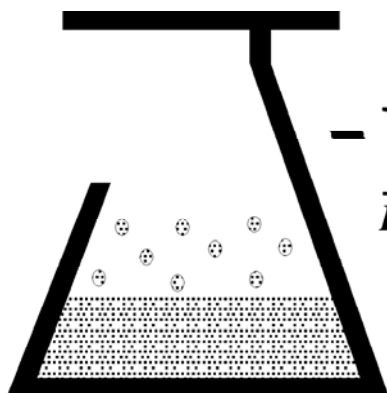


Pressure to Perform

Solid Phase Synthesis Regulator



- KEM Scientific, Inc.
Instruments for Science from Scientists

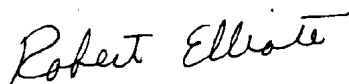
Quick Operating Instructions (Version 4.7) for the
J-KEM Solid Phase Synthesis Regulator

Here's an offer you can't refuse

J-KEM's Solid Phase Reactor is not a static instrument.

J-KEM's goal is to make the finest products available to the research community, period. We understand that research continuously changes, as a result this instrument is designed to allow customized upgrades to its software simply and in your own lab. Your controller is designed to take advantage of a new memory technology that allows new software (containing new or modified program features) to be uploaded directly to the controller's memory via e-mail. Upgradeable programming allows the controller to change as the requirements of your research change.

If you want the program to work a different way, or if you need a new feature added to the program, call us!! We're ready to work with you.



President

Setting up the Reactor

J-KEM has three models of solid phase synthesis reactor, a 48- and, 96-position preparative scale (i.e., 2ml - 60ml) reactor and a fritted microtiter plate reactor. The hardware setup for each of these systems is the same.

1. Place the reactor inside a hood near the pressurizing gas supply.
2. Connect the J-KEM high flow rate pressure regulator (Cat # SPS-HCR) directly to the source of pressurizing gas, which is normally nitrogen or argon.

Notes

1. It is critically important that only clean gas be used with your SPS regulator. Even a small amount of dirt or oil will destroy the pressure proportioning valve. It's recommended that a filter be placed between the gas supply and the high flow regulator, even when clean gases are used.
2. Most difficulties with J-KEM's SPS reactor are due to inadequate gas supplies to the reactor. The reactor requires a flow rate of 200 liters/minute at 20psi to function properly.

- Connect the outlet of the pressure regulator to the inlet of the proportioning valve using 1/4" I.D. tubing (tube A in Figure 1). The proportioning valve is the small valve with the gray cord. The proportioning valve must be connected in the right direction or the system will not work. The direction of flow will either be marked on the side of the valve, or if there are no markings the valve has an offset on the inlet side of the body of the valve as shown below.
WARNING: The tubing used must be able to withstand pressures of 20 psi.

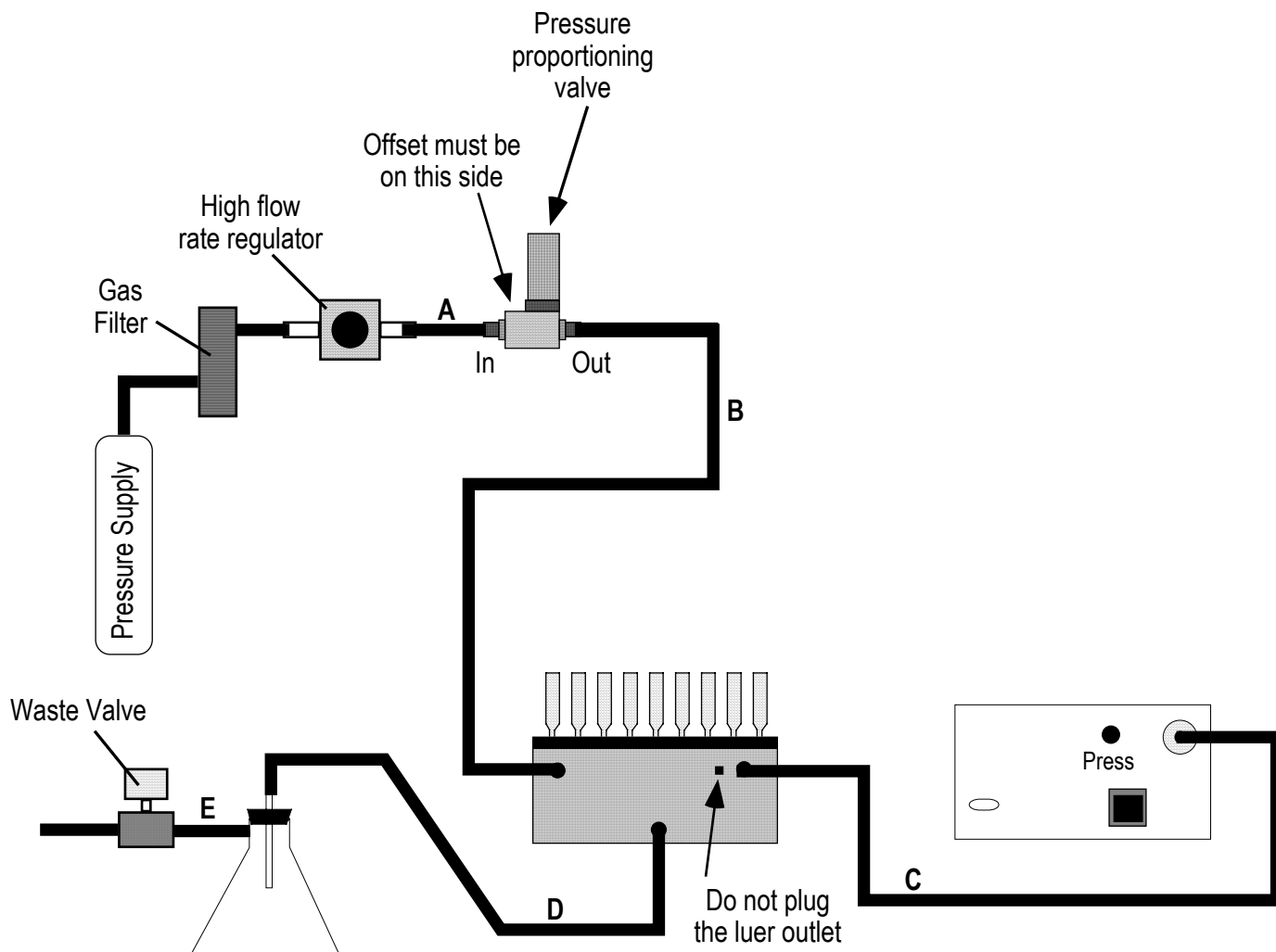


Figure 1

- Connect the outlet of the proportioning valve to one of the barbed nipples on the reactor base using 1/4" I.D. tubing (tube B in Figure 1).
- Plug the proportioning valve's gray cord into the valve connection plug on the back of the computer regulator.
- Connect a piece of 1/4" I.D. tubing between the remaining barbed nipple on the top of the reactor base and the pressure transducer connection on the back of the computer regulator (tube C in Figure 1).
- Connect a piece of 1/4" I.D. solvent resistant tubing between the bottom stainless steel nipple on the reactor base and the top of a side arm flask (tube D in Figure 1). The side arm flask collects waste from the various reaction and wash steps.

8. Connect the inlet of the waste valve to the side arm of the side arm flask using solvent resistant tubing (tube E in Figure 1). The waste valve is the value with a standard power cord and plug. Connect the outlet of the waste valve to a vacuum source and turn the vacuum source on.
9. Plug the waste valve into the power receptacle provided on the back of the computer regulator.
10. Remove the insert block from the reactor base. Place the O-ring in the channel along the top of the reactor base. Secure the reactor top plate to the reactor base using the 4 latches on the side of the base.
11. Place a solid phase reactor in every position on the reactor top or fill the luer connector with a port plug. Do not plug the luer outlet on the front of the reactor.

This complete the physical setup of the solid phase reactor.

Operating the Computer Regulator

When the controller is turned on it performs four tasks:

1. Displays an introductory message.
2. Provides the option of allowing the unit to 'warm-up' to stabilize the electronics.
3. Self-calibrates.
4. Initializes certain variables from memory.

During these steps, no key strokes or serial commands should be issued. Wait until the question asking about a 10 minute warm-up period appears before pressing any keys.

The function of the keys on the keypad are:

VACUUM Sets the set point of the regulator to 0.0 psi, closes the pressure valve and energizes the solenoid valve attached to the vacuum source. Places the reactor base under vacuum. This is used when filtering a reaction.

CLOSE Sets the set point of the regulator to 0.0 psi and closes the pressure valve. Used to simply turn the regulator off while setting up a new reaction.

ZERO Pressing this key causes the regulator to auto-calibrate the pressure transducer. It should only be pressed when the reactor is at atmospheric pressure. If the reactor is not at atmospheric pressure, an error message is displayed.

HOLD, PRES1, PRES2 The controller stores three user specified pressures for easy recall, the 'holding', 'pressure 1', and 'pressure 2' pressures. The holding pressure is defined as the pressure needed to hold solvent at the frit without allowing any leakage through the frit (about 0.15 psi). The two pressure keys can store pressures that produce two levels of bubbling (low and high) through the reactor frit. Pressing any of these keys recalls the user stored pressure associated with the key.

RAMP Initiates a ramp program that systematically bubbles the reactors for short periods of time. This is useful when a volatile reaction solvent is used and continuous bubbling would cause evaporation of the solvent. The user is allowed to enter bubble times and pressures.

PULSE Initiates a program that pulses the reactors with millisecond pulses of high pressure gas. This program is particularly useful for the fritted microtiter plate reactors where the surface area of the frit is small.

UP Arrow Pressing this key manually increases the pressure set point by 0.01 psi. A software pressure limit of 0.5 psi is enforced for safety reasons.

DOWN Arrow Pressing this key manually decrease the pressure set point by 0.01 psi.

STORE Used to store a user entered pressure for the variables "Holding Pressure", "Pressure 1", or "Pressure 2". To store a pressure:

- 1) Enter the desired pressure by pressing the ↑ (UP) or ↓ (DOWN) keys.
- 2) Press the "STORE" key, followed by
- 3) the 'Hold', 'Pres1', or 'Pres2' key to store the current setpoint at that location.

Test Procedure.

1. Turn on the pressurizing gas to the pressure regulator. Set the regulator for 20 psi outlet pressure.
2. Turn on power to the Infinity computer pressure regulator. For this test, reply “No” to the question of whether the regulator should warm up for 30 minutes.
3. Make sure that a solid phase reactor or reactor port plug is in every position of the reactor. Press the “Hold” key to instruct the regulator to go to the holding pressure of 0.150 psi. The display of the regulator will look as follows.

HOLDING PRESSURE
SP= 0.150 PV= 0.149

The display indicates that the setpoint pressure (i.e., the desired pressure) is set to 0.150 psi and the process value (i.e., the actual pressure in the reactor is 0.149 psi).

Wait for pressure in the reactor to settle to 0.150 psi (this should take about 20 seconds) then add 3-5ml of acetone to one of the reactors. Note that the acetone is held at the frit and that the flow rate of the pressurizing gas instantaneously adjusts to compensate for filling one of the reaction vessels.

If the above test fails:

If the pressure does not stabilize at 0.150 psi, almost certainly the problem is inadequate gas flow.

Check the gas flow by performing the following test.

1. Press the “Close” key on the controller keypad.
2. Verify that the pressure on the regulator is set to 20 psi.
3. Press the “Hold” key on the controller’s keypad and wait while the controller begins to pressurize the reactor.
4. Watch the pressure on the pressure regulator, if it falls below 18 psi, then the source of pressurizing gas is inadequate. The SPS reactor must be connected to a gas supply capable of delivering 200 liters/minute at an inlet pressure of 20psi. Correct the gas supply problem and begin again.

To supply sufficient quantities of pressurizing gas to the regulator,

1. Connect to an in-house gas supply (bottle gas often does not supply high enough flows).
2. You must be using J-KEM’s high flow pressure regulator.
3. Use large diameter tubing.
4. Call J-KEM if this doesn’t correct the problem.

4. Continue filling reactors with acetone and observe how the computer regulator adjusts the flow of gas to maintain a constant 0.150 psi back pressure in the reactor base. This ability to maintain precise back pressures independent of the number or reactors filled is the key to J-KEM’s solid phase reactor.
5. Store the current pressure as the controller’s “Holding Pressure” by pressing the “Store” key followed by the “Hold” key.
6. Add 3-5ml of acetone to all of the reactors. Press the ↑ (UP) key on the controller’s keypad until a gentle bubbling begins in all the reactors. Store this pressure as bubble 1 pressure by pressing the “Store” key followed by the “Pres 1” key. Continue pressing the ↑ (UP) key on the controller’s

keypad until a vigorous bubbling results. Store this pressure as Bubble 2 pressure by pressing the “Store” key followed by the “Pres 2” key.

7. Press the “Vac” key (for vacuum) and note how solvent is filtered from the reactors. When all reactors are evacuated press the “Hold” key to recall the holding pressure of 0.150 psi stored in Step 6.
8. At this point you can try various options of the regulator, such as “Ramp”, to see how the various function work.

Standard Regulator Operation

The solid phase regulator can be run from the controllers front panel keypad or by a remote PC as part of a robotic system via a serial connection. Operation of the regulator using the keypad is described below.

A solid phase reaction involves reaction setup, running the reaction, and then a series of wash steps. To demonstrate the functioning of your J-KEM Solid Phase Reactor the operations involved in a typical reaction sequence are outlined below.

Reaction Setup

1. Remove the collection block from inside the reactor, then secure the reactor top plate into position on the reactor base.
2. Insert an empty reaction tube* on every position of the reactor top plate or use a port plug to close off unwanted positions. Add the appropriate resin to the reaction tube.
*The porosity of the frit in the reaction tube has an effect on the pressure needed for holding and bubbling. J-KEM recommends 20 micron frits, such as are in J-KEM's reaction tubes.
3. Before adding solvent to the reaction tubes, pressurize the reactor to an appropriate holding pressure, which in most cases is about 0.150 psi. Wait for the pressure in the reactor to stabilize then begin adding solvent to the reaction tubes. Small variations in reactor pressure (± 0.005 to 0.010 psi) will be observed when adding solvent.
4. Add any desired reagents.
5. Stirring the reaction mixture is generally accomplished by bubbling gas up through the reactor frit causing mixing of the reactor's contents. Bubbling is initiated by increasing the pressure inside the block to between 0.25 to 0.30 psi. Once bubbling is observed in all the reactors, the pressure can be increased or decreased (using the arrow keys) to achieve the desired level of mixing. It's convenient to store the desired pressures at key locations Pressure 1 or Pressure 2 where they can be recalled with a single keystroke. If continuous bubbling is not desirable, a pressure ramp with intermittent bubbling can be entered (See the section titled Pressure Ramps).
Stirring can also be accomplished by mounting the SPS reactor on a bench top shaker. An appropriately configured shaker is available from J-KEM.
6. When the reaction is complete, all reactors can be filtered by pressing the Vacuum key. The vacuum key turns off nitrogen pressure and opens the waste valve. To turn off the vacuum when all reactors are filtered, press the Close key.

Wash Sequence

7. Press the Hold key and allow the reactor to stabilize at the holding pressure. Add the first wash solvent to all reaction tubes. Increase the reactor pressure until a modest bubbling is achieved to promote washing of the resin.
8. Filter the wash solvent by pressing the Vacuum key. When the reactors are evacuated, press the Close key to shut off the vacuum. Repeat Steps 7 & 8 for the remaining wash cycles.

Additional Reactions

9. Repeat Steps 3 - 8 for each additional reaction of the resin.

Cleavage Reaction

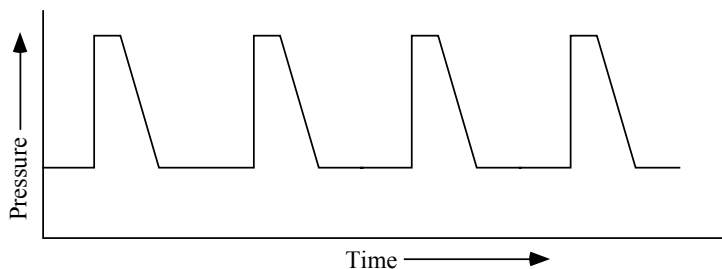
10. When the reactor content has been filtered, remove the top plate of the reactor and place the collection block inside. Place collection tubes in each position of the collection block then replace the top plate and secure it into position.
11. Repeat Steps 3 - 5 above, but this time add the cleaving agent. When the cleavage reaction is complete press the Vacuum key. The contents of the reaction tube are filtered into the corresponding collection tube in the collection block. It may be desirable to use only a gentle vacuum when filtering so as not to cause splashing of the filtered solution. Screw in handles are provided to make it easy to remove the collection block from the reactor.

<h3>Important Points</h3>

1. During the course of reactions the reaction tubes frits may become plugged to different degrees with resin fine particles which affects the pressure needed to cause bubbling. Eventually, this leads to uneven bubbling in the reactors. To minimize this affect, we've found it useful to initiate bubbling with a high pressure (around 0.3 psi) to shock the reactors and then lower the pressure to achieve the desired bubble rate. The Ramp program is useful to shock the reactors for short periods of time.
2. It may be desirable to use a needle valve on the vacuum source to limit the force of the vacuum. Filtering with too strong of a vacuum may cause splashing especially during the collection step following the cleavage reaction.

Pressure Ramp Program

Reactor contents can be bubbled either continuously or intermittently. Continuous bubbling is initiated by setting the reactor at a fixed pressure to achieve the level of bubbling desired. Intermittent bubbling is achieved by cycling the pressure in the reactor between a user entered holding pressure and a user entered bubble pressure. There are two intermittent bubbling programs in the SPS Regulator, the 'Pressure **Ramp** Program', described here, and the 'Pressure **Pulse** Program', described later. A typical pressure ramp is shown below.



Solid phase reactions are slow, diffusion limited reactions which in most cases do not require continuous mixing. There are two situations where a pressure ramp may be useful.

1. When volatile reaction solvents are used continuous bubbling may result in evaporation of the reaction solvent. Intermittent bubbling minimizes solvent evaporation. The use of J-KEM's reflux block for the SPS Reactor can also be used to condense vaporized solvent back into the reactor.
2. After several reaction and wash cycles, fine particles that have been shed from the resin begin to plug the reactor frit. To establish bubbling in these reactors it's useful to shock the frit with a high pressure and then reduce the pressure to the desired bubbling rate. The ramp program can be used to shock the reactors with a high pressure for a short period of time then reduce the pressure to a gentle bubbling pressure for a longer period of time.

Entering a Pressure Ramp Program.

At any point in a reaction a ramp program can be initiated by pressing the RAMP key. When the Ramp key is pressed you're given the option of recalling the last entered ramp program (which is automatically stored in memory). For this example, answer the question NO and enter the ramp manually as outlined below.

1. Enter the HOLDING pressure. Enter the low pressure of the pressure ramp program. Enter either a pressure that will simply hold the solvent in the reactor or cause a gentle bubbling.

Entering a floating point number (i.e., a decimal number) via the key pad can be confusing. The confusion is due to the ENTER key also being the decimal point key. When entering a decimal number, the first time the ENTER key is pressed a decimal point is inserted, the second time the ENTER key is pressed the number is actually 'entered'. For example, the key sequence required to enter the number '0.150' is:

0	Enter .	1	5	0	Enter .
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The first press of the ENTER key results in a decimal point appearing.
An incorrectly entered digit is removed by pressing the "Ramp/Del" key.

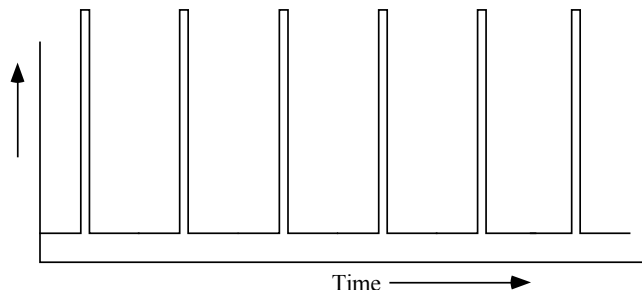
2. Enter the BUBBLE pressure. Enter a pressure appropriate for the vigorousness of bubbling desired.

3. Enter the HOLDING time. Enter the amount of time the reaction should remain at the holding pressure (in seconds).
4. Enter the BUBBLE time. Enter the amount of time the reaction should remain at the bubble pressure (in seconds). Following this question, the ramp begins. To exit a ramp, press any key on the keypad.

Note that in a pressure ramp program the pressure in the reactors gently returns to the lower holding pressure. The rate of return to the holding pressure is determined by the parameter “SP_constant” that can be changed in the ‘Programming Mode’ of the SPS Regulator. The last entered ramp is automatically stored in the controller’s memory. To use the last entered ramp program, simply respond YES to the question asking if you want to recall the last ramp program.

Pressure Pulse Program

The pressure pulse program is similar to the pressure ramp program in that the program raises the pressure inside the reactor for a short period of time to promote bubbling and then returns to a lower pressure for a more extended period of time. Beyond this similarity, the pressure pulse program is substantially different and produces substantially different results. In the pulse program the regulator shocks the frit of the reactors with very high pressure for millisecond periods of time. This program is particularly helpful when using the fritted microtiter plate reactor when frit surface area is quite small.



Entering a Pressure Pulse Program.

At any point in a reaction a pulse program can be initiated by pressing the PULSE key. When the Pulse key is pressed the following questions appear.

1. Enter LOW Pressure [PSI]: Enter the desired low pressure for the pulse sequence.
2. Pulse LOW Time [Sec]:. Enter the amount of time the reactor pressure should hold at the low pressure in seconds. Times of less than 15 seconds are not recommended since the reactor may not have time to recover from a previous pulse.

At this point the program begins. The run-time screen of the pulse program shows a clock that counts down to the next pressure pulse and the real-time pressure inside the reactor.

Pulse Sequence
00:00:45 PV= 0.175

The pulse program can be aborted anytime by pressing any key except the ENTER key.

Editing the Pressure Pulse Program. Pressing the ENTER key on the controllers keypad allows the duration and height of the pressure pulse to be edited. These values should be edited with caution, since entering values too large may cause the contents of the reactor to be blown out of the top. 'Pulse Times' are loaded in milliseconds (maximum: 500ms) and the height of the pulse (regulated by Pulse Ht) is entered as a number between 0 - 4095 where 0 is 'no pressure' and 4095 is 'maximum pressure'. Editing the pressure pulse program parameters by pressing the ENTER key results in a temporary change of the parameters that are lost when power to the regulator is turned off. New default values for pressure height and duration can be entered in the controllers programming mode (see the section titled Programming Mode).

Serial Communications

Overview:

The regulator sends and receives ASCII string commands. There are 7 regulator commands of the general form:

COMMAND{optional value}TERMINATING CHARACTER

The commands are:

1. **S** for 'Set point'. This command requires a floating point value.
Example: **S0.145\r**
2. **V** for 'Energize waste valve'
Example: **V\r**
3. **C** for 'Close' pressure and waste valves
Example: **C\r**
4. **P** queries the regulator for the current reactor pressure
Example: **P\r**
5. Pressure Ramp Program Commands. Defining a pressure ramp program requires the following 4 commands to be sequentially sent:
R1 Enters the ramp holding pressure. Example: **R10.150\r** (i.e., pressure = 0.150psi)
R2 Enters the ramp holding time. Example: **R230r** (i.e., 30 seconds)
R3 Enters the ramp bubble pressure. Example: **R30.350\r** (i.e., pressure = 0.350psi)
R4 Enters the ramp bubble time. Example: **R45\r** (i.e., 5 seconds)
6. Pulse Program. Defines the pressures and times of a pressure pulse program. Defining a pulse program requires the following 3 commands to be sequentially sent:
B1 Enters the pulse holding pressure. Example: **B10.150\r** (i.e., pressure = 0.150)
B2 Enters the pulse holding time. Example: **B2120\r** (i.e., 120 seconds)
B3 Initiate the pulse sequence. Example: **B31\r** (i.e., send a '1' to start). You must load the 'B1' and 'B2' parameters before sending the 'B3' start trigger.

Commands are case sensitive. The terminating character is '\r' or 0x0D (i.e., carriage return).

The regulator responds to a valid serial command by echoing the command and appending the characters 'OK' to the command string (see later). The response occurs AFTER the command is executed, so monitoring for the regulator's response is an excellent way of knowing when the regulator is ready to act on another command. The reply to an improperly formatted or invalid command is "ERROROK\r".

Example of Serial Communication Interchange

	Host Command	SPS Regulator Response	Comments
1	S0.150\r	S0.150OK\r	Set the controllers setpoint to 0.150psi
2	P\r	P0.051OK\r	Query actual reactor pressure. Pressure is at .051 psi (the reactor is beginning to charge)
3	P\r	P0.099OK\r	Pressure is at .099 psi
4	P\r	P0.128OK\r	Pressure is at .128 psi
5	P\r	P0.150OK\r	Reactor is at the requested pressure of 0.150 psi.
6	R10.2\r	R10.2OK\r	Set the ramp holding pressure. First parameter to initiate a pressure ramp program.
	R225\r	R225OK\r	Set the ramp holding time. Second parameter of a pressure ramp program.
	R30.400\r	R30.400OK\r	Set the ramp bubble pressure. Third parameter of a pressure ramp program.
	R43\r	R43OK\r	Set the ramp bubble time. Final parameter of the pressure ramp program.
7	B41\r	ERROROK\r	Non-existent command.

Communications parameters can be changed in the SPS regulators programming mode. Default communication parameters are:

Baud - 9600, Parity - none, Data bits - 8, Stop bits - 1.

Serial Commands Implemented in the SPS Regulator

Host Command	Meaning	Regulator Response
I Example: I\r	Initialize regulator for remote communications	IOK\r
S Example: S0.02\r	Set the regulators set point to 0.02 psi	S0.02OK\r
S1.72345\r	Set the regulator set point to 1.72345 psi. The controller has a software imposed set point limit of 0.5 psi. The set point is set to 0.5 psi, but the command is echoed as issued.	S1.72345OK\r
V Example: V\r	Energize the waste valve. This also sets the set point to 0.0 psi and closes the pressure valve.	VOK\r
C Example: C\r	Close the vacuum and pressure valves. This also sets the set point to 0.0.	COK\r
P Example: P\r	What is the current reactor pressure? The controller responds with the current pressure.	P0.137OK\r [i.e., the reactor is currently at 0.137 psi]
R1 Examp: R10.15\r	Set the ramp holding pressure to 0.150 psi	R10.15OK\r
R2 Examp: R230\r	Set the ramp holding time to 30 seconds	R230OK\r
R3 Examp: R30.3\r	Set the ramp bubble pressure to 0.300 psi	R30.3OK\r
R4 Examp: R43\r	Set the ramp bubble time to 3 seconds	R43OK\r
B1 Examp: B10.17\r	Set the pulse holding pressure	B1017OK\r
B2 Examp: B2300\r	Set the pulse holding time	B2300OK\r
B3 Examp: B31\r	Initiate the pulse sequence using the previously loaded 'B1' and 'B2' parameters	B31OK\r







The controller's key pad is still operative when the controller is being remotely addressed, and you can freely override any remotely transmitted command by pressing the appropriate keys on the keypad.

Programming Mode

Whenever the computer regulator is turned on, key values are read into the program for non-volatile memory. Access to these parameters to edit them is gained by placing the regulator into programming mode. Programming mode should only be entered when it's necessary to edit a parameter since inadvertently changing the wrong parameter can lead to unpredictable results.

Placing the Regulator into Programming Mode – When the controller is first turned on the unit beeps three times and the message 'Recall Data' appears. While this message is present on the screen if the ENTER key is pressed and released the regulator will enter programming mode. Below is a list of the parameters that can be set in programming mode. An excellent way to exit programming mode is simple to turn power off to the regulator. Any parameters that were edited retain their edited value, but turning power off will not affect any other part of the regulator or its program.

	Controller Display	Comment
1	Technical Help?	Selecting YES will display J-KEM's phone number and web page address
2	Initialize Unit?	This section is only entered during initial programming by J-KEM. The question should be answered NO
3	Edit Communications? 1=Yes 2=No	This allows the communication parameters for serial communication to be set.
	Baud = 9600 1= OK 2= Change	Select 'OK' or 'Change'. If 'Change' is selected, enter new baud rate.
	Data Bits=8 1= OK 2= Change	Select 'OK' or 'Change'. If 'Change' is selected, enter new data bits.
	Parity is NONE 1= OK 2= Change	Select 'OK' or 'Change'. If you change parity, the new screen that appears is: New Parity: 1= N (None) 2= E (Even) 3= O (Odd). Make your choice.
	Stop Bits = 1 1= OK 2= Change	Select 'OK' or 'Change'. If 'Change' is selected, enter new stop bits.
4	Enter Diagnostics? 1=Yes 2=No	This is used only when initially calibrating the regulator. Do not enter this section. Call J-KEM for assistance.
5	Enter Programming? 1=Yes 2=No	The following list of parameters can be edited by entering this section.
	CRACK VALUE: 500 Change? 1=Yes 2=No	Only modified when installing a new pressure regulating valve. Call J-KEM for assistance.
	ZERO ERROR: 0.0100 Change? 1=Yes 2=No	Do not change.

	PRESSURE_CF:126567.3 Change? 1=Yes 2=No	This is a pressure conversion factor. Do not change.
	SP_constant: 1 Change? 1=Yes 2=No	This parameter is used in the pressure ramp program and affects how fast the reactor pressure returns to the low pressure value following being at the high pressure value. If the pressure returns too slowly to the low pressure value, enter a higher number. If the pressure returns too fast to the low pressure value enter a smaller number. If a number too large is entered, unstable pressure regulation will result.
	Gain Adjust: 1.0	<p>This parameter is a gain factor for opening and closing the gas proportioning valve. If pressure stabilizes in the reactor block too slowly, this constant should be increased to a higher value. If pressure oscillates around the setpoint or has difficulty stabilizing, a smaller value for gain should be entered. This is a floating point number.</p> <p>Floating point numbers are entered by pressing the  the first time to enter a decimal point, then a second time to <i>enter</i> the value.</p> <p>For example, to enter a gain of 2.0 the key sequence is:     on the J-KEM controller</p> <p>[Note: the  key is also the decimal point key].</p>
	Pulse Width: 25ms Change? 1=Yes 2=No	This parameter is used in the pressure pulse program and is the default time for the pressure pulse. This value can be made longer or shorter.
	Pulse DAC Value:4095 Change? 1=Yes 2=No	This parameter is used in the pressure pulse program and is the default intensity of the pressure pulse. To make the pressure of the pulse higher, increase this number. To make the pressure of the pulse lower, decrease this number.
4	Enter Testing Mode? 1=Yes 2=No	This mode should only be entered during initial programming. Answer this question NO.