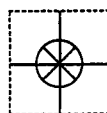
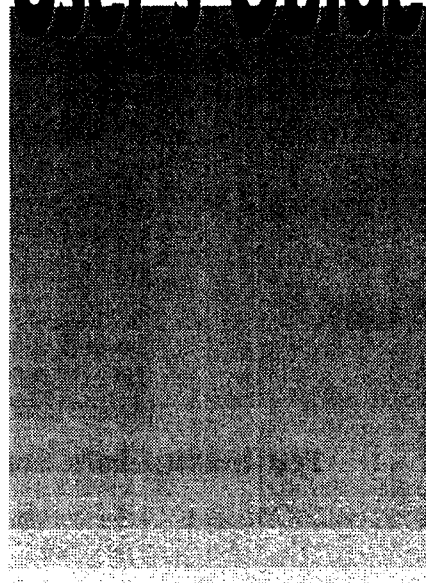
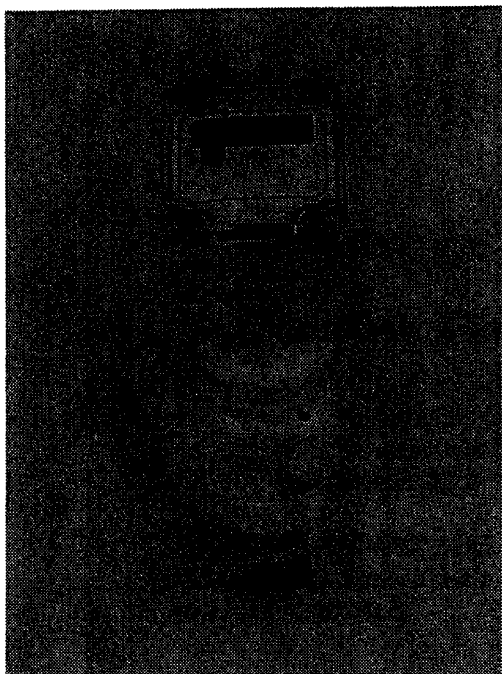


CE



User's Guide



omega.com™
ΩOMEGA®

www.omega.com
e-mail: info@omega.com

DPF201 INSERTION FLOW METER

OMEGAnet® On-Line Service
www.omega.com

Internet e-mail
info@omega.com

Servicing North America:

USA: One Omega Drive, P.O. Box 4047
ISO 9001 Certified Stamford CT 06907-0047
TEL: (203) 359-1660 FAX: (203) 359-7700
e-mail: info@omega.com

Canada: 976 Bergar
Laval (Quebec) H7L 5A1
TEL: (514) 856-6928 FAX: (514) 856-6886
e-mail: info@omega.ca

For immediate technical or application assistance:

USA and Canada: Sales Service: 1-800-826-6342 / 1-800-TC-OMEGA®
Customer Service: 1-800-622-2378 / 1-800-622-BEST®
Engineering Service: 1-800-872-9436 / 1-800-USA-WHEN®
TELEX: 996404 EASYLINK: 62968934 CABLE: OMEGA

Mexico: TEL: (001) 800-826-6342 FAX: (001) 203-359-7807
En Español: (001) 203-359-7803 e-mail: espanol@omega.com
info@omega.com.mx

Servicing Europe:

Benelux: Postbus 8034, 1180 LA Amstelveen, The Netherlands
TEL: +31 (0)20 6418405 FAX: +31 (0)20 6434643
Toll Free in Benelux: 0800 0993344
e-mail: nl@omega.com

Czech Republic: Rudé armády 1868, 733 01 Karviná 8
TEL: +420 (0)69 6311899 FAX: +420 (0)69 6311114
Toll Free in Czech Republic: 0800-1-66342 e-mail: czech@omega.com

France: 9, rue Denis Papin, 78190 Trappes
TEL: +33 (0)130 621 400 FAX: +33 (0)130 699 120
Toll Free in France: 0800-4-06342
e-mail: france@omega.com

Germany/Austria: Daimlerstrasse 26, D-75392 Deckenpfronn, Germany
TEL: +49 (0)7056 3017 FAX: +49 (0)7056 8540
Toll Free in Germany: 0800 TC-OMEGASM
e-mail: germany@omega.com

United Kingdom: One Omega Drive, River Bend Technology Centre
ISO 9002 Certified Northbank, Irlam, Manchester
M44 5EX United Kingdom
TEL: +44 (0)161 777 6611 FAX: +44 (0)161 777 6622
Toll Free in United Kingdom: 0800 488 488
e-mail: sales@omega.co.uk

It is the policy of OMEGA to comply with all worldwide safety and EMC/EMI regulations that apply. OMEGA is constantly pursuing certification of its products to the European New Approach Directives. OMEGA will add the CE mark to every appropriate device upon certification.

The information contained in this document is believed to be correct, but OMEGA Engineering, Inc. accepts no liability for any errors it contains, and reserves the right to alter specifications without notice.

WARNING: These products are not designed for use in, and should not be used for, patient-connected applications.

Operating Instructions

Omega Engineering Insertion Flow Monitor

The Omega Insertion Flow Monitor (DPF201) is a rugged, reliable and accurate instrument for monitoring and totalizing flows in full pipes of 2 to 30 diameters. The debris shedding turbo prop design makes the DPF201 ideal for irrigation water, well water, process water or other non-clean applications.

Precautions:

- The DPF201 is designed for pumped flows of less than 80 psi: do not use at greater pressures.
- Do not use for municipal gravity distribution systems or with pumped flows of greater than 80 psi.
- Turn off and lock out all pumps before installing the DPF201.
- Never attempt to remove the DPF201 with flow *on*, or with pressure in the pipe.
- Make sure the threads on the coupling are fully threaded and tight.
- Make sure the compression fitting nut is tightened fully, by using two hands or a strap wrench.
- Don't put your head over the DPF201 when starting the pump.

Installation:

The pipe to be measured must be provided with a 2" NPT female thread and a 2" diameter hole in the pipe. This can be accomplished by using a T fitting, a Weld-O-Let or a saddle (using standard plumbing techniques). The fitting should be on the top or sides of the pipe, *not on the bottom of the pipe*.

The Insertion Flow Monitor should be installed a minimum of 10 pipe diameters downstream from any turns, and 5 diameters upstream from any turns (or two thirds of the distance down a straight sections of pipe 15 diameters long). Longer straight sections of pipe will yield slightly better results. Shorter sections can be used but may result in a decrease in accuracy. If you have a shorter section of straight pipe, install the DPF201 two thirds of the distance down the straight section.

To install the DPF201, the probe must be put in so that the turbo-prop is inserted fully into the pipe. The prop support should face into the flow and the prop trailing. The red dot on the probe near the top should face *into* the flow.

For small diameter pipes, the prop is mounted near the pipe center. For large diameter pipes, the prop is mounted so the prop bearing screw is approximately one sixth of the diameter into the pipe. For pipe diameters of 2" to 8", mount the DPF201 so that the bottom of the probe is flush with the inside wall of the pipe. For larger diameter pipes, the probe bottom should stick into the pipe at distance = Diameter/6 - 1. (Example: For a 24" pipe, divide 24 by 6 = 4. Then subtract 1; the bottom of the probe should stick into the pipe 3".)

Since you will need to get the probe to the correct depth in the pipe, you will need to take a measurement. You can do this by using a standard tape measure with a hook on the end:

- Hook the inside of the pipe wall and measure to the top of the 2" female thread (this is distance "A" on the Insertion Flow Monitor Diagram). Note: If you are using a "T" fitting, increase your measured "A" distance by the thickness of the pipe wall.
- Screw the probe into the pipe by hand, until snug.
- Mark a spot on the male thread with a felt tip pen, one thread above the top of the female threaded piece. (This assumes that the probe will be inserted one turn more when you use the wrench at final installation.)
- Unscrew and remove the probe.
- Loosen the compression fitting that holds the probe into the fitting.
- Adjust the distance from the bottom of the probe to the ink spot on the thread to equal the measured distance from the pipe inside to the top of the female thread (distance "A"), plus the insertion depth (if any, as calculated above).

(If this is confusing just look at the Insertion Flow Monitor Diagram, which follows)

Apply teflon tape to the male thread and install the probe securely into the pipe, using a wrench. Then (without changing probe depth), twist the probe until the red spot faces into the flow. Tighten the compression nut, firmly, using both hands or a strap wrench.

Calibration Set Up:

You will need to set up the flow computer for the pipe diameter and the engineering units of flow and total. This is done by inserting calibration scaling numbers from the Insertion Flow Monitor Calibration Table (which follows). These numbers will only need to be reentered or changed when pipe diameters are changed, or when the batteries need to be changed, every 3-4 years.

To set the calibration numbers: remove the computer enclosure cover by unscrewing the four screws. (Note that the screws are retained in the cover; they are not removed.)

To enter the setup mode: flip the toggle switch to the UP position. There are 6 setup screens numbered 1 through 6 on the left side of the screen. You are in #1 now. Push the left button to move from setup screen to setup screen.

To find the calibration number for *Totalizer* look at the Insertion Flow Monitor Calibration Table corresponding to your Diameter and Totalizer Units.

- Under setup screen #1, insert this number, one digit at a time, by pushing the left button until the correct digit is blinking.
- Push the right button once to move to a new digit, and repeat until the number displayed is the same as the calibration number. When you have completed entering the number, all digits will stop blinking.
- Push the left button once to move to Screen #2. This is the decimal point for Totalizer, which is factory set to the far right (OFF) for no decimal point.
- For some units you will have to move this decimal place as required. Check the * at the top of the column and the notes at the bottom of the Insertion Flow Monitor Calibration Table (which follows).
- For other units, leave the decimal point at the far right (OFF).
- Push the left button once to enter Screen #3. This is Flow Rate Calibration Decimal Point.
- Set the decimal point to the position required by the Calibration Table, under the units and diameter you selected.
- Push left bottom to go to screen #4. Set the calibration number for Rate from the Table.
- Screen #5 is the Rate display decimal point which stays on OFF except for **mgd units** for which you need to move it one place to the left.
- Screen #6 is the front panel totalizer reset. Leave it "ON".

Note: For optional pulse output, screen #7 becomes the front panel totalizer reset. Leave it "on". Screen # 6 is the Pulse Output scaler. This output retransmits the input pulses by multiplying them by a value set table from 0.0001 to 0.9999. If you set this number equal to the "Totalizer" scaling number, a pulse out will occur each totalizer unit (once per gallon, once per m3, once per acre feet). If you set this number to be 1/10th the Totalizer number, you will get a pulse every 10 Totalizer units. If this number is 1/100 the Totalizer number you will get a pulse every 100 Totalizer units; etc.

This finishes the Calibration Set Up.

Put the toggle switch to the DOWN position and the Insertion Flow Monitor is ready to go. Push the right button once to reset the totalizer to 0.

Replace and firmly secure the cover.

Press on the rubber push- button to toggle between Rate and Totalizer displays.

The Flow Computer can be rotated on the Flow Meter for the best operator viewing.

It can be removed from the Flow Meter for maintenance or security by pulling the computer vertically away from the probe until it pops off. (It is secured by a stereo phone jack and plug.)

The display can be remoted 20' from the probe by using a standard 1/4 stereo extension cable. If the probe is used outdoors, seal the joint between the stereo plug and the probe with silicon rubber sealant.

Insertion Flow Monitor Calibration Table

Totalizer

Rate

Pipe Diameter (inches)	gal	m ³ **	* acre feet	Other	gpm	l/sec	cfs	*** mgd	Other
2	0.0177	0.0027	.0005		1.060	.073	.0026	.0153	
2.5	0.0276	0.0043	.0008		1.656	.115	.0041	.0238	
3	0.0340	0.0053	.0010		2.385	.165	.0058	.0343	
4	0.0683	0.0106	.0021		4.100	.284	.0100	.0590	
6	0.159	0.0247	.0049		9.54	.661	.0233	.1373	
8	0.283	0.0439	.0087		16.96	1.175	.0415	.2442	
10	0.442	0.0686	.0136		26.50	1.836	.0648	.3816	
12	0.636	0.0987	.0195		38.16	2.644	.0933	.5495	
14	0.866	0.134	.0266		51.94	3.510	.1270	.7479	
16	1.130	0.175	.0347		67.84	4.700	.1659	.977	
18	1.431	0.222	.0439		85.86	5.949	.2100	1.236	
20	1.766	0.274	.0542		106.0	7.344	.2593	1.526	
24	2.543	0.395	.0781		152.6	10.57	.3732	2.197	
30	3.975	0.617	.1220		238.5	16.52	.5834	3.434	

*Move decimal point 4 places to left **Move decimal point 2 places to left ***Move decimal point 1 place to left



WARRANTY/DISCLAIMER

OMEGA ENGINEERING, INC. warrants this unit to be free of defects in materials and workmanship for a period of **13 months** from date of purchase. OMEGA's WARRANTY adds an additional one (1) month grace period to the normal **one (1) year product warranty** to cover handling and shipping time. This ensures that OMEGA's customers receive maximum coverage on each product.

If the unit malfunctions, it must be returned to the factory for evaluation. OMEGA's Customer Service Department will issue an Authorized Return (AR) number immediately upon phone or written request. Upon examination by OMEGA, if the unit is found to be defective, it will be repaired or replaced at no charge. OMEGA's WARRANTY does not apply to defects resulting from any action of the purchaser, including but not limited to mishandling, improper interfacing, operation outside of design limits, improper repair, or unauthorized modification. This WARRANTY is VOID if the unit shows evidence of having been tampered with or shows evidence of having been damaged as a result of excessive corrosion; or current, heat, moisture or vibration; improper specification; misapplication; misuse or other operating conditions outside of OMEGA's control. Components which wear are not warranted, including but not limited to contact points, fuses, and triacs.

OMEGA is pleased to offer suggestions on the use of its various products. However, OMEGA neither assumes responsibility for any omissions or errors nor assumes liability for any damages that result from the use of its products in accordance with information provided by OMEGA, either verbal or written. OMEGA warrants only that the parts manufactured by it will be as specified and free of defects. OMEGA MAKES NO OTHER WARRANTIES OR REPRESENTATIONS OF ANY KIND WHATSOEVER, EXPRESS OR IMPLIED, EXCEPT THAT OF TITLE, AND ALL IMPLIED WARRANTIES INCLUDING ANY WARRANTY OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE HEREBY DISCLAIMED. LIMITATION OF LIABILITY: The remedies of purchaser set forth herein are exclusive, and the total liability of OMEGA with respect to this order, whether based on contract, warranty, negligence, indemnification, strict liability or otherwise, shall not exceed the purchase price of the component upon which liability is based. In no event shall OMEGA be liable for consequential, incidental or special damages.

CONDITIONS: Equipment sold by OMEGA is not intended to be used, nor shall it be used: (1) as a "Basic Component" under 10 CFR 21 (NRC), used in or with any nuclear installation or activity; or (2) in medical applications or used on humans. Should any Product(s) be used in or with any nuclear installation or activity, medical application, used on humans, or misused in any way, OMEGA assumes no responsibility as set forth in our basic WARRANTY/DISCLAIMER language, and, additionally, purchaser will indemnify OMEGA and hold OMEGA harmless from any liability or damage whatsoever arising out of the use of the Product(s) in such a manner.

RETURN REQUESTS/INQUIRIES

Direct all warranty and repair requests/inquiries to the OMEGA Customer Service Department. **BEFORE RETURNING ANY PRODUCT(S) TO OMEGA, PURCHASER MUST OBTAIN AN AUTHORIZED RETURN (AR) NUMBER FROM OMEGA'S CUSTOMER SERVICE DEPARTMENT (IN ORDER TO AVOID PROCESSING DELAYS).** The assigned AR number should then be marked on the outside of the return package and on any correspondence.

The purchaser is responsible for shipping charges, freight, insurance and proper packaging to prevent breakage in transit.

FOR **WARRANTY** RETURNS, please have the following information available **BEFORE** contacting OMEGA:

1. Purchase Order number under which the product was **PURCHASED**,
2. Model and serial number of the product under warranty, and
3. Repair instructions and/or specific problems relative to the product.

FOR **NON-WARRANTY** REPAIRS, consult OMEGA for current repair charges. Have the following information available **BEFORE** contacting OMEGA:

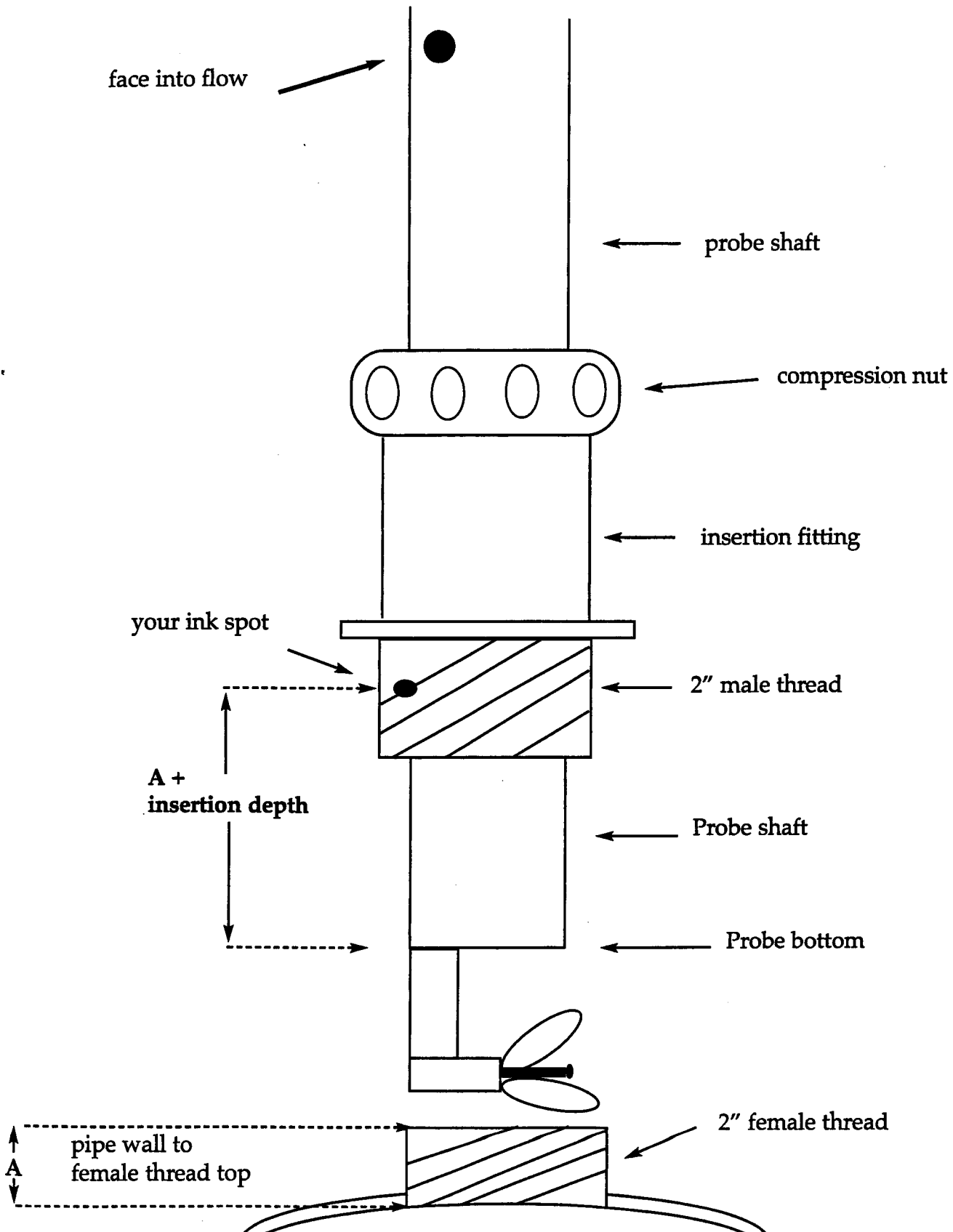
1. Purchase Order number to cover the **COST** of the repair,
2. Model and serial number of the product, and
3. Repair instructions and/or specific problems relative to the product.

OMEGA's policy is to make running changes, not model changes, whenever an improvement is possible. This affords our customers the latest in technology and engineering.

OMEGA is a registered trademark of OMEGA ENGINEERING, INC.

© Copyright 1999 OMEGA ENGINEERING, INC. All rights reserved. This document may not be copied, photocopied, reproduced, translated, or reduced to any electronic medium or machine-readable form, in whole or in part, without the prior written consent of OMEGA ENGINEERING, INC.

Omega Engineering Insertion Flow Monitor Diagram



Where Do I Find Everything I Need for Process Measurement and Control? OMEGA...Of Course!

TEMPERATURE

- Thermocouple, RTD & Thermistor Probes, Connectors, Panels & Assemblies
- Wire: Thermocouple, RTD & Thermistor
- Calibrators & Ice Point References
- Recorders, Controllers & Process Monitors
- Infrared Pyrometers

PRESSURE, STRAIN AND FORCE

- Transducers & Strain Gages
- Load Cells & Pressure Gages
- Displacement Transducers
- Instrumentation & Accessories

FLOW/LEVEL

- Rotameters, Gas Mass Flowmeters & Flow Computers
- Air Velocity Indicators
- Turbine/Paddlewheel Systems
- Totalizers & Batch Controllers

pH/CONDUCTIVITY

- pH Electrodes, Testers & Accessories
- Benchtop/Laboratory Meters
- Controllers, Calibrators, Simulators & Pumps
- Industrial pH & Conductivity Equipment

DATA ACQUISITION

- Data Acquisition & Engineering Software
- Communications-Based Acquisition Systems
- Plug-in Cards for Apple, IBM & Compatibles
- Datalogging Systems
- Recorders, Printers & Plotters

HEATERS

- Heating Cable
- Cartridge & Strip Heaters
- Immersion & Band Heaters
- Flexible Heaters
- Laboratory Heaters

ENVIRONMENTAL MONITORING AND CONTROL

- Metering & Control Instrumentation
- Refractometers
- Pumps & Tubing
- Air, Soil & Water Monitors
- Industrial Water & Wastewater Treatment
- pH, Conductivity & Dissolved Oxygen Instruments

