Tamson Instruments

Specification sheet

Filter Blocking Tendency

ASTM D2068 - IP 387 - IP PM EA/13 - CGSB 3.0 No. 142

Item	Unit	TFBT
P/N		00T0945
FBT range		1.0 to 30 (low number is best)
Output		Printer
Temperature	[°C]	Readout 0.1
	[°C]	Precision ± 0.05 (IEC 751)
Pressure	[%]	Nonlinearity 0.5
	[mBar]	Accuracy 1
	[mBar]	Max pressure 1500
Volume	[mL]	Linearity ± 0.2
	[mL]	Range 0 – 300
	[mL]	Resolution ± 0.5
Timers	[sec]	± 0.001
Voltage	[Vac]	85 .. 264
Frequency	[Hz]	47 .. 63
Power	[W]	40
Dimensions	[mm]	280x350x620 (LxWxH)
Weight	[Kg]	11
CE	Conforms to CE regulation	

- **Easy to use, menu guided test**
- **Touch screen**
- **Printer included**
- **Password protection**
- **Electronic calibration of all parameters**
- **Small footprint**

TFBT

General

The Tamson Filter Blocking Tendency-tester (TFBT) is an automated instrument designed to test the Filter Blocking Tendency (FBT) of distillate fuels including diesel, biodiesel (B100 & B5/7/20/30), gas oil, gas turbine fuel, and kerosene. It conforms to ASTM D2068 and IP 387. FBT analysis is achieved by measuring the pressure differential across a disposable filter. A FBT test determines whether fuel can potentially block filters in the distribution network or during use in a vehicle or power plant.

Fuel cleanliness is also an important issue as modern fuel injectors and injection pumps are being manufactured to more precise tolerances. Particles due to contamination, degradation, or corrosion of storage vessels can quickly clog filtration systems.

Cold soak issues with BX fuels containing bio components have resulted in the IP PM EA/13 method to check the quality of FAME and diesels to avoid major fuel operability problems.

The fully automated FBT provides a graphical guided user interface using a resistive touch screen. This screen guides the user through the test procedure. The guidance results in reliable performance of this test and the user can see what the apparatus is doing when it strictly follows the prescribed steps in the test method.

The fuel sample for this test is drawn from the fuel reservoir beaker with a constant flow of 20 mL/min by the piston pump. A pulse damper provides smooth and continuous flow. Fluid level, pressure and temperature of the sample are continuously monitored while it is pumped through the specified filter into the fuel receiver beaker. Depending on the test, the result is calculated when 300 mL of sample is pumped or the test is aborted when the maximum pressure is exceeded. When 300 mL of fluid is pumped, the end pressure is used to calculate the FBT number, or when the pressure reaches 105 kPa before the 300 mL is passed, the volume of fluid pumped at this moment is used to calculate the FBT number.

Result

Test result is displayed on screen and can be printed out, multiple copies if required. In the menu different parameters can be set for the test and calibration of the temperature, pressure, pump speed, and level sensor. The display provides the operator with test procedure information.

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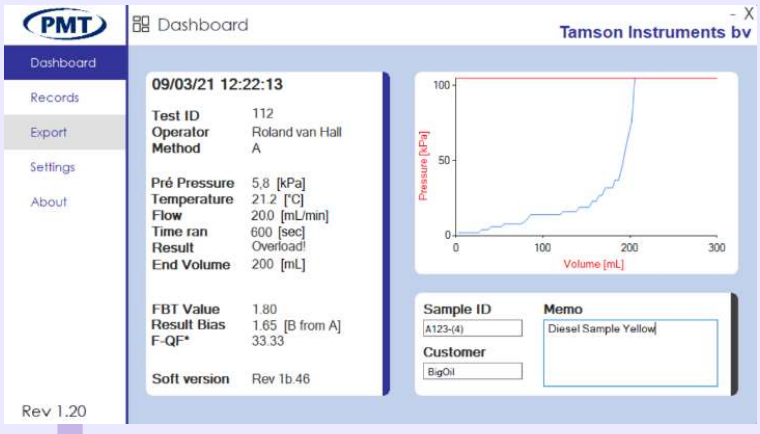
The following test results are printed:

- Date / time
- Username
- Procedure (A or B)
- Test result
- Time
- Flow (calculated)
- Sample temperature
- Pressure
- Volume
- FBT Value
- Bias between procedures “A” and “B”

The thermal printer is integrated and provides a permanent record of all the test parameters. A graph is available when the full 300 mL of sample has been pumped. The TFBT is equipped with an USB port to export the data to a PC. After each test, the data is stored automatically on the PC. The test result can be printed and can be exported to PDF, CSV and graphical formats (PNG). Comments can be added to the test result using a memo field. Also, the user can give the sample an ID for traceability.

The TFBT can be used as standalone unit where the result is printed after each test. With the software package, the user will have the possibility to save the test results in a digital database. The TFBT will be equipped with a mini USB connector to connect the TFBT to a PC.

Software package :



Tamson FBT

The fuel sample is drawn from the fuel reservoir beaker by the piston pump, and a pulse damper provides a smooth and continuous flow. The pressure and temperature of the fuel are continuously monitored while it is pumped through the specified filter into the fuel receiver beaker. A pressure relief valve is located on the arm holding the filter assembly. The flow adjustment of the piston pump has a locking mechanism. The complete TFBT, including the fuel input and output assemblies are directly grounded for operator safety.

The test result is calculated depending on the test:

- when 300 mL of sample was pumped
- if a maximum pressure is exceeded

The graphical screen offers the following:

- easy menu guided operation,
- step by step guidance of the test,
- easy entrance, one guest user and seven operators*
- screen to edit passwords and users*
- service screen* to check sensor values
- service for setting all test parameters*
- separate service screen to set pump speed, and calibrate** level, pressure and temperature sensor.

* Password protected

** Calibration fully is performed using the graphical display

Procedures “A” and “B”

The TFBT is equipped to operate according procedures “A” and “B”. An adaptor block (P/N **15T0005**) for both procedures is available and is standard included with the TFBT. Procedure "A" consists of a stainless steel reusable filter housing and a small disposable filter media. The filter media is replaced for each test. Procedure "B" uses a disposable filter (media in plastic housing).

Filter Blocking Tendency

Accessories

Standard included accessories with P/N 00T0945			
Item	**Picture**	**Quantities**	**Description**
15T0005		1	Adapter block for procedure A + B, including filter housing procedure “A” Millipore M5
31T2005		2	Beaker 400 mL made of glass
31T2004		1	Beaker 150 mL
28T7035		1	Printer paper, thermal, set of 5, 57 mm x dia 30 mm x 8 mm
24T0075		1	Adapter for procedure “B”

Necessary accessory for procedure A			
Item	**Picture**	**Quantities**	**Description**
24T0064		1	Pack (98) of filter media for procedure “A” Whatman GF/A (FBT)

Necessary accessories procedure B			
Item	**Picture**	**Quantities**	**Description**
24T0067		1	Pack (98) of filter media for procedure “B” Whatman syringe GF/A
24T0043		1	Silicon anti-splash tubing for procedure “B” (1 meter)

TFBT

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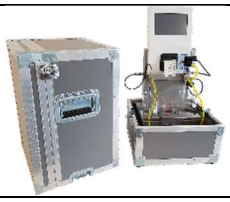
Accessories

Optional accessories for TFBT			
Item	**Picture**	**Quantity**	**Description**
19T9030		1	Calibration kit for volume and pressure, please see details on the next page.
21T0210		1	Carrying case for TFBT – For transport and storage – Separate compartment for accessories – Handles to carry the case
25T2230		1	FBT verification fluid for procedure “B” – Bottle of 500 mL – Non Hazardous for shipping – Nominal FBT value around 2 – Up to two years of shelf life – Including certificate of analysis

Spareparts TFBT		
Item	**Picture**	**Description**
24T0052		Hose tygon (15 x 3.2 x 6.4 mm). Can be used as anti-splash tubing for procedure A.
24T0060		Filter housing procedure “A” Millipore M5
24T0061		Kit procedure “A” Millipore 4 x set of : O - ring (thick) O - ring (thin) Stainless disc
24T0074		Stainless steel adapter for procedure “A + B”. This adapter is mounted on P/N 15T0005
24T0075		Adapter for procedure “B”. To be mounted on P/N 24T0074

TFBT

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Calibration kit FBT

Calibration kit containing volume (beaker) and pressure (case) accessories needed for calibration. Contents of P/N 19T9030 is specified below			
Item	**Picture**	**Quantity**	**Description**
31T0041		1	Pressure meter
31T2010		1	Measuring cylinder 500 mL
24T0052		1	Tubing tygon (per 1 m)
14T0305		1	Overpressure safety set to 2 Bar
28T4148		1	Festo T-Piece hose inner diameter 4 mm
31T2007		1	Silicone stopper 3.5mm

TFBT

Filter Blocking Tendency

Unique selling points

Compare our unique selling points:
• Single voltage from 85-230V, 50-60Hz.
• Excellent pump regulation guarantees a perfect constant flow. The flow is independent of the pumps' counter pressure.
• All critical parts (tubing, pressure sensor, piston pump) are clearly visible. This allows the user to visually verify the working of the instrument.
• Tubing and piston pump are easy accessible for cleaning to eliminate the risk of contamination, which could lead to incorrect measurement results.
• Small footprint, requiring minimum lab space.
• Portable, lightweight, suitcase model on request.
• Unit requires a power of only 40 Watts.
• Results in less than 15 minutes.
• Equipped with a large graphical touch screen which can be used with gloves.
• Real-time curve is shown.
• Visually guided test using step-by-step instruction, minimizing the need for operator training.
• Low operator time due to simplicity of setup and automation.
• Automated unit eliminates operator to operator variability, ensuring test repeatability and reproducibility.
• Equipped with integrated printer.
• Fully electronic calibration. Easy to maintain, service and calibrate in the field. No need to send the instrument to a service center.
• Temperature calibration traceable to IEC 751.
• PT100 can be replaced and calibrated using standard 1/10 DIN and an IEC 751 certificate.
• Touch screen is used to start the test, set the test parameters and calibrate the sensors.
• Service screen to checks all sensors.
• Password protection
  Service screen for calibration,
  Service screen for test parameters,
  Seven Users and one guest,
  If passwords protection is not required it can be switched off.
• Pre-settable user names.
• Resolution of temperature (± 0.05°C), pressure (non- linearity = 0.5%), (± 0.5 ml) and (±0,001 sec) timer.
• Printout of calibration data.
• Service screen to monitor sensor and pump speed.
• Integrated stopwatch / timer.
• Easy check and calibration of pump, semi-automated, no additional tools needed.
• Removable beaker tray for cleaning purposes.
• Software package to provide database with test results on a PC