plants.

Simulated operation (SIM)

The instrument uses the simulated value in the main display to activate the relay set point, the alarm relay and analog outputs.

In this operating mode the users modify the displayed value by means of the keyboard (see chapter "Configuration (page 37)").

The unit maintains the set point, alarm and analog outputs parameters in order to test the plant.

The type of action, the set points and parameters of the analog outputs remain as previously set.

The simulation of values is useful for testing the actuation of the devices connected to the relays and the analog outputs without connecting the sensor.

Filter software

The input signal has a filter with two selectable response time.

The user can separately set the response time relative to signals of small or large variation in order to obtain good reading stability and fast response to the variations of the measurement in the process.

Universal power supply

The instrument is equipped with a universal power supply that allows the use of the voltage from 85 to 264 Vac, 50-60 Hz.

Option low voltage 9 ÷ 36 Vdc or 12 ÷ 24 Vac

The installation of this option allows you to use either a DC power supply from 9 to 36 V or an AC voltage from 12 to 24 V, 50-60 Hz.

Setup

The setup menu access through a specific password allows the user to select:

- disable/enable of the calibration procedure set point values;
- set point, alarm and input logic parameters;
- autoclean cycles parameters;
- new password.

Configuration

The configuration menu access through a specific password allows the use to select:

- mode of operation (AUTO/MEASURE/SIMULATION);
- input 0-20 / 4-20 mA;
- single or differential input;
- measuring unit;
- decimal point position;
- low and high scale limits;
- filter software (SMALL e LARGE);
- type of control (ON-OFF/PID);
- type PID (FM or WM relay or analog output);
- minimum/maximum function of the set point (LO/HI);
- alarms associated with the operation time of the set point;
- condition of the alarm relay (ACTIVE/NON ACTIVE);
- measure related to the analog outputs;
- outputs 0-20 mA or 4-20 mA scalable;
- hold/alarm function of the logic inputs (HOLD/ALARM);
- password access to the configuration.

Info menu

The instrument is provided with an information menu to show:

- p/n and firmware release;
- LCD screen parameters;
- total operating hours.

4.2 TECHNICAL DATA

4.2.1 GENERAL SPECIFICATIONS

Precision	0.2 %
Ripetibility	0.1 %
Non linearity	0.1 %
Alphanumeric display	LCD 128 x 64 pixel
Keyboard	8 keys
Operating temperature	-10 ÷ 60 °C
Humidity	95 % without condensate
Power supply	85 ÷ 2640 Vac +/- 10 % 50/60 Hz
	9 ÷ 36 Vcc 12 ÷ 24 Vac (091.428 option)
Power	6 VA max.
Isolation	4000 V between primary and secondary
Immunity performance loss	< 1 % full scale
Terminal blocks	extractable
Weight	1300 g
Dimensions	256 x 230 x 89 mm
Protection	IP 65
EMC/RFI conformity	EN61326
Registered design	002564666-002

4.2.2 TECHNICAL SPECIFICATIONS

In the left column indicates the number of the display concerning:
- SETUP parameters are indicated by "S xy"
- CONFIGURATION parameters are indicated with "C xy" where
  x = paragraph and y = sequential 1..2..3..4..ecc

D1.0	MAIN MEASURING		Default
C1.0	Operating mode	AUTO/MEAS/SIM	AUTO
C1.1	Transmitters input (passive/active)	4-20 / 0-20 mA	4-20 mA
C1.2	Input type	SINGLE / DIFFER. (Single / Differential)	SINGLE
	Passive transmitters power	24 Vdc (max 50 mA)	
	Programmable scale		
C1.3	• Measuring unit	%, NTU, FTU, mg/l, g/l, ppm, µS, mS, pH, mV, custom	%
C1.4	• Custom measuring unit	ABCD (4 characters max)	ABCD
C1.5	• Decimal point	YYYY / YYY.Y / YY.YY / Y.YYY	YYY.Y
C1.6	• LO scale value	-9999 ÷ 9999	0.0 %
	4 mA (single 4-20)		
	0 mA (single 0-20)		
	-16 mA (diff. 4-20)		
	-20 mA (diff. 0-20)		
C1.7	• HI scale value	-9999 ÷ 9999	100.0 %
	20 mA (single 4-20)		
	20 mA (single 0-20)		
	16 mA (diff. 4-20)		
	20 mA (diff. 0-20)		
	Resolution	Digit	
	Interval | HI - LO |	> 100 digit	

D1.0	MAIN MEASURING		Default
	Single input		
	Under range (0-20 mA)	input < -0.50 mA or display < -9999	
	Over range (0-20 mA)	input > 20.50 mA or display > 9999	
	Under range (4-20 mA)	input < 3.50 mA o display < -9999	
	Over range (4-20 mA)	input > 20.50 mA or display > 9999	
	Differential input		
	Under range (0-20 / 4-20 mA)	display < -9999	
	Over range (0-20 / 4-20 mA)	display > 9999	
	Under range (0-20 mA)	input 1/2 < -0.50 or > 20.50 mA	
	Over range (4-20 mA)	input 1/2 < 3.50 or > 20.50 mA	
	Indeterminate measuring condition		
	• Display	- - - -	
	• Set point	Deactivated	
	• Alarm	Active	
	• Analog output	20.50 mA	
D1.1	Zero	±10 % of the scale	
D1.2	Sensitivity	12.5 % ÷ 250 %	
C1.8	Response time at 90 % large signal	0.4 ÷ 50.0 seconds	2.0 s
C1.9	Response time at 90 % small signal	0.4 ÷ 50.0 seconds	10.0 s

2.0	SCALA 100 %IN AND mA CHECK		Default
2.0	Scale	0.0 ÷ 100.0 %IN	
	Resolution	0.1 %IN	
2.0	I1 input	0.00 ÷ 20.00 mA (max. 30 mA)	
	Resolution	0.01 mA	
2.0	I2 input (differential only)	0.00 ÷ 20.00 mA (max. 30 mA)	
	Resolution	0.01 mA	

3.1	SET POINT 1		Default
C3.1	Regulation type	ON-OFF / PID	ON-OFF
		ON-OFF (referred to relay 1)	

3.1	SET POINT 1		Default
		PID (referred to relay 1 or OUT1)	
C3.2	Regulation referred to PID	FM / WM / OUT1 FM/WM to relay 1	FM
	ON-OFF regulation		
D3.1	• Set point value	LO / HI values	LO value
S3.1A	• Hysteresis	0.0 ÷ 10.0 % FS	0.1 % FS
S3.2A	• Delay	0.0 ÷ 100.0 seconds	0.2 s
C3.3	• Function	LO / HI (Min / Max)	LO
	PID regulation		
D3.1	• Set point value	LO / HI values	LO value
S3.1B	• Proportional band	0.0 ÷ 400.0 % FS	0.1 % FS
S3.2B	• Integral time	0.0 ÷ 999.9 minutes	0.0 min
S3.3B	• Derivative time	0.0 ÷ 999.9 minutes (0=disabl.)	0.0 min
C3.3	• Function	LO / HI (Min / Max)	LO
	FM regulation on relay 1		
S3.4B	• Pulse frequency	0 ÷ 120 pulses/minute	100 i/min
	• Pulse length	0.1 seconds	
	WM regulation relay 1		
S3.4B	• Pulse width	0 ÷ 99.9 seconds	20.0 s
	• Minimum width	0.3 seconds	
	Relay contacts	SPST 220 V 5 A resistive load	
	Analog output 1	4-20 mA	

3.23.2	SET POINT 2		Default
C3.4	Regulation type	ON-OFF / PID	ON-OFF
		ON-OFF (referred to relay 2)	
		PID (referred to relay 2 or OUT2)	
C3.5	Regulation referred to PID	FM / WM / OUT2 FM/WM on relay 2	FM

3.23.2	SET POINT 2		Default
	ON-OFF regulation		
D3.2	• Set point value	LO / HI values	LO value
S3.5A	• Hysteresis	0.0 ÷ 10.0 % FS	0.1 % FS
S3.6A	• Delay	0.0 ÷ 100.0 seconds	0.2 s
C3.6	• Function	LO / HI (Min / Max)	HI
	PID regulation		
D3.2	• Set point value	LO / HI values	LO value
S3.5B	• Proportional band	0.0 ÷ 400.0 % FS	0.1 % FS
S3.6B	• Integral time	0.0 ÷ 999.9 minutes	0.0 min
S3.7B	• Derivative time	0.0 ÷ 999.9 minutes (0=disabl.)	0.0 min
C3.6	• Function	LO / HI (Min / Max)	HI
	FM regulation on relay 2		
S3.8B	• Pulse frequency	0 ÷ 120 pulses/minute	100 i/min
	• Pulse length	0.1 seconds	
	WM regulation on relay 2		
S3.8B	• Pulse width	0 ÷ 99.9 seconds	20.0 s
	• Minimum width	0.3 seconds	
	Relay contacts	SPST 220 V 5 A resistive load	
	Analog output 2	4-20 mA	

4.0	ALARM		Default
	Min/Max alarm		
S4.1	• Min. value	LO value -5% / HI value + 5%	LO value -5%
S4.2	• Max. value	LO value -5% / HI value + 5%	HI value +5%
	• Hysteresis	± 0.1 % FS	
S4.3	• Delay	0.0 ÷ 100.0 seconds	1.0 s
	Set point operation time alarm		
C4.1	• Set point1	ON / OFF	OFF
C4.2	• Set point1 operation time	0 ÷ 60 minutes	60 min
C4.3	• Set point 2	ON / OFF	OFF
C4.4	• Set point 2 operation time	0 ÷ 60 minutes	60 min

4.0	ALARM		Default
C4.5	Contact function	ACTIVE / NON ACTIVE	ACTIVE
	Relay contacts	SPDT 220 V 5 A resistive	

D5.1	ANALOG OUTPUT 1		Default
	If not related to SET1		
C5.1	Input related to OUT1	(measure) / %IN	(measure)
C5.2	Output range	0-20 / 4-20 mA	0-20 mA
	Under / Over range (0-20)	0.00 / 20.50 mA	
	Under / Over range (4-20)	3.50 / 20.50 mA	
C5.3	Point 1 (0 mA or 4 mA) (measure)	LO value / HI value	LO value
C5.4	Point 2 (20 mA) (measure)	LO value/ HI value	HI value
C5.3	Point 1 (0 mA or 4 mA) (% s)	0.0 ÷ 100.0 %IN	0.0 %IN
C5.4	Point 2 (20 mA) (% s)	0.0 ÷ 100.0 %IN	100.0 %IN
	Response time	2.5 seconds to 98 %	
	Isolation	250 Vca	
	R max	600 ohm	

D5.2	ANALOG OUTPUT 2		Default
	If not related to SET2		
C5.5	Input related to OUT2	(measure) / %IN	%IN
C5.6	Output range	0-20 / 4-20 mA	0-20 mA
	Under / Over range (0-20)	0.00 / 20.50 mA	
	Under / Over range (4-20)	3.50 / 20.50 mA	
C5.7	Point 1 (0 mA o 4 mA) (measure)	LO value / HI value	LO value
C5.8	Point 2 (20 mA) (measure)	LO value/ HI value	HI value
C5.7	Point 1 (0 mA o 4 mA) (% s)	0.0 ÷ 100.0 %IN	0.0 %IN
C5.8	Point 2 (20 mA) (% s)	0.0 ÷ 100.0 %IN	100.0 %IN
	Response time	2.5 seconds to 98 %	
	Isolation	250 Vca	
	R max	600 ohm	

6.0	LOGIC INPUTS (D1 and D2)		Default
	HOLD condition		
	• Analog outputs	HOLD	
	• Set point	HOLD	

6.0	LOGIC INPUTS (D1 and D2)		Default
	• Alarm status	Alarm relay OFF Alarm indication held on display	
	ALARM condition		
	• Analog output	RUN	
	• Set point	OFF	
	• Alarm status	ON	
S6.1	Logic input 1	ON / OFF	OFF
C6.1	Logic input 1 function	HOLD / ALARM	HOLD
S6.2	Logic input 2	ON / OFF	OFF
C6.2	Logic input 2 function	HOLD / ALARM	ALARM
	Logic input activation	free voltage contacts	

D7.0	CLEANING		Default
S7.1	Cleaning function	OFF / AUTO / MANUAL	OFF
	Cleaning parameters		
S7.2	• Repetition time	0.5 ÷ 100.0 hours	24.0 h
S7.3	• Cleaning time	1.0 ÷ 60.0 seconds	15.0 s
S7.4	• Holding time	0.1 ÷ 20.0 minutes	3.0 min
	Cleaning cycle		
	• Analog output	HOLD	
	• Set point	OFF	
	• Alarm status	OFF	

D50.0	SETUP		Default
D50.1	Password	000 ÷ 999	0
S1.1	Calibration and set point	ON / OFF	ON
S3.1A	Hysteresis SET1 (ON-OFF)	0.0 ÷ 10.0 % of FS	0.1 %
S3.2A	Delay SET1 (ON-OFF)	0.0 ÷ 100.0 seconds	0.2 s
S3.1B	PID band SET1	0.0 ÷ 400.0 % of FS	1.0 %
S3.2B	Integral time SET1	0.0 ÷ 999.9 minutes	0.0 min
S3.3B	Derivative time SET1	0.0 ÷ 999.9 minutes	0.0 min
S3.4B	Pulse frequency PFM SET1	0 ÷ 120 pulses/minute	100 i/min
S3.4B	Pulse width PWM SET1	0.1 seconds	20.0 s

D50.0	SETUP		Default
S3.5A	Hysteresis SET2 (ON-OFF)	0.0 ÷ 10.0 % of FS	0.1 %
S3.6A	Delay SET2 (ON-OFF)	0.0 ÷ 100.0 seconds	0.2 s
S3.5B	Band PID SET2	0.0 ÷ 400.0 % of FS	1.0 %
S3.6B	Integral time SET2	0.0 ÷ 999.9 minutes	0.0 min
S3.7B	Derivative time SET2	0.0 ÷ 999.9 minutes	0.0 min
S3.8B	Pulse frequency FM SET2	0 ÷ 120 pulses/minute	100 i/min
S3.8B	Pulse width WM SET2	0.1 seconds	20.0 s
S4.1	Alarm LO (low value)	LO value / HI value	LO value
S4.2	Alarm HI (high)	LO value/ HI value	HI value
S4.3	Alarm delay	0.0 ÷ 100.0 seconds	1.0 s
S6.1	Logic input 1	ON / OFF	OFF
S6.2	Logic input 2	ON / OFF	OFF
S7.1	Cleaning function	OFF / AUTOCLEAN / MANUAL	OFF
S7.2	Repetition time	0.5 ÷ 100.0 hours	24.0 h
S7.3	Cleaning time	1.0 ÷ 60.0 seconds	15.0 s
S7.4	Holding time	0.1 ÷ 20.0 minutes	3.0 min
S50.1	Password change	XXX	

D60.0	CONFIGURATION		Default
D60.1	Password	000 ÷ 999	0
C1.0	Operating mode	AUTO / MEAS / SIM	AUTO
C1.1	Input from transmitters	4-20 / 0-20 mA	4-20 mA
C1.2	Input type	Single / Differential	Single
C1.3	Measuring unit	%, NTU, FTU, mg/l, g/l, ppm, µS, mS, pH, mV, custom	%
C1.4	Custom measuring unit	ABCD (4 characters max)	ABCD
C1.5	Decimal point	YYYY / YYY.Y / YY.YY / Y.YYY	YYY.Y
C1.6	Point LO	-9999 ÷ 9999	0.0 %
C1.7	Point HI	-9999 ÷ 9999	100.0 %
C1.8	RT Large Signal	0.4 ÷ 50.0 seconds	2.0 s
C1.9	RT Small Signal	0.4 ÷ 50.0 seconds	10.0 s
C3.1	SET1 regulation	ON-OFF / PID	ON-OFF
C3.2	SET1 regulation related to (PID only)	RELAY1 FM / RELAY1 WM / OUT1	FM
C3.3	SET1 function	LO / HI (Min / Max)	LO
C3.4	SET2 regulation	ON-OFF / PID	ON-OFF

D60.0	CONFIGURATION		Default
C3.5	SET2 regulation related to (PID only)	RELAY1 FM / RELAY1 WM / OUT1	FM
C3.6	SET2 function	LO / HI (Min / Max)	HI
C4.1	Alarm related to SET1 operation time	ON / OFF	OFF
C4.2	SET1 operation time	0 ÷ 60 minutes	60 min
C4.3	Alarm related to SET2 operation time	ON / OFF	OFF
C4.4	SET2 operation time	0 ÷ 60 minutes	60 min
C4.5	Alarm function	ACTIVE / NON ACTIVE	ACTIVE
C5.1	Input related to the analog output 1	(measure)/ % s	(measure)
C5.2	Analog output 1 range	4-20 / 0-20 mA	0-20 mA
C5.3	Point 1 analog output 1	-9999 ÷ 9999	0.0
C5.4	Point 2 analog output 1	-9999 ÷ 9999	100.0
C5.5	Input related to the analog output 2	(measure)/ %IN	%IN
C5.6	Analog output 2 range	4-20 / 0-20 mA	0-20 mA
C5.7	Point 1 analog output 2	0.0 - 100.0 %IN	0.0 %IN
C5.8	Point 2 analog output 2	0.0 - 100.0 %IN	100.0 %IN
C6.1	Logic input 1 function	HOLD / ALARM	HOLD
C6.2	Logic input 2 function	HOLD / ALARM	ALARM
C60.1	Password change	XXX	

70.0	INFO MENU		Default
I1.0	Release code	BC6587 R1.0X	
I2.0	LCD brightness	(0 ÷ 30)	20
I3.0	LCD contrast	(0 ÷ 30)	12
I4.0	LCD mode	NORMAL / REVERSE	NORMAL
I5.0	Hours of operation time	xxxxxx h	

5 INSTALLATION

5.1 PACKING LIST

The package contains:

- N° 1 unit with serial number label;
- N° 1 instruction manual.

5.2 PACKING AND UNPACKING

1 Open the carton box and keep it.
2 Remove the instrument for the carton box.
3 Remove the plastic protection from the instrument.
If repackaging do the reverse.

5.3 STORAGE AND TRANSPORT

For prolonged storage, keep the product in dry places.
In case of transportation, pack the product in a carton box.

5.4 INSTALLATION OF THE INSTRUMENT

The instrument can be installed in proximity of the transmitter or in a remote area.
Panel installation must be performed on a rigid surface, in a protected position from shock and corrosive fumes.
Accessories for alternate mounting are available on request (see Fig. 3 and Fig. 4 of chapter "Dimensions and installation (page 41)").

5.4.1 WALL MOUNTING INSTRUCTIONS

The instrument requires 3 screws and fixing accessories suitable for the wall material for mounting (see Fig. 2):

- a screw in the top center of the instrument to hang it;
- two fixing screws at the bottom of the instrument.

Open the front cover to fix these two screws.
The diameter for the top screw head is 8.5 mm.
The diameter for the bottom screws is 4.7 mm.

Mounting without a drilling template

1 Fix the central screw on the wall, ensuring a distance of 6 mm between the screw head and the wall.
2 Remove the front cover of the instrument.
3 Hang the instrument on the central screw (attention to the projection of the screw head, if excessive it can remove the instrument's inner seal).
4 Mark on the wall the position of the bottom holes.
5 Remove the instrument and drill the two holes.
6 Hang the instrument again.
7 Fasten the two bottom screws in the holes.
8 After making all electrical connections required, close the lid.

Mounting with a drilling template

1 Prepare a drilling template according to the measurements shown in Fig. 1 of chapter "Dimensions and installation (page 41)".
2 Make the 3 holes required.
3 Perform steps 1-2-3-7-8 of "Mounting without a drilling template".

5.5 ELECTRICAL INSTALLATION

For all the electrical connections refer to the label on the instruments, also shown and described in the chapter "Installation drawing (page 40)".
All connections to the instrument are made using removable terminal blocks.

The cable glands are supplied with a cap that ensures IP65 seal; unscrew the nut and remove it only for the cable glands actually used.
Use cables of the appropriate diameter to ensure the IP65 sealing.

The power connections are on two terminal blocks (one for a power supply and one for connection to the relays).
The power connections of the input signals of the transmitters are on a 4-position terminal block.
The connections of the analog and logic input are on a 6-position terminal block.

5.5.1 CONNECTING TO THE MAINS

- Connect the ground to the terminal 3
- Connect the mains to the terminals 1-2 marked L-N.

⚠ The device is very sensitive and absorbs very little power.
Use the following precautions to avoid irreversible damage to the electronic circuits.

- Power the device between phase and neutral. Avoid the use of auto-transformers.
- Avoid power taken from nodes with strong inductive loads that may produce noise or damage to the internal circuits .
- In the case of installations with the presence of inverter, check that they are properly installed and not induce noise on the network, on the ground or on the signals.
- Install a switch in the control cabinet for the power of the instrument. This switch can be "specific" or "general" for all electronic equipment installed.
- Install in the control cabinet protection fuses for power supply.
- Install the power cables away from the signal cables.
- Check the voltage supply before turning on the power.

⚠ It should be remembered that the electronic instruments may be subject to accidental failures.
Take the necessary precautions to avoid any damage caused by their dysfunction.

5.5.2 CONNECTING THE TRANSMITTERS

The connection of the input signals is the most critical part of the whole system because of possible noise or interference.
The application also accidental of signals not originate from the transmitters or from simulators may damage the electronic input circuits.

- Use twisted cables and with low losses along the entire length between the transmitter and the input terminals of the instrument.
- Avoid interruptions of the cable. If necessary use only special terminal blocks with very high insulation and protect from moisture.
- Keep the connection cables far from the power cables also inside the electrical panel.

The transmitters provide output current "active" or "passive".
A transmitter with passive output is not equipped with an own power supply and requires the Vdc power by the instrument BC 6587.
A transmitter with the active output is equipped with an own power supply and does not require the Vdc power by the instrument BC 6587.

Connecting a transmitter with active analog output

- Connect the positive terminal of the transmitter to the terminal 23 marked I1.
- Connect the zero of the transmitter to the terminal 22 marked 0V.

Connecting transmitters with active analog output for differential measurements

- Connect the positive terminal of the transmitter 1 to the terminal 23 marked I1.
- Connect the positive terminal of the transmitter 2 t the terminal 24 marked I2.
- Connect the zero of the transmitters 1 and 2 to the terminal 22 marked 0V.

In this case the display will show the difference between I1 and I2.

Connecting a transmitter with passive analog output (4-20 mA current loop)

- Connect the positive terminal of the transmitter to the terminal 25 marked 24V.
- Connect the negative of the transmitter to the terminal 23 marked I1.

Connecting transmitters with passive analog output for differential measurements

- Connect the positive terminal of the transmitters 1 and 2 to the terminal 25 marked 24V.
- Connect the negative terminal of the transmitter 1 to the terminal 23 marked I1.
- Connect the negative terminal of the transmitter 2 to the terminal 24 marked I2.

In this case the display will show the difference between I1 and I2.

⚠ Do not connect the terminal 25 marked 24V to a transmitter with active analog output. It can damage the instrument BC 6587.

5.5.3 CONNECTING ANALOG OUTPUTS

The instrument provides two output signals in current to drive external recorders, PLC or other similar devices.

- Connect terminal (+) of recorder N°1 to the terminal 30 marked R1 +.
- Connect terminal (+) of recorder N°2 to the terminal 31 marked R2 +.
- Connect terminal (-) of the two recorders to the terminal 29 marked R0 -.

If the analog output signal will drive more devices, they must be connected in "series" between them. The sum of their input resistance must not be greater than 600 Ω.

⚠ Do not give any power to the analog output. It will damage the circuits of the instrument.

5.5.4 CONNECTING PUMPS, SOLENOIDS AND ALARMS

the relays contacts are available on the terminal block of the instrument.

They consist of two open contacts SPST corresponding to the set point 1 and set point 2 and a contact SPDT corresponding to the alarm.

SET POINT 1

terminal 5 marked C : common

terminal 4 marked NO : normally open

SET POINT 2

terminal 7 marked C : common

terminal 5 marked NO : normally open

Drive the loads of the relay by a power different from that of the instrument in order to prevent disturbances arising from loads of inductive nature.

If necessary use snubbers.

Protect the relay contacts by fuse.

Do not exceed the rated current value of the contacts (5 A resistive).

Each relay can be configured to perform the functions of the maximum or minimum.

The set point values can be set if it was not inhibited calibration, the delay is set in the setup menu. (See chapters "Set point (page 34)" e "Setup (page 35)").

To change the minimum/maximum (LO/HI) function of the set point, see chapter "Configuration (page 37)".

ALARM

terminal 9 marked C : common

terminal 8 marked NO : normally open

terminal 10 marked NC : normally closed

The alarm relay can be configured on/off (ACTIVE/NON ACTIVE) during alarm conditions of the measurement.

The configuration "disabled" (NON ACTIVE) allows to signal shutdown or not operation of the instrument.

The alarm condition occurs when:

- the measure exceeds the selected min/max values;
- the operating time of set point 1 and 2 is exceed (if configurated);
- contact from logic input 1 and 2 (if configurated).

As for set point the user can set a delay (see "Setup (page 35)").

5.5.5 CONNECTING THE LOGIC INPUTS

The free voltage contacts (in closure) from an external device should be applied to the logic input terminals 27-28 (marked D1-D+) e 26-28 (marked D2-D+).

The activation and the configuration of the logic input are described on the display S6.1 ("Setup (page 35)") and C6.1 ("Configuration (page 37)").

The hold or alarm function are described in the chapter 6.0 "Technical data (page 14)".

5.5.6 CONNECTING THE CLEAN SYSTEM

The contacts of the cleaning relay are on the terminal block of the instrument.

terminal 12 marked C : common

terminal 11 marked NO : normally open

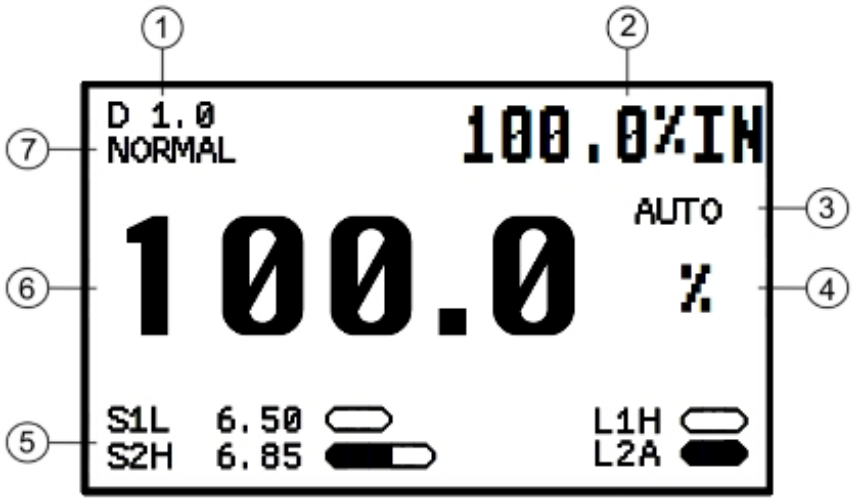
terminal 13 marked NC : normally closed

5.6 DISPOSAL

In case of disposal of the instrument, apply the terms of the law provided for the disposal of electronic devices.

6 OPERATING PROCEDURES

6.1 DISPLAY



1. Display ID
2. Secondary display
3. Operating mode
4. Main measuring unit
5. Information display (set points and analog inputs status; functions and messages)
6. Main display
7. Instrument status: NORMAL, CLEAN, HOLD, ALARM (MEAS/S1/S2/L1/L2)

6.2 KEYBOARD

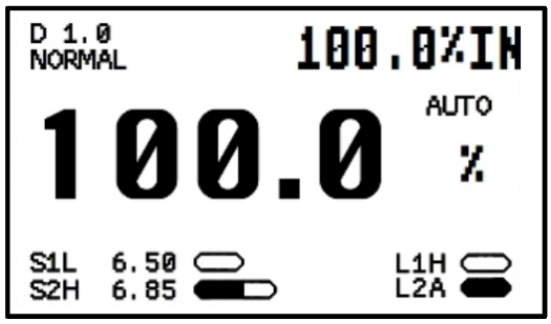
KEYS	FUNCTION
ZERO	- To access the zero calibration
SENS	- To access the sensitivity calibration
SET 1	- To access the set point 1 setting
SET 2	- To access the set point 2 setting
MODE	- To visualize the available displays - To exit from the not confirmed calibrations sequences
^	Key "UP" - To modify (increase) the displayed data - To return the unit to the main display
v	Key "DOWN" - To modify (decrease) the displayed data
ENT	- To enter the effected changings and selections

6.3 USERS INSTRUCTION

6.3.1 MAIN MEASURING

The display shows the measuring value or the differential value in % or measuring unit as selected in the configuration menu. It allows the access to the calibration procedure and set point changing if those functions has not been disabled into the setup menu.

At the right top of the display (called "secondary display") the measured value is displayed as a percentage of full scale (0 to 100% IN).



The instrument configured to operate with single input, will send the over range or under range messages when the measuring or the input current is over or under range.

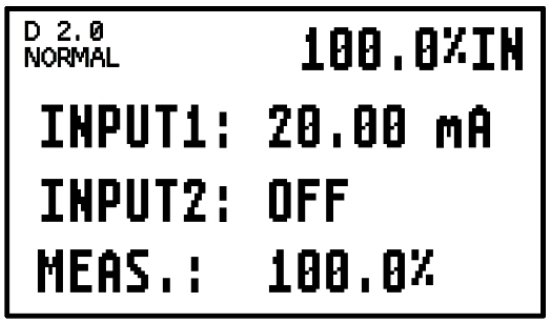
The instrument configured to operate with differential input, will send the indefinite measuring message when one or both inputs current is below or above the scale.

If the cleaning function is activated, during the cycle the display will visualize the measuring value and the running cleaning phase: CLEAN or HOLD.

Symbol map	
	Active relay or input
	Non active relay or input
	Relay's activation delayed
	Proportional activation level (PID)

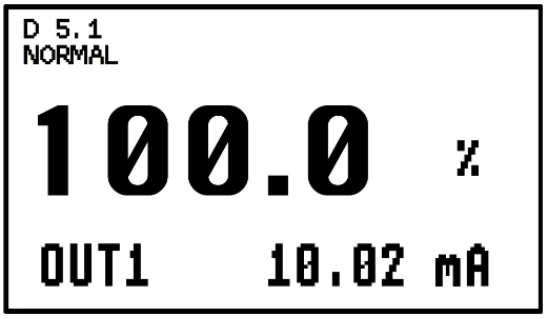
6.3.2 INPUT CURRENT VALUES

Press MODE from the display D1.0 to visualize the input current on the input terminals.



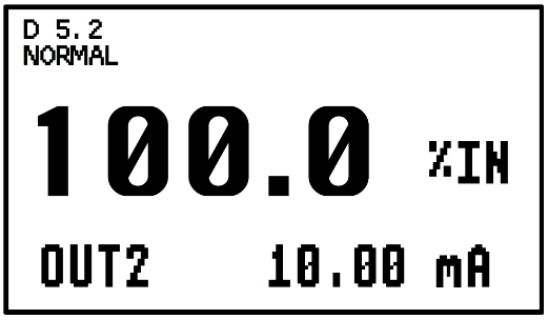
6.3.3 ANALOG OUTPUT 1 VALUES

Press MODE two times from the display D1.0 to visualize the output signal and the corresponding current value.



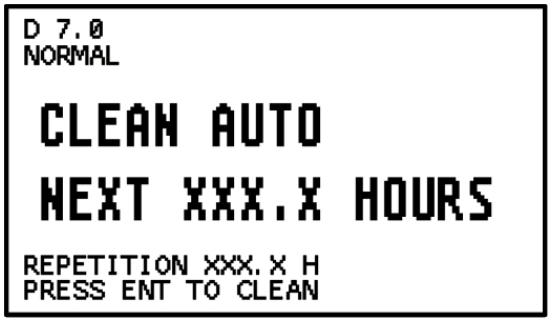
6.3.4 ANALOG OUTPUT 2 VALUES

Press MODE three times from the display D1.0 to visualize the output signal and the corresponding current value.



6.3.5 AUTOCLEAN

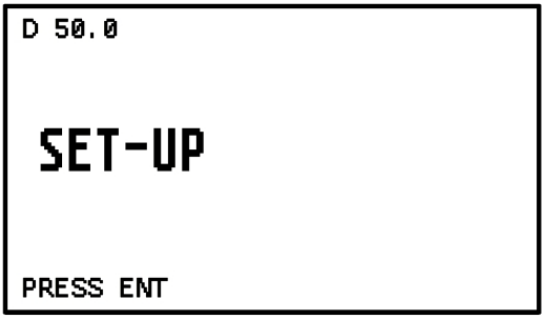
Press MODE four times from the display D1.0 to visualize the autoclean state, the remaining time to the next cycle and the repetition time as configured in the setup menu.



ENT	to start a cleaning cycle.

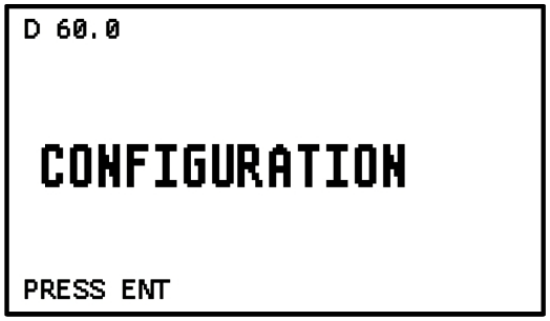
6.3.6 PARAMETERS FOR THE MAINTENANCE STAFF

Press MODE five times from the display D1.0 to visualize the SETUP display to access to the maintenance menu of the unit.



6.3.7 PARAMETERS FOR THE PLANT ENGINEER

Press MODE six times from the display D1.0 to visualize the CONFIGURATION display to access to the installation menu of the unit.



6.3.8 INFORMATION MENU

Press MODE seven times from the display D1.0 to visualize the information menu from which you can access the information functions of the instrument.

ENT	press the key to visualize and to confirm in sequence the parameters
UP or DOWN	press the key to modify the values
MODE	press the key to turn to the D70.0 display any time

Display	Contents	Meaning	Possible values
I1.0	B&C electronics BC6587 R1.00	P/N e firmware release	
I2.0	LCD BRIGHTNESS 8	Screen brightness	0 ÷ 30
I3.0	LCD CONTRAST 8	Screen contrast	0 ÷ 30
I4.0	LCD MODE NORMAL	Type of visualization of the screen	NORMAL REVERSE
I5.0	TOTAL: XXXXX h	Total operating hours	

6.4 USERS INSTRUCTION

6.4.1 PRELIMINARY OPERATIONS

All the functioning operations must be done with sensor or simulator connected to the unit.

If the input terminals are not connected to a current source, the unit will show 0 mA.

Verify if the configuration, the set point and the alarm parameter are suitable for the current application.

Follow the procedures described in the chapter "Setup (page 35)" to verify the parameters without modifying the values.

The display and the keys in the front panel allow the operator to perform the preliminary check.

The lit display indicates that the unit is powered and the power circuits work correctly.

6.4.2 MEASURING OPERATIONS

In order to operate the system, verify previously the following:

- the transmitters are connected and in operation;
- the power and the ground are connected;

and if necessary

- the analog output;
- the loads of relays 1 and 2;
- the alarm relay;
- the logic inputs.

Power the unit and look on the display the measuring value and the set points status.

If the transmitters are connected as described in the chapter "Installation (page 23)", the system will work correctly and it will need just the calibration, the set points and alarm values selection.

6.4.3 CALIBRATION

Depending of the application the customer may perform two calibration types in order to get:

1 the correspondence between the input current and the scale of the display as selected into the configuration menu. It is possible to use a mA simulator (i.e. the BC 125 model) or to measure the input current from the transmitter by means of an accurate mAmeter;

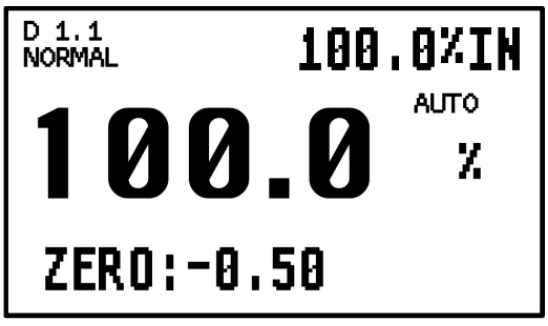
2 the correspondence between the transmitter measuring value and the display value.

The user must consider the following:

- the zero calibration will modify in the same quantity any value within the scale;
- the sensitivity calibration will modify the slope (i.e. the conversion multiplier factor).

Zero calibration

Press ZERO to get the following display:

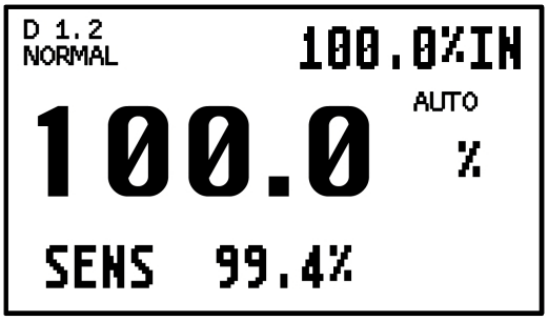


UP or DOWN	press the key to modify the values
ENT	press the key to confirm the new value

On the information display will appear UPDATE message or error message if the calibration is not successful.

Sensitivity calibration

Press SENS to get the following display:

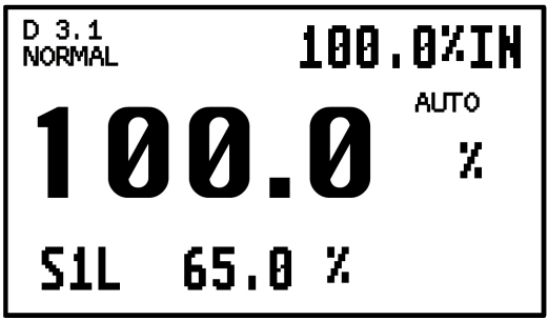


UP or DOWN	press the key to modify the values
ENT	press the key to confirm the new value

On the information display will appear UPDATE message or error message if the calibration is not successful.

6.4.4 SET POINT

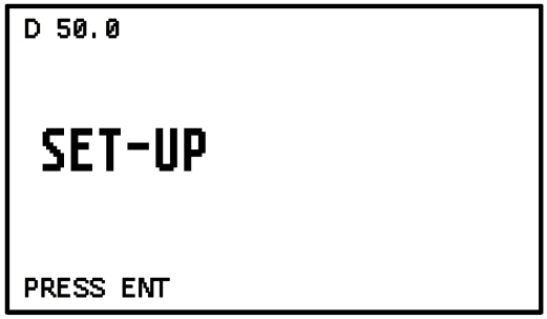
Press SET1 or SET2 to get the following display:



UP or DOWN	press the key to modify the values
ENT	press the key to confirm the new value

6.4.5 SETUP

Press MODE five times from the D1.0 display to get the D50.0 display.



ENT	press the key to visualize and to confirm in sequence the setup parameters
UP or DOWN	press the key to modify the values
MODE	press the key to turn to the D50.0 display any time

Depending of the instrument configuration some setup parameters may not be visualized.

Display	Contents	Meaning	Possible values
D50.1	PASSWORD SET-UP ---	Password to access the setup menu	000 ÷ 999
S1.1	CAL FUNCTION ON	Inibition of zero/sensitivity calibration and set point changings	ON OFF
S3.1A	HYSTERESIS SET1 0.1 %	Hysteresis of the set point 1	Selectable
S3.2A	SET1 DELAY 0.2 s	Delay of the set point 1	0.0 ÷ 99.0 s
S3.1B	PROP. BAND SET1 1.0 %	Proportional band of the set point 1 in PID function	0.0 ÷ 400.0 %
S3.2B	INTEG. TIME SET1 0.0 m	Integral time (minutes) of the set point 1 in PID function	0.0 ÷ 999.9 m
S3.3B	DERIV. TIME SET1 0.0 m	Derivative time (minutes of the set point 1 in PID function	0.0 ÷ 999.9 m
S3.4B	IMPULSE F. SET1 100 i/m	Pulse frequency of the set point 1 in PID (FM) function	0 ÷ 120 i/m
S3.4B	IMPULSE T. SET1 20.0 s	Pulse width of the set point 1 in PID (WM)	0 ÷ 99.9 s
S3.5A	HYSTERESIS SET2 0.1 %	Hysteresis of the set point 2	Selectable
S3.6A	SET2 DELAY 0.2 s	Delay of the set point 2	0.0 ÷ 99.0 s

Display	Contents	Meaning	Possible values
S3.5B	PROP. BAND SET2 1.0 %	Proportional band of the set point 2 in PID function	0.0 ÷ 400.0 %
S3.6B	INTEG. TIME SET2 0.0 m	Integral time (minutes) of the set point 2 in PID function	0.0 ÷ 999.9 m
S3.7B	DERIV. TIME SET2 0.0 m	Derivative time (minutes of the set point 2 in PID function	0.0 ÷ 999.9 m
S3.8B	IMPULSE F. SET2 100 i/m	Pulse frequency of the set point 2 in PID (FM) function	0 ÷ 120 i/m
S3.8B	IMPULSE T. SET2 20.0 s	Pulse width of the set point 2 in PID (WM)	0 ÷ 99.9 s
S4.1	LO ALARM 0.0 %___	Alarm relay minimum value	Selectable
S4.2	HI ALARM 100.0 %___	Alarm relay maximum value	Selectable
S4.3	ALARM DELAY 1.0 s	Delay (seconds) of the alarm relay	0.0 ÷ 100.0 s
S6.1	LOGIC INPUT1 OFF	Logic input 1 function	ON OFF
S6.2	LOGIC INPUT2 OFF	Logic input 2 function	ON OFF
S7.1	CLEAN OFF	Autoclean function	OFF AUTOCLEAN MANUAL
S7.2	CLEAN REPETITION 24 h	Cleaning cycle	0.5 ÷ 100.0 h
S7.3	CLEAN TIME 15.0 s	Cleaning time	1.0 ÷ 60.0 s
S7.4	HOLD TIME 3.0 m	Holding time after the cleaning cycle	0.1 ÷ 20.0 m
S50.1	PASSWORD MODIFY ---	Password changing of the setup menu	0 ÷ 999

6.4.6 MAINTENANCE

Quality components are used to give the controller a high reliability.

The frequency of controller's maintenance depends on the nature of each particular application.

⚠ Disconnect the power supply to the unit before performing the following:

- dust removal from the terminals;
- operations on the wires connecting the terminals;
- mounting of the instrument.

As with any electronic device mechanical components such as buttons, relays, terminal blocks, are the parts most subject to failure.

- Periodically check that the device is not subject to excessive moisture.
- Check that the connections to the terminals are free of dust and corrosion.
- Check that the terminals screws are tight.
- Check that the cable glands are properly tightened.

6.5 INSTALLATION INSTRUCTION

6.5.1 SAFETY REQUIREMENTS

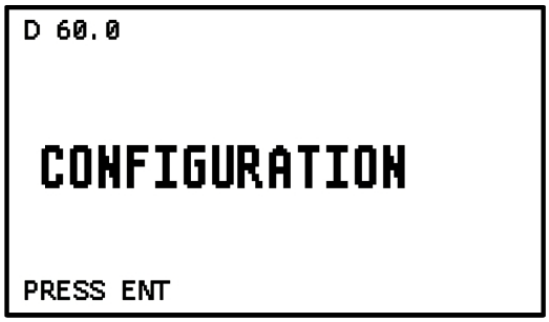
⚠ After performing the installation (see chapter "Installation (page 23)"), before turning the power on and proceed to the configuration of the instrument is recommended to do the following:

- check that the terminal 3 is grounded;
- check that all connections are correct;
- check that all connections are blocked on the terminals;
- check that the mechanical fixing of the cables does not cause any twisting or bending on the terminal blocks;
- check that eventual protection fuses are of appropriate value.

⚠ The damages due to incorrect connections during the installation are not covered by warranty.

6.5.2 CONFIGURATION

Press MODE six times from the D1.0 display to get the D60.0 display.



ENT	press the key to visualize and to confirm in sequence the configuration parameters
UP or DOWN	press the key to modify the values
MODE	press the key to turn to the D60.0 display any time

Depending of the instrument configuration some configuration parameters may not be visualized.

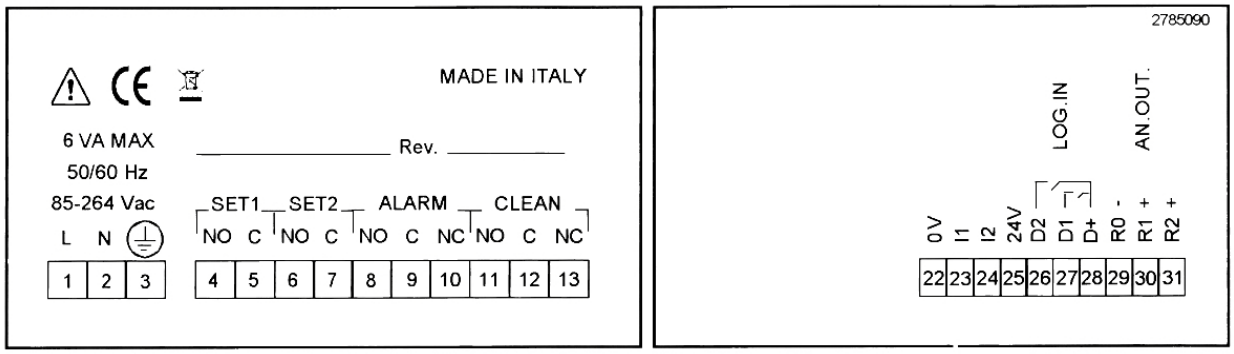
Display	Content	Meaning	Possible values
D60.1	PASSWORD CONFIG. ---	Password to access the configuration menu	000 ÷ 999
C1.0	CONTROLLER MODE AUTO	Operating mode	AUTO MEAS SIM
C1.1	INPUT 4-20mA	Input current	4-20 mA 0-20 mA
C1.2	INPUT TYPE SINGLE	Input type (single or differential)	SINGLE DIFFER.
C1.3	MEASURE UNIT %	Measuring unit	%, NTU, FTU, mg/l, g/l, ppm, uS,mS, pH, mV, custom
C1.4	CUSTOM UNIT ABCD	Custom measuring unit	ABCD
C1.5	DECIMAL POINT YYY.Y	Decimal point position	YYYY / YYY.Y YY.YY / Y.YYY
C1.6	POINT LO 4mA (*) 0.0 %___	Value corresponding to 0 (4) mA	-9999 ÷ 9999
C1.7	POINT HI 20mA (*) 100.0 %___	Value corresponding to 20 mA	-9999 ÷ 9999
C1.8	RT LARGE SIGNAL 2.0 s	Filter software small	0.4 ÷ 50.0 s
C1.9	RT SMALL SIGNAL 10.0 s	Filter software large	0.4 ÷ 50.0 s
C3.1	REGUL. MODE SET1 ON-OFF	Regulation type of the set point 1	ON-OFF PID
C3.2	ACTUATION SET1 FM	PID type of the set point 1	FM WM OUT1
C3.3	SET1 FUNCTION LO	Function of the set point 1	LO HI
C3.4	REGUL. MODE SET2 ON-OFF	Regulation type of the set point 2	ON-OFF PID
C3.5	ACTUATION SET2 FM	PID type of the set point 2	FM WM OUT2
C3.6	SET2 FUNCTION HI	Function of the set point 2	LO HI
C4.1	ALARM SET1 OFF	Alarm on the active time of the set point 1	ON OFF

Display	Content	Meaning	Possible values
C4.2	TIME SET1 60 m	Active time of the set point 1	0-60 m
C4.3	ALARM SET2 OFF	Alarm on the active time of the set point 2	ON OFF
C4.4	TIME SET2 60 m	Active time of the set point 2	0-60 m
C4.5	ALARM FUNCTION ACTIVE	Alarm relay function	ACTIVE NON ACTIVE
C5.1	OUT1 INPUT %___	Measuring related to the analog output 1	(measure) % IN
C5.2	OUT1 0-20 mA	Range of the analog output 1	0-20 mA 4-20 mA
C5.3	OUT1 POINT P1 0.0 %___	Point of the analog output 1 related to the beginning of the scale	Variable
C5.4	OUT1 POINT P2 100.0 %___	Point of the analog output 1 related to the end of the scale	Variable
C5.5	OUT2 INPUT %	Measuring related to the analog output 2	(measure) % IN
C5.6	OUT2 0-20 mA	Range of the analog output 2	0-20 mA 4-20 mA
C5.7	OUT2 POINT P1 0.0 %	Point of the analog output 2 related to the beginning of the scale	Variable
C5.8	OUT2 POINT P2 100.0 %	Point of the analog output 2 related to the end of the scale	Variable
C6.1	LOGIC INPUT1 HOLD	Logic input 1 function	HOLD ALARM
C6.2	LOGIC INPUT2 ALARM	Logic input 2 function	HOLD ALARM
C60.1	PASSWORD MODIFY ---	Configuration password changing	0 ÷ 999

In SIM operating mode the user can change the displayed value by means of ENTER key followed by UP and DOWN keys and confirm it with ENTER key.

7 INSTALLATION DRAWING

7.1 CONNECTION DIAGRAM



Terminal	Function
1	Power supply 85 ÷ 264 Vac
2	Power supply 85 ÷ 264 Vac
3	Ground
4	NO Set1
5	C Set1
6	NO Set2
7	C Set2
8	NO Alarm
9	C Alarm
10	NC Alarm
11	NO Autoclean
12	C Autoclean
13	NC Autoclean

Terminal	Function
22	Zero of transmitters
23	Input of transmitter n. 1
24	Input of transmitter n. 2
25	+ 24 Vcc transmitters power supply
26	Logic input 2
27	Logic input 1
28	Common logic inputs
29	- Common analog outputs
30	+ Analog output 1
31	+ Analog output 2

7.2 DIMENSIONS AND INSTALLATION

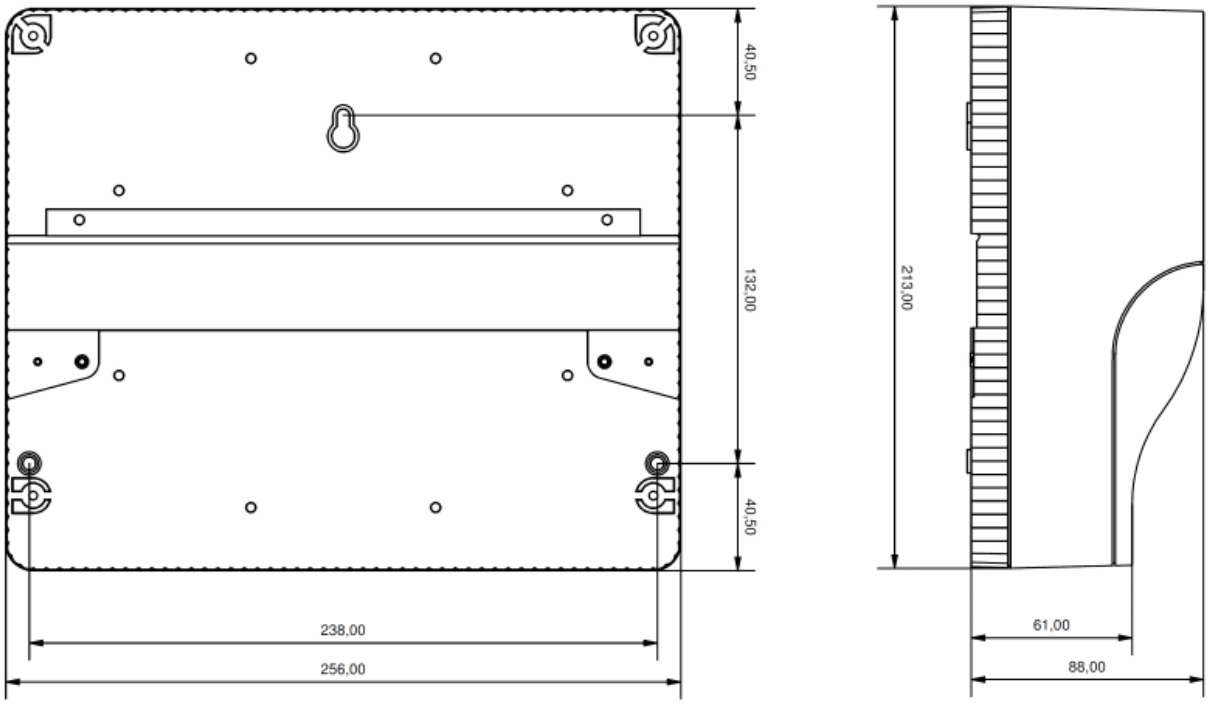


Fig. 1 Dimensions

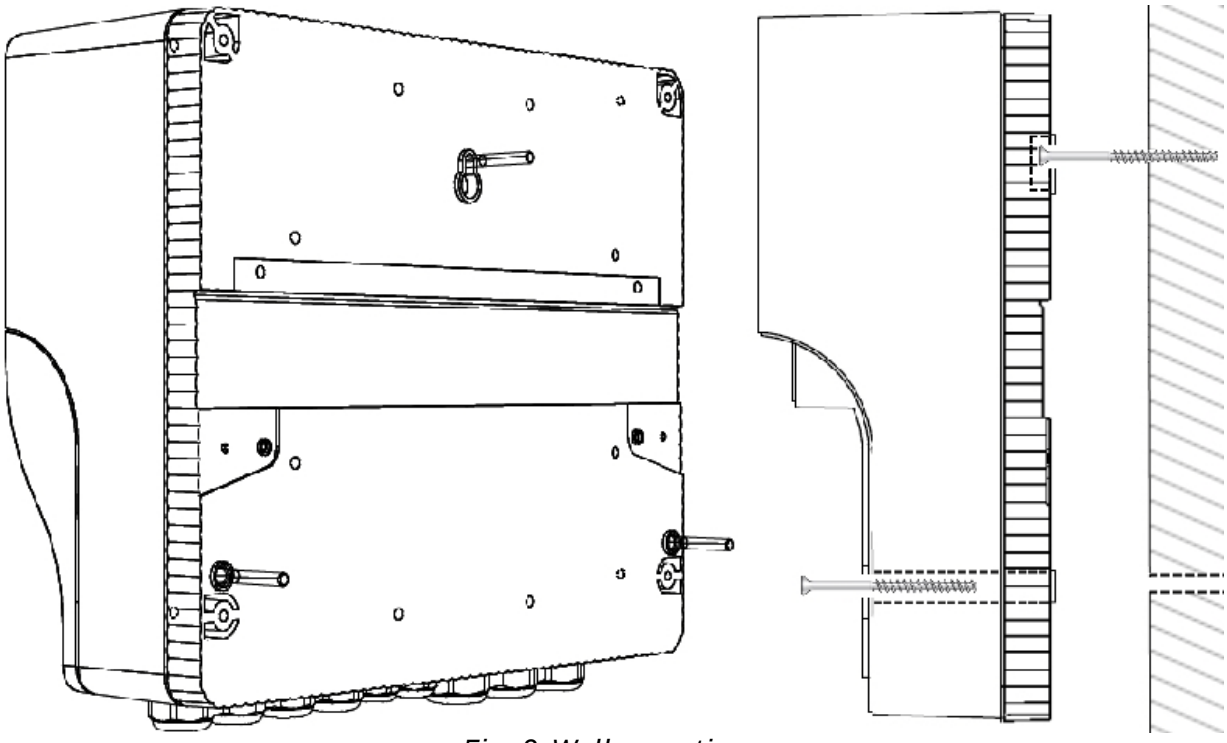


Fig. 2 Wall mounting

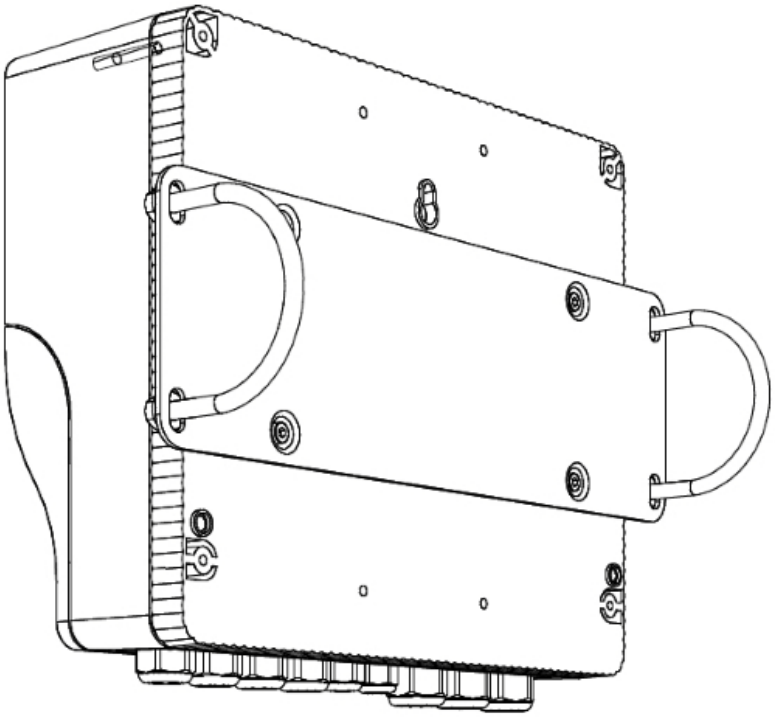


Fig. 3 Pipe mounting (horizontal or vertical)

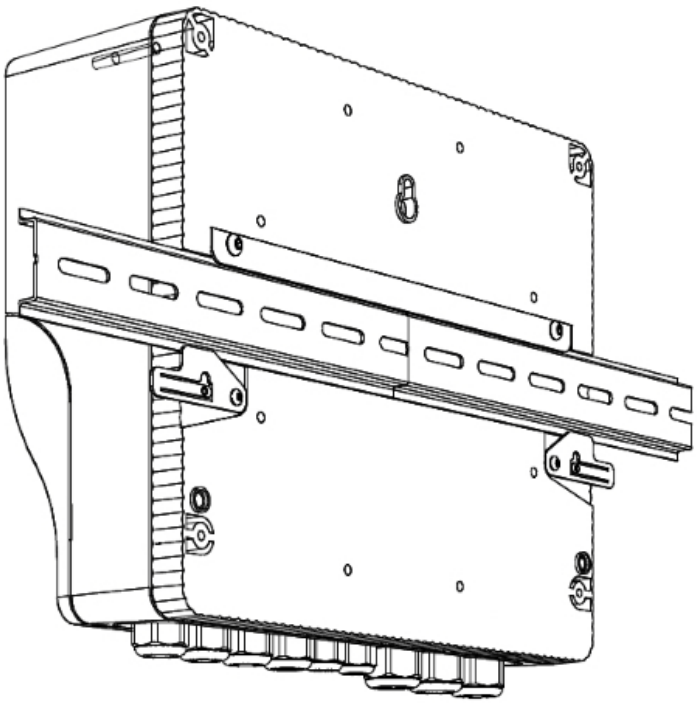
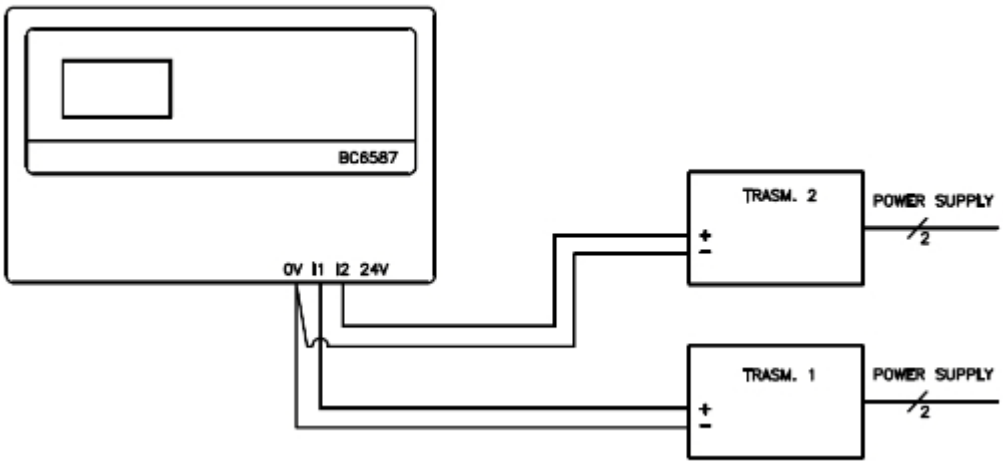
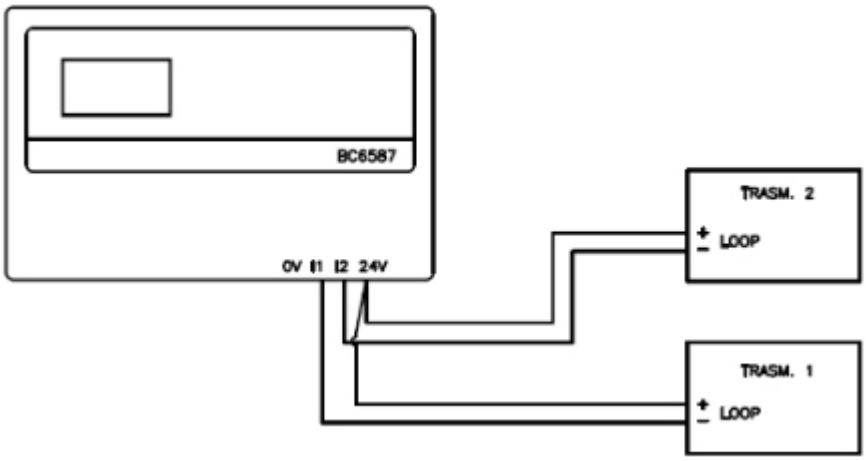


Fig. 4 Rail-DIN mounting

7.3 ACTIVE TRANSMITTERS



7.4 PASSIVE TRANSMITTERS



8 WARRANTY

1 Your product is guaranteed for 5 years from the date of purchase, for failure due to manufacturing defects.

2 The warranty is void in case of tampering or deterioration due to improper installation or maintenance.

3 The warranty covers only free repair at the laboratories of the manufacturer.

4 B&C Electronics is not liable for any damage arising from misusing its instruments and products.

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9 REPAIRS

For faster and efficient service it is recommended to fill in the "Information card" for the repair service and attach it to a "Repair order".

1 The estimated cost, if required by the customer, is free if the repair is confirmed. Otherwise flat rate results in a charge for the analytical work performed and expenses incurred.

2 The products to be repaired must be sent to B&C Electronics with freight prepaid. Any expenses incurred on behalf of the client and not previously agreed will be charged.

3 Our sales department will submit to the customer the repair estimate or offer a replacement in the following cases:

- repair cost is considered excessive in relation to the cost of the product;
- the repair is technically impossible or unreliable.

4 In order to reduce the time of delivery of the repaired products, unless otherwise offered or arranged by the customer, the shipment will be made with ex-factory, prepaid carriage by a courier.

INFORMATION SHEET

for service repairs

In the event of a fault, we recommend you contact our repair service, to photocopy and complete this information sheet to be attached to the product to be repaired.

□ ESTIMATE □ REPAIR

COMPANY NAME

ADDRESS ZIP TOWN

REFER TO MR/MRS TELEPHONE

MODEL S/N DATE

Consult the instruction manual to identify the area of the defect and/or describe it:

□ SENSOR
□ POWER SUPPLY
□ CALIBRATION
□ DISPLAY
□ ANALOG OUTPT
□ SET POINT
□ RELAYS CONTACTS
□ INTERMITTENT PROBLEM

DESCRIPTION OF THE DEFECT

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