

# Sap Velocity - Thermal Dissipation Probe



TDP sensors are easily installed and removed for reuse.

## Features

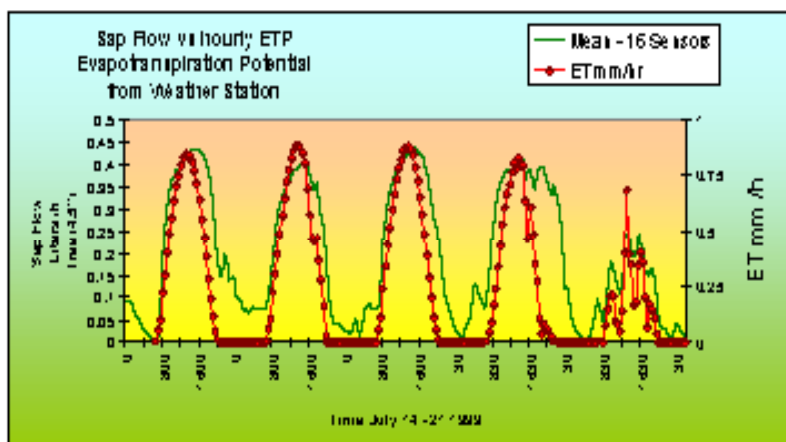
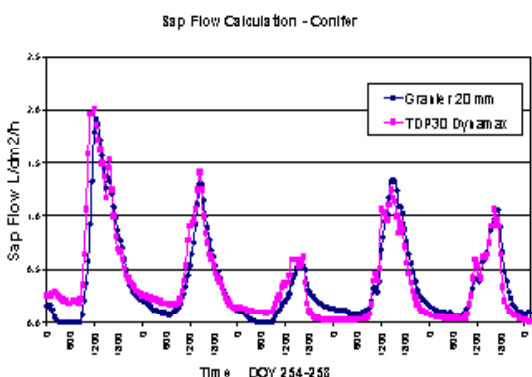
- Dual needle, patented Granier design with Dynamax upgrades
- Easily inserted and removed for reuse
- Constant heat, thermal dissipation method; not heat pulse
- Continuous measurement method
- No waiting periods and no heat pulses
- Stainless steel needles are Teflon coated for durability and longevity
- Compatible with most data loggers
- Differentially wired T- type thermocouples
- Electronics and connectors sealed / weatherproofed
- Wires directly to data logger, one differential channel each
- Ten ft. cables, sensor insulation, and manuals included

The newest method of transpiration measurement is now available from Dynamax for large trees and plants. The Thermal Dissipation Probe (TDP) transpiration sensor measures sap velocity which is converted to volumetric flow rate. TDP is a simple and affordable device originally proposed by Granier. The basic TDP probe has two thermocouple needles inserted in the sapwood, the upper one containing an electric heater. The probe needles measure the temperature difference ( $dT$ ) between the heated needle and the sapwood ambient temperature below. The  $dT$  variable and the maximum  $dT_m$  at zero flow provide a direct conversion to sap velocity.

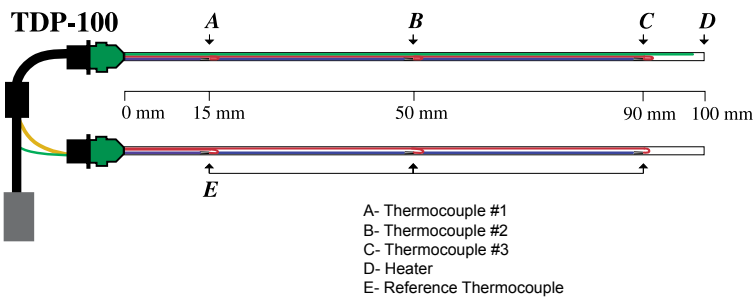
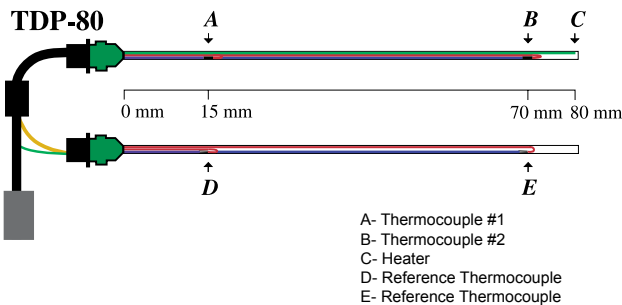
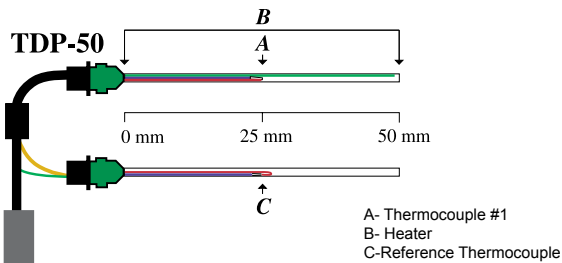
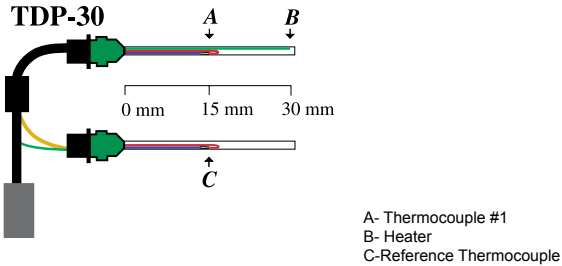
For uniform trees in a closed canopy, only one sensor per tree is needed. For irregular canopies or with mixed species, sap flow varies around the circumference of large trees. Thus multiple probes are recommended in a single tree to make flow calculations accurately. Normally, install two probe sets per tree for trees 3" to 6" (75 to 150 mm) in diameter, and four probe sets per tree for trees 6" to 18" in diameter (>150 mm). Calibration is recommended for new species.

## TDP Specifications

Model	TDP-10	TDP-30	TDP-50	TDP-80	TDP-100
Length	10mm	30mm	50mm	80mm	100mm
Diameter	1.2mm	1.2mm	1.65mm	1.65mm	1.65mm
T-Type T/C's	1 ea	1 ea	1 ea	2 ea	3 ea
Probe Spacing	40mm	40mm	40mm	40mm	40mm
Power	.08 - .12W	.15-.2W	.25-.30 W	.45 W	.5 - .6 W
Cable	10 ft/5 Cond	10 ft/5 Cond	10 ft/5 Cond	10 ft/6 Cond	10 ft/7 Cond
Heater Resistance	26 Ohms	52 Ohms	77 Ohms	122 Ohms	144 Ohms
Operating Volts @-7°C	2.0 V	3.0 V	5.0 V	7.0 V	8.5 - 9 V
Signal Out	40 $\mu$ V/°C	40 $\mu$ V/°C	40 $\mu$ V/°C	40 $\mu$ V/°C	40 $\mu$ V/°C



# TDP Accessories



Evapotranspiration potential, ETP is compared to TDP sap flow on an hourly basis (left). Four consecutive days of hot sunny weather cause a corresponding sap velocity in poplar trees. On the fifth day, cloudy and cooler weather cause transpiration rates to vary in step with ETP. By comparing the daily ETP and the daily sap flow, the crop index may be computed for this type of tree. Crop index makes seasonal estimates of transpiration very straightforward.

## Ordering Information

FLDL-TDP  
TDP Sap Velocity System, fully assembled, DL2 based

FLGS-TDPXM1000  
TDP Sap Velocity System, fully assembled, CR1000 based

FL32-GS8  
Flow32 expansion kit for TDP probes with 8 TDP30 sensors

FL32-GS16  
Flow32 expansion kit / same as above with 16 TDP-30 sensors and cables

FL32-GS  
Extension cables to 75 ft, Solar panels

TDP-30  
Sap Velocity Thermal Dissipation Probe 30 mm, 10 ft cable with connector

TDP-50  
Sap Velocity Thermal Dissipation Probe 50 mm, 10 ft cable with connector

TDP-80  
Sap Velocity Dual T/C Thermal Dissipation Probe 80 mm, 10 ft cable with connector

TDP-100  
Sap Velocity Profile Probe. 100 mm, 10 ft cable with connector. Extension cable EXTP-xxP, xx ft.

## Accessories

TDPJ1 Installation kit. Drilling jig, drill bits (4), removal prybar

TDPJ2 Drilling jig, drill bits (4), battery power drill, 120 Vac charger, removal prybar

EXTP-25 Extension cable, 5 Wire/25 ft (7.6 m)

EXTP-50 Extension cable, 5 Wire/50 ft (15 m)

EXTP-75 Extension cable, 5 Wire/75 ft (22.8 m)

EXTP-100 Extension cable, 5 Wire/100 ft (30.5 m)

EXTP-25D Dual T/C extension cable for TDP-80, 6 wire 25 ft

EXTP-50D Dual T/C extension cable for TDP-80, 6 wire 50 ft

EXTP-75D Dual T/C extension cable for TDP-80, 6 wire 75 ft

EXTP-100D  
Dual T/C extension cable for TDP-80, 6 wire 100 ft

EXTP-25T Extension cable, 7 Wire/25 ft (7.6 m)

EXTP-50T Extension cable, 7 Wire/50 ft (15 m)

EXTP-75T Extension cable, 7 Wire/75 ft (22.8 m)

EXTP-100T Extension cable, 7 Wire/100 ft (30.5 m)

AVRD Dual adjustable voltage regulator for 6-12 V battery

MSX50R 50W solar panel with mounts and regulator

MSX30R 30W solar panel with mounts and regulator

MSX20R 20W solar panel with mounts and regulator

## Dynamax Inc

10808 Fallstone Rd #350  
Houston, TX 77099 USA

Tel: 281-564-5100 Fax: 281-564-5200

admin@dynamax.com

www.dynamax.com

