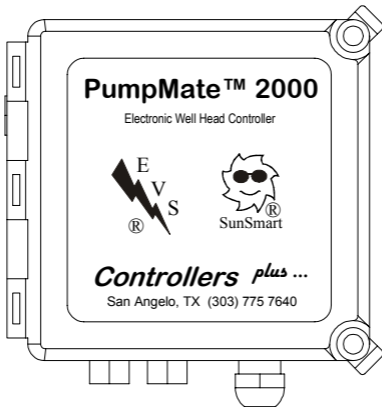


OPERATOR'S GUIDE

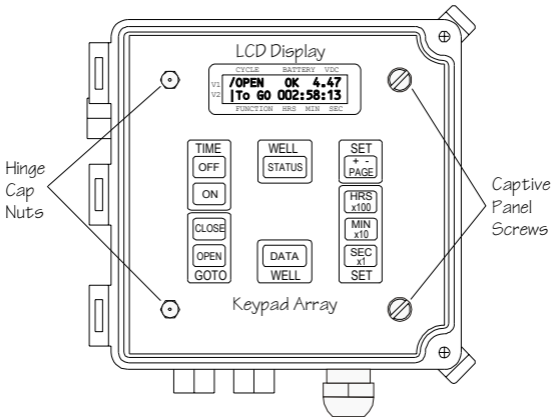


SunSmart® Technology with EVS System

Non-Incendive, Intrinsically Safe for
Class I, Groups C and D Hazardous Locations

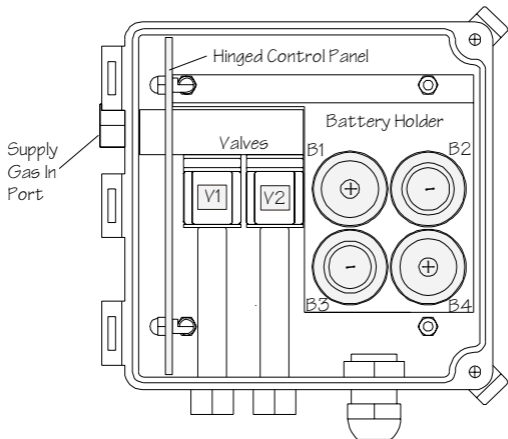
U.S. Patent No.'s 6,194,793 and 6,462,507
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Control Panel



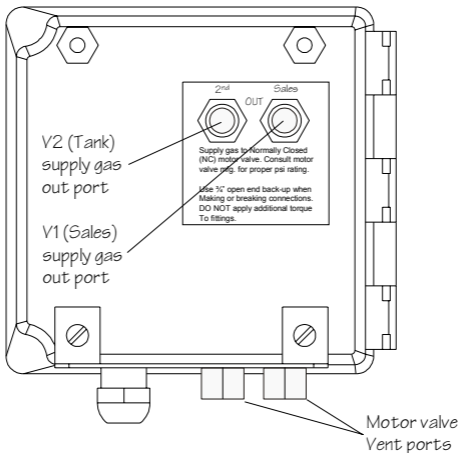
A 32-character LCD display provides information on current operating status, stored well operating data, and verifies user keypad commands. Large, colored control keys simplify user setup and control. Captive panel screws and a hinged control panel provides easy access to internal components.

Internal Hardware



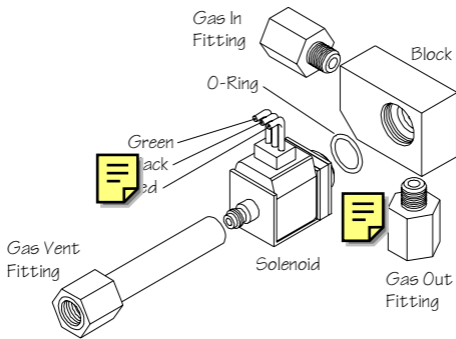
Internal solenoid valve assemblies (V1, V2), battery holder assembly with four D-Cell alkaline batteries (B1, B2, B3, B4) or with two rechargeable Nicd / Nimh D-Cell batteries (B1, B2) and control panel connections are easily accessed by opening the hinged control panel.

Motor Valve Out Ports

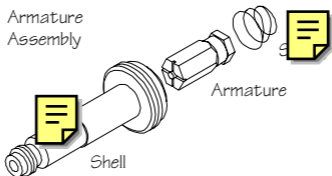


Rear panel 1/4-NPT fittings source 0-100 psi supply gas to open one or two diaphragm operated motor valves. Bottom panel 1/4-NPT fittings vent pressurized gas from normally closed (NC) motor valves to shut-in one or two motor valves. Use clean, dry supply gas with filters for best performance.

Valve Assembly



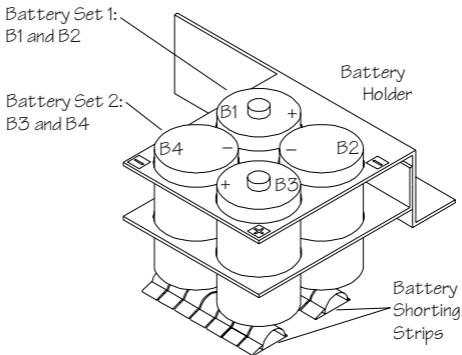
Single dual-port valve assembly including fittings.
Note green wire to solenoid left for proper assembly.



Solenoid armature assembly with conical spring.
Armature has rubber gaskets on top and bottom.

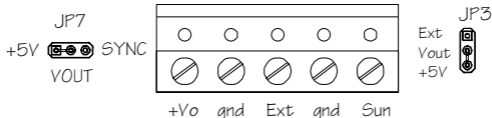
Battery Assembly

The control panel configures batteries in the battery holder as two sets of 2 D-Cell battery packs. Using alkaline type batteries, 4 D-Cell batteries provides two sets of D-Cell packs (B1/B2 and B3/B4) in parallel for double the capacity. Two cell only operation should use the B1/B2 batteries.



The use of rechargeable Nicd or Nimh batteries with a solar panel for recharging should use only the top two D-Cells in the B1 and B2 positions. Using more than two batteries will not increase capacity. Please note that it is not recommended to use rechargeable D-Cell batteries in a series / parallel configuration.

Power Connector



+VO – gnd

Voltage output to either power a 3-wire arrival sensor or pressure transducers. Normally set for +5Vdc power supply.

Ext – gnd

External power input for use as an alternate to internal D-Cell batteries. Remove internal batteries when used.

Sun – gnd

Solar panel charger input for charging rechargeable Nicd or Nimh D-Cells. Remove alkaline batteries when used.

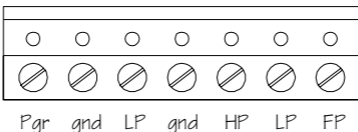
JP3

Selectable jumper to chose +VO output of +5V or to route EXT power input back out through the +VO connection.

JP7

Selectable jumper to allow +VO output to be used for external SYNC output to synchronize with another controller. Put JP3 on the Vout/+5V position for SYNC.

Sensor Connector



Pgr – gnd

2-wire type plunger arrival sensor.
Pgr connects to the + or signal wire.
gnd connects to the – or common wire.

LP – gnd

Low side (CLOSE) pressure switch.
LP connects to the Off or low side wire.
gnd connects to the – or common wire.

HP – gnd

High side (OPEN) pressure switch.
HP connects to the On or high side wire.
gnd connects to the – or common wire.

SP - gnd

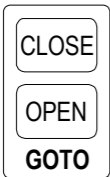
High sales line shut-in and hold switch.
SP connects to the On or high side wire.
gnd connects to the – or common wire.

FP - gnd

Differential flow sensor signal input.
Used only in advanced applications.

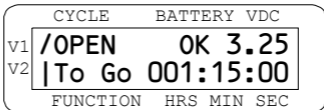
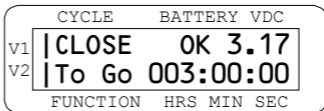
#22 AWG wire is recommended for sensor hook up. A complimentary screwdriver is provided for convenience.

GOTO Keys



The orange GOTO keys manually override controller operation to go to a valve CLOSE or valve OPEN control cycle.

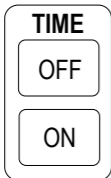
Pressing a GOTO key updates the V1 and V2 valve status indicators. If the STATUS display is showing, the display is updated to reflect the change in current cycle status.



2-Valve
Option

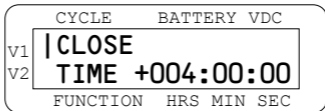
If the 2-Valve feature is active, each GOTO OPEN key press will toggle between the two OPEN and TANK valve control states.

TIME Keys



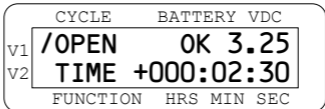
The yellow TIME keys display OFF and ON cycle times for programming using the SET keys. A "+" sign is displayed in front of all settable cycle times or operating parameters.

TIME keys are multi-function and automatically display additional or optional cycle times with each successive press of the respective TIME key.



*Optional OFF
key items*

FALL time, BakUp time, PURGE time.



*Optional ON
key items*

DELAY time, TANK wait, TANK time,
TANK skip, PopUp time, PNGR min time.

SET Keys



*Setting
Zero Time*

*Roll Up,
Roll Down
Feature*

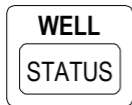
The beige SET keys are used to program Off and ON cycle times and to zero or clear WELL data and plunger arrival time logs. When a TIME key is pressed, a "+" sign is displayed to indicate that the SET keys may be used to change a time or Numeric value.

Entries or changes made to cycle times and other parameters with the SET keys are automatically updated and stored as changes are made. Changes in any cycle time will not alter or change the current operating cycle time, but rather update to the new time on the next activation of the timing cycle.

When setting times to zero, it is best to begin by setting the HRS to zero, then setting the MIN to zero, and lastly setting the SEC to zero.

A "Roll Up / Roll Down" feature is used to automatically adjust hours, minutes and seconds time. For example, subtracting one minute from the time display 001:00:00 will Roll Down the display to show 000:59:00. A Roll Up works opposite of a Roll Down.

WELL STATUS Key

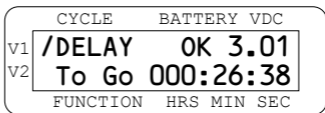


The bright blue STATUS key provides current operating cycle status, switch / sensor activation status, power supply status, sales and service information. The STATUS key's five displays are:

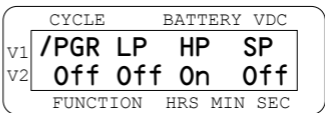
Multi-Function key provides five displays.

- 1st - Current Cycle Status
- 2nd - Sensor On/Off Status
- 3rd - Power Information
- 4th - Sales Information
- 5th - Service Call Out

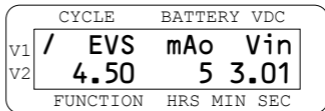
Current Cycle
Battery voltage
Remaining time



Sensor or switch
On (closed) or Off
(open) status



EVS voltage
Drain current
Battery voltage



2-Valve Control

The optional 2-Valve configuration activates the TANK timing and control functions to allow control over when and how long the 2nd (TANK) valve opens and closes during the OPEN flow control cycle.

TANK wait - The time delay from the start of the OPEN cycle until the 2nd (TANK) valve is opened. If the TANK time entry is non-zero and the TANK wait time is zero (000:00:00), then the 2nd valve will open at the start of the OPEN cycle.

*2-Valve
standard*

TANK time - The time or duration the 2nd (TANK) valve remains open once activated at the end of the TANK wait period. If the TANK wait time is non-zero and the TANK time is zero (000:00:00), then the 2nd valve will remain open until either the end of the OPEN cycle or the DELAY cycle closes the 2nd valve.

*2-Valve
standard*

TANK skip - An optional entry that determines how often the 2nd (TANK) valve is used. Enter a skip value from 0 to 99 to indicate how many production cycles to “skip” the 2nd valve operation. For example, if the 2nd valve is only used on every 3rd production cycle, a “skip” value of 3 is entered.

*2-Valve
optional*

WELL DATA Key



The green WELL DATA key is used to display important well information that has been logged during routine well operation. When viewing WELL DATA displays, pressing the HRS, MIN or SEC SET keys will zero or clear all data. See SET PAGE key for displaying the Plunger Arrival log and other data.

Multi-Function for up to four displays. The TANK display is an optional display.

- 1st - CLOSE % Total / Count / Time
- 2nd - OPEN % Total / Count / Time
- 3rd - TANK % Total / Count / Time
- 4th - Plunger Arrival Count / Time

Percentage of total production, total cycle count and total cycle time.

	CYCLE	BATTERY	VDC
V1	/CLOSE	78%	47
V2	TOTAL	013:50:41	
	FUNCTION	HRS	MIN SEC

Last plunger arrival time and total arrival count.

	CYCLE	BATTERY	VDC
V1	/PNGR		46
V2	TIME	000:13:57	
	FUNCTION	HRS	MIN SEC

SET PAGE Key



The beige SET PAGE key is used to access additional logged data and for viewing sensor gage readings.

The page feature is only used in conjunction with a WELL DATA key press. To page to the other WELL DATA displays, press the green WELL DATA key, then press the SET PAGE key. Each successive press of the SET PAGE key pages to a different WELL DATA display.

Multi-Function key
presses for up to
four displays.

- 1st - Well Totals Log
- 2nd - Plunger Arrival Log
- 3rd - Sensor Gage Display
- 4th - Flow Data Display

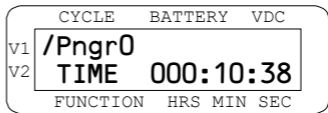
The sensor gage and flow data displays are optional, advanced features that may not be active and available in your controller. These advanced features require additional sensor hardware for proper operation.

When viewing the WELL DATA logs that are accessed by the SET PAGE key, successive presses of the WELL DATA key steps down a list of logged data, i.e., plunger arrival log.

Plunger Arrival Log

The Plunger Arrival log stores the last ten plunger times for viewing. The plunger arrival log is accessed by pressing the WELL DATA key and then pressing the SET PAGE key. When viewing the plunger arrival log, successive presses of the WELL DATA key sequences down the ten plunger arrival time entries Pngr0 through Pngr9. The Pngr0 time is the most recent arrival and Pngr9 is the time for the 10th previous production cycle.

Multi-Function key presses for up to four displays.



Successive key presses display the previous ten plunger arrivals.

- 1st - Pngr0 Plunger Arrival Time
- 2nd - Pngr1 Plunger Arrival Time
- 3rd - Pngr2 Plunger Arrival Time
- ... - ...
- ... - ...
- 9th - Pngr8 Plunger Arrival Time
- 10th - Pngr9 Plunger Arrival Time

The plunger arrival log is active and is available for all operating modes, including On/Off timer. The plunger arrival time is timed from the start of the OPEN or flow cycle. A 000:00:00 plunger arrival time is used as a “no” or “missed” plunger arrival placeholder.