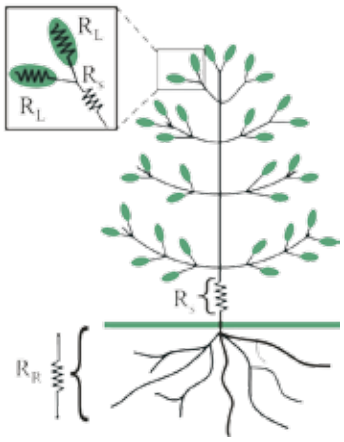
HCFM-XP
High Pressure Flow Meter

Dynamax



The Hydraulic Conductance Flow Meter (HCFM) is designed to perform quantitative root and stem analysis without having to dig up roots or drag limbs back to the lab. In most cases, the analysis of a sample root or shoot is completed in as little as 10 minutes. You can quickly measure the major components of the hydraulic conductance in the soil-plant atmosphere continuum. The hydraulic architecture of a whole shoot or of a single leaf can be represented by a resistance diagram similar to the one on the left. One can measure the values of the individual hydraulic resistances, then compute the pattern of water flow and water potentials in the resistance network. Each hydraulic resistance element (R) equals the pressure difference driving flow through the element divided by the resulting flow (F). In the HCFM method, the resistance of the root and shoot are measured separately by pressure perfusion and added together. The HCFM will help plant physiologists and agronomists look forward to those seasonal studies of root and shoot progression, water potential, or soil treatment effects.

The HCFM is Designed for Two Types of Numerical Analysis

The first analysis is an in-situ transient analysis of hydraulic conductance. HCFM measures the flow as the water pressure increases while flowing into the root or shoot. The software then intelligently calculates the slope of the increased flow and pressure. That slope is the hydraulic conductance. The second analysis is a quasi-steady state, constant pressure and flow into the sample. This derives the flow pressure and conductance in a steady state environment.

Software

The HCFM comes with menu driven software that is easy to use and straight forward in its approach. The software also includes diagnostics and calibration modes to assure the user of correct readings. All data is saved to the PC hard drive for later analysis by your favorite spreadsheet and graphing packages.

Features

- **Very portable "briefcase" design**
- **NIST calibration standard feature**
- **Instant data regression, and auto-saver aged results**
- **USB powered data acquisition**
- **New High Res Generation 3 HCFM**
- **Roots or Shoots, Stems or Petioles**
- **Intelligent regression**
- **Vista, XP, and Windows 7 supported**
- **Root conductance in the lab or field**

Dynamax, Inc | 10808 Fallstone Rd #350 | Houston TX 77099 | USA | admin@dynamax.com | www.dynamax.com | 800-896-7108

Specifications

Stem Ranges	1 mm to 36 mm diameters
Flow Rates	0.01 to 350 grams/hr in 5 overlapping ranges
Conductance	7.7E-08 to 3.5E-04 Kg s-1 MPa-1
Electronic A/D	24-bit resolution dual Analog / Digital converters
Analog/Digital	One reading every two seconds
Data Interface	USB, USB powered
Dimensions	22” x 19” x 9” (61 x 48 x 23 cm)
Weight	33 lb (15 kg)
Capacity	24 oz. Degassed Water
Maximum Pressure	90 psi (620 kPa)
Air Gas Tank	6 cu. ft. (170 liter) with CGA-580 Valve & Connector

Ordering Information

Dynamax includes all the fittings and couplings you may require for analysis. These additional parts include high quality couplings machined out of Lexan for durability and easy viewing.

Compression Couplings to Plants

a) 1-4 mm stem / HPLC Coupling, with O-Rings
b) 4-10 mm stem / HPLC Coupling, with O-Rings
c) 10-20 mm stem / HPLC Coupling, 6 Rubber seals with
d) compression rings
e) 19-36 mm stem / HPLC Coupling, 9 Rubber seals with
f) compression rings

Components Included with the System

- Pressure bottle with 1,800 psi (12.5 MPa) pressure regulator
- Pressure safety valve
- 2 ft (0.6 m) high pressure hose
- 6 ft of FEP hose, 5 ft of HPLC hose with spare couplings
- 8-way manifolds, two each
- Micron filter
- Portable degassed water refill kit with quick disconnects
- Algicide
- Cutting tools
- Coupling lubricant
- Bleeding kit
- Manual & Software CD