

Electronic differential pressure regulator

for dust cleaning systems

83400

Intended for use with neutral gases

Description (standard model)

This regulator is used for monitoring the differential pressure across fabric filters, and actuating electronic pulse control units. Such a system can be used to adapt the cleaning cycle according to the dust build-up, thereby saving energy and extending filter element life.

A microcontroller acquires the measurements and provides the control function. The pressure signal is obtained with an 8 bit sensor. All of the regulator models except for the 10mbar one provide a choice of two ranges for the display and pressure measurement supplied via the analog output.

The 2-point regulator's switching points for Relay output ON and OFF can be set separately. Two alarm contacts can be configured to detect cleaning faults indicated by the pressure falling outside the limits. All of the switching outputs are operated in a safety circuit to ensure the contacts are closed if the supply to the regulator fails.

The regulator conforms to the Electromagnetic Compatibility (EMC) (89/336/EEC) and Low Voltage (72/73/EEC) Directives. The models with IP65 case have been tested by the DMT-Fachstelle für Sicherheit elektrischer Betriebsmittel for use in Zone 22 (Category 3D) hazardous areas.



Features

- Regulator can be operated off 230V AC, 115V AC or 24V DC
- Good interference immunity to EMC Directive
- Operation using dot matrix LCD display and three buttons
- Each model offers choice of two measuring ranges
- Analog output can be configured for 0-10V, 0-20mA, 4-20mA
- All relay outputs can be switched in manual mode
- Wide selection of pressure measuring ranges

Models

Pressure range mbar	Type	Protection system	Dimension diagram	Catalogue no
10	Protective case	IP65	01	8340000.0000.00000
10	Standard rail mounting	IP00	02	8340100.0000.00000
10	Panel mounting case	IP54/IP20	03	8340200.0000.00000
25/50	Protective case	IP65	01	8340001.0000.00000
25/50	Standard rail mounting	IP00	02	8340101.0000.00000
25/50	Panel mounting case	IP54/IP20	03	8340201.0000.00000
50/100	Protective case	IP65	01	8340002.0000.00000
50/100	Standard rail mounting	IP00	02	8340102.0000.00000
50/100	Panel mounting case	IP54/IP20	03	8340202.0000.00000
500/1000	Protective case	IP65	01	8340003.0000.00000
500/1000	Standard rail mounting	IP00	02	8340103.0000.00000
500/1000	Panel mounting case	IP54/IP20	03	8340203.0000.00000

Detmolder Strasse 256
D-32545 Bad Oeynhausen

PO Box 10 02 52-53
D-32502 Bad Oeynhausen

Phone ++49 5731 / 791-0
Fax ++49 5731 / 791-179

<http://www.buschjost.com>
mail@buschjost.de

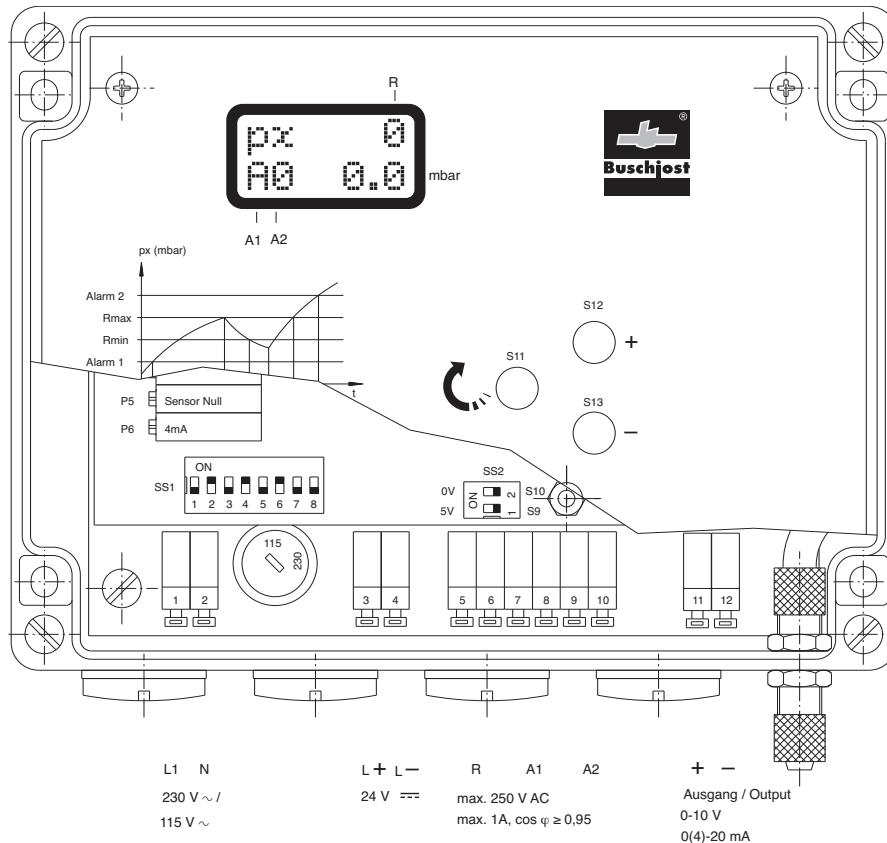
Technical data

Supply voltage:	230V, ±10%, 50-60 Hz or 115V, ±10%, 50-60 Hz or 24V DC -10% to +25%, filtered (residual ripple < 1V _{pp}) or 24V DC -10% to +15%, unfiltered	Maximum pressure:	0.7bar for 10mbar measuring range, 1 bar for 25/50 and 50/100mbar measuring range, 2 bar for 500/1000mbar measuring range
Power consumption:	4VA for AC version 1.8W for DC version	Analog output:	switchable 0 to 10V, rating 1mA max 0 to 20mA, max load resistance 600 Ω 4 to 20mA
Max power loss:	3 W for AC version 2.7 W for DC version	After-cleaning time:	0 to 60 minutes resolution: 1 second
Terminals:	screwless, for connection cross sectional areas from 0.08 to 2.5 mm ²	Weight:	83400... 0.830 kg 83401... 0.610 kg 83402... 1.040 kg
Protection system:	IP65 protective case, IP00 standard rail mounting, panel mounting case IP54 front IP20 back, to DIN EN 175301-803 (10/00), IP 65	EMC interference:	EN50081-1: 1992
Relay contacts:	max 250V AC max 1A at power factor ≥ 0.95 2 x 10 ⁶ switching cycles	EMC interference immunity:	EN61000-6-2:2001
Ambient temperature:	-20 to +60°C	Safety:	EN60730-1:2000
LCD display:	2 x 8 character dot matrix 5 x 7 dots, character height 5.5 mm	Software class:	A
Fluid under pressure:	neutral gases	Dust explosion protection:	DN 50281-1-1:1998 Only models with IP65 protection
Gas ports:	Fitting for plastic tube with OD/ID of 6/4mm	Fuses:	32mA slow blow for 230V/115V AC supply 100mA slow blow for 24V DC supply
Pressure signal damping:	S8 = 1 (on), time constant 10s S8 = 0, time constant ≤ 5ms		

● Other models available on request

Note: For applications necessitating Category 3D equipment, the ambient and the measuring pressure must lie between 0.8 and 1.1 bar absolute.

Wiring



Terminals

Caution: Please check the position of the selector switch before connecting the regulator to the mains!

1	Phase (for 115V/230V AC operation)	9,10	Alarm 2 switching output
2	Neutral for 115V/230V AC-operation)	11	+ or 0 to 10V analog output
3	L+ (for 24V DC operation)	12	- or 0V analog output
4	L- (for 24V DC operation)		
5,6	Regulator switching output	NB:	Terminals 4 and 12 are connected in the regulator.
7,8	Alarm 1 switching output		

Controls

SS1	Slide switch 1 with S1 to S8, factory setting: 10110101 (1=ON), measuring range: small, analog output 4-20mA, actual value damping On	S11	Button for displaying next parameter
		S12	Button for incrementing parameter displayed
		S13	Button for decrementing parameter displayed
SS2	Slide switch 2 with S9 and S10, factory setting: 00 (1=ON), only intended for calibration in the factory!		

Function of SS1:

Analog output	S1	S2	S3	S4	S5	S6	S7	S8	
0-10V	0	1	0	0	1	x	x	x	
0-20mA	0	1	0	1	0	x	x	x	
4-20mA	1	0	1	1	0	x	x	x	
Measuring range	S1	S2	S3	S4	S5	S6	S7	S8	Sensor
10 mbar	x	x	x	x	x	1	0	x	10 mbar
25 mbar	x	x	x	x	x	1	0	x	50 mbar
50 mbar	x	x	x	x	x	0	1	x	50 mbar
50 mbar	x	x	x	x	x	1	0	x	100 mbar
100 mbar	x	x	x	x	x	0	1	x	100 mbar
500 mbar	x	x	x	x	x	1	0	x	1000 mbar
1000 mbar	x	x	x	x	x	0	1	x	1000 mbar
Damping	x	x	x	x	x	x	x	1	ON (time constant 10s)
	x	x	x	x	x	x	x	0	OFF (time constant ≤ 5ms)

List of parameters that can be set:

- 1) **Actual value:**
"px....R"
"AA.xxx.x" xxx.x = actual value in mbar
- 2) **Regulator MIN switching point:**
"Rmin...."
"....10.0" factory setting: 10.0mbar
- 3) **Regulator MAX switching point:**
"Rmax...."
"....15.0" factory setting: 15.0mbar
- 4) **Alarm1 switching point:**
"Alarm1.."
"....5.0" factory setting: 5.0mbar
- 5) **Alarm2 switching point:**
"Alarm2.."
"....20.0" factory setting: 20.0mbar
- 6) **After-cleaning time:**
"tac/M:S."
"....0:00" display in minutes: seconds
factory setting: 0:0
- 7) **Manual - regulator output**
"Manual.y" y can be set on "R" or "0" with ± buttons
"...xxx.x" xxx.x = actual value in mbar
- 8) **Manual - alarm 1 output**
"Manual" y can be set on "A" or "0" with ± buttons
"y.xxx.x" xxx.x = actual value in mbar
- 9) **Manual - alarm2 output**
"Manual.."
"y.xxx.x" xxx.x = actual value in mbar
- 10) **Display range**
"Range..."
"...xxx.x" xxx.x = 10.00, 25.0, 50.0, 100.0, 500, 1000
can be set with ± buttons;
factory setting: on small measuring range
- 11) **Alarm1 switching mode**
"pxzA\1.."
"A...." z can be set on ">" or "<" with ± buttons;
A flashes factory setting:
px<A\1
- 12) **Alarm2 switching mode**
"pxzA\2.."
"A...." z can be set on ">" or "<" with ± buttons;
A flashes factory setting:
px<A\2

When the regulator is switched on, the version of the program being used by the microcontroller is displayed ("VERxx/xx") for 1 second. The regulator then adopts its normal mode of operation, ie the differential pressure and the switching status of the regulator output and the alarm outputs are displayed. Any alarm signals are suppressed for the first 30 seconds after switching on. Pressing button S11 displays the next parameter. Once the parameters have been set, the normal mode must be reselected to activate the regulation process.

Provided it is not in its manual mode (parameters 7, 8, 9), the regulator returns to its normal mode if no buttons are pressed over a period of 10 minutes. Pressing the "+" and "-" buttons simultaneously for ≥ 6 seconds initialises the parameter memory to the factory setting.

Principle of operation

The differential pressure in the filter housing is measured via the ports (+ dusty gas, - clean gas side). If parameter 1 is selected, the measurement is displayed with 8 bit resolution. The regulator has two measuring ranges, which can be

selected by setting the amplifier with DIP switches and the display range by means of the program.

Example:

Output: The 8340001.0000.00000 model (25/50mbar measuring range) is to be changed over from the 0-25 mbar factory setting to 0-50mbar.

Procedure: On slide switch SS1, S6 must be brought into the AUS (OFF) position and S7 into the EIN (ON) position. Then operate S11 several times until the word "Range" appears on line 1 of the LCD display. Finally increment the value in line 2 to "50" using the "+" button.

The sensor's signal must be damped electronically to ensure perfect operation. For test and adjustment purposes this damping can be switched off by operating S8 (on SS1)

When the rising differential pressure reaches the upper switching point "R_{max}", the regulator contact is closed. This starts the pulse control unit connected operating. The switching status is indicated by an "R" on the LCD display. This unit remains switched on until cleaning has progressed to the extent where the lower switching point "R_{min}" is reached. Any after-cleaning required can now also be started. Its duration is set with the adjustable "tac" value.

Two other switching points, "Alarm1" and "Alarm2", set above or below the set points as required, are used to give an alarm in the event of faults. Parameters can be used to choose whether the associated relay contact closes when the pressure exceeds or falls below these switching points. The switching status is indicated by an "A" or a "0" on the LCD display. The alarm outputs are enabled 30 seconds after the power is switched on.

Installation and commissioning

Install the regulator in an easily accessible location which is free from vibration and subject to an ambient temperature of -20 to +60°C. Only the models with IP65 case may be used in Zone 22 (Category 3D) hazardous areas; models with panel mounting case and those for standard rail mounting are not approved for this category.

Make sure the electrical connections to the individually marked terminals in accordance with the VDE guidelines.

The regulator may only be operated with its plastic front panel fitted. The standard rail mounting model does not have a closed case, and may therefore only be operated within an additional case (or switch cabinet) protecting against electric shock hazard.

Use RC networks or recovery diodes to suppress interference from inductive loads such as solenoid valves, contactors etc operated in the vicinity of the regulator or its wiring.

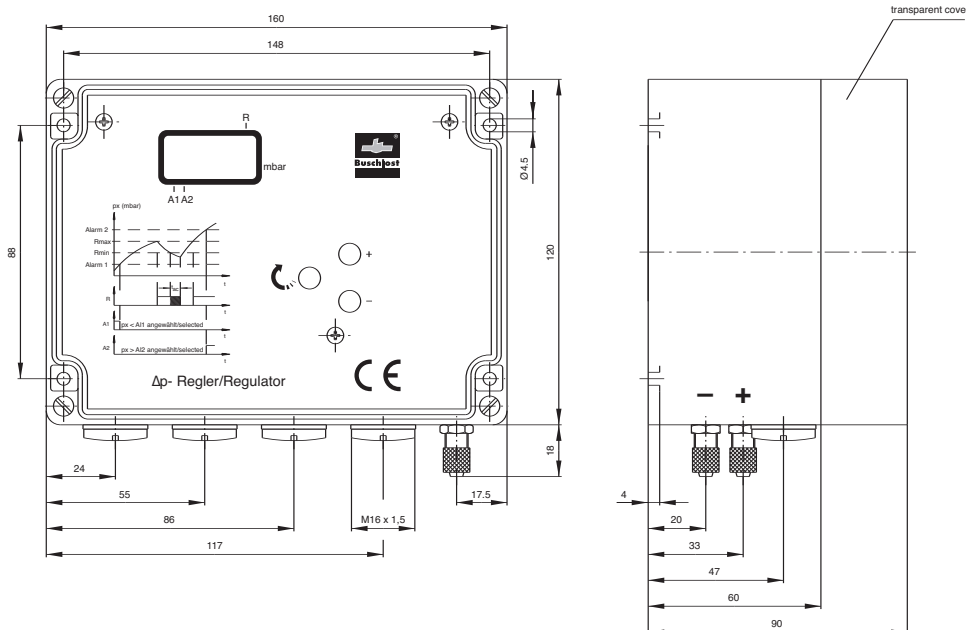
The tube fitting of the port marked "+" must be connected to the dusty gas side, that marked "-" to the clean gas side of the filter.

To prevent the measuring lines blocking in systems with critical types of dust, we recommend automatic cleaning with the Buschjost 8493571 series purge valve.

Note: When install pay attention to a qualified cable gland to meet the requirements of the corresponded zone!

Dimension diagramm

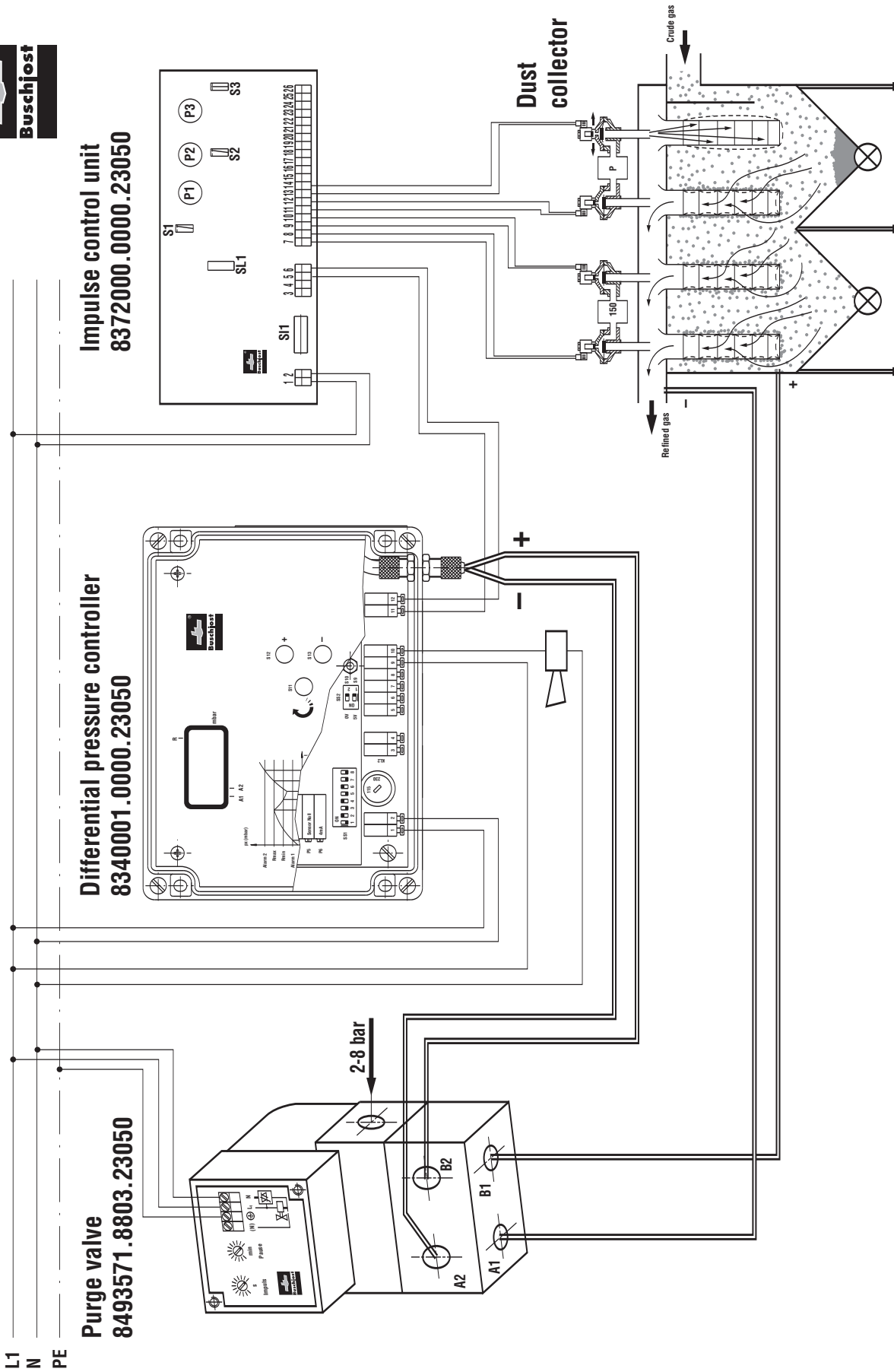
01



Ensure regulators installed outdoors (models with IP65 case only) are protected against direct sunlight and rain.

Connection diagram with pulse control unit and purge valve

Connection diagram filter systems — Changing the cleaning interval



L1
N
PE

Purge valve
8493571.8803.23050

Differential pressure controller
8340001.0000.23050

Impulse control unit
8372000.0000.23050



Valve Technology and Systems
IMI NORGREN BUSCHJOST GMBH + CO.KG

Detmolder Str. 256
D-32545 Bad Oeynhausen
PO Box 100252-53
D-32502 Bad Oeynhausen
Phone 05731/791-0
Fax 05731/791179
<http://www.buschjost.com>
mail@buschjost.de

EC Declaration of Conformity

We hereby declare that all the electronic differential pressure regulators of the 83400 series

conform to the requirements of the following directives:


- 89/336/EEC** – Electromagnetic Compatibility
as amended by **91/236/EEC**,
92/31/EEC and **93/68/EEC**
- 73/23/EEC** – Low Voltage Directive
as amended by **93/68/EEC**.

The regulators have been developed and designed to the following harmonised standards:

- | | |
|----------------------------|--------------------------|
| EN 50081-1 : 1992 | EMC (Emission) |
| EN 61000-6-2 : 2001 | EMC (Immunity) |
| EN 60730-1 : 2000 | Electrical Safety |

We also declare that the electronic differential regulators with item numbers:

83400 xx.0000.00000 (in the IP65 housing)

marked  II 3 D IP65 T75°C

in addition to the requirements of the above-mentioned directives, also conform to directive

- 94/9/EC** – Equipment and Protective Systems for
Use in Potentially Explosive Atmospheres

In addition to the above-mentioned standards, these regulators in the IP65 housing have been developed and designed to the following harmonised standard:

- EN 50281-1-1: 1998** Electrical Apparatus for Use in the
Presence of Combustible Dust - Part 1-1:
Electrical Apparatus Protected by
Enclosures - Construction and Testing

A type inspection certificate is available for downloading from the Buschjost homepage.

pp 
Design Management

pp 
Quality Assurance Management

Bad Oeynhausen, 24 June 2003



a subsidiary of IMI plc **IMI**

HRA 498 Bad Oeynhausen
Complementary:
IMI Norgren Buschjost
Verwaltungs GmbH
HRB 91 Bad Oeynhausen
General Manager:
Thomas Voigt



Series 83400

Electronic differential pressure regulator

Buschjost and the picture  are registered trademarks of the IMI Norgren Buschjost GmbH + Co. KG, Germany.