

Compressed Air for the Varian Linear Accelerator

Market Application Publication



Background:

The Varian Clinac® and Trilogy® linear accelerators (Linacs) are medical grade linear accelerators that focus high energy x-ray radiation with great precision. Linacs are found in hospital Oncology Departments, and are used for treating tumors and other malformations with radiation therapy or radiosurgery. The precision of the instrument allows for delivery of large amounts of radiation directly to a tumor with minimal radiation exposure to adjacent tissue. The radiation modifies the DNA of the tumor cells so that they cannot reproduce. Linacs are most typically used to treat discrete tumors of the brain, breast, prostate, head and neck, lung, and other parts of the body, inoperable lesions and postoperatively to eliminate any cancer cells that may have been left behind. They are also used to obliterate



abnormal blood vessels in congenital arteriovenous malformations (AVMs). Medical radiation physicists are responsible for testing the equipment

regularly, to make sure it is working properly. There are approximately 5,000 Varian Linacs in operation worldwide.

Contact Information:

Parker Hannifin Corporation
Filtration and Separation Division
242 Neck Road
Haverhill, MA 01835

phone 800 343 4048 or 978 858 0505
fax 978 556 7501

www.balstonfilters.com

Features and benefits:

- No electricity
- Simple 5 minute maintenance
- No moving parts
- Promotes patient satisfaction
- No power related issues
- Low cost of ownership
- High reliability
- Assures consistent operation of a profit center



ENGINEERING YOUR SUCCESS.

Application:

Compressed air is used within the Varian Linear Accelerator to power control valves and positioning cylinders. Compressed air from a typical hospital compressor must be treated prior to use on the Varian Linear Accelerator. According to the manufacturer, Varian, air must meet or exceed ISA 7.0.01-1996. The flow should be at least 1 scfm at 50 psig. A minimum 10 gallon storage tank is required. The Balston 76-02 air dryer and 40-012 Air Storage tank exceeds these requirements and assure long life and trouble-free Linac operation.



Case Study:

Boston's Brigham and Women's Hospital is a Harvard teaching hospital and is well known for its best practices. They know how important it is to have a Balston Dryer conditioning the compressed air used for their Linac. See what they say:

"I have used Balston dryers for over ten years and they are still working. Prior to that I used refrigerated dryers and they just didn't get the air dry enough. I want my Varian Linac to perform as well ten years down the road as it does when it is new. We had problems where a slug of water came

into the air system. The Balston dryer removed all that water and protected our equipment. I like the new Balston 76-02 air dryer because it is reliable and only requires simple annual maintenance. Reliability is important. A day of downtime causes the patients a lot of inconvenience, and the hospital loses revenue. The Balston dryer is cheap insurance to keep our Linac running."

Jerry Maddox, M.S.
Chief Oncology Engineer

Brigham and Women's Hospital
Dana-Faber Cancer Institute
Principal Associate in Radiation Therapy
Harvard Medical School, Boston, MA



Specifications:

Model	76-02
Max. Flow Rate at -40°F (-40°C) Dewpoint (1)	2 SCFM
Min/Max Inlet Air Temp. (2)	40°F/120-°F (4°C/49°C)
Ambient Temp. Range	40°F - 120-°F (4°C - 49°C)
Min/Max Inlet Pressure	60 psig/150 psig
Max. Pressure Drop	5 psid
Wall Mountable	Yes
Prefilter (included) (4)	Yes
Inlet/Outlet Port Size	1/4" NPT (female)
Electrical Requirements	None
Dimensions	6"W x 23"H x 5"D (15cm x 58cm x 13cm)
Shipping Weight	10 lbs. (5 kg)

Ordering Information:

Description	Model 76-02
Replacement Prefilter cartridges	100-12-BX
Optional Additional Coalescing Prefilter	2004N-1B1-DX
Replacement Filter Cartridges for Optional Prefilter	100-12-DX
Pressure Regulator (0-130 psig) 1/2" NPT Ports	72-130
10 Gallon Air Storage Tank	40-012

Notes:

- Dewpoint specified for saturated inlet air at 100°F (38°C) and 100 psig. Outlet flows will vary slightly for other inlet conditions.
- Inlet compressed air dewpoint must not exceed the ambient air temperature.
- 5 psid at -40°F (-40°) dewpoint operating parameters.
- If compressed air is extremely contaminated, a Balston Grade DX prefilter should be installed directly upstream from the membrane dryer.

Parker Hannifin Corporation
Filtration and Separation Division
242 Neck Road
Haverhill, MA 01835
phone 800 343 4048 or 978 858 0505
fax 978 556 7501
www.balstonfilters.com

