

ON BOARD IMAGER

MODEL NO.

OBI

SERIAL NO.

H080262

MANUFACTURED

MAY 2006



ETL LISTED
CONFORMS TO
UL 60601-1
CERTIFIED TO



Made In The United Kingdom

CAN/CSA STD C22.2 NO. 601.1-M90

This equipment is designed to meet the requirements of US CFR 1020.30/32

100018849-03

VARIAN
medical systems

ONCOLOGY
SYSTEMS



Medical Linear Accelerator, High Energy

MODEL NO.

IX

SN

1225

MANUFACTURED

MAY 2006

Supply Ratings: 200 to 240 Vac 50 or 60 Hz 125 Amps max @ 208V 3~
360 to 440 Vac 50 or 60 Hz 65 Amps max @ 400V 3N~



ETL LISTED
CONFORMS TO
UL 60601-1
EN 60601-2-1
CERTIFIED TO

CAN/CSA STD C22.2 NO. 601.1-M90



Varian Medical Systems Inc.
3100 Hansen Way, Bldg 4A
Palo Alto, CA 94304, USA

MADE IN U.S.A. 1105491-17

VARIAN
medical systems

**ONCOLOGY
SYSTEMS**

MADE IN USA

PART NO

100016791-01

REV

C

SCHEM

REV

SERIAL NO

JLH 2556

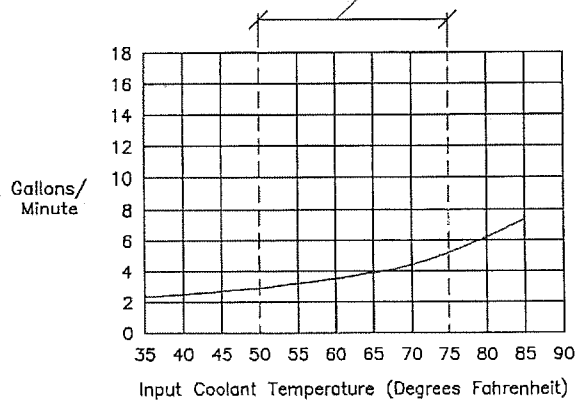
DESCRIPTION

HIGH ENERGY MAJOR MECH ASSY

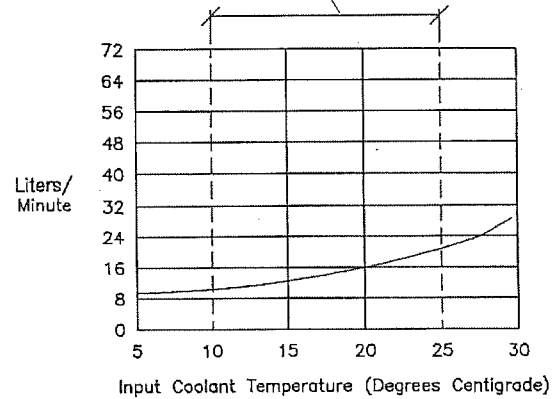
B853665-01

3.6.2 Clinac Coolant System

The typical incoming coolant temperature range is 50 deg. F. to 75 deg. F. (10 Deg. C. to 25 deg. C.). The coolant system must be designed to eliminate the possible formation of condensation. If lower temperature coolant is used, a psychrometric chart must be consulted to determine the dew point in the facility. If the inlet coolant temperature is at or below this dew point, condensation will form on the coolant system pipes which could result in equipment damage.



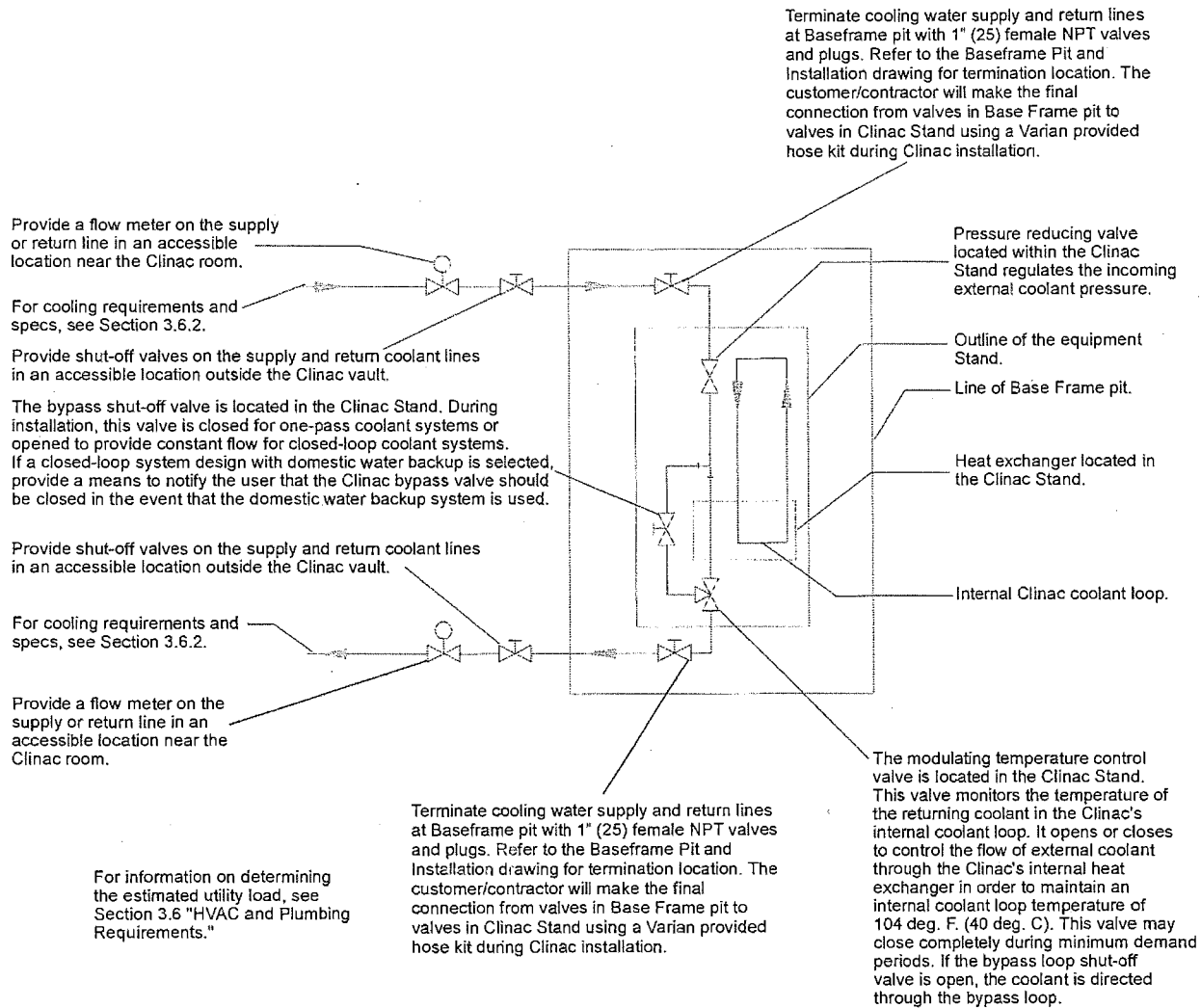
U.S. Systems - Imperial



SI Systems - Metric

HE060-0

Figure 3-48 Minimum Coolant Flow Requirements



HE059-0

Figure 3-49 Coolant Diagram

3.6.2.1 Dual Energy Clinac Coolant Requirements

The Dual Energy Clinac coolant heat load varies with the Operational State as outlined in Table 3-3.

Table 3-3 Dual Energy Clinac Coolant Requirements

Standby State coolant heat load	2 kW (6,830 Btu/hr)
No Mode State coolant heat load	10 kW (34,152 Btu/hr)
Ready State coolant heat load	12.5 kW (42,690 Btu/hr)
Beam-On State coolant heat load	25 kW (85,379 Btu/hr)
Normal treatment cycles (see "Clinac Operational States" on page 3-42)	Requires heat dissipation into cooling water of 13.3 kW (45,422 Btu/hr)
Minimum operational heat load	2 kW (6,830 Btu/hr) – 24 hour cooling required.
Maximum heat load (during Beam-On)	25 kW (85,379 Btu/hr)
Maximum overall input pressure, including normal back pressure	100 PSIG (7 kg/cm ²)
The pressure differential between the inlet and outlet fittings at the Clinac Stand will be adjusted to between 10 PSI (0.7 kg/cm ²) and 20 PSI (1.4 kg/cm ²) while the Clinac is in the Ready State.	
The actual pressure drop through the Clinac under maximum heat load conditions is 20 PSI (1.4 kg/cm ²).	
Periodic cooling water flow through the Clinac	0 GPM (with the internal bypass valve closed only).
Average water temperature rise during Beam-On, Standby, and Ready States (w/closed bypass valve)	27 deg. F. (15 deg. C.)

3.6.2.2 Coolant Specifications

The cooling water requirement can be satisfied with a Closed-Loop system or a One-Pass system. Although most water and sanitary districts restrict the use of one-pass cooling, it can generally be used for backup. If a closed-loop system is used, provide a one-pass system for backup.

Table 3-4 Coolant Specifications for External and Internal Water Sources

Water Sources ^{a b}	External Coolant One-Pass: City Water	External Coolant Closed-Loop: Facility Water
	Direct water from the domestic city water supply. Water is disposed in a waste drain after it exits the machine.	Direct chilled/cold water from Hospital closed loop system or chiller system dedicated to machine
Base Water Quality ^c	Clean, Clear (non-turbid) water. Disinfected, Potable grade surface water, Aquifer, or Well water.	Clean, Clear (non-turbid) industrial water, Appropriately treated with nitrite, Mo, silicate, borate, or other suitable corrosion inhibitor.
Pathogens (cfu/ml)	Nil	Nil
Heterotrophic plate count (HPC) (cfu/ml)	<100	<100
pH	7.0-9.0	7.5-10.0
Electrical conductivity (μS/cm)	>250	>2000 ^d
Total dissolved solids (Mg/L)	>160	>1300 ^d
Total chlorides (mg/L as Cl)	>50	>150
Total hardness (mg/L as CaCO ₃)	>75 ^e	>150 ^e

- City Water is intended solely as a backup supply and is not recommended for permanent use as the external coolant source.
- Facility Water is preferred for permanent use as the external coolant source.
- Experience has shown that some local potable water supplies have caused excessive corrosion and frequent replacement of the internal heat exchanger.
- Facility Water has higher conductivity and total dissolved solids limits because added corrosion inhibitors would raise these control measures. In a small percentage of systems, the conductivity could be lower based on the type of corrosion inhibitor used.
- For systems where soft water or purified water is used for makeup, lower total hardness is acceptable if there is sufficient corrosion inhibitor in the system.

- When glycol is added to external facility water, propylene glycol is preferred (due to its better environmental safety record compared to other glycols) at a strength not to exceed 50% by volume (v/v).
- External water (from city or facility) will require secondary disinfection (i.e. in addition to any bleach/chlorine/chloramine reserve present) to avoid biofilm formation in the machines heat exchanger. Seek advice from a water treatment professional.



Note: The water coolant specification in this section does not apply to the Accelerator's internal coolant water loop. Only qualified operators or service personnel should refer to the appropriate Varian maintenance/service manual or contact the Varian Help Desk at 1-(888)-Varian5 (827-4265) for the internal coolant water quality specifications.

3.6.3 Compressed Air System

Compressed air is required for the High Energy Clinac. Provide instrument quality, dry compressed air per ISA-7.0.01-1996, with a maximum particle size of 5 μm . If an existing system is not available, provide a dedicated system. Provide a minimum of 1 cubic foot per minute (CFM) at 50 PSIG (1.7 m^3/hr . at 3.6 kg/cm^2). A 10 gallon (38 liter) tank capacity is adequate.

Terminate 1/2" compressed air line at the Baseframe pit with 1/2" female NPT ball valve. (See Figure 3-50 and Figure 3-51 for termination location.) Final connection from valve in Baseframe pit to valve in Clinac Stand will be installed by Customer/contractor using Varian provided hose kit during Clinac installation.

3.6.4 Environmental Specifications

- Humidity range – 15% to 80% Relative Humidity, Non-condensing
- Room temperature range – 60° to 80°F (16° to 27°C)

3.6.4.1 Ventilation

Clinacs will produce detectable levels of ozone under certain conditions. Four to six air changes per hour are normally required to maintain undetectable levels, depending on the size of the vault and air circulation efficiency. Ventilation required to remove the heat dissipated to the vault air normally accomplishes this. The ventilation system should use *fresh-air* as part of its design. Treatments should not be performed if the ventilation system is not in operation. Long irradiation's at high dose rates, such as those performed for physics measurements, should be followed by *airing out* the vault. It is important to provide positive air pressure in the Clinac vault to *hold* swing-type doors closed.