0700CG1F123F1 MANIFOLD INSTRUCTIONS

0700CG1F123F1 Manifold with 1000, 1500F1 and 1600 Extractors June 2016

Figure 01 - Typical 0700CG1F123F1Manifold Setup

Your 0700CG1F123F1 Manifold is completely assembled, tested, and ready for mounting on your laboratory wall. The 3/4-inch thick formica-covered base, which supports the various components, can be drilled at any convenient location for mounting with wood screws or bolts to the laboratory wall.

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SOILMOISTURE®

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UNPACKING

The Model 0700CG1F123F1 Manifold was thoroughly tested before shipment. When packed, it was in perfect working order. Unpack with care being sure to remove all packing material. Follow the instructions carefully in order to assure long, trouble-free service.

Any damage found upon receipt should be reported immediately to the transport carrier for claim. It is important to save the shipping container and all evidence to support your claim. Be sure to read all operating instructions thoroughly before operating the unit.

WARRANTY & LIABILITY

Soilmoisture Equipment Corp. (SEC) warrants all products manufactured by SEC to be free from defects in materials and workmanship under normal use and service for twelve (12) months from the date of invoice provided the section below has been met.

Soilmoisture Equipment Corp. (SEC) is not liable for any damages, actual or inferred, caused by misuse or improper handling of its products. SEC products are designed to be used solely as described in these product operating instructions by a prudent individual under normal operating conditions in applications intended for use by this product.

CAUTIONS & WARNINGS

- Do not input more than 300 psi into the manifold.
- Do not allow water to build up in the tank of the compressor – bleed regularly.
- If bulging is found in the hose – discontinue use.
- Do not ram the air pressure – (rapid on and rapid off) – turn knobs slowly both input and exhaust.
- Do not exceed maximum pressure on the gauge.

Do not exceed 300 psi into the manifold.

The air filter had been plugged to enhance safety and operation at 300 psi – the plastic flat at the base of the bowl is non-functional. To clean out the air filter, first exhaust the air in the manifold and disconnect the quick connect line from the compressor. It is then possible to rotate and pull down to remove the bowl of the air filter for cleaning and removing water.

- All parts are safe in the temperature range of 140 degrees F or below (60 degrees C or below).
- Galvanized fittings are ratted for 300psi.
- Brass fittings are rated for 600 psi or more.
- All regulators and air filters are safe at 300 psi at or below 140 degrees F.
- The Hoses are all rated for 300 psi continuous use. If a hose shows signs of bulging which usually occurs at the ferrule but can occur anywhere - discontinue use immediately.

Safety relief valves on the extractor protect both the extractor, the gauge, and the manifold. Input pressure is protected by the compressor design (0505V# set to 20 bars max) and in the case of nitrogen then input regulator (0767P0300L05 – end of regulation 250-300psi).

Use caution if using other equipment without 300 psi overprotection.

0700CG1F123F1 MANIFOLD

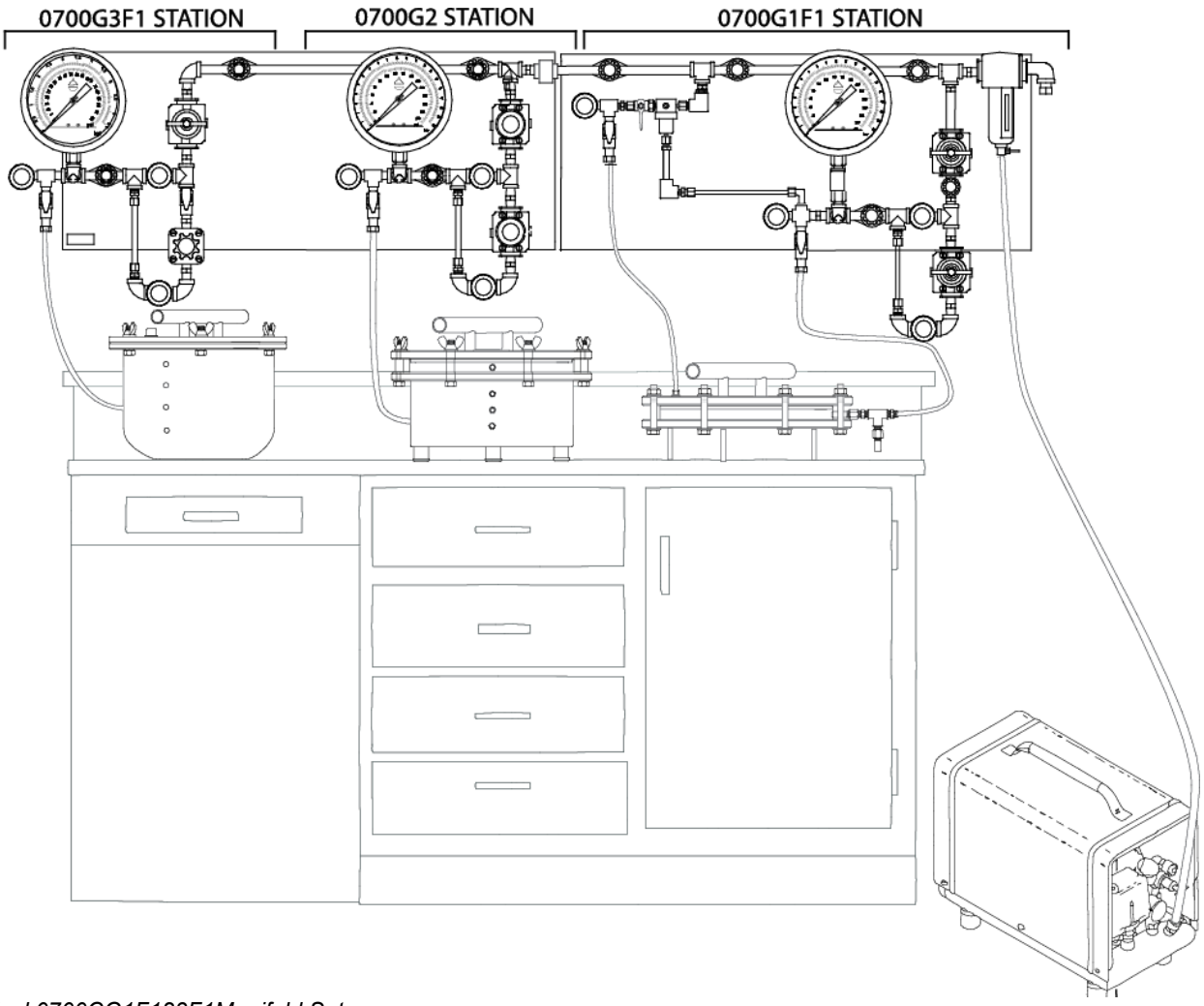

Figure 02 - Typical 0700CG1F123F1Manifold Setup

The 0700CG1F123F1 Manifold is a combination manifold which combines the 0700G1F1 Station, the 0700G2 Station and the 0700G3F1 Station.

- The **0700G1F1** Station is used to operate the 15 bar pressure membrane extractor (Model 1000) in the range of 5-225 psi without the use of mercury.

- The **0700G2** Station is used to operate the 15 Bar Ceramic Plate Extractor (Model 1500F1) in the range of 5–225 psi.

- The **0700G3F1** Station provides very precise, low-pressure regulation in the pressure range from 1 to 60 psi and a rougher range of 5-75 psi. This manifold is used for operation of the Volumetric Pressure Plate Extractor (Model 1250), Tempe Pressure Cells (Models 1400/1450), and the 5 Bar Pressure Plate Extractor (Model 1600).

0700G1F1 Station

The 0700G1F1 station, designed for the operation and control of the model 1000 Pressure Membrane extractor, consists of a 10 to 250 psi Pressure Regulator (Model 0766P0250); a 5 to 150 psi Pressure Regulator (Model 0766P0150); a 0 to 300 psi Test Gauge (Model 0780P0300) and a “plus 5 psi” pressure booster (0769-5PSI) which eliminates the need for Mercury on older models, plus all the necessary valves and fittings.

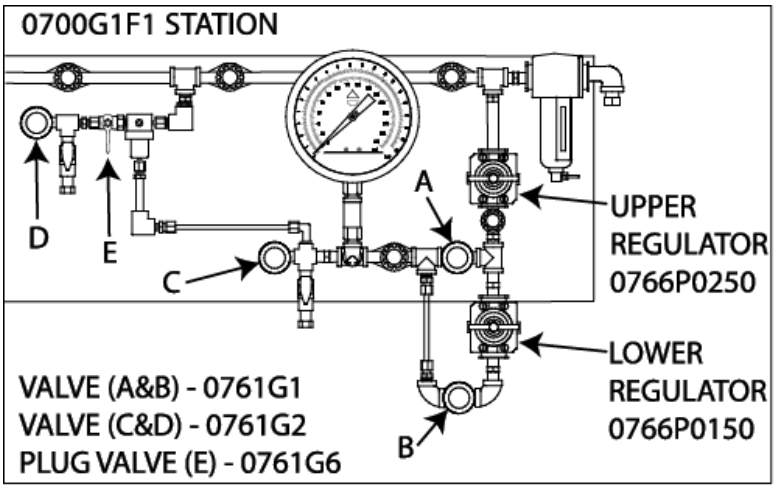

Figure 03 - 0700G1F1 Station

There are 2 outlet valves and hoses that go from the manifold to the extractor. On the right side are 2 regulators and a test gauge plus valves and fitting to regulate 5-225 psi into the extractor itself. On the left side is another hose that goes to the lid of the 1000 extractor and ultimately into a bladder in the lid that expands to put pressure onto the sample rings against the cellulose membrane to counter any shrink swell changes in the clay sample. To accomplish this there is a precision “plus 5” psi regulator that follows the pressure readout on the gauge and adds 5 psi more. This precision “plus 5” regulator is non-relieving which means that as long as you are going up in pressure there is no need to do anything. The right hand of the manifold operates exactly the same as the 1500F1 for pressurizing the 1000 extractor itself.

If you need to reduce pressure you must follow the following procedure to prevent over-pressurizing the bladder. To reduce pressure in the Model 1000 extractor the following procedure must be followed. Failure to do so will result in over-pressurizing of the bladder in the lid and possible disruption to the soil samples in the extractor. The bladder may also become dislodged from the lid.

1. Close the inlet to the precision “plus 5” regulator valve which is red in color and will be perpendicular to the direction of air flow when closed. (E)
2. Open the exhaust valve on the precision “plus 5” side of the manifold. (D)
3. Reduce pressure as desired on the right side of the manifold (extractor pressure regulating side). (LOWER OR UPPER REGULATOR)
4. Close the exhaust valve on the precision “plus 5” side of the manifold. (D)
5. Re-open the inlet to the precision “plus 5” valve – same red in color as in number one. It will now be parallel in direction to the airflow. (E)

The right side of the manifold or the extractor pressure control side of the 0700G1F consists of a 10 to 250 psi Pressure Regulator (Model 0766P0250); a 5 to 150 psi Pressure Regulator (Model 0766P0150); a 0 to 300 psi Precision Test Gauge (Model 0780P0300); plus all the necessary valves and fittings and is the same as the 0700G2 station. In setting extraction pressures in the range from 125 psi to 225 psi, valve A, referenced in fig 01, is opened (counterclockwise) and valve B is closed (clockwise). All pressure regulation is then done with the one Regulator (Model 0766P0250). The Regulator is turned clockwise for higher pressure values (or counterclockwise for lower pressure values) and the pressure is read directly on the Test Gauge. For low extraction pressures in the range from 5 to 150 psi, valve A is closed and valve B is opened. The High Pressure Regulator (Model 0766P0250) is set for a pressure value that is 10-20 psi above the planned value of setting the low pressure regulator. This High Pressure Regulator then supplies pressure to the Low Pressure Regulator (Model 0766PO150). This Low Pressure Regulator is then set for the extraction pressure desired and the pressure is read out on the test gauge. This system for low pressure regulation is known as “double regulation” and is frequently used to provide very accurate control of pressure. All regulators reflect, in their output pressure, variations present in the pressure from the sources of supply. By placing two regulators in series, such as mentioned above, variations in the output pressure from the first regulator are considerably reduced by the second regulator so that the output pressure from the second regulator is very constant with source pressure variations reduced in the ratio of 1:100 or more.

At the end of a run when you want to exhaust the air from the extractor, first close the precision “plus 5” regulator valve and exhaust the precision “plus 5” regulator side, then you can close valves A and B, then open up the exhaust valve on the regulation side of the manifold (right side) until the extractor is emptied of air. The extractor is now safe to open.

0700G2 Station

The 0700G2 station, designed for the operation and control of the model 1500F1, consists of a 10 to 250 psi Pressure Regulator (Model 0766P0250); a 5 to 150 psi Pressure Regulator (Model 0766P0150); a 0 to 300 psi Test Gauge (Model 0780P0300); plus all the necessary valves and fittings.

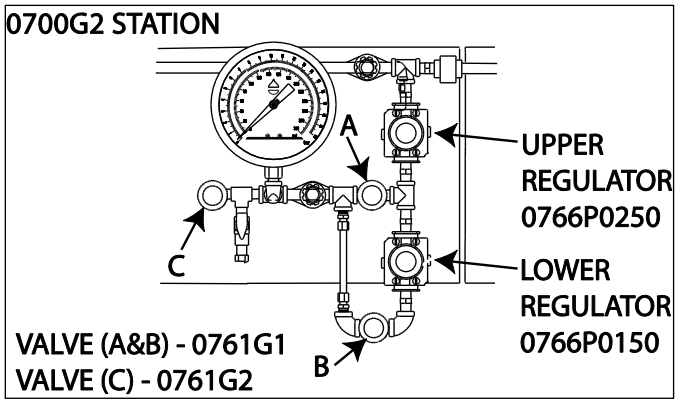

Figure 04 - 0700G2 Station

In setting extraction pressures in the range from 125 psi to 225 psi, valve A, referenced in the attached drawing, *fig 1.* is opened and valve B is closed. All pressure regulation is

then done with the one Regulator (Model 0766P0250). The Regulator is turned clockwise for higher pressure values and the pressure is read directly on the Test Gauge. For low extraction pressures in the range from 5 to 150 psi, valve A is closed and valve B is opened. The High Pressure Regulator (Model 0766P0250) is set for a pressure value that is 10-20 psi above the planned v--- of setting the low pressure regulation. This High Pressure Regulator then supplies pressure to the Low Pressure Regulator (Model 0766P0150). This Low Pressure Regulator is then set for the extraction pressure desired and the pressure is read out on the test gauge.

This system for low pressure regulation is known as “double regulation” and is frequently used to provide very accurate control of pressure. All regulators reflect, in their output pressure, variations present in the pressure from the sources of supply. By placing two regulators in series, such as mentioned above, variations in the output pressure from the first regulator are considerably reduced by the second regulator so that the output pressure from the second regulator is very constant with source pressure variations reduced in the ratio of 1:100 or more.

At the end of a run when you want to exhaust the air from the extractor, simply close valves A and B, then open up the exhaust valve C until the extractor is emptied of air. The extractor is now safe to open.

0700G3F1 Station

The 0700G3F1 station consists of a 5 to 150 psi Pressure Regulator (Model 0766P0150); a 1 to 60 psi precision Nullmatic Regulator (0765); a 0 to 100 psi Test Gauge (Model 0780P0100); and all the necessary valves and fittings.

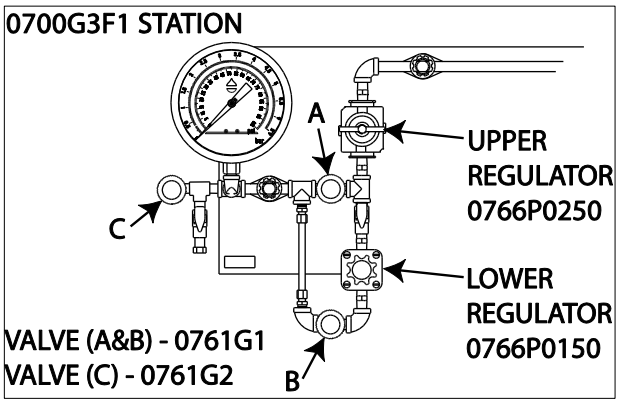

Figure 05 - 0700G3F1 Station

In making pressure settings at this station, it is important to carefully adjust both of the pressure regulators. The Nullmatic Regulator continuously exhausts a certain amount of air when it is used on “dead-end service” such as is the case with our Extractors.

The amount of air exhausted is proportional to the pressure differential between the supply air and the pressure setting of the delivered air. For normal use and for maximum conservation of compressed air from the tank, the Regulator (Model 0766P0150) should be set at a pressure ten to twenty psi higher than the equilibrium pressure you wish delivered from the Nullmatic Regulator. When this procedure is followed, the amount of air that escapes from the Nullmatic Regulator is in the order of 2/100 cu.ft. of air per minute. Keep in mind that the nullmatic is accurate in the range of 1-60 psi and the

150psi regulator is accurate in the range of 5-150 psi. If the bleeding of the nullmatic is problematic in your application (such as a limited nitrogen source), then just leave it on in the 1-5 psi range, after which valve B can be closed and the isolation valve D also closed to effectively remove the nullmatic from the system. Also note that in the range of 60-75 psi, the nullmatic must be isolated because the pressure is beyond the rated use of the unit. If you can use the nullmatic, it will provide you a little higher accuracy in stability than the 150 regulator but the tradeoff being higher air loss rate. This amount of air is very easily built up by the compressor pump in the course of its pumping cycle.

When setting the pressure for a run, the procedure is as follows (please reference *(Fig.01)*).
The valve at the end of the Connecting Hose is first closed. The Nullmatic Regulator is then opened a number of turns so that you are sure it is set at a pressure considerably above that which you plan to use. Then the Regulator (Model 0766P0150) is opened so that the pressure can flow through the Nullmatic Regulator and register on the Test Gauge. The Regulator (Model 0766P0150) is adjusted so that Pressure Gauge reads, say, three psi higher than the equilibrium pressure you plan to use in the Extractor. The Nullmatic Regulator is now closed until the excess air is exhausted up to the pressure value you desire in the Extractor and which will now be registered on the Test Gauge. The valve to the Pressure Extractor can now be opened and the regulators will maintain the pressure in the Extractor at the value set. A minor adjustment is needed at the end due to the added friction of additional path for the air to flow.

PROPER SETTING FOR USING OR EXCLUDING THE NULLMATIC REGULATOR:

If the nullmatic regulator is to be used, the upper valve a must be closed (turned clockwise to stop), the lower valve B must be open (turn counter-clockwise to stop) and the isolation valve D must be open (valve handle perpendicular to pipe).

If the nullmatic regulator is not to be used or using the 150 regulator exclusively, then the upper valve A must be open (turn counter-clockwise to stop), the lower valve must be closed (turn clockwise to stop) and the isolation valve must be closed (valve handle perpendicular to pipe).
This system for low pressure regulation is known as “double regulation” and is frequently used to provide very accurate control of pressure. All regulators reflect, in their output pressure, variations present in the pressure from the sources of supply. By placing two regulators in series, such as mentioned above, variations in the output pressure from the first regulator are considerably reduced by the second regulator so that the output pressure from the second regulator is very constant with source pressure variations reduced in the ratio of 1:100 or more.
At the end of a run when you want to exhaust the air from the extractor, simply close valves A and B, then open up the exhaust valve C until the extractor is emptied of air. The extractor is now safe to open.

Soilmoisture Laboratory Compressor (Model 0505V#)

Figure 06 - 0505V Soilmoisture Compressor

Normally, the Laboratory Compressor (Model 0505V#) is set adjacent to the laboratory bench and the Pressure Control Manifold. As indicated in *(Fig.02)*, a Connecting Hose Combination (Model 0505-2000) is used for pressure connection between the Compressor and Manifold, and is included in the Model 0505V#. The Connecting Hose Combination has a quick connect fitting which snaps into the back pressure outlet on the compressor tank.

The flexible rubber hose connects the compressor with the inlet fitting on the Manifold. The thread size of this Connecting Hose, as well as the Connecting Hose used to connect the various extractors to the Manifold, is 9/16-18 “B” or CGA-022. A pressure seal at the hose connection is made when the round “nose” of the brass stem inside the hose nut is pressed against the recessed conical surface of the pressure fittings. This is a metal-to-metal seal and is very effective. The screw threads on the fitting and the hose nut only serve as a means of holding the parts in contact. The threads themselves do not make a seal. Only a small amount of torque should be used to connect the hoses.

REPLACEMENT PARTS

PART #	DESCRIPTION
1000	15 BAR PRESSURE MEMBRANE EXTRACTOR
1500F1	15 BAR CERAMIC PLTE EXTRACTOR
1600	5 BAR PRESSURE PLATE
0775L60	60″ CONNECTING HOSE FOR 1000 & 1500 EXTRACTORS
0776L60	60″ CONNECTING HOSE FOR 1250 & 1600 EXTRACTORS
0765	NULLMATIC REGULATOR, 1-6- PSI RANGE
0760G1	AIR FILTER, 300 PSI
0766P0150	REGULATOR, 5-150 PSI RANGE
0766P0250	REGULATOR, 10-250 PSI RANGE
0769-5PSI	5 PSI DIFFERENTIAL REGULATOR
0780P0100	TEST GAUGE 0-100 PSI / 0-6.5 BAR, 6” DIAL
0780P0300	TEST GAUGE 0-300 PSI / 0-20 BAR, 6” DIAL
0761G1	VALVE, ¼″ AMLE NPT BOTH ENDS
0761G2	VALVE, RIGHT ANGLE. ¼″ MALE NPT
0761G3	VALVE, ¼″ MALE PIPE TO STANDARD HOSE
0761G6	PLUG VALVE
0772G01	ADAPTER, ¼″ MALE PIPE TO STANDARD HOSE
0772G19	BRASS TEE, ¼″ NPT
0772G20	¼″ NPTM X ¼″ NPTF BRASS STREET ELBOW
0772G30	BRASS ELBOW ¼″ NPT FEMALE
0772G35	BRASS MALE CONNECTOR ¼ TUBE X ¼ NPT
Z0702CR	STANDOFF NIPPLE WITH HARDWARE
MMK022	REPLACEMENT DIAPHRAGM ONLY FOR R73G REGULATOR
MMK023	REGULATOR REPAIR KIT FOR R73G REGULATORS
Z0765K1	COMPLETE REPAIR KIT 0765
0765K1-001	0765 DIAPHRAGM ONLY
0505V1106	110 VOLTS 60HZ
0505V2206	230 VOLT 60 HZ COMPRESSOR
0763G5K1	SAFETY RELIF VALVE UPGRADE KIT (5BAR)
0763G7K1	SAFETY RELIF VALVE UPGRADE KIT (15BAR)
0763G9K1	SAFETY RELIEF VALVE ASSEMBLY (FOR 1000 EXTRACTOR ONLY)
0772G24	MALE BRASS CONNECTOR, ¼″ X ¼″ NPT NIPPLE
0772G04	¼ X 2 ½ SS SCH 80 SEML NIPPLE

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