

Data sheet

Psychrometer HYGROPHIL 4457

Precise hygrometry under different using conditions in research and development and in the laboratory.

Especially suitable for inspection of capacitive humidity sensors in climatic applications.

Programmable measurement memory.

Data transfer to PC.

Delivery with accessories in a handy carrying case.



Application

HYGROPHIL® 4457 is a portable, microprocessor-controlled hygrometer. Together with special probes it can be used to measure the temperature and the humidity of the air (psychrometric measurement), and to determine other measurands in the field of air conditioning.

The compact system can be operated with batteries and can be used in many areas of application, both as a stationary and as a mobile unit.

Therefore arise a great variety of application e.g. in

Development,
Research,
Production,
Museums,
Air conditioning,
Horticulture and wine growing institutes,
Meteorology,
Building experts.

The device is delivered together with complete accessories in a equipment carrying case.

As a stationary unit, the system is powered by a 12V DC plug-in power supply.

Function

The probe's functional principle is that of an aspirated psychrometer, or wet and dry bulb hygrometer: Air is sucked in by means of a fan. The air flow passes a wet-bulb thermometer and a dry-bulb thermometer with a certain velocity. Due to the difference between the water vapor partial pressure of the air flow and the saturated water vapor pressure above the wet-bulb thermometer water evaporates above the wet-bulb thermometer. The evaporation heat is taken from the passing air flow, causing a (psychrometric) temperature difference between the two thermometers. This difference is a measure for the degree of humidity of the air. Since the temperature difference is slightly affected by the air temperature and air pressure, these values must be measured at the same time. The relative or mixed humidity can be derived from the psychrometric temperature difference by applying Sprung's formula as given in the DIN 50012 standard.

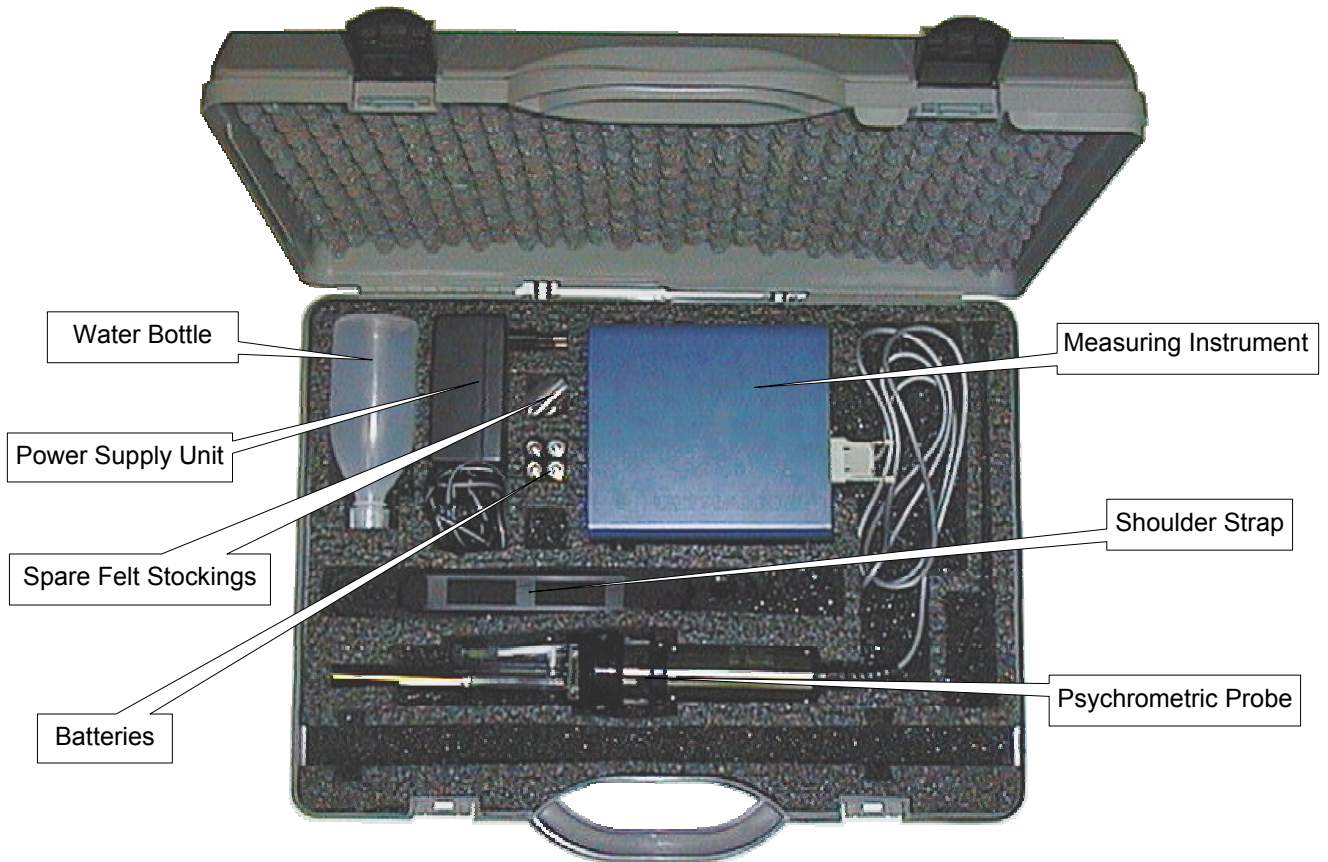
- **Measured quantities:**

True temperature	TT
Humid temperature	HT
Dewpoint temperature	DT
Relative humidity	RH
Mixed humidity	MH
Vapour Pressure	VP
Enthalpie	h
Wind velocity	v
- **Analog output for indicated quantity**
- **Independent from mains by battery power**
- **Programmable operating parameters**
- **Interface RS 232**
- **Measuring processing by using the PC**

Technical Data		
Display ranges	Dry-bulb temperature (TT)	-20...+100 °C / -20...+210 °F
	Wet-bulb temperature (HT)	-20...+100 °C / -20...+210 °F
	Dew point (DT)	-20...+100 °C / -20...+210 °F
	Relative humidity (RH)	5...100%
	Mixed humidity (MH)	0...500 g/kg
	Vapor pressure (VP)	0...500 hPa
	Enthalpy (h)	0...400 kJ/kg
	Wind velocity (V)	0,3...19,99 m/s
Analog output	Output voltage	0...1000 mV = 0,25 mV / Digit
	Burden	≥ 1kΩ
	Precision	≤ 0,5% of measuring range
Precision	Precision of measuring	≤ ± 0.1 °C or 0.2°F ± 1 digit for TT/HT/DT ≤ 1% for RH / MH / VP / h ≤ 0.1 m/s ± 1 digit for V
	Nominal conditions	23 °C ± 2 °C or 73 °F ± 4 °F
	Temperature effect	≤ 0.01 % of measuring range
Auxiliary power	Battery set	4x mignon batteries, type AA, R6, UM3 or RLR 6AA (rechargeable), sufficient for 10 hours of operation
	Power consumption	100 mA
	Power supply unit	DC 12 V, 300 mA
Environmental conditions	Period of operation	10 h with batteries, continuous operation with power supply unit
	Working temperature	0...50 °C or 30...120 °F
	Storage temperature	-10...+50 °C or 10...120 °F
Casing	Climatic category	KWF in compliance with DIN 40040
	Quality	Blue aluminum casing with embossed, sealed key panel
	Category of protection	IP 20
	Dimensions	140 x 70 x 150 mm
Psychrometric probe, type W 1465	Weight	About 8.3 N (= 830 g)
	Functional principle	Psychrometric measurement of the humidity of the air
	Measuring precision *	≤ ± 0.1 °C within a range of -20...+100 °C
	Working temperature	0...+80 °C (5 min: -10...+100 °C)
	Storage temperature	-20...+80 °C (water must have been removed)
	Weight	About 4 N (= 0.4 kg)
	Dimensions	Max. Ø 52 x 320 mm
	Connection	1.5 m cable with 9-pin plug
	Interface	RS 485
	* For psychrometric humidity measurement it is not possible to directly state the error range for RH, VP, MH, and H.	
Dimensions	Casing	

Delivery Package

The HYGROPHIL® 4457 measuring system comes complete with accessories and carrying case.. There are three standard measuring sets available (see Order Numbers).



Order Numbers

Designation	Order No.
Hygrophil porty type 4457-10 (Measuring set)	
Measuring instrument (evaluation unit) type 4457	U 310 1 445 710
Psychrometric probe type W 1465	
Shoulder strap	
Water bottle	
Power supply unit	
4 batteries (alkali-manganese), size AA	
Felt stockings (3 pieces)	
Carrying case	
Hygrophil porty plus type 4457-11 (Measuring set)	
Delivery scope like 4457-10, higher performance by an additional digital thermometer TFN 1293 with all purpose temperature probe T 320 (-100 °C...+500 °C, NiCr-Ni)	U 310 1 445 711
Hygrophil porty type 4457-12 (Measuring set)	
Delivery scope like 4457-10, with additional external start key type 4457-102	207810

Description	Order No.
Single devices/Accessories	
Measuring instrument (evaluation unit) type 4457	U 310 1 44 57
Psychrometric probe type W 1465	U 750 1 1465
Anemometer V1902	U 762 1 1902
Telescope for anemometer	U 762 1 190 2100
Extension cable for psychrometric probe (5m)	U 750 1 146 5103
Extension cable for psychrometric probe (10m)	U 750 1 146 5104
Power supply unit AC 230 V / DC 12 V, 600 mA	U 496 476
Power supply unit 100...240 V / DC 12 V, 600 mA	U 010 1 443 1283
Digital thermometer type TFN 1293 for NiCr-Ni-probe	U 882 1 12 93
Temperature probe type T320 (NiCr-Ni, T _{max} 500 °C)	U 7111102320
Interface cable RS 232 – Printer	U 496 442
Interface cable RS 232 – PC	U 496 443
External start-key type 4457-102	206 566
Consumption materials	
Felt stockings (10 pieces)	U 750 1 146 510
Felt strips type WN 306 (10 pieces)	U 030 1 2306
Round felt wick type WN 294 (10 pieces)	U 030 1 2294
Measuring chamber	U 750 1 465 101
Ddistilled water, pure, 200 ml	U 050 0 7652
Batteries 1,5 V (alkali-manganese), size AA (4 pieces)	U 0101240106
Spare parts	
Fan	U 750 1 146 5100
Stopper for water supply container	U 050 0 0564
Shoulder strap	U 310 1 445 7101
Carrying case with padding	U 180 0 03