PRODUCT MANUAL & DATASHEET

PX SERIES
PRECISION PRESSURE CONTROLLER

V5 | APRIL 2023

GENERAL DESCRIPTION

The FLUIGENT PX pressure controller is a single, miniaturized electronic pressure controller with integrated and intelligent feedback loop for highest performance. Its patented, field proven Fastab™ technology allows both fast settling times and outstanding stability. It provides a dual interface USB and RS232 for high versatility in the integration. The delivered sotware package is suitable for Windows and Linux platforms.

WARNINGS

DO NOT CONNECT THE PX TO A PRESSURE OR VACUUM SOURCE ABOVE RECOMMENDED MAXIMUM
DO NOT CONNECT THE PX POWER INLET TO THE INCORRECT VOLTAGE
DO NOT SUBMERGE OR DIRECTLY EXPOSE PX TO LIQUIDS OR EXTREME TEMPERATURES

APPLICATIONS

The PX controllers could be used for replacing manual regulators, vent orifices, needles valves or gravity for fluid flows. Typical applications: 1. flow control for microfluidics (e.g. droplet generation), 2. carrier gas flow control 3. Liquid handling (aspirate/dispense).

SCHEMATIC ILLUSTRATION
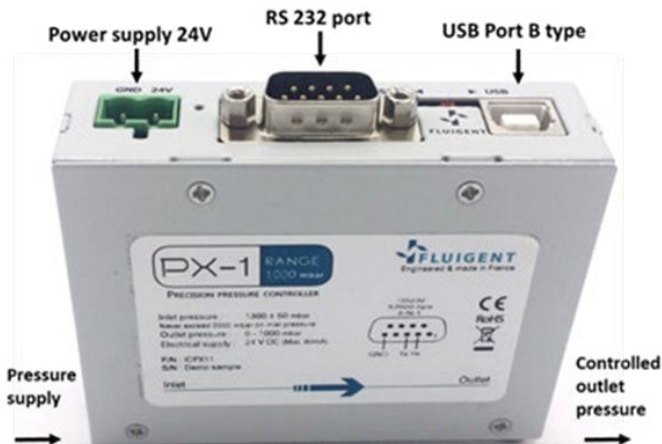
TECHNICAL DATA

	PX-1 (P/N: ICPX11)	PX-2 (P/N: ICPX21)	PX-345 (P/N: ICPX345)	PX-V1 (P/N:ICPXV1)	PX-V2 (P/N: ICPXV2)
PERFORMANCE					
Available pressure ranges	0 to 1000 mbars (0 to 14.5 psi)	0 to 2000 mbars (0 to 29 psi)	0 to 345 mbars (0 to 5 psi)	0 to -600 mbars (0 to 8.7 psi)	0 to -750 mbars (0 to 10.8 psi)
Pressure stability	<0.5% FS				
Accuracy	0.25% FS				
Repeatability (1σ)	<0.01% FS — Standard deviation of mean values for same pressure order				
Sensor resolution	0.03% FS				
Mechanical response time	<10 ms				
Settling time (volume dependant)	<150 ms (Time to reach area between 95 and 105% of target pressure, measure done on a 2 mL reservoir to reach 500 mbars using a PX-1)				
MECHANICAL					
Weight	192 g				
Dimensions	82.4 x 25.7 x 67.9 mm				
Manifold	Aluminium				
Valve	FKM/FKM, Stainless Steel				
Interior tubing	Silicon platinum				
Pressure sensor	High temperature polyamide, Epoxy, Silicone gel				
Exhaust restrictor	NBR (o ring), Brass, PVA, polyethylene				
Operating temperature range	-10°C to 80°C				
Storage temperature	-40°C to 85°C				
Operating humidity	0-100% HR				
Storage humidity	0-100% HR				
Operating pressure supply	1300 mbars +/- 50 mbars	2400 mbars +/- 50 mbars	800 mbars +/- 50 mbars	Vacuum below -300 mbars	Vacuum below -300 mbars
Maximum inlet pressure	2000 mbars (29 psi)	3000 mbars (43.5 psi)	2000 mbars (29 psi)	NA	
Operating vacuum supply	NA			-900 mbars +/- 50 mbars	-900 mbars +/- 50 mbars
Internal leakage	<0.35 L/min				
Sensor type	Piezzo resistive silicon pressure sensor				
Pneumatic connections	M5 thread				
Mounting type	DIN rack (in option)				
Gas compatibility	Clean and dry non-corrosive gases				
Gas temperature	4°C to 37°C				
ELECTRICAL					
Digital communication interface	USB, RS232				
Readout sample time	5 ms				
RS232 connection	Sub DB9				
Power supply connector type	Phoenix contact MSTBA 2.5				
Power supply	24 VDC				
Current supply	80 mA				
Maximum power	2 W				
Data refresh rate	10 Hz				
Internal refresh rate	10 Hz				
Digital communication protocol	USB, RS232				
Compatible OS	Windows, Linux, MacOS				
Software control	OxyGen or SDK				

AVAILABLE ACCESSORIES

M5-Speedfit 4 mm adapter (P/N: IAPCT4M1)

M5-Speedfit 6 mm adapter (P/N: IAPCT6M1)

Sub DB9 cable (RS232) (P/N: IAECBRS1)

USB cable A to B (P/N: IAECBUSB1)

Backflow Filter (P/N: IAPABFF1)

Attention: It is crucial to ensure the proper connection of the power wires to the PX to prevent damage or malfunction of the device. Incorrect connections can lead to severe damage or failure of the device.

+24 0V
Power IN

FLUIGENT
SMART MICROFLUIDICS™

▌OPERATION

1. INTRODUCTION

The Fluigent PX allows for USB (Porte B type) and RS-232 communication for a variety of applications. Do not use both USB and RS-232 ports at once.

Before powering on the device, make sure the red switch next to the serial port is set to the desired USB or RS-232, as indicated in the image below, in order to enable serial communication.
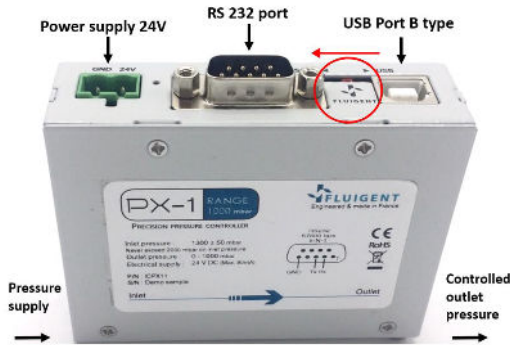

Figure 1 - Switch position for RS-232 communication

When the instrument is turned on you must follow the following preheating procedure: apply 45% on the electro-valves during 10 minutes (use the command: CHAN:1:EV:45 wait for 10 minutes and then CHAN:1:EV:0).

2. RS-232 INTERFACE

The RS-232 interface is a 9-pin D-Sub socket used for remote communication. The voltage level is ±10 V (pin 5: GND; pin 2: RX +-10V; pin 3: TX +- 10V).

3. RS-232 INTERFACE SETTINGS FOR THE SERIAL PARAMETERS

Serial Communication parameters should be set as follows:

Baud Rate	57 600 bps
Data Bits	8
Stop Bits	1
Parity	No parity
Flow Control	None

Table 1 - Serial Parameters

REMOTE OPERATION (RS-232) - CONTINUE

4. REMOTE COMMAND SET

This remote command set is the default set available on the instrument. All commands must be terminated with a <CR>. All decimal values use the point "." as decimal separator.

It is recommended to send a single carriage return character <CR> before sending the first command to the instrument, to ensure that the buffer is empty. Make sure your serial communication software does not add line feed or flow control characters, as the instrument will not be able to parse them and will consider the command invalid.

A query command ends with a question mark "?" for queries. The data column represents the response of the instrument. All response strings are terminated with a <CR>. Any response containing multiple values will have the values separated by commas ",", without spaces.

For all commands (no question mark "?"), the data column represents the required parameters to be sent to the instrument following the string in the command column. Any command that requires multiple parameters must have the parameters separated by commas ",". In case of error in the command spelling, the command is ignored by the instrument and no error code is returned.

Command/Query	Data	Function/Response
<CR>		Send a single carriage return character to flush the instrument's serial communication buffer
SYST:IDN?	<vendor> <instrument> <serial number> <version number>	Returns the identification string. SN and VN are in decimal and on 5 characters.
SYST:STATUS?	<status>	Returns the instrument status: 1 = Reset in progress 2 = Normal
SYST:MEAS:ALL?	<pmeasure 1>	Returns the current measured pressure on the channel P_{meas} is in mbar
SYST:RESET		Reinitialize the processor and the electro-valve
CHAN:1		If no sensor is detected on the channel the response is "ERROR CHANNEL"
CHAN:1:CONF?	<pmax> <alpha>	Returns the configuration of the channel number P_{meas} is in mbar
CHAN:1:MEAS?	<pmeasure>	Returns the current measured pressure on channel number P_{meas} is in mbar
CHAN:1:P:	<value>	Sets the pressure setpoint in mbar
CHAN:1:ALPHA:	<value>	Sets alpha value. This value is linked to the PID performance. The default value is 5.
CHAN:1:EV:	<value>	Sets electro-valve voltage (%). The manual control of the electro-valve is not recommended and the output pressure is no longer regulated.
CHAN:1:ZERO		Realizes auto zero sequence.

Table 2 - Remote Command Set

DRAWINGS WITH DIMENSIONS
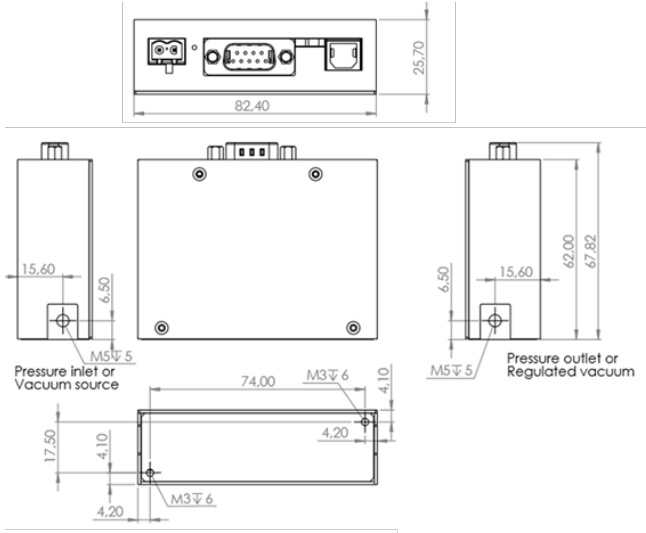
CERTIFICATION

The PX Series are CE and RoHS compliant
FLUIGENT SA is ISO 9001 certified since 2010

WARRANTY CONDITIONS

Do not apply a higher inlet pressure than the value advised by Fluigent
Do not use oil pump
Do not use any corrosive or toxic gas
Use a dry and clean gas
Prevent foreign objects or liquids from entering the PX and from spattering on the electronic card
Connect the 2 power cables to the correct voltage
Do not treat the PX in order the clean it (autoclave)
Do not apply any electricity voltage on the PX other than the power supply
Respect the temperature compatibility (from 5°C to 50°C)

CONTACT

For repair, recalibration or recycling
of this product, please contact:

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