

**MICRO
PURGE**
basics
▼ QED

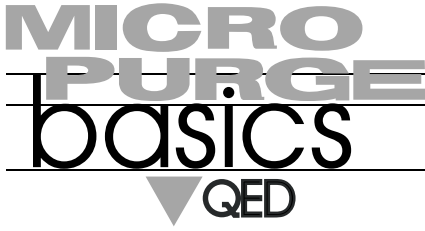
*First in Control & Power
For Low-Flow Sampling*

Low-Flow Purging Procedure with MicroPurge Basics Equipment



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MicroPurge basics™ means you can choose your own system - with the control and power to match your site requirements

MicroPurge® low-flow sampling offers important advantages over traditional purging and sampling methods, and can benefit many groundwater monitoring programs. It requires three basic steps:

1. Set the purge flow rate;
2. Control drawdown in the well;
3. Stabilize the purge water quality indicator parameters.

MicroPurge basics™ is a revolution in low-flow sampling control. The complete line of new MicroPurge basics products, combined with proven Well Wizard® pumps, will help you through all three steps with equipment that is easier to use, smaller, lighter, more powerful, and lower priced too!

Every MicroPurge basics component is complete, ready to use, and engineered for rugged field duty. The whole system is designed to let you choose the control and power options that fit your site needs now, with flexibility to meet future requirements.

Microprocessor-based control with water-level feedback and exclusive monitoring devices delivers the most accurate, precise samples you can get, assuring you consistent, repeatable data and eliminating most regulatory hassles.

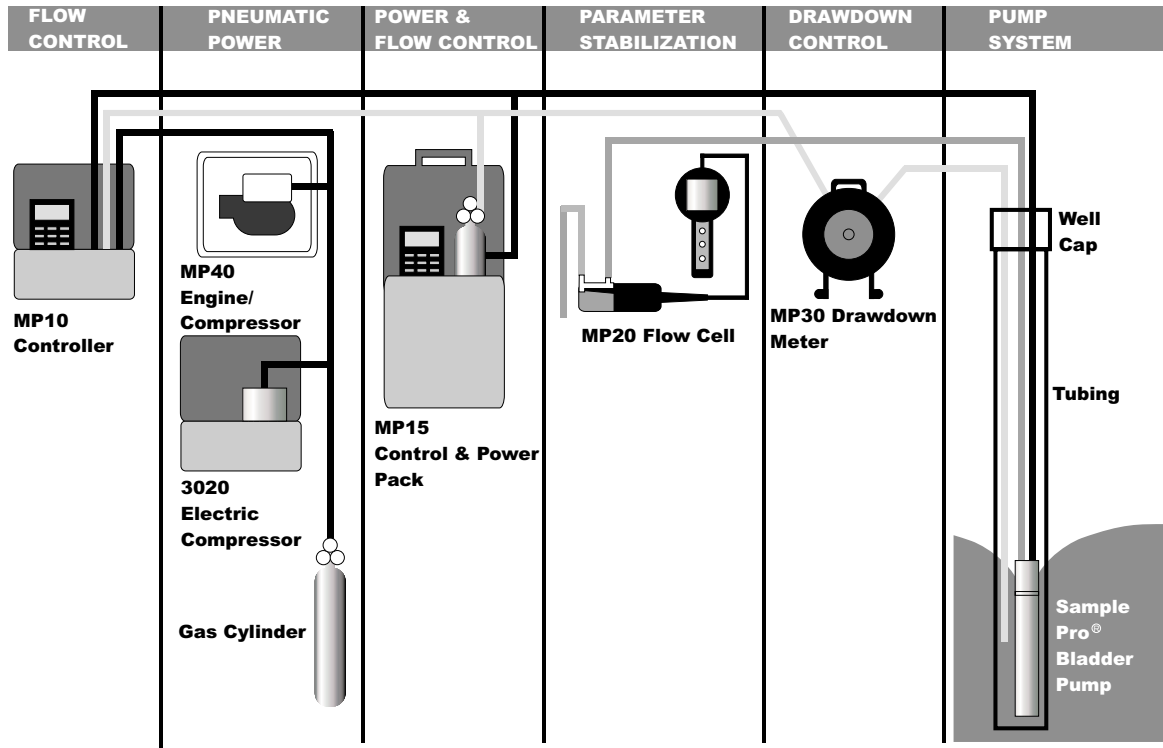
Low-flow Purging Procedure with MicroPurge basics Equipment

The following procedure is intended as an overview of typical operations at the well with MicroPurge **basics** equipment. This procedure assumes that all of the equipment is fully prepared with respect to battery condition, calibration and PurgeScan setup of the flow cell and charging of any compressed gas cylinders. Full detail is provided in the individual manuals for each product.

Summary:

1. Measure static water level with MP30 Drawdown meter.
2. Set MP30 probe at desired drawdown limit.
3. Connect compressed gas source (compressed gas cylinder or compressor) to MP10 or MP15 MicroPurge **basics** controller then connect controller to the pump supply fitting on the well cap.
4. Connect pump discharge tube to MP20 Flow Cell inlet tube, turn MP20 power ON, and verify that PurgeScan setup includes desired parameters and time interval.
5. Follow controller instructions to set desired flow rate; if drawdown limit is exceeded, reduce flow rate as needed to stay within limit.
6. Initiate PurgeScan on MP20 Flow Cell and write down data storage location #.
7. Watch for MP20 sound and flashing display indicators of stabilization, then begin sample collection.

MicroPurge Basics System Overview



Detailed Procedure:

Water Level

1. Determine static water level with MP30 Drawdown Control Meter power switched "ON" and Drawdown Control mode switched to "OFF" (see Figure 1 below).

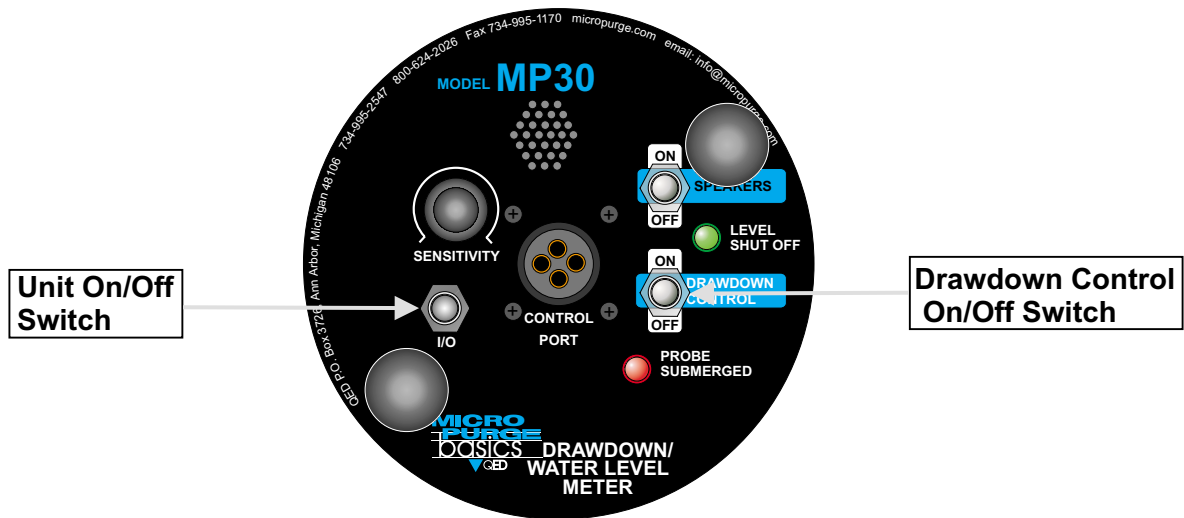



Figure 1
MP30 Control Panel

2. When well purging is to begin, switch the MP30 Drawdown Control switch to "ON" and lower the probe to desired drawdown control level.

Purge Flow

3. Connect the MP30 to the MicroPurge **basics** controller with the cable provided (See **Figure 2** below).
4. Connect MicroPurge **basics** controller (MP10 or MP15) to pump air supply fitting on the well cap (See **Figure 2** below).
5. Connect the pump discharge tube to the MP20 Flow Cell inlet tube (See **Figure 2** below) and press the MP20 Power "ON"  key.

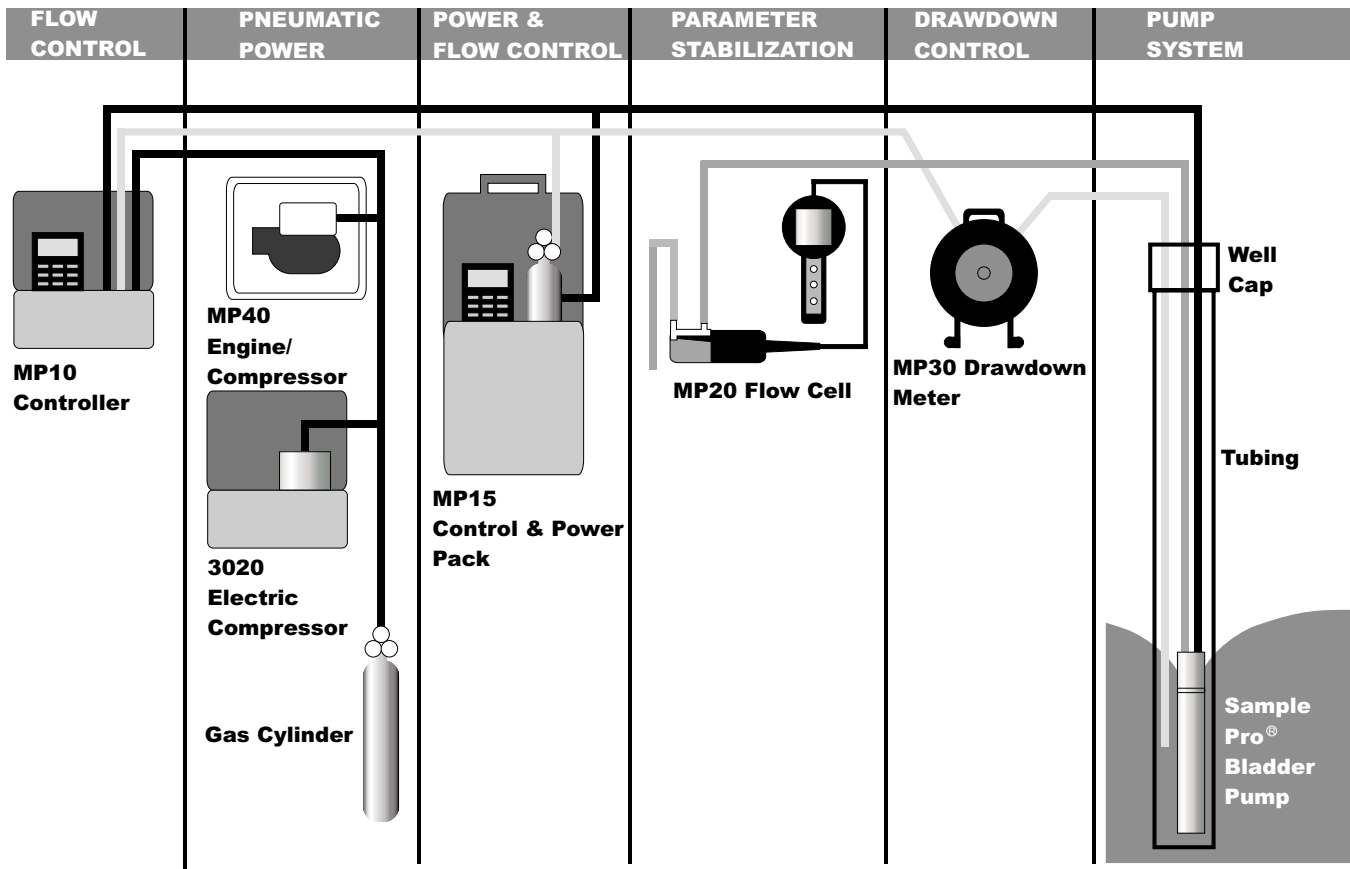




Figure 2
Basic System Diagram

6. Press **basics** controller power "ON"  key (see Figure 3 below).
7. On **basics** controller, select desired Cycles Per Minute (CPM) with  arrow key (default value is 4 CPM, lower CPM for deeper wells, higher CPM possible with shallow wells) (see Figure 3 below).

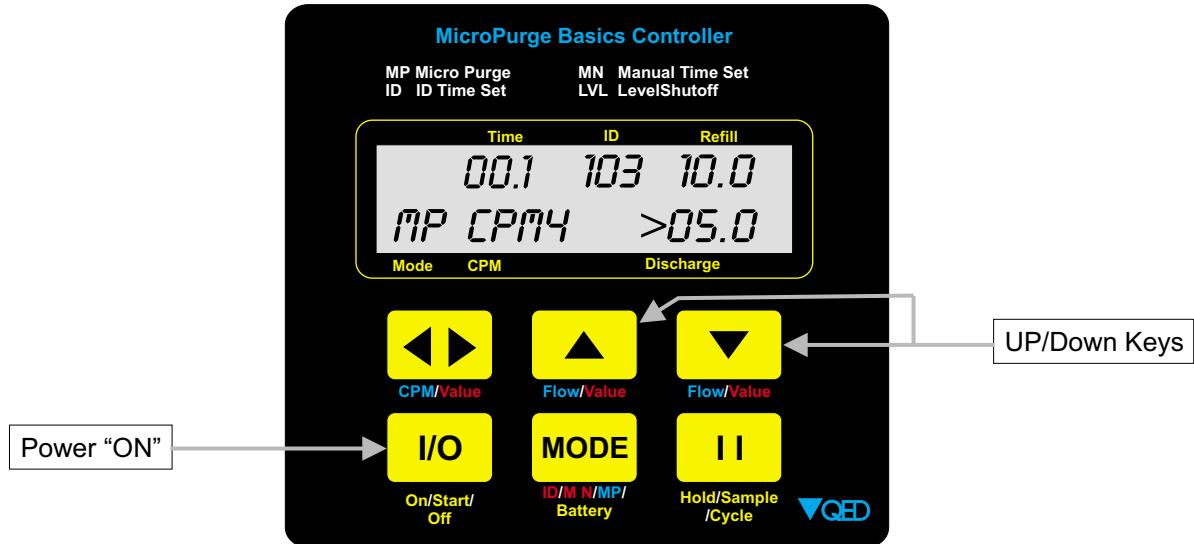



Figure 3
MP10 Keypad

8. Turn **basics** controller throttle to set depth on gauge to 10-20 feet deeper than the pump location in the well (see Figure 4 below).



Figure 4
MP10 Throttle and Gauge

9. Press **basics** controller "ON"  key (see Figure 3 above) again to start pumping.
10. When water discharge begins, adjust throttle until a slow, steady flow-stream is achieved.
11. Press **basics** controller "UP/DOWN" keys (see Figure 3 above) to set the desired purge flow rate.

12. The MP30 Drawdown Meter will automatically signal the controller to pause pumping if the probe is no longer submerged, and will also activate the buzzer and the "Level Shutoff" (see Figure 4 below) light.
13. If the water level in the well recovers and reaches the probe, the basics controller will resume pump operation and the MP30 "Probe Submerged" light (see Figure 4 below) will activate
14. If the drawdown level exceeds the selected drawdown limit point too consistently, the flow purge flow rate can be further decreased with adjustment of the controller through one or more presses of the flow "DOWN" arrow key (see Figure 5 below). If the flow rate is already at or near a minimum desired rate, in some cases it may be also possible to lower the probe to a new, lower drawdown control point to increase the well recovery rate. Consult the site Sampling and Analysis Plan and regulatory guidance before adjusting purging protocols.

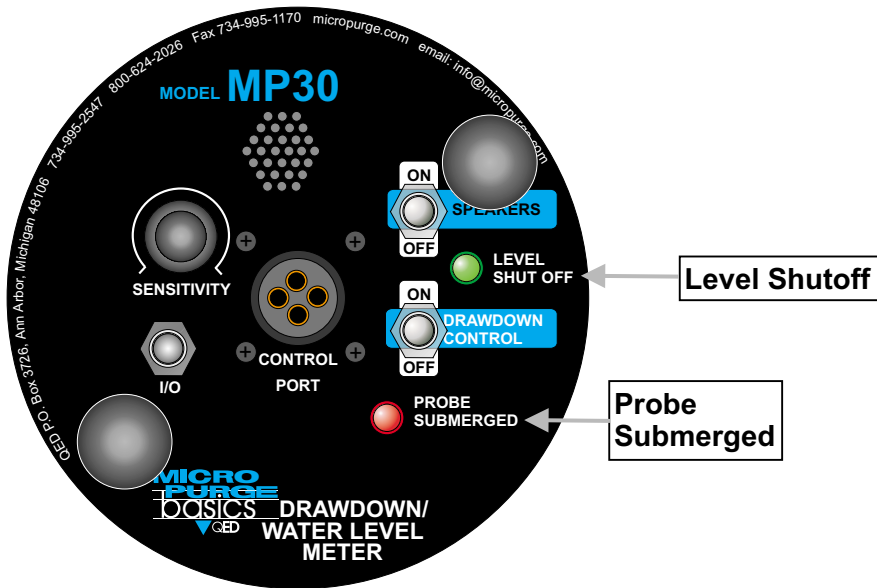


Figure 4
MP30 Control Panel

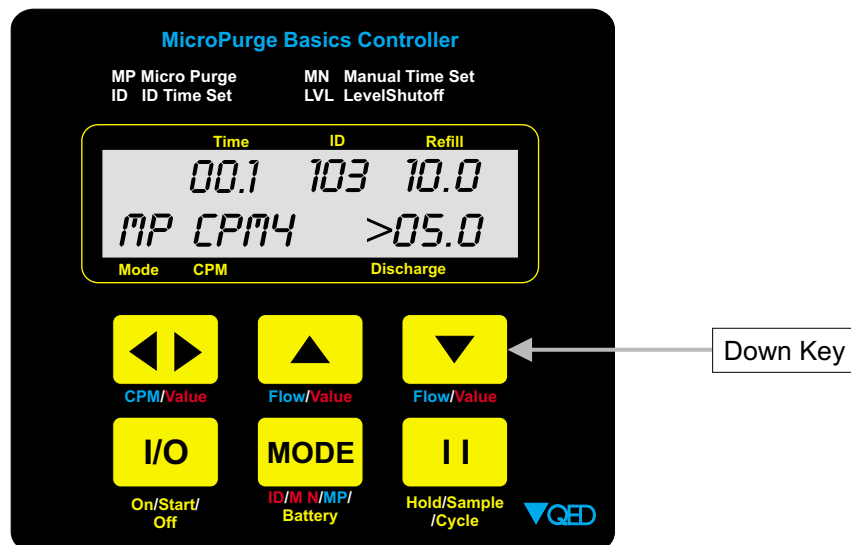







Figure 5
MP10 Keypad

Purge Water Quality Stabilization

15. When the final purge rate is achieved, record the ID value and pressure settings from the MP10/MP15 controller, then initiate PurgeScan on the MP20 Flow Cell by pressing the “RIGHT”  arrow key once to highlight "STORE", then pressing "ENTER" . This begins a PurgeScan stabilization cycle, starting at 00:00 elapsed time at the bottom (See Figure 6 Below) of the MP20 display, including automatic storage of key data frames. If it is desired to restart PurgeScan, press “ESC” , then "RIGHT" arrow  and "ENTER"  again.

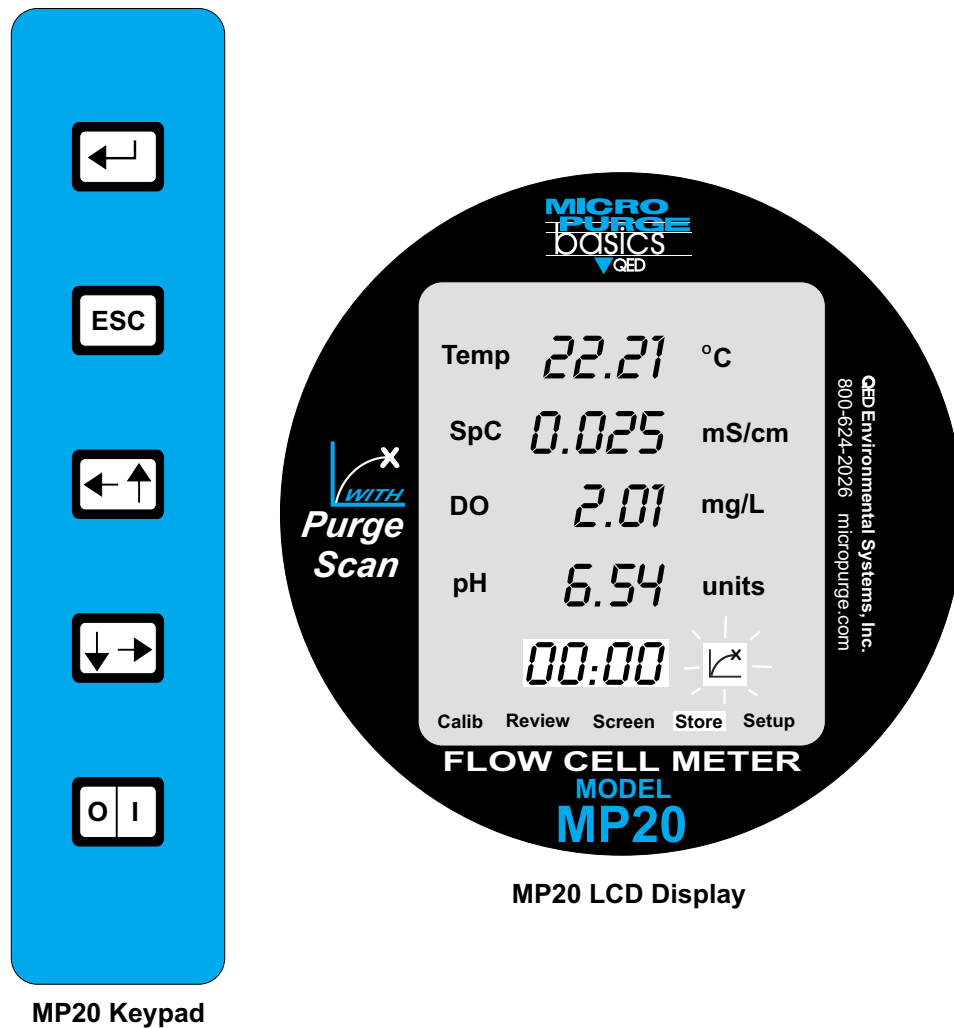


Figure 6

16. Record the data frame Index value from the lower left corner of the MP20 display; this identifies the initial, "TIME ZERO" data set of each PurgeScan event, used for later review of stored data.
17. Monitor the MP20 display for the beeping and the flashing PurgeScan icon which signal that three successive readings at the selected time interval were within the stabilization range for selected parameters. Purging is complete and sampling can begin.

Overview on Drawdown, Purge Flow and Stabilization Settings

Drawdown Control Point Selection

The amount of drawdown permissible must be determined for each well on site, and may be affected by federal, state and local regulations or guidance applicable to the site. Once this is determined, the Drawdown Control probe can be positioned using several approaches. First, it can be lowered directly to the point of maximum desirable drawdown and kept in place. Secondly, it can be periodically raised from the set point to detect any changes in water level, then lowered again. Finally, it can be positioned just part of the distance to the maximum drawdown point, for quicker feedback of the response between purge flow rate and drawdown. For example, if 10 inches of maximum drawdown is desired, the probe could be initially lowered to just 5" or less below the static water level. Then, if purge flow exceeds well recovery, this imbalance will be signaled more quickly than in waiting for the whole 10" to be drawn down, and purge flow can be reduced sooner to achieve equilibrium of purge flow with well recovery.

Flow Rate Selection

In general, the flow rate goal in low-flow rate sampling is a rate equal to or less than the well's recovery rate while staying within the drawdown limits. Minimizing drawdown reduces the impact of sampling on the aquifer, and helps minimize turbidity and drawing water from different zones than during undisturbed conditions. Actual flow rates typically range from 100ml/min to 1000ml/min. Within this range, if acceptable, higher flow rates allow faster filling of large volume sample containers. In all cases the flow rate should follow applicable regulations and existing sampling plans.

Purge Stabilization

The most common water quality parameters used to determine purging stabilization are dissolved oxygen (DO), specific conductance, and pH; ORP (redox) and turbidity are less commonly used, and arguments exist against their value for this purpose. The MP20 uses the following, fixed ranges as the basis for determining stabilization in the PurgeScan mode:

Stabilization Parameter	Stabilization Range
pH	.2 units
DO	0.2 mg/l
Conductivity	0.020 mS/cm
ORP (Redox)	20 millivolts

The time interval used to determine stabilization with PurgeScan should take the purge flow rate and purge cell volume into account. In general, the minimum PurgeScan time interval setting should be equal to or greater than the time required to replace the internal volume of the flow cell, 175 ml. On this basis, a one-minute or greater interval should be used with purge flow rates of 175 ml/min and higher. A purge flow rate of approximately 90 ml/min would require a time interval of 2 minutes or greater. A 50 ml/min flow rate would require use of a 4 minute interval. A more conservative approach would be to select an interval that allows two or three cell volumes to be purged between readings.

Low-flow Purging Procedure with Other Equipment

This procedure assumes use of a conventional water level meter, pump and control systems other than MicroPurge basics, and conventional flow cell instrumentation.

1. Measure static water level.
2. Select maximum drawdown level and lower probe to this level.
3. Adjust purge flow to initial target level, and monitor flow periodically to watch for changes in rate.
4. Begin purge flow, while monitoring continued alarm signals from water level meter to make sure drawdown level is not exceeded.
5. Begin to monitor purge water quality, watching for all stabilization parameter readings to stay within the selected limits for the required time period. Continue to observe the water level meter for excess drawdown.

CONTACT INFORMATION

For additional assistance contact QED Service at:

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