

NOTE !

Read the entire instruction before start.

Application

MicaFlex MF-PFCP is a pressure and flow controller with a built-in pressure sensor. With the four keypads **▼▲ PGM ESC** the desired function is selected as well as setting and scaling. The two-line display clearly indicates the selected function.

Installation

MF-PFCP is designed to be placed on a wall or for recessed mounting through a wall or cabin door. When recessed mounting, a mounting kit, MFM-PANEL is used. The unit is fixed to the wall by four screws, max 4 mm. The location of the holes is shown at the back of the enclosure.

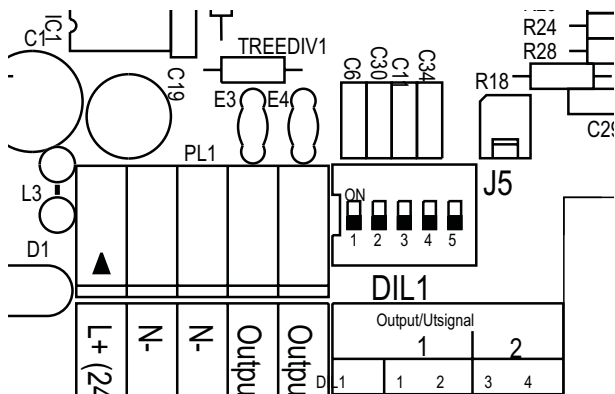
Unscrew the four screws of the front cover and use the bottom screws to attach the front cover on the upper end of the casing, see figure. This makes installation and electrical connection easier.

Connect power supply according to the electrical connection.

To each front cover the CPU is mounted, since the I/O calibration of the main circuit board is stored on the CPU-board, it is not possible to move the front cover between different units.

Output signal

MF-PFCP has two analogue outputs to be used for actual value of pressure and flow. VDC or mA output signal must be set by the DIL-switch. The same programming must then also done under "Outputs".



DIL 1	1 on, 2 off	volt 1
	3 on, 4 off	volt 2
	1 off, 2 on	mA 1
	3 off, 4 on	mA 2

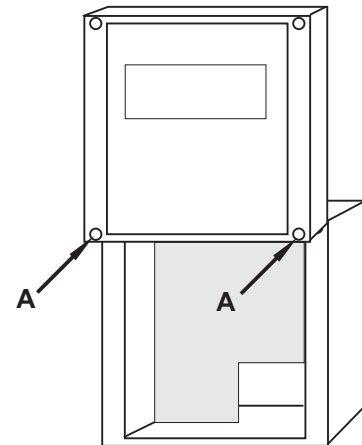


Figure 1, Use the front cover bottom screws (marked **A**) to fix the front cover at the enclosures top edge during installation.

Basic programming instruction

When the power supply is connected a start menu will be displayed. With **▼▲** it is possible to go through the different start menus. To always have the same start menu, the selection is programmed under "Systems settings". Pressing **ESC** when some other menu is displayed means that the programmed menu is displayed.

Programming

Press **PGM** until "PROGRAM-MENU" is displayed. Display shows parameter group, see list page 2. With **▼▲** it is possible to scroll through the parameter groups below.

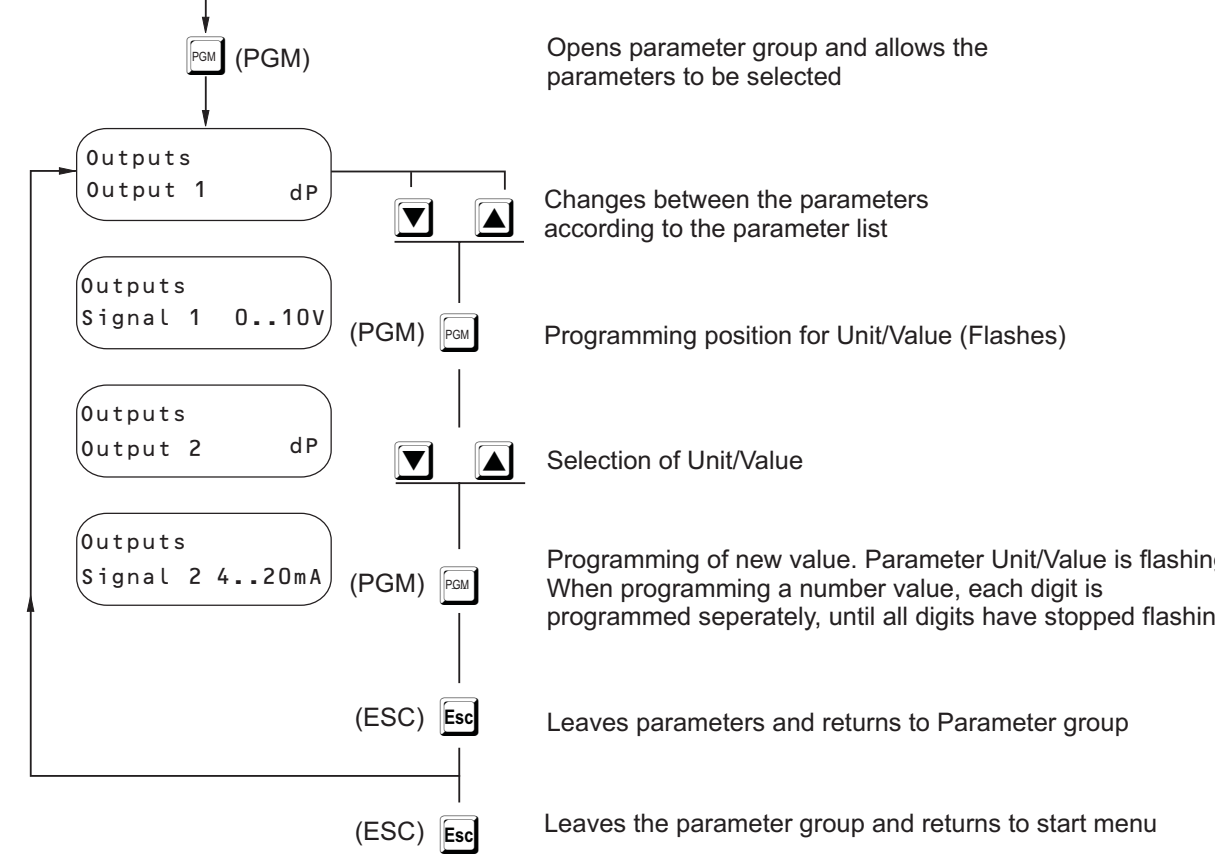
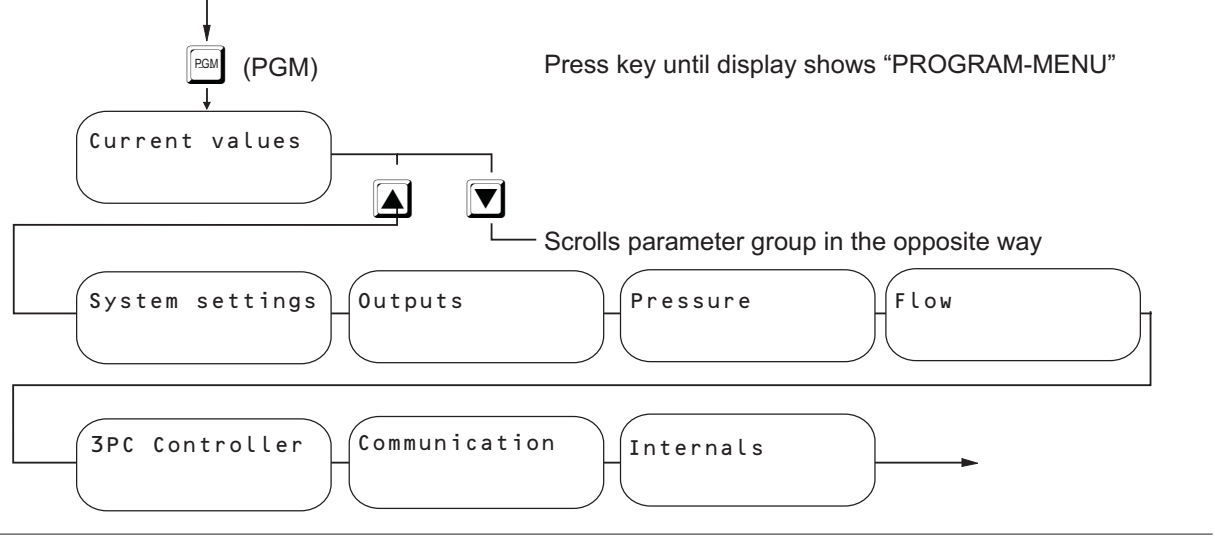
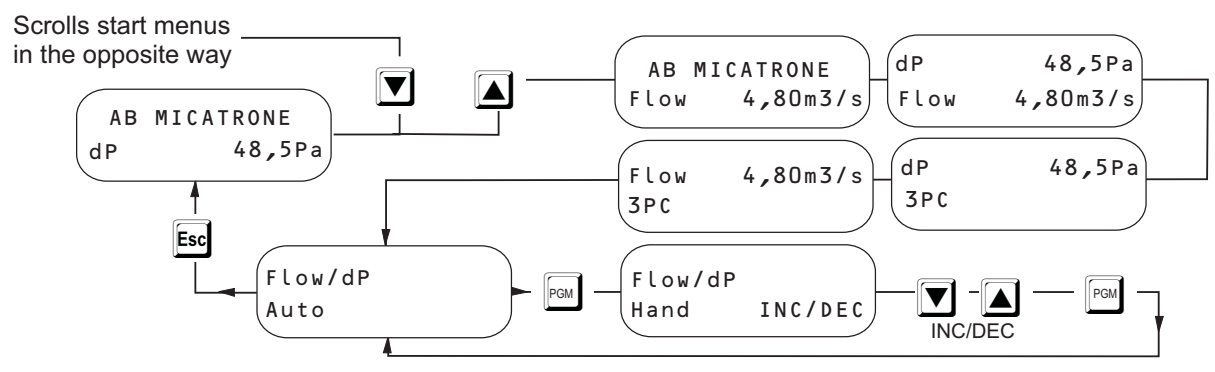
1. Current values
2. System settings
3. Outputs
4. Pressure
5. Flow
6. 3PC controller
7. Communication
8. Internals

When the parameter group to be programmed is shown, press **PGM**.

The parameters in the selected group are then shown, with **▼▲** select the parameter to be programmed and press **PGM**.

Par.no:	Lead text	Range	Value
Internals			
0	Prog ver	0,00...9,99	
Current values			
100	dP	-32768...32767	
101	Flow	-32768...32767	
104	3PC	OFF DEC DEC BZ NZ INC BZ INC	
105	3PC CSP	-32768...32767	
107	SPC Input	0,00...100,00	
108	SPD Input	OPEN CLOSED	
109	Mute Input	OPEN CLOSED	
Parameter 109 is not used in PFPCP			
System settings			
4	Display	dP FLOW dP+FLW dP+3PC FLW+3PC	
5	Damping[s]	0,0...9,9	
Outputs			
19	Output 1	dP FLOW	
20	Signal 1	0..10V 2..10V 0..20mA 4..20mA	
21	Output 2	dP FLOW	
22	Signal 2	0..10V 2..10V 0..20mA 4..20mA	
Pressure			
23	MinCal[Pa]	-32768...32767	
24	MaxCal[Pa]	-32768...32767	
25	Unit dP	Pa PaDec mbar iwc	
26	Min range	-32768...32767	
27	Max range	-32768...32767	
28	Min out	-32768...32767	
29	Max out	-32768...32767	
30	Sign dP	POS NEG	
Flow			
31	Unit flow	l/s m3/s m3/h m/s	
32	Max flow	0...32767	
33	Scale flw	0...32767	
34	Set flow	0...32767	

Par.no:	Lead text	Range	Value
3PC controller			
76	Source	OFF dP FLOW	
77	Mode	AUTO HAND	
86	SP1	-32768...32767	
88	SP2	-32768...32767	
89	SPC Type	OFF 0..10V 2..10V 0..20mA 4..20mA	
90	SPD Mode	OFF SP2 INC DEC FROZEN	
81	Pulse [s]	0,0...99,9	
82	Pause [s]	0,0...99,9	
80	NZ [%]	1...50	
83	BZ [%]	0...100	
84	Pulse BZ [s]	0,00...9,99	
Communication			
47	Address	1...247	
48	Location	0...32767	
49	Protocol	COMLI	
50	Baud	600 b 1200 b 2400 b 4800 b 9600 b	
51	Protect	NO YES	



PFCP
Programming guide

Always note the programmed data beside the parameter in the programming protocol for future documentation

Digit programming

Every digit is separately programmed. Press Δ for 1...9 after 9 if negative values are accepted -9...0. Digit to be changed is flashing. When all digits are programmed press **PGM** and the whole row will flash. To stop incorrect programming press **ESC** and then **PGM** to execute new programming.

Unit or value programming

Press ∇/Δ to change unit/value. When selected press **PGM** then the whole row will flash.

Press **ESC** to return to parameter group.

Press **ESC** to leave the parameter group and return to start menu.

NOTE ! It is always possible to stop an incorrect programming with **ESC** if you have not pressed **PGM** after the last digit or unit/value selection.

Programming instruction

We recommend you to follow this instruction.

Press **PGM** until display shows: "PROGRAM-MENU".

1. Current values

Current values		
100	dP	-32768...32767
101	Flow	-32768...32767
104	3PC	OFF DEC DEC BZ NZ INC BZ INC
105	3PC CSP	-32768...32767
107	SPC Input	0,00...100,00
108	SPD Input	OPEN CLOSED
109	Mute Input	OPEN CLOSED

Shows the actual values.

2. System settings

System settings		
4	Display	dP FLOW dP+FLW dP+3PC FLW+3PC
5	Damping[s]	0,0...9,9

Select the start menu to be shown. Select the time constant (damping) for the flow and pressure measurement 0...9,9 seconds, normally 1...3 seconds.

3. Outputs

Outputs		
19	Output 1	dP FLOW
20	Signal 1	0..10V 2..10V 0..20mA 4..20mA

21	Output 2	dP FLOW
22	Signal 2	0..10V 2..10V 0..20mA 4..20mA

Select the sources for the two analogue outputs. The selection is possible between actual value of pressure or flow.

To measure and control flow or velocity the unit must be connected to a measuring device mounted either in the duct or directly to the fan.

NOTE ! The DIL-switch on the circuit board for VDC or mA output must be set the same.

It is possible to have VDC on one of the output and mA on the other.

Pressure

Pressure		
23	MinCal[Pa]	-32768...32767
24	MaxCal[Pa]	-32768...32767
25	Unit dP	Pa PaDec mbar iwc
26	Min range	-32768...32767
27	Max range	-32768...32767
28	Min out	-32768...32767
29	Max out	-32768...32767
30	Sign dP	POS NEG

NOTE ! If the unit is used for flow measurement, you do not need to do any programming under "Pressure".

MF-PFCP is factory calibrated to a special range. The range is marked on the label on the right side of the casing. The calibration is always in Pa.

Under "Pressure" you also find the calibrated range, "Min cal" and "Max cal".

These values are only notes and are not possible to change. If you want to change another unit program "Unit dP". Selection Pa, Pa Dec (Pa with decimal), mbar or iwc (inch water).

When programming a new unit the actual range is shown under "Min range" and "Max range". These values are only notes and not possible to change.

To change the range in selected unit or factory programmed unit, program "Min output" and "Max output". The programmed values shall always be in the selected unit (Pa, Pa,dec, mbar, iwc). When scaling, note that the accuracy always is in % of the factory scaled range.

Sign for dP

When measuring a negative pressure normally the MF-PFCP will show the same as measuring a positive pressure (no sign).

When programming "Sign dP" to 'NEG', the unit will show a negative [-] sign before the actual value.

5. Flow

Flow			
31	Unit flow		l/s m ³ /s m ³ /h m/s
32	Max flow	0...32767	
33	Scale flw	0...32767	
34	Set flow	0...32767	

If you have programmed the MF-PFCP for flow follow this instruction.

Program the unit for flow l/s, m³/s, m³/h or m/s.

The basic flow calculation used is made with \sqrt{dP} .

To have the display and the output corresponding to the actual flow or velocity in the selected unit it is necessary to make some calculations.

Different manufacturers of flow measurement devices have different calculation, but common for all is \sqrt{dP} . Use the actual formula to calculate the max flow for the factory calibrated measure range.

The calculated flow or velocity is then programmed under "Max flow" in the selected unit. The value must not exceed 30000, otherwise a different engineering unit must be selected for "Unit flow", for instance: m³/s.

It is possible to scale the flow range under "Scale flw".

NOTE ! If scaling is not performed, the same value that is programmed in "Max flow" must be programmed in "Scale flw".

When scaling the flow note that the accuracy depends on the Max flow range.

If adjustment of the displayed actual flow or velocity must be done, it is possible to do under "Set flow". Programme the actual flow from a reference flow sensor or equal.

NOTE ! The programming must be done at the same time as the reference values are presented.

Automatically the "Max flow" programming will be changed for the new values.

If the unit is connected to a BMS system or equal, the value for the scaled flow "Scale flw" must be programmed in the connecting system.

Eg 3,5 m³/s = 10 VDC. The output signal is linear to the flow or velocity.

6. 3PC controller

3PC controller			
76	Source		OFF dP FLOW
77	Mode		AUTO HAND
86	SP1	-32768...32767	
88	SP2	-32768...32767	

89	SPC Type		OFF 0..10V 2..10V 0..20mA 4..20mA
90	SPD Mode		OFF SP2 INC DEC FROZEN
81	Pulse [s]		0,0...99,9
82	Pause [s]		0,0...99,9
80	NZ [%]		1...50
83	BZ [%]		0...100
84	Pulse BZ [s]		0,00...9,99

MF-PFCP has a 3-point controller specially developed for pressure or flow control.

The controller has an analogue input SPC for Volt/mA and a digital input SPD which is activated by a potential free closing. SPC and SPD function may be used together.

At closed contact the SPD function gets priority.

SPC

SPC function is used when an external Volt/mA signal shall change the set point.

The set point continuously changes between two selected limits/set points, SP1 and SP2.

Selection between volt/mA is made with DIL-switch no 2, and is programmed with SPC TYPE 0/2...10 VDC/0/4...20 mA or Off.

SPD

SPD function is activated by a potential free closing contact. The function can change between two different set points SP1 and SP2 or forced operation for open or closed position.

In SPD MODE the selection SP2 is made if a change between two set points is desired, INC/DEC if forced operation is wanted.

FROZEN places the controller in a neutral zone.

Programming

Select source: OFF, dP or FLOW

Select mode: AUTO or HAND (Normally AUTO)

Programme the set point in the same engineering unit as selected in "Pressure/Flow". Set the neutral zone "Nz" between 1..50% for the selected pressure or flow range, normally 1...5%. Half neutral zone on each side of the set point.

The controller works with increase/decrease signals.

Within a programmed level "BZ" the control output may be given in small pulses to minimize the risk of oscillation across the neutral zone. Half break zone on each side of the set point.

The length of the pulse "Pulse BZ" and the length of the "Pause" are programmable.

When the actual value is within the programmed neutral zone "NZ" the pulses are stopped.

Also outside the limits for BZ it is possible to pulse the control output, the setting for this is programmed in the parameter "Pulse".

Normally the time for this is set to give a constant output increase or decrease signal.

Hand position

Return to start menu and select this menu.

Flow / dP

Auto

Press **PGM**, "Auto" will shift to "Hand" and make it possible to set the output INC/DEC with ∇/\blacktriangle -keys .

To return to "Auto" press **PGM**.

To return to start menu press **ESC**.

Zero set of the pressure sensor

Disconnect the pressure tubes or set the manifold valve in the calibration position.

With the startmenu displayed, press simultaneously both the keys ∇/\blacktriangle until the display shows:

ZERO OFFSET

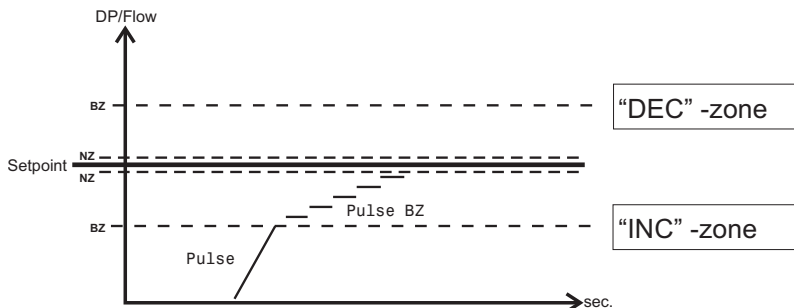
Release the keys when the display shows:

ZERO OFFSET
ADJUSTING

When zero set is ready, the unit displays

ZERO OFFSET DONE

and automatically returns to start menu.



Technical Data:

Display: Alphanumeric LCD
2 rows, 32 characters

Measurement range,
Pressure: See label on outside of enclosure.

Flow: 0...30.000

Accuracy: 0,5 %

Temperature dependence: ± 0,5 % /10 °C

Damping: 0...9,9 sec.

Output: Two analogue outputs
0/2...10 VDC, 0/4...20 mA
selectable and scalable

Input: SPD potential free closing
SPC 0/2...10 VDC, 0/4...20 mA

Control output: Two potential free relay contacts.
48 VAC - 5A / 48 VDC - 1,5A

Ambient temp.: 0...50 °C

Power supply: 24 VAC ±15 %
20...32 VDC

Power consumption: 3 VA

Housing class: IP 65

Electric connections,
- rigid wire : 1 x 2,5 mm² / terminal
- flexible wire : 1 x 1,5 mm² / terminal

Cable entry: 3 threaded holes M16x1,5

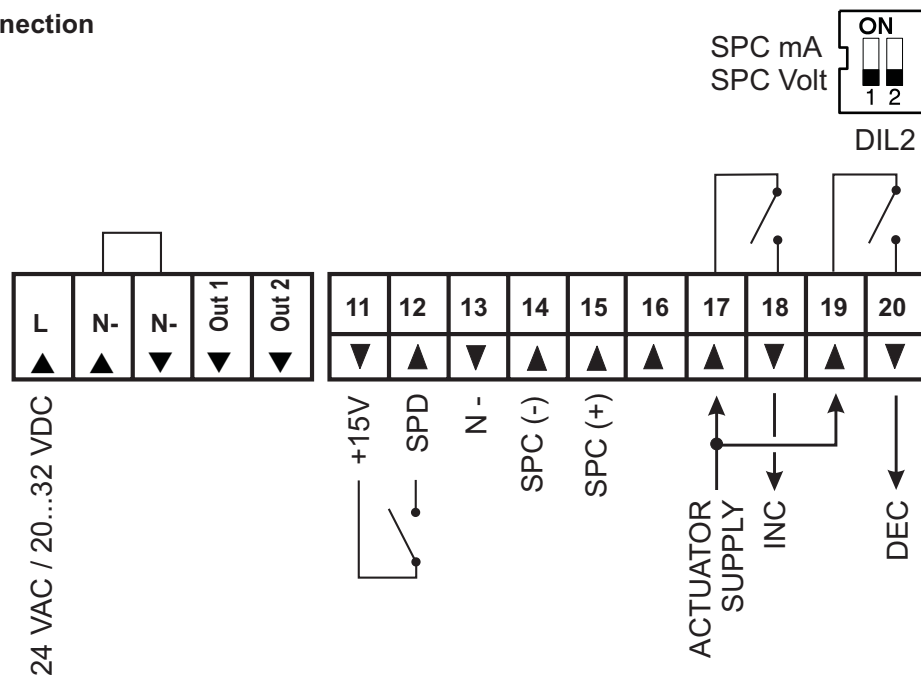
Dimensions: WxHxD 122 x 120 x 87mm

Conformity: EMC SS-EN 50081-1
SS-EN 50082-2
LVD SS-EN 610101-1

Service

Check the zero point every 6:th month.

Electric connection



AB MICATRONE
Dalvägen 8
SE-169 56 SOLNA
SWEDEN

Telephone: +46 8-470 25 00
Fax: +46 8-83 27 80
Internet: www.micatrone.se
E-mail: info@micatrone.se