

# INOMax DS<sub>IR</sub><sup>®</sup>

(Delivery System)

## Pocket Guide



Pre-Use Procedure  
Backup INOMAX<sup>®</sup> Delivery  
Transport Regulator/Cap Assembly  
Oxygen Dilution Chart  
INOMAX Cylinder Duration Chart  
Circuit Connection Diagrams  
Changing INOMAX Cylinders  
High Calibration Connection Diagrams  
INOMax DS<sub>IR</sub> Disposable Adapters

# IKARIA<sup>®</sup>

For 24 Hour Assistance  
Call 1-877-566-9466

Part No. 20131 Rev-02  
2012-09

**IMPORTANT:** This guide is provided as a convenience and for general information only. Do not use this product without clearly and thoroughly understanding the most recent revision of the INOmax DS<sub>IR</sub><sup>®</sup> Operation Manual. The Operation Manual is the source for specific, updated information regarding warnings, cautions, checklists, diagrams, and/or instructions contained in this guide.

## Overview

### INOmax DS<sub>IR</sub>

The INOmax DS<sub>IR</sub> has an interface using infrared (IR) technology which will allow the INOmax DS<sub>IR</sub> to communicate with the INOmeter<sup>®</sup> (which is mounted to each INOMAX<sup>®</sup> cylinder).

The INOmax DS<sub>IR</sub> cart (PN 10018) has a cover with an infrared transceiver mounted directly above each INOMAX cylinder. When INOMAX cylinders are loaded, communication will take place between the INOmax DS<sub>IR</sub> and the INOmeter after the boot up phase of the INOmax DS<sub>IR</sub> is complete. A cylinder icon will be displayed on the main screen when an INOMAX cylinder is recognized by the INOmax DS<sub>IR</sub>.

### INOmax DS<sub>IR</sub> Transport Regulator/Cap Assembly

This assembly is used during medical transport to provide pressurized INOMAX to the INOmax DS<sub>IR</sub> as well as communicate INOMAX use information via Infrared transceivers between the INOmax DS<sub>IR</sub> (PN 10007) and the INOmeter.

The transport cap assembly provides Infrared technology molded in the cap. This allows the INOmax DS<sub>IR</sub> to communicate via Infrared with the INOmeter, which is mounted to each INOMAX cylinder.

## Definitions

INOMeter - The factory installed INOMeter is designed for use with INOMAX cylinders only. This time-metric device records the amount of time the cylinder valve is opened.

iButton – Raised silver data port on the side of the INOMeter.

## Symbols

Ir  Infrared Input/Output

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## Pre-Use Checkout Outline

- A. Initial Connections
- B. High Pressure Leak Test
- C. Low Range Calibration
- D. Purge and Alarm Verification
- E. Backup INOMAX Delivery Test
- F. INOmax DS<sub>IR</sub> Performance Test
- G. INOblender Test

## A. Initial Connections

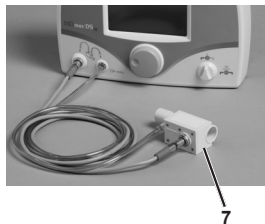
1. Check white plastic tip.



2. Connect high pressure regulator.



3. Connect the INOMAX regulator hose to one of the INOMAX inlets
4. Connect the INOblander inlet hose to the INOmax DS<sub>IR</sub> blender outlet
5. Connect the infrared cable to the back of the INOmax DS<sub>IR</sub>
6. Connect the oxygen hose to the INOblander oxygen inlet
7. Ensure the water separator cartridge/water trap bottle/ sample line and injector module are all in place
8. Turn INOmax DS<sub>IR</sub> ON, verify speaker function.



## B. Perform High Pressure Leak Test

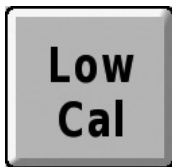
(Open/Close INOMAX cylinder valve)

Wait 30 seconds and ensure no pressure drop.

Note: Make sure INOmax DS<sub>IR</sub> backup and INOblender are OFF.

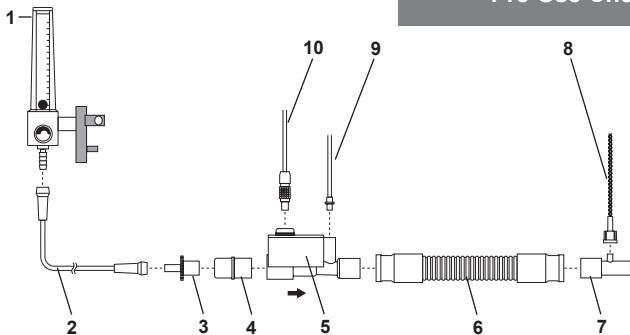


## C. Perform Low Range Calibration (second menu level)



Note: Once the calibration is completed (bars turn green and single tone sounds) press the menu button twice to return to the main screen.





- |  |  |
|--|--|
| 1. O <sub>2</sub> Flowmeter (Connected to wall/tank) | 6. 300mm of 22mm Hose                  |
| 2. O <sub>2</sub> Tubing                             | 7. Gas Sample Tee                      |
| 3. 15M x 4.5mm Adapter                               | 8. Patient Gas Sample Line with Nafion |
| 4. 22M / 15F x 22M / 15F Adapter                     | 9. NO/N <sub>2</sub> Injector Tube     |
| 5. Injector Module                                   | 10. Injector Module Electrical Cable   |

### **(Assemble connectors and tubing as shown)**

## **D. Perform Purge and Alarm Verification**

1. Ensure cylinder valve is closed.
2. Set O<sub>2</sub> flowmeter to 10 L/min.
3. Purge INOmax DS<sub>IR</sub>.
  - a. Set INOMAX dose to 40 ppm
  - b. “Cylinder Valve Closed” alarm will occur
  - c. Cylinder gauge pressure should drop to 0 psig
  - d. Purge is complete when “Low NO/N<sub>2</sub> Pressure” alarm activates
4. Open cylinder valve.
5. Turn INOMAX dose to zero (note: The “Set Dose is Zero, Close Cylinder Valve” indicator will appear).

## E. Perform Backup INOMAX Delivery Test

1. Turn backup delivery ON.

2. Verify “Backup ON” alarm activates.



3. Verify values.

NO = 14-26 ppm
----------------

NO <sub>2</sub> = <1.0 ppm
----------------------------

4. Turn backup delivery OFF.



## F. Complete INOMax DS<sub>IR</sub> Performance Test

Set Dose	40 ppm
Acceptable NO Value	35-45 ppm
Acceptable NO <sub>2</sub> Value	<1.5 ppm
FiO <sub>2</sub>	95% ±3%

1. Ensure oxygen flow of 10 L/min.

2. Set INOMAX dose to 40 ppm and allow values to stabilize.

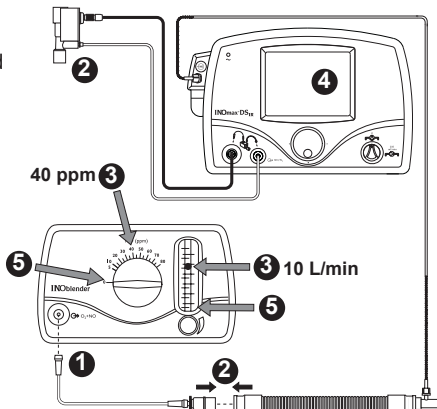
3. Verify values (see table).

4. Turn the INOMAX dose to zero.

## G. Perform INOblender Test

Note: Ensure INOblender inlet hose is connected to the back of the INOmax DS<sub>IR</sub> and the quick-connect cover is in place.

1. Remove the Pre-Use set-up oxygen tubing from the oxygen flowmeter and connect it to the front of the INOblender.
2. Remove the Injector Module from the Pre-Use set-up and reconnect adapters.
3. On the INOblender, set INOMAX dose to 40 ppm and O<sub>2</sub> flow to 10 L/min.
4. Verify values on the INOmax DS<sub>IR</sub>.
5. Turn the dose and flow to zero and remove the Pre-Use set-up from the INOblender.



Acceptable NO Value	32 - 48 ppm
---------------------	-------------

**The INOmax DS<sub>IR</sub> is now ready to connect to the patient.**

- Set the INOMAX dose to be delivered to the patient.
- Set the appropriate alarm settings on the INOmax DS<sub>IR</sub> and breathing device.

**WARNING: If not starting therapy within 10 minutes, depressurize the INOMAX regulator.**

**End of Pre-Use Checkout**

**WARNING:**

When the backup NO delivery mode is used, a flow of at least 5.0 L/min should be present in the ventilator circuit to avoid INOMAX concentrations greater than 40 ppm.

The backup is intended for short term use when the electronic delivery system fails until a replacement NO delivery can be brought to the bedside.

If the backup is on, along with the main delivery system an INOMAX value greater than set will be delivered (a high priority alarm will be present).

The backup mode delivers a variable concentration of NO to the patient depending on the ventilator flow being used. See table below for details.

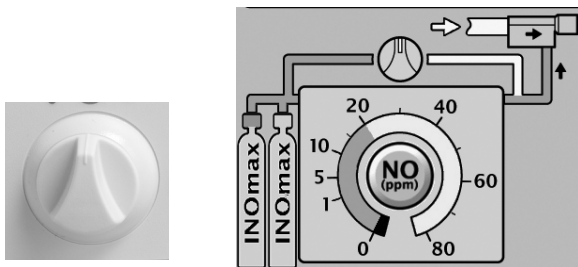
The table below indicates the nominal concentrations delivered for different ventilator gas flows.

Ventilator/Gas Flow (L/min)	5	7.5	10	15	20
NO Concentration (ppm)	40	27	20	13	10

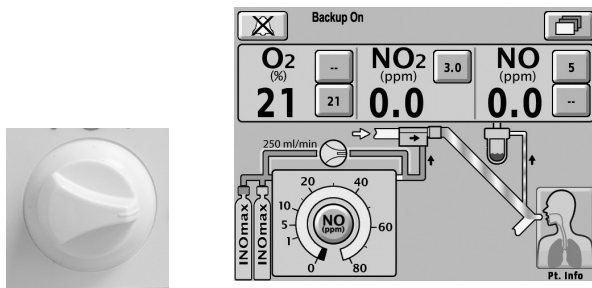
INOMAX cylinder conc. X 0.25 L/min / ventilator flow = delivered dose

The backup delivery provides a fixed flow of 250 mL/min of INOMAX directly into the ventilator circuit through the Injector Module.

Backup NO delivery is completely pneumatic and is not reliant on the operation of the main system.



**Backup delivery mode OFF.**



**Backup delivery mode ON (with a Low Priority alarm).**

### Transport Regulator/Cap Assembly

#### WARNING:

- A new INOMAX cylinder and regulator must be purged before use to ensure the patient does not receive greater than 1.0 ppm of NO<sub>2</sub>.
- Loss of communication between the INOMax DS<sub>IR</sub> and the INOMAX cylinder for more than one hour will result in interruption of INOMAX delivery.

Caution: When using the Transport Regulator/Cap Assembly (PN 10022) ensure the cap is in place on the cylinder and the infrared cable is connected to the infrared connector port on the back of the INOMax DS<sub>IR</sub>.

Note: Check the INOMAX cylinder for the correct product identity labels, cylinder concentration and expiration date. Ensure the INOMAX gas cylinder has more than 200 psig.

#### Step One

Note: Ensure the white plastic tip is in place on the regulator connector and not chipped or cracked (see Figure 2).

Connect a high pressure regulator to an INOMAX cylinder and tighten the fitting to the INOMAX cylinder (see Figure 1).



Figure 1



Figure 2

## Step Two

Connect the INOMAX regulator hose to one of the INOMAX inlets on the back of the INOMax DS<sub>IR</sub> (see Figure 3).



Figure 3

## Step Three

Connect the Infrared cable from the Transport Regulator/Cap Assembly to the back of the INOMax DS<sub>IR</sub> (see Figure 4).



Figure 4

## Transport Regulator/ Cap Assembly

### Step Four

Place the Cap Assembly over the INOMeter (see Figure 5).

Note: Be sure to align the keyway inside the Cap Assembly with the iButton on the INOMeter (see Figure 5 and 6).



Figure 5

iButton

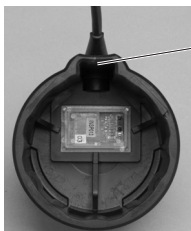


Figure 6

### Step Five

Grasp the Cap Assembly to open cylinder valve (see Figure 7 and 8).



Figure 7

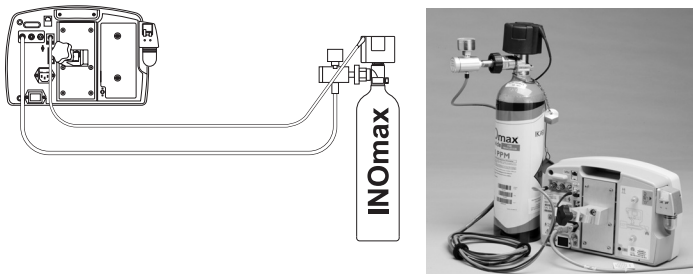


Figure 8



## Final Set-up Diagram

The following diagram and photo illustrates all of the components connected.



## Additional Information

Communication will take place between the INOmax DS<sub>IR</sub> and the INOmeter after the boot up phase of the INOmax DS<sub>IR</sub> is complete.

Note: Cylinder icons are not visible and the dose control button will remain inactive until the INOmax DS<sub>IR</sub> recognizes an INOMAX cylinder.

Note: When using the Transport Regulator/Cap Assembly only one cylinder will be displayed (see Figure 9).

## Proceed with the INOmax DS<sub>IR</sub> Pre-Use Checkout

(see page 6)

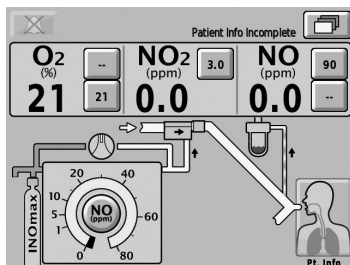


Figure 9

## Oxygen Dilution Chart

For delivery with 800 ppm cylinder of  
INOMAX (nitric oxide) for inhalation.

(Illustrative Only)

		Set FiO <sub>2</sub>				
		.21	.40	.60	.80	1.00
INOMAX Dose	10	0.21	0.40	0.59	0.79	0.99
	20	⚠ 0.20	0.39	0.59	0.78	0.98
	40	⚠ 0.20	0.38	0.57	0.76	0.95
	80	⚠ 0.19	0.36	0.54	0.72	0.90
		Actual FiO <sub>2</sub>				

⚠ Caution FiO<sub>2</sub> less than 21%

Please Note:

The calculations on this chart have been determined based on an 800 ppm cylinder of INOMAX (nitric oxide) for inhalation.

This chart is representative of a range of doses available on the INOmax DS<sub>IR</sub> and doses higher than 20 ppm are not intended as the recommended therapeutic dose.


Calculations are considered estimates and may vary under clinical conditions.

All numbers have been rounded to the nearest hundredth.

## INOMAX Cylinder 88-Size

For an **88-Size** 800 ppm Cylinder Concentration\*  
(Illustrative Only)

		FLOW			
		5 L/min	10 L/min	20 L/min	40 L/min
INOMAX Dose	5 ppm	43.3 Days	21.7 Days	10.8 Days	5.4 Days
	10 ppm	21.5 Days	10.7 Days	5.4 Days	2.7 Days
	20 ppm	10.6 Days	5.3 Days	2.6 Days	31 Hours
	40 ppm	5.2 Days	2.6 Days	31 Hours	15 Hours
	80 ppm	2.4 Days	29 Hours	14 Hours	7 Hours



This chart is representative of a range of doses available on the INOMax DS<sub>IR</sub> and doses higher than 20 ppm are not intended as the recommended therapeutic dose.


\* All calculations for the table above are based on a full cylinder of 2000 psig, 1963 liters “88” cylinder, and also accounting for cylinder change at 200 psig. The figures are calculated on total continuous flow cylinder conversion factor 0.98.

- INOMAX flow = [Desired dose X total ventilator flow] / [Cylinder concentration - desired dose]
- Cylinder volume = Cylinder conversion factor X cylinder pressure psig
- Cylinder duration = Cylinder volume / INOMAX flow rate

Calculations are considered estimates and may vary under clinical circumstances. For more information, call 1-877-KNOW-INO (1-877-566-9466).

## INOMAX Cylinder D-Size

For a **D-Size** 800 ppm Cylinder Concentration\*  
(Illustrative Only)

		<b>FLOW</b>				
		5 L/min	10 L/min	20 L/min	40 L/min	
<b>INOMAX Dose</b>	5 ppm	<b>7.8 Days</b>	<b>3.9 Days</b>	<b>46 Hours</b>	<b>23 Hours</b>	
	10 ppm	<b>3.9 Days</b>	<b>46 Hours</b>	<b>23 Hours</b>	<b>11 Hours</b>	
	20 ppm	<b>45 Hours</b>	<b>22 Hours</b>	<b>11 Hours</b>	<b>5 Hours</b>	
	40 ppm	<b>22 Hours</b>	<b>11 Hours</b>	<b>5 Hours</b>	<b>2 Hours</b>	
	80 ppm	<b>10 Hours</b>	<b>5 Hours</b>	<b>2 Hours</b>	<b>1 Hour</b>	

### Typically used in transport

This chart is representative of a range of doses available on the INOMAX DS<sub>IR</sub> and doses higher than 20 ppm are not intended as the recommended therapeutic dose.

\* All calculations for the table above are based on a full cylinder of 2000 psig, 353 liter "D" cylinder, and also accounting for cylinder change at 200 psig. The figures are calculated on total continuous flow cylinder conversion factor 0.18.

- $\text{INOMAX flow} = \frac{[\text{Desired dose} \times \text{total ventilator flow}]}{[\text{Cylinder concentration} - \text{desired dose}]}$
- $\text{Cylinder volume} = \text{Cylinder conversion factor} \times \text{cylinder pressure psig}$
- $\text{Cylinder duration} = \text{Cylinder volume} / \text{INOMAX flow rate}$

Calculations are considered estimates and may vary under clinical circumstances. For more information, call 1-877-KNOW-INO (1-877-566-9466).

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Proper use of these products depends on careful reading and understanding of labeling and instructions. Please refer to the INOmax DS<sub>IR</sub> and INOblender operation manuals for guidance. Also refer to the specific breathing device operation manual or instructions for use.

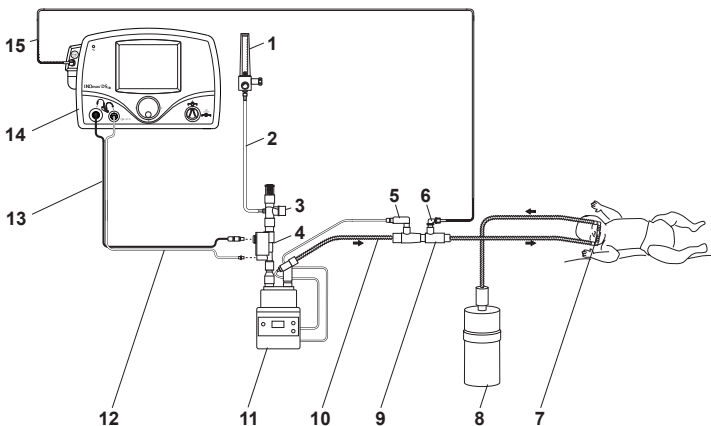
### **INOmax DS<sub>IR</sub> Warnings:**

- **INOmax DS<sub>IR</sub> subtracts gas from the breathing circuit via the gas sampling system at 230 mL per minute; this can affect the sensitivity of a flow triggered synchronized breath mode of some ventilators. The trigger sensitivity of the ventilator should be checked after connecting the INOmax DS<sub>IR</sub> to the breathing circuit.**
- **Patient disconnect and high-pressure alarms are required for the ventilator.**

### **INOmax DS<sub>IR</sub> Cautions:**

- Insert the Injector Module on the dry side of the breathing circuit prior to the humidifier (this will ensure correct flow measurement).
- Avoid medications interfering with the gas monitoring system; administer any aerosolized medications distal to the sampling tee.

## Connection to the A-Plus Medical Babi-Plus Bubble CPAP



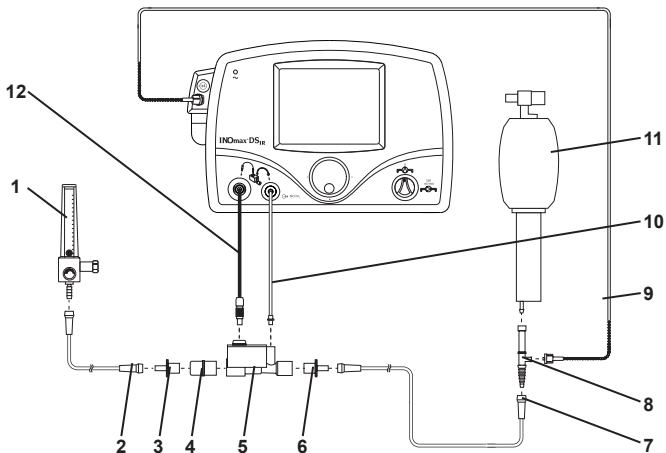
- |                                  |   |
|----------------------------------|---|
| 1. Oxygen Source                 | 9. Tee Adapter                          |
| 2. Oxygen Tubing                 | 10. Breathing Circuit                   |
| 3. Pressure Relief Manifold      | 11. Humidifier                          |
| 4. Injector Module               | 12. NO/N <sub>2</sub> Injector Tube     |
| 5. Temperature Probe             | 13. Injector Module Electrical Cable    |
| 6. 90 Degree Sample Port Adapter | 14. INOMax DS <sub>1R</sub>             |
| 7. Nasal Prongs                  | 15. Patient Gas Sample Line with Nafion |
| 8. Babi Plus Bubble PAP Valve    |   |

## Connection to Bagging Systems While Using the Injector Module

**WARNING:** To minimize the delivered concentration of NO<sub>2</sub>, the following steps should be taken for use with the manual resuscitator bags:

- Use the smallest bag adequate to deliver the desired tidal volume.
- Inspiratory tubing lengths greater than 72 inches should not be used.
- Use the highest fresh gas flow rated (up to 15 L/min) that is practical.
- Use the lowest practical inspired oxygen concentration.
- After starting fresh gas flow, squeeze the bag several times to empty residual gas in the bag prior to using the system to ventilate a patient.



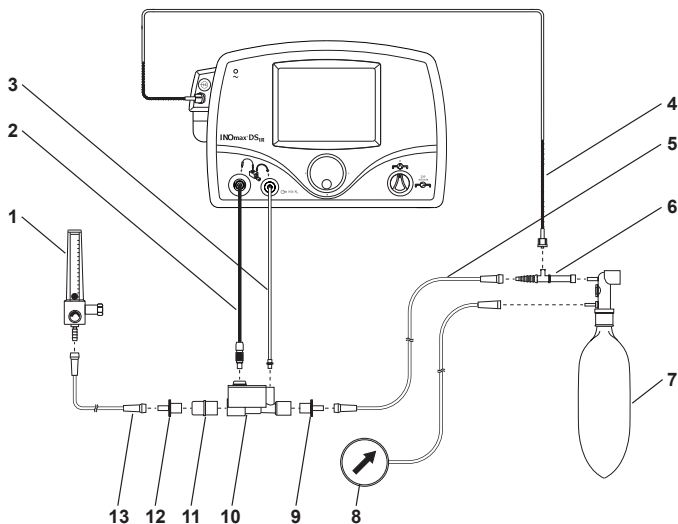


1. O<sub>2</sub> Flowmeter (wall outlet or cylinder)
2. O<sub>2</sub> Tubing
3. 15M X 4.5mm Adapter
4. 22M/15F X 22M/15F Adapter
5. Injector Module
6. 15M X 4.5mm Adapter
7. O<sub>2</sub> Tubing
8. O<sub>2</sub> Tubing Sample Tee
9. Patient Gas Sample Line with Nafion
10. NO/N<sub>2</sub> Injector Tube
11. Resuscitator Bag with O<sub>2</sub> Reservoir
12. Injector Module Electrical Cable

### WARNING:

- The hyperinflation bag will, under some conditions, contain  $\text{NO}_2$  in excess of 1 ppm. Use of large tidal volume breaths may expose the patients to the  $\text{NO}_2$  present in the bag, for part of the breath. In general, if the inspiratory flow rate induced by the manual ventilation does not exceed the fresh gas flow rate, the patient should not be exposed to the concentrations of  $\text{NO}_2$  present in the hyperinflation bag.
- Adult and infant hyperinflation bags generate more  $\text{NO}_2$  when used at lower minute ventilation. If use of the bag is interrupted (for example to adjust the tracheal tube), before resuming ventilation of the patient, the user should squeeze the bag several times to empty residual gas from the bag.
- Because of the potential for inhalation of excessive concentrations of  $\text{NO}_2$ , and the difficulty in monitoring the peak inhaled  $\text{NO}_2$  concentrations, ventilation with a hyperinflation bag or self inflating bag is intended only for short term use.
- The monitoring system within the INOmax DSIR will not detect generation of  $\text{NO}_2$  within the hyperinflation bag or self-inflating bag devices and the alarms for excessive  $\text{NO}_2$  cannot warn of  $\text{NO}_2$  produced within the manual bag system.
- To minimize the delivered concentration of  $\text{NO}_2$ , the following steps should be taken for use with the manual resuscitator bags:
  - Concentrations greater than 20 ppm  $\text{NO}$  should not be used because of excessive  $\text{NO}_2$  generation.
  - Use the smallest bag adequate to deliver the desired tidal volume.
  - Inspiratory tubing lengths greater than 72 inches should not be used.
  - Use the highest fresh gas flow rate (up to 15 L/min) that is practical.
  - Use the lowest practical inspired oxygen concentration.
  - After starting fresh gas flow, squeeze the bag several times to empty residual gas in the bag prior to using the system to ventilate a patient.

## Connection to Bagging Systems While Using the Injector Module



- |  |                               |
|--|-------------------------------|
| 1. O <sub>2</sub> Flowmeter            | 8. Pressure Gauge             |
| 2. Injector Module Electrical Cable    | 9. 15M X 4.5mm Adapter        |
| 3. NO/N <sub>2</sub> Injector Tube     | 10. Injector Module           |
| 4. Patient Gas Sample Line with Nafion | 11. 22M/15F X 22M/15F Adapter |
| 5. O <sub>2</sub> Tubing               | 12. 15M X 4.5mm Adapter       |
| 6. O <sub>2</sub> Tubing Sample Tee    | 13. O <sub>2</sub> Tubing     |
| 7. Hyper-Inflation Bag                 |                               |

## Connection to a Bunnell Life Pulse High Frequency Ventilator Circuit

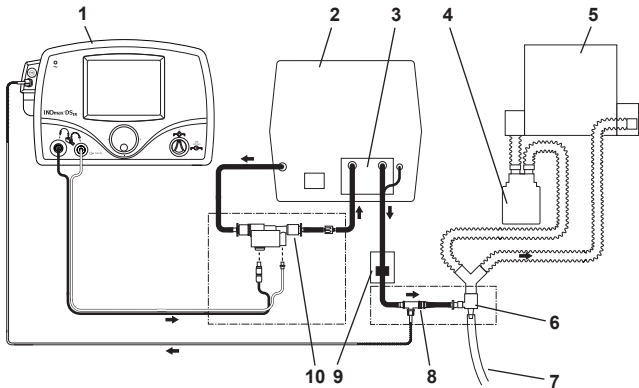
### WARNING:

- The INOmax DS<sub>IR</sub> backup mode (250 mL/min.) should not be used with the Bunnell Life Pulse as ventilator flow rates are normally below the recommended ventilator flows.
- Place the Life Pulse in Standby prior to suctioning the patient to avoid NO delivery transiently exceeding the set dose by up to 30 ppm. Press ENTER to reestablish ventilation as soon as the catheter is removed from the airway. This will limit the extent of over delivery above the NO set dose.

### Caution:

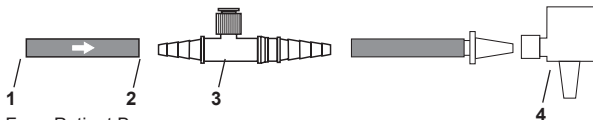
- If the set dose is below 5 ppm and the Servo pressure is 2.0 psig. or less, this will result in flow rates outside of the specification of the Injector Module and fluctuating NO values may result.
- A one-way valve should be placed between the injector module and the humidifier chamber to prevent water from backing up into the injector module if the Life Pulse is either put into Standby or cycled OFF.
- There are higher pressures in the breathing circuit than normal; use only parts provided in disposable package #50046 and tightly secure all connections.

## Connection to a Bunnell Life Pulse High Frequency Ventilator Circuit (cont.)



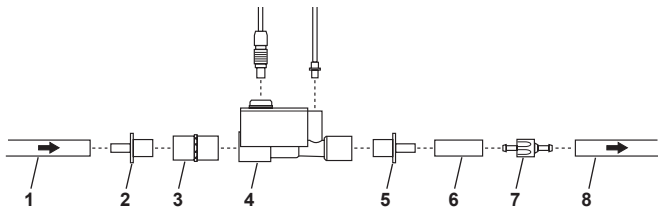
- |                            |                      |
|----------------------------|----------------------|
| 1. INOmax DS <sub>IR</sub> | 6. Life Port Adapter |
| 2. Bunnell Life Pulse      | 7. Endotracheal Tube |
| 3. Humidifier              | 8. Sample Tee        |
| 4. Humidifier              | 9. Patient Box       |
| 5. Conventional Ventilator | 10. Injector Module  |

### Connecting INOmax DS<sub>IR</sub> Sample Tee to the Bunnell Life Pulse Circuit



1. From Patient Box
2. Cut Green tube at midpoint (approximately 6 in. from the Life Port Adapter)
3. Insert Sample Tee
4. Life Port Adapter

### Connecting INOmax DS<sub>IR</sub> Injector Module to the Bunnell Life Pulse Circuit

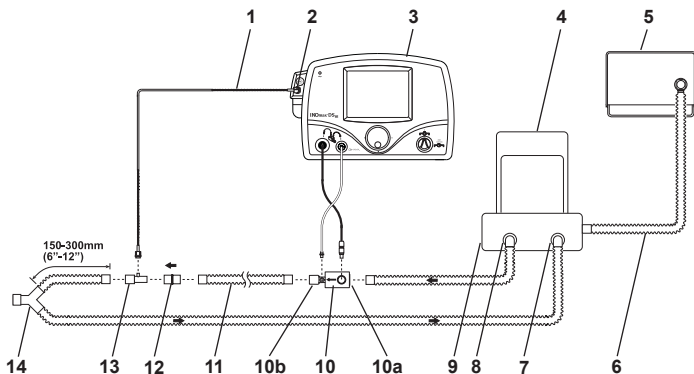


1. Gas Out Tube from Vent
2. 15M X 4.5mm I.D. Adapter
3. 22M/15F X 22M/15F Adapter
4. Injector Module
5. 15M X 4.5mm I.D. Adapter
6. 3cm Piece of Green Gas Out Tube
7. One-Way Valve
8. Green Gas Out Tube to Humidifier

#### WARNING:

- The INOmax DS<sub>IR</sub> backup mode (250 mL/min.) should not be used with the Bunnell Life Pulse as ventilator flow rates are normally below the recommended ventilator flows.
- Place the Life Pulse in Standby prior to suctioning the patient to avoid NO delivery transiently exceeding the set dose by up to 30 ppm. Press ENTER to reestablish ventilation as soon as the catheter is removed from the airway. This will limit the extent of over delivery above the NO set dose.

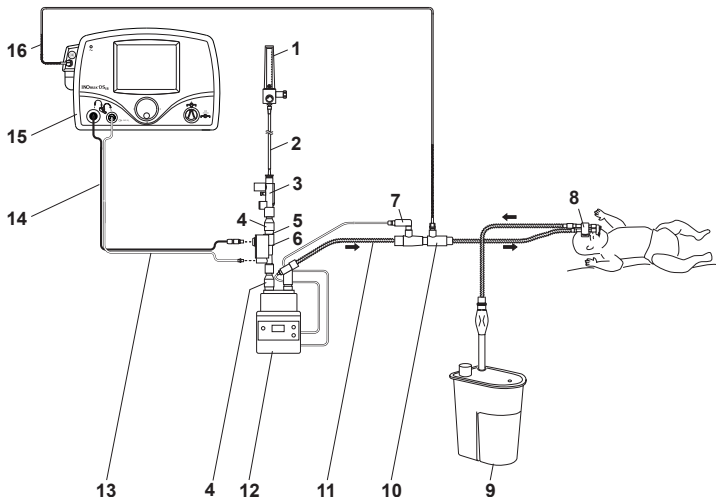
## Connection to a Circle Anesthesia System



- |   |                               |
|---|-------------------------------|
| 1. Patient Gas Sample Line with Nafion      | 8. Absorber Inspiratory Port  |
| 2. Patient Gas Sample Line Input Connection | 9. Absorber                   |
| 3. INOmax DS <sub>IR</sub>                  | 10. Injector Module           |
| 4. Bellows Assembly                         | a. Injector Module Input End  |
| 5. Ventilator                               | b. Injector Module Output End |
| 6. Ventilator Drive Gas                     | 11. Inspiratory Tubing        |
| 7. Absorber Expiratory Port                 | 12. 22M/15F X 22M/15F Adapter |
|   | 13. Gas Sample Tee            |
|   | 14. Patient Wye               |

**WARNING:** Fresh gas flow should be equal to or greater than patient minute ventilation to avoid recirculation of gases.

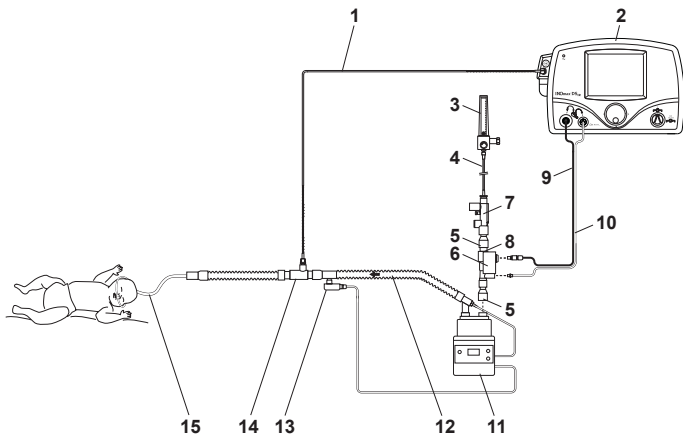
## Connection to the Fisher & Paykel Bubble CPAP



- |                                  |   |
|----------------------------------|---|
| 1. Oxygen Source                 | 10. F/P Inline Infant Nebulizer Kit (RT010) Adapter |
| 2. Oxygen Tubing                 | 11. Breathing Circuit                               |
| 3. Bubble CPAP Pressure Manifold | 12. Humidifier                                      |
| 4. 22F X 15M Adapter             | 13. NO/N <sub>2</sub> Injector Tube                 |
| 5. 22M/15F X 22M/15F Adapter     | 14. Injector Module Electrical Cable                |
| 6. Injector Module               | 15. INOmax DSIR                                     |
| 7. Temperature Probe             | 16. Patient Gas Sample Line with Nafion             |
| 8. Nasal Prong Infant Interface  |   |
| 9. Bubble CPAP Generator         |   |

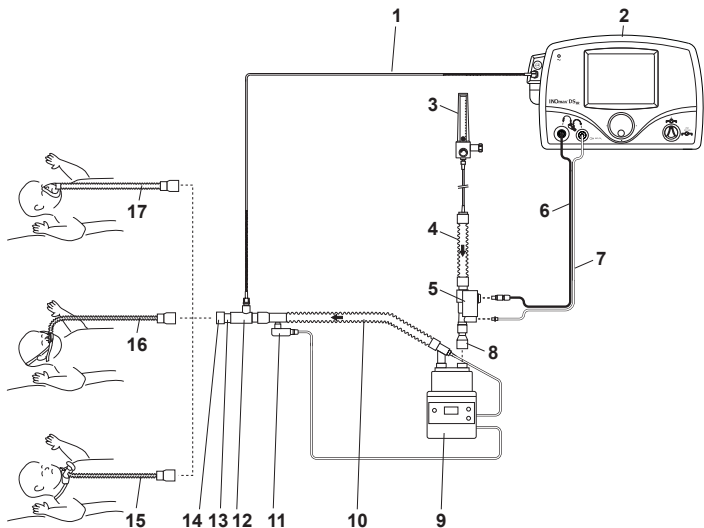


## Connection to the Fisher & Paykel Infant Circuit Nasal Cannula



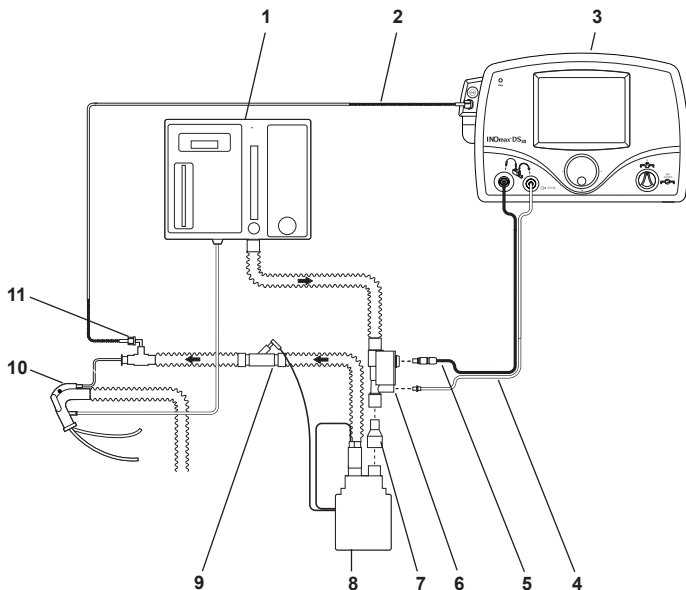
- |  |                                     |
|--|-------------------------------------|
| 1. Patient Gas Sample Line with Nafion | 9. Injector Module Electrical Cable |
| 2. INOMax DS <sub>IR</sub>             | 10. NO/N <sub>2</sub> Injector Tube |
| 3. Oxygen Source                       | 11. Humidifier                      |
| 4. Oxygen Tubing                       | 12. Breathing Circuit               |
| 5. 22F X 15M Adapter                   | 13. Temperature Probe               |
| 6. Injector Module                     | 14. Gas Sample Tee                  |
| 7. Pressure Relief Manifold            | 15. Nasal Cannula                   |
| 8. 22M/15F X 22M/15F Adapter           |                                     |

## Connection to the Fisher & Paykel Optiflow Breathing Circuit



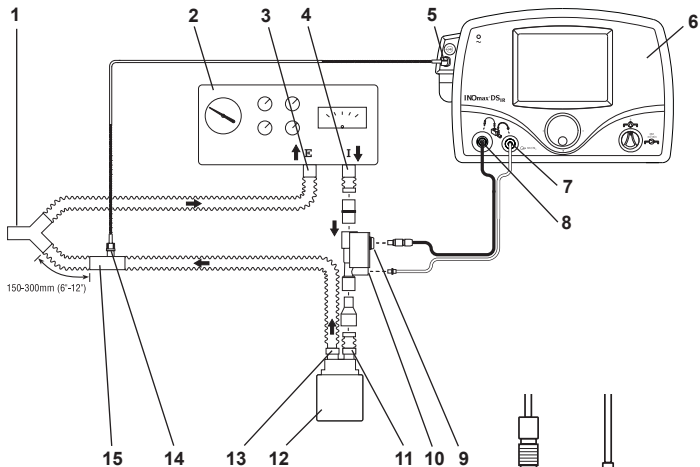
1. Patient Gas Sample Line with Nafion
2. INOmax DSIR
3. Oxygen Source
4. Breathing Circuit Hose
5. Injector Module
6. Injector Module Electrical Cable
7. NO/N<sub>2</sub> Injector Tube
8. 22F X 15M Adapter
9. Humidifier
10. Breathing Circuit
11. Temperature Probe
12. Gas Sample Tee
13. 22M/15F X 22M/15F Adapter
14. 22 mm ID X 22 mm ID Cuff Adapter
15. Optiflow Tracheostomy
16. Optiflow Nasal Cannula
17. Optiflow Mask

## Connection to the Hamilton Arabella Nasal CPAP

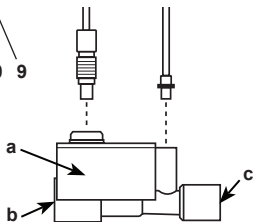


- |  |                                   |
|--|-----------------------------------|
| 1. Arabella                            | 7. 22F X 15M Adapter              |
| 2. Patient Gas Sample Line with Nafion | 8. Humidifier                     |
| 3. INOmax DS <sub>IR</sub>             | 9. Heated Delivery Circuit        |
| 4. NO/N <sub>2</sub> Injector Tube     | 10. Universal Generator           |
| 5. Injector Module Electrical Cable    | 11. 90 Degree Sample Port Adapter |
| 6. Injector Module                     |                                   |

## ICU Ventilator Circuit

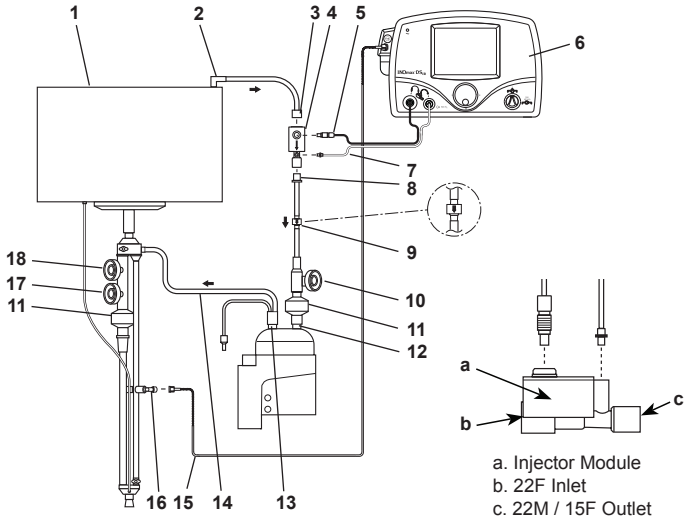


1. Patient Wye
2. Ventilator
3. Ventilator Expiratory Port
4. Ventilator Inspiratory Port
5. Patient Gas Sample Line Input Connection
6. INOmax DS<sub>IR</sub>
7. NO/N<sub>2</sub> Injector Tube Front Panel Connection
8. Injector Module Electrical Cable Front Panel Connection
9. Injector Module Electrical Cable Connection
10. Injector Module NO/N<sub>2</sub> Injector Tube Connection
11. Humidifier Inlet
12. Humidifier
13. Humidifier Outlet
14. Patient Gas Sample Line with Nafion
15. Gas Sample Tee



- a. Injector Module
- b. 22F Inlet
- c. 22M / 15F Outlet

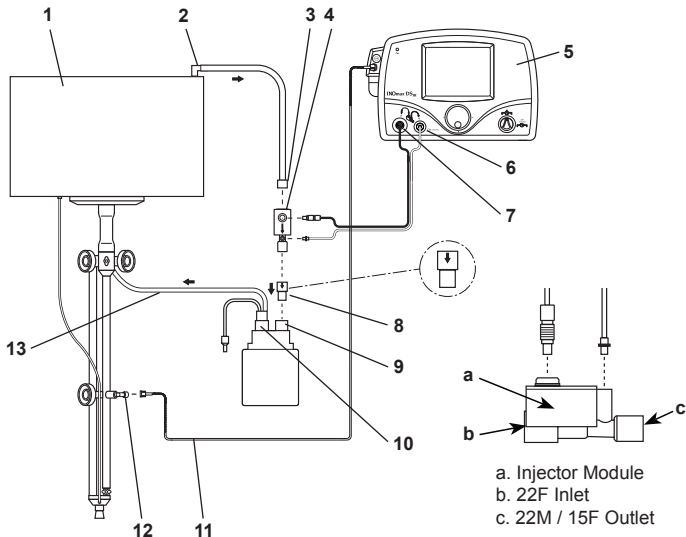
## Sensormedics 3100A/B High Frequency Oscillatory Ventilator with a Filtered Circuit



- |  |   |
|--|---|
| 1. Sensormedics 3100A/B Ventilator             | 10. Paw Limit Valve Control             |
| 2. Ventilator Outlet                           | 11. Filter                              |
| 3. 22M Adapter                                 | 12. Humidifier Inlet                    |
| 4. Injector Module                             | 13. Humidifier Outlet                   |
| 5. Injector Module Electrical Cable Connection | 14. Bias Flow Tube                      |
| 6. INOmax DSIR                                 | 15. Patient Gas Sample Line with Nafion |
| 7. NO/N <sub>2</sub> Injector Tube             | 16. 90 Degree Sample Port Adapter       |
| 8. 15M Adapter                                 | 17. Dump Valve Control                  |
| 9. One-Way Valve                               | 18. Paw Control Valve                   |

**WARNING: Omission of the one-way valve may result in high NO delivery.**

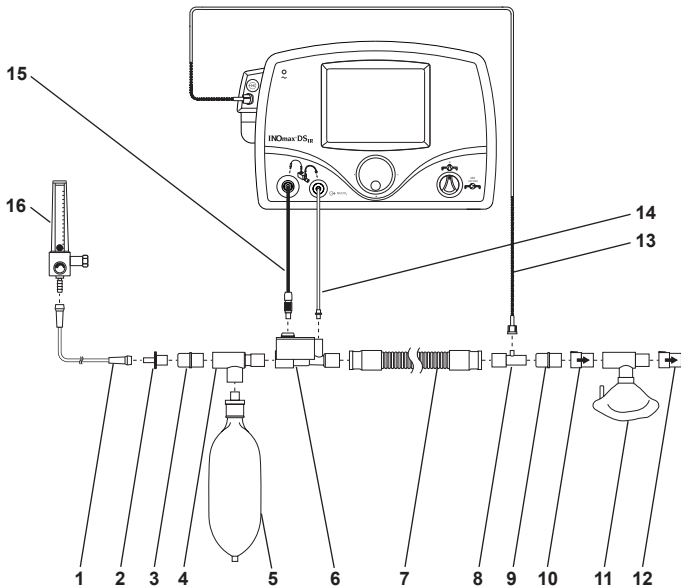
## Sensormedics 3100A/B High Frequency Oscillatory Ventilator with a Rigid or Flexible Circuit



- |  |   |
|--|---|
| 1. Sensormedics 3100A/B Ventilator             | 9. Humidifier Inlet                     |
| 2. Ventilator Outlet                           | 10. Humidifier Outlet                   |
| 3. 22M Adapter                                 | 11. Patient Gas Sample Line with Nafion |
| 4. Injector Module                             | 12. 90 Degree Sample Port Adapter       |
| 5. INOmax DS <sub>IR</sub>                     | 13. Bias Flow Tube                      |
| 6. NO/N <sub>2</sub> Injector Tube Connection  |   |
| 7. Injector Module Electrical Cable Connection |   |
| 8. One-Way Valve                               |   |

**WARNING: Omission of the one-way valve may result in high NO delivery.**

## Connection to Spontaneous Breathing Patient on a Mask Circuit

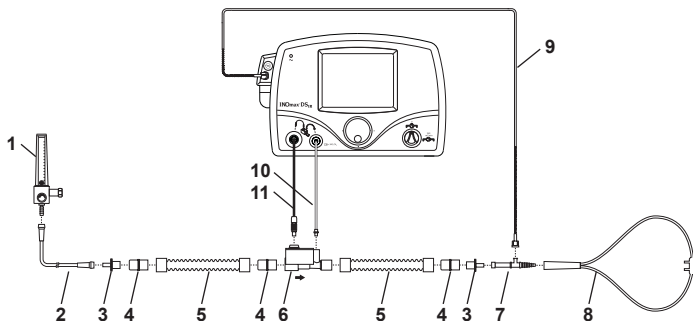


- |                              |  |
|------------------------------|--|
| 1. O <sub>2</sub> Tubing     | 9. 22M/15F X 22M/15F Adapter                           |
| 2. 15M X 4.5mm Adapter       | 10. One-Way Valve                                      |
| 3. 22M/15F X 22M/15F Adapter | 11. Sealed Face Mask                                   |
| 4. Breathing Circuit Tee     | 12. One-Way Valve                                      |
| 5. Breathing Circuit Bag     | 13. Patient Gas Sample Line with Nafion                |
| 6. Injector Module           | 14. NO/N <sub>2</sub> Injector Tube                    |
| 7. Breathing Circuit Hose    | 15. Injector Module Electrical Cable                   |
| 8. Gas Sample Tee            | 16. O <sub>2</sub> Flowmeter (wall outlet or cylinder) |

## Connection to Spontaneous Breathing Patient on a Nasal Cannula

The INOmax DS<sub>IR</sub> can be used with nasal cannula to deliver INOMAX concentrations from 5-80 ppm and an oxygen flow rate as low as 2 L/min.

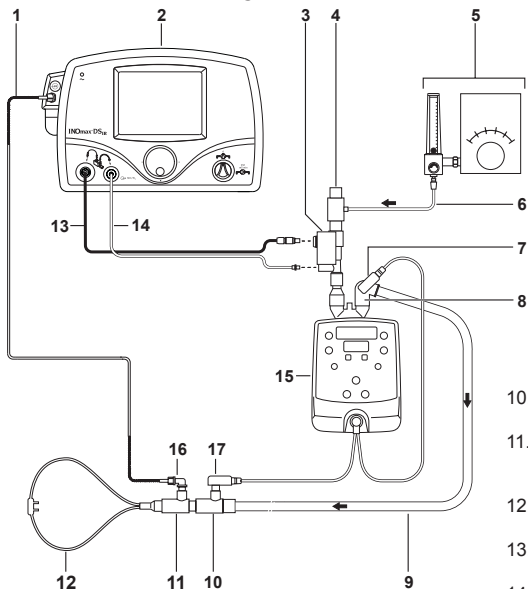
**WARNING: Do not use the INOmax DS<sub>IR</sub> backup mode with flow rates less than 5 L/min.**



1. O<sub>2</sub> Flowmeter
2. O<sub>2</sub> Tubing
3. 15M x 4.5mm Adapter
4. 22M/15F x 22M/15F Adapter
5. 300mm of 22mm Hose
6. Injector Module
7. O<sub>2</sub> Tubing Sample Tee
8. Patient Nasal Cannula
9. Patient Gas Sample Line with Nafion
10. NO/N<sub>2</sub> Injector Tube
11. Injector Module Electrical Cable



## Connection to the Teleflex Medical Comfort Flo Humidification System

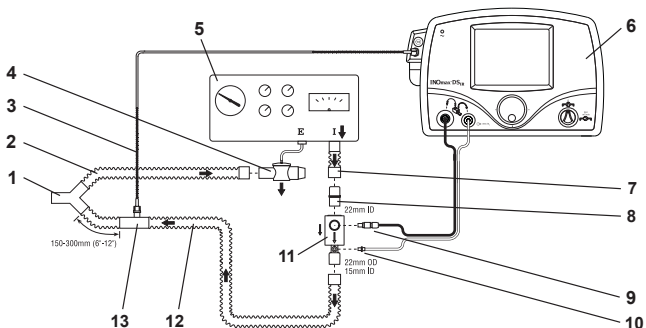


1. Patient Gas Sample Line with Nafion
2. INOmax DS<sub>IR</sub>
3. Injector Module
4. System Pressure Relief Valve

5. Air/Oxygen Blender or Oxygen Blender
6. Oxygen Tubing
7. Temperature Probe (Short Cable)
8. Angled 22 mm Connector
9. Patient Circuit

10. Temperature Probe Connector
11. Second Temperature Probe Connector
12. Comfort Flo Cannula
13. Injector Module Electrical Cable
14. NO/N<sub>2</sub> Injector Tube
15. ConchaTherm Heated Humidifier
16. 90 Degree Sample Port Adapter
17. Temperature Probe (Long Cable)

## Transport Ventilator Diagram



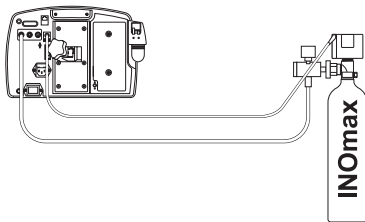
- |  |  |
|--|--|
| 1. Patient Wye                         | 7. Ventilator Inspiratory Port         |
| 2. Expiratory Breathing Circuit Hose   | 8. 22M/15F X 22M/15F Adapter           |
| 3. Patient Gas Sample Line with Nafion | 9. Injector Module Electrical Cable    |
| 4. Ventilator Expiratory Valve         | 10. NO/N <sub>2</sub> Injector Tube    |
| 5. Ventilator                          | 11. Injector Module                    |
| 6. INOmax DS <sub>IR</sub>             | 12. Inspiratory Breathing Circuit Hose |
|  | 13. Gas Sample Tee                     |

**WARNING:** If the INOmax DS<sub>IR</sub> is to be used in a transport vehicle, it should be affixed to the transport mounting post part number 10009 (see Figure 10).

Figure 10



Figure 11

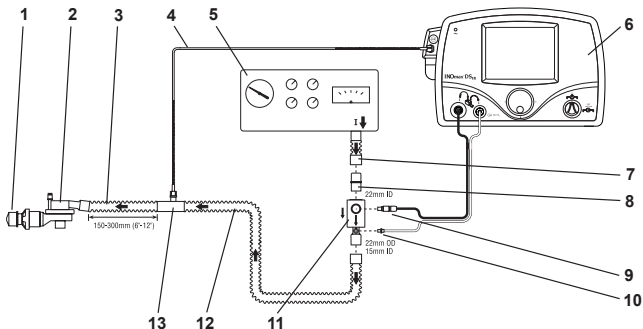


**Caution:**

When using the Transport Regulator/Cap Assembly (PN 10022) ensure the cap is fully seated and in place on the INOmeter and the infrared cable is connected and latched to the infrared connector port on the back of the INOmax DS<sub>IR</sub> (see Figure 11).

It is recommended that a second transport regulator cap assembly is available during all transports.

## Single-Limb Transport Ventilator Diagram



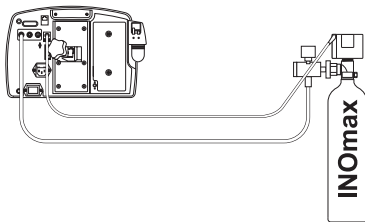
- |   |  |
|---|--|
| 1. PEEP/Exhalation Valve                  | 7. Ventilator Inspiratory Port         |
| 2. Patient Wye                            | 8. 22M/15F X 22M/15F Adapter           |
| 3. Circuit Hose                           | 9. Injector Module Electrical Cable    |
| 4. Patient Gas Sample Line<br>with Nafion | 10. NO/N <sub>2</sub> Injector Tube    |
| 5. Ventilator                             | 11. Injector Module                    |
| 6. INOMax DS <sub>IR</sub>                | 12. Inspiratory Breathing Circuit Hose |
|   | 13. Gas Sample Tee                     |

**WARNING:** If the INOmax DS<sub>IR</sub> is to be used in a transport vehicle, it should be affixed to the transport mounting post part number 10009 (see Figure 10).

Figure 10



Figure 11

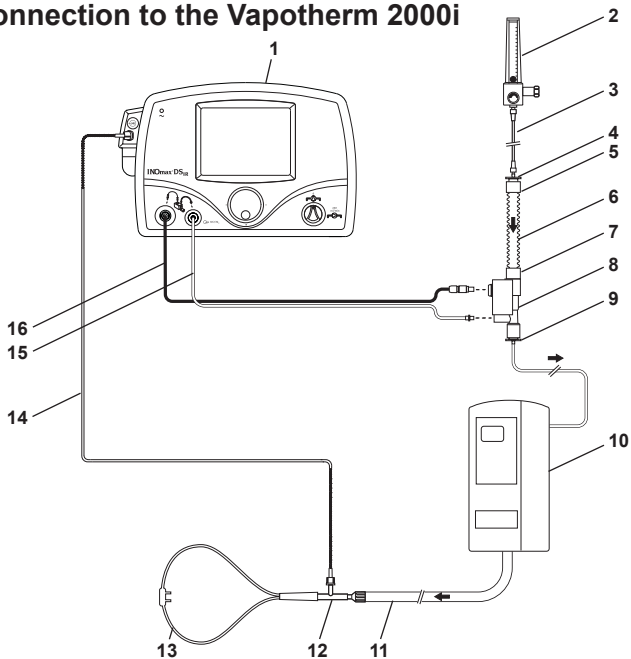


**Caution:**

When using the Transport Regulator/Cap Assembly (PN 10022) ensure the cap is fully seated and in place on the INOmeter and the infrared cable is connected and latched to the infrared connector port on the back of the INOmax DS<sub>IR</sub> (see Figure 11).

It is recommended that a second transport regulator cap assembly is available during all transports.

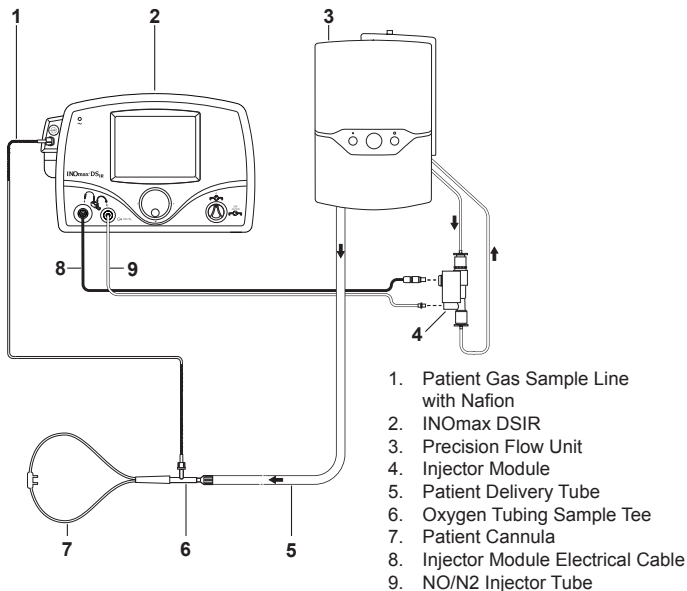
## Connection to the Vapotherm 2000i



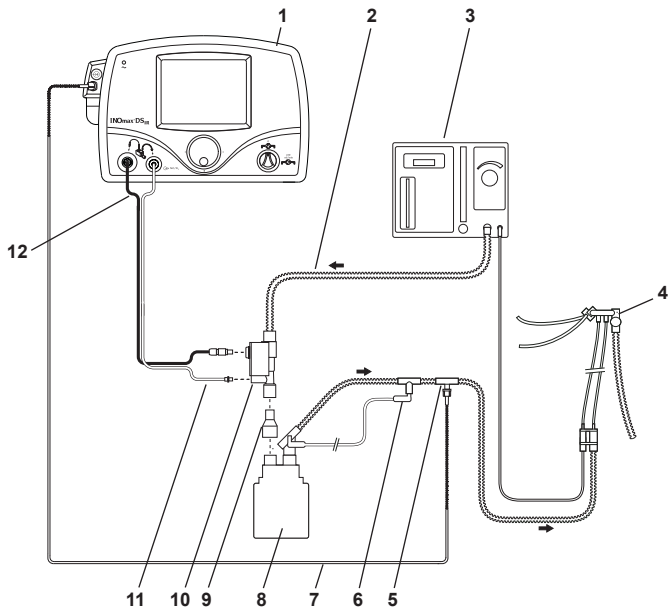
- |                              |  |
|------------------------------|--|
| 1. INOmax DS <sub>IR</sub>   | 9. 15M x 4.5mm Adapter                     |
| 2. O <sub>2</sub> Flowmeter  | 10. Vapotherm 2000i                        |
| 3. O <sub>2</sub> Tubing     | 11. Patient Delivery Tube                  |
| 4. 15M x 4.5mm Adapter       | 12. O <sub>2</sub> Tubing Sample Tee       |
| 5. 22M/15F x 22M/15F Adapter | 13. Patient Cannula                        |
| 6. 300mm of 22mm Hose        | 14. Patient Gas Sample Line<br>with Nafion |
| 7. 22M/15F x 22M/15F Adapter | 15. NO/N <sub>2</sub> Injector Tube        |
| 8. Injector Module           | 16. Injector Module Electrical Cable       |

## Connection to the Vapotherm Precision Flow

- The INOmax DS<sub>IR</sub> adds NO/N<sub>2</sub> gas flow to the breathing circuit flow in proportion to the NO setting (up to 10% at 80 ppm) and subtracts gas from the breathing circuit via gas sampling at a nominal flow rate of 0.23 L/min.
- These effects impact the delivered gas flow rate when using the Vapotherm Precision Flow. It is recommended that after an NO setting change the user checks the delivered gas flow rate and adjusts the gas source flow rate as necessary.
- Follow all manufacturer instructions for connection to the Vapotherm Precision Flow.



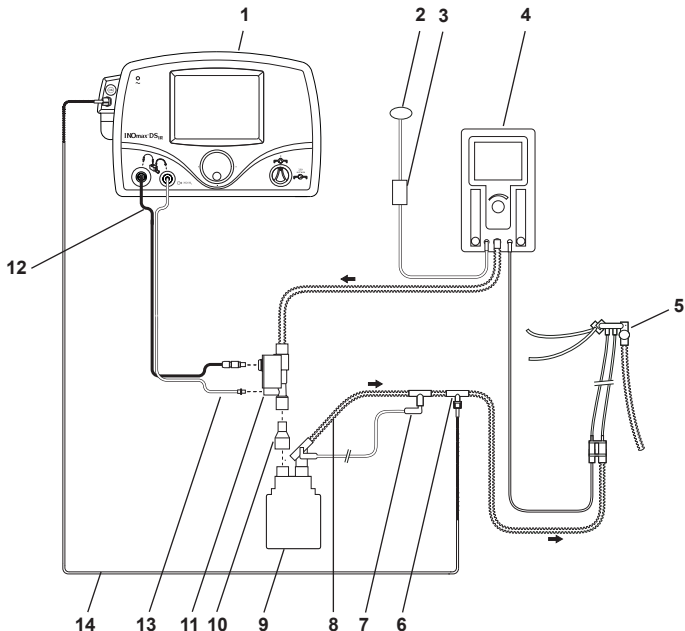
## Connection to the Viasys Infant Flow CPAP System; Cardinal AirLife nCPAP System



- |  |  |
|--|--|
| 1. INOmax DS <sub>IR</sub>                           | 7. Patient Gas Sample Line with Nafion |
| 2. Heated Delivery Circuit                           | 8. Humidifier                          |
| 3. Infant Flow System; Cardinal AirLife nCPAP System | 9. 22F X 15M Adapter                   |
| 4. Infant Flow Generator                             | 10. Injector Module                    |
| 5. Sample Tee  | 11. NO/N <sub>2</sub> Injector Tube    |
| 6. Temperature Probe                                 | 12. Injector Module Electrical Cable   |



## Connection to the Viasys Infant Flow SiPAP



- |                                 |  |
|---------------------------------|--|
| 1. INOmax DS <sub>IR</sub>      | 8. Heated Delivery Circuit                 |
| 2. Abdominal Respiratory Sensor | 9. Humidifier                              |
| 3. Transducer Interface         | 10. 22F X 15M Adapter                      |
| 4. Infant Flow SiPAP            | 11. Injector Module                        |
| 5. Infant Flow Generator        | 12. Injector Module Electrical Cable       |
| 6. Sample Tee                   | 13. NO/N <sub>2</sub> Injector Tube        |
| 7. Temperature Probe            | 14. Patient Gas Sample Line<br>with Nafion |

### INOblender Warnings:

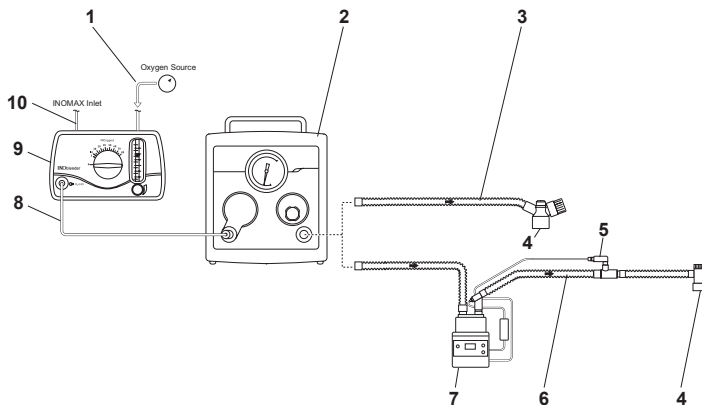
- **The purge procedure must be followed to help ensure NO<sub>2</sub> is purged from the pressure regulator, INOblender and hoses before the manual resuscitator bag or nasal cannula is connected to the patient. The manual bag should be squeezed continuously during use to avoid NO<sub>2</sub> building up in the bag. If the bag is not squeezed continuously while delivering INOMAX, the bag should be removed from the patient and the purge procedure performed before continuing.**
- **Persons using this device should be trained on and experienced in the use of this device to assure effective administration of INOMAX and to avoid injury to the patient or others resulting from inhalation of excess INOMAX, nitrogen dioxide or other reaction products.**

### INOblender Cautions:

- Refer to the manufacturer's procedures for using the resuscitation bag. When finished, turn the INOMAX cylinder off and continue to flow O<sub>2</sub> until the NO pressure gauge reads zero, then turn the O<sub>2</sub> flow off and the NO dial to zero ppm.

Note: Connections to various ventilators as well as their corresponding disposable circuits, are unique to each manufacturer. Please refer to the specific breathing device operation manual or instructions for use for guidance.

## INOblender Connection to the Fisher & Paykel Neopuff Resuscitator



1. Oxygen Source
2. Neopuff
3. T-Piece Circuit (with Duckbill Port)
4. Patient Connection
5. Temperature Probe
6. Humidified Resuscitation System Circuit
7. Humidifier
8. Oxygen Tubing
9. INOblender
10. INOMAX Inlet

### Changing INOMAX Cylinders

#### WARNING:

- A new INOMAX cylinder and regulator must be purged before use to ensure the patient does not receive greater than 1.0 ppm of NO<sub>2</sub>.
- Loss of communication between the INOmax DS<sub>IR</sub> and the INOMAX cylinder for more than one hour will result in interruption of INOMAX delivery.

#### Caution:

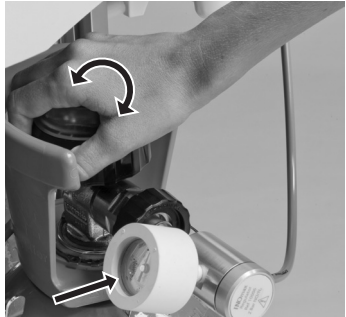
- Replace an INOMAX cylinder when its pressure is less than 200 psig.
- When using the Transport Regulator/Cap Assembly (PN 10022) ensure the cap is fully seated and in place on the INOmeter and the infrared cable is connected and latched to the infrared connector port on the back of the INOmax DS<sub>IR</sub>.

Note: Ensure the white plastic tip is in place.

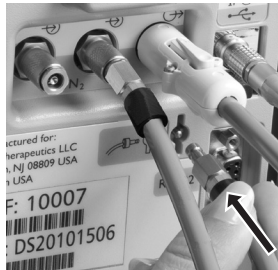
- A. Attach a regulator to an INOMAX cylinder with greater than 200 psig.**



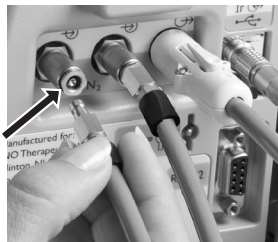
**B. Perform high pressure leak test.**



**C. Purge the high pressure hose.**



**D. Connect the pressure hose.**



### Changing INOMAX Cylinders (cont.)

- E. Open the cylinder valve (this may activate the “Two Cylinders Open” alarm until the empty cylinder valve is closed).**

Note: If using the INOmax DS<sub>IR</sub> Transport Regulator/Cap Assembly, transfer the cap from the exhausted INOMAX cylinder to the new INOMAX cylinder at this time; the “Cylinder Not Detected” alarm may occur.

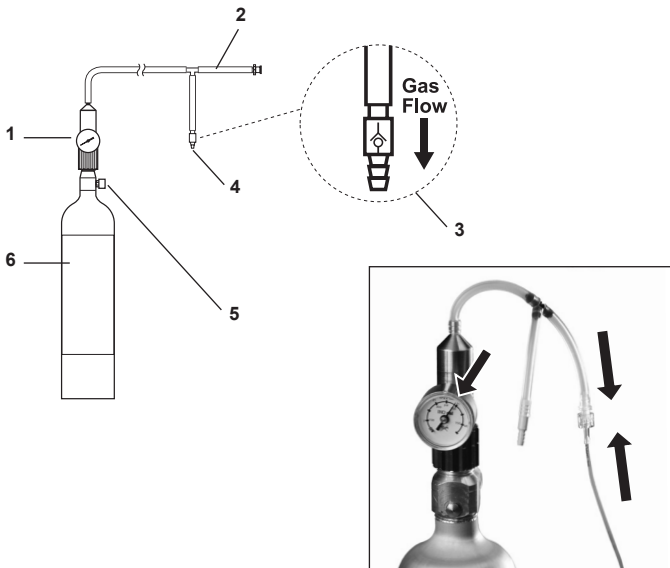
- F. Close the cylinder valve on the empty cylinder and remove the hose from the back of the INOmax DS<sub>IR</sub>.**

- G. Depressurize and remove the regulator from the empty cylinder.**



(Intentionally left blank)

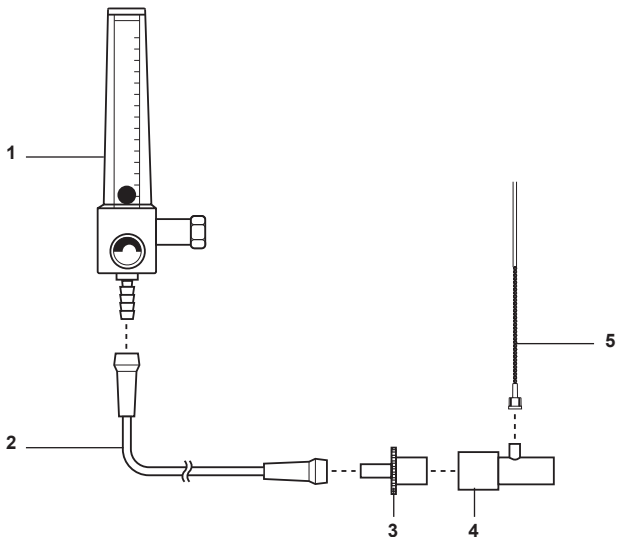
## Connection Diagram for NO and NO<sub>2</sub> High Range Calibration



1. Calibration Gas Cylinder Pressure Gauge
2. Sample Line Connection
3. One-way Valve
4. Vent to Atmosphere or Scavenge - Do Not Occlude
5. Cylinder ON/OFF Control
6. NO or NO<sub>2</sub> Calibration Gas Cylinder



## Connection Diagram for O<sub>2</sub> High Range Calibration



1. 100% O<sub>2</sub> Source
2. O<sub>2</sub> Tubing
3. 15M x 4.5mm I.D. Adapter
4. Gas Sample Tee
5. Patient Gas Sample Line with Nafion

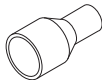
**INOMax DS<sub>IR</sub> Patient Circuit Disposables**

(Note: Graphics not actual size)

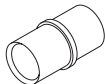
Adapter,  
15M Fits 4.5mm ID Tubing



Adapter, 22F X 15M



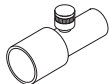
Adapter, 22M/15F X 22M/15F



Adapter, Cuff, 22mm ID X 22mm ID



Adapter, Gas Sample Tee



Adapter, 90 degree Sample Port



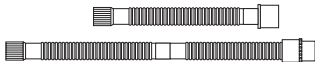
Bunnell Life Pulse Disposable  
Adapters Convenience Pack



Disk Filter, 0.5 micron



Neonatal Tubing,  
10mm (2 pieces)



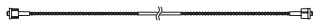
NO/N<sub>2</sub> Injector Tube



**One-way Valve, 22F X 22M**



**Patient Gas Sample Line with Nafion**



**Pediatric Extension,  
15 mm (6 inches)**



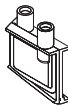
**Sample Tee, O<sub>2</sub> Tubing**



**Sensormedics 3100A/B  
Filtered Circuit  
Disposable Adapters  
Convenience Pack**



**Water Separator Cartridge**



**INO Therapeutics d/b/a Ikaria, Inc.  
Perryville III Corporate Park  
53 Frontage Road, Third Floor  
Hampton, NJ 08827-9001, USA  
1-877-566-9466**