

PRESENTATION

The **IFR6000** (Injection Flow and Rate) is a device for measuring injection volume on a stroke-by-stroke basis.

It is particularly adapted for monitoring the high-energy multi-stroke injection systems found on modern diesel motors.

It is dedicated to heavy duty, train, boat motors ...

IFR 6000



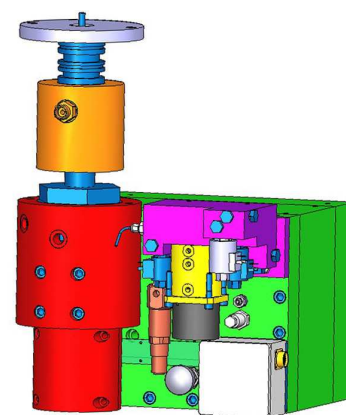
ADVANTAGES

- **Instantaneous flow measurement of up to 10 injections/revolution.**
- **Real time display of the injection rate curve.**
- **Injection rate identical to the measurement given by a «rate tube».**
- Analysis of the injection rate and time measurements.
- Mass measurement accuracy regardless of injection conditions : pressure, speed.
- Back pressure can be regulated from 5 to 200 bar.
- Injection measurement during 180° rotation from the pump (360° motor).

DEVICE STRUCTURE

The **IFR6000** system is made up of :

- a **mechanical element** including measurements of volume (mass), pressure and temperature.
- an **electronic cabinet** which manages the measurement cycle and carries out all the necessary calculations at each revolution.



PRINCIPLE OF OPERATION

The injected fluid is collected in an injection chamber maintained at a constant, static pressure. This injection back-pressure can be regulated from 5 to 200 bars. The increase of the mass in the injection chamber causes an increase in the instantaneous pressure, providing an image of injection volume.

At the end of the injection cycle, the injected fluid is transferred into a volumetric measurement chamber which performs an accurate measurement of the total injected mass. The pressure signal from the first chamber is analysed to determine all the mass measurements, the time intervals and the duration of each injection.

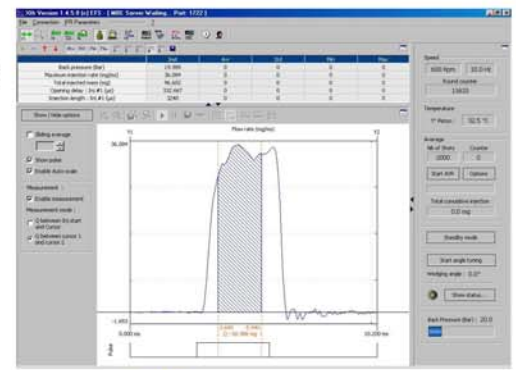
MAIN FUNCTIONS

- Measurement of mass and volume injected up to 10 injections per revolution.
- Measurement of time intervals and duration of each injection.
- Injection rate is displayed with analysis of the principal parameters.

xIFR is the configuration software of the **IFR6000** module. This software runs under Windows98®, Windows2000®, WindowsXP® and uses an Ethernet link.

Main functions :

- **Display and storage**
 - of mass and time measurements
 - of the injection rate curve
- **Injection command display.**

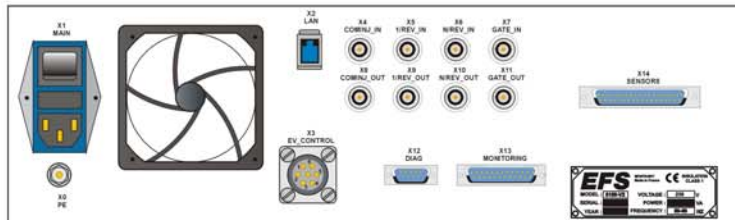


xIFR (EFS 1722)

TECHNICAL SPECIFICATIONS

Measurement	
Total volume injected per cycle	Up to 6000mm ³
Measurement window per cam revolution	180° (360° crank angle)
Injection frequency	From 0.5 Hz to 30 Hz or 30 to 1800 rev/mn came
Measurement accuracy	2 mg/stroke from 0 to 1000mg, 3 mg/stroke above
Timing resolution	5 μs
Timing accuracy	10 μs
Delay between 2 injections	200 μs
Back-pressure	From 5 to 200 bar
Bench Synchronization signals	2 inputs: 1/rev and 3600/rev (accuracy: 0,1°)
Averaged temperature of injected fluid	From - 40 to 150°C (with cooling)
Number of injection pulses per cycle	From 1 to 10
Fluid type	Normafluid BR, Viscor 1487, Exxsol D80 (ISO 4113), gasoil, Tellus 32.
Cooling circuit flow	20 l/min
Cooling fluid	The same as injected fluid at 40°C
Assembly	
Injector adaptor	Specific
Injector clamping	Specific
Power	
Power supply	230V/50Hz or 115V/60Hz
Consumption	400 VA
Connections	
Mechanical power connection	Jaeger 37-pin female socket
Mechanical measurement connection	Sub-D 37-pin
Monitoring connection	Sub-D 25-pin
Running and synchronization controls	BNC sockets
Ethernet link	100Mbs LAN connection
Cabinet spatial requirements	
Dimensions (overall)	20, 19", (989 mm x 600 mm x 800 mm)
Weight (kg)	90 kg
Mechanics spatial requirements	
Dimensions (mm)	Height: 340, width: 400, depth: 640 (without feeding and injection output hoses)
Weight (kg)	350 kg (without oil and injector)

RACK REAR PANEL



- Draining electrovalve connection
- Mechanics connection
- Logical input/output
- Socket for dynamic/static pressure and piston raising signals monitoring
- Diagnostic socket
- Ventilator ensuring thermal dissipation
- PE socket, AC main connector



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