TECHNICAL MANUAL

SYNVIVO

REALISTIC. DYNAMIC.

Organ-on-Chip Models

Pneumatic Primer Guide

Catalog # :205001

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INTRODUCTION

Introduction

SynVivo Pneumatic Primer

The Pneumatic Primer is a low-pressure regulation system (0–15 PSI) designed to efficiently remove air bubbles from SynVivo device channels and barriers. Using inert nitrogen gas, the applied pressure drives trapped air through the pores of the PDMS within approximately 10–20 minutes.

The system setup includes a nitrogen gas cylinder connected to an in-line filter (supplied to prevent contamination) and the Pneumatic Primer unit. SynVivo devices may be primed individually or in batches of up to six using the included manifold.

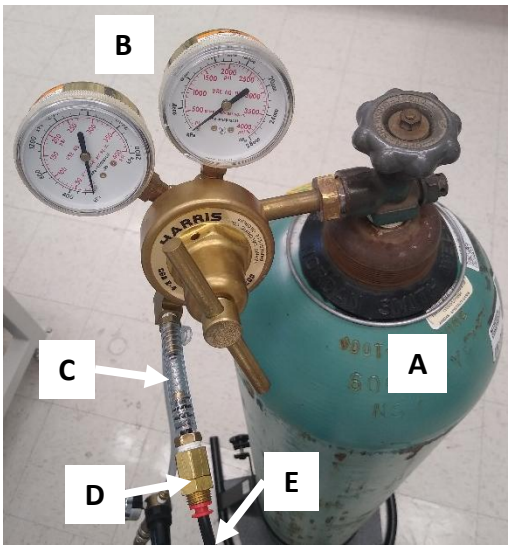
INSTRUMENT SET-UP

Instrument Set-Up

Equipment:

- Compressed Nitrogen Gas Cylinder
- Single Stage CGA 580 Regulator (suggestion: Grainger 46Z483)
- Barb hose fitting (suggestion: McMaster-Carr 5346K14)
- ¼" OD push-to-connect fitting (suggestion: McMaster-Carr 5779K131)
- ½ in PVC Plastic tubing (suggestion: McMaster-Carr 50285K42)
- ¼ in rigid gas-compatible tubing (suggestion: McMaster-Carr 5156K87)
- Optional: two hose clamps
- Pneumatic Primer with in-line filter (SynVivo 205001)

Set-Up Procedure:

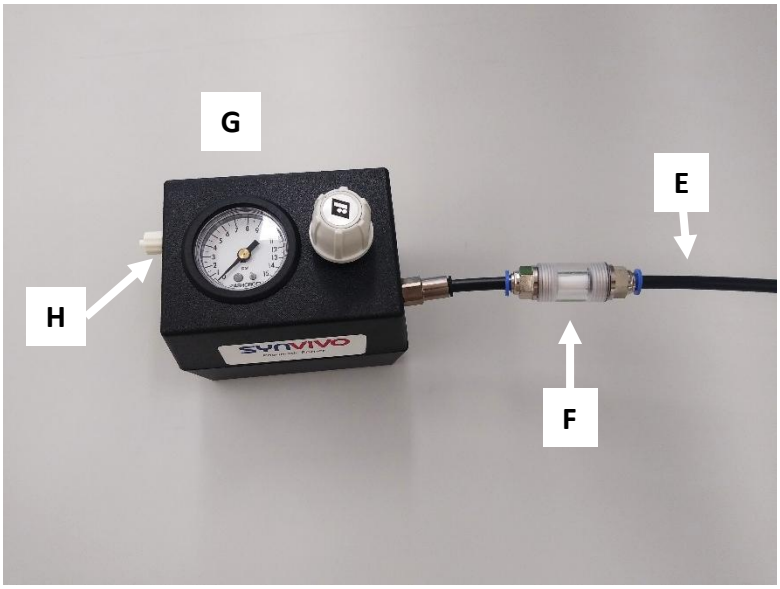


1. Attach the CGA 580 regulator (B) to the nitrogen gas cylinder (A).
2. Cut a length of ½ in PVC plastic tubing (C) and attach it to the barbed outlet of the regulator.
3. Tightly join the barb hose fitting and push-to-connect fitting (D).
4. Attach the open end of the ½ in PVC plastic tubing (C) to the barb hose fitting assembly (D).
5. Optionally: secure the tubing connections to the barbs with hose clamps.
6. Ensure the ¼ in rigid tubing is long enough to reach from the push-to-connect fitting to the surface in which the primer box will sit.
7. Insert one end of the ¼ in rigid tubing (E) into the push-to-connect fitting (D).
8. Insert the other end of the ¼ in rigid tubing (E) into one end of the in-line filter (F).
9. Cut a small piece (3-5 in) of ¼ in rigid tubing.

INSTRUMENT SET-UP

Set-Up Procedure (cont.):

10. Insert the small piece of ¼ in rigid tubing into the open end of the in-line filter (F).
11. Insert the other end of the small piece of ¼ in rigid tubing into the Pneumatic Primer (G).
12. Gently pull the rigid tubing connections to ensure the connection is tightly sealed.
13. Open the nitrogen gas tank and listen for leaking air.
14. A 24 G blunt-tipped needle or the supplied manifold can be connected to the Luer-Lock fitting (H).
15. Once all connections are checked for tightness, the Pneumatic Primer is ready to use.



PRIMER OPERATION

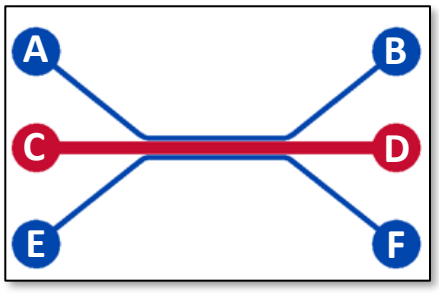
Primer Operation

Equipment:

- Set-up Pneumatic Primer (pages 4-5)
- Primer manifold
- SynVivo Devices
- Serum-free basal media or 1X PBS
- Tygon tubing (0.02 inch ID x 0.06 inch OD, or 0.05 cm ID x 0.15 cm OD; SynVivo 201005)
- 1 mL syringe with Luer-Lock tip (25 pack; SynVivo 203005)
- 24-gauge blunt-tipped needles (0.5 inches or 1.27 cm long; SynVivo 204003)
- Blue slide clamps (SynVivo 202001)

Procedure:

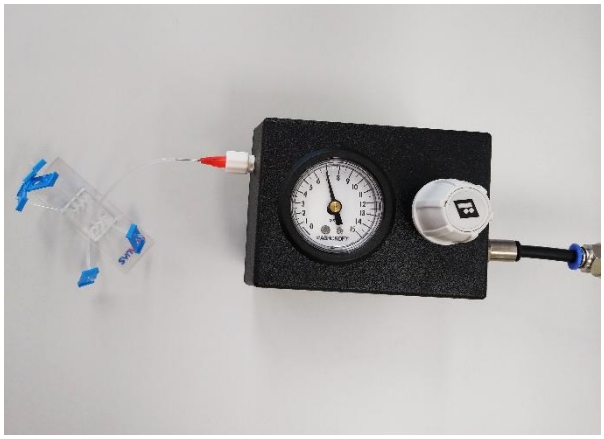
1. Cut and insert 1" pieces of Tygon tubing into each outlet port.
2. Attach a 24-gauge blunt-tipped needle to a 1ml syringe. Fill the syringe with either serum-free basal medium.
3. Cut and attach a 5-8 inch segment of Tygon tubing to the end of the needle, and using gentle pressure, fully perfuse the attached tubing.
4. Connect the free end of the tubing to Port A. Perfuse media into the channel until 1-2 drops of liquid come out the tubing of **Port B**. Clamp the **Port B** tubing below the liquid line.
5. Cut the tubing attached to the syringe to approximately 1-inch from **Port A** and clamp.
6. Repeat Steps 4 and 5 for **Port E** and **F**. At this point, there should be 4 clamps on the device.
7. Connect the syringe and tubing to **Port C**. Perfuse media into the channel until 1-2 drops of liquid come out the tubing of **Port D**. Clamp the **Port D** tubing below the liquid line.



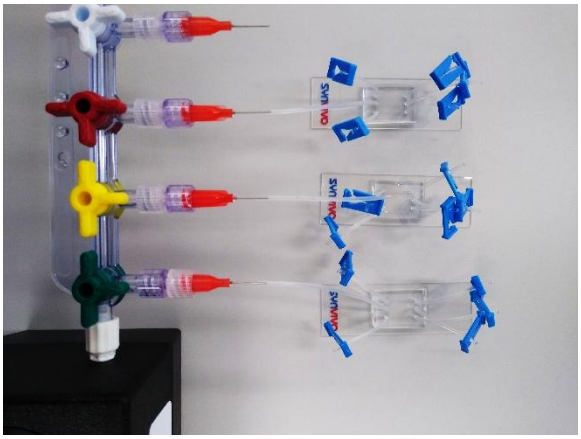
PRIMER OPERATION

Procedure (cont.):

8. With one end of Tygon tubing still attached to **Port C**, slip the other end of the tubing off the needle. All port tubes except **Port C** should be clamped.
9. Connect the chip to the Pneumatic Primer by attaching the **Port C** tubing to the needle on the Luer-Lock connector on the manifold. Note: Multiple chips can be primed simultaneously using the included multiple port manifold.
10. Turn the knob on the controller box and adjust the pressure to 5-7 PSI. Apply the pressure for ~10-20 minutes (more complex device architectures need more time).
11. Turn off the pressure and disconnect the Tygon tubing from the Pneumatic Primer.
12. Observe the primed device under the microscope. If there are remaining bubbles, return the device to the Pneumatic Primer. If there are no bubbles present, the device is ready for use.



Single Device Priming



Multi-Device Priming

Unless otherwise expressly stated on the Product or in the documentation accompanying the Product, the Product is intended for research only and is not to be used for any other purpose, including without limitation, unauthorized commercial uses, in vitro diagnostic uses, ex vivo or in vivo therapeutic uses.