APPENDIX 8

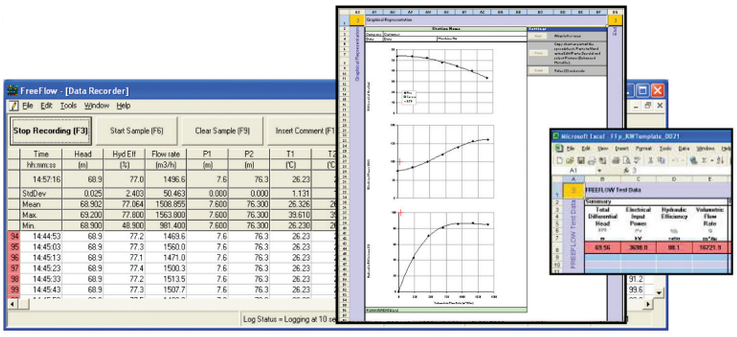
FREEFLOW™

PORTABLE PUMP TESTING SYSTEM
MODEL: FFP-G2

VERSION 1.5

For Professional Pump Performance Results

The FREEFLOW Instrument is a thermodynamic pump monitoring instrument designed for use in an industrial environment. It can measure hydraulic performance down to the individual pump level. This enables the user to determine hydraulic condition, pump efficiency and its effectiveness as part of the dynamic pumping system.



System Components

- One Freeflow Instrument
- One Set of Temperature transducers
- One 10 bar Suction Pressure transducer
- One 20 bar Delivery Pressure transducer
- One Power Measurement system (LV/HV)
- Data display and collection device
- Protective Flight case
- Two Insertion glands
- Earth Safety strap
- Software & Instrument User manual

Accurate Real-Time Data

The Portable FREEFLOW instrument can measure the real-time performance of a given pump. A range of test points are sampled across the operating range of the pump.

Comprehensive Real-time pump data is displayed and updated continuously at 1-second intervals.
With excellent user-training and measurement accuracy of better than ±1% in most applications, you can rely on FREEFLOW results.

Confidence in Results

The FREEFLOW Instrument can produce pump curves which enable the performance and condition of the pump to be accurately recorded and compared with manufacturer pump curves. Statistical parameters are computed in real-time to indicate the stability of measurement – and provide confidence to the operators.

Precision Measurement

The principal function of the FREEFLOW is to calculate pump efficiency and flow rate from the primary inputs. The FREEFLOW is designed to measure inputs from the following measurement transducers:

- Suction Temperature transducer
- Delivery Temperature transducer
- Suction Pressure transducer
- Delivery Pressure transducer
- Power Meter

An Integrated System

The FREEFLOW is a fully functional self-contained instrument which is conveniently integrated into a compact flight case. All accessories are also protected and stored including the pressure and temperature sensors.

A separate flight case is supplied for the power meter and its accessories.

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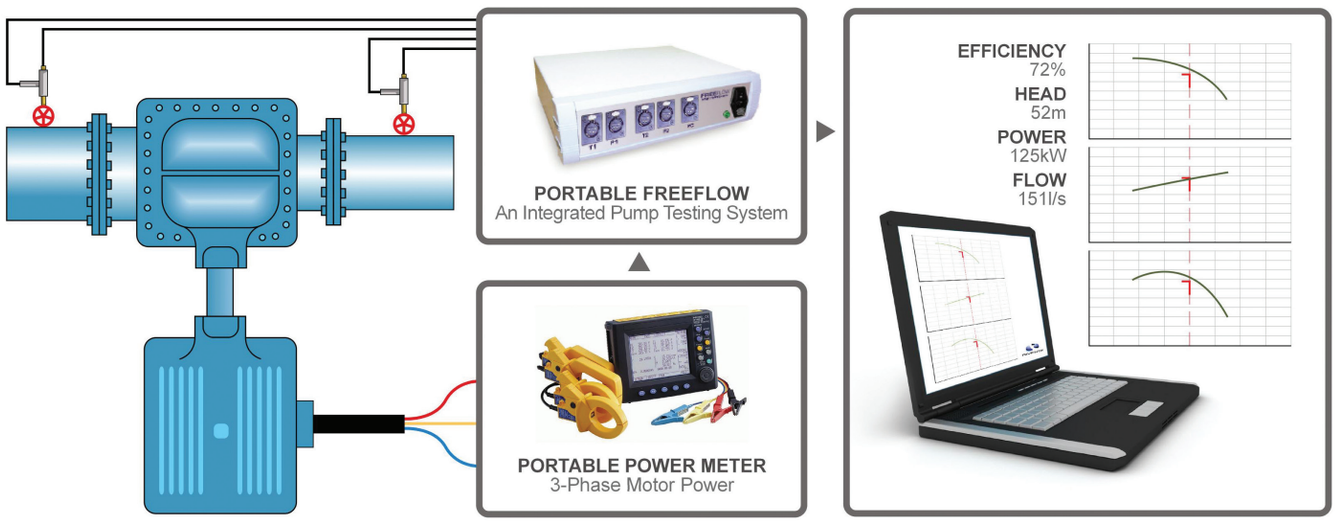
FREEFLOW™

TECHNICAL SPECIFICATION	
Diff. Temperature Accuracy:	± 0.001 °C
Standard Temperature Range:	0 to 40 °C
Pressure Accuracy:	± 0.1% of reading
Maximum Pressure Range:	400 Bar
Flow rate Accuracy	± 1% of reading
Data display:	IBM Compatible PC or Touchscreen PC
Operating Temperature:	-10 to 50 °C (avoid condensation)
Channel Scan rate:	4x per second
Auto zero inputs	Built-in
Noise rejection	Eliminates 50/60 Hz
Resolution:	24-bit
Size:	300mm (W) x 190mm (D) x 85mm (H)
Flight case size:	730mm (W) x 410mm (D) x 330mm (H)
Weight:	12 kg (with standard accessories)
Mains Power:	110V/220Vac (50/60Hz), 24Vdc
Communication port:	RS485 Modbus Protocol

FREEFLOW PARAMETERS	UNIT
Hydraulic Efficiency	%
Flow Rate	l/s
Differential Head	m
Electrical Power	kW
Differential Temperature	mK
Suction Pressure	(P1) m
Delivery Pressure	(P2) m
Suction Temperature	(T1) °C
Delivery Temperature	(T2) °C

SYSTEM DIAGRAM



Riventa Contact Details

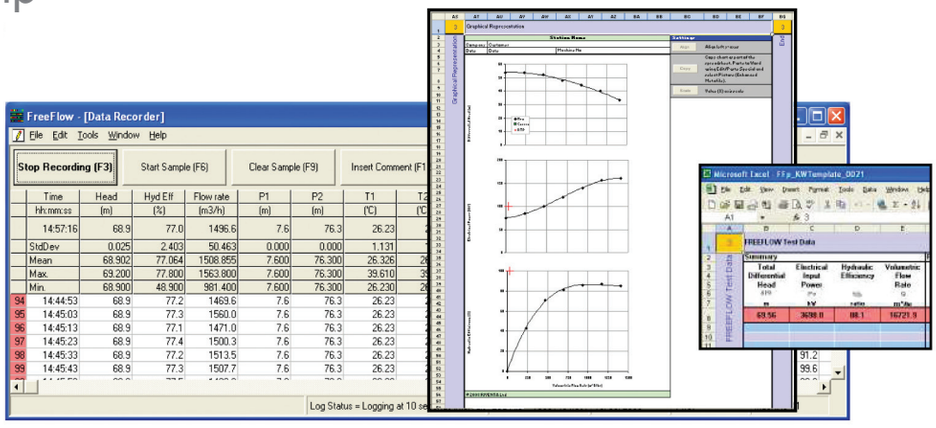
For all enquires please email **info@riventa.co.uk**
Visit our website for further details **www.riventa.com**

RIVENTA™

FREEFLOW
PORTABLE SOFTWARE

VERSION 1.5

For Professional Pump Performance Results



The FREEFLOW Instrument is an intelligent instrument designed for used in an industrial environment. The system has been designed by users, to ensure both efficient and reliable pump testing results.

Interaction with the FREEFLOW is via a laptop computer running Microsoft Windows XP or above, providing flexibility and ease of use.

Site and transducer parameters are set via the FREEFLOW Portable software. The software is preinstalled on the laptop and the installation files are supplied on a CD for backup.

Accurate Real-Time Data

Essential Real-time pump data is shown on the Computer Screen and updated continuously at one second intervals.

With excellent user-training and measurement accuracy of better than ±1% in most applications, you can rely on FREEFLOW results.

Confidence in Results

Statistical parameters are computed in real-time to indicate the stability of measurement – and provide confidence to the operators.

Parameters include **Standard Deviation, Mean, Max** and **Min** values recorded during the sample period.

Secure Data

The real time data is logged to file and stored on the local computer HDD. Utilise the TMIS web-portal to store your pump test and pump asset information in our secure online database for access anywhere in the World.

Industry Standard Charting

The FreeFlow Portable Software can send real-time pump parameters to Microsoft Excel for display and charting. Use the Excel template file provided to generate pump performance curves for your test.
Add manufactures test curves on the same chart for comparison purposes.

Manufacturers Test/Type Data

Add manufacturers test data and Chart for comparison with your latest pump test results.

Riventa Contact Details

For all enquires please email **info@riventa.co.uk**
Visit our website for further details **www.riventa.com**

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