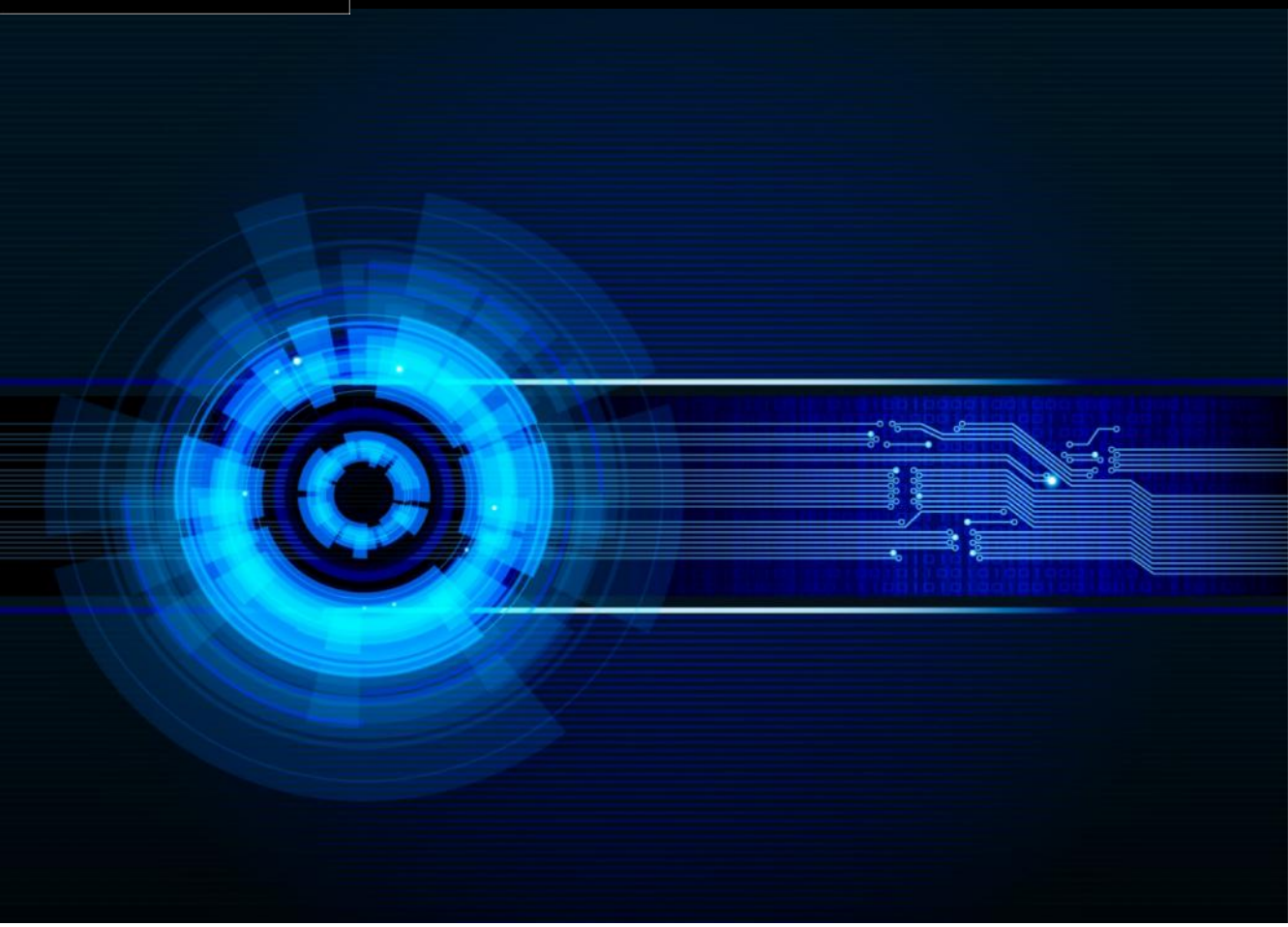
FOCUS APPLIED TECHNOLOGIES

BRIDGING THE GAP BETWEEN
WHAT YOU HAVE AND WHAT YOU NEED



TECHNOLOGIES FOR THE FUTURE

BUATAN MALAYSIA

Rev 0317

FOCUS APPLIED TECHNOLOGIES SDN BHD,
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www.focusappliedtechnologies.com

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Sungai Jawi 14200, Penang Malaysia.
Tel: +604 582 2466

AUTOMOTIVE CHASSIS DYNAMOMETER

Model ACD-500

This high power chassis dynamometer can extract 500kW of mechanical power from competition vehicles, including cars and trucks. Its heavy-duty frame and deep-grove textured 12-inch roller are ideal for high power applications without tire slip. The air-cooled eddy current dynamometer requires no external cooling lines, and is easy to install and use, giving years of trouble free service. The sophisticated controller can operate the dynamometer from the front panel or from a computer via the remote mode. Control modes include Manual Load, Speed, Torque and Road Load control. The dynamometer can hold the vehicle under test at a given speed for tuning, or fuel consumption measurements, or mimic actual road load conditions. Drive cycle software is included allowing vehicles to be tested on any drive cycle required. Additional inputs are included for Data Acquisition, display and logging.

FEATURES

- 500kW (670hp) mechanical power absorption
- 300kph (186mph) top speed
- 12 inch deep-textured roller
- 5th Generation controller included
- Integrated DAQ Input Channels for Logging
- Adjustable Nose for various wheel-base
- Free computer software for Graphic Display
- 1 Year Warranty Included

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We have local technical support, straight from the factory

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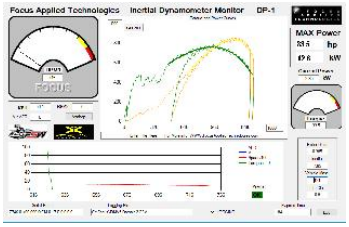
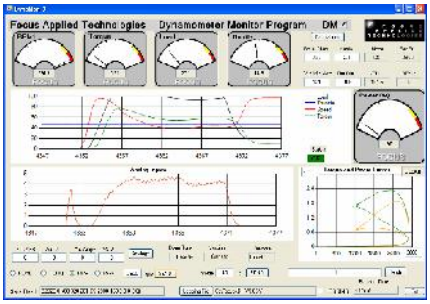
AUTOMOTIVE CHASSIS DYNAMOMETER

Rear-approach ramp



"Power Pull"



R&D Screen Shot

SPECIFICATIONS

PHYSICAL

Weight: 750kg (approx)
LxWxH: 312 x 235 x 50 cm
Deck: 302 x 90 x 43 cm

MAINS POWER

Voltage: 120/240VAC
Frequency: 50/60Hz
Current Draw: 10/5A max

CONTROLLER OUTPUT

Controller Power: 3.5kW (100V. 35A)
Coms: 9600 baud, 8bit, NP

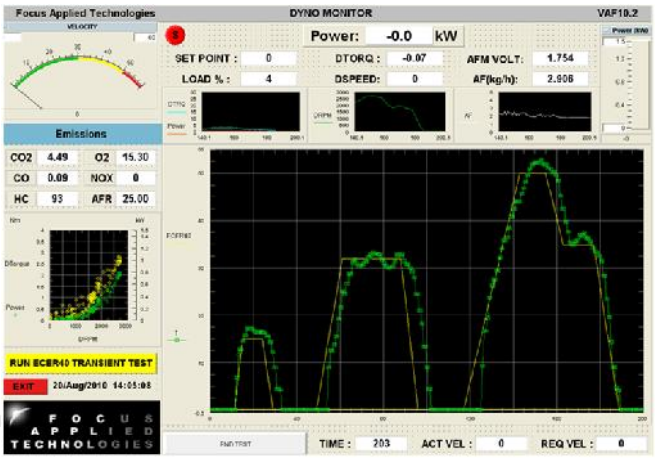
DYNO

Mechanical Power: 670hp max
Torque: 1000Nm max
Roller: 320mm diameter
Speed: Hall Effect, 5V excitation
30 pulse per revolution
3,500 rpm, 200kph maximum
Load Cell: 1250Nm, 200 to 500 ohm
4-wire Wheatstone bridge
5 or 10V excitation

ENVIRONMENTAL

Temp:10 to 40° C Operational
0 to 50° C Non-Operational
Humidity:5 to 90% Non-condensing
Shock/Vibe:<10g

The Automotive Chassis Dyno is widely used by tuning shops to prove power increases to customers. It is also extensively used by R&D organizations and for trouble shooting tough problems, as it can hold the vehicle at a constant load or speed, unlike inertial dynos. Road load mode can simulate road performance for drive cycle testing for emissions or fuel consumption certification testing.



OPTIONS

- High-volume, low noise blower and stand
- Wide Band O2 (AFR) sensor
- Digital Fuel Scale
- 5-Gas Analyzer
- Current/Voltage Clamp Meter
- In-floor or Ramp versions available

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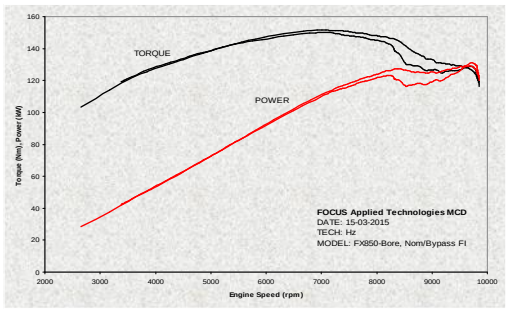
SUPERBIKE CHASSIS DYNAMOMETER

Model SCD-200

This high power chassis dynamometer can extract over 200kW of mechanical power from competition vehicles, including GP race bikes. It's heavy duty frame, and deep-grove textured 12-inch roller are ideal for high power motorcycles. The sturdy nose clamp can be adjusted to accommodate various motorcycle lengths, and comes with a mechanical or pneumatic tire clamp. The air-cooled eddy current dynamometer requires no external cooling lines, and is easy to install and use. The sophisticated controller can operate the dynamometer from the front panel or from a computer via the remote mode. Control modes include Manual Load, Speed, Torque and Road Load control. The dynamometer can hold the vehicle under test at a given speed for tuning, or fuel consumption measurements, or mimic actual road load conditions. A throttle position controller is included which outputs an analog Throttle Position command. Additional inputs are included for Data Acquisition, display and logging.



FEATURES

- 200kW (267hp) mechanical power absorption
- 200kph (115mph) top speed
- 12 inch deep-textured roller
- 5th Generation controller included
- Integrated DAQ Input Channels for Logging
- Adjustable Nose for various wheel-base
- Free computer software for Graphic Display
- 1 Year Warranty Included

**** Available in 100 - 300kw***

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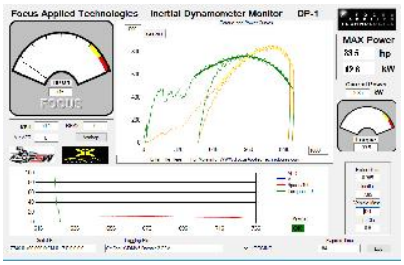
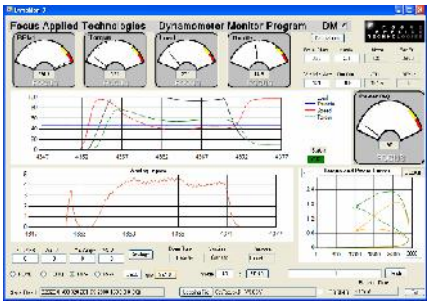
SUPERBIKE CHASSIS DYNAMOMETER

Model SCD-200

Rear-approach ramp



"Power Pull"



R&D Screen Shot

SPECIFICATIONS

PHYSICAL

Weight: 350kg (approx)
LxWxH: 212 x 135 x 45 cm
Deck: 202 x 90 x 43 cm

MAINS POWER

Voltage: 120/240VAC
Frequency: 50/60Hz
Current Draw: 10/5A max

CONTROLLER OUTPUT

Controller Power: 1kW (100V. 10A)
Coms: 9600 baud, 8bit, NP

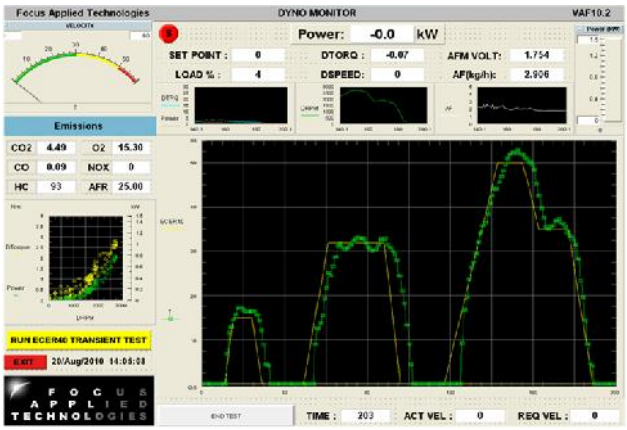
DYNO

Mechanical Power: 267hp max
Torque: 600Nm max
Roller: 320mm diameter
Speed: Hall Effect, 5V excitation
30 pulse per revolution
3,500 rpm, 200kph maximum
Load Cell: 1250Nm, 200 to 500 ohm
4-wire Wheatstone bridge
5 or 10V excitation

ENVIRONMENTAL

Temp:10 to 40° C Operational
0 to 50° C Non-Operational
Humidity:5 to 90% Non-condensing
Shock/Vibe:<10g

The Super Bike Chassis Dyno is widely used by tuning shops to prove power increases to customers. It is also extensively used by R&D organizations and for trouble shooting tough problems, as it can hold the bike at a constant load or speed, unlike inertial dynos. Road load mode can simulate road performance for drive cycle testing for emissions or fuel consumption certification testing.



OPTIONS

- High-volume, low noise blower and stand
- Pneumatic or screw type wheel clamp
- Wide Band O2 (AFR) sensor
- Digital Fuel Scale
- 5-Gas Analyzer
- Current/Voltage Clamp Meter
- In-floor or Ramp versions available

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COMPACT CHASSIS DYNAMOMETER

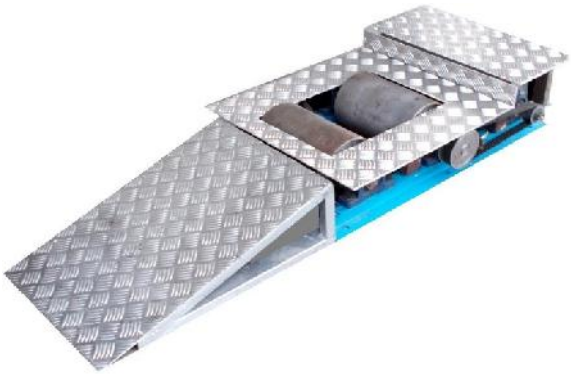
Model CCD-10

Available in 10Kw & 50Kw

This heavy duty engine dynamometer can extract 300kW of mechanical power from automotive engines, including cars and trucks. Its heavy-duty frame and universal engine coupling shaft are ideal for high torque applications. The air-cooled eddy current dynamometer requires no external cooling lines, and is easy to install and use, giving years of trouble free service. The sophisticated controller can operate the dynamometer from the front panel or from a computer via the remote mode. Control modes include Manual Load, Speed, Torque and Road Load control. The dynamometer can hold the vehicle under test at a given speed for tuning, or fuel consumption measurements, or mimic actual road load conditions. Drive cycle software is included allowing vehicles to be tested on any drive cycle required. Additional inputs are included for Data Acquisition, display and logging. With optional throttle servo motor the dynamometer can run fully automated test cycles.

FEATURES

- 10 kW Mechanical power ratings
- Suitable for motorcycle up to 200cc
- Up to 90 kph, 120Nm at wheel
- Precision Torque and Speed Measurement
- Simple “Air Heater” dump load
- Advanced Dynamometer Controller
- Includes Analog Input Channels for Logging
- Free computer software for Graphic Display
- 1 Year Warranty Included



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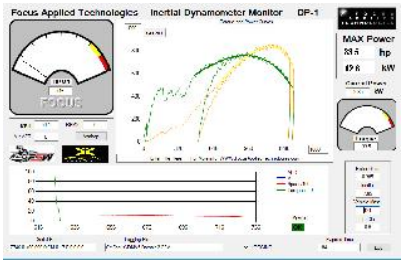
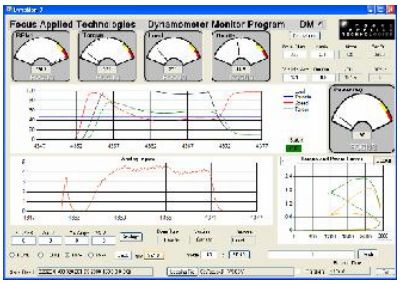
COMPACT CHASSIS DYNAMOMETER

Model CCD-10

Rear-approach ramp



"Power Pull"



R&D Screen Shot

SPECIFICATIONS

PHYSICAL

Weight	: 70kg (approx)
LxWxH	: 900 x 500 x 290 mm

MAINS POWER

Voltage	: 120/220VAC
Frequency	: 50/60Hz
Current Draw	: 4A max

CONTROLLER OUTPUT

Resistance	: 10Ohms Min
Power	: 300W Max
Voltage	: 100V Nominal
Current	: 3A Max

DYNAMOMETER POWER

Mechanical Power: 10,000W Max

Voltage Output	: 300V Max
Current	: 20A Max

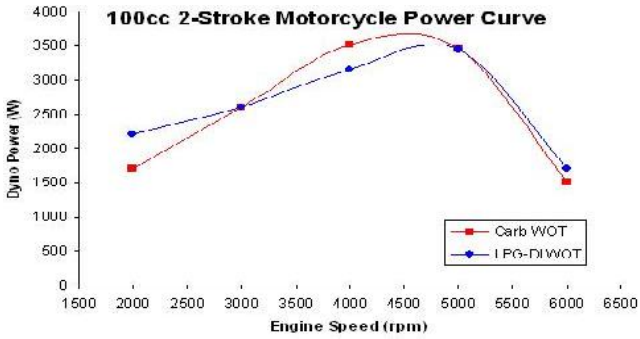
INPUTS

Speed:	1 to 60 pulse per revolution
	10V pk-pk maximum
	2500 rpm maximum at main roller
	16.8 cm Roller Diameter
	78kph (50mph) maximum linear speed
Load Cell:	40Nm maximum Loading
	200 to 500 ohm
	4-wire Wheatstone bridge
	5 or 10V excitation

ENVIRONMENTAL

Temp:10 to 40° C Operational
0 to 50° C Non-Operational
Humidity:5 to 90% Non-condensing
Shock/Vibe:<10g

This small, robust dynamometer is an excellent match for 50 to 200cc motorcycles. It measures both Torque and Speed, and calculates Power. It can be used for graphing the torque or power curve of the vehicle, as well as tuning and research and development. The sophisticated dynamometer controller can hold the vehicle to a given speed, torque, operated to simulate road load, and run manually from the front panel or automatically from a computer. The controller can accept additional analog input channels for display and logging, and has an integrated Throttle Control for automated testing. Throttle actuator is sold separately



OPTIONS

- High-volume, low noise blower and stand
- Wide Band O2 (AFR) sensor
- Digital Fuel Scale
- 5-Gas Analyzer
- Current/Voltage Clamp Meter
- Combustion Analysis

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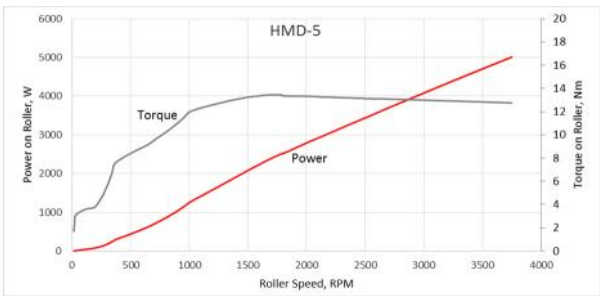
HYPERMILEAGE CHASSIS DYNAMOMETER

Model HMD-5

This very compact chassis dynamometer can extract over 5kW of mechanical power from a “Hypermilage” competition vehicle, small motorcycle and electric bicycle. It is lightweight and compact size make it easily transportable, even in a carry-on luggage. The air-cooled eddy current dynamometer requires no external cooling and is easy to install and use. The sophisticated controller can operate the dynamometer from the front panel or from a computer via the Remote Mode. Control modes include Manual Load, Speed, Torque and Road Load control. The dynamometer can hold the vehicle under test at a given test speed for tuning, or fuel consumption measurements, or mimic actual road load conditions. A throttle position controller is included which outputs an analog Throttle Position command. Addition inputs are included for Data Acquisition, Display and Logging.

FEATURES

- Dynamometer weights only 18kg
- 5kW peak mechanical power absorption
- 90kph (60mph) top speed
- 21 x 15 x 50 cm size fits carry-on luggage
- 5th Generation controller included
- Integrated DAQ Input Channels for Logging
- Power is Circuit Breaker Protected
- Free computer software for Graphic Display
- 1 Year Warranty Included



Laboratory Exercise Manual Included with Labs, Quizzes and sample data

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HYPERMILEAGE CHASSIS DYNAMOMETER

Model HMD-5

Connects in Second

Fits in 24" Luggage

Run and Troubleshoot on Dyno

SPECIFICATIONS

PHYSICAL

Weight: 18kg (Dyno), 8kg (Controller)
LxWxH: 500 x 210 x 152 mm

MAINS POWER

Voltage: 120/240VAC
Frequency: 50/60Hz
Current Draw: 10/5A max

CONTROLLER OUTPUT

Controller Power: 200W (50V, 3A)
Coms: 9600 baud, 8bit, NP

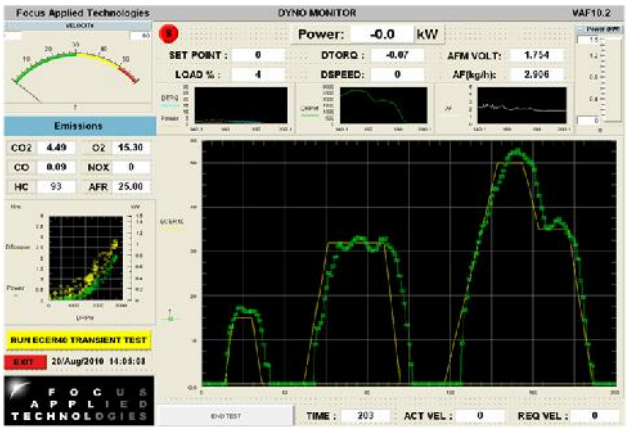
DYNO

Mechanical Power: 5kW @4,000 rpm
Torque: 12Nm max
Roller: 10cm diameter
Speed: Hall Effect, 5V excitation
8 pulses per revolution
4,000 rpm, 75kph maximum
Load Cell: 35Nm, 350 ohm
4-wire Wheatstone bridge
5 or 10V excitation

ENVIRONMENTAL

Temp:10 to 40° C Operational
0 to 50° C Non-Operational
Humidity:5 to 90% Non-condensing
Shock/Vibe:<10g

The Chassis Dynamometer is extensively used by vehicle manufacturers for quality control and R&D organizations for troubleshooting tough problems, as it can hold the bike at a constant load or speed, unlike inertial dynos. Road load mode can simulate road performance for drive cycle testing for emissions or fuel consumption certification testing.



OPTIONS

- Detachable Nose/Wheel Clamp
- Wide Band O2 (AFR) sensor
- Digital Fuel Scale
- 5-Gas Analyzer
- Current/Voltage Clamp Meter

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STANDARD SPECIFICATION OF CHASSIS DYNAMOMETER

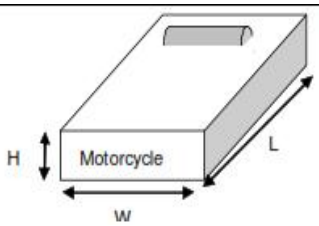
Focus Applied Technologies

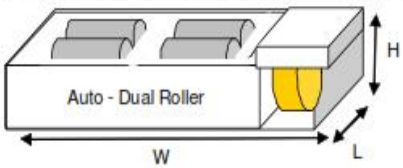
Chassis Dynamometer Spesifications

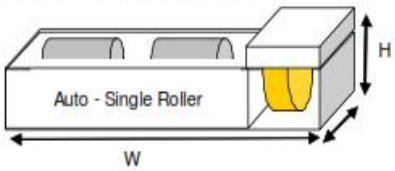
REV: 11-16

		Motorcycle							Auto - Truck - Bus			
Dynamometer:	**Units**	**HCD**	**CCD-10**	**CCD-50**	**SCD-50**	**SCD-100**	**SCD-200**	**SCD-300**	**ACD-100**	**ACD-300**	**ACD-500**	**ACD-1000**
Absorber Power	kW	7.5	10	50	50	100	200	300	100	300	500	1000
Maximum (Acelleration) Power	kW	10	15	75	75	150	300	500	150	500	750	1500
Nominal Max Torque (at dyno)	Nm	12.5	40	67.5	135	400	600	1200	400	600	1200	2400
Roller Diameter	m	0.101	0.17	0.17	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32
Maximum Surface Force	N	248	471	794	844	2500	3750	7500	3750	6250	11250	22500
Maximum Speed	rpm	5000	2500	7500	3000	3000	3000	3000	3000	3000	3000	3000
Maximum Speed	kph	95	78	234	200	200	200	200	200	200	200	200
Gear Ratio (Dyno/Roller)		2	2	1/2	1	1	1	1	1	1	1	1
Power Required	V	240	240	240	240	240	240	240	240	240	240	240
Power Required	A	4	4	6	6	15	20	25	6	20	25	35
Power to Dyno	V	75	100	100	100	100	100	100	100	100	100	100
Power to Dyno	A	3	3	8	9	22.5	30	37.5	9	30	37.5	52.5
Single Roller Dimensions L	mm	500	900	1200	2020	2020	2020	2200	500	500	500	540
W	mm	160	500	500	890	890	890	900	3000	3000	3000	3000
H	mm	170	290	450	460	460	460	480	460	460	480	520
Weight	kg	18	70	170	250	300	330	360	550	600	720	1000
Dual Roller Dimensions L	mm								540	540	540	580
W	mm								3000	3000	3000	3000
H	mm								460	460	480	520
Weight	kg								963	1050	1260	1750

Specifications subeject to change without notice. For latest information please contact us at www.FocusAppliedTechnologies.com







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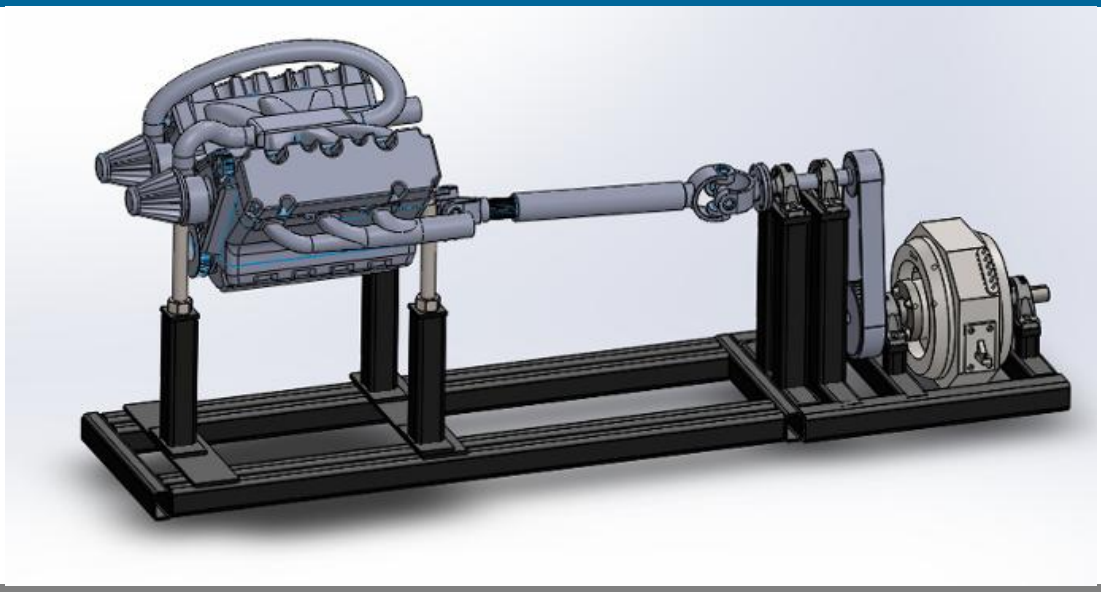
AUTOMOTIVE ENGINE DYNAMOMETER

Model AED-300



This heavy duty engine dynamometer can extract 300kW of mechanical power from automotive engines, including cars and trucks. Its heavy-duty frame and universal engine coupling shaft are ideal for high torque applications. The air-cooled eddy current dynamometer requires no external cooling lines, and is easy to install and use, giving years of trouble free service. The sophisticated controller can operate the dynamometer from the front panel or from a computer via the remote mode. Control modes include Manual Load, Speed, Torque and Road Load control. The dynamometer can hold the vehicle under test at a given speed for tuning, or fuel consumption measurements, or mimic actual road load conditions. Drive cycle software is included allowing vehicles to be tested on any drive cycle required. Additional inputs are included for Data Acquisition, display and logging. With optional throttle servo motor the dynamometer can run fully automated test cycles.

FEATURES

- 300kW (400hp) mechanical power absorption
- 600Nm Torque from 500 to 6000 rpm
- Heavy-Duty Universal Joint Coupler
- 5th Generation controller included
- Integrated DAQ Input Channels for Logging
- Engine Jacks for easy adjustments
- Free computer software for Graphic Display
- 1 Year Warranty Included

Our systems are 100% Made in Malaysia

We have *local* technical support, straight from the factory

For continuous duty testing we also have Water Cooled Eddy Current Dynos!

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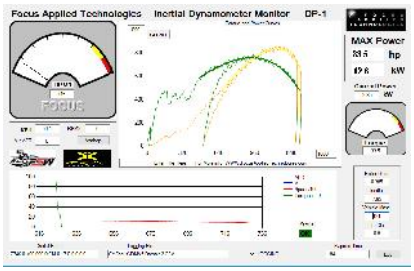
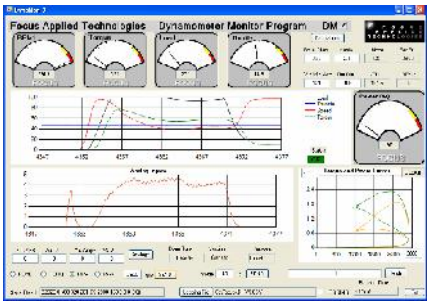
AUTOMOTIVE ENGINE DYNAMOMETER

Typical Application



"Power Pull"



R&D Screen Shot

SPECIFICATIONS

PHYSICAL

Weight: 450kg (approx)
LxWxH: 240 x 60 x 65 cm

MAINS POWER

Voltage: 120/240VAC
Frequency: 50/60Hz
Current Draw: 30/15A max

CONTROLLER OUTPUT

Controller Power: 3.5kW (100V. 35A)
Coms: 9600 baud, 8bit, NP

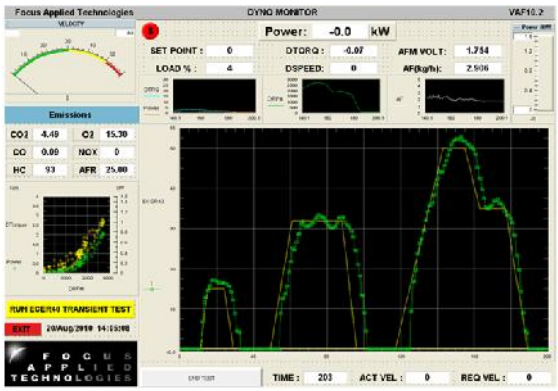
DYNO

Mechanical Power: 400hp max
Torque: 600Nm max
Speed: Hall Effect, 5V excitation
30 pulse per revolution
3,500 rpm, 200kph maximum
Load Cell: 1000Nm, 200 to 500 ohm
4-wire Wheatstone bridge
5 or 10V excitation

ENVIRONMENTAL

Temp:10 to 40° C Operational
0 to 50° C Non-Operational
Humidity:5 to 90% Non-condensing
Shock/Vibe:<10g

The Automotive Engine Dynamometer is used for testing engines, measuring torque, power, fuel consumption and emissions at various loads. It is extensively used by R&D organizations for tuning engines, as it can hold the engine at a constant load or speed, for long periods of time. The Air-Cooled Eddy Current Dynamometer requires no water lines or external cooling tower, making it easy to install and relocate.



OPTIONS

- High-volume, low noise blower and stand
- Wide Band O2 (AFR) sensor
- Digital Fuel Scale
- 5-Gas Analyzer
- Combustion Analysis System
- Servo Throttle Motor and Controller

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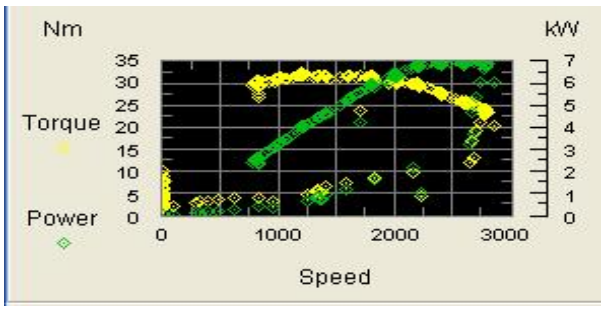
BENCH-TOP DYNAMOMETER

Model BD-10

Available in 10Kw & 15Kw

This Student Benchtop Dynamometer System consists of a dynamometer frame incorporating the electric motor/Diesel/Gasoline engine, inertial wheel, a load dynamometer and associated sensors & data acquisition system. It is designed for performance testing of the electric motor regenerative braking performance. The inertial wheel is mounted on the shaft using taper lock device for easy dismantling and change/add another inertia wheel (purchased optionally) to match different motor power.

Features of heavy duty frame, integrated torque and speed measurements, and a universal dynamometer controller for control, display and recording of information via a computer interface. Our generator type dynamometer does not require water circulation, and the electrical dump load may be mounted remotely. Various power sources and coupling options are available.



Laboratory Exercise Manual Included with Labs, Quizzes and sample data

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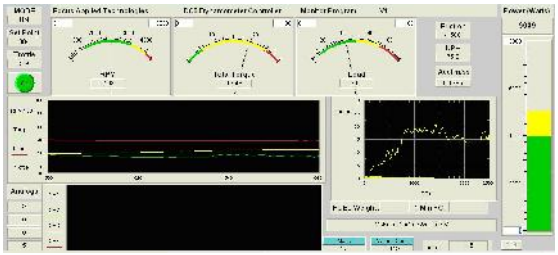
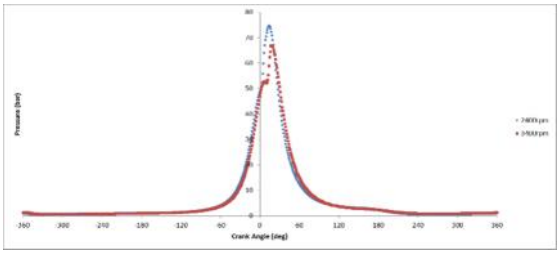
BENCH-TOP DYNAMOMETER

Model BD-10



Torque Screenshot



Cylinder pressure vs crank angle

SPECIFICATIONS

PHYSICAL

Weight:: Approx 65kg (without engine)
LxWxH: 1200 x 490 x 400 mm

POWER IN

Voltage: 220VAC +/- 10%
Frequency: 50Hz
Current Draw: 4A max

CONTROLLER OUTPUT

Resistance : 10 ohms Min
Power : 300W Max
Voltage : 50V Nominal
Current : 5A Max

DYNO

Mechanical Power: 10,000W Max
Voltage Output : 400V Max
Current : 10A Max

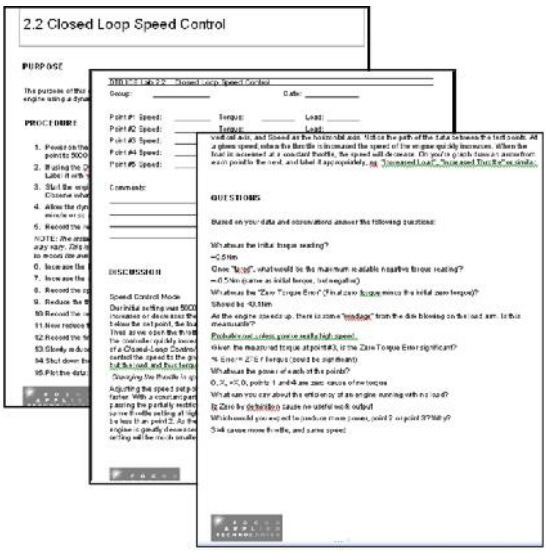
INPUTS

Speed Input : Variable Reluctance type input
1 to 60 pulse per revolution
10V pk-pk Max
60 to 10,000 rpm (typical)
Strain : 200 to 500 ohm
4 wire Wheatstone bridge
5 or 10V Excitation

ENVIRONMENTAL

Temp:10 to 40° C Operational
0 to 50° C Non-Operational
Humidity:5 to 90% Non-condensing
Shock/Vibe:<10g

The Bench-Top system is widely used by student laboratories in Universities and Polytechnics and for Research and Development. Laboratory exercises are available, including sample data, physical explanations and quiz questions and answers.



OPTIONS

- Throttle Controller
- Fuel Scale
- Gasoline / Diesel Engine
- Blower / Fan
- Electric Motor
- Combustion Analysis
- Inertial
- Wide Band O2 Display (AFR)
- Gas Emission Analyzer

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STANDARD SPECIFICATION OF ENGINE DYNAMOMETER

Focus Applied Technologies

Engine Dynamometer Spesifications

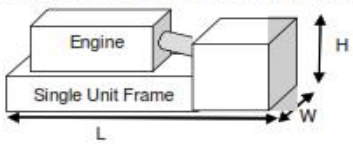
REV: 1-17

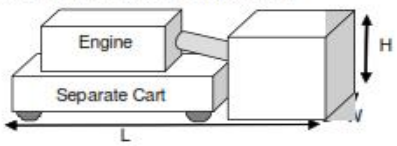
		BENCH UNITS				Automotive							
Dynamometer:	**Units**	**BD-10**	**BD-15**	**BD-50**	**BD-100**	**AED-100**	**AED-200**	**AED-500**	**WED-100**	**WED-200**	**WED-500**	**HED-100**	**BED-1000**
Maximum Power	kW	10	15	50	100	100	200	500	100	200	500	100	1000
Nominal Max Torque	Nm	12.5	40	135	400	400	600	1200	400	600	1200	400	2400
Maximum Continous Speed	rpm	5000	2600	5000	4000	7000	7000	7000	7500	7500	6000	5000	8000
Load Unit	Type	Gen	Gen	ACEC	ACEC	ACEC	ACEC	ACEC	WCEC	WCEC	WCEC	HP	WB
ExternalCooling Required	Y/N	NO	NO	NO	NO	NO	NO	NO	YES	YES	YES	YES	YES
Gear Ratio (Engine/Dyno)		1	1	1	1	2	2	2	1	1	1	1	1
Power Required	V	240	240	240	240	240	240	240	240	240	240	240	240
Power Required	A	2	3	6	6	6	12	18	4	6	12	1	1
Power to Dyno	V	100	75	100	100	100	100	100	100	100	100	-	-
Power to Dyno	A	4	9	12	12	12	20	30	8	10	20	-	-
Single Unit Dimensions L	mm	1200	1400	1200	1400	2300	2300	2500	2300	2300	2500	2000	2000
W	mm	490	530	530	530	600	600	700	600	600	700	600	600
H	mm	400	440	440	440	750	750	850	750	750	800	750	750
Weight	kg	65	70	80	130	290	310	340	310	330	350	200	210
Separate Engine Cart Dims L	mm					2400	2400	2600	2400	2400	2600	2100	2100
W	mm					600	600	700	600	600	700	600	600
H	mm					850	850	950	850	850	900	850	850
Weight	kg					310	330	360	330	350	370	220	230

Load Types:

Generator	Gen
Air Cooled Eddy Current	ACEC
Water Cooled Eddy Current	WCEC
Hydraulic Pump	HP
Water Break	WB

Specifications subeject to change without notice. For latest information please contact us at www.FocusAppliedTechnologies.com





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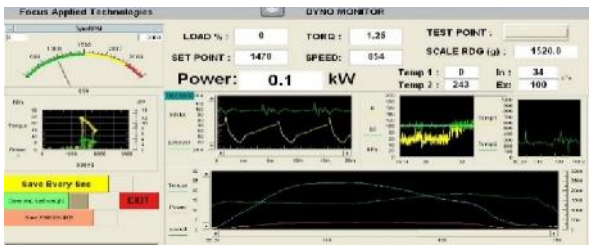
DESK-TOP DYNAMOMETER SYSTEM

Model DTD-5

This “Desk Top” Dynamometer is a complete eddy current dynamometer system designed for use in student teaching laboratories. It can be provided with a Honda GX35 4-stroke engine, AC or DC electric motors. The air-cooled eddy current dynamometer requires no external cooling lines, and is easy to install and use. The sophisticated controller can operate the dynamometer from the front panel or from a computer via the remote mode. Control modes include Manual Load, Speed, Torque and Road Load control. Software provided allows logging of speed, torque and load and additional inputs can be used for measuring engine temps and fuel flow, or motor voltage and current. A throttle position controller is included which outputs an analog Throttle Position command. Student laboratory exercises and teaching material are included.

FEATURES

- ICE Dynamometer weighs only 17kg
- 2kW mechanical power absorption
- ICE, AC and DC motors available
- Motors/Engine can be quickly changed
- 5th Generation controller included
- Integrated DAQ Input Channels for Logging
- Power is Circuit Breaker Protected
- Free computer software for Graphic Display
- 1 Year Warranty Included



Laboratory Exercise Manual Included with Labs, Quizzes and sample data

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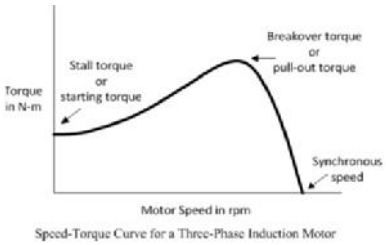
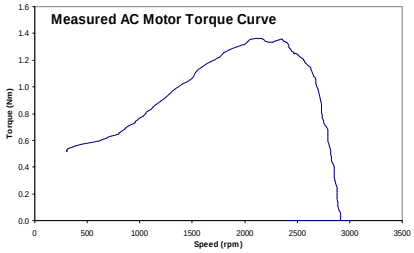
DESK-TOP DYNAMOMETER SYSTEM

Model DTD-5

AC Motor Dynamometer



Speed-Torque Curve for a Three-Phase Induction Motor



Theoretical and measured AC Induction Motor Torque Curves

SPECIFICATIONS

PHYSICAL

Weight: 13, 14, 17kg (DC, AC, ICE)
LxWxH: 500 x 160 x 170 mm

MAINS POWER

Voltage: 120/240VAC
Frequency: 50/60Hz
Current Draw: 4A max

CONTROLLER OUTPUT

Controller Power: 200W (50V. 3A)

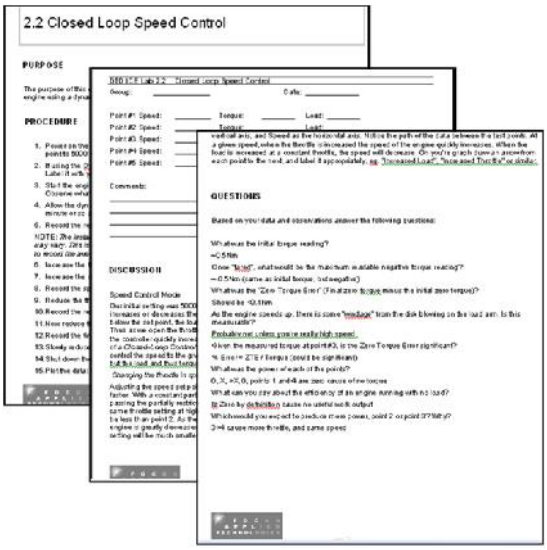
DYNO

Mechanical Power: 2kW max
Disk: 200mm diam., 6mm thick
Speed: Hall Effect type, 5V excitation
4 pulse per revolution
5V Zero-peak
10,000 rpm maximum
Load Cell: 20Nm, 200 to 500 ohm
4-wire Wheatstone bridge
5 or 10V excitation
Baud, Bits, Parity, Stop:
9600, 8, N, 1

ENVIRONMENTAL

Temp:10 to 40° C Operational
0 to 50° C Non-Operational
Humidity:5 to 90% Non-condensing
Shock/Vibe:<10g

The Desktop Dynamometer is widely used by student laboratories in Universities and Polytechnics. It comes with an extensive library of Laboratory exercises, including sample data, physical explanations and quiz questions and answers.



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DYNAMOMETER CONTROLLER

Model DC-5

Universal Dynamometer Controller

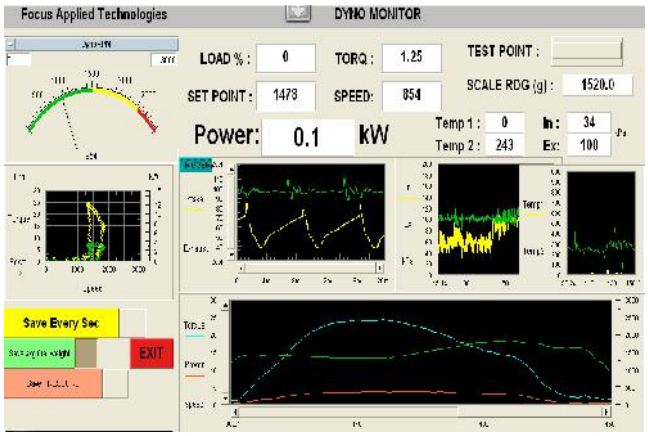
- 25V to 100V PWM Output
- Current from 3A to 10A
- Full PID control of Torque/Speed
- Modes of Operation:
  Manual, Remote, Speed, Torque, Road
- Throttle Position Controller Included
- Additional DAQ Channels for Logging
- Integrated Circuit Breaker Protection
- Ignition cut-off switch for Safety
- Large LCD Display
- Free Software for Logging/Display
- 1 Year Warranty

Computer Control Mode:

Mode and Set Point and Throttle can be controlled by computer for Automated Testing

Additional Options Include:

- Fuel Scale
- Emissions Analyzer



This 5th generation dynamometer controller is a universal dynamometer controller for all eddy current and generator type dynamometers. With optional Hydraulic Servomotor it can run hydraulic and Water Break dynamometers as well. A Throttle Position sending control is provided from the front panel, and with optional throttle control servomotor can control the engines throttle.

In Computer Control mode the actual control mode (manual, speed, torque, road load) and set point can be controlled by the computer along with the throttle position. This allows for fully automated engine/vehicle drive cycle testing.

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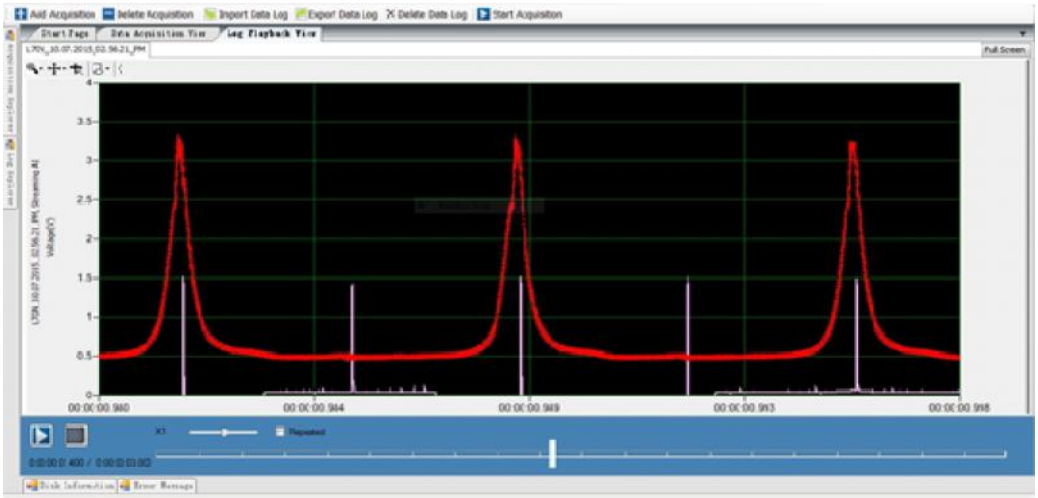
COMBUSTION ANALYSIS

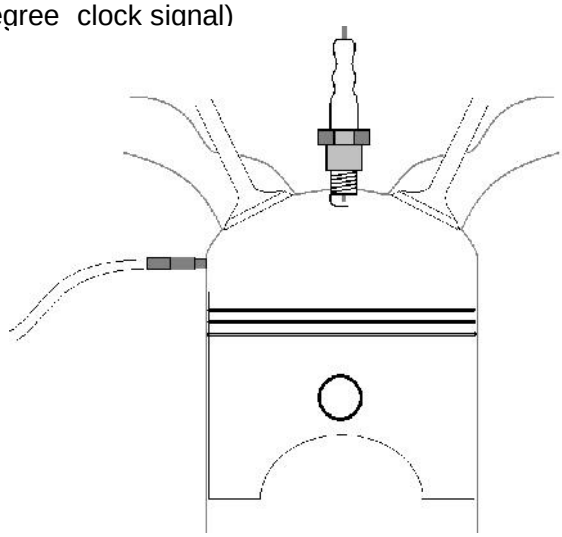
Model CAS-5



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



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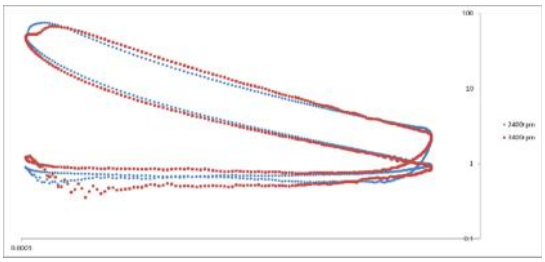
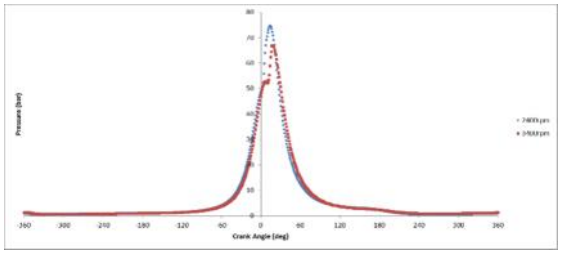
COMBUSTION ANALYSIS

Model CAS-5



PV diagrams



Cylinder pressure vs crank angle

SPECIFICATIONS

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)

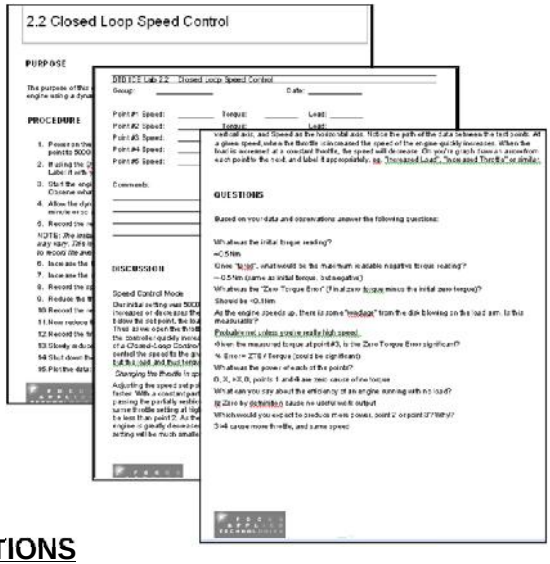
DATA ACQUISITION UNIT

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.



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

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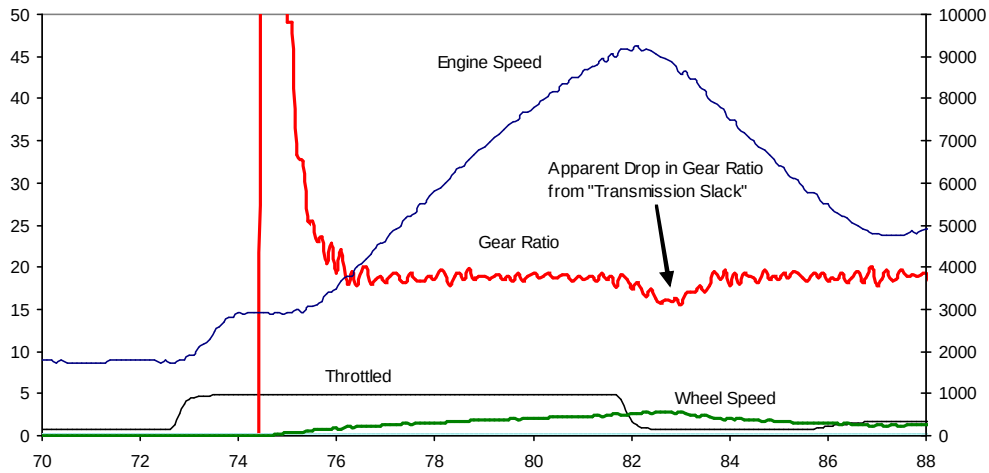
VEHICLE DATA LOGGER

Model DL-5

Features :

- 2 x Speed Signal (RPM)
- 2 x Thermocouple
- 2 x Thermistor
- 2 x DC Voltage (>5V)
- Throttle Position Signal
- Load Cell
- Manifold Air Pressure
- 5 Extra Analog Input (0-5V) e.g. O2 & Air Fuel Ratio
- 12V Nominal Power Input

This Vehicle Data Display and Logger is designed as a robust display and logger for small vehicles. It is preset to operate at 10Hz, automatically recording a new file to the SD memory card every time the unit is powered on. The files are saved as ASCII text files numbered sequentially, with commas separating the individual columns of data for easy importing to Excel or other spreadsheet programs. The data can similarly be analyzed by other programs, or by simply viewing the data in the text file.



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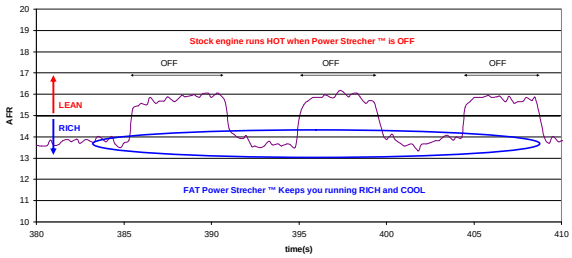
FUEL STRETCHER

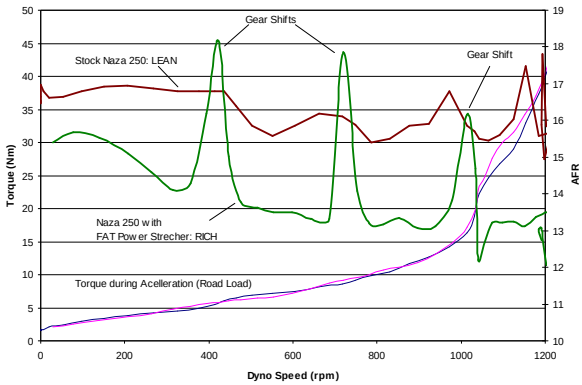
Model FS-1



This Electronic Fuel Injection "piggyback" controller reads the injection signal, and the Throttle Position (TPS). The Injector signal is then "stretched" by a programmable amount, depending on the TPS. A "Synthetic" oxygen signal (O2) is generated to keep the stock Electronic Control Unit (ECU) from over-correcting, or going into a limited power "safe" mode. This allows any fuel injection bike to be modified, and still use the stock ECU for operation, but with greatly improved performance, taking advantage of the additional air, and supplying the right amount of fuel.

Features

- Easy Installation
- Instant Results
- Engine runs cooler
- More Power!
- Smother Operation
- Synthetic O2 Signal keeps ECU happy
- Simple setup via Serial Port
- Allows performance upgrades to Fuel Injection vehicles
- 12V DC, 70 x 50 x 20mm



Most Fuel Injection systems don't allow the vehicle to be heavily modified. The FAT Power Stretcher ™ solves this by easily plugging into you're vehicles fuel injection system, taking over control of the fuel injector, and O2 signal. The Injector signal is then "stretched" as required by the throttle signal (TPS) in order to maintain the appropriate Air/Fuel Ratio, delivering the maximum power, drivability, and longevity, keeping you're engine cool.

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PRICE LIST FOR INSTRUMENTATION

CHASSIS DYNAMOMETER SYSTEM

MODEL	USD
ACD-500	36,250.00
AED-300	37,500.00
SCD-300	26,800.00
SCD-200	24,500.00
SCD-100	22,300.00
SCD-50	20,000.00
CMCD-50	18,500.00
CCD-10	13,000.00
HMD-5	7,500.00

OTHER INSTRUMENTATION

MODEL	USD
DTD-5	10,000.00
CAS-5	7,800.00
DC-5	6,500.00
BD-15	15,000.00
BD-10	12,000.00
DL-5	1,800.00

ALL THE PRICES QUOTED ARE EXCLUDING SHIPPING

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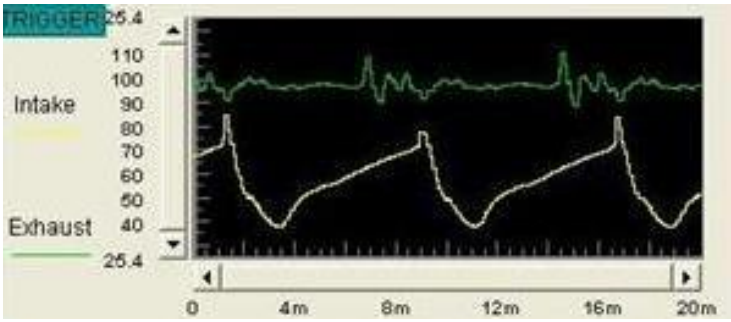
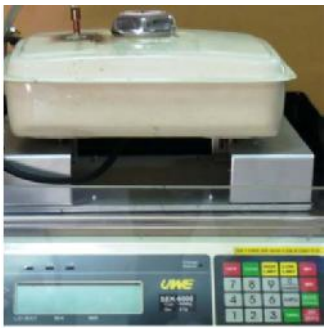
ENGINE AND DYNO OPTIONAL EQUIPMENT

Popular Additional Equipment includes :

- Clamp Current Meter
- Digital Fuel Scale
- High Voltage Sense Probe
- Adjustable AC Power Supply
- Adjustable DC Power Supply
- Intake/Exhaust Pressure Sensors
- Exhaust Gas 4, 5-Gas Analyzer
- Combustion Analysis
- Throttle Servo Motor
- Engine Temperature Sensor (Thermistor, Thermocouple)
- Exhaust Gas Wide-Band O2 Sensor (AFR Sensor)





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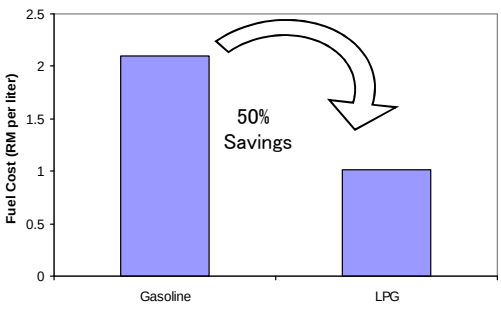
ELECTRONIC FUEL SYSTEMS – LPG / CNG

2-Stroke Direct Injection of LPG (Manila)

Our 4-stroke LPG Bi-fuel EFI kit is available as a "DIY" for interested individuals. For fleet owners, or distributors please contact us directly for full installation and tuning support. It can be installed by any competent mechanic or clever individual who can handle things such as soldering wires, and turning a wrench. The kit consists of the following major components:

- Electronic Control Unit
- Wiring Harness
- LPG Fuel Injector
- Bi-Fuel Carburetor
- LPG Pressure Regulator
- Cylinder Head Temperature Sensor
- Fuel Filter

This system comes as a kit which is simple to install on both upright cylinder engines (eg. Honda CB/CG series) and "under bone" engines (eg. Honda Cub/EX5). We have pre-programmed Electronic Control Units (ECUs) for most makes and models allowing installation in just a couple of hours. 50% SavingsIn most markets LPG (often available as common cooking gas) is less expensive than gasoline. In Malaysia, for example, cooking gas can be obtained for 21.50RM per 12kg (wholesale price), which is about 1RM per liter, compared to 2.10RM/liter for gasoline. Fuel consumption per liter is approximately the same for LPG and gasoline, thus operators can expect to see a saving of about 1RM per liter. For vehicles operating 50km per day on the highway, this results in a savings of about 1RM per day, while delivery vehicles traveling 50km per day may save as much as 2RM per day. Vehicles traveling further, or consuming more fuel will obviously save more.



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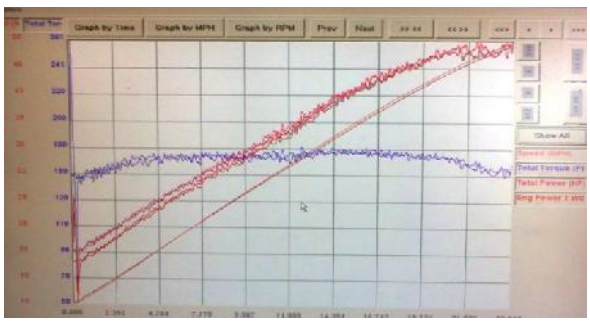
DYNAMOMETER SERVICING & REPAIR

Focus has a long history of designing and servicing dynamometers of various brands. Our controllers were originally designed as upgrades to older dynamometer systems of various brands. In response to requests from customers we now offer servicing for all makes and models of dynamometers, both chassis and engine dynos.

The most common scenario is that the customer has an old dyno system that has either been idle for a long time, has an out of date PC based controller, or doesn't function properly for an unspecified reason. We generally do a site visit to asses the equipment and determine exactly what is required to get it running again, then provide a quote detailing all the work to be done. We guarantee our work, and can even provide various warrantees.

Models we've serviced to date include:

- API
- SuperFlow
- Mustang
- DynoJet
- DynoMite
- Clayton
- Dayton
- Digilog
- SAJ
- Froude Hofmann
- Cussons
- Precision Engineering



If you have a dyno that's not performing as expected, give us a call, or an email to schedule an appointment.

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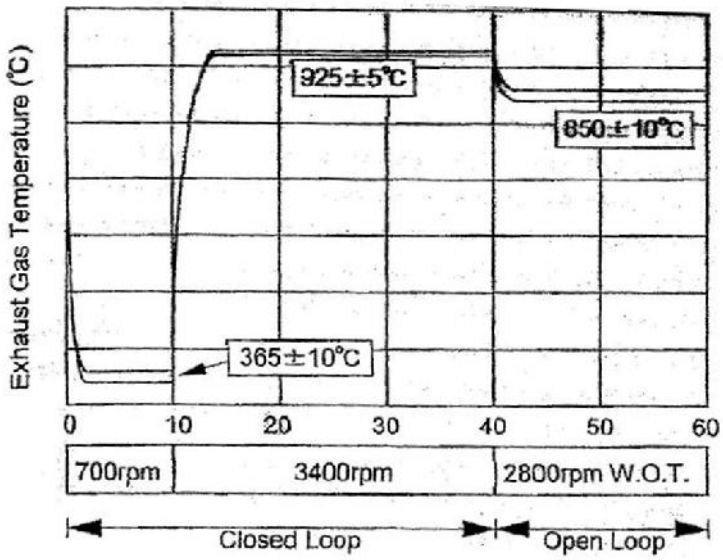
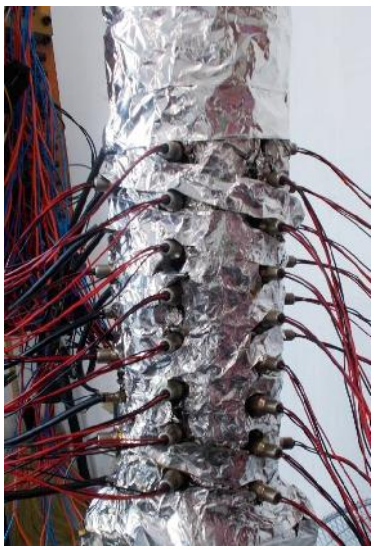
ENGINE / COMPONENT TESTING SERVICES



In conjunction with our dynamometers we offer various motor vehicle and subsystem/component testing services, alternative fuel and fuel additive testing. Testing can be performed as one-time or on an ongoing basis. Individual reports, periodic reports and continually updated database access can be given for instant access to crucial results.

Fuel consumption and emissions analysis can be done to any desired drive cycle, for hundreds of sensors simultaneously. Longer term testing includes engine despite formation and/or ware, or component reliability testing, and can last up to several years, or many *thousands* of hours of engine operation. Some of this testing requires operation on specific engines (eg. Truck 2.5 liter turbo diesel engine), or under precise conditions (eg. 3400rpm engine speed, with EGT of 925C). We can also analyze component failures, and suggest design improvements.

When allowed we frequently publish testing results in peer-reviewed scientific journals to help raise awareness of new technologies.



Examples of our testing services

- Diesel Combustion Chamber Deposit as effected by Fuel Additive
- Low Sox Diesel Emissions Testing
- Evaluation of NOx Reducing Fuel Additive
- Evaluation of various “Fuel Saving” Devices
- Gasoline Fuel Additive Testing
- Long Term (1000hour) Oxygen Sensor Reliability Testing
- Component Failure Analysis

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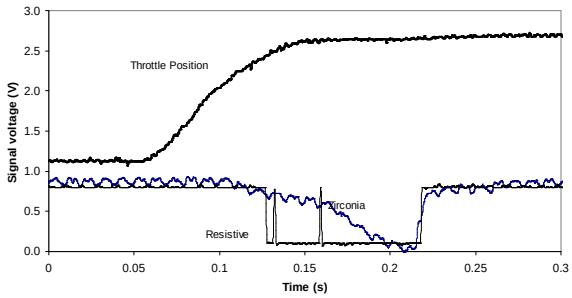


Transient AFR testing of various Exhaust Sensors

Inconel Exhaust Gas Test Section

SPECIFICATIONS

A wide range of testing is available. We can also develop custom test equipment for specific customer needs.

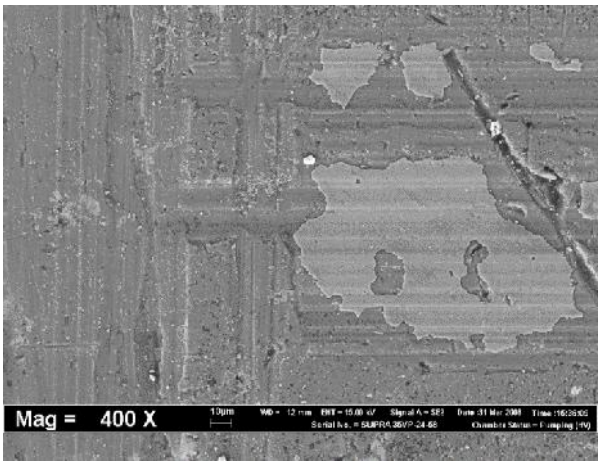
FUELS
Diesel, Gasoline, CNG, LPG, Ethanol, Blended Fuels, etc.

ENGINE
2 - Stroke, 4 – Stroke, Turbo, NA, Fuel Injection, Carbureted, 20cc to multi liter displacement

CONTROLED PARAMETERS
Speed
Torque
Power
Exhaust Gas Temp
Coolant Temp
Transient / Steady State

MEASURMENTS
Electrical Component Analysis
Materials Analysis
Mechanical Analysis
Friction, Wear, Weight, Resistance, Voltage, Current, Torque, Force, Speed, Strain, Temperature, Flow Rate, etc.

Via our close connection with the University Science Malaysia we have access to a wide range of materials analysis tools including Fourier Transform Infrared Spectroscopy, Gas Chromatography, Scanning Electron Microscope – Xray Diffraction, and etc.



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