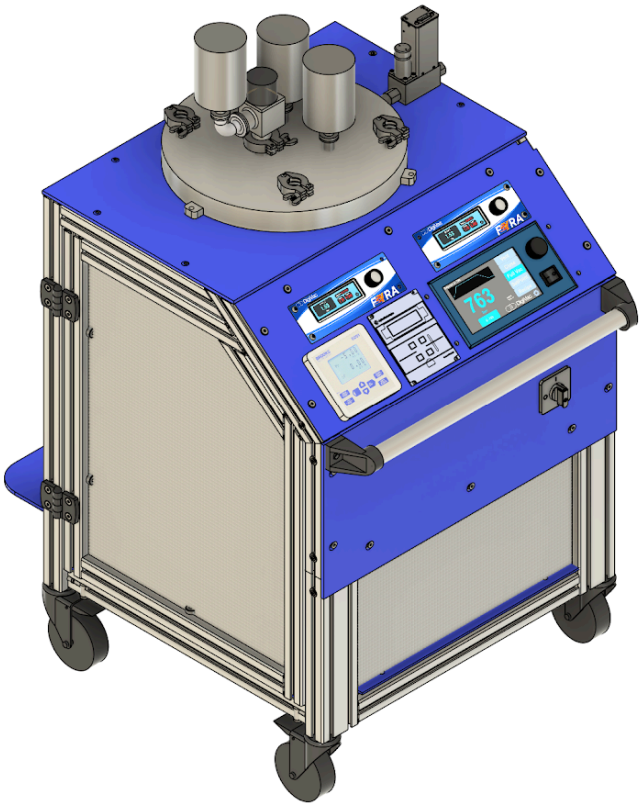
DigiVac
Scientific Measurement & Control

High Vacuum Calibration Cart with Automated SNAP Controls & Fyra Displays



Operation Manual

YOU MUST READ THIS MANUAL BEFORE USE

August 2025

TABLE OF CONTENTS

SECTION 1: Overview

The purpose of this document is to describe the functions, installation, maintenance and use of the **High Vacuum Calibration Turbo Cart**.

This High Vacuum Calibration Turbo Cart includes a test chamber for calibration validation. It is meant to operate in medium to high vacuum conditions and evacuate the chamber to high vacuum after it has been roughed to a pressure that is less than 1 Torr. There is a built-in SNAP vacuum controller used to control the rough and high vacuum levels in the chamber. Two Fyra vacuuming gauges in place for calibration and validation of MKS pressure transducers. A Brooks mass flow controller to power and control the MFC. Finally, there is also a Turbo control panel that can be used to power on or off the Turbo pump on the cart.

System Specifications

Operating Temperature	+5°C to +35°C		
Power	120V with Nema 5-15 plug (requires 15-amp service connection)		
Current	15 Amps		
Wheels	4” Diameter Solid Polyethylene, locking. All four wheels swivel		
Physical Dimensions	**Standard**		**Shipping**
	48” x 26” x 36”		52” H x 35” W x 45” D
Weight	**Standard**		**Shipping**
	366 lbs		580 lbs
System Connection Type	Calibration Manifold with adaptable KF16 native sensor ports. KF40 inlet.		
System Crossover Point	150mT		
SNAP Vacuum Controller: Vacuum Controller to control Roughing and High vacuum pumps			
Accuracy/Control	+/- 5% of reading		
Time to convergence within 5% after disturbance	<30 seconds		
Vacuum Path Orifice	minimum orifice of 20 mm		
Minimum Bleed Valve Orifice	10 mm		
Vacuum Connection	KF25		

PID	P=0.500	I=0.300	D=0.00
SNAP External Sensor: DPCP			
Measuring range	7.5x10-5 to 1000 Torr		
Measuring principle 1x10-6 to 1x10-3 mbar	MEMS Pirani thermal conductivity		
Measuring principle 6 to 1333 mbar	MEMS piezo diaphragm		
Measurement Accuracy (Torr)	From 7.5×10-5 to 7.5×10-5: 50%	From 7.5×10-5 to 7.5×10-3: 20%	From 7.5×10-3 to 1000 Torr: 3%
TwisTorr 74FS Turbo Pump			
Base pressure	<5 x 10-10 mBar	< 5.0 x 10-7 Torr if used with KF-type connections.	
Pumping Speed	60L/s		
Cooling Method	Air cooling, Water cooling		
Flange Type	ISO63		
Compression Rate N2	1 x 109		
Foreline Flange Size	KF 16 NW		
Maximum Gas Throughput of N2, Water Cooling	130 sccm		
Noise Level	40 dB(A)		
IDP 3 Dry Scroll Pump: Backing pump to properly & safely run a turbo pump			
Peak Pumping Speed	60 Hz: 60 L/min (3.6 m3 /h)	50 Hz: 50 L/min (3.0 m3 /h)	
Base Pressure	3.3 x 10-1 mbar	2.5 x 10-1 Torr	
Vacuum Interface	KF16		
Gas Ballast	female, ¼ inch, national pipe thread (shipped with gas ballast port plug installed; 20 µm sintered filter provided)		
Noise Level	55 dB(A)		
IDP 7 Dry Scroll Pump: Roughing pump to initially evacuate the vacuum system			
Peak Pumping Speed	60 Hz: 152 L/min (9.1 m3 /h)	50 Hz: 120 L/min (7.2 m3 /h)	
Base Pressure	2.6 x 10-2 mbar	2.0 x 10-2 Torr	
Vacuum Interface	KF25		
Exhaust Connection	KF16		

Gas Ballast	Female, ¼ inch, national pipe thread, (20 µm sintered plug provided)		
Noise Level	52 +/- 2 dB (A)		
Fyra Vacuum Gauge: Provides simultaneous readouts of the 'units under test' and the 'standards'			
Measurement Range	7.5 x 10-6 Torr to 1000 Torr		
45 Degree Heated Capacitance Manometers	2 Torr	100 Torr	1000 Torr
Resolution2	0.001% Full Scale		
Sensor Accuracy	0.10% of Reading		
Temperature Coefficients - Zero	0.002% Full Scale/°C		
Temperature Coefficients - Span	0.02% Reading/°C		
Warmup Time	2 hours nominal (1 hour stabilization timer for unheated)		
Input Power	+24 VDC ±10% @ 560 mA ±15 VDC @ 480 mA		
Brooks SLA5850 Mass Flow Controller: Used for fine control Nitrogen gas			
Max Press 1500 psig	[103 BAR]		
Max Temperature	149F [65C]		
Meter Material	316L SS		
Valve Type	NC		
Valve Seat & O-Ring	Viton		
Electrical Connection	15-pin, D-Conn		
Connection Type	FNPT		
Fs Flow Rate	100 SCCM		

System Features

- **SNAP Vacuum Controller** - Automated vacuum measurement and system control
- **Fyra Multi Sensor Vacuum Gauge** - Vacuum measurement and calibration validation
- **Brooks Mass Flow Controller** - Fine tune flow control when below 150mT
- **Turbo Controller**- Powers on/off the Turbo, controls turbo venting automatically
- **Cart Power On/Off Switch**- Powers on/off the entire Pump-down System, once plugged in it is ready to use.

- **Gas Regulator**- Reads and regulates inert gas flow into the Turbo Pump-System and MFC. Make sure gas flow stays below **1 PSIG** for proper SNAP control performance.

SNAP Vacuum Controller Information

The SNAP is a vacuum controller with touch screen mounted to the console of the cart with the capabilities of Recipe Control, Ramping, Setpoints, Venting, Isolating the System and high vacuum pump actuation.

SNAP Features Specific to Cart

- High Vacuum Gauge Card + DPCP
- Additional vacuum valve driver card + Turbo Isolation Valve

Displays and Readings

- The actual system pressure
- The crossover point (threshold 150mT) and turbo isolation valve state
- Target and Actual Setpoint - or Recipe selected with progress

Fyra Multi Vacuum Gauge Information

The Fyra is a vacuum controller with a touch screen, 2 Fyras are mounted to the console of the cart with the capabilities of reading and displaying up to 3 vacuum sensors at a time each for calibration and tool validation.

Fyra Features Specific to Cart

- Total of 6 Active Gauge Cards
    - 3 MKS 45 degree Heated Capacitance Manometers
        - 2 Torr
        - 100 Torr
        - 1000 Torr
- Additional vacuum valve driver card + 2 Torr Manometer Isolation Valve

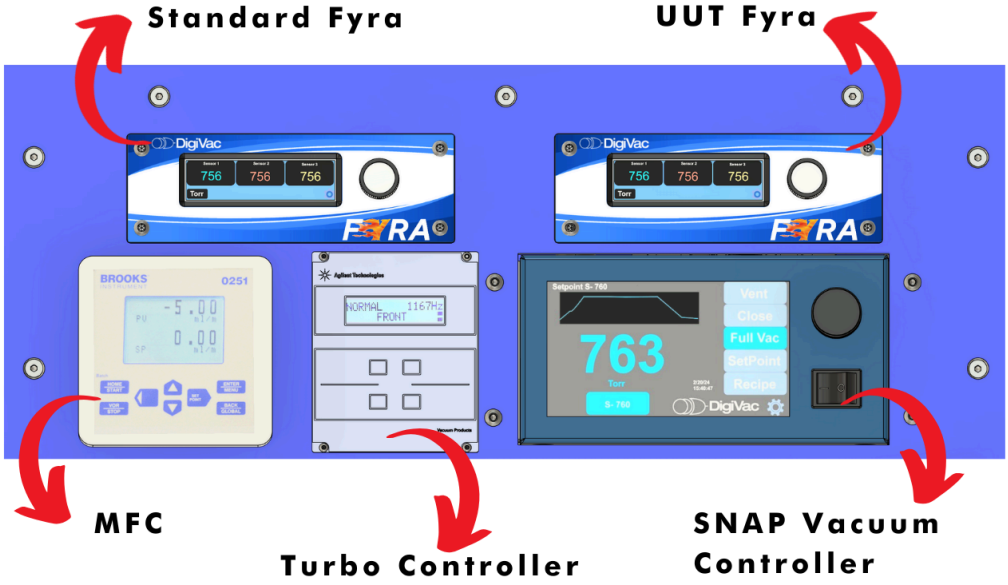
Displays and Readings

- The actual system pressure - 3 MKS gauges and 3 gauges from facility

SECTION 2: Quick Start Guides

System Setup

Control Panel Walkthrough



OVERVIEW

The Automated High Vacuum Calibration System consists of several key components that allows the mobile system to be fully automated with the integration of the SNAP vacuum controller and display up to 6 vacuum gauges used for calibration and validation via 2 Fyra Vacuum Controllers.

Standard Fyra

The Standard Fyra on the **Left** side of the System displays the 3 MKS vacuum gauges: 2, 100, and 1000 Torr. They will be used to validated the "UUT" Fyra's gauges during calibration and testing.

UUT Fyra

The UUT (Unit Under Test) Fyra on the **Right** side of the System displays the 3 vacuum gauges: 2, 100, and 1000 Torr. The gauges will be tested and calibrated against the "Standard" Fyra's gauges

SNAP Vacuum Controller

The SNAP Vacuum Controller is the integrated automated vacuum control instrument that will be running the system via its valving connections and recipe control interface. This will allow the system to adjust setpoints and time duration of the testing procedure to automate the calibration and validation process

Turbo Controller

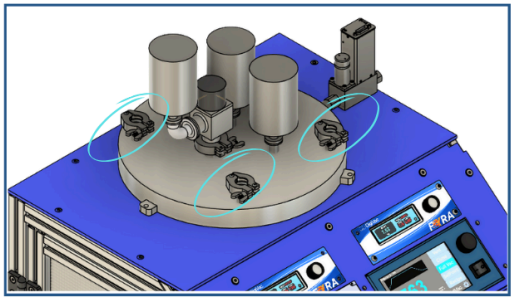
The Turbo Pump Controller is used in this configuration to power on and off the turbo pump in the system.

MFC

The MFC (Mass Flow Controller) is used in this configuration to control at pressures **less than** the cross over point of 150mT

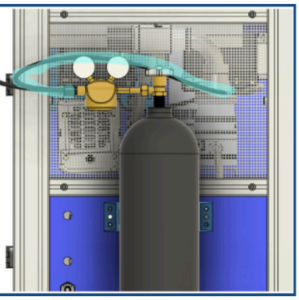
Quick Start

Automated High Vacuum Calibration System



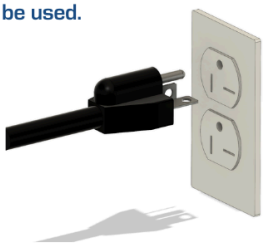
Connect the testing gauges to your manifold via the alocated flanges. *Note: Smooth connections are better for flow.

*Make sure the Gas Regulator does not exceed 1 psig.

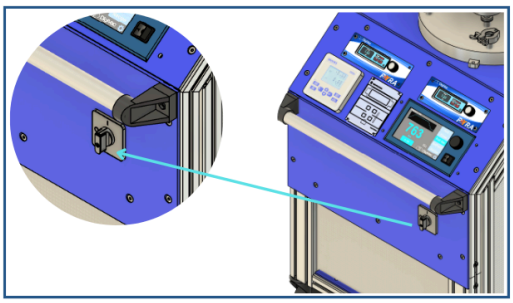


Connect the Gas regulator on the nitrogen or other inert gas tank to the KF16 venting port on the back of the cart via silicon hose. Or leave open to air.

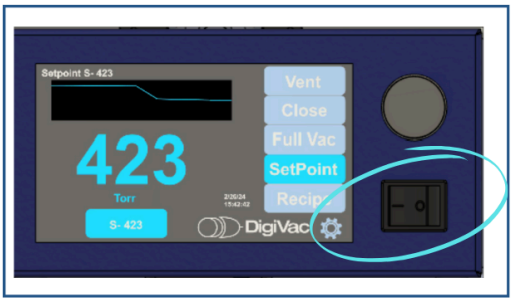
*Extension cords should not be used.



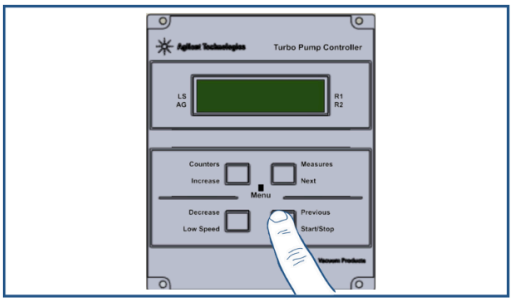
Plug cart into a 15 amp 120V receptacle outlet. *Note: Only the cart can be plugged into the outlet, no other devices.



Turn on the power to the cart via the switch on the front.

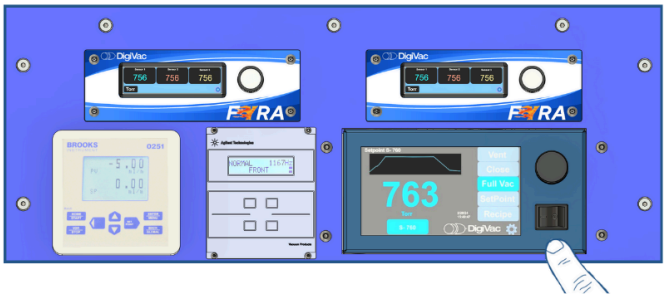


Verify that the SNAP is also switched on.



Press “Start” on the Turbo Controller and wait 5 minutes for it to spin up.

The cart is now ready to control vacuum via the SNAP screen and Calibrate and Validate with the Fyras.



Quick Start

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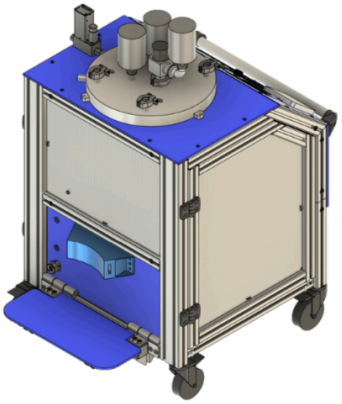
Automated High Vacuum Calibration System

QUICK START:

1. Install manometers by fully tightening the ½" tube connections.
2. Connect the Gas Regulator to a Nitrogen or other inert gas tank. Nitrogen is recommended. Backfill gas is supplied to the SNAP controller as well as the MFC. ***Note: Make sure that the regulator does not exceed 1 PSIG.**
3. Plug cart into a 15 amp 120V receptacle outlet. ***Note: Only the cart can be plugged into the outlet, no other devices. Extension cords cannot be used either.**
4. Turn the switch on the front to the power on the cart
5. Verify that the SNAP is also switched on.
6. Press "Start/Stop" on the Turbo Controller to power on the Turbo and wait 5 minutes for the turbo to spin up.
7. The cart ships with all device switches in the "ON" position. If instruments do not operate when the MAIN power switch is energized, ensure that the local device switches are ON.

STORAGE GUIDE:

1. Press "Start/Stop" on the Turbo controller to turn it off and wait 5 minutes.
2. Vent cart using SNAP controller.
3. Disconnect Cart once atmosphere is reached.
4. Turn off power switch
5. Close inert gas tank.
6. Unplug the cart from the wall outlet and store.



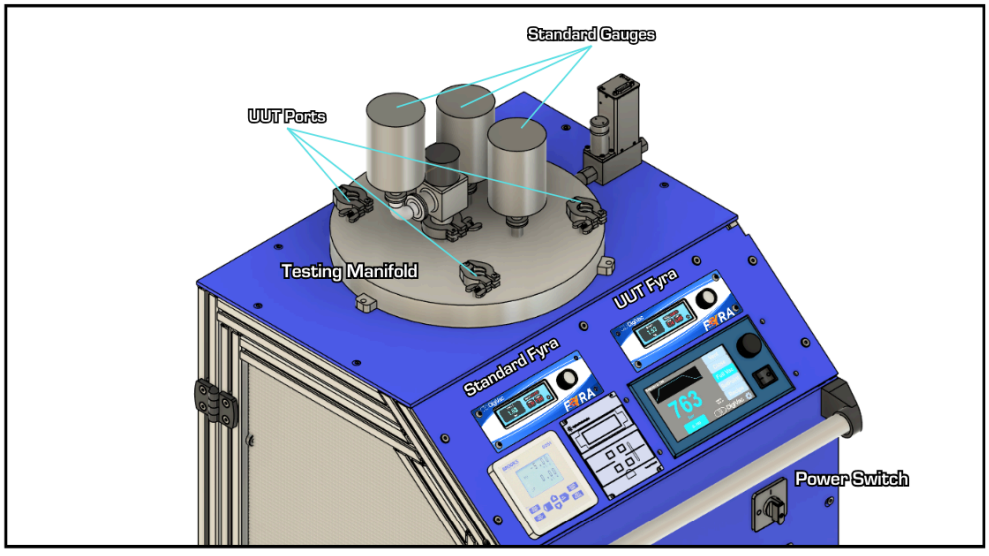
Testing Devices Installation Guide

How to Install Testing Devices:

There are 6 ports on top of the calibration manifold, 3 are occupied by the standard gauges that will be used to validate/calibrate the UUT sensors the other 3 are open to be used for the UUT sensors.

If cart is powered off:

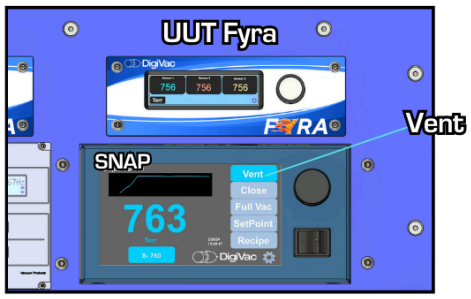
1. Select the sensor you would like to Test: 2T, 100T, 1000T CMs
2. Connect the gauge to any of the available 3 ports using 1/2" tube to KF16 adapter and KF16 Clamp.
3. Plug in the matching labeled sensor wire to the gauge your are testing, the corresponding wires will be labeled: 2T, 100T, and 1000T
4. Once the sensors are connected and installed, power on the system via system power switch.
5. The Control Panel on the System will turn on (this includes the 2 Fyra units, SNAP, Turbo and MFC Controllers), you are now ready for testing and calibration.

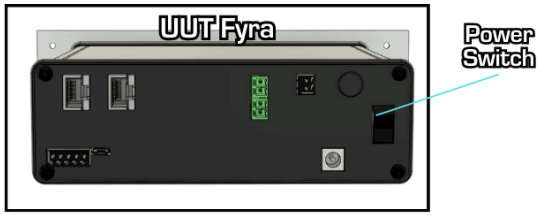


Automated High Vacuum Calibration System

If cart is powered on and testing an additional batch:

- Vent System to atmosphere using SNAP's "Vent" button
- Once the system reaches atmosphere open the right side panel door to access the power switch on the UUT Fyra, you will need to power this unit off.
- Once the UUT Fyra screen goes black, install the next sensor you would be testing.
- Select the sensor you would like to Test: 2T, 100T, 1000T CMs
- Connect the gauge to any of the available 3 ports using 1/2" tube to KF16 adapter and KF16 Clamp.
- Plug in the matching labeled sensor wire to the gauge your are testing, the corresponding wires will be labeled: 2T, 100T, and 1000T
- Once the sensors are connected and installed, power on the UUT Fyra again via power switch.
- The UUT Fyra will power on and start displaying the vacuum measurement, the remaining Controls in the system's control panel will already be on, you are now ready for testing and calibration.

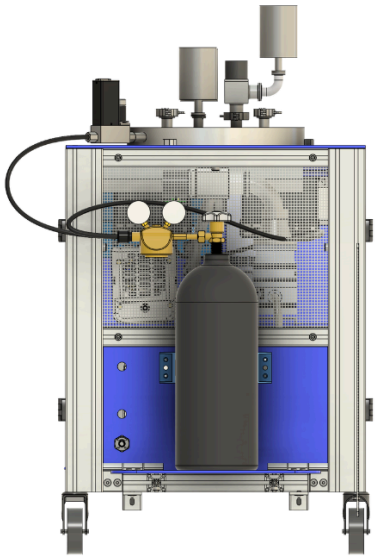


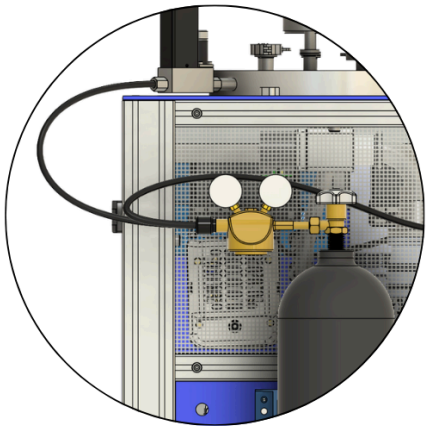


Automated High Vacuum Calibration System

How to Install the Nitrogen/Inert Gas Tank:

1. On the back of the cart where the system connects, take the tape off the shelf that is folded up.
2. Place the tank (customer supplied, 40 ft³ recommended) on the rubber pad that is attached to the shelf.
3. Use the strap of the bracket around the tank and tighten it to secure the tank in place.
4. Attach the Regulator to the top of the tank. Make sure that the Regulator is set at no more than **1 psig**.





SECTION 3: Operation

This section describes **in more detail** about the installation and operation of the cart. The cart was designed to work in a laboratory environment.

Installation & Operation Guide

Below is a detailed, step by step instruction guide on how to install and operate the cart:

1. Make sure all fittings that will be used for high vacuum are clean. No dust, dirt, etc.
    a. *To Clean*: Wipe clean fittings with ethanol or other mild solvent. Ensure all KF centering rings are clean and the Viton rubber on the rings are in good shape.
    b. *Note*: If in doubt, replace. If using vacuum grease, less is better.
2. Install UUT manometers by fully tightening the ½" tube connections.
3. Install Nitrogen or inert gas tank to the back of the cart by strapping it into place.
4. Install Gas Regulator to the nitrogen or other inert gas tank.
5. Nitrogen is supplied to the SNAP vent port and MFC. ***Note: Make sure that the regulator does not exceed 1 PSIG.***
6. Plug cart into a 15 amp 120V receptacle outlet. ****Note: Only the cart can be plugged into the outlet, no other devices. Extension cords cannot be used either.***
7. Turn the switch on the front to the power on the cart ***Turn the cart on with the black dial switch on the front of the cart (Horizontal is "off" Vertical is "on")**.
8. The cart ships with all device switches in the "ON" position. If instruments do not operate when the MAIN power switch is energized, ensure that the local device switches are ON.
9. Verify that the SNAP & Fyras are also switched on.
10. Press "Start/Stop" on the Turbo Controller to power on the Turbo and wait 5 minutes for the turbo to spin up (you will see RPM in Hz increase).
11. The cart is now ready to control vacuum via the SNAP screen and perform calibration/validation with the FYRAs.

Testing Procedure

Conducting Validation Test

To conduct the tests, follow these steps:

1. Secure the three units under test and their corresponding standards to the vacuum manifold.
2. Using the SNAP vacuum controller, input the desired test pressure according to the calibration protocol.
3. On the two Fyra vacuum controllers, observe the simultaneous readouts for all the units connected to the manifold. In an ideal situation, these values should match.

4. On the SNAP controller, select ‘high vac,’ zero the readings, and confirm that the values are still consistent.

For more information and recipes see SNAP Recipes section

Storage Guide

Below is a detailed, step by step instruction guide on how to Power off and store the cart:

1. Stop the Turbo pump by pressing the “**Start/Stop**” button on the Turbo controller. Wait 5 minutes for Turbo “Braking” feature. The system will automatically vent the Turbo.
2. Press the “**Vent**” button on the SNAP controller to vent the cart to Atmosphere.
3. Disconnect unused measurement devices from the chamber once atmospheric pressure is reached. Install plastic caps on all unconnected flanges. This will help keep the systems clean, last longer, and improve pump-down times.
4. Turn off the High Vacuum Cart with the black dial switch on the front of the cart. The dial should be turned to the left pointing at the “O” symbol (Horizontal is off)
5. Close inert gas tank.
6. Unplug the cart from the wall outlet, and store the vacuum system in a safe place.

SNAP | Pressure Measurement and Control

From the SNAP’s HOME screen, system pressure is continuously displayed as long as the SNAP is ON. Recipes added to the SNAP can be viewed and selected by the SNAP Settings menu. For more information on the SNAP and its recipes please see the SNAP Operation Manual.

The SNAP includes 2 recipes with the capability to edit existing recipes or create an additional 8 recipes for a total of 10 recipes stored in the SNAP.

SNAP Recipes

This configuration includes 2 recipes. Please note when using recipes if you would like to remain at high vacuum once the recipe completes add an additional step(s) to the recipe with a duration of 999(mins) and a pressure of 0.000.

Calibration Recipe

This recipe is used for calibration testing, select “Recipe 2”, press play, and cycle through the important recipe steps. Test Points can be achieved using the control method stated in the table below.

Validate/Calibration Test Points (Torr)				
Test Points	***1000***	***100***	***2***	**Control Method**
700	700			SNAP
500	500			SNAP
100	100			SNAP
9.5	9.5	9.5		SNAP
5		5		SNAP
1		1	1	SNAP
0.5		0.5	0.5	SNAP
0.2		0.2	0.2	SNAP
0.1			0.1	MFC at ~90 sccm
0.05			0.05	MFC at ~40 sccm

When transitioning from Control Method: SNAP to MFC at the test points of 0.1 & 0.05 the SNAP will be in “Full Vac” mode and test points will be imputed into the MFC for testing via flow rates specified at each respective test point. Please note when using the SNAP Control Method the MFC flow rate should be at 0 or off.

When completed using MFC Control Method set gas flow back at 0 or enable MFC VOR mode which shut gas off.

Recipe 2			
	Vac Time		
Step	**minutes**	**Vacuum level**	**Ramp/Hold**
1	2	700	**H**
2	2	500	**H**
3	2	100	**H**
4	2	9.5	**H**
5	2	5	**H**
6	2	1	**H**
7	2	0.5	**H**
8	2	0.2	**H**
9	2	0.1	**H**

	10	2	0.05	H	
	11	100	0.001	H	
	12	3	760	H	

Purging Recipe

This is the recipe input as "Recipe 1" for the purpose of Purging the manifold so it can get down low quickly

	Recipe 1				
		Vac Time			
	Step	minutes	Vacuum level	Ramp/Hold	
	1	2	0.3	H	
	2	2	20	H	
	3	2	0.3	H	
	4	2	20	H	
	5	2	0.3	H	
	6	2	20	H	
	7	2	0.3	H	
	8	2	20	H	
	9	2	0.3	H	
	10	2	20	H	
	11	2	0.3	H	
	12	2	20	H	
	13	2	0.3	H	
	14	2	20	H	
	15	2	0.3	H	
	16	2	20	H	
	17	2	0.3	H	
	18	2	20	H	
	19	2	0.3	H	
	20	2	20	H	
	21	2	0.3	H	

	22	2	20	**H**	
	23	2	0.005	**H**	
	24	0	0	**R**	

PID

The SNAP is capable of controlling much smaller and larger vessels, but may require some PID tuning to optimize the control. There is a PID help screen on the unit as well that explains basic PID tuning.

For more background on PID learn more here.

You can access PID variables from the Setpoint (S - xxx) button when in Setpoint mode. To adjust:

- Click on S - xxx button
- Click on PID
- To put in a different number, input that number in the dialogue box
- Touch the value box of the variable you want to change (P, I, D)
- Click OK
- Your new PID variable is set.

For this systems configuration the SNAP's PID is Set to the Following:

PID	P=0.500	I=0.300	D=0.00

Mass Flow Controller

The Mass Flow Controller is used in this system to control pressures below the crossover point of 150mT. The MFC can also be used to inject inert gas into the calibration chamber at a desired rate.

Changing Set Point with MFC

To change the Mass flow set point from 251 screen:

1. Select Menu
2. Select Instrument Config
3. Scroll down to SP Rate
4. Hit Enter
5. Scroll over to values
6. Use up and down to change values at different decimal places

7. Hit Enter to confirm
8. Home to go to home screen
9. Note current flow set point should match actual flow setpoint closely

Mass Flow vs Pressure

The following data was taken on the the cart on 8/25/2025 with a starting pressure < 250 millitorr with the Turbo pump fully engaged

SCCM Flow	Pressure maintained (Torr)	Standard used	Notes
0.45	7.00E-04	FRG700	Lowest flow rate possible with 100 SCCM MFC
1	0.002	FRG700	
5	0.008	2 Torr CM	
15	0.021	3 Torr CM	
30	0.04	4 Torr CM	
50	0.6	5 Torr CM	
100	0.114	6 Torr CM	

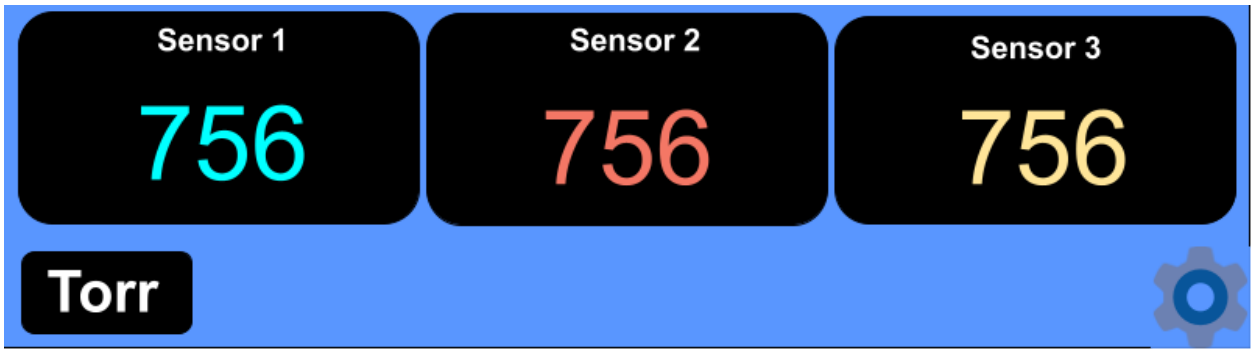
Note that the MFC is a stand-alone device - whatever flow rate is selected would be in parallel with the vent mode on the SNAP controller. When below 150mT the SNAP should be in “Full Vac” mode. When using the SNAP MFC should have a flow rate of 0 or gas should be turned off.

Fyra | Vacuum Measurement and Display

There are two FYRA controllers mounted in the calibration cart. Viewing the cart face-on, the FYRA controller on the **LEFT** displays the system standards (currently, 2T, 100T and 1000T manometers). These are your standard pressure indications.

The FYRA on the **RIGHT** displays the pressure readings of the UUTs - whatever manometers or vacuum sensors are installed for calibration or verification.

Fyra Sensor Display



The Fyra Multi Gauge Vacuum Controller will display vacuum readings from the Standard Sensors and the UUT sensors as shown above on their designated Fyra display.

The Sensor Cables and Fyra Controller have been labeled for each designated sensor per Fyra card slot: Sensors 1-3.

- Sensor 1 = 2T CM
- Sensor 2 = 100T CM
- Sensor 3 = 1000T CM

Cables should match to the designated sensor for accurate measurement and readings.

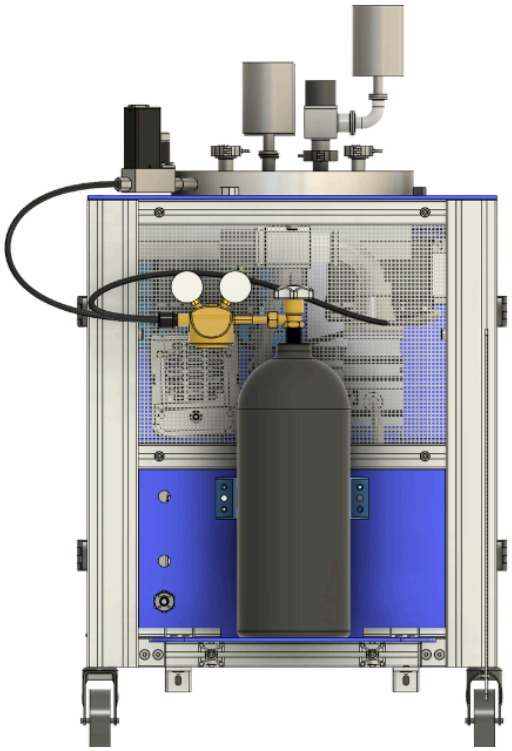
Powering On

The Fyras should power on when the system power is switched however if they do not power on with the system switch open the side door and turn on the UPS power backup.

For more information on the Fyra please refer to the Fyra Operation Manual.

Connections & Flow Paths

Nitrogen Tank Connection: The image below depicts the connections and venting lines the vacuum cart has. Here, you can see where the venting line is to install an inert gas tank and regulator once connected the would be now be connected to the MFC and the SNAP vacuum controller.

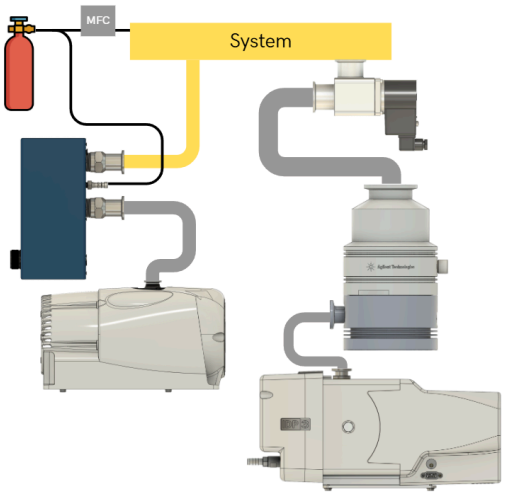


Flow Paths: The vacuum system has several chamber control features on how to control the system manifold. It can:

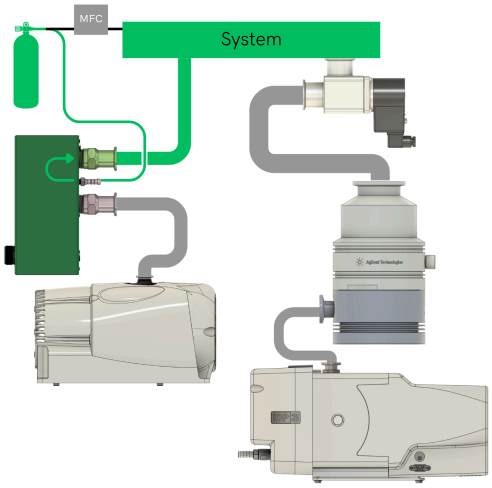
- Isolate and close off the chamber at any desired set point or vacuum level
- Vent in air or inert gas to increase the positive pressure of the system
- Bring the system to medium vacuum range through its rough pump (above 150mT)
- Bring the system chamber to high vacuum using the turbo pump (below 150mT)

Below are images to show the variety of flow paths the vacuum cart can execute to control the connected chamber:

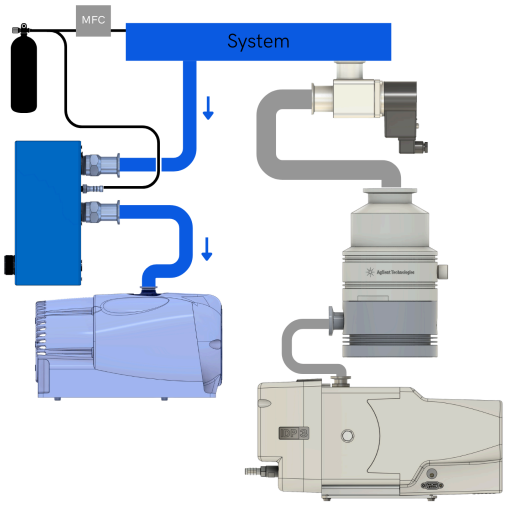
Chamber Isolation



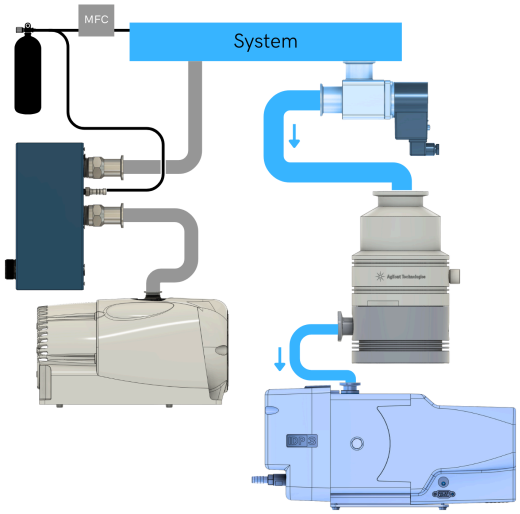
Chamber Venting



Chamber Roughing



Chamber High Vacuum



Rough Pump Delay Adjustments

1. The IDP7 rough pump has a delay feature to prevent undesirable breaker tripping from occurring during startup. The delay is factory set at 6 seconds.
2. The delay is user-adjustable from 0 to 10 seconds by turning the knob on the Delay Relay mounted on the lower-rear panel, accessible from the inside of the cart. It is recommended that the delay be set to 5 seconds minimum.

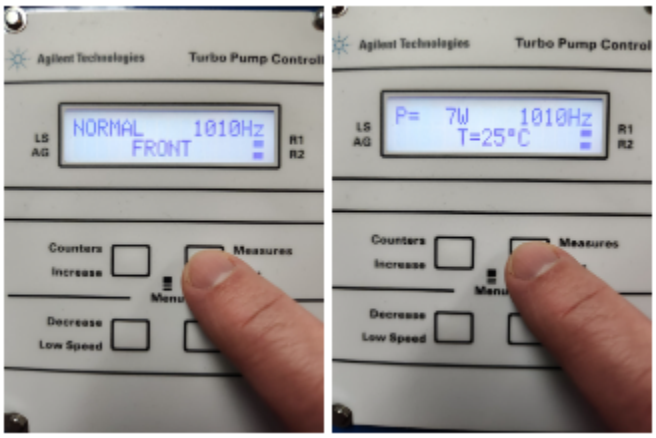
How to Check Temperature

Care should be taken to monitor the Turbo pump temperature.

If the temperature indication on the Turbo **exceeds 35°C** or **95°F**, the **Turbo should be turned off**.

1. Press the "**Measure**" button
2. Note the temperature. If the temperature is greater than **35°C**, shut down the machine.

Do not move or bang the Turbo cart when the Turbo is running. If you need to move the cart, shut down the Turbo pump first.



Turbo Venting

The 74FS Turbo has an automatic vent upgrade kit. To vent the Turbo, press the "**Start/Stop**" button while the Turbo is running. It will begin to slow down appropriately. When the Turbo is at 0Hz (it will say "**0 Hz**"), you can then vent the rest of the system. The Turbo Isolation Valve will remain open as long as the Turbo is in **STOP** mode.

PLEASE NOTE: The air used in venting is taken from Atmosphere.

SECTION 4: Maintenance

This following section describes the various ways to maintain and upkeep the High Vacuum Turbo Cart.

Hose Inspection

When disconnecting or replacing bellows hoses, take caution to avoid sharp bends or abrasions from adjacent equipment.

KF Screen Replacements

KF-type O-Rings (including those with mesh screens) should be cleaned with a dry, lint-free cloth (E.G. “Kim Wipes”) when replacement is necessary. Inspect flanges and mating surfaces for nicks or defects which might prevent a proper vacuum seal. Replace as necessary.

Tip Seal Replacements

To replace tip seals refer to sections for IDP3 and IDP7 vacuum pump maintenance on this page and page 17. To install the new seals and O-rings:

1. Unpack the Tip Seal.
2. Install the closed loop portion of the Tip Seal onto the Orbiting Scroll (item 9).
3. Sequentially insert the seal from center to the outer edge of the scroll wall.
4. Cut the Tip Seal about 1/8" (3 mm) from the groove end.
5. Use the remaining Tip Seal material to fill the seal groove on the Scroll Housing and again trim the excess Tip Seal so that a gap of about 1/8" (3 mm) remains.
6. Place the new main O-ring onto the Frame (item 10). Make sure the area where the O-ring sits is clean.
7. Carefully replace the Scroll Housing making sure to line up the Locating Pins. Be sure that the Tip Seal has not fallen out of its groove.
8. Reinstall (4) M5 bolts (item 4). Torque the (4) M5 bolts to 4 N-m (40 in-lbs).
9. Place the front cowling in place and replace the M8 bolts.
10. Reinstall the exhaust adapter.
11. Reconnect the pump to the electrical power mains.

Turbo Maintenance

No general maintenance is necessary. If there is excessive noise, call Agilent to troubleshoot. If used less than once every 6 months, or for other details, consult the 74FS instruction manual.

The Turbo is an especially delicate piece of equipment, so sudden movements or direct hits to the device can cause violent failure. So can particles that get in the inlet side of the Turbo. It is

recommended to not tamper with the Twistorr 74FS Turbo Pump as well as keep the Calibration Cart enclosed in order to protect the device.

IDP 3 Scroll Pump Maintenance

In 2-3 year intervals, replace tip seals. For any excessive noise, contact Agilent for troubleshooting. For further maintenance details, refer to the following instruction manual: **Dry Scroll Vacuum Pump Instruction Manual** (See Page 17).

IDP 7 Scroll Pump Maintenance

In 2-3 year intervals, replace tip seals. For any excessive noise, contact Agilent for troubleshooting. For further maintenance details, refer to the following instruction manual: **Dry Scroll Vacuum Pump Instruction Manual** (See Page 24).

Calibration

To ensure gauge accuracy, return the SNAP & Fyra unit for calibration to DigiVac once yearly. For cart gauges, we recommend an onsite calibration or validation of the high vacuum gauge (against recently calibrated remote gauge) once every 2 years, or when readings are suspect. Note the internal components of this sealed gauge are in a nitrogen bath to mitigate any moisture concerns and maximize life time. Calibration for this gauge must include evacuation and backfilling of Nitrogen of the enclosure.

For any other maintenance concerns please contact us at DigiVac.

Optimizing Pump-Down Times

High vacuum pump down times are optimized with clean smooth surfaces and the largest flow paths possible. To improve high vacuum pump down times, keep the system sealed and use clean, dry Nitrogen as purge gas.

See section SNAP Recipes: Purging Recipe to learn more.

For any additional high vacuum calibration turbo cart or vacuum gauge related troubleshooting, please contact sales@digivac.com or 732-765-0900.

Serial Numbers

Manufacturer	Part Name/Number	Serial Number	Notes
Agilent	IDP3	MY2523S044	
Agilent	IDP7	MY2420SB06	
Agilent	Turbo Controller (Rack)	IT2520C290	
Agilent	Turbo Pump (X350-64170)	IT25056049	
Brooks	Mass Flow Controller	01C52601646	
DigiVac	DPCP	25175121883	
DigiVac	SNAP	K25H056	Software version: K25D01
DigiVac	FYRA	K25H057	
DigiVac	FYRA	K25H058	
MKS	1000 Torr CM	113199260	
MKS	2 Torr CM	113119259	
MKS	100 Torr CM	113199261	

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