

30KPS Pressure Controller

Instruction Manual



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30KPS Pressure Controller Instruction Manual

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Houston, Texas, USA

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1 Introduction

The 30KPS Pressure Controller has been designed to digitally control the pressure set point during testing, and can be plumbed to provide pressure to other devices (e.g. autoclaves or curing chambers). It includes a communications port for control and data interface to external devices, self-contained operation, and functionality to set maximum usable pressure.

The 30KPS can be used with any equipment requiring external pressure regulation.. The unit is capable of controlling pressure from 200 to 30K psi with resolution of +/- 100 psi. It can be controlled manually via the front panel controls or can be interfaced with Fann software programs that take advantage of communications port for automatic pressure control. The small footprint of the pressure controller allows for minimal laboratory space usage.

Contained in this manual are instructions for proper use of this controller and guidance for troubleshooting and maintenance.

1.1 Document Conventions

The following icons are used as necessary in this instruction manual.



NOTE. Notes emphasize additional information that may be useful to the reader.



CAUTION. Describes a situation or practice that requires operator awareness or action in order to avoid undesirable consequences.



MANDATORY ACTION. Gives directions that, if not observed, could result in loss of data or in damage to equipment.



WARNING! Describes an unsafe condition or practice that if not corrected, could result in personal injury or threat to health.



ELECTRICITY WARNING! Alerts the operator that there is risk of electric shock.



HOT SURFACE! Alerts the operator that there is a hot surface and that there is risk of getting burned if the surface is touched.



EXPLOSION RISK! Alerts the operator that there is risk of explosion.

2 Safety

Safe laboratory practices and procedures should be observed while operating and maintaining the 30KPS. This section lists precautions to follow.

2.1 Pressure

The 30KPS has pressurized air and water lines that present a hazard if not depressurized before maintenance or disassembly.

Compressed air is required to operate the hydraulic pump. This air should be regulated from 80 to 100 psi to insure proper operation and to prevent damage to internal components.

High pressure lines present the greatest hazard as they can hold up to 30k psi. Operators must ensure that the pressure has been bled off to zero before removing the protective cover.

Domestic water is used by the unit as a pressurizing fluid. The domestic water supply should always be shut off prior to maintenance being performed on the equipment.



WARNING! Operators should exercise extreme caution when working with the high pressure lines which may be energized up to 30,000 psi. it is critical to evacuate all pressure to zero before removing the protective cover.

2.2 Electrical

This unit operates on 110/220 VAC utilizing a universal power adapter supplied with the unit. The internal electronics are low voltage (24VDC).

3 Features and Specifications

The features of the 30 KPSI pressure controller include

- Digital control of pressure set point
- Device maintains pressure within 100 psi of set point
- Ability to set maximum usable pressure
- Provides pressure to other devices, such as autoclaves, curing chambers etc.
- Small footprint, self-contained operation
- Communications port for control and data interface to external devices

Table 3-1 30KPS Specifications

Operational	Specification
Size	9 x 15 x 21 in. (w x h x d)
Weight	45 lbs.
Pressure Min	0 or 200 PSI
Pressure Max	30000 PSI
Pressure Tolerance Min.	100 PSI
Operating Temperature	4°C to 50°C
Operating Humidity	80% RH at 87.8°F (31°C) or less 50% RH at 104°F (40°C)
Operating Altitude	2000 meters AMSL
Electrical	Specification
Power	Single-phase 90 to 264VAC connection (Universal AC/DC Power adapter is supplied) 30KPS is 24VDC device.
;Mechanical Ports	Specification
Water In	¼ in. NPT Female, 10 PSI min
Drain Out	¼ in. NPT Female
Air In	¼ in. NPT Female
High Pressure Out	HF4 Female
Data Port	Specification
EIA485 (2, Daisy chained)	Serial over RJ45
Ethernet	TCP/IP over RJ45
Display and Control	Specification
LCD Display	Set Point, Current Value
Detent Knob with Push Button	Change Set Point or Machine Parameters

4 Pressure Controller Installation

Prior to commissioning; local facilities and safety prerequisites must be understood and followed. In addition, certain materials and tools are necessary for the mechanical installation and maintenance not supplied with the pressure controller. Laboratory must take into account these physical and operational considerations before commissioning of equipment.

4.1 Physical Space Requirements

The pressure controller requires an area that is suitable with the type of plumbing and connections that are desired to connect external equipment. The unit itself occupies 9 in. wide x 15 in. high x 21" deep.

For control of air pressure an optional regulator is sold, part number 102334877 (see accessories list in Table 9-1).

4.2 Operational Considerations

The operation of the pressure controller requires an electrical connection of either 110VAC or 220VAC, supply/drainage of compressed air, and water.

Table 4-1 30Kpsi Component Specifications

Component	Specification
Electrical	Single-phase 90 to 264VAC connection (Universal AC/DC Power adapter is supplied) 30KPS is 24Vdc device.
Compressed Air	100 psi (0.79 MPa), Filtered, 50 micron
Water	30 psi (0.31 MPa), Filtered, 250 micron/60 mesh
Drainage (water)	Free flowing gravity feed.
High Pressure out	High Pressure tubing (use recommended Fann kit 102363627)

See below Figure 4-1 and Figure 4-2 for diagrams of the front and back of the controller unit.



Figure 4-1 30KPS Front Panel

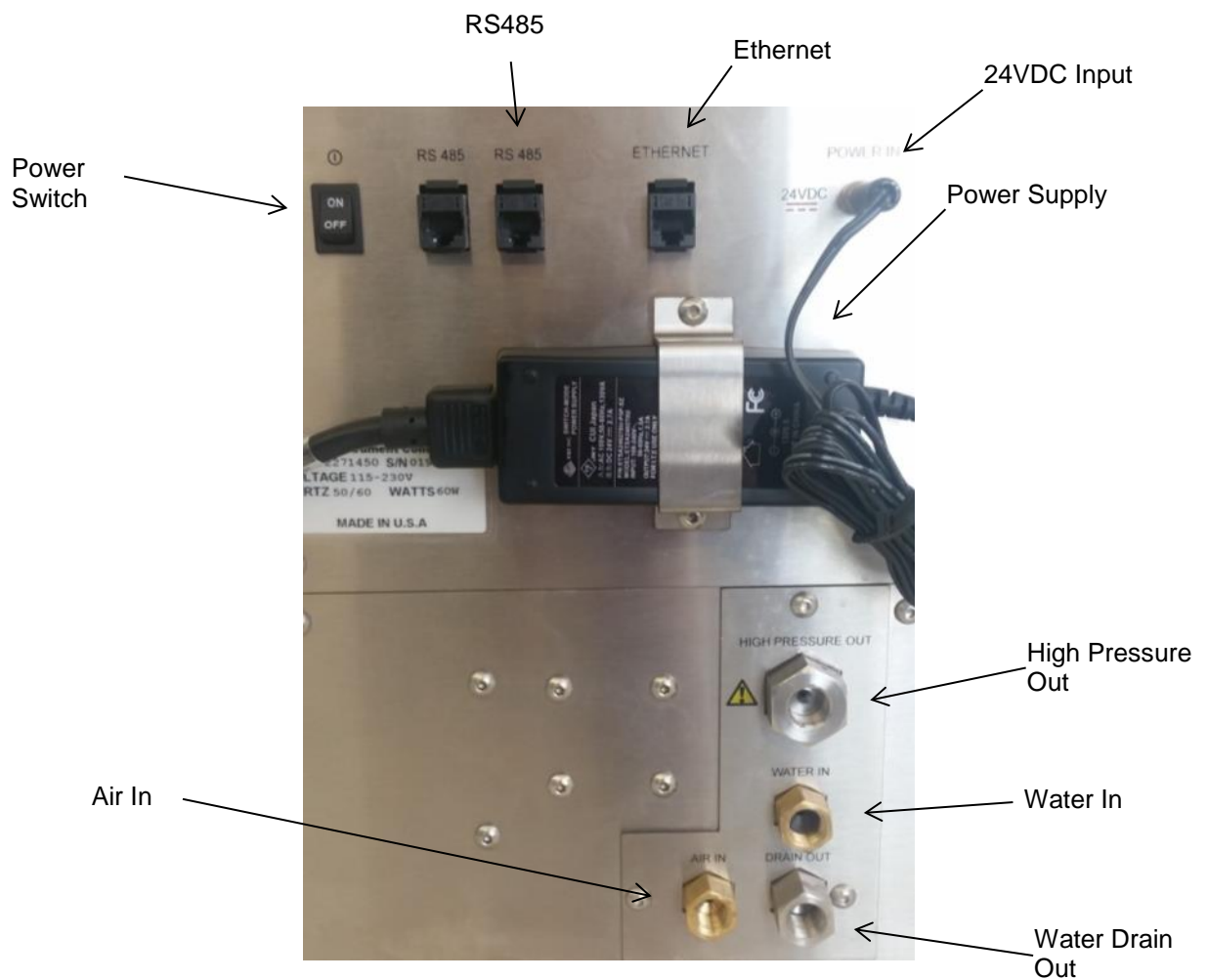


Figure 4-2 30KPS Back Panel

Table 4-2 Front and Back Panel Descriptions

Component	Description
High Pressure Indicator	Indicates flashing red when pressure is above zero
Display	Displays operational information on the controller
Control Knob	Setup system parameters Press and hold knob to enter setup Press and release to accept or change setting
Remote/Local Switch	Allows remote operation by external computer this is used when interfaced with other automatic devices such as the Modular UCA (part no. 101887045)
Power Switch	Switch turns the unit power on or off. When the pressure controller power is engaged, wait approximately 2 minutes for initialization to complete before operating the unit.
RS485(2)	This is the communication port used to connect external devices with software to connect and control the 30KPS. Two ports are provided to be able to daisy chain other devices through 30KPS
Ethernet	This is the Ethernet port used for calibrating the equipment and may be used for future web enabled capabilities.
24 VDC Input	This is the Power input to 30KPS. Use the included power supply to connect to this port
Power Supply	This is the universal power supply. One end of the power supply is connected to user AC power. The other end goes to 24VDC input
Air In	Connect clean dry air as per specification to allow the unit to operate.
Water In	Connect Water supply as per specification to supply the pressurization medium
High Pressure Out	This is the port where high pressure water is available to use as source for pressurization
Water Drain Our	Connect drain line to drain any water released during depressurization,

5 Manual Operation Procedure

Following is the procedure for manual operation of the 30KPS pressure controller.

1. Switch power “On” using power switch located on the rear panel.
2. Open valves for air, water, and drainage
3. See main screen (shown in Figure 5-1)
- a. SP: Set Point (set pressure of system)
- b. PV: Process Value (current pressure of system)

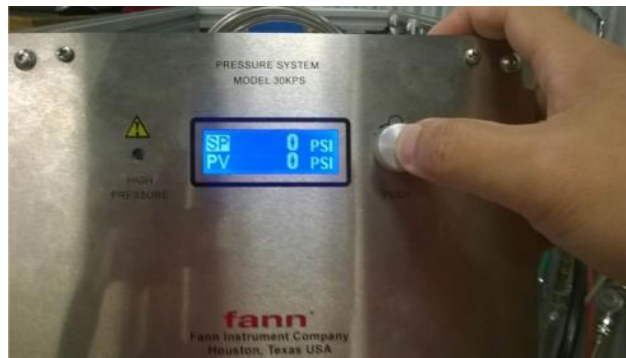


Figure 5-1 Display Screen

4. To change the set pressure, press the control knob once; SP will then flash. The SP value can be **increased** by slowly rotating the control knob **clockwise** and its value can be **decreased** by rotating the knob **counterclockwise**.



If the unit is pressurized, the pressure will release to zero if the control knob is depressed and held for 10 seconds. If the unit is not pressurized, then when the control knob is held for 10 seconds it will enter system setup.

5. Once the desired pressure value is set, press the control knob once, and the SP screen will go back to the previous static state.



6 System Setup

To enter into Setup menu, press and hold the control knob for 10 seconds. The following screen will appear:



6.1 Communication Address

Adjust com address by entering setup as previously described, then rotate control knob until display reaches Setup Com Address. Press the control knob once. The below screen will appear. To **increase** the value, turn the control knob **clockwise**, to **decrease** the value, turn it **counterclockwise**. Press the control knob to select.



6.2 Baud Rate

Adjust baud rate by rotating control knob until unit reads as below, then press the control knob once.



There are three baud rate options to select from: 9,600, 19,200 and 57,600. Select the desired baud rate by rotating the control knob to the desired selection. Once selection is chosen, press the control knob one time to select.



6.3 RS485 Communication

Rotate the control knob until the below screen appears, and depress the control knob to select RS485.



There are two options for RS 485 communication – 2 WIRE (default) or 4 WIRE.



Rotate the control knob to the desired option, then press once to select.

6.4 Maximum Pressure Setting

Rotate the control knob until the below screen appears, and press the knob to select.



After the knob is pressed, the below screen will appear. The desired maximum pressure can be adjusted from 0-30K psi by rotating the knob. Once the pressure is entered, press the control knob once to select. Once the MAX PRESS (Maximum Pressure) is set, that value will be the maximum operation pressure of the controller.



6.5 Setting Deadband

Rotate the control knob until the below display is reached, then press the control knob once to select.



The display will appear as below. Pressure value can be adjusted by rotating the control knob. The dead band can be changed in increments of 100 on each turn of the control knob.



6.6 Setting Valve Type

This option is reserved by Fann for future additions and upgrades that are not available at this time.



By default, valve type 0 valve is automatically selected. Press the knob to select.



6.7 IP Address



The IP address is automatically set when powering up, if the unit is connected to a network.



If the device is not connected to a network, a link local address will be assigned. If the unit is connected to a network after the device is powered up, then the unit will not be visible on the network until power is cycled so the IP address will be assigned.

6.8 Serial Number

The serial number is found in setup mode by rotating the control knob until the below display appears. Press the control knob once to select the SER NUMBER.



The serial number of the pressure controller will then be displayed.



6.9 Exit

In setup mode, rotate the control knob until the display below appears. Press the control knob once; in a few seconds 30KPS will exit setup



6.10 Remote function

The 30KPS controller can be run remotely or locally, by selecting either REMOTE or LOCAL. To switch modes the toggle switch has to be pulled outwards and then toggled to appropriate mode. This is to ensure that the unit does not change modes inadvertently or casually,

The remote position should be used when operating the unit with external Software and as part of a larger system such as Fann UCA Controller (P/N 102444466) or Fann StandAlone UCA system (P/N 101887045) software.

In the “Remote” Mode, external software on Computer is allowed to take control of the 30KPS unit. External devices can change Pressure setpoints at will. This is useful when doing automated pressure ramping and scheduled pressure control as part of a recipe or profile. However if the end user wants to inhibit and prevent such a control (in case of troubleshooting, or leak or any inadvertent activity), then the user may switch to “Local” mode.

The unit can be operated locally and manually irrespective of whether the unit is in “Remote” or “Local” mode. The unit can be operated remotely by another external device only if the unit is in “Remote” mode.



7 Calibration Procedure



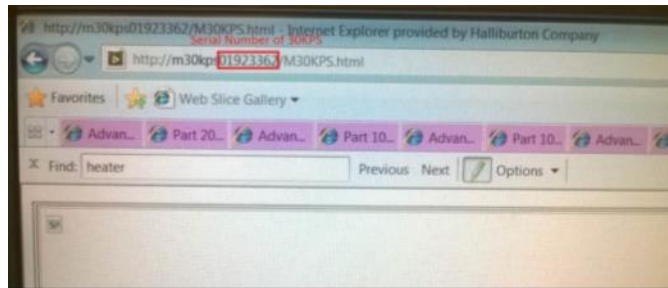
NOTE. The calibration link in step 5 below is active based on: how long the unit is online, and whether it has been activated by Fann IT. Contact Fann customer service with questions.

1. Verify the switch on 30KPS is set for “REMOTE”.



2. Vent pressure and disconnect the high pressure connections from the back of the device.
3. Connect a calibrated pressure gauge to the high pressure port at the back of the unit.
4. Run Internet Explorer.
5. Type in the following for the http address: <http://ipaddress/m30kps.html> *

*where IP address is the actual IP address of the device. See section 6.7 on how to obtain the IP address.



6. If this is the 1st time accessing the 30KPS pressure controller through Internet Explorer then a prompt to install LVRTE2013min.exe will pop up as shown below.



7. Click “Yes” to install LVRTE2013min.exe. After installation, software will prompt for a reboot of the computer.
8. After computer reboots, open Internet Explorer and type in the following for the http address: <http://m30kpsSERIALNUMBER/m30kps.html> *.

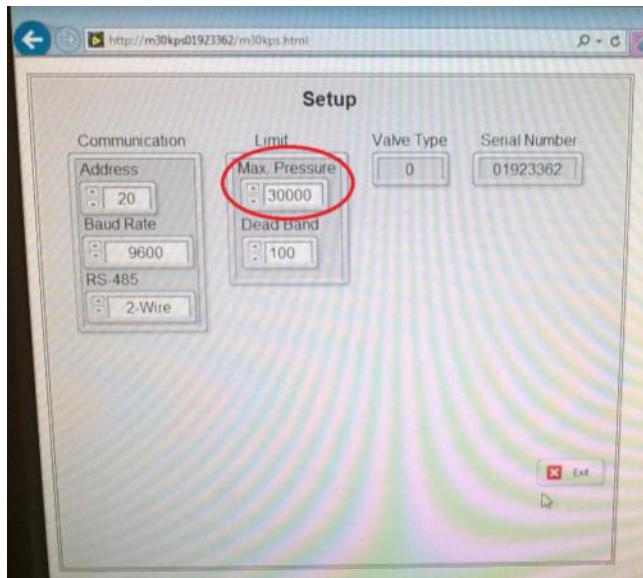
* where SERIAL NUMBER is the actual serial number of the device. See section 6.8 for how to find the serial number.

Then, the following screen will appear:

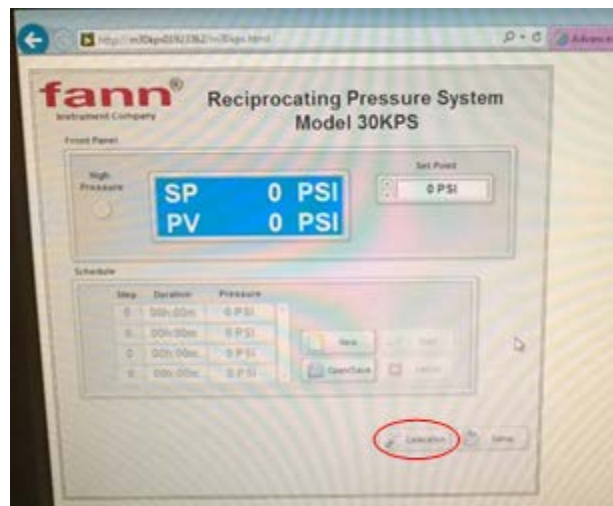


Click Setup button in lower right corner

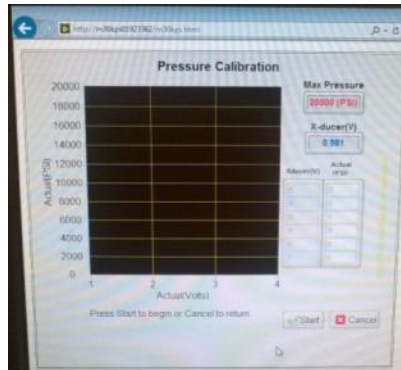
9. Verify that the maximum pressure is set to 30000. Hit “Exit” button when complete and previous screen will return. If Max. Pressure value is below 30000, adjust or type 30000 as shown below then click “Exit” button.



10. Click “Calibration” button



The following screen will appear:



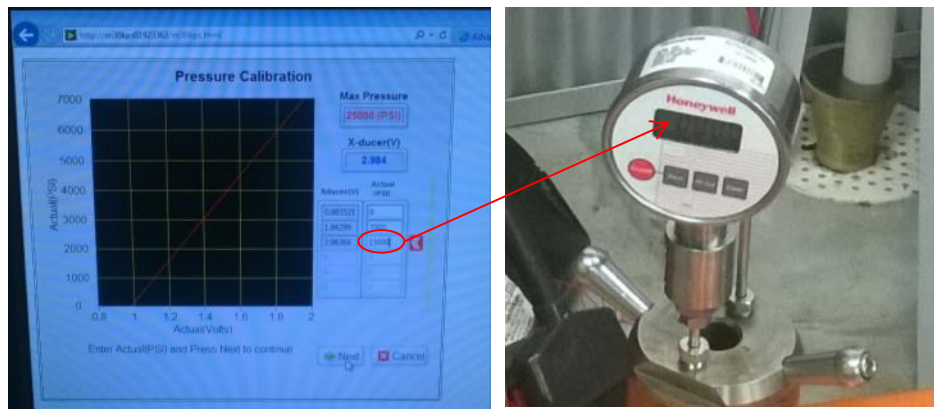
11. Click “Start” button and record the pressure reading on the calibrated gauge attached to the cell. Enter the recorded pressure reading in the circled box and press the “Enter” button as shown in the picture below, noting that the first reading will be at 0 psi.



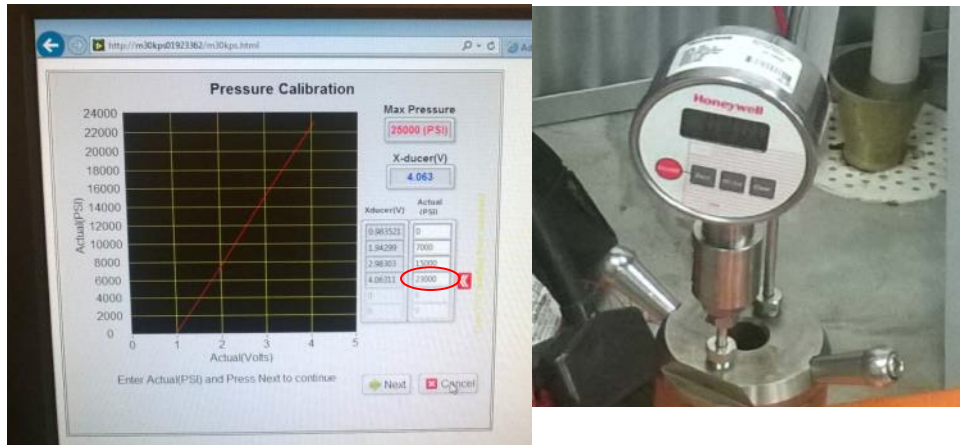
12. Click “Next” button and record the next pressure reading on the calibrated gauge attached to the cell. Enter the recorded pressure reading in the circled box and press the “Enter” button as shown in the picture below:



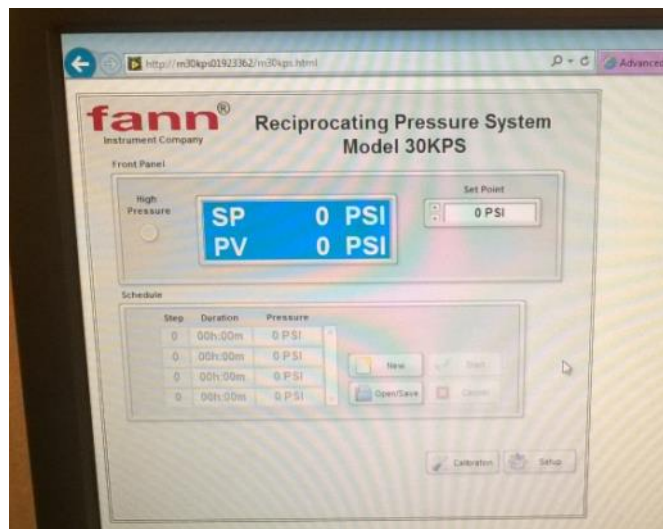
13. Click “Next” button and record the next pressure reading on the calibrated gauge attached to the cell. Enter the recorded pressure reading in the circled box and press the “Enter” button as shown in the picture below:



14. Click “Next” button and record the next pressure reading on the calibrated gauge attached to the cell. Enter the recorded pressure reading in the circled box and press the “Enter” button as shown in the picture below:

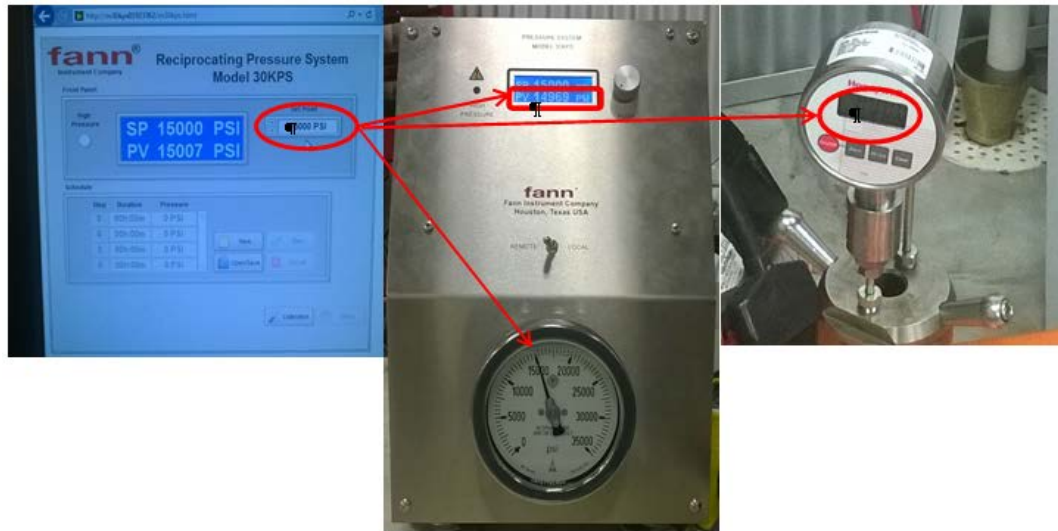


15. Continue pressure calibration until the table is completely filled out and then hit “Cancel” button to exit out of the Pressure Calibration. When you hit the “Cancel” button, the calibration values will automatically be saved to the electronic board on the 30KPS and Internet Explorer will exit back to the main screen as shown below.



16. To verify that the Pressure calibration was performed correctly, manually set a pressure Set Point in the circled box by typing a value and hitting the “Enter” key and then comparing the displayed PV value on the LCD screen and the displayed value on the pressure gauge. NOTE: If the measurement of either of the displayed values on the LCD screen or the pressure gauge is

off by more than ± 250 from the Set Point value then the 30KPS Pressure Controller will need to be recalibrated.



Make sure to set the setpoint back to 0 psi before powering off the 30 KPS unit, after verifying that the setpoint pressure is maintained.

8 Troubleshooting and Maintenance

Troubleshooting and regular maintenance procedures are described in this section. If more extensive maintenance or service of the instrument is required, please contact Fann Instrument Company.

Table 8-1 Troubleshooting Guide

Problem, Symptom	Possible Cause	Corrective Action
Not pressuring up	No power	Make sure power is connected
	No air	Make sure air is connected
	No water	Make sure water is connected
	External leak	Check for external leaks and repair
	Internal leak	Remove cover and check for internal leaks, repair leak
	Pump	Pump should be isolated and air supply checked; contact Fann
	Hipco valve	Hipco valve should be isolated and air supply checked; contact Fann
No display	No power	Make sure power is connected, see No Power below
No power (continued)	AC not connected	Verify AC power present at wall, check breaker
	DC not connected	Verify DC power at back of 30KPS, replace power supply
	Power switch not on	Turn switch on
Analog gauge not reading	Gauge malfunction	Contact Fann

9 Accessories

The following accessories are available for this instrument.

Table 9-1 Accessories

Part Number	Description
102363627	Plumbing Kit, 30KPS to Single UCA
102334877	Kit Accessory, 30KPS Air Filter/Regulator

10 Parts List

Table 10-1 Parts List

Item No.	Part No.	Qty	Description
0001	102108918	1	2 PORT SOLENOID VALVE FOR AIR, 4.5MM ORIFICE, 1/8 IN NPT PORTS, 24 VDC, GROMMET SUGRE PROTECTOR, WITH BRACKET
0002	101392263	1	60K BULKHEAD FOR 1/4 F HIGH PRESSURE X 1/4 F HIGH PRESSURE
0003	101392264	1	60K MALE TO MALE 1/4 HIGH PRESSURE CONNECTOR
0004	102304806	1	ADAPTER DESKTOP 24VDC WITH LOCKING CONN
0005	102292644	1	ADAPTER, 1/8 TUBEX3/8 MNPT SWAGELOK, SWAGELOK SS-200-1-6
0006	101543074	1	ADAPTER, BRANCH, 1/4 TUBE, SMC
0007	101818804	3	ADAPTER, ELBOW, BRASS, 1/8 MNPT X 1/4 TUBE
0008	101452502	1	ADAPTER, ELBOW, BRASS, 3/8 MNPT X 1/4 TUBE
0009	101470447	2	ADAPTER, STRAIGHT, 1/4 FEMALE NPT BULKHEAD TO 1/4 INSTANT TUBE
0010	101463369	3	ADAPTER, STRAIGHT, 1/4 MALE NPT TO 1/4 INSTANT TUBE
0011	101705712	2	ADAPTER, STRAIGHT, 1/8 MALE NPT TO 1/4 INSTANT TUBE
0012	205533	1	CABLE CAT5 RJ45-RJ45 10FT LG
0013	203522	1	CABLE POWER 115V 14 AWG M&F PLUG
0014	102271762	1	CAPILLARY TUBE FOR 30KPS
0015	102046993	1	COMPACT CONNECTOR 2-CONDUCTOR TERMINAL BLOCK WITH LEVERS MAX.
0016	102046995	3	COMPACT CONNECTOR 5-CONDUCTOR TERMINAL BLOCK WITH LEVERS MAX.
0017	102321863	1	CONN MINI FIT JR RCPT 2POS DL
0018	101356226	1	CONNECTOR BULKHEAD 1/8X1/4F
0019	203863	3	CONNECTOR RJ45 JACK 8-CON IDC
0020	100023811	4	CONNECTOR, PLASTIC TUBING, 90 DEG, 1/4 TUBE X 1/4 MPT
0021	102304865	1	CQZ2000 SERIES VALVE, 3 POSITION CENTER CLOSED, RUBBER SEAL, 24VDC, PLUG CONNECTOR WITH LEAD WIRE .3M.
0022	102182828	2	CROSS, 1/4 HP, 60000 PSI MOUNTING HOLES
0023	102304866	1	DC POWER JACK, 0.080IN (2.0MM) PIN, SOLDER LUGS TERMINATION LONG BUSHING.
0024	101675112	1	ELECTRO-PNEUMATIC REGULATOR, 0.9 MPA, POWER VOLTAGE 24 VDC, INPUT SIGNAL 0-5 VDC, ANALOG OUTPUT 1-5 VDC, 1/4 PORT, PRESSURE DISPLAY UNIT PSI
0025	101485628	1	FILTER, WATER, 3 PORT 1/4 NPT, 10 MICRON
0026	101539543	1	GAUGE, 4 INCH PANEL MOUNT, 0-35K, SS
0027	101295741	1	HI PRES 1/4" FEM TO 1/8"
0028	102304867	1	HIGH PRESSURE TUBING KIT FOR 30 KPS

Item No.	Part No.	Qty	Description
0029	102271738	1	KNOB CLR GLOSS .63 IN DIA 6MM SHAFT. NO INDICATOR
0030	102316341	1	LOW PRESSURE TUBING KIT SS 30 KPS
0031	102304869	4	M3.5 METRIC 18-8 STAINLESS STEEL SOCKET HEAD CAP SCREW 8MM LENGTH, .5MM PITCH
0032	102186261	2	M5 POST-ASSEMBLY INSERTION SPRING NUTS, HFS5 SERIES ALUMINUM EXTRUSIONS
0033	102316348	1	MODEL 30 KPS CONTROL BOX
0034	101578786	4	MOUNT,VIBRATION, FEMALE TO MALE 1/4-20
0035	100032885	1	MUFFLER, EXHAUST, PNEUMATIC, 1/4,
0036	207631	2	NUT 8-32 HEX REGULAR STAINLESS
0037	100026578	2	NUT, HEX, #10-32 UNF, STAINLESS STEEL
0038	100001867	4	NUT, HEX, 1/4-20 NC, STAINLESS STEEL
0039	206626	1	PLUG PIPE 1/4 NPT SOCKET HEAD STAINLESS
0040	102450312	2	PLUG, DC CONNECTOR ASSEMBLY, 1000MM
0041	102316146	1	POLYETHYLENE DOUBLESIDE TAPE 0.009IN THICK AND COATED WITH SYNTHETIC RUBBER ADHESIVE ON BOTH SIDES.
0042	390009	1	PUMP, LIQUID, AIR OPERATED, 1:440 RATIO
0043	101542809	1	RUPTURE DISC, BURST PRESSURE 34500 PSI @ 72 F, 1/4 ANGLED SEAT, 316 SS
0044	101388193	1	SAFETY HEAD, HIGH PRESSURE, RATING- 60K, (F/RUPTURE DISK) INLET- MALE 1/4 HP (HM4) X OUTLET- FEMALE 3/8 NPT HIP 60-61HM4
0045	102316144	1	SCREEN PROTECTOR .014 THICK CLEAR MYLAR
0046	101254428	6	SCREW, BUTTON HEAD SCS (METRIC) - M5 x 12 - 18-8 SS
0047	101254422	2	SCREW, BUTTON HEAD SCS (METRIC) - M5 x 6 - 18-8 SS
0048	100028426	4	SCREW, HEX CAP, 1/4-20 NC X 1/2, STAINLESS STEEL
0049	101265409	2	SCREW, THREADED, CAP, SOC HEAD (US) - NO. 10 - 32 UNF x 0.50 - 18-8 SS
0050	101265328	2	SCREW, THREADED, CAP, SOC HEAD (US) - NO. 8 -32 UNC x 0.75 - 18-8 SS
0051	101255842	2	SCREW, THREADED, CAP, SOCKET HEAD (METRIC) - M5 x 30 - 18-8 SS
0052	101262960	2	SCREW, THREADED, FLAT HEAD SCS (US) - NO. 8 -32 UNC x 1.75 - 18-8 SS
0053	102271640	1	SHEET METAL AND EXTRUSION KIT, 30 KPS
0054	101485630	2	SILENCER, NAN(BC SINTERED), GENERAL PURPOSE, NOISE REDUCTION: 16db, 1/8 MALE NPT
0055	101834838	1	SWITCH ROCKER SPST BLK 10A
0056	378120	1	TEE UNION 1/8 TUBE SS-200-3
0057	102321864	2	TERM FEMALE 22-28AWG CRIMP TIN
0058	102271752	1	TOGGLE SWITCH 6A, 125VAC, 30VDC,LOCKING LEVER, PANEL MOUNT, BUSHING THREAD 1/4IN-40,
0059	100022028	1	TRANSDUCER, PRESSURE, 30000 PSI, 4-20 MA, 0.5% ACCURACY, F-250C AUTOCLAVE PRESSURE PORT, 2 WIRE ELECTRICAL CONNECTION WITH 1/2-14 CONDUIT FITTING, ADJ ZERO AND SPAN POTS
0060	205405	5	TUBING NYLON FLEXIBLE-1/4in. OD X

Item No.	Part No.	Qty	Description
0061	102312525	1	VALVE, AIR OPERATED, 60000 PSI, DUAL ACTING, 1/8 PORT WITH 213070 PACKING SET
0062	102292652	1	VALVE, CHECK, 1/8 TUBING, O-RING SEAT, 316 SS, 1 PSI CRACKING PRESSURE
0063	207895	2	WASHER FLAT 8
0064	207947	4	WASHER SPLIT 8 STAINLESS STEEL
0065	100029888	8	WASHER, FLAT, 1/4, STAINLESS STEEL
0066	101267981	8	WASHER, LOCK, REGULAR SPRING (US) - 0.25 DIA - 18-8 SS
0067	101267977	2	WASHER, LOCK, REGULAR SPRING (US) - NO. 10 - 18-8 SS

11 Warranty and Returns

11.1 Warranty

Fann Instrument Company warrants only title to the equipment, products and materials supplied and that the same are free from defects in workmanship and materials for one year from date of delivery. THERE ARE NO WARRANTIES, EXPRESS OR IMPLIED OF MERCHANTABILITY, FITNESS OR OTHERWISE BEYOND THOSE STATED IN THE IMMEDIATELY PRECEDING SENTENCE. Fann's sole liability and Customer's exclusive remedy in any cause of action (whether in contract, tort, breach of warranty or otherwise) arising out of the sale, lease or use of any equipment, products or materials is expressly limited to the replacement of such on their return to Fann or, at Fann's option, to the allowance to Customer of credit for the cost of such items. In no event shall Fann be liable for special, incidental, indirect, consequential or punitive damages. Notwithstanding any specification or description in its catalogs, literature or brochures of materials used in the manufacture of its products, Fann reserves the right to substitute other materials without notice. Fann does not warrant in any way equipment, products, and material not manufactured by Fann, and such will be sold only with the warranties, if any, that are given by the manufacturer thereof. Fann will only pass through to Customer the warranty granted to it by the manufacturer of such items.

11.2 Returns

For your protection, items being returned must be carefully packed to prevent damage in shipment and insured against possible damage or loss. Fann will not be responsible for damage resulting from careless or insufficient packing.

Before returning items for any reason, authorization must be obtained from Fann Instrument Company. When applying for authorization, please include information regarding the reason the items are to be returned.

Our correspondence address:

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P.O. Box 4350
Houston, Texas USA 77210

Telephone: 281-871-4482

Toll Free: 800-347-0450

FAX: 281-871-4446

Email fannmail@fann.com

Our shipping address:

Fann Instrument Company
14851 Milner Road, Gate 5
Houston, Texas USA 77032