Large Displays

FEMA ELECTRÓNICA

Series BDF

Large Displays for process signals

BDF-xx-32 for mA
BDF-xx-36 for Vdc

IDEAL SOLUTION for reading process signals at long distances, with scaled values on display, coming from 4/20mA or 0/10Vdc standard signals and others. Very strong housing and electrically protected units, designed for all type of industrial applications.

USER'S MANUAL
(1273R01)

Models 32 and 36

Large displays for process signals in mA and Vdc

The BDF series of large displays for process signals is composed of model «32» for 4/20 mA signals and similar, and model «36» for 0/10 Vdc signals and similar. Both instruments are available in 4 digit format, with digit height of 57mm and 100mm, and negative led sign.

The input signal in mA and Vdc is scaled on display up to a maximum of «9999». For signals corresponding to a higher reading value, the unit will show «9999» flashing on display (*«Flash»* function for overrange signals)

Instruments «32» and «36» provide an internal power supply regulated from 10 to 24Vdc in order to power-up transducers and sensors.

The mechanical of the BDF instruments is a very strong and sturdy aluminium housing anodized in black color, for panel mount, and for wall mount as an option. The front lens is antirreflexive and is firmly inserted on the aluminium profile with a rubber gasket around, providing IP65 protection on the front.

The signal wires are connected to plug-in screw clamps for higher security of the connections, accesible at the rear side of the instrument. The power is connected to a 3 terminal plug (2 power connections and 1 earth) containing an integrated protection fuse and an additional fuse as spare part.

Order reference

	Size	Model	Power	Color	Others	Adjustment
BDF -	**24** -	**32** -	**0** -	**R** -	**---** -	**4/20mA=0/100.0**
	-24 -44	-32 -36	-0 (230 Vac) -1 (115 Vac) -6 (24 Vdc isolated)	-Red -Green (check for availability)	-65 *(IP65)** *-(empty)*	4/20mA = ??? 0/10Vdc = ??? ...

* the IP65 option uses a completely different type of housing from the indicated in this documentation. Check the BDF IP65 housing documentation for more information.

Models

MODEL BDF-xx-32 .- Instrument for process signals up to 50mA. Several signal ranges selectable with internal jumpers. Display reading scalable in engineering units with internal «Span» and «Offset» potentiometers. Regulated power supply to power-up sensors and probes. Overrange advise with *«Flash»* function.

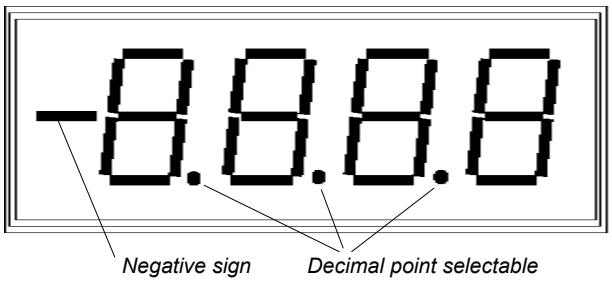
MODEL BDF-xx-36 .- Instrument for process signals up to 200Vdc. Several signal ranges selectable with internal jumpers. Display reading scalable in engineering units with internal «Span» and «Offset» potentiometers. Regulated power supply to power-up sensors and probes. Overrange advise with *«Flash»* function.

Sizes

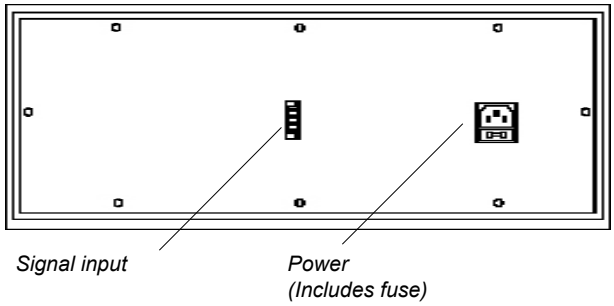
SIZE BDF-24 - Instrument with 4 digits digit 57mm height (2,3")

SIZE BDF-44 - Instrument with 4 digits digit 100 mm height (4,0")

Front view



Rear view



General specifications

DISPLAY 4 digits in red color
7 segment Led
reading from «-9999» to «9999»
decimal point selectable
negative sign «-»
digit 57 mm (2,3") with Series BDF-24
digit 100 mm (4,0") with Series BDF-44
Antirreflexive front filter
IP65 front protection

OVERRANGE indicated by display flashing at «9999»

A/D CONVERTER
dual slope autozero, mean value
integration time 100 msec.
2,5 readings / second
400 KHz Quartz crystal

ACCURACY [0,1% FS from selected «Offset» range] +
[0,1% FS from selected «Span» range] +
±1 digit

ENVIRONMENTAL DATA
Working Temp. 0/+50ºC (32/122 ºF)
Storage Temp. -20/+85°C (-4/185ºF)
Rel. Humidity 0 to 85% non condensated

HOUSING extruded aluminium
anodized in black color
for panel mount (optional wall mount)

POWER SUPPLY
standard 230 Vac 50/60 Hz
(optional 115 Vac 50/60 Hz)
(optional 24 Vdc isolated)

CONSUMPTION
6 VA with Series BDF-24
12 VA with Series BDF-44

WEIGHT 2.3 Kg (5,0 lbr) with Series BDF-24
5.0 Kg (11,0 lbr) with Series BDF-44

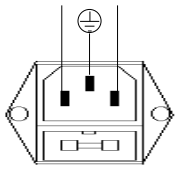
Vexc Output from 10 to 24 Vdc (50mA) regulated

Power supply connections

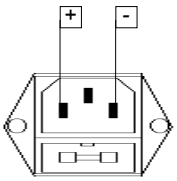
The power connector allows one terminal for earth and two power terminals. Internal fuse is integrated on the connector and an additional fuse is available as a spare part. The value of the fuses depends on the power supply, and is according to rule IEC127/2

230 Vac - 200 mA fuse time-lag
115 Vac - 400 mA fuse time-lag
24 Vdc - 350 mA fuse fast

Powered
230 Vac (115 Vac optional)



Powered
24 Vdc Isolated

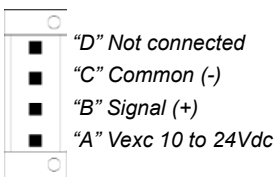


Fuse

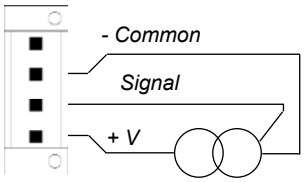
Signal connections

The connection for the input signal is done at the rear side plug-in screw terminal

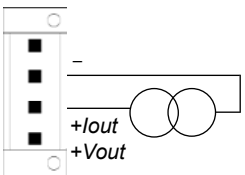
Input Signal Terminal



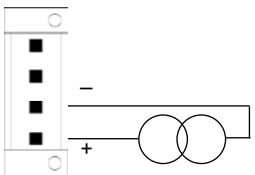
Connections for 3 wire transducer



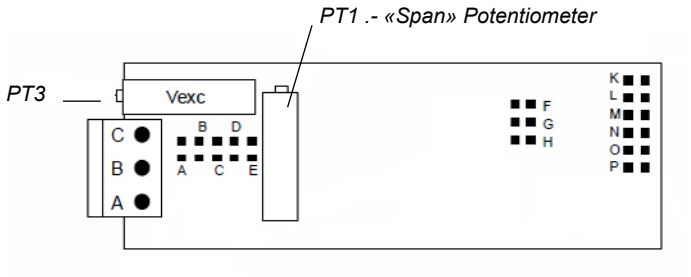
Connections for Vdc and mA Generator



Connections for 2 wire transducer (mA)



Model 32 - Range selection



SIGNAL	Close jumpers	Input impedance	Imax. mA
4...20 mA	A, C, F	24.9 Ohm	70
0...20 mA	A, C, F, G	24.9 Ohm	70
0...50 mA	A, B, F, G	10 Ohm	100
10...50 mA	A, B, F	10 Ohm	100
1...5 mA	A, D, F	100 Ohm	35
0...5 mA	A, D, F, G	100 Ohm	35
0...1 mA	A, D, G	100 Ohm	35
1...5 Vdc	E, F	1.1 MOhm	----
0...5 Vdc	E, F, G	1.1 MOhm	----
0...1 Vdc	E, G	1.1 MOhm	----

OFFSET	Close jumpers
de 0000 a 2499	P
de 2500 a 4999	--
de 5000 a 9999	N

Note *.- The «Offset» value is the reading at Minimum Input*

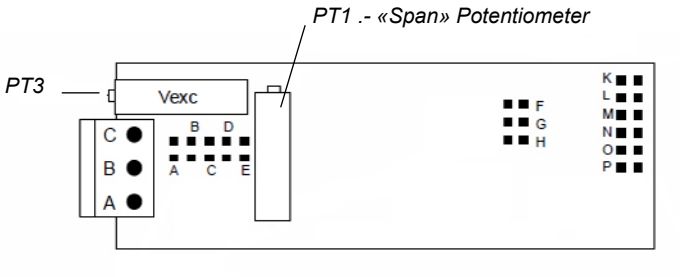
Jumper «M»	Closed
Jumper «O»	Open

Note *.- If the reading at minimum input is higher than «0000», then open «M» and close «O».*

SPAN	Close Jumpers
de 0000 a 4999	K
de 5000 a 9999	--
de 10000 a 20000	L

Note *.- The «Span» value is the reading at Maximum Input minus the reading at Minimum Input*

Model 36 - Range selection



SIGNAL	Close jumpers	Input impedance
0...200 Vdc	E, G, F	1.1 MOhm
0...100 Vdc	D, G, F	1.1 MOhm
0...10 Vdc	C, G, F	1.1 MOhm
0...1 Vdc	B, G	1.1 MOhm

OFFSET	Close Jumpers
de 0000 a 2499	P
de 2500 a 4999	--
de 5000 a 9999	N

Note *.- The «Offset» value is the reading at Minimum Input*

Jumper «M»	Closed
Jumper «O»	Open

Note *.- If the reading at minimum input is higher than «0000», then open «M» and close «O».*

SPAN	Close jumpers
de 0000 a 4999	K
de 5000 a 9999	--
de 10000 a 20000	L

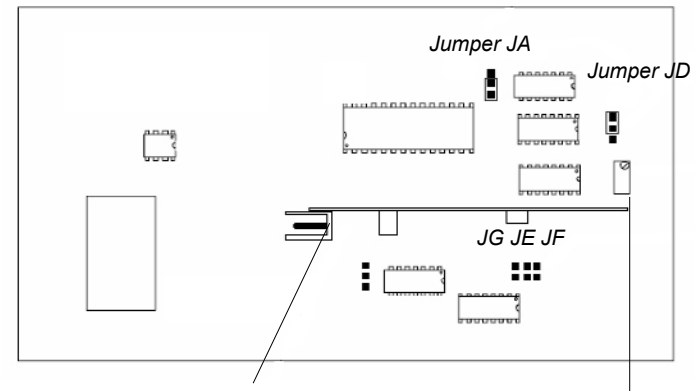
Note *.- The «Span» value is the reading at Maximum Input minus the reading at Minimum Input*

Control board

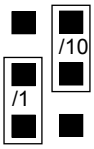
On the surface of the *«Control Board»* is placed the *«Offset»* potentiometer, used to adjust the reading value for minimum input signal, also the *«Input signal Module»* and the following jumpers :

Jumpers JG .- decimal point selection
Jumpers JA .- divide the reading by «/10» or «/1»
Jumpers JD .- fix the last digit to zero «XXX0»

Control Board



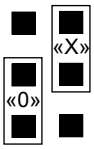
Jumper JA Divisor «/10»



«/10» Divider /10

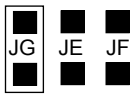
«/1» Divider /1

Jumper JD Fixed digit



«X» Free Digit
«0» Fixed Digit

Decimal Point



JG = XXX.X
JE = X.XXX
JF = XX.XX

Recalibration

In order to change the relation between input signal and reading for the instruments BDF-xx-32 or BDF-xx-36, it is needed to configure the internal jumpers, generate the desired signal at the input signal terminal, and operate the internal *«Span»* and *«Offset»* potentiometers according to the indications below :

Example .- configure unit BDF-xx-32 for *«4/20 mA»* input signal and *«0/100.0»* reading

a.- Unplug the instrument from the power supply Unscrew the rear side cover to access the *«Control Board»* and the *«Input Module»*

b.- Select the *«Input Signal»* jumpers. For *«4/20 mA»* close jumpers «A», «C» and «F»

c.- Select the jumpers for *«Offset»*. The *«Offset»* value is the reading for the minimum signal input. In this case *«4mA = 0000»* and the *«Offset»* value is *«0000»*, close jumpers «P» and «M»

d.- Select the jumpers for *«Span»*. The *«Span»* value is the reading for maximum signal input minus the reading for minimum signal input. In this case *«4/20mA = 0/1000»* and the *«Span»* value is *«Span»* = 1000 - 0000 = *«1000»*. Select jumper «K»

e.- Connect a 4/20mA signal generator to the input signal terminal. Plug the power supply, and leave 3 minutes for warm-up

f.- Generate 4 mA
Operate the *«Offset»* potentiometer on the *«Control Board»* until reading is *«0000»*

g.- Generate 20mA
Operate on *«PT1»* (*«Span»* potentiometer) at the *«Input Signal Module»* until reading is *«1000»*

h.- Repeat the adjustments at 4mA and 20mA until the readings at *«4mA=0000»* and *«20mA=1000»* are stable

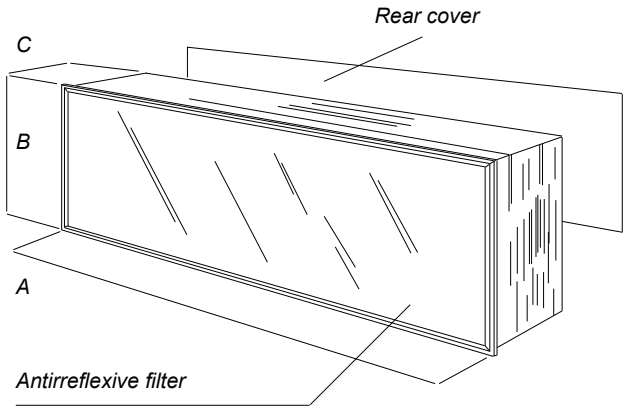
i.- Select the decimal point at «XXX.X» position, closing «JG» at the *«Control Board»*

Mechanical dimensions

Size 24	A	B	C
4 digits 57mm (2")	264mm (10,40")	120mm (4,75")	112mm (4,41")

Size 44	A	B	C
4 digits 100mm (4")	480mm (18,90")	180mm (7,09")	112mm (4,41")

Note *.- add 27mm to the «C» dimension for the power supply plug*

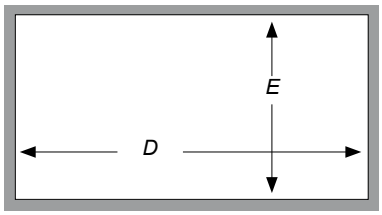


Panel cut-out and weights

Size 24	D	E	weight
4 digits 57mm (2")	256mm (10,07")	112mm (4,40")	2.3 Kg (5 lbs)

Size 44	D	E	weight
4 digits 100mm (4")	472mm (18,58")	172mm (6,77")	5.0 Kg (11 lbs)

PANEL CUT-OUT

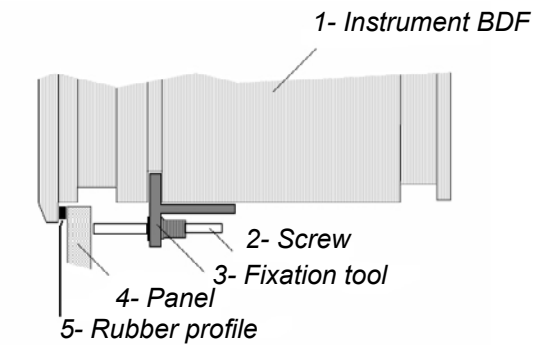


Panel width
Max. 14 mm (0,55")
Min. 2,5 mm (0,10")

Panel installation

Introduce the instrument «1» into the panel cut-out and place a fixation piece «3» on each side. Place the screw «2» through the fixation piece «3» until it presses the panel «4» and is firmly fixed.

Note *.- The front of the instrument is sealed with a protection level IP65. To have the same level of protection between the panel and the instrument, place a rubber profile (squared or round) as indicated «5».*



Warranty

All instruments are warranted against all manufacturing defects for a period of 24 MONTHS from the shipment date. This warranty does not apply in case of misuse, accident or manipulation by non-authorized personnel. In case of malfunction get in contact with your local provider to arrange for repair. Within the warranty period and after examination by the manufacturer, the unit will be repaired or substituted when found to be defective. The scope of this warranty is limited to the repair cost of the instrument, not being the manufacturer eligible for responsibility on additional damages or costs.

CE Declaration of conformity

Manufacturer FEMA ELECTRÓNICA, S.A.
Altimira 14 - Pol. Ind. Santiga
E08210 - Barberà del Vallès
BARCELONA - SPAIN
www.fema.es - info@fema.es

Series-Models BDF-24 y BDF-44
32 and 36

The manufacturer declares that the instruments indicated comply with the directives and rules indicated below.

Directive of electromagnetic compatibility 2004/108/CEE
Directive of low voltage 73/23/CEE

Security rules	61010-1
Emission rules	50081-2
Immunity rules	50082-1

NOTE .- During an electromagnetic disturbance (10V/m) it is permitted a worst case error of 1% of the A/D range. The instrument will recover automatically its functionality when the disturbance stops, without need of the operator to reset or restart.

Barberà del Vallès October 2009
Daniel Juncà - Quality Manager

Precautions on installation

INSTALLATION PRECAUTIONS.- The installation and operation of this instrument must be done by qualified operators. This instrument DOES NOT have power switch and will start to operate as soon as the power supply is connected. The instrument has an internal protection fuse, according to IEC-127/2, and is located inside the power-supply connector. The values are

Fuse 200 mA Time Lag (for 230 Vac power)
Fuse 400 mA Time Lag (for 115 Vac power)
Fuse 350 mA Fast (for 24 Vdc power)

When the instrument is used to control machines or processes where the personnel or the process can be damaged, the appropriate security elements must be added to the system in order to protect the operator and / or the system.

SAFETY PRESCRIPTIONS.- This instrument has been designed and verified according to the UNE-20553 rules and is delivered in perfect conditions of operation. This manual contains the adequate information for the electrical installation. Before starting operations for connections, readjustment, substitution, maintenance, repair, etc, the instrument must be unplugged from the power supply. The instrument must be installed in places with good ventilation to avoid excessive heating, and far from sources of electrical noise or magnetic field generators, such as power relays, electrical motors, speed controls, etc... The instrument can not be installed in open places. Do not use until the installation is finished. The instrument is designed to be mounted on a metallic panel with the adequate protections. DO NOT clean the front lens with abrasive products (such as solvents, alcohol, etc) use a clean and water humid rag. Do not expose the instrument to excessive moisture. DO NOT operate the unit in the presence of flammable gases or fumes.

EXCITATION VOLTAGE Vexc.-
Instruments BDF-xx-32 and BDF-xx-36 supply an excitation voltage of 10 to 24 Vdc (50mA) to power transducers, available between terminals A and C. Do NOT connect these terminals to an external power supply, permanent damages may result on both instruments.

POWER SUPPLY .- Connect the Power Supply to the terminals indicated in this manual. Verify that the voltage and frequency of the power supply is according to the voltage and frequency values indicated in the label attached to the unit. DO NOT connect the instrument to power lines which are overloaded, or power lines with loads working in ON/OFF cycles, or with inductive loads.

SIGNAL WIRING .- Information to consider relating the wiring of the sensors, probes, transducers, etc. The wires can act as antennas and introduce electrical noise from the environment into the signal wires, specially if the wires are close to noise sources or electromagnetic sources. There are several rules generally known which should be taken into consideration for the wiring :

a.- DO NOT install impulse, control or signal wires together in the same conduits as the wires connected to power lines, connected to CC or AC engines, electromagnets, ...

b.- When using shielded wires, connect the shield to the common of the instrument, and leave not-connected the probe side

c.- The wires of impulse, control and signal should be placed in places far away from switches, transformers, control relays, etc...

IN CASE OF FIRE
1.- Disconnect the unit from the power supply.

2.- Give the alarm according to the local rules.
3.- Switch off all the air conditioning devices.
4.- Attack the fire with carbonic snow, do not use water in any case.

WARNING : In closed areas do not use systems with vaporized liquids.

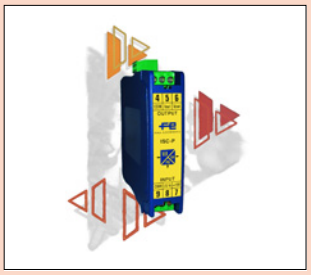
other products

Panel Meters
Standard 96x48mm

Panel Meters
Small 72x36 mm

Panel Meters
Miniature 48x24 mm

Large Displays
60 & 100 mm digit



Signal Converters
& Isolators

Panel Meters
Standard 96x48mm

www.fema.es

ELECTRONIC INSTRUMENTATION FOR INDUSTRY

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