



# Cambustion

## Cambustion DPF Testing System Performance Specifications

The Cambustion DPF testing system includes the following systems for testing of Diesel Particulate Filters:

- DPG - for flow testing, loading and regenerating of soot filters. Incorporates a Diesel burner and electric flow controllers for precise control of DPF conditions. Includes software for automatic control and analysis of DPF tests.
- Turbo Blower System – Additional systems to increase the backpressure capability of the DPG up to 300 or 450 mbar. Can be installed inside the DPG (at time of production).
- FTH Filter Test Housing - for the mounting of uncanned filters. Allows filters to be tested at all conditions up to regeneration temperatures without the need for canning and without the uncertainty of support mat performance.
- Monitoring System – Integration of an AVL415 smokemeter with the DPG control software, allows testing of filtration efficiency and real time monitoring of the soot loading the filter.

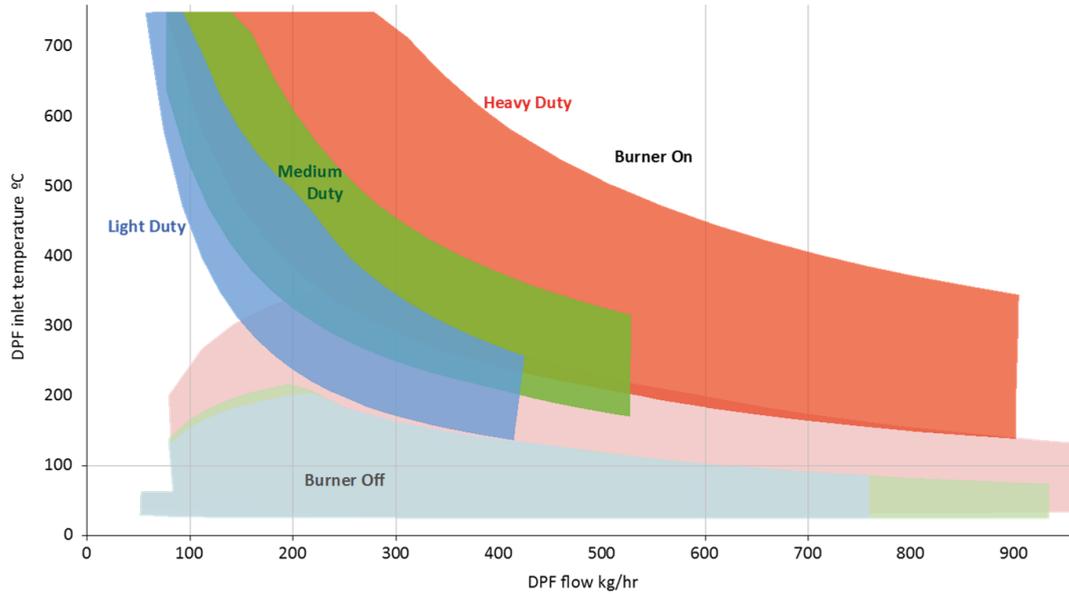
### DPG Specifications.

See also installation specifications for detailed physical size and installation requirements.

Flow control	Variable Speed Blower	
Soot generation rate	<0.1 g/h (warmup mode), 2 – 20 g/h (exact setpoint agreed with customer)	
Soot generation	Diesel burner	
Fuel compatibility	Diesel fuel, max 10% biodiesel recommended.	
Soot rate repeatability	20% (plus fuel variation: note that use with biodiesel reduces soot output)	
Temperature control	Feedback control via electric heating in loading modes Uncontrolled temperature in Regeneration mode determined by fuel and airflow setpoints.	
User thermocouples	16, type K (+ additional 4-16 optional, R-type optional)	
Auxiliary user analogue inputs	2, 16 bit -10 to + 10 V, logged in datafile.	
Data logging	User defined rate, max 1 Hz.	
Safety systems	Automatic shutdown in case of Fire (smoke detection) Ambient CO limit Over temperature Fuel leak System faults.	
Accuracy	DPF flow measurement	±5% of reading above 100kg/h
	DPF Inlet Temperature Measurement	±1K ±1% reading (K) (excluding radiation correction errors)
	DPF backpressure measurement	±0.05 mbar ±1% reading
Ambient conditions	5 – 40°C: cooling air inlet temperature -20°C to 40°C	
Control functions	Remote control & logging via PC over Ethernet. Automatic control according to preset program: suitable for unattended operation. Automatic production of test result reports	
Test section size	1700mm length x 622mm height x 518mm depth (for longer test section lengths contact Cambustion)	

## Flow & Temperature Capability

The DPG is available in three configurations: for light, medium and heavy duty engine equivalent testing. Approximate achievable flow & temperature:



Burner off conditions are used for flow sweep testing.

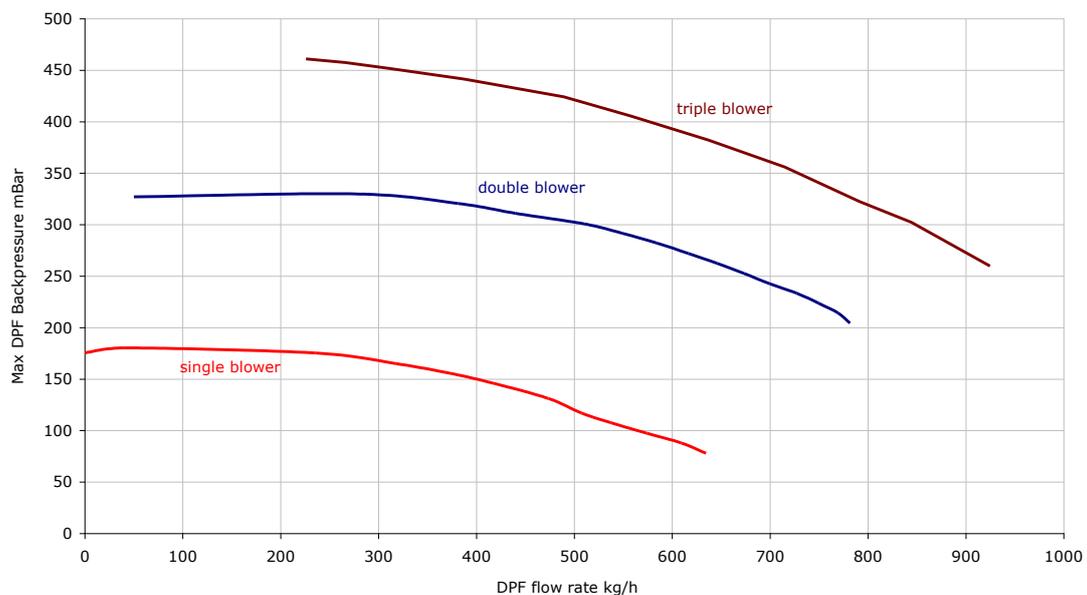
Typical operating flow rates for the different versions:

	Light Duty	Medium Duty	Heavy Duty
Loading	175 - 250 kg/h	400 – 500 kg/h	700 – 1000 kg/h
Regeneration	60 – 100 kg/h	200 kg/h	400 kg/h

## Filter Backpressure & Flow Rate Capability

The maximum flow rate and backpressure in the DPG are connected. In addition to the standard single blower system, turbo systems with double and triple blowers are available as options to increase the backpressure capability for loading to high soot loads.

**Maximum DPF Flow Rate vs Backpressure**  
(ambient temperature)



These performance specifications are for ambient temperature operation (ie in flow sweep testing) at sea level. Flow and pressure capability may be reduced by up to 30% at loading temperatures and reduced atmospheric pressure.

### Filter Test Housing Specifications

The FTH allows testing of uncanned parts in the DPG. It allows the full range of cold flow, loading and regeneration tests.

Test filter size	Maximum 9" (225 mm) diameter × 12" (300 mm) length (for larger parts please contact Cambustion) Round or non-circular filters Different part sizes accommodated by interchangeable adaptors – contact Cambustion for full range of filter shapes available
Leak rate bypassing seal	less than 2.5 kg/h @ 200 mbar differential pressure*
Leak rate into FTH upstream of test part	less than 1 kg/h @ 50 mbar inlet depression*
Seal life	5 tests
Max clamping pressure on filter	15 bar
Instrumentation	Fittings for upstream and downstream pressure measurement at full flow diameter Upstream and downstream flow temperature thermocouples fitted Fitting for inlet soot concentration measurement Provision for thermocouples fitted inside filter

\* leak rates calculated from results of test at room temperature test with assumption that volumetric leak rate is viscous, ie. proportional to differential pressure divided by viscosity.

### Monitoring System Specifications

AVL415SE Smokemeter can be mounted on the DPG, drawing its power from the DPG, for on-line measurement of DPF inlet soot concentration and filtration efficiency

Sequencing of monitoring system measurements is controlled by the DPG control software, and calculation and reporting of measured soot load and filtration efficiency is automatic.

Measurement principle	Filter paper blackening
Measurement cycle time	13s – 120 s measurement at low concentrations requires long sample times
Accuracy of penetration* measurement	± 25% (repeatability + linearity)
Max measureable filtration efficiency	99.8%
Communications with computer	Serial (RS232)

\* penetration = 1 – filtration efficiency

Note that integration with TSI 3790 CPC or AVL489 Particle Counter for PN measurement is also possible: contact Cambustion for details.