

operators manual

# SMART SAVER<sup>®</sup>

SOLVENT RECYCLING UNIT



**BIOTECH.**  
INNOVATIVE LABORATORY  
PRODUCTS

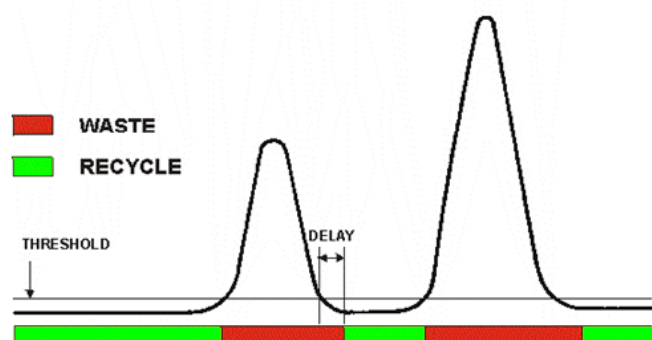
# Operators Manual

## USB SOLVENT RECYCLER STARTUP GUIDE

### USB Solvent Recycler

USB Solvent Recycler is a device dedicated for use in isocratic HPLC. Efficient recycling of mobile phase may save up to 90% of solvent. Usually, most of the mobile phase is free of contaminants and must not be wasted. With continuous monitoring of the detector signal solvent recycler performs redirection of the uncontaminated mobile phase back to the solvent reservoir and save the solvent and waste disposal costs.

According to input signal level the 3-way valve is switched to waste or recycle position. The switching valve is connected to the detector mobile phase output. If the signal level is greater than signal threshold, the valve is switched to waste position. The back switching to recycle position is delayed with respect to time required to liquid transport from the detector cell to 3-way valve (see illustration below).



### General specifications

Input Range:	± 1000 mVolts
Threshold:	1 - 1000 mVolts (detects both positive and negative peaks)
Delay:	0 – 255 second
Autozero:	50% of input range
Valve:	3 way electrically actuated, ¼ - 28" flat bottom fittings, 30 psi max.
Wetted Materials:	PEEK (valve body), PTFE (valve membrane, tubing)
Inputs:	analog, TTL (contact closure) user configurable
Indicators:	ready (yellow) LED, recycle (green) LED
PC Communication:	USB
Power Requirements	5 V/100mA (USB powered)

### Tubing Connection

Use the 1/16" PTFE tubing and flange free fittings. Ferrule must be placed in the proper position against the nut (see illustration). Detector mobile phase output should be connected to common port of 3 – way valve of recycler (marked as **DETECTOR**). Connect **RECYCLE** valve port with the mobile phase reservoir, **WASTE** port with the solvent waste bottle.



### Software installation

Install the software package **prior** connection of USB recycler to the computer. Insert software CD into drive on your computer and wait until the installation process automatically starts. If the auto play function is disabled, run setup.exe from the root folder of CD. Follow the instruction of the installer.



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## ELECTRICAL CONNECTION

Connect the **SIGNAL** input of the solvent recycler with integrator (1V FS) output of your detector.

**START** input should be connected to the contact closure of autosampler. This contact closure must be activated at the moment of injection. The default function is auto zero. If the output of autosampler

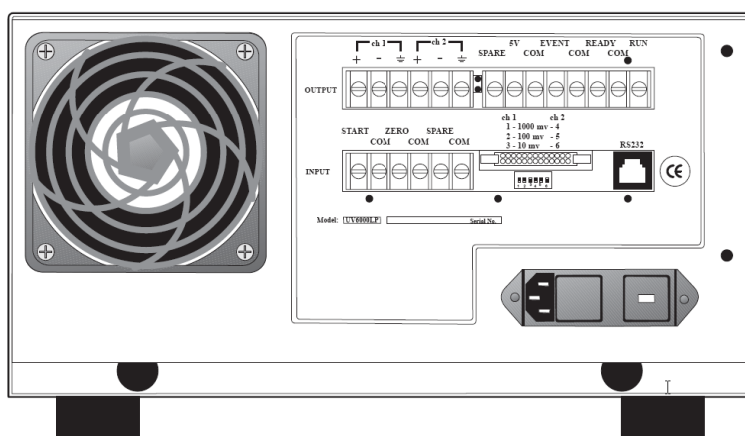
is polarized (e.g. open collector output), respect the polarity of **START** input (it has an internal pull-up resistor).

Connect the USB cable of solvent recycler to the PC with software and drivers installed.

### Connecting THERMO UV6000 PDA Detector

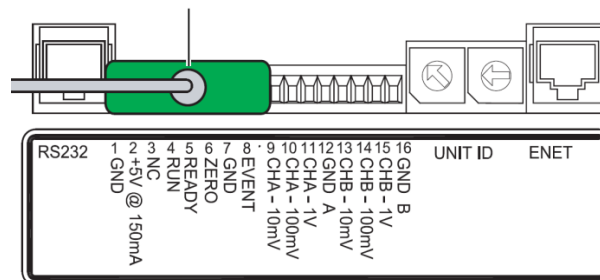
Locate the "OUTPUT" screw terminal on the rear panel of UV6000 detector. Connect blue wire to the CH1+ position and black wire to CH1 - position.

Channel 2 can be used alternatively. It is necessary to setup analog output within software prior use the solvent recycler. Use standard analog input cable (P/N 29-0362).



### Connecting SURVEYOR PDA Detector

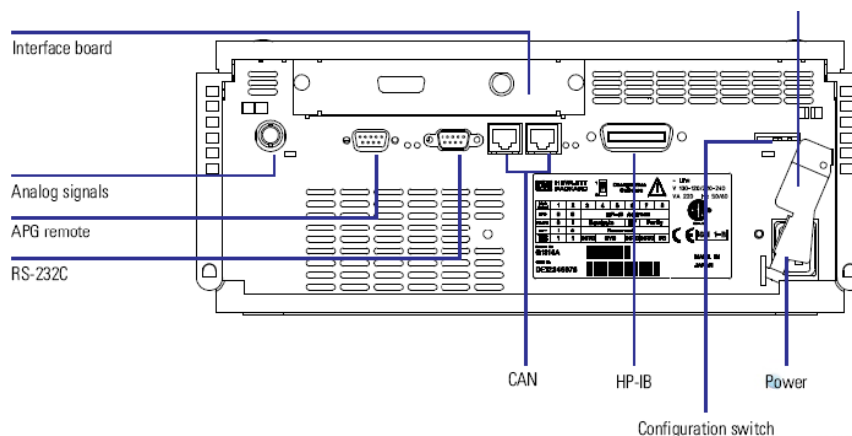
Connect blue wire to the CHA - 1V output and black wire to GND A position. Channel B can be used alternatively. It is necessary to setup analog output within software prior use the solvent recycler. Use standard analog input cable (P/N 29-0362).



### Connecting AGILENT Detectors

Connect the analog signal output of Agilent detector on the rear panel to SmartSaver using Agilent

analog input cable provided with solvent recycler (P/N 29-0363). Setup the analog output to 1 Volt FS.




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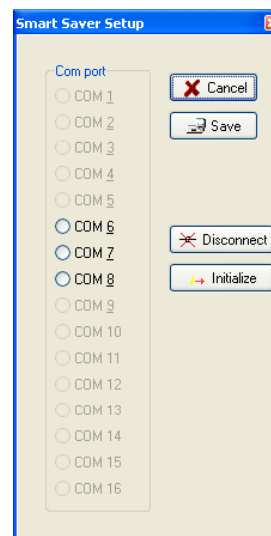
## INITIAL SETUP

Solvent recycler has build in USB interface. Communication with PC (running MS Windows operating system) is accomplished via "virtual com port driver" using simple text protocol. Communication may be done by using any terminal program (e.g. Windows Hyperterminal) or provided software.

After connection of USB solvent recycler to the PC, operating system recognizes the hardware and installs the necessary virtual com port driver. Use the Windows hardware manager to detect com port number reported as "USB Serial Port". It is necessary to set this com port number later in recycler software setup.

Start the SmartSaver application. You will probably get an error message "Invalid port number" first time. Ignore it (click OK) and continue with setup. New icon  appears on the Windows task bar. By right mouse click on the icon open local menu and select Setup. Select com port (if appropriate com port is currently unavailable, click Disconnect button). Then click Save button.


The solvent recycler is now ready for communication with the control application.





## First Steps

Prior using the USB solvent recycler the Threshold and Delay parameters must be correctly set according to chromatographic system properties.

Activate the status window by right click on saver task bar icon and Show Status item.

Enter threshold value into threshold edit box (200 mV in attached example) and click Set Threshold button (). The value is now stored in solvent recycler nonvolatile internal memory.

Enter delay value (typical setting is between 0 and 5 seconds, depending on tubing length and flow rate) into delay edit box and click Set Delay button (.

Wait until detector baseline is stable. Zero your detector signal and then click Auto Zero () button on speed bar of recycler status window.



## Fail Safe Design

The USB solvent recycler was designed to recycle the mobile phase only if switched on. The normal position of 3- way valve is waste. Therefore, in case of

power failure the valve remains in waste position and the mobile phase in the reservoir remains uncontaminated.