



SERVICE OPTIONS



- + ELECTROSTATIC CLASSIFIER 3082;
- + DIFFERENTIAL MOBILITY ANALYZERS
3081(A), 3085(A), 3086;
- + AEROSOL NEUTRALIZERS 3077, 3077A,
AND 3088

TSI service, performed on an annual basis, helps to keep your instruments in proper working order. For the 3082 Electrostatic Classifiers and for all models of DMA's, TSI offers two levels of service: **Clean and Calibrate**, and **Repair, Clean and Calibrate**. For the aerosol neutralizers, since no calibration is possible, TSI offers slightly different service options. Read the following pages to learn what is included in each service.

SERVICE OPTIONS



3082: Clean and Calibrate Service includes:

Maintain	+ Clean sheath ports, and impactors (if returned)
Replace	Parts + Replace internal flowmeter, internal filters, o-rings and fan filter media. Replace internal tubing as needed
	Firmware + Ensure latest firmware update is installed
Test	Calibrate + Touchscreen, voltages, sheath flow, impactors (if returned), and sensors for absolute sheath pressure, differential pressure across impactor, temperature, and RH
	Leak check + Sheath system, as well as entire classifier with DMA installed
	Zero checks: Check #1 + Use a CPC to confirm that the classifier-DMA releases zero particles with voltage off and sheath flow on Check #2: + Conduct an SMPS scan of filtered air, confirm 0 #/cm ³ is measured
	Aerosol tests + Confirm size accuracy and resolution, as well as concentration accuracy and stability, using aerosolized 100 nm polystyrene latex spheres (PSL). For dual-polarity classifiers, this test is conducted once for each polarity
Does NOT Include	Broken parts + Ex.: blower, high voltage supply
	Physical damage + Physical damage to frame or housing

3082 Repair, Clean and Calibrate Service includes:

Repair	+ Repair or replace broken parts
Clean and Calibrate	+ All actions in a standard 'Clean and Calibrate' service are then performed
Does NOT Include	+ Physical damage to frame or housing

3082IMP Clean and Calibrate Service includes:

Maintain	+ Clean impactor nozzle and plate
Test	Leak check + Expose all three impactors to -0.75 bar gauge pressure for 5 minutes; ensure the measured pressure changes by < 5% / hour
	Calibration + Each impactor is calibrated at six pressure drops within the flow range prescribed for that nozzle size. Calibration is written to the chip on the impactor body
Does NOT Include	Physical damage + If an impactor is found to be damaged to an extent that negatively affects its function, it is replaced and the customer is billed appropriately. Impactors are not replaced due to cosmetic imperfections

REQUEST SERVICE

Specify	Description
CL-3082	Clean and Calibrate
RP-3082	Repair, Clean and Calibrate
CL-3082IMP	Clean and Calibrate

TSI Service uses your inlet impactors, DMA, and 3088 neutralizer during the 3082 Classifier service procedure, provided those component(s) were sent in along with your 3082. Those components can be used in a serviced or unserviced state during the 3082 procedure. If you would like the inlet impactors, DMA, and/or 3088 neutralizer to be serviced prior to their use in the 3082 procedure, please be sure to order the appropriate services for the inlet impactors, DMA, and/or 3088 neutralizer; refer to the following pages. If any of these components is sent along with a 3082, but no service is ordered for that component, TSI will contact you for permission to bill the separate service.

SERVICE OPTIONS

3081, 3081A, 3085, 3085A, 3086 DMA's Clean and Calibrate Service includes:

Maintain	<ul style="list-style-type: none">+ Disassemble DMA while wearing powder-free gloves. Hand-clean and sonicate parts as appropriate in residue-free detergent. Clean parts further with alcohol wipes and dry with particle-free air. Clean Dacron screen by soaking in acetone and blowing dry with particle-free air+ Model-specific: clean narrow openings with size-specific brushes
Replace	<ul style="list-style-type: none">+ Replace internal o-rings during re-assembly, applying grease where appropriate+ Replace fittings if needed+ Model-specific: replace Dacron screen in 3086. For all other DMA models, replace Dacron screen as needed
Test	Electrical continuity <ul style="list-style-type: none">+ Measure electrical resistance across the DMA at various points to confirm that electrical connections are correct following reassembly
	Leak check <ul style="list-style-type: none">+ Verify DMA holds a vacuum
	Zero check <ul style="list-style-type: none">+ Confirm the DMA releases zero particles when operated at 1.5 L/min aerosol flow, 15 L/min sheath flow, -9600V (using the customer's 3082 classifier and/or 3088 neutralizer, if available)
	Aerosol challenge <ul style="list-style-type: none">+ Conduct both monodisperse and polydisperse challenge aerosol tests to confirm sizing accuracy
Does NOT Include	Broken parts <ul style="list-style-type: none">+ Ex.: high voltage supply
	Physical damage <ul style="list-style-type: none">+ Ex.: cosmetic scratches



**3081, 3081A, 3085, 3085A, 3086 DMA's
Repair, Clean and Calibrate Service includes:**

Repair	+ Repair or replace broken parts
Clean and Calibrate	+ All actions in a standard 'Clean and Calibrate' service are then performed
Does NOT Include	+ Physical damage: ex.: cosmetic scratches

REQUEST SERVICE

Specify	Description
CL-DMA	Clean and Calibrate
RP-DMA	Repair, Clean and Calibrate

CL-3081
CL-3081A
CL-3085
CL-3085A
CL-3086

RP-3081
RP-3081A
RP-3085
RP-3085A
RP-3086

SERVICE OPTIONS

TSI offers two service options for the Advanced Aerosol Neutralizer 3088:

Clean and Calibrate (CL-3088) and **Replace X-Ray Source (RO-3088)**.

In QU-3088, the unit is examined by an experienced technician to determine what repairs are needed. You are then contacted before any work proceeds. In RO-3088, the soft x-ray source is replaced; this is followed by all the actions included in the QU-3088 service. Read below to learn what is offered in each service.

CL-3088 Service includes:

Maintain	+ Clean aerosol-exposed parts in a sonicating bath and by hand
Replace	+ Firmware: ensure latest firmware update is installed
Test	+ Radiation: confirm performance of x-ray source + Radiation exposure: confirm emitted radiation of finished unit < 0.8 μ Sv/hr + Leak check: ensure reassembled instrument holds vacuum
Does NOT Include	Physical damage + Ex.: scratches on the exterior case

RO-3088 Service includes:

Replace	+ Replace the Soft X-ray source inside the 3088
Also Included	+ All actions appropriate to a CL-3088 service are then performed



For radioactive aerosol neutralizers there are no cleaning, calibration, or repair services available; only return and transfer services are available.

Radioactive neutralizers have a limited lifetime (both 3077 and 3077A have a half-life of 10.7 years.) After one half-life has passed, TSI recommends purchasing a new radioactive neutralizer to ensure adequate aerosol charge conditioning. The old neutralizer must, according to government regulations, be returned to TSI Incorporated. In such cases, please request a return service using the information in the 'Request Service' box below. After you order the return service, TSI will contact you with the procedure.

Government regulations also require that you notify TSI Incorporated if you wish to transfer a radioactive neutralizer to a different facility for continued use. This is true even if the second facility belongs to the same party (i.e. company, organization). TSI is required by law to assist you with this process. After you order the transfer service as noted below, TSI will contact you with the procedure for transfer.

REQUEST SERVICE

Specify	Description
RO-3077DISP	Return a 3077
RO-3077A DISP	Return a 3077A
RO-3077TRNSFR	Transfer a 3077 to a new facility for continued use
RO-3077ATRNSFR	Transfer a 3077A to a new facility for continued use

REQUEST SERVICE

Specify	Description
QU-3088	Quote
RO-3088	Replace x-ray source

SERVICE OPTIONS

WHAT MAKES TSI SERVICE VALUABLE?

As a result of TSI service, you are returned an optimally performing and updated instrument. The service is performed by TSI's experienced technicians. All CL-, RP-, and RO- services are performed for a fixed price. This simple service process allows you to stay focused on the work that is important to you.

Calibration of TSI DMA's and 3082 electrostatic classifiers is traceable to NIST and other accepted values of physical constants. TSI's calibration process for the 3082 includes tests for particle size accuracy, size resolution, and number concentration in accordance with Chapter 7 of ISO 15900:2009. TSI is registered to ISO-9001:2005.

These TSI services come with a 90-day warranty on labor performed, or parts used, during the service.

Call, or visit
[tsi.com/requestservice](https://www.tsi.com/requestservice)



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