

Quick Reference Guide

US EPA METHOD 300.0 WITH METROHM IC

OVERVIEW

This quick reference guide outlines best practices for running US EPA Method 300.0 on Metrohm ion chromatography (IC) systems. Whether you're new to Metrohm IC or an experienced analyst, this guide offers step-by-step instructions to support high-quality data, consistent performance, and minimal downtime. It includes tips for daily startup, suppression module care, troubleshooting, and routine quality checks.

DAILY STARTUP CHECKLIST

Before beginning your daily run:

- Replace all rinse water bottles with fresh 18 M Ω (mega-ohm) deionized water.
- Check all reagent levels. Do not top off eluent—prepare fresh as needed.
- Open Workplace → Load Method → Start Hardware:
 - Observe baseline.
 - Expect an initial acid peak—this is normal during equilibration.
 - Typical equilibration time: ~30 minutes (if MSM auto-step every 10 minutes).
 - After ~3 MSM steps, baseline should approach 1–2 μ S/cm (similar to DI water).

Suppression Module Overview

MSM (METROHM SUPPRESSOR MODULE)

- Three internal chambers for ion exchange.
- Reduces carbonate/bicarbonate eluent baseline (~700 μ S/cm) to ~15 μ S/cm.

MCS (METROHM CO₂ SUPPRESSOR)

- Further lowers baseline to 1–2 μ S/cm.
- Enhances baseline stability and sensitivity.

CLEANING PROCEDURE

Add 50 mL of C4 Eluent 20X Concentrate (Nitric acid/DPA – Part #ERA-IC1110) to 1 L of regeneration solution. Do this every 3 months or as needed during troubleshooting.

DAILY SAMPLE AND QC SEQUENCE

Run samples and standards in this order:

- Water Blank (18 M Ω UP H₂O) – Run two if using in-line ultrafiltration cell.
- Check Standard – Typically midpoint of calibration curve.
- Water Blank
- Samples
- Check Standard – If bracketing samples is required.

PERFORMANCE LOGBOOK

- Keep a daily record of instrument performance including:
 - Baseline conductivity
 - System pressure
 - Track retention time of Chloride and/or Sulfate
 - Other Notes
 - Column changes and cleaning
 - System maintenance
 - Suppressor cleaning

Troubleshooting Guide

POWER/COMMUNICATION

- Confirm instrument power and cable connections
- Check PC communication via software

PRESSURE ISSUES

- High Pressure: Blocked guard/analytical column, MSM obstruction → Replace column or flush flow path
- Low Pressure: Air bubble, eluent depletion, leaks, faulty check valves → Purge pump, inspect lines, replace check valves

BASELINE INSTABILITY

- Analyze Check Standard in triplicate
- Check suppressor function, regen quality, and eluent prep
- Replace suppressor or clean as needed

INJECTION ERRORS

- Verify autosampler, sample loop, and injection depth

POOR PEAK SHAPE / RECOVERY

Common issues and likely causes—this is not a comprehensive list.

- Fronting: Column overloading, deteriorated column → Dilute sample, replace column
- Tailing: Contamination, dead volume → Flush column/system, inspect fittings
- Split Peaks: Injector malfunction or column channeling → Replace injector or column
- Decreasing Peak Height: Temperature instability, detector fouling → Verify oven/lab temp or clean detector cell

LOW RECOVERIES – CCVS OR SAMPLES

- If using in-line ultrafiltration (UF):
 - Bypass UF and check recovery
 - Verify filter compatibility and sample pH
- Check:
 - Expiration and prep of standards
 - Sample prep method
 - System bubbles or leaks
- Recalibrate if needed

ION-SPECIFIC RECOVERY TIPS

- Fluoride: Aluminum or Tin contamination → Add 50 mL C4 Eluent to 1L Regen for chelation
- Bromide / Phosphate: Iron (rust) contamination → Use chelation cleaning
- Nitrite: Oxidation to nitrate → Track nitrite:nitrate ratio; prepare standards fresh

In rare cases, passivation of the entire flow path may be needed. Contact Metrohm Tech Support for guidance

ADDITIONAL SUPPORT & RESOURCES

Visit support.metrohmusa.com for guides:

- Routine IC Maintenance
- Injection Valve Issues
- MagIC Net User Guide
- Troubleshooting & Maintenance Guides