

3000F01/3005F01

OPERATING INSTRUCTIONS

Plant Water Status Console

February 2011



Fig. 01 - Model 3005F01 Plant Water Status Console - Table top



Fig. 02- Model 3005F01 Plant Water Status Console
(EXTENSION LEGS ATTACHED)

Model 3000F01

The Plant Water Status Console, Model 3000F01, is supplied without the compressed gas cylinder or the pressure regulator, but does come with a 5-foot long, flexible, high pressure (3,000 psi working pressure) stainless steel connecting hose to connect to your pressure source. One end of the connecting hose is sealed to the pressure inlet of the console. The other end can be fitted with standard 1/4-inch pipe fittings to connect to your regulated pressure source. We recommend you use brass pipe and tube fittings that have a 3,000 psi working pressure. The regulated pressure that you supply to the console must not exceed the maximum pressure reading of the pressure readout gauge of the console. For standard units this pressure is 600 psi.

Model 3005F01

The Plant Water Status Console, Model 3005F01, is supplied with a compressed gas cylinder and connected pressure regulator for field operation. The pressure regulator has been set at the factory for the maximum operating pressure of the unit which, for standard units, is 600 psi.

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UNPACKING

The Plant Water Status Console 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 ensure 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.

The Plant Water Status Console comes fully assembled. See page 4 for instructions on how to assemble the leg extensions for laboratory use.

CAUTIONS & WARNINGS

As with any pressure system, use reasonable caution. Be sure all valves are off before transporting. Do not lean directly over the specimen holder. Leave it to a qualified technician to do the repairs. Have the unit serviced at least once a year. DOT standards on aluminum pressure vessels require hydrostatic testing every 5 years.

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.

GENERAL SPECIFICATIONS

- 22 cubic foot aluminum DOT-3AL aluminum cylinder with CGA-580 fitting rated for 2216 psi – requires hydrostatic testing every 5 years.
- Single stage, step-down regulator set to 600 psi at the factory (can be reset by user if necessary).
- Standard pressure vessel 7", 0.5 liter volume, 2.4 kg, 40 or 80 bars. Cam lock. Specimen holder with safety valve. Internal diameter 2.73" with vertical useable height 5.837".
- 12" and 20" vessels also available. 12", 3.8 kg, 1 liter volume, 10.837" height. 20", 6.3 kg, 1.8 liter, 19.837" height.
- All vessels 2.73" diameter and rated for 80 bars with cam lock and safety valve features. Made of stainless steel for a lifetime of use.
- 6" scientific test gauge with beryllium copper movement and stainless steel case, ¼ of 1% full scale accuracy and the highest quality you can buy for many years of service.
- 600 psi gauge, 40 bars. Subdivisions 2 psi, 0.2Bars, 20 kPa.
- Resolution ½ a division. Dual scale psi + kPa, Parallax mirror and adjustable needle to re-zero if necessary.
- 1500 psi gauge, 80 bars. Subdivisions 10 psi, 0.5 Bars, 50 kPa.
- Resolution ½ a division. Dual scale psi + kPa, Parallax mirror and adjustable needle to re-zero if necessary.

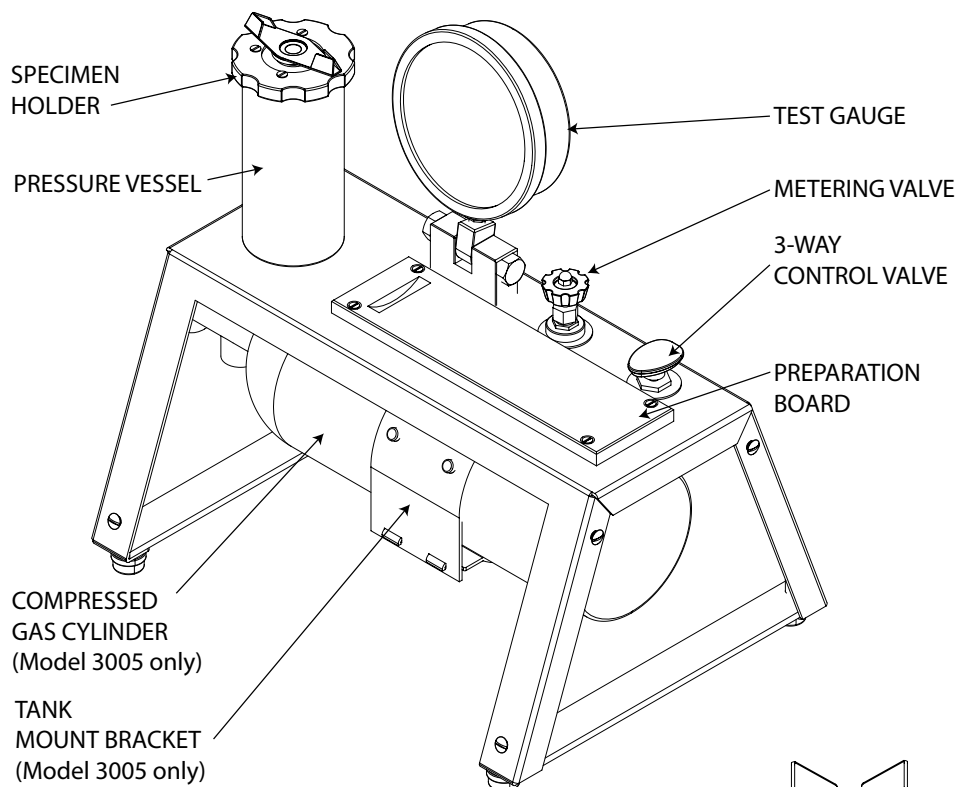
THEORY OF OPERATION

The roots of a plant are using reverse osmotic forces to overcome the matrix potential of the soil. The stomates on the leaves of a plant are transpiring at different rates throughout the day. The resulting tension in the xylem column can be measured using a plant water status console device.

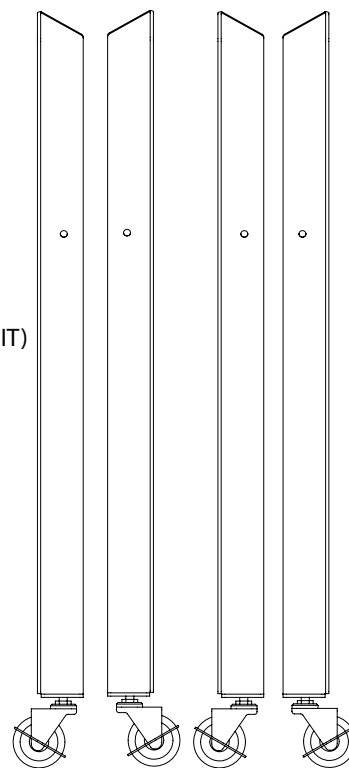
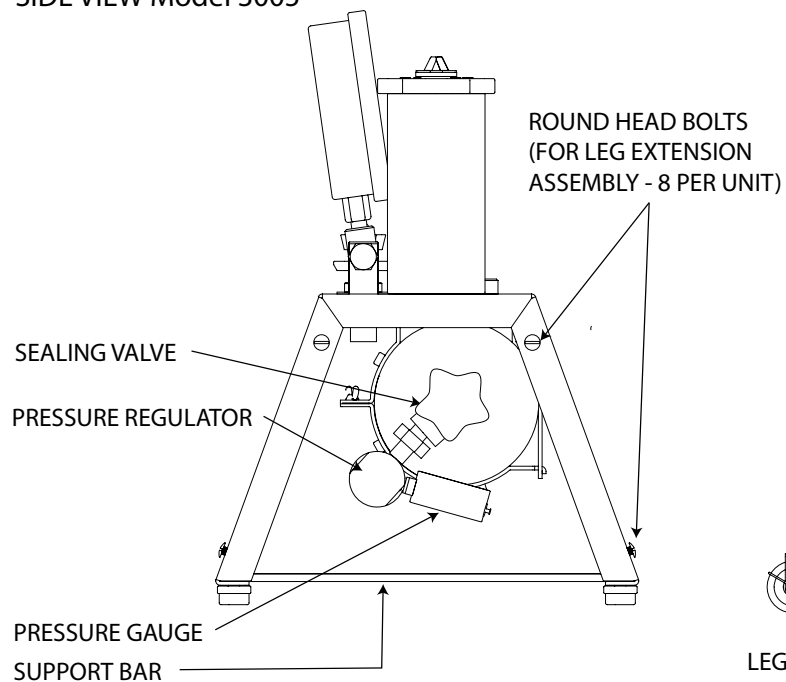
The petiole of a leaf or stem is placed in a rubber grommet so the leaves are inside the pressure chamber and the stem is outside at atmospheric pressure. By pressurizing the chamber and watching the point where the sap oozes out of the stem at atmospheric pressure the 2 forces are in balance – the reading on the gauge and the tension in the xylem column. This value can vary from the bottom to the top of the plant and at different times of the day due to temperature, humidity, sunlight, and wind. By stressing the plant, better crops can be produced and water use better managed.

AQUAINT YOURSELF WITH THE PARTS

Model 3005 PLANT WATER STATUS CONSOLE



SIDE VIEW Model 3005

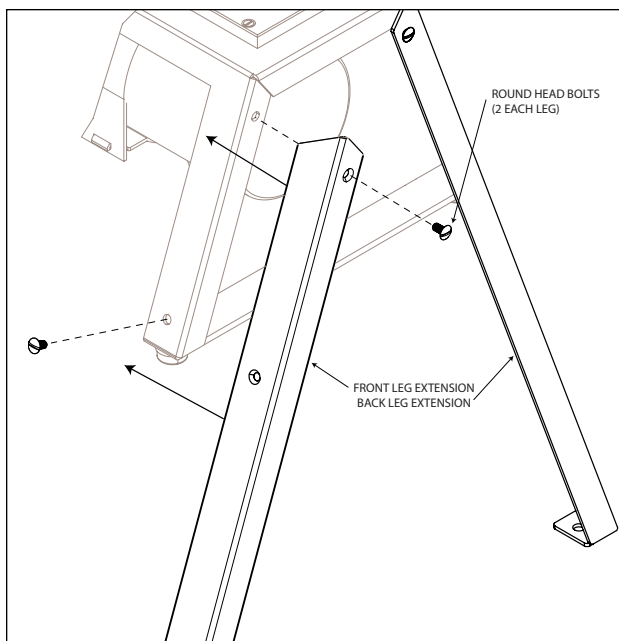


LEG EXTENSIONS (2 FRONT / 2 BACK)

Fig. 03 - Plant Water Status Console primary parts

AQUAINT YOURSELF WITH THE PARTS (cont.)

LEG EXTENSION ASSEMBLY



Assembly may require assistance depending on the size of pressure vessel and total weight of unit.

(Fig.04)

1. Unscrew round head bolts on each leg. (Total of 8 bolts included solely for the leg extensions)
2. Gently lay unit on front or back side. The unit may be resting on the pressure vessel. Although the pressure vessel is bolted securely on the chassis, be careful not to add any additional pressure.
3. Match legs to bolt holes. Re-insert bolts through bolt holes and tighten.
4. Gently turn unit over and repeat steps 2 & 3 with the final two legs.

Fig. 04 - Leg extension assembly

SPECIMEN HOLDER AND PRESSURE VESSEL



The specimen holder is held securely in place with four internal cams at the top of the vessel. The vessel's high pressure gas inlet is in the center of the vessel base. Remove the specimen holder by turning the closing cap counterclockwise 45° and pulling the holder upward (Fig. 05). To insert the specimen holder for a run, turn the specimen holder 45° clockwise to lock it in place.

When the specimen holder is removed the first time, it may require considerable force. The "O" ring used to make the pressure seal tends to "seize" to the metal surface if it is allowed to remain in the compressed position for a considerable time. To minimize this problem, apply a thin coat of light grease, such as stopcock grease or Vaseline, to the "O" ring. Then, after the specimen holder is removed for the first time, it will enter and close.

Fig. 05- Specimen Holder

AQUAINT YOURSELF WITH THE PARTS (cont.)

The fail safe valve (*Fig. 6*), in line with the pressure vessel cams, prevents build up of pressure in the pressure vessel unless the specimen holder is completely locked in place.

The sealing knob (*Fig. 6*) on the specimen holder actuates the collet-type closure that pressure seals the specimen and sealing sleeves during a run. Turning the sealing knob clockwise seals the specimen. Turning counterclockwise releases the seal. (*Sealing sleeves and grommets are discussed on pages 15-18.*)

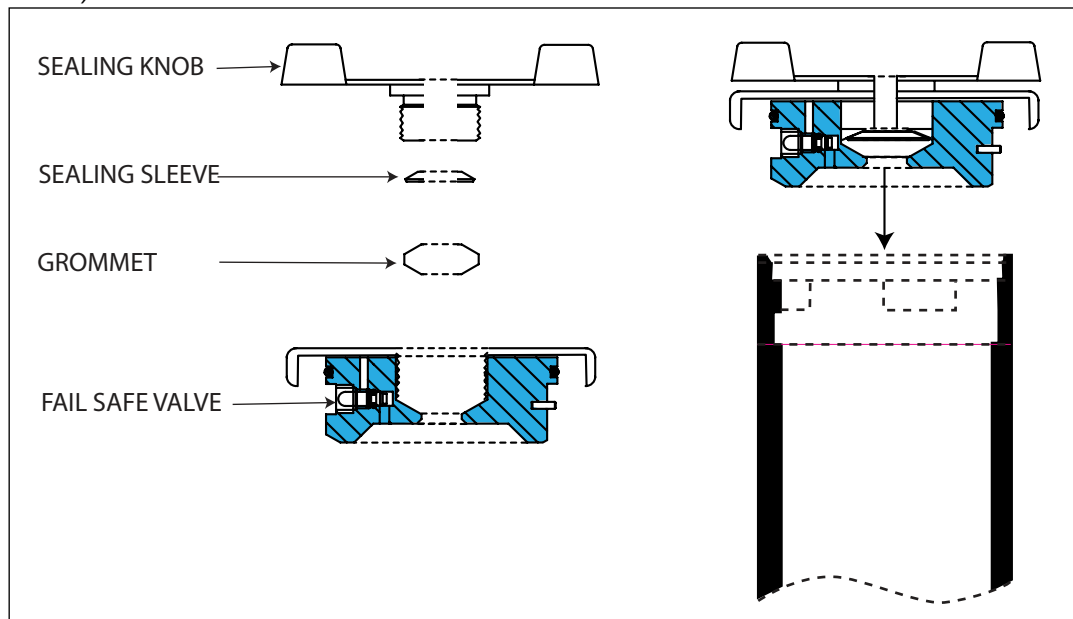


Fig. 06- Specimen Holder

GAUGE

The 6 inch dial face, 1/4 +/- of 1% accuracy test gauge, graduated in both psi (pounds per square inch) and in bars, indicates the pressure within the pressure vessel at all times. The swivel support base provides a detent to hold the gauge in two reading positions and one position for transport (*Fig.07*). A zero pointer position adjusting screw is provided for zeroing the pointer in the event it is jarred out of place.



Fig. 07- Test gauge with swivel base

AQUAINT YOURSELF WITH THE PARTS (cont.)

PREPBOARD

The high density polyethylene preparation board provides a convenient cutting block for the preparation of leaf samples. The notch at the end holds the specimen holder during the loading operation to minimize possibilities of damage (*Fig. 08*).

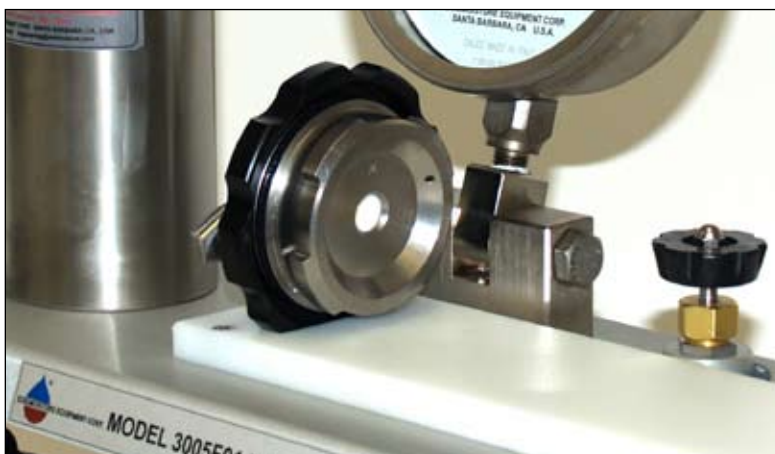


Fig. 08- Specimen holder on prep board

VALVE CONTROLS

The metering valve controls the rate at which pressure is built up in the pressure vessel. The valve is usually adjusted so that the rate of pressure increase is in the range of 5-10 psi per second. Turning the valve counterclockwise increases the rate of flow. During routine tests, this valve can be left at one fixed position to give uniform pressure building up on all samples. When the metering valve is closed (by turning clockwise) care should be taken not to exert excessive closing force since this tends to damage the valve seat and the long tapered valve which provides the sensitive gas flow control (*Fig. 09*).

The control valve directs the flow of gas into or out of the pressure vessel or seals the gas within the pressure vessel (*Fig. 10*). When the control valve is in the "OFF" position, high pressure gas within the pressure vessel is sealed in and no gas can enter or leave. When the control valve is in the "PRESSURIZE" position, high pressure supply air from the pressure regulator flows through the metering valve, through the control valve and into the pressure vessel. When the control valve is in the "EXHAUST" position, the high pressure gas within the pressure vessel exhausts immediately to the atmosphere.

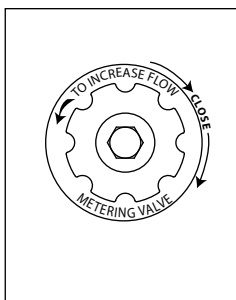


Fig. 09- Metering valve settings

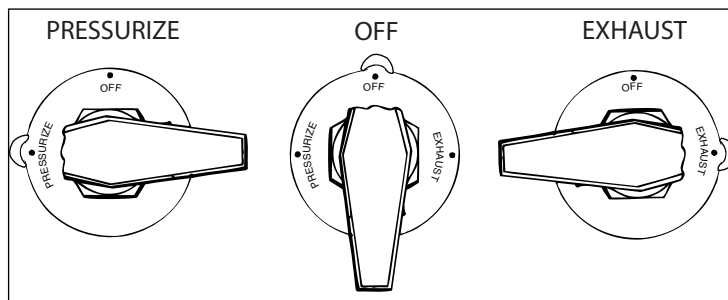


Fig. 10- Control valve settings

AQUAINT YOURSELF WITH THE PARTS (cont.)

Underneath the panel a safety relief valve is incorporated in the system to prevent damage from any excess buildup of pressure. The relief valve is set at the factory so that pressure will be released when it exceeds the maximum operating range of the console (Fig. 11).



Fig. 11 - Safety relief valve

The pressure regulator is connected to the compressed gas cylinder. It can readily be removed for replacement or refilling of the cylinder. The output pressure on the regulator has been set at the factory at 600 psi for standard consoles.

The small pressure gauge, screwed into one of the ports of the regulator indicates the pressure within the compressed gas cylinder and is used as a guide to indicate when the cylinder needs refilling (Fig. 12).

The refillable 2,216 psi, 22 cubic feet capacity, compressed gas cylinder is held securely by the tank mounting bracket beneath the chassis. When empty, it can be filled in place without removing it from the chassis. The sealing valve at the end of the tank should be kept closed (turn clockwise) except when the console is in use.

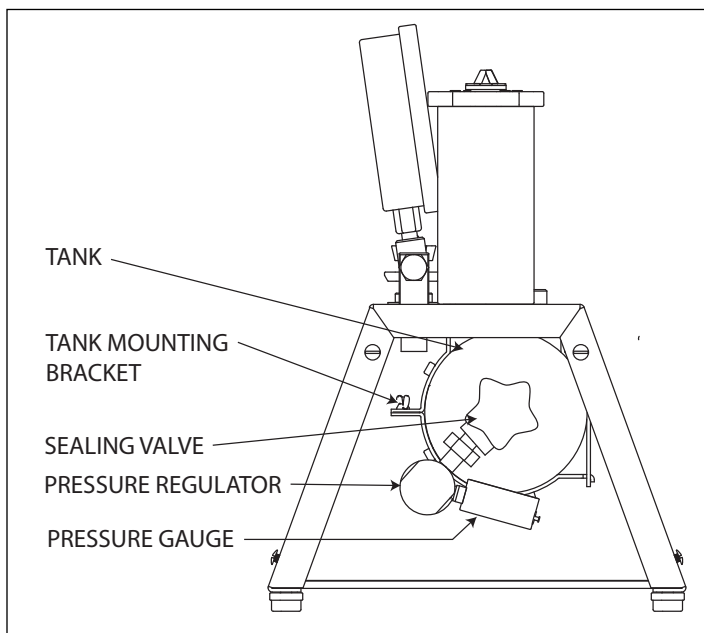


Fig. 12 - Parts under chassis

HOW TO USE AND/OR OPERATE THE UNIT

Step 1

Close the metering valve, turning clockwise (*Fig. 09*).

Step 2

The refillable 2,216 psi, 22 cubic feet capacity, compressed gas cylinder is held securely by the bottle bracket beneath the chassis. When empty, it can be filled in place without removing it from the chassis. The sealing valve at the end of the tank should be kept closed (turn clockwise) except when the console is in use (*Fig. 12*).

Step 3

Open compressed gas cylinder sealing valve, by turning counterclockwise (*Fig. 12*).

Step 4

Remove specimen holder from pressure vessel, as described earlier, and place in notch of sample preparation board (*Fig. 08*).

Step 5

Select sample leaf to run.

On initial run to check the unit and to acquaint yourself with its operation, you can substitute a round rod for the leaf sample in order to seal the specimen holder. A nail, rivet, dowel pin, or round 1/8-inch to 1/4 inch in diameter may be used. If the diameter to be sealed is less than 1/8-inch, select the support washer with the 9/64-inch hole. If the diameter to be sealed is greater than 1/8 inch select the support washer with the 1/4 inch hole. Next, select one of the rubber sealing sleeves that best fits the stem diameter.

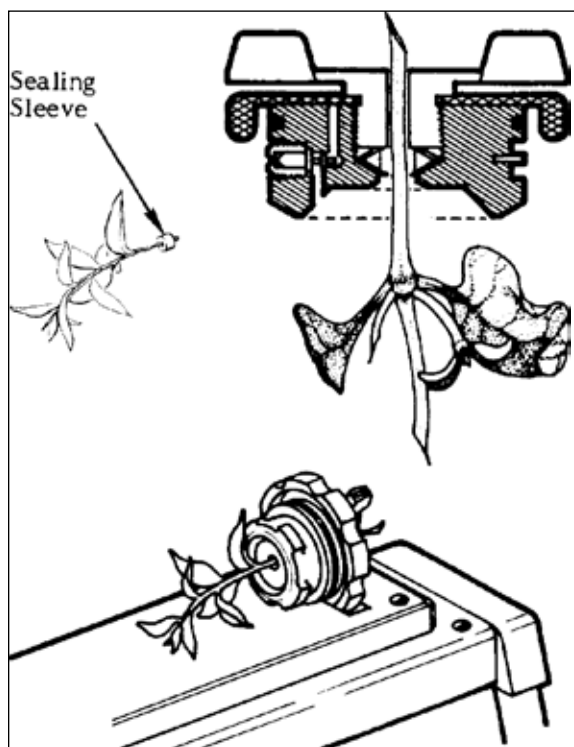


Fig. 13 - Stem insertion into the specimen holder

Step 6

Arrange the sealing sleeve on the stem, as shown, and insert into the specimen holder, as shown. Turn the sealing knob clockwise until the compressing grommet squeezes the sealing sleeve sufficiently around the stem to hold it securely (*Fig. 13*).

Step 7

Holding the specimen holder by the closing cap, insert the leaf sample into the pressure vessel and then push the specimen holder down into place in the pressure vessel. Pushing down with both thumbs (one thumb on either side of the specimen holder, is a good way to secure the specimen holder in place.) Then, turn the specimen holder 45° clockwise, using the closing caps to lock it under the cams of the pressure vessel.

Step 8

Tighten the sealing knob further, if necessary, to be sure that the sealing sleeve is sealing properly around the stem.

HOW TO USE AND/OR OPERATE THE UNIT (cont.)

Step 9

Turn the control valve to the PRESSURIZE position (*Fig. 10*).

Step 10

Slowly open the metering valve, by turning it counterclockwise, and observe the pressure buildup on the readout gauge (*Fig. 09*). Adjust valve until rate of increase is in the range of 5-10 psi per second or at the rate you desire for the test.

Step 11

To stop the build up of pressure within the vessel at any time, simply turn the control valve (*Fig. 10*) to the "OFF" position. To resume build up of pressure, turn the control valve slowly to the "PRESSURIZE" position.

Note: if the control valve is turned quickly to the "PRESSURIZE" position after an interruption in pressure build up, as above, there will be a quick jump in pressure of a few pounds within the pressure vessel. This is caused by the high pressure gas that builds up in the connecting tube between the metering valve and the control valve while the control valve is in the "OFF" position. When the control valve is opened quickly, this small volume of high pressure gas (supply pressure -600 psi) discharges immediately into the pressure vessel. Thereafter, the metering valve limits the flow.

Step 12

The build up of pressure within the vessel can also be stopped or reduced at any time by turning the metering valve in a clock-wise direction. Once you know the approximate value for the equilibrium pressure for the plant specimen being tested, it is usually desirable to reduce the rate of pressure build up as you approach the equilibrium pressure so that the equilibrium value can more accurately be determined.

Step 13

As pressure builds up in the pressure vessel, carefully observe the cut end of the petiole of the sample. (*Fig. 14*)



Fig. 14 - Observing the cut petiole of the sample

If you hear air escaping around the sealing area of the sample, or if the stem seems to be "extruding" or moving up out of the sealing sleeve, simply tighten the sealing knob further to exert higher sealing pressure to stop the leak or movement.

CAUTION: Never put your eye directly over the center of the pressure vessel during a run. Always observe the sample stem from the side. Remember you are dealing with high pressures and it is possible that a sample - such as an individual needle from a pine tree - can be ejected from the holder. It is recommended that the end of the cut petiole be observed through a low-power magnifying glass. The glass will give a better view and also offers protection for the eyes.

Step 14.

The equilibrium pressure for the individual sample is reached when sap starts to flow from the exposed cut end of the sample.

HOW TO USE AND/OR OPERATE THE UNIT (cont.)

After the sample has been mounted in the Plant Water Status Console(PWSC), and during the initial stages of the pressure build up within the PWSC, the cut end will appear relatively dry. However, when the equilibrium pressure is reached, the end will slicken up and be shiny and wet in appearance as sap starts to flow from the end of the sample. If pressure is further increased, small bubbles may be formed and arise in the extruded sap.

The build up of pressure should be stopped immediately when the cut end of the sample starts to slicken in appearance by the extrusion of sap. The pressure reading at this point is the equivalent to the negative force with which the plant water is held within that particular sample. After the equilibrium pressure has been reached, one can verify the pressure immediately by dropping the pressure in the pressure vessel below the equilibrium value. When this is done, you will note that the sap stops flowing immediately, pulls back into the stem of the sample, and the cut surface acquires the relatively dry appearance again. The build up can then be resumed again at a slow rate until sap again begins to flow. You will note that the second equilibrium obtained matches very closely the first reading.

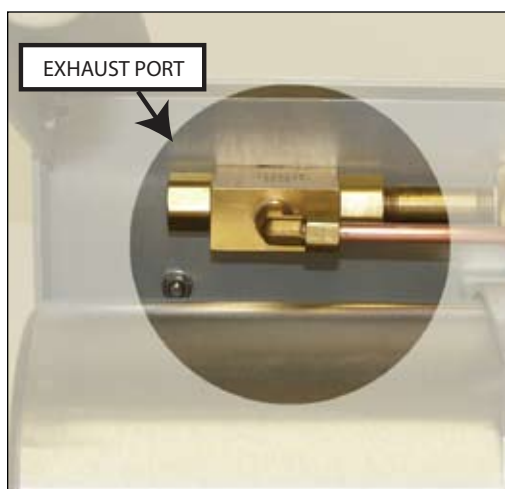


Fig. 15 - Exhaust Port

Step 15

After this equilibrium value, sometimes referred to as plant water potential or plant water stress, has been determined and noted, pressure in the pressure vessel is exhausted through the control valve by turning it to the "EXHAUST" position.

The exhausting gas will make an appreciable noise depending upon the pressure in the extraction vessel. The exhaust port is underneath the control panel (*Fig. 15*) and baffled by the end castings that hold the leg. The exhausting gas presents no hazard to the operator.

Step 16

Remove the sample by loosening the sealing knob slightly when the specimen holder is still in the pressure vessel. Then, turn the closing cap of the specimen holder 1/8 turn (45 °) in a counterclockwise direction.

Pull the specimen holder, with the specimen still in place, directly up out of the pressure vessel. Further release the sealing pressure on the specimen by turning the sealing knob counter-clockwise until the specimen and sealing sleeve can be readily removed.

The thrust washer will tend to remain in place in the specimen holder and can be left there to accept a subsequent sample.

Step 17

If no further samples are to be run, shut off the compressed gas cylinder sealing valve. Remaining high pressure gas within the system beyond the storage tank valve can be cleared, if desired, by turning the control valve to the "PRESSURIZE" position with the metering valve opened somewhat. Under these conditions, the gas in the system beyond the storage tank will exhaust through the pressure vessel. After exhausting the pressure, turn the control valve again to the "OFF" position.

GENERAL CARE AND MAINTENANCE



Fig. 16 - Removing the tank by loosening the bolt.



Fig. 17 - Disconnect the bracket

HOW TO REPLACE THE COMPRESSED GAS CYLINDER

The compressed gas cylinder can be easily replaced with a full tank or the tank can be filled from a larger supply tank without removing it from the console.

Step 1

Set the console on end and support it so that it doesn't fall over.

Step 2

Loosen and undo the 1-1/8 inch lock nut that holds the tank. A 1-1/8 inch open-end wrench or a crescent wrench of sufficient size is required for this operation (*Fig. 16*). This lock nut has a right-hand thread and therefore the nut must be turned in a counter-clockwise direction to undo it.

When the lock nut is completely removed from the storage tank fitting, the pressure regulator will separate from the gas cylinder and can be left hanging from its stainless steel connecting tube.

If the storage tank needs to be removed completely, loosen the bottle bracket wing nut, then swing the closure bolt free from the hinged bracket (*Fig. 17*).

The compressed gas cylinder can be refilled with gas while it is still mounted to the console after the regulator has been removed.

GENERAL CARE AND MAINTENANCE (cont.)

HOW TO REFILL THE COMPRESSED GAS CYLINDER

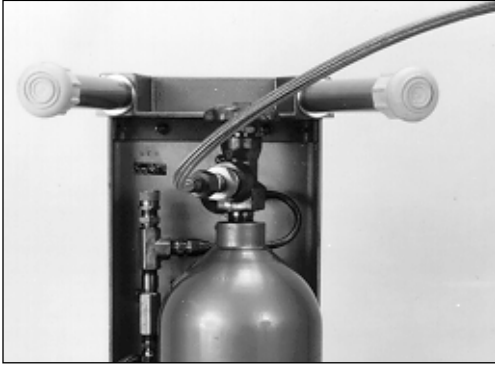


Fig. 18 - Valve filler hose

To fill the storage tank from a larger supply tank, our Model 0777L60 valved filler hose is used (*Fig. 18*). The lock nuts on the ends of the flexible hose are tightened securely in place on both tanks, using a 1-1/8" open-end wrench or the equivalent. The tank valve on the small storage tank is now opened first.

The valve on the larger pressure supply tank is then opened slowly so that the high pressure air from the large tank can flow to the small tank. After a period of time, when no further flow noise of gas is observed, the valve on the

large tank is sealed shut. The valve on the smaller tank is then closed securely. After the valves on both tanks are closed, the lock nut on one end of the hose is loosened slowly. High pressure gas within the flexible hose will drain out of the loosened end. Thereafter, the flexible high pressure hose is removed from both tanks. After filling, the pressure regulator is again connected to the compressed gas cylinder. The round nose on the connection fitting of the pressure regulator makes the pressure seal to the compressed gas cylinder. The lock nut serves only to hold this round nose securely in contact with the mating fitting on the tank. The threads of the lock nuts themselves do not make a pressure seal.

Tighten the lock nut securely.

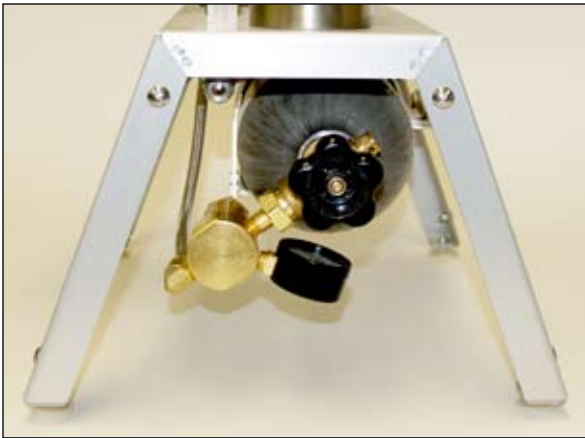


Fig. 19 - Angle of the pressure regulator

NOTE: If the compressed gas cylinder has been removed from the console, be sure that it is oriented in the proper position (*Fig. 19*), so that the regulator fits correctly below the console.

The pressure gauge on the pressure regulator should be in a "face up" position when the storage tank is oriented properly.

HELPFUL HINTS IN NORMAL USE

- Keep the cam area and specimen holder "O" ring area and relief valve areas clean and free of dirt.
- Do not block the bottom of the pressure vessel that could prevent air exhaust.
- Do not leave the pressure vessel pressurized while not in use.

TROUBLESHOOTING

Leaking at the valve stem on the 3-way ball valve or metering valve

Remove handle and either remove stem nut to remove the stem assembly for cleaning, lubricating with light oil and re-assembly or just tightening of the valve stem nut to stop the leaking. You may want to just tighten the nut first to see if that is all that is needed to stop the leak.

Locating leaks elsewhere when the unit is not holding pressure

Use soapy water and a small brush and check every joint in the system for leaks. Fix where possible.

MINOR ADJUSTMENTS

TO ADJUST THE ZERO POSITION OF THE PRESSURE READOUT GAUGE

In the event the pointer is jarred off of the zero position during transportation and handling, it can be re-zeroed easily. To do this, unscrew the cover plate of the test gauge by turning it counterclockwise.



Fig. 20 - Zero adjust

The zero adjusting gear (*Fig. 20*) on the gauge pointer is then turned clockwise or counterclockwise with the adjusting tool supplied with the unit to bring the pointer back to the zero position.

Replace the cover plate by screwing it on in a clockwise position. Tighten securely to prevent infiltration of dust into the gauge.

Note: On special units the readout pressure gauge is sometimes supplied with a friction-type adjustable pointer. If this type of gauge is on your unit, the zero position of the pointer is adjusted by grasping the knurled disc at the center of the pointer and moving the pointer itself with respect to this disc until the desired zero position is obtained.

Specimen Holders and Specified Grommets

(Fig. 21) Model 3015G4
Specimen Holder



SEALING SLEEVES	STEM GROMMETS (use with petioles)	LEAF GROMMETS (use with leaves or grasses)	SUPPORT WASHERS

(Fig. 22) - Complete G4 Grommet kit (3019G4K3) shown above

The G4 Specimen Holder (Fig. 21) is a General Purpose Holder. It can be set up to accept round petioles from 1/32 inch diameter to 1/2 inch diameter; for short petioles from 1 cm long; and for blade-type leaves up to 1/2 inch wide and on mid-vein of larger leaves. Above, (Fig. 22) are the range of

Grommets, Sealing Sleeves, and Support Washers used with the Plant Water Status Console using the G4 Specimen Holder.

The first stem Grommet, second column, (Fig. 22), a solid Grommet (no hole), can be used for testing the system for leakage or to make your own Grommet. The next five Grommets in the same column, are used for testing petioles from the size of pine needles up to thick leaves, selection based on the size of the petiole to be tested. The last item in the row, with the very large hole, is a Grommet that accepts the sealing sleeves shown in the first column (Fig. 22).

Rather than disassembling the specimen holder for each test, the sealing sleeves can be quickly taken in and out of the Grommet for fast sampling.

The Grommets with slits in them, third column, (Fig. 22), are usually used for testing large leaves or grass blades.

The G4 Series Brass Support Washers, fourth column, (Fig. 22), are used in conjunction with the Grommets to protect the Grommet when the knob is tightened, thereby providing equal pressure over the entire surface of the Grommet. The Support Washers also prevent the Grommet from being pushed out of the specimen holder when pressurized.

G4 Specimen Holder REPLACEMENT PARTS

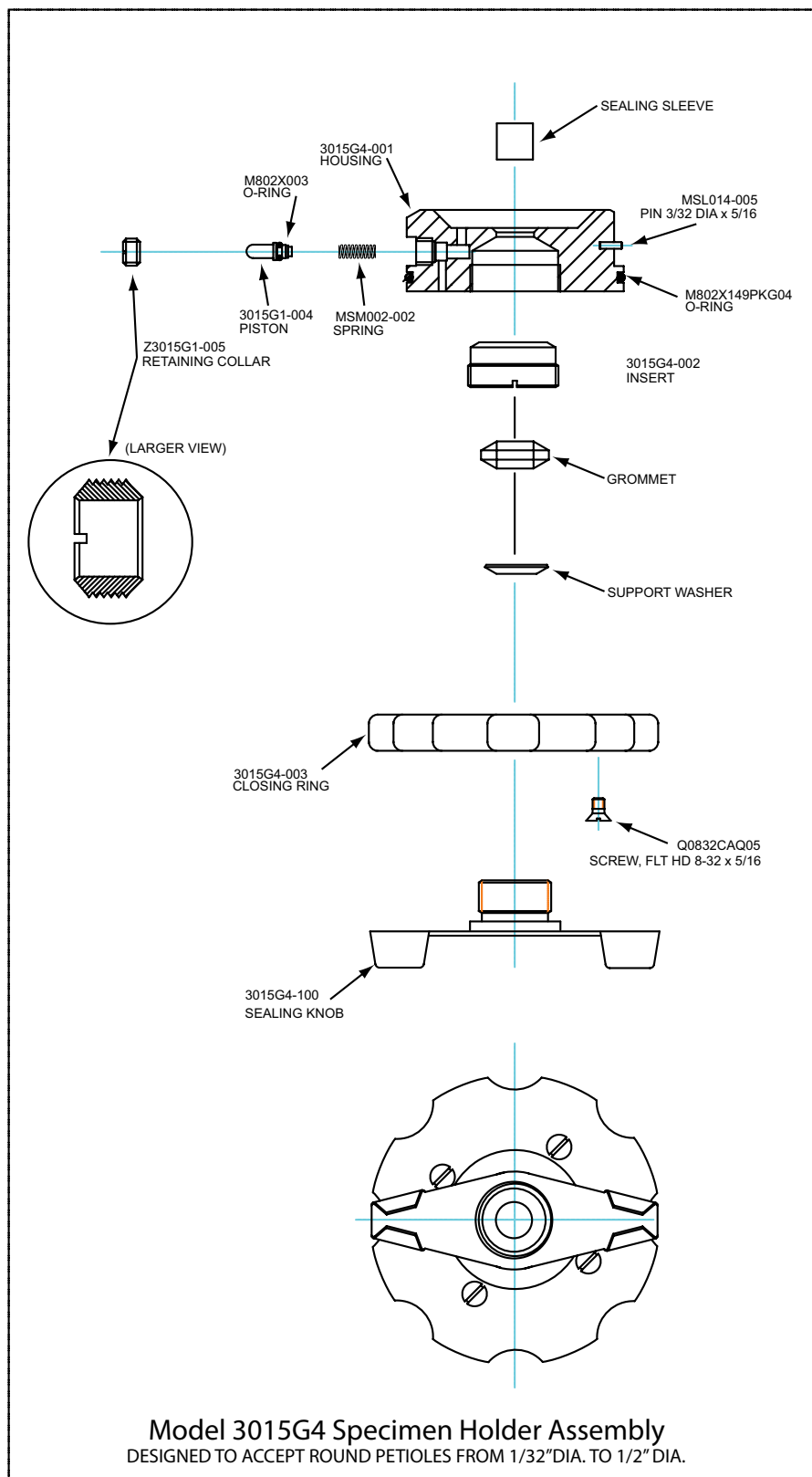


Fig. 23 - Replacement parts for Model 3015G4 Specimen Holder Assembly

G2 Specimen Holder (used for Blade-type Leaves)

The G2 Specimen Holder (*Fig. 25*) is used specifically for blade-type leaves up to 1 inch in width.



(*Fig. 25*) Model 3015G2
Specimen Holder

The items shown in the left column of (*Fig. 24*), are called Grommets. They are for use with broad leaves or grasses; and the brass items shown, in the right column, are called Support Washers.



(*Fig. 24*) MODEL 3017G2K1
G2 Series Complete Grommet Kit

NOTE: The 3017G2 Series Grommets can only be used with the G2 Specimen Holder.

G2 Specimen Holder REPLACEMENT PARTS

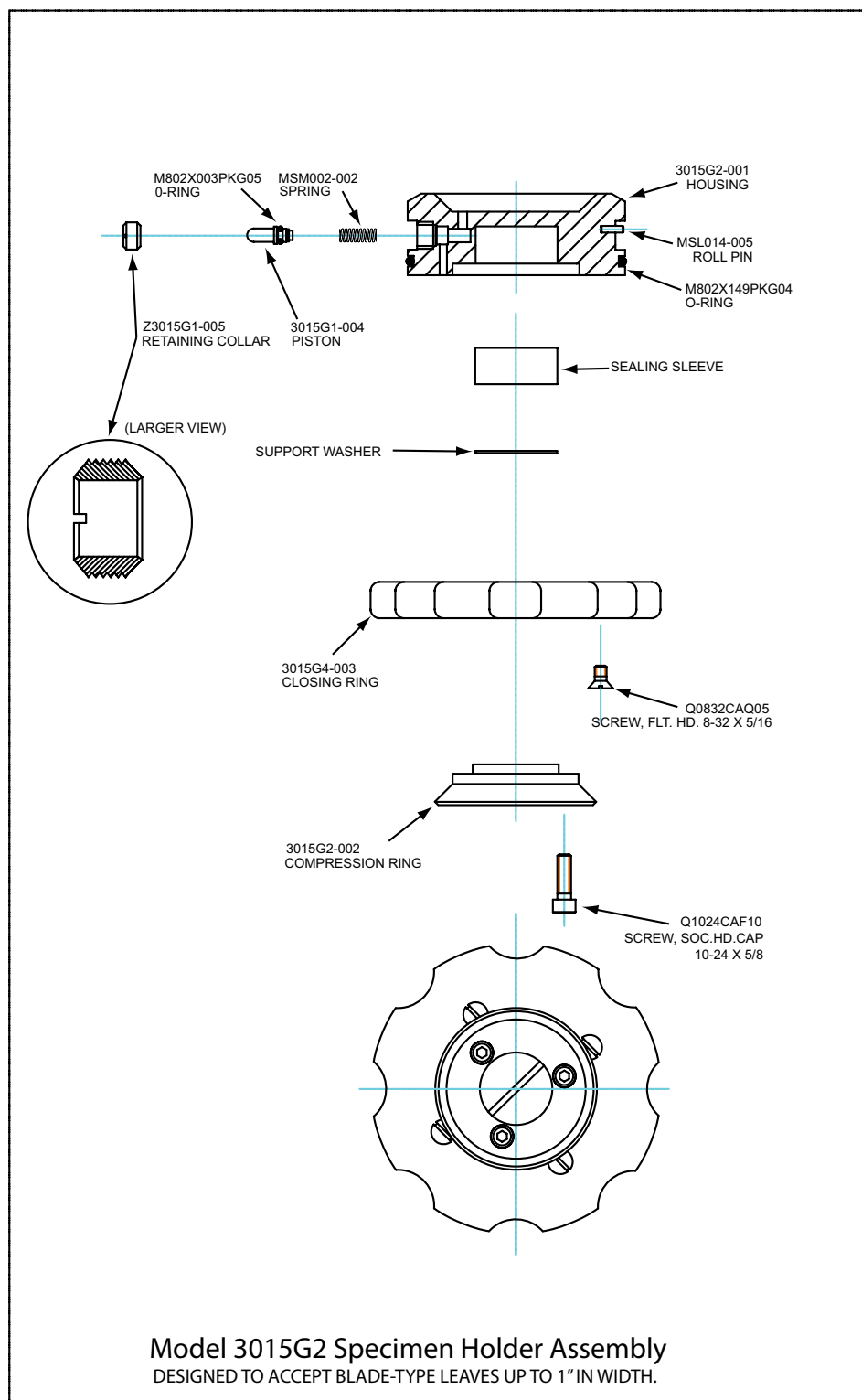


Fig. 26 - Replacement parts for Model 3015G2 Specimen Holder Assembly

NOTES

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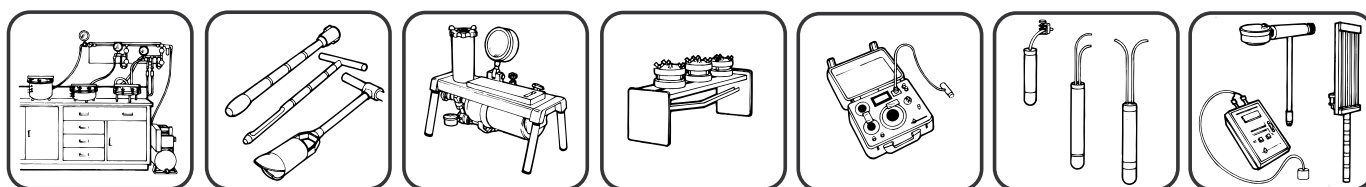
NOTES



PLANT WATER STATUS CONSOLE REPLACEMENT PARTS

	ITEM PART #	DESCRIPTION
1.	3010L07	PRESSURE VESSEL 7"
	3010L12	PRESSURE VESSEL 12"
	3010L20	PRESSURE VESSEL 20"
2.	3015G2	SPECIMEN HOLDER
	3015G4	SPECIMEN HOLDER
3.	0780P1500	TEST GAUGE, 0 to 1500 psi, (0 to 100 bars)
	0780P0600	TEST GAUGE, 0 to 600 psi, (0 to 40 bars)
4.	Z3000-011	METERING FLOW CONTROL VALVE
5.	0761G5	THREE-WAY PRESSURE CONTROL BALL VALVE
6.	3000-001	PREP BOARD
7.	3000-201	CHASSIS BODY
8.	3000-202	CHASSIS REPLACEMENT RIGHT LEG EXTENSION
9.	3000-203	CHASSIS REPLACEMENT LEFT LEG EXTENSION
10.	3000-204	CHASSIS SUPPORT BAR
11.	3005-2000	TANK MOUNT BRACKET
12.	3072V22	COMPRESSED GAS CYLINDER 25 cubic ft. capacity nitrogen supply tank
13.	0772G34	BRASS ELBOW
14.	Z3000-009L2.25	CONTROL VALVE CONNECTOR, 1/4" NPT
15.	MBT013	COPPER TUBING
16.	0772G35	BRASS ELBOW
17.	0772G19	BRASS TEE
18.	Z0767PO750G1	TANK REGULATOR REPLACEMENT FOR 3005F1 - 40 BAR
19.	0772G42	BRASS ELBOW (ALSO INCLUDED IN Z0767PO750G1)
20.	0763G6/G4	RELIEF VALVE - 40 BAR / 80BAR
21.	XFSMR1032CAS06	10-32 X3/8 ROUND HEAD SLOTTED MACHINE SCREW
HELPFUL ITEMS / ACCESSORIES		
	3023	LIGHTED HAND LOOP
	Z0767P2000G2	SOURCE TANK REGULATOR, for 3000 Plant Water Status Console, high pressure, 80 BAR
	0777L60	VALVE FILLER HOSE
	Z0767PO750G2	SOURCE TANK REGULATOR ACCESSORY FOR 3000F1 - 40 BAR
	3022	4" DISPLACEMENT INSERT
	3072K1	TANK CARRYING HANDLE FOR BACK-UP TANK
SPECIMEN HOLDER / HELPFUL ITEMS AND KITS		
	Z3015K1	SPECIMEN HOLDER RELIEF VALVE REPAIR KIT
	3025K1	GROMMET INSERTION TOOLS
	3017G2K1	G2 SERIES COMPLETE GROMMET KIT FOR G2 SPECIMEN HOLDER
	3018G4K1	QUICK SEAL, FULL SET, SEALING SLEEVES, COMPRESSING GROMMETS AND SUPPORT WASHERS
	3018G4K2	QUICK SEAL, SLEEVE SET, SLEEVES ONLY
	3018G4K3	QUICK-SEAL, SLEEVE SET WITH COMPRESSION GROMMET, less support washers
	3018G4K4	QUICK SEAL, SUPPORT WASHER SET, a set D250, D140, DBLK support washers
	3019G4DK1	COMPRESSION STEM GROMME SET, 1.ea. all "D" round holes, Saucer Type
	3019G4UK1	SPECIALITY COMPRESSION STEM GROMMET "UT" KIT, all arcs/ellipses, Saucer Type, Complete SET
	3020G4DK1	COMPLETE SUPPORT SET for all 3019G4D round hole series
	3020G4UTK1	COMPLETE 3019G4UT SUPPORT SET, for all specialized grommets.

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PLANT WATER STATUS CONSOLE REPLACEMENT PARTS (cont.)

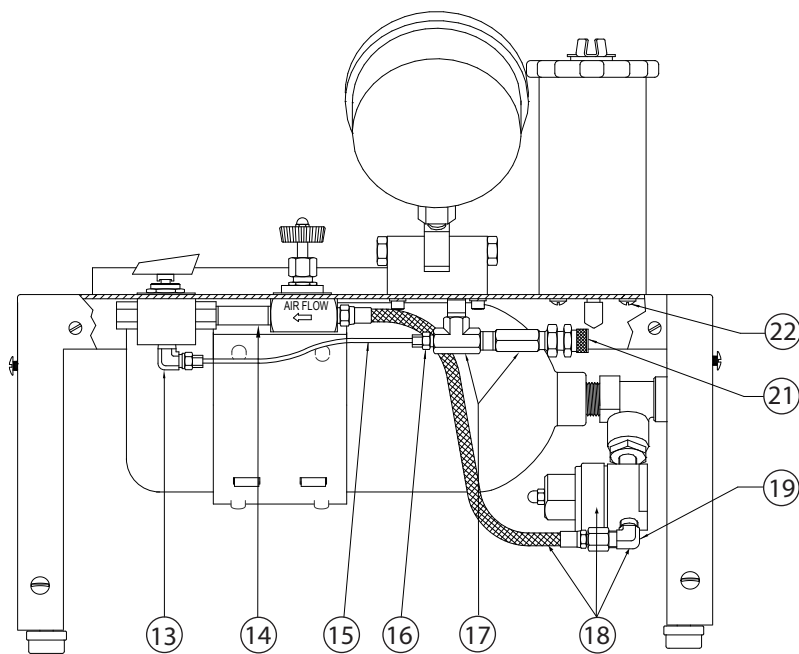
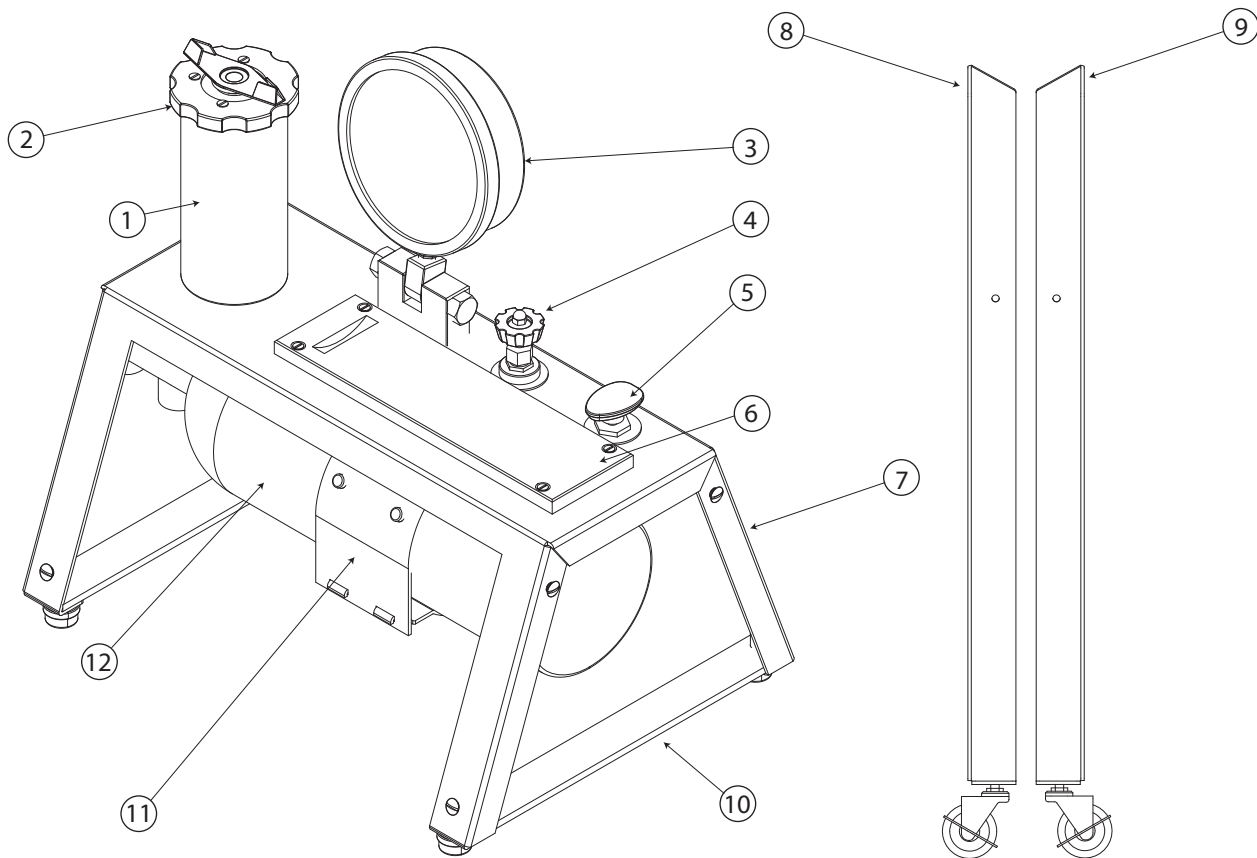


Fig. 27 - Replacement Parts