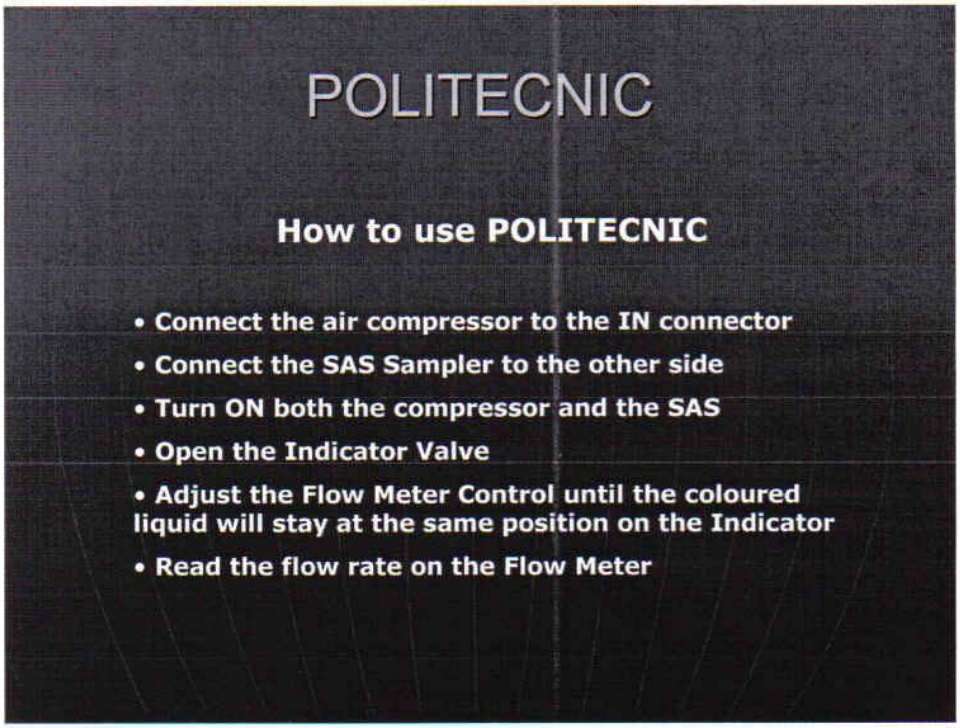
FAQ about "Politecnic" SAS Validation System

What's the reason of "Politecnic"?

The "Politecnic" physical validation system allows instant physical validation of SAS air samplers and enables the operator to certify to inspection agencies (e.g: FDA) the actual volume of aspirated air in a specific time.

How to use "Politecnic" System?



Why and when do you need air sampler validation?

It is important to verify that the volume of air you are sampling with your air sampler is correct to avoid errors in monitoring the contamination of the environment. Validation is an important step to assure that the final calculation is based on an accurately sampled volume of air. Validation of the aspirated volume should be performed every 6 months or maximum of 12 months. The air sampler validation is recommended also each time the air flow rate could be changed due to a long use of the instrument or after other events that could compromise the flow rate.

Why should you use "Politecnic" for SAS air sampler official control?

An official validation of the SAS air sampler is required as the event of an inspection. The flow meter of "Politecnic" should be calibrated by an official agency at regular intervals (usually every year). Official validation of the flow meter may also be performed by PBI's customer support service.

Which are the characteristics of "Politecnic"?

Dimensioni / Size	450X220X220 mm
Peso / Weight	Kg. 6
Costruzione /Construction	PVC antiacido / PVC antiacid
Flussometro / Air flow meter	50/400 litri / liters
Temperatura massima / Max temperature	10°C - 30°C temperatura ambiente / room temperature
Allacciamento elettrico / Power supply	N/A
Massima altitudine / Max altitude	2000 metri / meters
Temperatura esterna / External temperature	N/A
Umidità relativa massima / Max relative humidity	50%
Aria compressa / Compressed air	Lo strumento deve essere alimentato con aria compressa ad almeno 5 atm. Il tubo dell'aria compressa deve avere Ø esterno uguale a 8 mm / The instrument should be feeded with compressed air at 5 atm. The compressed air tubing should have an external diameter of 8 mm

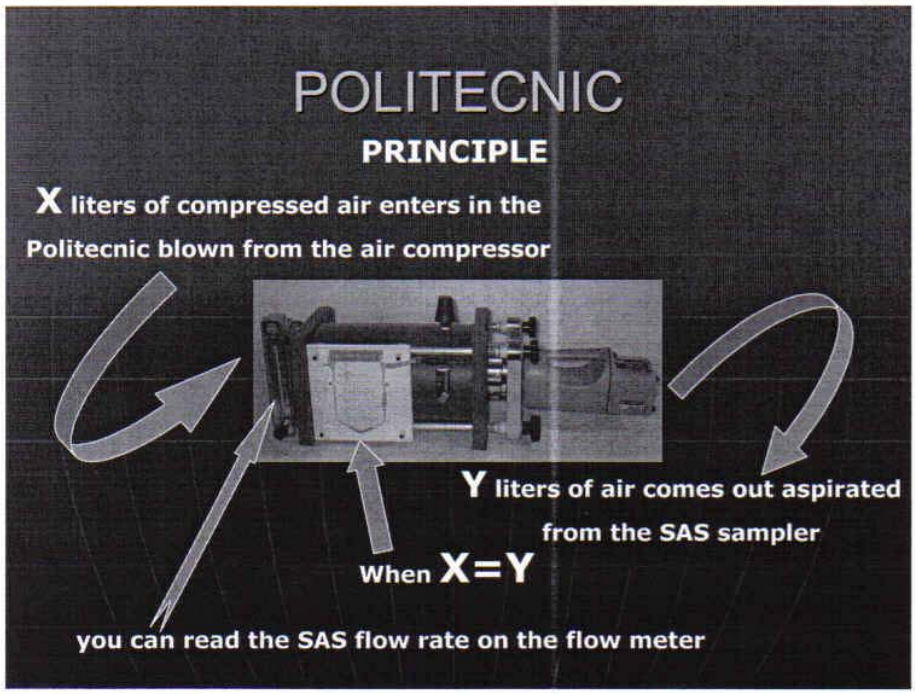
Where was the "Politecnic" developed?

The "Politecnic" System was developed at "pbi" R&D Dpt. under the supervision of the Institute of Aerospatial Research in State Milan University.

How does "Politecnic" work?

Compressed air source should be connected to the "Politecnic" SAS validation system.
The SAS air sampler is fixed on the appropriate bearing. The air sampler and the compressed air or gas are switched on at the same time. The flow meter is regulated at the correct volume (e.g.: 100 lts of air/minute for SAS Super 100): the front indicator should remain in rest position to confirm that the external and internal pressure are equalised. If not, the air flow of the sampler should be regulated until the indicator reaches the central rest position.

Which is the principle of "Politecnic" System?



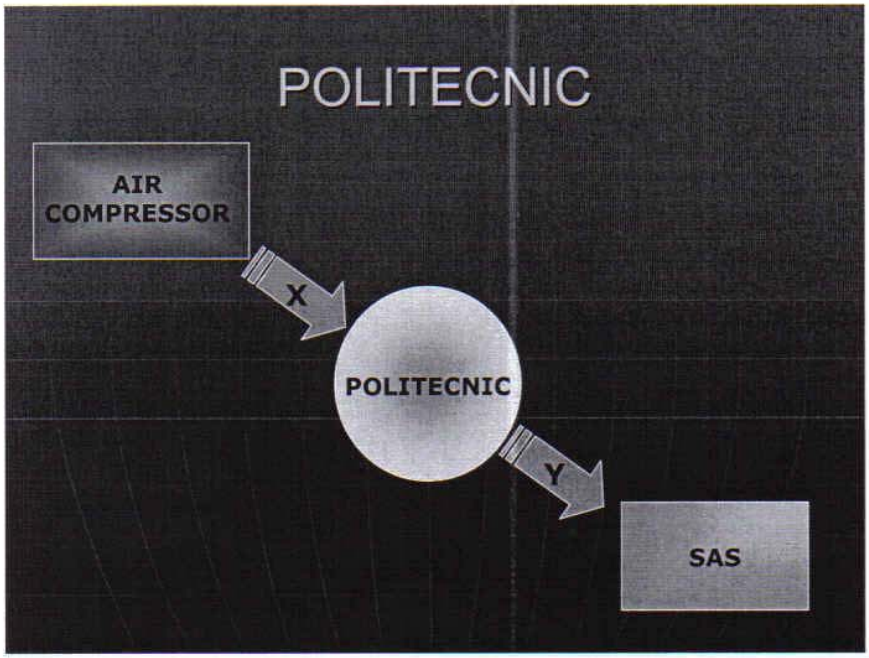
How should the "Politecnic" System installed?

1.Position the instrument on a flat clean bench with the command panel in front of the operator.

2. Connect the compressed air tubing to the air flow meter inlet (1) on the left side of the instrument.

3. The compressed air source should be provided of tap.

4. Remove the small cap on the left part of "V" indicator tubing and insert the indicator fluid by a syringe up to reach the line number 2 on the graduated scale.



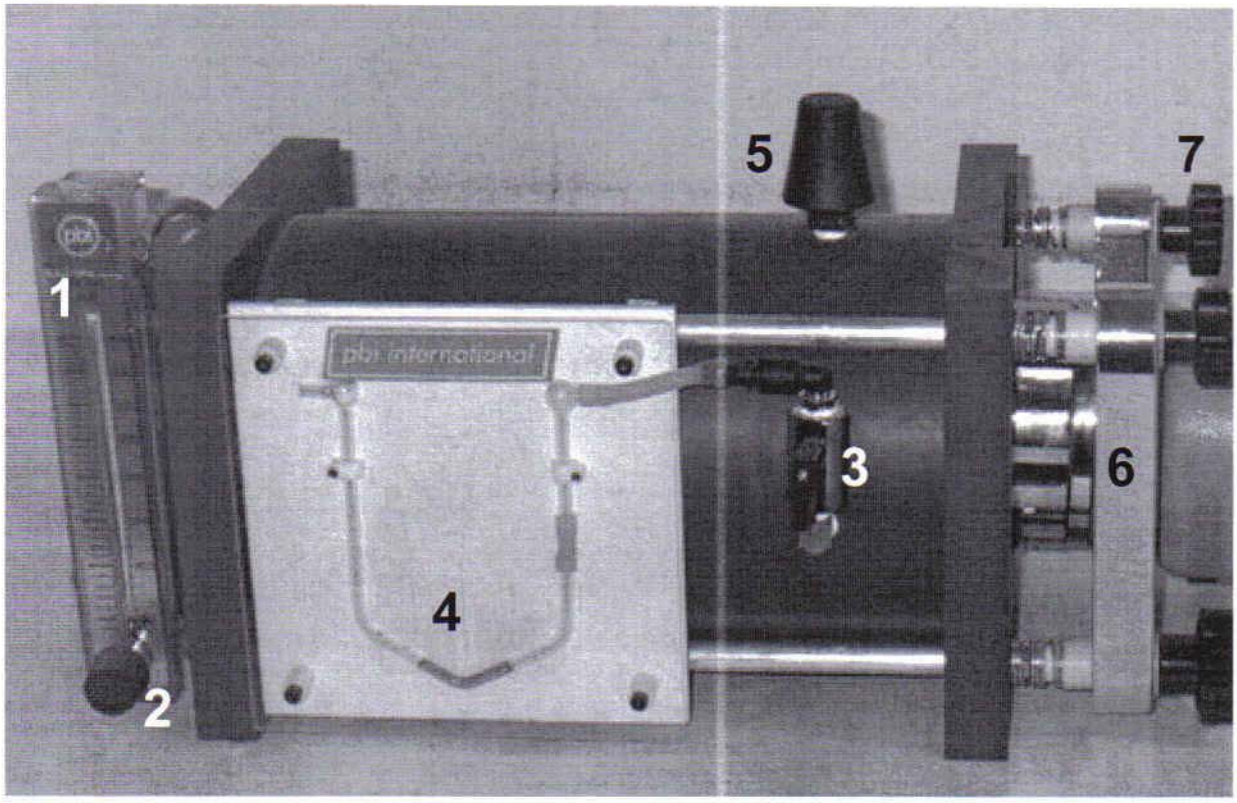
At which temperature should the test be performed?

The test should be performed at room temperature (20/25°C).

What about the accuracy?

The accuracy is +/- 5%.

Which are the components of "Politecnic"?



1) air flow meter
2) compressed air inlet knob
3) tunnel pressure tap/valve of the "V" indicator
4) inlet/outlet compressed air balance ("V" tubing)
5) safety valve
6) "SAS Super" connection device
7) "SAS Super" aspirating head fixing knobs

How does the "Politecnic" work?

1. Control that:
   a. Compressed air outlet is closed.
   b. Air flow meter knob (2) is in closed position (clockwise turned).
   c. Tunnel pressure tap/valve of the indicator (3) is in closed position (horizontal).

2. Insert the "SAS" air sampler (complete of aspirating head and contact plate) in its housing from top to bottom on the right side of "Politecnic" instrument. Screw the four fixing knobs with diagonal operation to be sure about the sealing of the aspirating head.

3. The rear part of "SAS Super" air sampler should be open in case it is necessary to modify the volume of aspirated air for a new calibration (this operation should be performed only by authorized personnel, on the regulation trimmer on the electronic card).

4. Open the compressed air outlet tap slowly. Open the air flow meter knob (2) slowly up to read on the graduate scale of the air flow meter the requested value, looking at the indicating ball. Use the conversion table below to get the flow rate in litre/min.

5. Switch on the "SAS Super" air sampler and program it for at least a sampling volume of 500 lts. Press the START button.

6. Open slowly the tunnel pressure tap/valve of the indicator (3).

7. Act on the knob of the air flow meter (2) up to obtain equilibrium of the colour fluid of the pressure indicator (4): the fluid should be positioned on the same level of the two arms of the transparent "V" device. This rest position identifies an equivalent pressure between the outside atmospheric pressure and the inside tunnel pressure. In this condition, the air sampler is aspirating the volume of air indicated on the scale of the air flow meter (same volume inlet and outlet air).

8. If the coloured fluid of the tunnel pressure indicator (4) is going on the left side, it means that the air sampler is aspirating a volume of air lower of the value indicated by the air flow meter.
If the read value is in the range of tolerance of the sampler, report the figure on the certificate and you do not need to act on the electronics of the air sampler.

If the read value is outside the range of tolerance of the sampler, the servicing people should act on the trimmer of the air sampler up to obtain the correct value.

9. If the coloured fluid of the tunnel pressure indicator (4) is going on the right side, it means that the air sampler is aspirating a volume of air higher of the value indicated by the air flow meter.

10. At the end of the test, close the taps of the feeding compressed air, air flow meter (2), tunnel pressure tap valve indicator (3) and disconnect the air sampler from the "Politecnic" unscrewing the four fixing knobs.

How to calculate the air flow in litres per minute?

The readings of the air flow meter should be transformed in litres per minute. Follow the reported table.

SCFH	litri/min
180	84,96
185	87,47
190	89,98
195	92,51
200	95,04
205	97,58
210	100,13
215	102,68
220	105,25
225	107,82
230	110,40
235	112,99
240	115,58
245	118,19
250	120,80

SCFH	litri/min
255	123,42
260	126,05
265	128,68
270	131,33
275	133,98
280	136,64
285	139,31
290	141,98
295	144,67
300	147,36
305	150,06
310	152,77
315	155,48
320	158,21
325	160,94

SCFH	litri/min
330	163,68
335	166,43
340	169,18
345	171,95
350	174,72
355	177,50
360	180,29
365	183,08
370	185,89
375	188,70
380	191,52
385	194,35
390	197,18
395	200,03
400	202,88

What about servicing?

For a correct maintenance of the instrument just follow these sample steps:

1) The instrument should be cleaned regularly and stored to avoid dust accumulation.

2) The "V" device of the tunnel pressure indicator (4) should contain the correct amount of fluid. If necessary it should be refilled.

3) The "O-ring" sealing of "SAS" sampler connection device should be regularly treated with silicone oil to guarantee the seal between the aspiration head of the air sampler and the tunnel.

If the aspirated volume of air of "SAS" is not correct, what is it necessary to do?

The servicing personnel should open the rear part of "SAS" and adjust a specific trimmer until to read the correct volume of aspirated air.