

MASAR[®] List of Design and Operating Data Requirements

The following are operating and design data parameters utilized by the *Membrane Analysis System and Automated Reporter, MASAR[®]*. Each record data set must contain at least the parameters listed under *Required Data*, in order for MASAR[®] database and operating system to produce the design output and system features. Also required is a set of **design projection data for each train/stage** (all parameters listed under I. plus the projected product flow and salinity). These will be the basis for normalization of data (i.e., *Standard Conditions*); they should represent the average of actual conditions as much as possible, according to ASTM D 4516 standard data normalization method.

I. **Required Parameters**

1. Train or Skid Name, Number or ID.
2. Stage Number (1,2 or 3).
3. Date of each data set collected.
4. Operating Hour (total operating time excluding membrane system shutdowns).
5. Feed Temperature (*first stage* input only).
6. Feed Salinity or Electrical Conductivity (*first stage/pass*** input only) – **RO/NF**.
7. Feed Pressure (input to *each stage*).
8. Membrane Pressure Drop (feed pressure minus brine pressure directly across the average pressure vessel (*per stage*)*).
9. Permeate Pressure (output from *each stage*)* - *final value is adequate*.
10. Final Reject or Brine Flow (*final discharge*).
11. Permeate Flow (output from *each stage*).
12. Permeate Salinity or Electric Conductivity (*per stage*)* – **RO/NF**.
13. Total No. of Pressure Vessels On-line (*per stage*)*.
14. Number of Membrane Cartridges per Pressure Vessel On-line (*per stage*)*.

II. **Optional Parameters**

1. Turbidity "NTU" (*Membrane system feed*).
2. Silt Density Index "SDI" (*Membrane system feed*).
3. Micron Filter Pressure Drop (*Membrane system feed line*).
4. RO Feed pH (*Membrane system or common acidified feed line*).
5. Redox Potential or ORP reading (*Membrane system or common feed line*).
6. Chlorine Residual (*Membrane system or common feed line*).
7. Other (*as may be specifically requested by the user*).

* IF STAGE DATA IS NOT AVAILABLE, OVERALL SYSTEM DATA (i.e., *as one stage or pass*) CAN BE USED BUT IT WILL BE LESS ACCURATE AND RESULTS CANNOT INDICATE STAGE-SPECIFIC PROBLEMS.

**For double-pass systems (i.e., UF/RO or RO/RO), same data parameters are required for each pass (except the primary feed temperature).