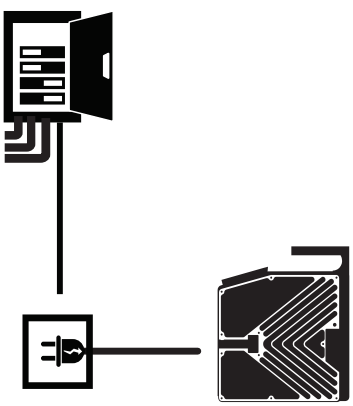
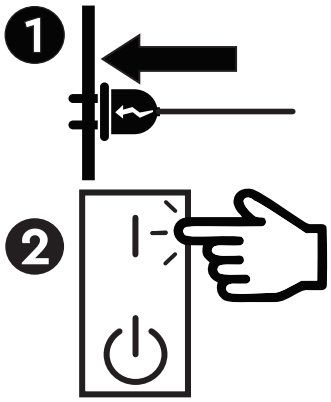
THE BELMONT®
RAPID INFUSER RI-2

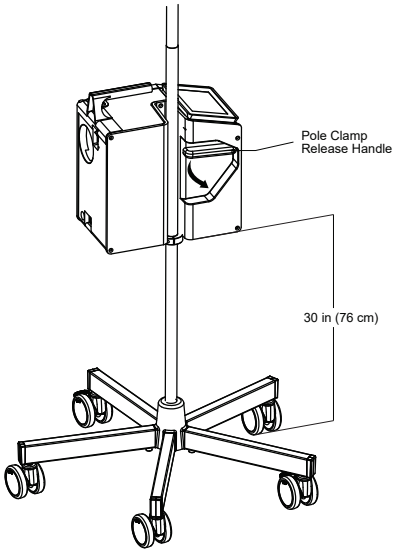
QUICK REFERENCE GUIDE

IT IS ESSENTIAL THAT YOU READ AND UNDERSTAND THE OPERATOR'S MANUAL BEFORE USING THIS DEVICE

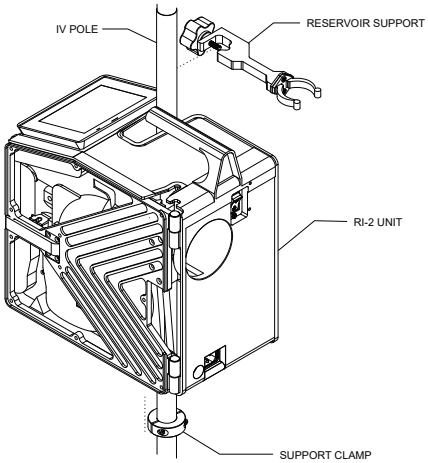
Registered in Accordance with ISO 13485

Step-By-Step Quick Set Up	
SETUP: • Inspect the system: ➢ Power cord: 14/3 SJT cable with Hospital plug (USE ONLY SUPPLIED POWER CORD) ➢ IV pole: 5 wheel IV pole (max. diameter 1 1/4”) ➢ Pole mount support assembly (Support Clamp & Optional Plastic Washer) ➢ Reservoir support ➢ Disposable set ➢ 3.0 L Reservoir and reservoir holder, if needed	**IMPORTANT:** • Use a dedicated circuit breaker. • Ensure the power cord is plugged into the wall outlet BEFORE turning the unit on.  

IV POLE MOUNTING:



- Install the Pole Mount Support Assembly (support clamp and optional plastic washer) approximately 30” from the ground.
- Mount The Belmont® Rapid Infuser RI-2 above the Pole Mount Support Assembly.
- Push the “Pole Clamp Release Handle” down to lock the RI-2 onto the IV Pole.
- Clamp the Reservoir Support approximately 9” above the RI-2.



Quick Setup Guide

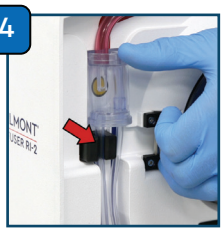
1 Plug the main connector of the detachable power cable into a dedicated circuit breaker. Fully seat the device connector (C-19) of the power cable into the power receptacle on the back of The Belmont® Rapid Infuser RI-2. If a moisture guard is present, ensure it is over the device connector and flat against the back of the machine.

Tighten all connections and snap the reservoir chamber into the support

3

Load the circular heat exchanger with the red arrow pointing up

4



Place the pressure chamber into the pressure chamber well and press the infuse line into the air detector

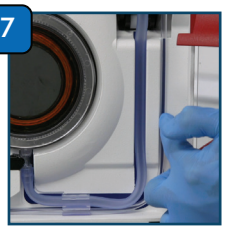
5

Place the infuse line to the left of the valve wand and the thinner recirc line to the right of the valve wand

6

Firmly position the interlock block on top of the shelf with the blue arrow pointing inward

7



Place the larger blue tubing in the groove to the left and the smaller tubing to the right, close and latch the door

8 POWER ON AND PRIME

- Turn power switch ON. Ensure AC POWER PRESENT is displayed on the start up screen.
- Close all spike clamps. Hang and spike fluid bag(s). Open spike clamps on lines with fluid bags. If the spike is not connected to a fluid bag leave clamp closed.
- Press PRIME to prime the internal circuit. The prime volume is displayed on screen.
- Prime the patient line. Press PT. LINE PRIME once to prime at 50mL/min or press and hold PT. LINE PRIME to prime at 200mL/min. Press STOP when the line is free of all air bubbles.

9 CONNECT TO PATIENT AND INFUSE

- Connect the patient line to a single dedicated intravenous access site using aseptic technique and without entrapping air.
- Press INFUSE to begin infusion at 10mL/min.
- Press INFUSE RATE ▲/ ▼ to set the desired flow rate.

WARNING:

- Do NOT leave device unattended while in use.
- Do not use with pressure infusers or “bag squeezers”. The system pump provides adequate pressure to infuse fluid. Do not pressurize the reservoir.

BATTERY

- System automatically switches to battery when AC is disconnected. Battery operation should be used only briefly or at very low flow rates because there is no heating.

BOLUS INFUSION

- Infuse fixed volume at 200 mL/min (Fixed volume: Factory set at 200 mL)
- Return to previous flow rate if flow rate was set at 50 mL/min or lower.
- Return to 50 mL/min if flow rate was set higher than 50 mL/min.
- Change the preset BOLUS volume: Press and hold the BOLUS key. Release the key when the desired BOLUS volume appears in the volume delivered position.

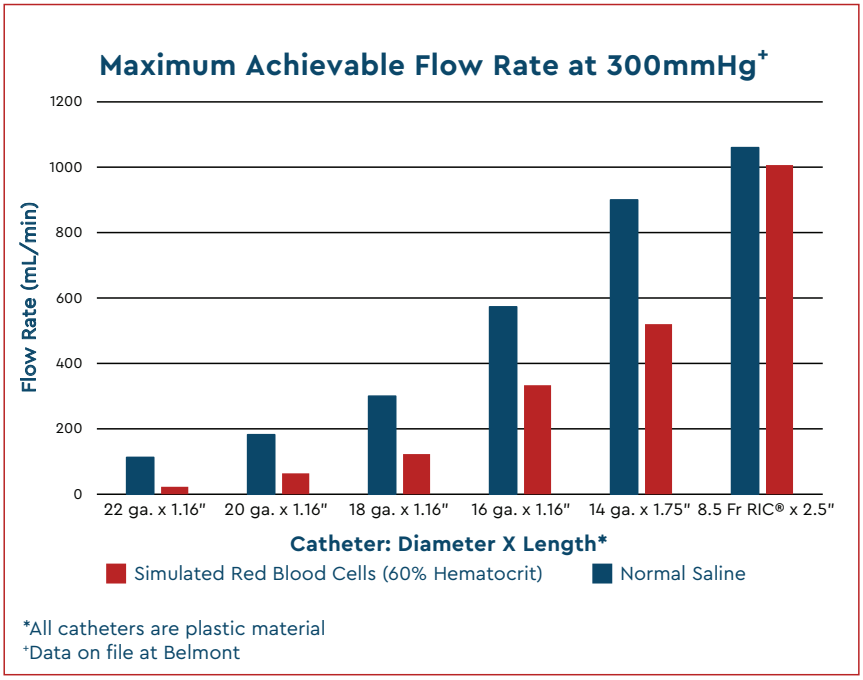
RECIRCULATION

- Recirculate fluid, warm, and remove air in the main system at a preset rate of 200 ml/min. Recirculation automatically stops and beeps after 5 minutes.

CAUTION:

- Immediately wipe any spills from the device.
- Excessive or prolonged recirculation may damage red blood cells by exposing them repeatedly to the rollers inside the pump head.
- Do not prime with blood or blood products.

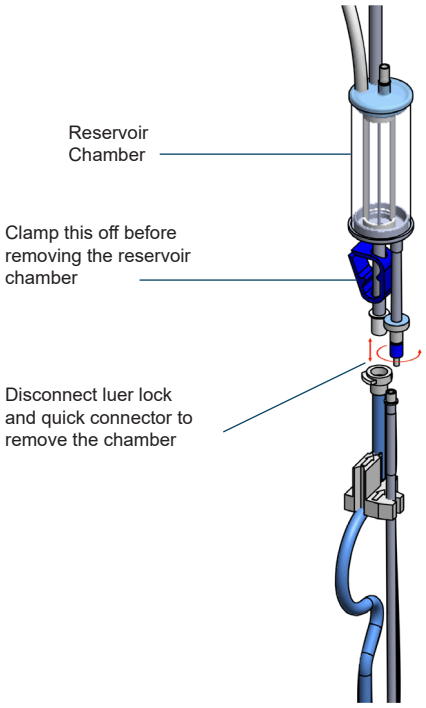
CANNULA SIZE: Match Infusion Set to Flow Rate and Fluid Type



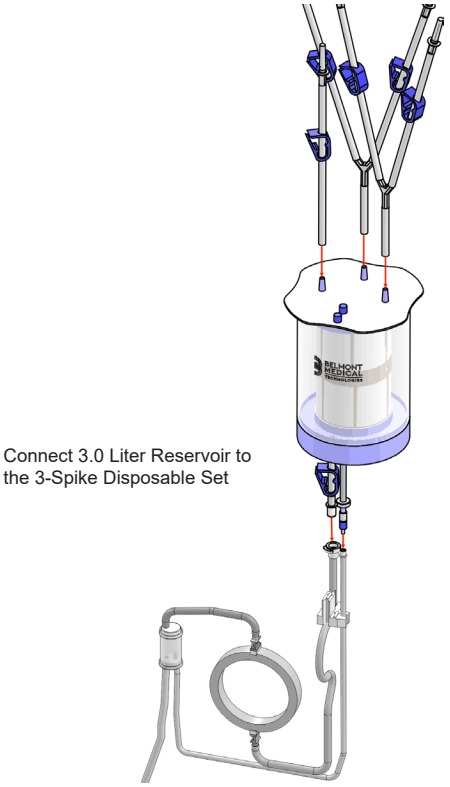
*All catheters are plastic material
+Data on file at Belmont

INSTALLING THE DISPOSABLE SET / OPERATING INSTRUCTIONS

Replace Filter / Standard Reservoir Chamber (Fluid Supply)



Install 3 Liter Reservoir



REPLACING RESERVOIR CHAMBER

CAUTION

Replace filter, reservoir chamber and/or disposable set if filter becomes clogged. If it becomes occluded the fluid out sensor will activate, an audible alarm will sound, a message “Fluid Out, Check inlet tubing and Filter. Add more fluid” will appear and the pump will stop.

1. Clamp off the pump tubing using the clamp.
2. Using aseptic techniques, remove the reservoir chamber from the 3-Spike disposable set.
   - Disconnect the larger pump tubing by pressing in the lock tab on the quick connector and pulling out the connector.
   - Disconnect the thinner recirculate line by unscrewing the luer connector.
3. Connect the reservoir chamber to the luer connectors of the 3-Spike disposable set.

INSTALL 3.0 LITER RESERVOIR

1. Using aseptic technique, attach the three fluid supply tails onto the top of the 3.0L Reservoir.
2. Attach the reservoir holder on the IV pole, place reservoir in the holder.
3. Clamp off the pump tubing using the clamp.
4. Using aseptic techniques, remove the reservoir chamber from the 3-Spike disposable set:
   - Disconnect the larger pump tubing by pressing in the lock tab on the quick connector and pulling out the connector.
   - Disconnect the thinner recirculate line by unscrewing the luer connector.
5. Disconnect the thinner recirculate line by unscrewing the luer connector.Connect the 3.0 L Reservoir to the quick connect and luer connectors of the 3-Spike disposable set.
6. Adjust the reservoir holder to make sure that the two connection leads underneath the reservoir are not stretched or kinked.

OPERATIONAL ALARMS

ALARM / MESSAGE	POSSIBLE CAUSE	SOLUTION
UNIT DOES NOT POWER UP	• Power switch not completely depressed	• Depress power switch completely
AIR DETECTION	• Air in the line • Tubing in Air detector Sensor not fully seated • Leak in disposable set • Air detector sensor dirty	• Open door, squeeze tubing directly below air detector sensor to clear air. Recirculate to remove air in line • Reseat tubing in Air detector Sensor • Replace disposable set, if leak • Clean sensor with moistened Q-tip and dry
DOOR OPEN	• Door is open	• Close the door
FLUID OUT	• Out of fluid • Bag clamps not fully opened • Bag not fully spiked • Tubing in Fluid OUT Sensor not fully seated • Filter clogged • Recirculate line (smaller tubing) blocked	• Add fluid • Open bag clamps • Check bag spikes • Reseat tubing in Fluid OUT Sensor • Replace filter if it becomes clogged • Check recirculate line
HIGH PRESSURE	• Infusion site may be positional • Cannula bore size is too small • Patient line is blocked • Recirculate line is kinked • Pressure limit setting is set too low	• Check the infusion site • Use appropriate cannula size • Check patient line • Check recirculate line • Increase pressure limit setting. • See Chapter IV of Operator's Manual
LOW BATTERY	• Battery voltage is too low	• Plug system into AC outlet • Check power cord at AC outlet and unit
MISSING DISPOSABLE	• No disposable set in the unit	• Install disposable set

HEATING ALARMS		
SYSTEM ERROR #101 CHECK TEMPERATURE PROBES FOR BLOCKAGE. CLEAN WINDOWS. PRESS RETRY TO CONTINUE. SERVICE MACHINE IF ERROR PERSISTS.	• IR probes are wet, dirty, or blocked • Disposable set windows are wet, dirty, or blocked • IR probe errors • For 230V/50Hz operation: System was turned on without AC power present.	• Clean IR probes with moistened cotton swab and dry. Clean window and dry. Replace disposable set, if clogged. Press RETRY to continue. If error persists, call service. • The device should be powered down using the switch on the back of the device. Ensure that the device is connected to the AC mains power supply and then switch the device back on using the switch on the back of the device. If these steps do not resolve the error 101, follow instructions for cleaning the temperature probes.
SYSTEM ERROR #102 INFUSATE OVER TEMPERATURE. DISCARD DISPOSABLE AND BLOOD. RESTART SYSTEM WITH A NEW DISPOSABLE. SERVICE MACHINE IF ERROR PERSISTS.	• IR probes are wet, dirty, or blocked • Fluid supply is over temperature limit • Restricted flow or out of fluid	• Clean IR probes with moistened Q-tip and dry. • Clean window and dry. Replace blood and disposable set • Make sure bag clamps are open and flow is unimpeded. Make sure that filter (in reservoir chamber) is not clogged, replace if needed. Add more fluid, if fluid out
INTERNAL SYSTEM FAULT ALARMS		
SYSTEM ERROR #201	• Air detector errors	• Power off and restart. Service machine if error persists
SYSTEM ERROR #202	• Fluid out detector errors	• Power off and restart. Service machine if error persists.
SYSTEM ERROR #203	• Excessive AC power line noise or internal failure	• Pres RETRY to continue. Service machine if error persists.
SYSTEM ERROR #204	• Power feedback circuit errors	• Power off and restart. Service machine if error persists.
SYSTEM ERROR #205	• Heater hardware errors	• Pres RETRY to continue. Service machine if error persists.
SYSTEM ERROR #206	• Power driver module overheating	• Make sure air vent, at the bottom of the unit, is not blocked • Wait for unit to cool. Display will return to infuse screen when error clears • Service machine if error persists
SYSTEM ERROR #207	• Fluid pump errors	• Check that pump turns freely and head is clean • Press RETRY to continue. Service machine if error persists
SYSTEM ERROR #208	• Valve errors • Valve position sensor errors	• Check that valve is not blocked • Power off and restart. Service machine if error persists
SYSTEM ERROR #209	• Printed Circuit Board overheating	• Make sure air vent, at the bottom of the unit, is not blocked • Wait for unit to cool. Display will return to infuse screen when error clears • Service machine if error persists
SYSTEM ERROR #210	• Power Driver module overheating	• Power off and restart. Service machine if error persists.

DIFFICULTY	POSSIBLE CAUSE	SOLUTION
BATTERY NO HEAT	• Power cord not plugged in AC outlet • Power cord is loosened from back of the unit	• Plug into AC outlet • Check power cord connection
DIM DISPLAY	• Display brightness has been set to the lowest	• To increase display brightness, see SYSTEM PARAMETERS SETTING below
FLOW RATE SLOWING DOWN AND DOES NOT GO TO SET FLOW RATE	• Line kinked or obstructed • Cannula is too small • System keeps pressure in-line under pressure limit setting	• Check if line is kinked • Use appropriate cannula size • To change pressure limit, see SYSTEM PARAMETERS SETTING below
KEY PAD NOT RESPONDING	• Key pad sensitivity has been set to SLOW • Key pad errors	• To reset key pad sensitivity, see SYSTEM PARAMETERS SETTING below • Power down and retry. If error persists, call service
WILL NOT HEAT	• Windows on disposable set or IR probes are wet, dirty, or obstructed • Power Driver module is not calibrated properly • IR probes are out of calibration	• Clean IR probes with moistened Q-tip and dry. Replace disposable set, if clogged • Re-calibrate, Chapter IV • Re-calibrate, Chapter IV
WILL NOT PRIME	• Out of fluid • Bag clamps not fully opened • Bag not fully spiked • Tubing in Fluid OUT Sensor not fully seated • Filter clogged • Recirculate line (smaller tubing) blocked	• Add fluid • Open bag clamps • Check bag spikes • Reseat tubing in Fluid OUT Sensor • Replace filter if it becomes clogged • Check recirculate line
UNABLE TO CALIBRATE	• Hardware errors	• Call technical support

SYSTEM PARAMETERS SETTING

The CALIBRATION/SET-UP screen is accessed by pressing SERVICE key during power-up
This key appears on the BELMONT logo screen and remains active for 4.5 seconds before system enters the PRIME screen.

DATE/TIME

- Press DATE TIME key.
- Start with either DATE or TIME.
- Enter appropriate date or time. Enter time in 24 hour clock format (i.e 1:00 PM = 13:00).
- Press UPDATE to save the new value.
- Press NEXT to return to setup screen.

DISPLAY BRIGHTNESS

- Press DISPLAY BRIGHT key.
- There are four (4) levels of display brightness. Release the key when the desired brightness appears.
- Default setting is level 4.

KEY RATE

- Press KEYRATE key.
- There are three (3) levels of touch screen sensitivity, FAST, MEDIUM, SLOW.
- Factory set at FAST.
- Press to select the time required to depress a key for stoke to be recognized. (SLOW requires the most time and makes the touch key less sensitive).

BOLUS VOLUME

- Press SETUP BOLUS key.
- Factory set at 200 mL.
- Change the preset volume: Press and hold BOLUS key. The bolus volume can be set from 100 to 1000 mL and can be changed from 100, 200, 400, 500, and 1000 mL each time SETUP BOLUS key is pressed.
- Release the key when the desired volume appears in the volume delivered position.

PRESSURE LIMIT

- Press PRESS LIMIT key.
- Defaults to 300 mmHg.
- Press and hold to change the limit in increment of 50 mmHg.

Rapid Infuser Incompatible Solutions

Solution	Description	Compatible?
Sodium Bicarbonate Solutions		NO
½ NS	0.45% NaCl	NO
3% NS	3% NaCl	NO
Platelets	Should not be diluted, stick to tubing	NO
Cryoprecipitate	Should not be diluted	NO
Calcium Containing Solutions	Ca	NO
Lactated Ringer's Solution	K, Na, Cl, Ca, Lactate	NO
Ringer's Solution	K, Na, Cl, Ca, Lactate	NO
Hartmann's Solution	K, Na, Cl, Ca, Lactate	NO
Hextend	Hetastarch in Lactated Ringer's	NO
8% Amino Acids		NO
Intralipids 10%		NO
Intralipids 20%		NO
D5W	5% Dextrose in Water	NO
D10W	10% Dextrose in Water	NO
D20W	20% Dextrose in Water	NO
D50W	50% Dextrose in Water	NO
D5 ¼ NS	5% Dextrose 0.2% NaCl	NO
D5 ½ NS	5% Dextrose 0.45% NaCl	NO
D5NS	5% Dextrose 0.9% NaCl	NO
D10NS	10% Dextrose 0.9% NaCl	NO
10% Dextran in 5% Dextrose		NO
Granulocyte Suspension		NO

Conversions & Heating			
Heats to 39° C		Heats to 37.5° C	
mL/min	mL/hr	mL/min	mL/hr
2.5	150	60	3600
5	300	70	4200
10	600	80	4800
20	1200	90	5400
30	1800	100	6000
40	2400	200	12000
50	3000	300	18000
		400	24000
		500	30000
		600	36000
		700	42000
		750	45000
		1000	60000

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