FLEXIFLO QUANTUM
Enteral Pump

OPERATING MANUAL

For Enteral Use Only
Not For Parenteral Use
SPECIFICATIONS

Power
Voltage: 100 to 130 VAC, 47-63 Hz, 1 Phase
Power: 4 watts (average)
Fuse: ½ AMP SB type
Wire Cord: Hospital-grade, non-detachable (10 feet)
Leakage: Less than 100 microamps

Mechanical
Height: 8.25 inches
Width: 7.5 inches
Depth: 6.0 inches (8.0 inches with pole clamp)
Weight: 7.2 lbs

Operational Specifications—Flow Rates
Range: 0-300 mL/hr
Increment: 1 mL/hr
Accuracy: ±10% (refer to CHECKING PUMP ACCURACY, page 13)
Pressure: Pumps against 15 psi (mean) back pressure before occlusion alarm

Battery Operation
Type: 2.1 Ah rechargeable sealed lead acid
Voltage: 12 V; the pump will fully recharge in a maximum of 8 hours
Expected Life: When fully charged, 8 hours at 125 mL/hr

Standards
Designed and manufactured to meet requirements of UL 548 (1976).

PUMP CHARACTERISTICS

The FLEXIFLO® QUANTUM™ Enteral Pump is a microprocessor- (computer-) controlled pump that provides for accurate, controlled enteral feeding in a safe, user-friendly system. The Quantum Pump is a volumetric pump that uses a specially designed feeding set, which includes a cassette that delivers measured amounts of enteral product. As an optional feature, the Quantum Pump will flush the feeding set and manwheel feeding tube each hour with a 25-mL flush.

PRECAUTIONS: This pump is designed to deliver only a liquid enteral feeding product (standard liquid product. Intraformula or reconstituted powder product has been thoroughly mixed into solution).

The Quantum Pump offers these features:
1. Automatic priming (no manual priming is necessary)
2. Automatic flush feature
3. Dose setting
4. Protection against overdelivery:
   - Motor speed is continuously monitored
   - Senses malfunctions that could result in gravity flow
5. Volume feed accumulation displays for enteral product and flush solution
6. Flow-rate selection from 1 to 300 mL/hr in 1 mL/hr increments
7. Accuracy to ±10% (refer to CHECKING PUMP ACCURACY, page 13)
8. 8-hour battery operation at 125 mL/hr, when fully charged
9. Alarms:
   - OCCLUSION
   - EMPTY
   - DOSE COMPLETE
   - TURN TO RUN
   - LOW BATTERY
   - DOOR/CASSETTE
   - SET RATE
10. System self-check
11. Adjustable alarm volume
12. User-friendly operating controls
13. Simple setup (no hand cassette feeding)
14. Memory—Automatic retention of the following values until turned off and disconnected from AC power:
   - FEED and FLUSH volume accumulations (VOL, RED)
   - SET RATE
   - SET DOSE values
**CLEANING**

There are no routine calibration or adjustment procedures required with the Quantum Pump. All servicing or adjustments should be referred to qualified technical personnel (refer to Service Manual).

For trouble-free operation, check the pump daily and clean immediately after spills occur.

While cleaning, pump should be turned off and unplugged.

Do not submerge, autoclave, heat, steam, ETC. or radiation sterilize the pump.

THE PUMP CAN BE CLEANED AS FOLLOWS:

**HOUSING**
- Clean outside surface with soft cloth and warm, soapy water.
- For general cleaning, use dishwashing detergent (non-chlorine-based) or isopropyl alcohol.
- For general disinfecting, use 70% concentration isopropyl alcohol.
- For disinfecting after exposure to AIDS or hepatitis, use 10% concentration of 5.25% sodium hypochlorite (household bleach). This solution may discolor the pole clamp. **DO NOT SPRAY THIS SOLUTION INTO PUMP CAVITY.** After exposure to tuberculosis, use 70% concentration isopropyl alcohol. These recommendations are not substitutes for official procedures that may differ among institutions.

**PUMP CAVITY**
To facilitate cleaning, the cassette receptacle door may be disconnected from the face of the pump. However, this should be removed only by a qualified service technician, in the following manner:
- Tilt pump back.
- Lift blue lever so cassette door is in open position.
- Push out door-release tab to release cassette door.
- Allow door to open fully.
- Lift up on door to remove completely from brown hinge.
- Reinstall cassette door by following above procedures in reverse order.
- Do not spray water or cleaning solution into pump cavity.
- Clean with a cotton swab, soft brush or soft cloth and warm soapy water.
- Dry thoroughly.
- Be sure no soap film or residue is left in the pump cavity.

**PANEL DISPLAYS**

Here is a simple explanation of the panel displays. Understanding them is necessary for successful operation of the pump.

**FRONT PANEL**
- **FEEDING Display**
- **Pump Oil?**
- **Light will FLASH when pump is in N/M mode**

**BACK PANEL**
- **Pole Clamp**
- **Ground Test Point**
- **HOSPITAL-GRADE POWER CORD**

**BOTTOM VIEW**
- **BATTERY ACCESS DOOR**
**TROUBLE-SHOOTING**

The Quantum Enteral Pump is designed to be highly reliable. As with any electromechanical device, however, problems may occur. The following tips will help correct minor in-service problems that may arise.

Intermittent audio alarms are accompanied by messages on the front panel indicating the cause of the alarm for all alarm conditions except LOW AUDIO (visual only), which indicates low alarm volume has been selected.

### VISUAL DISPLAY OR PROBLEM

**OCCLUSION**—Flow has stopped.
- Clear obstruction/flush tubing of closed clamps.
- Turn dial to RUN to start pump.

**EMPTY**—Feed or flush bag empty.
- Turn dial to HOLD.
- Refill container(s).
- Turn dial to RUN to start pump.

**DOSE COMPLETE—VOL FED a.
**Equal to the SET DOSE. Pump stops.
- Turn dial to SET DOSE.
- Press keypad arrows to increase dose OR set to zero dose setting OR turn dial to CLEAR VOL.
- To silence alarm, turn dial to HOLD, then RUN.

**SET RATE**—Dial turned to RUN without entering rate.
- Select flow rate (1 to 300 mL/hr).
- To silence alarm, turn dial to HOLD, then RUN.

**TURN TO RUN**—Pump dial in setting other than RUN or OFF more than 5 minutes.
- Turn the dial to HOLD then RUN to reset.

**DOOR/CASSETTE**—Door open, cassette not properly loaded or excess foam or air in cassette.
- Confirm cassette in place and close door.
- Manually reprime to remove foam or air from cassette.
- Replace set.
- If alarm condition persists, pump requires service.

### CONTROL DIAL SETTINGS (continued)

**DIAL:**

**HOLD**

**FUNCTION:**

- Stops pumping action and audio alarms.
- HOLD is used when correcting an alarm condition or whenever temporary cessation of pumping action is desired (such as when connecting a new feeding container). If pump dial is left on HOLD for more than 5 minutes, an alarm will sound and the message TURN TO RUN will be displayed.

**VOL FED**

- Stops pumping action. The FEEDING display will show feed volume delivered and the FLUSH display will show flush volume delivered. Pump accumulates feed volume delivered up to 999.9 mL and flush volume up to 99 mL. Unless these volumes are reset to zero by turning to CLEAR VOL (or the pump is unplugged while in the OFF (CHARGE) mode), upon exceeding the maximum feed or flush volume allowed in the display, the value returns to zero and a new accumulation begins.

**CLEAR VOL**

- Stops pumping action and clears to zero both the feed and flush volume read. NOTE: The pump will "deep" four times before erasing volumes to alert the user that the dial has been turned to CLEAR VOL. The user must turn dial away from CLEAR VOL (to any other setting) before the fourth beep to avoid an unintentional erase of volume total(s).
- CLEAR VOL does not work while pump is priming.
INSTRUCTIONS FOR USE (continued)

14. To clear the feeding and flush volume delivered, turn dial to CLEAR VOL. (This occurs after four loops.)

15. When desired, disconnect pump-set tubing from patient's enteral feeding tube. Close clamp on feeding bag (and flush bag, if used). Lift blue lever on face of pump, remove cassette and discard set and container.

16. When feeding is complete, turn pump dial to OFF.

17. When feeding is complete, turn pump dial to OFF.

NOTE: Pump stops and sounds an alarm automatically when the container is empty. Simulate the dose. Complete the Dose Message when the selected dose is reached.

PRECAUTION: The pump set and container should be replaced at least every 24 hours. mehr avoid product-contamination problems. For single-patient use only.

PUMP SETS

The Quantum Pump offers a wide choice of feeding sets with either a Pump Set Without Flush Bag (single-fused cassette) or a Pump Set With Flush Bag (dual-fused cassette).

PUMP SET (WITHOUT FLUSH BAG) — SINGLE INLET CASSETTE

EXAMPLE SHOWN:
FLEXI-HOLD® Low-Fill Enteral Nutrition Bag
With Preattached Quantum™ Pump Set

Gravity Feed or MANUALLY PRIME:
1. Completely close CAIR® clamp (and slide clamp, if flush set is used).
2. Remove cassette from pump.
3. Pull out orange plungers knob and regulate flow with CAIR clamp.

CAIR® pump manufactured under license from Abbott Laboratories, Inc. Covered by one or more of the following U.S. Patents: No. 4,057,544, 4,283,181, 4,173,344, 4,069,014, 4,118,947.

In case of CAIR® pump is the same instruction how to be giving, but adjusting might be the completely different.

INFOMARY REMINDER WHEN USING A PUMP SET (WITHOUT FLUSH BAG):
• A FLUSH display will be blank when a single-fused cassette is used.