

User's Manual

The Stack

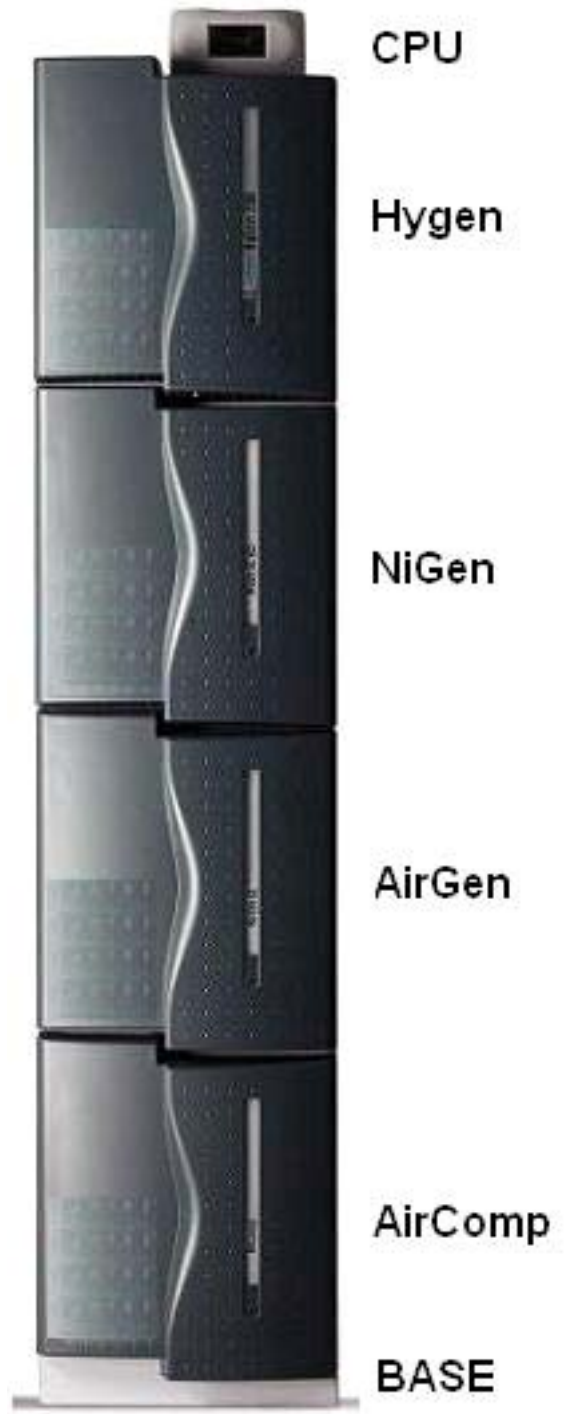


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1. Introduction

This document gives basic instructions for the assembly of a stack of gas generators. The design of the gas generators allows up to four (4) units to be stacked, thereby saving valuable laboratory floor space. In addition, multiple generators can be controlled and monitored from a single operator interface.

The following units can be stacked:

Model	Gas Generated
AirComp	Compressed Air
NiGen GC / NiGen GC HC / NiGen GC MICRO	Nitrogen
AirGen GC / AirGen TOC	Pure Air
HyGen	Hydrogen

For information relating to technical specifications, intended use, safety and certification, refer to the respective generator manuals.

With regard to installation and maintenance, it is assumed that the user is familiar with the use of pneumatic circuit components, and in particular is aware of the safety aspects of compressed air and nitrogen.

The margin of the text contains the following symbols, indicating:



Compulsory safety standards to be observed






Electrical hazard








Recommendations and important information

It is strongly recommended to carefully read all safety warnings before carrying out any operation on the generators.

2. Safety

-  *The Brezza generator stack must be assembled in compliance with the instructions given in this manual*
-  *Each generator must be installed and used in compliance with the instructions given in its user manual. Furthermore, the generators must only be used for the purposes given in Chapter 1 of their respective manuals. Failure to observe the foregoing will render the guarantee null and void and release PROTON ONSITE (“PROTON”) from all liability for direct or indirect damage or physical injury.*
-  *The user is responsible for asking local authorities if there are local safety regulations that are stricter than what is described in this manual.*

2.1. Warnings

-  **Place the Stack FAR FROM SOURCES OF HEAT**
-  **Place the Stack in an environment PROTECTED AGAINST RAIN AND WIND**
-  **Do not stack more than four (4) generators**
-  **The Stack must be installed on a flat surface, at a slope of no more than 1°**
-  *Repairs and inspections must be carried out exclusively by **QUALIFIED PERSONNEL** and/or the Proton Technical Service Team.*

2.2. Technical Service

PROTON Technical Service can be contacted as follows:

*Proton OnSite
10 Technology Drive
Wallingford, CT 06492
203-949-8697
203-678-2000
customerservice@protononsite.com
www.protononsite.com*

3. Mechanical Assembly

3.1. Stack Configuration





-  The Stack may be composed of 2, 3, or 4 generators.
-  If an AirComp unit is present, it must go at the bottom of a Stack.
-  If a HyGen unit is present, it must go at the top of a Stack.
-  *Figure 3.1 gives an example of a Stack configuration.*



Figure 3.1

3.2. Mechanical Assembly

3.2.1. Position the Base

- The surface where the stack is installed must be level (maximum incline $\pm 1^\circ$).

3.2.2. Secure the Bottom Generator

- Use two screws supplied with the generator to secure the rear of the enclosure to the rear of the base. Reference Figure 3.2.2 B.

3.2.3. Secure the Remaining Generators

- Remove the front panel.
- Use two pins and two mounting tabs supplied with the generator to secure the front base of the enclosure to the top front of the enclosure underneath. Insert the pins into the mounting tabs. Use the holes pre-drilled into the enclosure top and bottom. Reference Figure 3.2.2 A.
- Use two screws supplied with the generator to secure the rear of the enclosure to the rear of the base. Reference Figure 3.2.2 B.

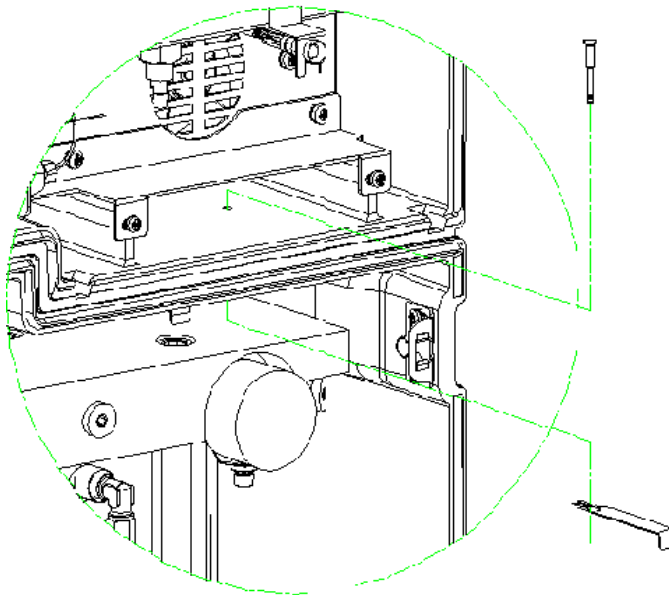


Figure 3.2.2 A

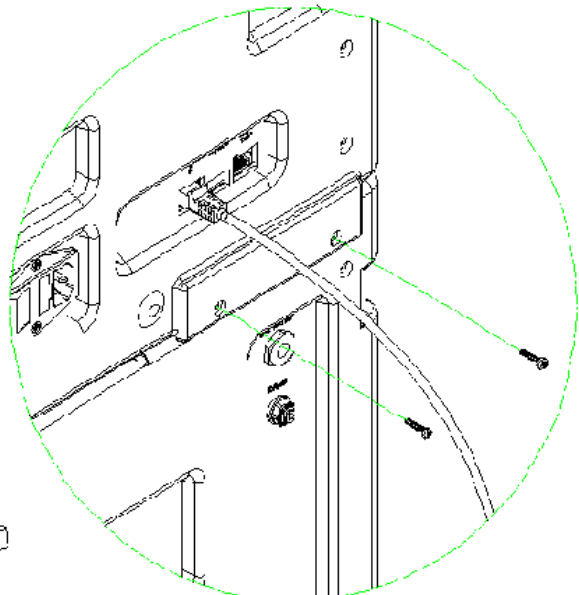


Figure 3.2.2 B

3.2.4. Mounting the Operator Interface

- Locate the Operator Interface bracket onto the top generator enclosure. Orient in line with the holes on top of the enclosure.
- Secure the bracket to the enclosure with two screws supplied with the generator. Reference Figure 3.2.4.

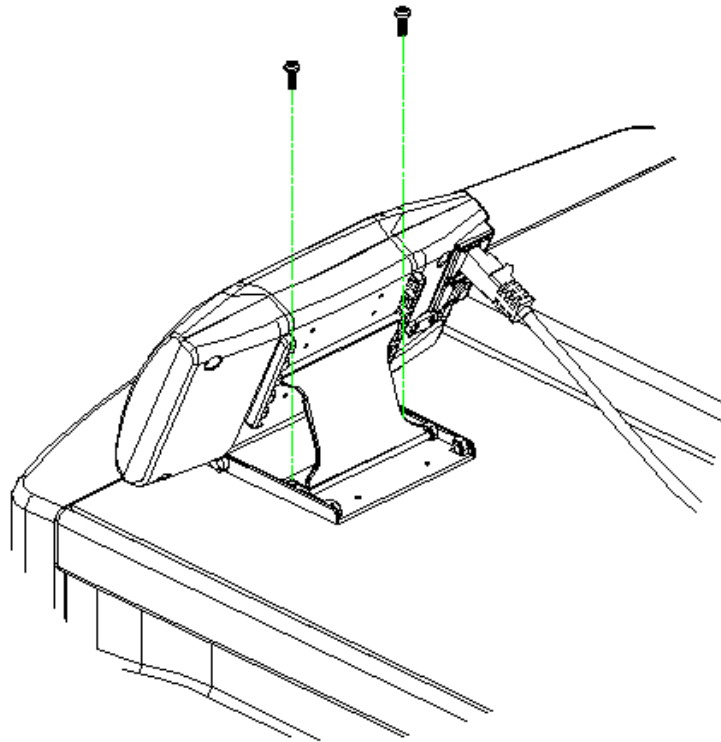


Figure 3.2.4

4. Communication

When configured properly, multiple generators can be controlled by a single operator interface.

4.1. Connections

Using the RJ45 ethernet cables supplied with each generator, connect the operator interface to each generator. Reference Figure 4.1 for connection details.

1. Connect the top port of the operator interface to the CAN BUS IN port of the nearest generator.
2. Connect the CAN BUS OUT port of the previous generator to the CAN BUS IN port of the next generator in the stack. Continue this step until the last/bottom generator is reached.
3. The bottom generator is considered the “End of Line” generator and it will only have an RJ45 ethernet cable terminated to its CAN BUS IN port.

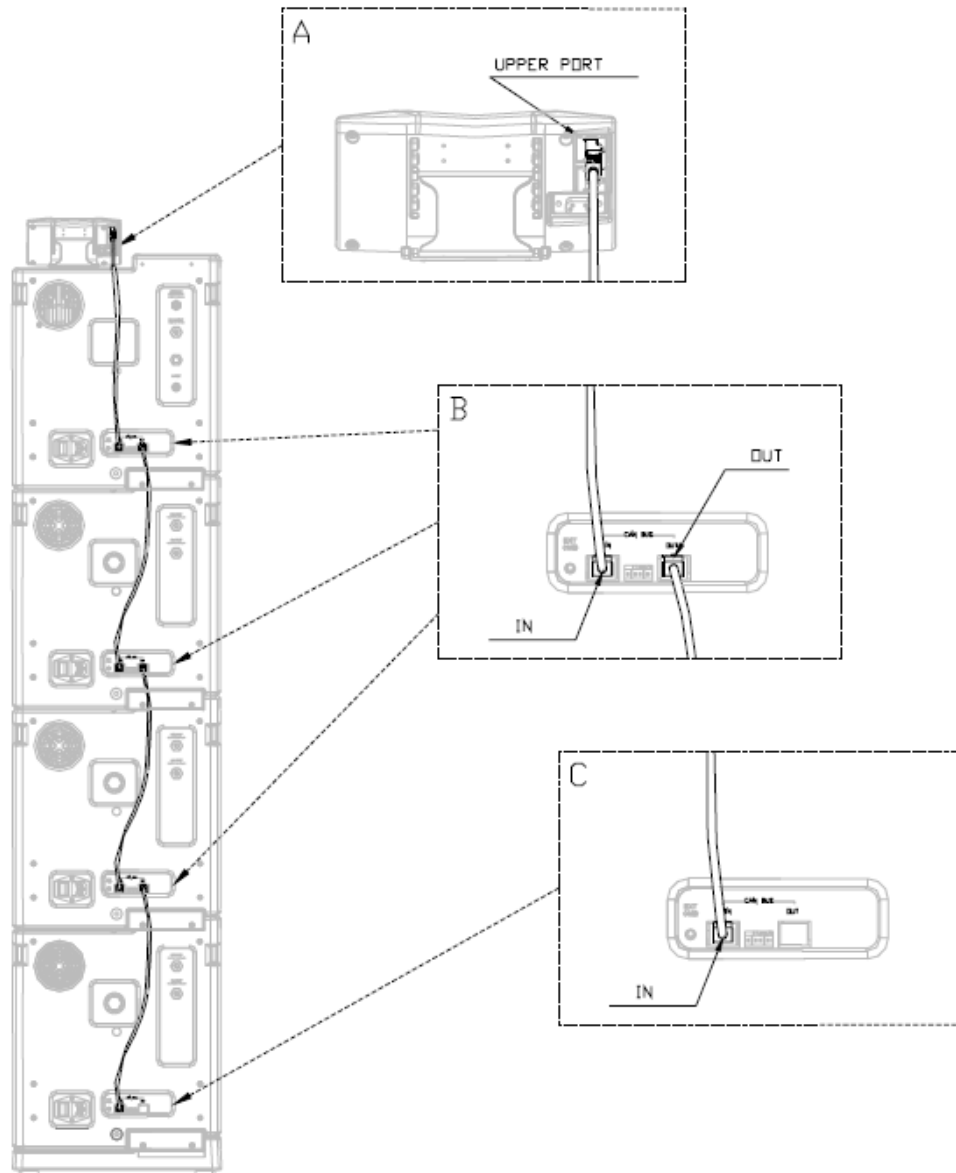


Figure 4.1

4.2. Generator Addressing

In order to communicate to the operator interface, each generator must be assigned its own unique address. To set a generator’s address, adjust the DIP switches on the back of each generator panel. The DIP switches are located between the CAN BUS IN and CAN BUS OUT ports. Reference Figure 4.2 for address assignments

- ⓘ *NiGen, AirGen and AirComp generators have 4 DIP switches; HyGen generators have 6 DIP switches.*

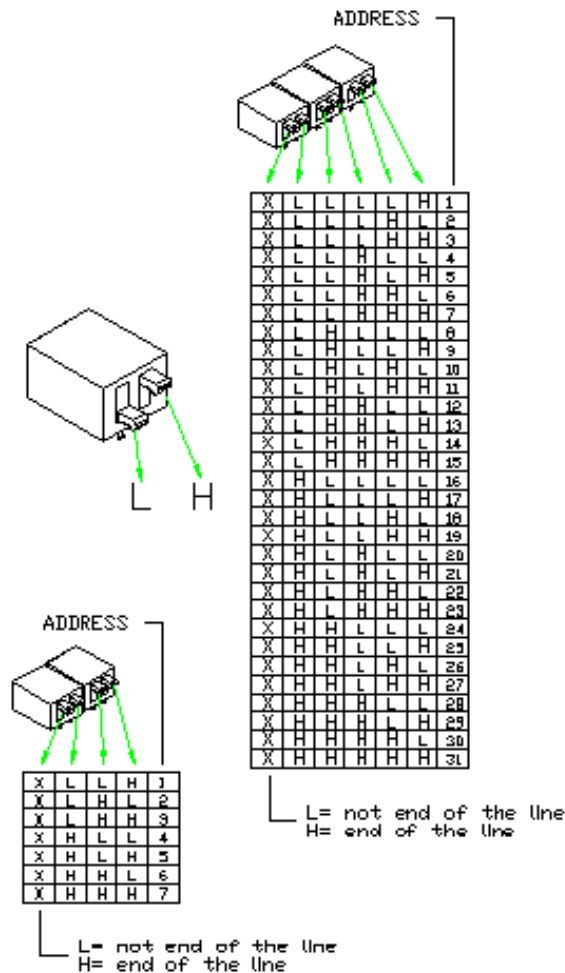


Figure 4.2

The leftmost DIP switch determines whether the generator is an “end of the line” unit. The “end of the line” unit is the generator furthest from the CPU. If the generator is an “end of the line” unit (or if it is a single generator) set the leftmost DIP switch to the up position (H); otherwise set it to the down position (L).

5. Pneumatic Connections



To connect facility compressed air to NiGen or AirGen generators, use piping and fittings rated to operate at the maximum pressure to be supplied by the compressed air source.

5.1. Configuration



In the event the compressed air source is an AirComp generator, one (1) AirComp generator can support the compressed air needs of:

- *1 NiGen Micro generator*
OR
- *Up to 3 NiGen GC generators*
OR
- *Up to 2 AirGen generators*
OR
- *1 NiGen GC generator + 1 AirGen generator*

To connect the AirComp to the other generators, use the quick disconnect fittings and flexible tubing provided with each generator. Reference Figure 5.1 as an example of pneumatic connections for a stack.

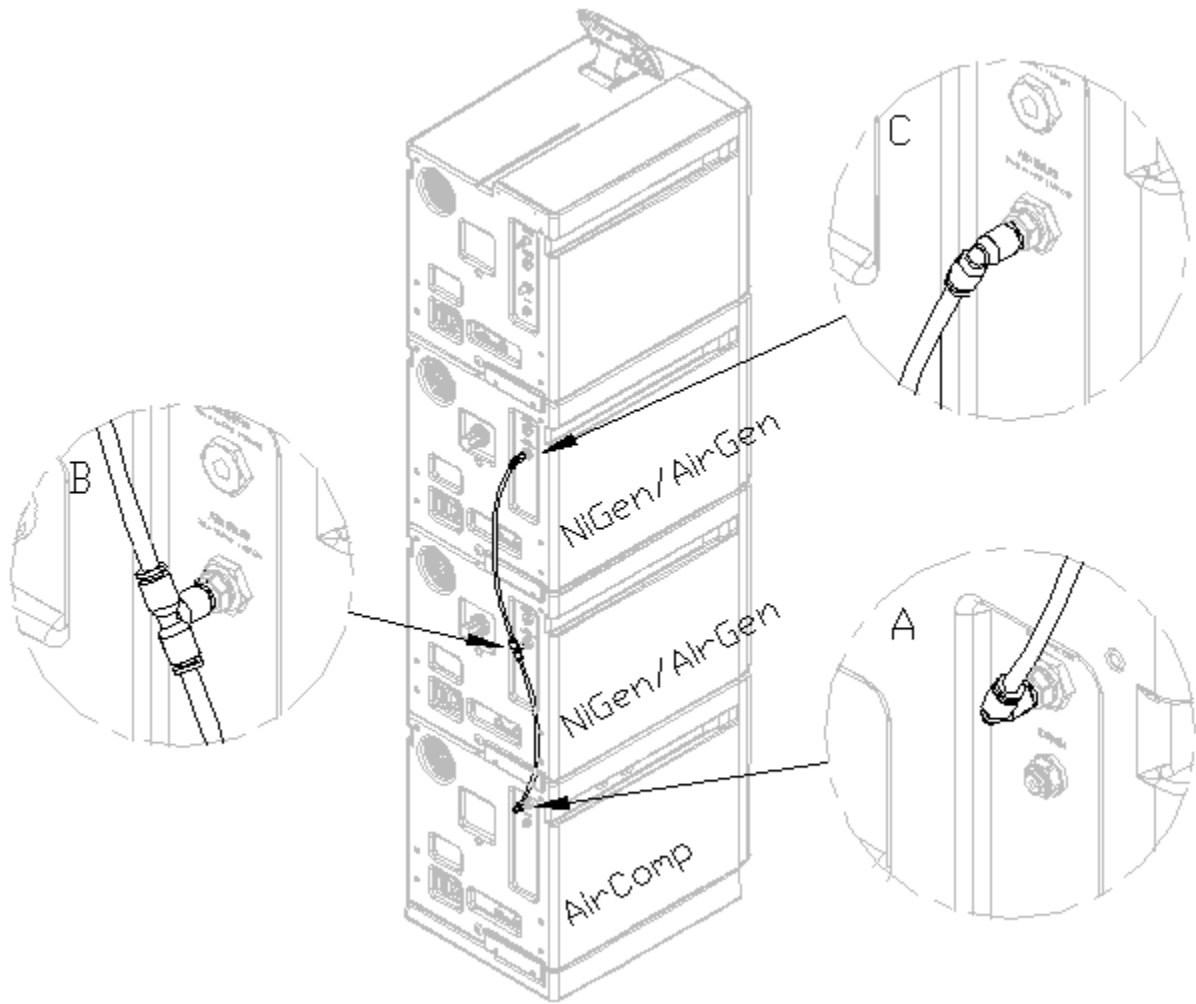


Figure 5.1

6. Start Up Sequence

ⓘ *In order to avoid generator communication errors, the following start up sequence is recommended:*

- *Power up the first generator – the generator connected directly to the operator interface.*
- *Power up the generator connected directly to the first generator.*
- *Proceed with the remaining generators until the last generator (the generator “furthest” from the operator interface) has been powered up.*

6.1. Operator interface

TOUCH SCREEN

The Operator Interface Touch Screen enables the user to interact with the generators in the stack. In addition to the ability to give specific commands and set parameters, the operator interface also provides system status including the annunciation of warnings and alarms.

Figure 6.1 provides a navigation menu for maneuvering through the operator interface. Reference the specific generator manual for more detailed information.

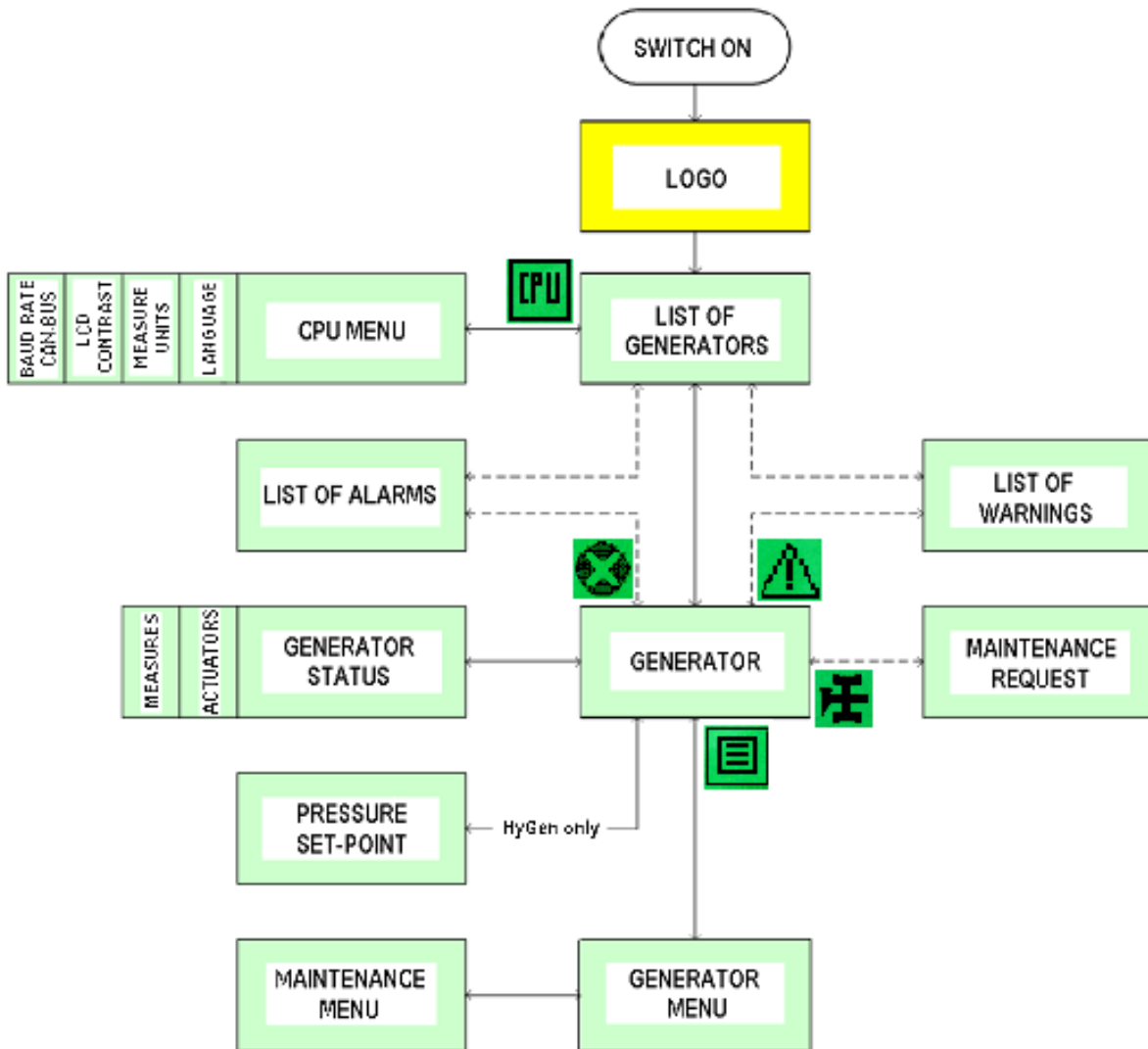


Figure 6.1

Proton OnSite
10 Technology Drive
Wallingford, CT 06492
203-678-2000
203-949-8697
www.protononsite.com