COMBUSTION ANALYSIS



This combustion analysis system consists of an in-cylinder pressure transducer and amplifier, crank angle encoder with TDC trigger and data acquisition unit (DAQ) to capture the combustion pressure. The pressure transducer is an optical type sensor (at right) measuring diaphragm deflection to calculate cylinder pressure. This type of sensor gives very stable and consistent signal, unlike the piezo-electric sensor which will drift over time. The DAQ is clocked by the encoder crank angle signal, where each pressure data point corresponds to a particular crank angle. This allows much easier data processing than the time based DAQ.

FEATURES

- Optics diaphragm deflection detection give stable and consistent pressure signal
- Crank angle based data acquisition greatly simplified combustion data processing (only 360 data points for each engine revolution, using 1 degree clock signal)
- Small M5 Sensor
- Free computer software to capture data
- 1 Year Warranty Included





COMBUSTION ANALYSIS





PV diagrams

Cylinder pressure vs crank angle

SPECIFICATIONS MAINS POWER

MAINS POWER

Voltage: 120/240VAC Frequency: 50/60Hz Current Draw: 1A max

PRESSURE TRANSDUCER

Pressure: 0 to 200 bar (optional up to 2000 bar) Signal: 0 to 4.5V DC

ENCODER

Pulse per revolution: 360 (optional up to 720)

DATA ACQUISITION UNIT

Sampling rate: 200,000 sample per second

ENVIRONMENTAL

Temp:10 to 40° C Operational 0 to 50° C Non-

Operational Humidity:5 to 90% Non-condensing Shock/Vibe:<10g The combustion analysis system is widely used by student laboratories in Universities and Polytechnics and for Research and Development on alternative fuels, fuel blending, HCCI and etc. Laboratory exercises are available, including sample data, physical explanations and quiz questions and answers. The DAQ system provides separate Pressure output and Indexer signals for separate recording and measurement if required.

PURPOSE		
The purpose of the re engine using a dyna	DIDICE Lab 22 Dosed Group	Coop Speed Control
PROCEDURE	Frank 2: See 1 Frank 2:	Temper Lead
1. Power on the point to 5000		a given speed, when the Bortlin minomand the speed of the engine-guididy increases, whe has in accessed at a constant hadfe, the speed will denote the you're graph faw as a an each point the nonit and label it appropriately. In <u>Denoted Last</u> . <u>These and The Railor</u>
2. If using the D Laber if with a		
 Start the engli Observe what 		QUESTIONS
 Allow the dyn minute ersc. 		Based on your data and open-rations answer the following substitute:
d. Record the re		
NOTE: The insta way kary. This is to record the ave		Whatwas the initial bright reading? =0.5Nm
 Ince ate the 1 Ince ate the 1 		Once "logg", what would be the maximum in adabte negative to rose reading? 0.5*im (came as initial brows, bytheogative)
9. Record the st 9. Reduce the to 10. Record the co		Whatwas the "Zee" "Crope Ere" ("In alone \$1000 minus the initial zero longue)? Showides "Outern As the ondre previous, there is some "wedgage" from the date blowing on the load arm. In th
11.New reduce 1 12.Record the fit		Probable met unless groute really high speed.
13 Skeety a duca		Over, the measured to goe at point #3, to the Zero To goe Error significant?
54 Shut down the		% Eno:= ZTE / Tergue (cost : be cignificant)
95.Piotitive data:		Whatwas he power of each of he point?
CONTRACTOR OF THE OWNER		O. X. HZ, O. points 1 and 4 are zero cause of no torque What can you say about the efficiency of an angles running with no load?
		It Zaro by definition saule no uptivi wells output
54	same throtte setting at high	Which would you explact to preduce mere power, point 2' or point 3'7 WP 97
	engine is greatly decrease acting will be much smalle	314 cause more finellie, and same speed
	P	

OPTIONS

- 10kW Bench Dynamometer
- Internal Combustion Engine (gasoline or diesel)
- Digital Fuel Scale for ICE
- Electronic controlled fuel injection system

• Extensive seminars on Combustion Analysis are also available