THE ENERGY CONSERVATORY

# DIGITAL TRUEFLOW®
# AIR HANDLER FLOW METER


## OVERVIEW

# Digital TrueFlow® Solution

**The first easy-to-use air system analysis tool**
Provides reliable measurements and guidance on how to address comfort issues - with a simple customer-friendly report.

**Sales**
Add the analysis to your bids to differentiate

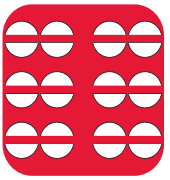
**Installs**
Recognized by ANSI / ACCA / RESNET 310 for grading of new installs

**Service**
Comprehensive analysis for service techs to diagnose and resolve air flow related issues with confidence.

# How Digital TrueFlow® Works

## TrueFlow® App

Follow step-by-step process to complete flow measurement or pressure & flow analysis via free TrueFlow® App (iOS, Android)



TrueFlow


## Equipment

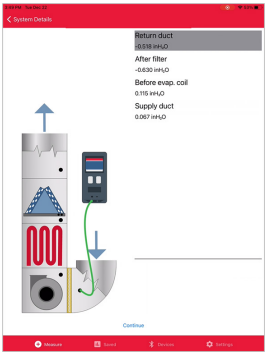
Collect data from Digital TrueFlow® grid and DG-8 digital pressure guage via Bluetooth. Digital TrueFlow® is also compatible with the DG-1000 pressure & flow gauge.

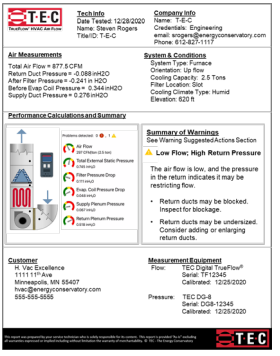

+


or


## Automated Reports

Customer-friendly report helps you understand system performance and explain your proposed solution to homeowners.



# Digital TrueFlow® Solution Basic Operation - Airflow Only

**Download TEC TrueFlow® App for iOS or Android**

## Step 1: Turn on the HVAC System

- Typically design conditions are high cool.
- Allow to run for 10 minutes to ensure system is running at proper conditions.

## Step 2: Turn on the TrueFlow® Grid and DG-8

## Step 3: Follow the TrueFlow® App Step-by-Step Instructions

- Launch the TrueFlow® app on your iOS or Android device.
- Enter type of measurement
- Establish Bluetooth® connection to your Digital TrueFlow® and DG-8.
- Enter furnace or air handler type
- Enter system orientation
- Enter system details

## Step 4: Measure Normal Operating Sytem Pressure

- Drill 3/8" hole in supply plenum
- Insert static pressure probe
- Leave probe in the supply plenum for testing

## Step 5: Turn HVAC System Off

## Step 6: Replace HVAC System Air Filter with Digital TrueFlow® Grid

## Step 7: Turn HVAC System On

## Step 8: Measure Airflow following the TrueFlow® App Instructions

# Digital TrueFlow® Solution Basic Operation - Total System Performance

**Download TEC TrueFlow® App for iOS or Android**

## Step 1: Turn on the HVAC System

- Typically design conditions are high cool.
- Allow to run for 10 minutes to ensure system is running at proper conditions.

## Step 2: Turn on the TrueFlow® Grid and DG-8

## Step 3: Follow the TrueFlow® App Step-by-Step Instructions

- Launch the TrueFlow® app on your iOS or Android device.
- Enter type of measurement
- Establish Bluetooth® connection to your Digital TrueFlow® and DG-8.
- Enter furnace or air handler type
- Enter system orientation
- Enter system details

## Step 4: Measure Normal Operating Sytem Pressure

- Drill 3/8" hole in locations indicated in the app: return, after filter, before coil and supply
- Insert static pressure probe
- Leave probe in the supply plenum for testing

## Step 5: Turn HVAC System Off

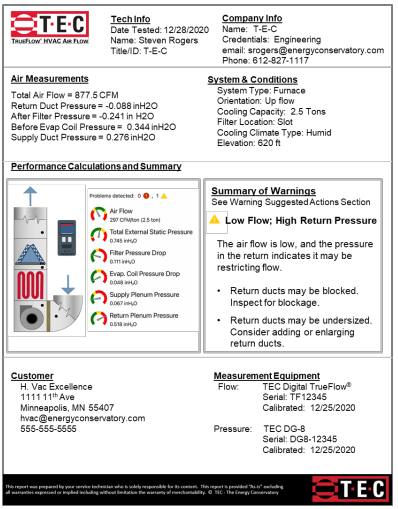
## Step 6: Replace HVAC System Air Filter with Digital TrueFlow® Grid

## Step 7: Turn HVAC System On

## Step 8: Measure Airflow following the TrueFlow® App Instructions

# Where to use the Digital TrueFlow® Solution

The Digital TrueFlow® is intended to simplify analysis of HVAC Air system performance by offering a structured process and consistent measurements you can have confidence in.



**Tech Info**
Date Tested: 12/28/2020
Name: Steven Rogers
Title/ID: T-E-C

**Company Info**
Name: T-E-C
Credentials: Engineering
email: srogers@energyconservatory.com
Phone: 612-827-1117

**Air Measurements**
Total Air Flow = 877.5 CFM
Return Duct Pressure = -0.088 inH2O
After Filter Pressure = -0.241 in H2O
Before Evap Coil Pressure = 0.344 inH2O
Supply Duct Pressure = 0.276 inH2O

**System & Conditions**
System Type: Furnace
Orientation: Up flow
Cooling Capacity: 2.5 Tons
Filter Location: Slot
Cooling Climate Type: Humid
Elevation: 620 ft

**Performance Calculations and Summary**

Problems detected: 0 , 1
Air Flow
297 CFM/ton (2.5 ton)
Total External Static Pressure
0.745 inH2O
Filter Pressure Drop
0.111 inH2O
Evap. Coil Pressure Drop
0.048 inH2O
Supply Plenum Pressure
0.067 inH2O
Return Plenum Pressure
0.518 inH2O

**Summary of Warnings**
See Warning Suggested Actions Section

**Low Flow; High Return Pressure**

The air flow is low, and the pressure in the return indicates it may be restricting flow.

- Return ducts may be blocked. Inspect for blockage.
- Return ducts may be undersized. Consider adding or enlarging return ducts.

**Customer**
H. Vac Excellence
1111 11th Ave
Minneapolis, MN 55407
hvac@energyconservatory.com
555-555-5555

**Measurement Equipment**
Flow: TEC Digital TrueFlow®
Serial: TF12345
Calibrated: 12/25/2020

Pressure: TEC DG-8
Serial: DG8-12345
Calibrated: 12/25/2020


The process is driven by the TrueFlow® App, which connects over Bluetooth® to both the TrueFlow® Grid and the DG-8 pressure gauge. The app will help you set up the system information, take the required measurements and provide an initial diagnosis of the system performance – including the airflow, pressures in the system, and any key areas to investigate. The results are displayed immediately and can be exported as data or a PDF report – designed for both internal use and for presenting to homeowners.

# Digital TrueFlow® Solution Components

### The Digital TrueFlow® Solution Full Kit includes:

- Digital TrueFlow® Grid
- 8 filter size adapter plates
- DG-8 Digital Pressure Gauge
- USB type-C power adapter
- Magnetic static pressure probe
- 5 ft blue hose
- 5 ft green hose
- Inline hose connector
- Static pressure port plugs
- DG-8 neoprene sleeve
- DG-8 accessory bag
- TrueFlow® carrying case
- TrueFlow App (Free download for iOS & Android)

Note: Digital TrueFlow® Grid Kit (not solution) is also available. It does not include the DG-8 Digital Pressure Gauge, sleeve or accessory bag and is designed for users who already own a DG-8 or DG-1000.

### TrueFlow® Filter Adapters

TrueFlow® is designed to be used with TrueFlow® filter adapters to deliver the best measurement results. The TrueFlow® grid snaps into the grid for fitting the filter location – whether a grille or a slot. There are 8 adapter sizes matching the 7 most common filter sizes, and an option for a universal (25" x 25" cut to fit in the field) adapter.

### TrueFlow® Filter Adapter Sizes

| | | | |
|---|---|---|---|
| 14 x 20 | 16 x 20 | 16 x 25 | 20 x 20 |
| 20 x 24 | 20 x 25 | 24 x 24 | Universal (25" x 25" cut-to-fit) |

### Full Kits

When you select the Digital TrueFlow® Full Kit, you get all 8 adapters, which includes the 7 most common filter sizes, as well as a cut-to-fit 25 x 25 adapter which can be cut in the field.

### Custom Kits

You can also order a custom kit, which allows you to select between 1 and 8 adapters you would like included to match the filters you work on.

# Digital TrueFlow® Overview

### Powering on and off the Digital TrueFlow®

To power on the Digital TrueFlow® press and hold the power button for 3 seconds until button flashes green. To power off the Digital TrueFlow® press and hold the power button for 3 seconds until button flashes red.

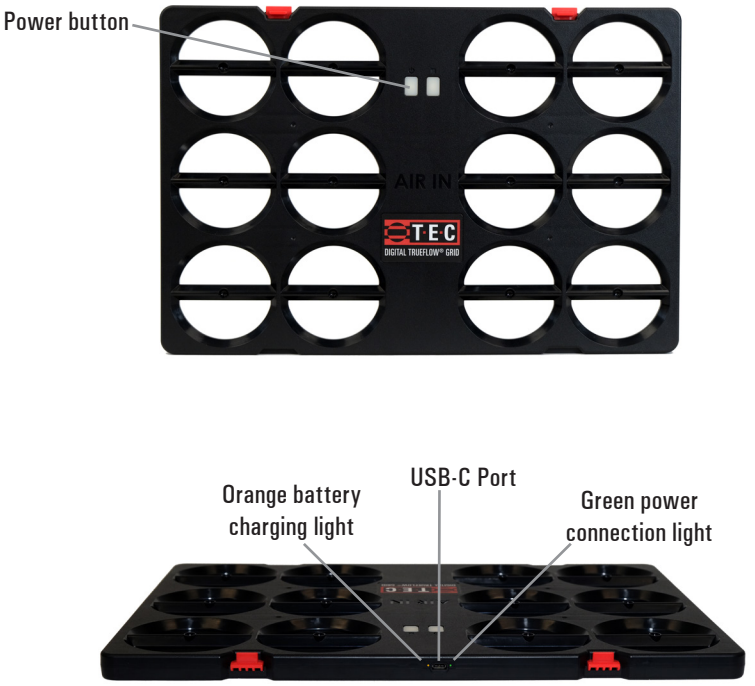
### Charging instructions

The Digital TrueFlow® battery is charged through its USB-C receptacle. When using the included USB-C power supply, the Digital TrueFlow® will charge from empty to 100% in approximately 2 hours. When charging the Digital TrueFlow® using an aftermarket USB-A to USB-C cable it will take approximately 5 hours to fully charge from empty.

When the Digital TrueFlow® is connected to a power source, the green LED light next to the USB-C port will be lit. While the battery is actively charging the orange LED light located on the opposite side of the USB-C port will be lit as well. Once fully charged, the orange LED will turn off.

The Digital TrueFlow® battery should only be charged between 32° F and 115° F (0° C and 45° C).

TEC recommends using the supplied USB-C power supply for optimal charging.



## Battery information

The Digital TrueFlow® uses a single protected lithium-ion polymer battery that is rechargeable, but is not user-replaceable.

Battery run time is typically 24 hours. All batteries self-discharge over time; TEC recommends charging the battery using the included fast charger at least once every three months regardless of battery level.

## Temperature thresholds

The Digital TrueFlow® should be stored in a dry place with temperatrue between 32° F and 77° F (0° C and 25° C). Operating temperatures are between 32° F and 115° F (0° C and 45° C).

## Calibration information

The Digital TrueFlow® should be calibrated at the TEC calibration lab once every four years. The date of calibration can be found on the label on the back of the gauge. Visit the TEC website for more information on arranging calibration service.

## Digital TrueFlow® specifications

| COMPONENT | SPECIFICATIONS |
|---|---|
| Flow Accuracy[1] | +/- 5% |
| Digital Communication | Bluetooth Low Energy, USB 2.0 |
| Flow Range | 300 to 1600 CFM (cubic feet per minute) |
| Power | Lithium-Ion Polymer Rechargeable Battery 2,000 mAh with USB-C® charger/power adapter included |
| Battery Life | Typically over 24 hours of continous use |
| Auto-off | 30 minutes |
| Grid Dimensions | 12 x 18 x 0.75 inches |
| Grid Weight | 2.1 Lbs. (952 g) |
| Adapter Weight | Varies by size, approximately 1.5 Lbs. (680 g) |
| Recommended Calibration Interval | 48 months |
| Operating Temperature Range[2] | 32° F to 115° F (0° C to 45° C) |
| Storage Temperature Range[3] | Less than one month: 15° F to 115° F (-10° C to 45° C)<br>One month up to one year: 32° F to 77° F (0° C to 25° C) |

[1] In standard installation with no obstruction 2 inches downstream and 6 inches upstream of Digital TrueFlow® Grid.

[2] For use at temperature conditions outside the typical conditions in Note 1, or the as-calibrated range in Note 2, add an additional 0.037% of pressure reading per degree F over the stated range.

[3] Storage limits are based on batteries. Storing outside these limits may require battery replacement.

Specifications subject to change without notice.

## THE ENERGY CONSERVATORY WARRANTY

**EXPRESS LIMITED WARRANTY**
Seller warrants that this product, under normal use and service as described in the operator's manual, shall be free from defects in workmanship and material for a period of 24 months, or such shorter length of time as may be specified in the operator's manual, from the date of shipment to the Customer.

**LIMITATION OF WARRANTY AND LIABILITY**
This limited warranty set forth above is subject to the following exclusions:

- With respect to any repair services rendered, Seller warrants that the parts repaired or replaced will be free from defects in workmanship and material, under normal use, for a period of 90 days from the date of shipment to the Purchaser.
- Seller does not provide any warranty on finished goods manufactured by others. Only the original manufacturer's warranty applies.
- Unless specifically authorized in a separate writing, Seller makes no warranty with respect to, and shall have no liability in connection with, any goods which are incorporated into other products or equipment by the Purchaser.
- All products returned under warranty shall be at the Purchaser's risk of loss. The Purchaser is responsible for all shipping charges to return the product to The Energy Conservatory. The Energy Conservatory will be responsible for return standard ground shipping charges. The Customer may request and pay for the added cost of expedited return shipping.

The foregoing warranty is in lieu of all other warranties and is subject to the conditions and limitations stated herein. No other express or implied warranty IS PROVIDED, AND THE SELLER DISCLAIMS ANY IMPLIED WARRANTY OF FITNESS for particular purpose or merchantability.

The exclusive remedy of the purchaser FOR ANY BREACH OF WARRANTY shall be the return of the product to the factory or designated location for repair or replacement, or, at the option of The Energy Conservatory, refund of the purchase price.

The Energy Conservatory's maximum liability for any and all losses, injuries or damages (regardless of whether such claims are based on contract, negligence, strict liability or other tort) shall be the purchase price paid for the products. In no event shall the Seller be liable for any special, incidental or consequential damages. The Energy Conservatory shall not be responsible for installation, dismantling, reassembly or reinstallation costs or charges. No action, regardless of form, may be brought against the Seller more than one year after the cause of action has accrued.

The Customer is deemed to have accepted the terms of this Limitation of Warranty and Liability, which contains the complete and exclusive limited warranty of the Seller. This Limitation of Warranty and Liability may not be amended or modified, nor may any of its terms be waived except by a writing signed by an authorized representative of the Seller.

**TO ARRANGE A REPAIR**
Please visit our website (www.energyconservatory.com/calibration-repair) before sending any product back for repair or to inquire about warranty coverage. All products returned for repair should include a return shipping address, name and phone number of a contact person concerning this repair, and the purchase date of the equipment.

**Safety, warnings and troubleshooting information**

- Follow all safety instructions provided when used with any TEC products.
- Do not operate the gauge if any liquid gets inside the gauge and contact TEC
- A hard reset may be performed by holding down both silicone buttons until the gauge powers off. This is only advised if holding the power button alone does not power off the gauge or gauge is unresponsive.

**Lithium Ion battery safety and warnings**

- The battery should only be charged in conditions between 32° and 115° Fahrenheit (0° and 45° Celsius).
- Do not leave the gauge in direct sunlight or in an area heated by sunlight. The battery could generate heat, smoke or flames.
- Do not use the battery when there is rust present, the battery has a bad smell or if the battery is damaged in any other way.
- Keep the battery out of the reach of children and animals.
- If fluid from the battery leaks out and makes contact with skin, wash with soap and water. The fluid may cause irritation. If this happens please see a doctor immediately.
- Do not expose the battery to extreme heat, flames or liquids.
- Do not modify or disassemble the battery as this could result in leakage or explosion.

## Software Information

The Energy Conservatory (TEC) offers Windows-based programs for your computer along with mobile apps for both Android and iOS devices. These programs can be found and downloaded for free at software.energyconservatory.com or your mobile device app store.

## Instructional Videos

The Energy Conservatory (TEC) offers a variety of online instructional videos. Visit www.YouTube.com/EnergyConservatory to see all of TEC's instructional videos.

## Selecting a Gauge

The Energy Conservatory (TEC) offers two highly accurate digital pressure gauges, the single-channel DG-8 and the two-channel DG-1000. Here is a useful guide for selecting a gauge based on your needs:

| Digital TrueFlow® Offering | I already own a DG-8 or DG-1000 | I do not own a DG-8 or DG-1000 |
|---|---|---|
| | **Digital TrueFlow® Grid** | **Digital TrueFlow® Solution** |
| Full Kits (All 8 Adapters) | **Digital TrueFlow® Grid Full Kit**<br>•Digital TrueFlow® Grid<br>•All (8) filter adapters, including cut-to-fit*<br>•Accessories & Carrying Bag | **Digital TrueFlow® Solution Full Kit**<br>•Digital TrueFlow® Grid<br>•DG-8 Digital Pressure Gauge<br>•All (8) filter adapters, including cut-to-fit*<br>•Accessories & Carrying Bag |
| Custom Kits (1 to 8 Adapters) | **Digital TrueFlow® Grid Custom Kit**<br>•Digital TrueFlow® Grid<br>•Option to add adapters for $69 each including cut-to-fit*<br>•Accessories & Carrying Bag | **Digital TrueFlow® Solution Custom Kit**<br>•Digital TrueFlow® Grid<br>•DG-8 Digital Pressure Gauge<br>•Option to add adapters for $69 each including cut-to-fit*<br>•Accessories & Carrying Bag |

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