



® Knowledge
Beyond
Measure.



Testing Biomedical Equipment Has Never Been Easier

Certifier™ Plus Flow Analyzer
Handheld Test System for Gas Flow Analysis



Testing Biomedical Equipment Has Never Been Easier

Certifier flow analyzers are the go-to tool for biomedical professionals to efficiently test and service respiratory medical equipment. Certifiers utilize TSI® flow sensing technology which is optimized for medical applications where accuracy and reliability are key requirements.

Portable and Easy to Operate

- Compact and lightweight design
- Color touchscreen display
- Simple user interface with easy data viewing
- Up to 8 hours of continuous battery operation

Faster Test Setups and Reporting

- User configurations to save or recall past test setups
- Transfer configurations between Certifier Plus instruments
- Automatic breath detection, don't need to set manual triggers
- Snapshot features saves screen capture along with data displayed
- Easy export via the USB port

Benefits of Unique Modular Design

The Certifier Plus is a modular test system with the interface display separated from the measurement by coiled cable. This design enables customer benefits such as purchasing flexibility (purchase as a system or in pieces), lower service costs, and increased testing "up time".

Test Parameter Measurements

The Certifier™ Plus Flow Analyzer can measure 28 different test parameters:

- Gas flows
- Gas volumes
- Gas pressures (barometric and/or breathing circuit)
- Gas temperature
- Breathing parameters
- Oxygen concentration

Full-featured Test System

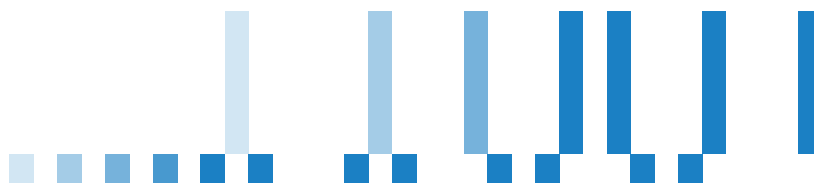
The Certifier™ Plus Flow Analyzer is able to test a wide range of respiratory medical equipment including:

- Mechanical ventilators
- Anesthesia machines
- Air oxygen blenders
- Insufflators
- Oxygen concentrators
- Positive air pressure devices

Users and Applications

Technicians, engineers, designers, researchers, and scientists use TSI® Certifier™ Flow Analyzers in applications such as:

- Maintenance and field service
- Engineering product development
- Manufacturing and quality assurance
- Research





Modular System Design

- Components include 4089 Interface Module, 4081 High Flow Module, and 4082 Low Flow Module
- Test systems (4080-S and 4080-F) include a 4089 interface module and 4081 high flow module
- Purchase modules individually or as part of a test system
- All modules and systems are kitted with accessories



Certifier™ Plus Flow Analyzer Test System

The Certifier Plus flow analyzer is a full-featured test system capable of testing a wide range of virtually all models of ventilators including: Adult, Pediatric, Anesthesia, Neonatal, and High-frequency.

This multi-functional pneumatic test system can measure 28 different test parameters and graph waveforms in real-time. It's easy operation, compact size, rugged design, and mounting options make the Certifier Plus Flow Analyzer ideal for use in field service, biomedical shops, and manufacturing.

Test Parameters

- Flow rate, peak flow, and minimum flow
- Volume (inhaled and exhaled)
- Minute volume
- Low pressure (differential)
- Peak, PEEP, and plateau pressures
- Mean and minimum airway pressures
- High pressure
- Barometric pressure
- Static compliance
- Inspiratory, inspiratory pause, and inspiratory rise times
- Expiratory times
- I:E ratios
- Respiratory rate
- Gas temperature
- Oxygen concentration (with optional 4073 kit)



Ventilator Test Systems

Certifier™ Plus Test System- Standard Kit

4080-S, High Flow System with Standard Kit

- Includes Certifier™ Interface Module 4089, Certifier™ High Flow Module 4081, and accessories
- See the table on page 7 for a complete list of included components

Certifier™ Plus Test System- Full Kit

4080-F, High Flow System with Full Kit

- Everything you need for ventilator testing with a single model
- Includes Certifier™ Modules 4089, 4081, Oxygen Sensor Kit 4073, adult test lung, mounting kit, and more
- See the table on page 7 for a complete list of included components

Oxygen Sensor Kit

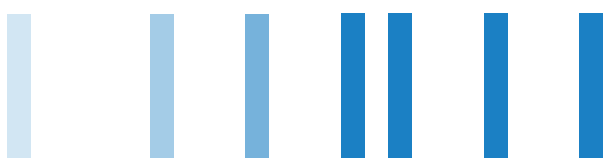
4073

- Measures oxygen concentration from 0-100%
- Sensor connects to high flow modules via coupling and cable
- The 4073 kit can be purchased as a separate accessory
- The 4073 is included as part of the 4080-F and 4089-F kits

Optional Certifier Plus Mounting Kits

130398 & 130399

- Securely mount the Certifier Plus test system
- Interface Module Mount
- Interface + Flow Module Mount



Anesthesia Machine Testing

Order the 4082 Certifier™ Plus Low Flow Module kit

- Includes N₂O gas calibration
- Low flow module must be operated with a Certifier™ Plus Interface Module
- See the table on opposite page for a list of kit components



Upgrading from the Certifier™ FA+ to the Certifier™ Plus

Order the 4089 or 4089-F Certifier™ Plus Interface Module kit

- 4089 interface module works with existing 4081 and 4082 flow modules
- 4089 kits include an updated flow module cable
- See the table on page 4 for a complete list of included components



Optimize Your Setup and Save Space

- Mount to ventilator rails, mobile carts, IV poles, and more
- Helps to make efficient use of limited space
- Adjust mount to optimize the positioning of your test setup



Certifier™ Plus Instrument Kits

| Parts | Description | 4080-S High Flow System, Std. Kit | 4080-F High Flow System, Full Kit | 4081 High Flow Module Kit | 4082 Low Flow Module Kit | 4089 Interface Module, Std. Kit | 4089-F Interface Module, Full Kit |
|---------|---------------------------------------|--|--|---------------------------------|--------------------------------|--|--|
| 4089 | Interface module | ■ | ■ | | | ■ | ■ |
| 4081 | High flow module | ■ | ■ | ■ | | | |
| 4082 | Low flow module | | | | ■ | | |
| 4073 | Oxygen sensor kit | | ■ | | | | ■ |
| 1602341 | Inlet filter, 22mm M/F | ■ | ■ | | | | |
| 1611221 | Adapter, high pressure | ■ | ■ | ■ | | | |
| 1102091 | Adapters, 22mm x 6mm (2) | ■ | ■ | ■ | | | |
| 1102093 | Adapter, 15mm ID x 22mm OD | ■ | ■ | ■ | | | |
| 1611330 | Airway pressure fitting | ■ | ■ | ■ | | | |
| 3002053 | Pressure tubing, silicone | ■ | ■ | ■ | | | |
| 2913110 | Velcro strap (for use with 4081) | ■ | ■ | ■ | | | |
| 130384 | Flow module cable, coiled | ■ | ■ | | | ■ | ■ |
| 130400 | Power supply with plug set | ■ | ■ | | | ■ | ■ |
| 130385 | Li-ion battery (installed) | ■ | ■ | | | ■ | ■ |
| 130392 | Protective cover (attached) | ■ | ■ | | | ■ | ■ |
| 130389 | Hybrid carrying case | ■ | | | | ■ | |
| 130396 | Adult test lung, 1.0L | | ■ | | | | ■ |
| 130399 | Mounting kit, interface + flow | | ■ | | | | ■ |
| 130373 | Adapter, 22mm F to 22mm F | | ■ | | | | ■ |
| 130374 | Adapter, 15mm M to 22mm F | | ■ | | | | ■ |
| 130370 | Stylus, capacitive touch | | ■ | | | | ■ |
| 130393 | Deluxe carrying case, fitted | | ■ | | | | ■ |
| 1602342 | Inlet Filter, 3/8 to 1/2 inch barb | | | | ■ | | |
| 1601180 | Coupling, 3/8 inch tube | | | | ■ | | |
| 1601179 | Adapter, 3/8 inch tube to barb | | | | ■ | | |

To find product accessories, visit the product page at [tsi.com](https://www.tsi.com).



Features and Specifications

Certifier™ Plus Test Systems

Models 4080-S, 4080-F

| Features | Certifier Plus |
|------------------------------------|--|
| Gas Calibrations | Air, O ₂ , Air/O ₂ mixtures, N ₂ , CO ₂ , N ₂ O |
| Flow Direction | Bi-directional (4081 high flow module) |
| Gas Conditions | STP, ATP, BTPS, BTPD, plus user-defined |
| Temperature & Pressure Compensated | Yes |
| Max Breath Rate | 1500 BPM |
| Pressure Measurements | Low, High, Barometric |
| Dual Flow Module Capability | Yes |
| Display | 5-inch color touchscreen display up to 18 test parameters |
| User configurations | Save, load, and transfer test setups |
| Batteries | Li-Ion rechargeable (4-cell) |
| AC adapter | Yes |
| Data acquisition | Save measurement data and screen captures to internal memory, USB export |
| Export / Import | USB |

| Measurements | Gas/Mode | Range | Accuracy** |
|----------------------------|---|---------------------------------|------------------------------------|
| Flow Rate – High Flow | Air, O ₂ | -200 to +300 slpm* | ± 2% or 0.075 slpm |
| | Air/O ₂ mixtures | 0 to 300 slpm | ± 3% or 0.1 slpm |
| | N ₂ | -200 to +300 slpm | ± 3% or 0.1 slpm |
| | CO ₂ | -40 to +40 slpm | ± 3% or 0.1 slpm |
| Flow Rate – Low Flow | Air, O ₂ | 0.01 to 20 slpm | ± 2% and 0.008 slpm |
| | N ₂ , CO ₂ | 0.01 to 20 slpm | ± 3% and 0.010 slpm |
| | N ₂ O | 0.01 to 20 slpm | ± 4% and 0.025 slpm |
| Inhaled Volume – High Flow | Air, O ₂ | 0.01 to 10 std liters | ± 2% and 0.02 liters |
| | Air/O ₂ mixtures | 0.01 to 10 std liters | ± 4% and 0.02 liters |
| Exhaled Volume – High Flow | Air, O ₂ | 0.01 to 10 std liters | ± 3% and 0.03 liters |
| | Air/O ₂ mixtures | 0.01 to 10 std liters | ± 4% and 0.04 liters |
| Inhaled Volume – Low Flow | Air, O ₂ | 1 to 100 std mL | ± 2% or 2 mL |
| | N ₂ O | 1 to 100 std mL | ± 4% or 2 mL |
| Minute Volume | MV | 0.01 to 100 std liters | ± 3% |
| Low Pressure | PIP, PEEP, P _{MIN} , P _Δ , P _{MAP} , P _{PLAT} | -25 to +150 cm H ₂ O | ± 0.5% or 0.15 cm H ₂ O |
| High Pressure | P _{High} | -10 to +150 psi | ± 1% or 0.1 psi |
| Barometric Pressure | P _{ABS} | 7 to 23 psi | ± 0.16% psi (11 mbar) |
| Respiratory Times | t _I , t _{IP} , t _{I+P} , t _E , t _R | 0.04 to 30 secs | ± 2% or 0.01 secs |
| I:E Ratios | I:E, I:E _{I+P} | 1:100 to 100:1 | ± 4% |
| Respiratory Rate | f | 1 to 1500 bpm | ± 2% or 0.01 bpm |
| Static Compliance | C _{STAT} | 0.01 to 1000 mBar/mL | ± 3% or 1 mbar/mL |
| Oxygen Concentration | O ₂ % | 21% to 100% | ± 2% |
| Temperature | T | 5 to 40°C | ± 1°C at flow rates above 2 L/min |

* slpm = Standard Liters per Minute

** Accuracy stated as percent of reading at TSI standard gas conditions
See operator's manual for more complete specifications



Find out more at
[tsi.com/certifierplus](https://www.tsi.com/certifierplus)

TSI, the TSI logo are registered trademarks of TSI Incorporated in the United States and may be protected under other country's trademark registrations.



TSI Incorporated - Visit our website www.tsi.com for more information.

| | | | |
|----------------|------------------------|------------------|-----------------------|
| USA | Tel: +1 800 874 2811 | India | Tel: +91 80 67877200 |
| UK | Tel: +44 149 4 459200 | China | Tel: +86 10 8219 7688 |
| France | Tel: +33 1 41 19 21 99 | Singapore | Tel: +65 6595 6388 |
| Germany | Tel: +49 241 523030 | | |