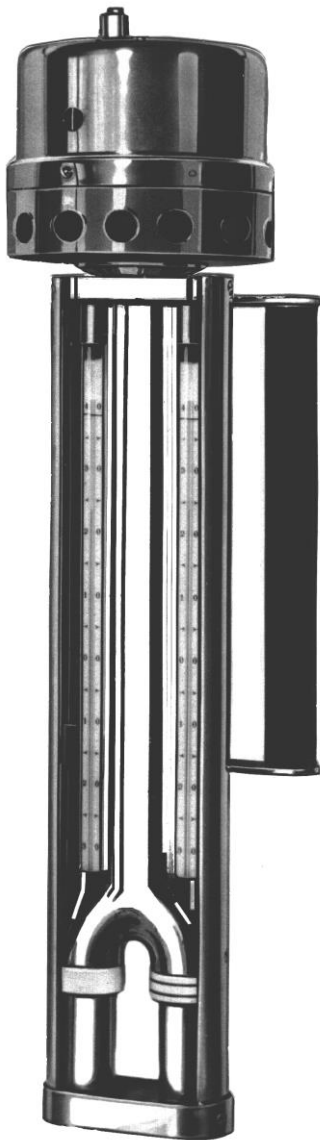
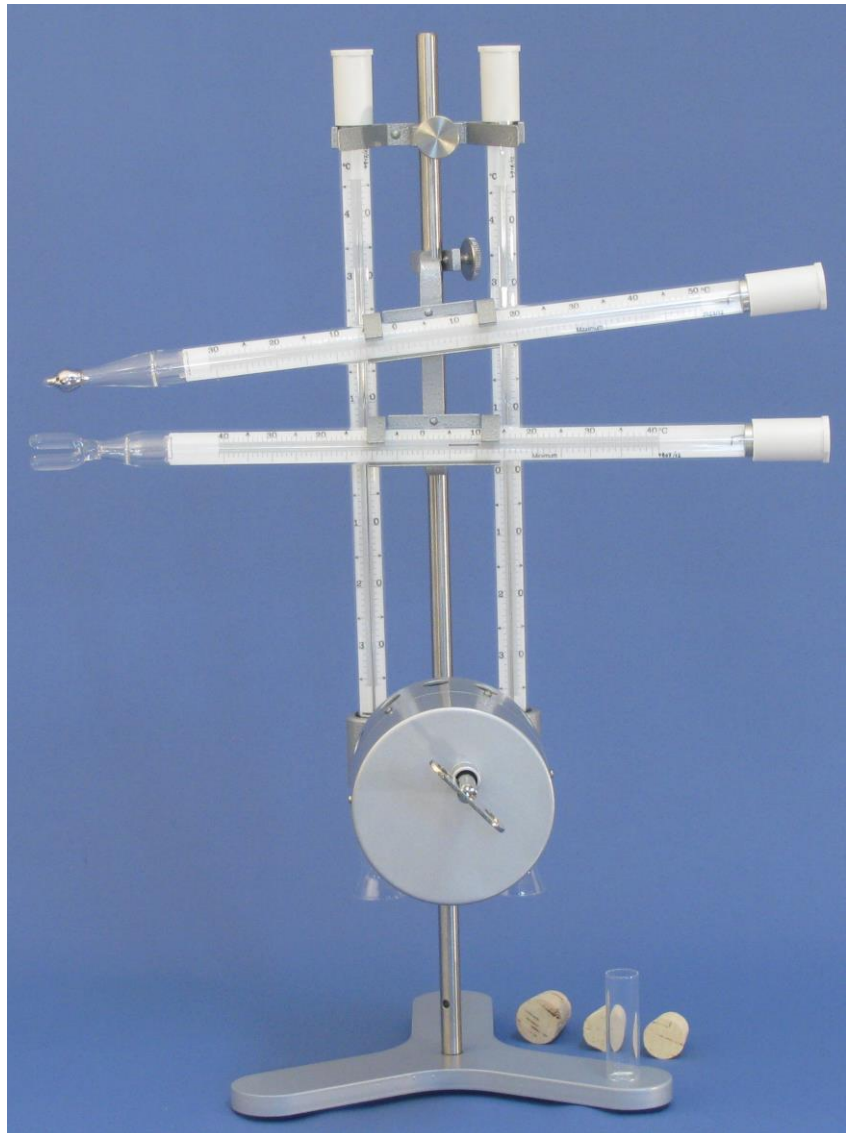


PSYCHROMETERS

for Determination of True Temperature and Humidity of the Air



Aspiration-Psychrometer
Assmann Type



Aspiration-Psychrometer
August Type with extreme Thermometers

Psychrometers consist of two equal thermometers, the bulb of one of which, i. e., the so-called "wet thermometer", is covered with a thin piece of muslin that is to be moistened, whilst the bulb of the second, the "dry thermometer", remains without covering. The dry thermometer indicates true temperature, while the wet thermometer, due to coldness of evaporation, indicates the lower a value, the drier the ambient air is. The two readings make possible accurate determination of relative and absolute humidity of the air, vapour pressure, and the dew point, either by calculation or by means of psychrometric tables.

The difference between both temperatures, i.e., the "psychrometric difference", is, additionally, depending upon the speed, with which the air flows past the wet thermometer. Only above 2 m/sec further increase of speed will no longer be noticeable. The relevant equations for compensation and the psychrometric tables in use are based on a speed of ventilation of, at least, 2 m/sec. In the case of psychrometers with artificial ventilation, one is to take care therefore that this speed is guaranteed during measurement.

Although it is possible, by means of Jelinek's psychrometric tables, to take into consideration their influence of different air speeds, psychrometers without artificial ventilation are, just the same, little suited for accurate measurement, because true speed is hardly to be determined, practically. For reliable determination of humidity of the air, therefore, at least the wet-bulb thermometer should be ventilated. For especially accurate measurement, however, ventilation of both thermometers has proved expedient.



Fig.1 Psychrometer 28, August-Type, without ventilation, consisting of grey lacquered stand, with thermometer holders, water vessel with holder for 2 equal thermometers



Fig. 2 Psychrometer 28/2 with large aspirator, for ventilation of both thermometers



Fig.3

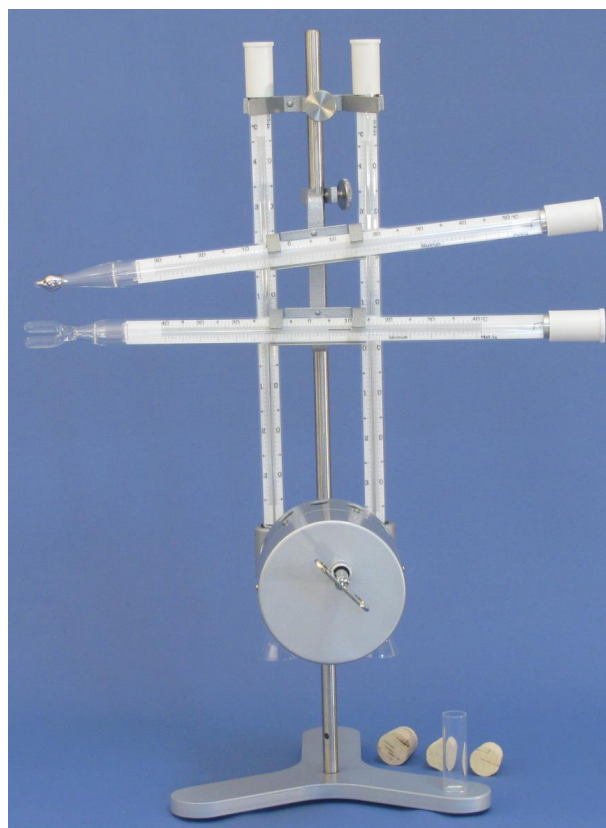


Fig. 4

Fig. 1: No. 28 plus two like thermometers

Fig. 2: No. 28/2 plus two like thermometers

Fig. 3: No. 28 plus two like thermometers and holder T23 UG14 with maximum and minimum thermometer

Fig. 4: No. 28/2 plus two like thermometers and holder T23 UG14 with maximum and minimum thermometer

(on the pictures 2 and 4 the mechanical aspirator is shown, this type is out of production, and the instrument is equipped with electrical aspirator)

At an extra charge, all thermometers will be supplied either with a factory test certificate or a certificate of "Physikalisch-Technische Bundesanstalt" (National Physical-Technical Institute of German Federal Republic), of which the latter test certificate involves the higher fees and necessitates a longer time of delivery.

All thermometers can be supplied with mercury-free filling except for the maximum thermometers.

Extreme Thermometers

	division	1/2°C	1/5°C
	length	29 cm	37 cm
	weight	0.075 kg	0.080 kg
	range	No.	No.
Maximum-Thermometer	-30 °C ... +50 °C	42/50	43c/50
	-10 °C ... +60 °C	42/60	43c/60
Minimum-Thermometer	-40 °C ... +40 °C	MIN-40+40/0,5	MIN-40+40/0,2
	-10 °C ... +60 °C	MIN-10+60/0,5	MIN-10+60/0,2
	-30 °C ... +50 °C	MIN-30+50/0,5	MIN-30+50/0,2

T23 UG14

holder for maximum- and minimum-thermometers

Psychrometers 28 and 28/2 (August Type)

These are to be mounted against radiation; i. e., best in a thermometer screen. In this case the thermometer holders are fastened to the rod arranged inside the screen. For other cases a tripod with bar can be supplied simultaneously. The August type psychrometer may be used:

- a) without artificial ventilation, as per fig.1;
- b) with ventilation of both thermometers by large mechanical aspirator T23 UG25 as per fig.2.
(not deliverable anymore, please use the follow-up model with electric aspirator No. T23 UG25E)
- c) with ventilation of both thermometers by large aspirator with electric drive and rechargeable batteries T25 UG25E.

The aspirators for artificial ventilation are easily removable. They consist of a small blower, designed of which latter guarantees the required speed of air flow past the thermometer bodies.

Specifications

No.		weight in kg
	Psychrometer, August type, consisting of 2 like thermometers, range -35°C to +45 °C or -10°C to +60 °C (or -30°C ... +50°C)	
28/45P	pair of equal thermometers range -35 to +45°C, division in 1/5°, length 370 mm	0.10
28/60P	pair of equal thermometers range -10 to +60°C, division in 1/5°, length 370 mm	0.10
28/50P	pair of equal thermometers range -30 to +50°C, division in 1/5°, length 370 mm	0.10
AUG-20+60/0,2	thermometer free of mercury, range -20 to +60°C, division in 1/5°, length 370 mm	
AUG-30+50/0,2	thermometer free of mercury, range -30 to +50°C, division in 1/5°, length 370 mm	
AUG-35+45/0,2	thermometer free of mercury, range -35 to +45°C, division in 1/5°, length 370 mm	
29/45P	pair of equal thermometers range -35 to +45°C, division in 1/2°, length 340 mm	0.08
29/60P	pair of equal thermometers range -10 to +60°C, division in 1/2°, length 340 mm	0.08
28	Tripod complete, without ventilating device as per fig. 1 (without thermometers), consisting of:	1.6
	T23 UG16 2 thermometer holders	0.10
	T23 UG04,1 1 water vessel	0.01
	T23 T007 1 holder for water vessel	0.03
	T23 UG01 1 tripod with bar	1.45
	31LD 1 Set muslin sleeve and wick	
	T23 T072 2 stoppers	
	(2x)	
28/2E	Tripod complete with electrical ventilating device for both thermometers as per fig. 2 (without thermometers), consisting of:	2.5
	T23 UG25E 1 large electrical aspirator, only	0.75
	T23 UG06 2 thermometer enveloping tubes with cemented-on threaded rings	0.02
	T23 UG09A 1 holder for large aspirator	0.20
	T23 UG16 1 holder for thermometer	0.05
	T23 UG01 1 tripod with bar	1.45
	31L/8 1 muslin sleeve	
	T23 UG21 Set of 3 stoppers	
	T23 T090 1 moistening glass	
28/SH	Tripod and support without aspirator	
	T23 UG06 2 thermometer enveloping tubes with cemented-on threaded rings	
	T23 UG09A 1 holder for large aspirator	
	T23 UG16 1 holder for thermometer	
	T23 UG01 1 tripod with bar	
	31L/8 1 muslin sleeve	
	T23 UG21 Set of 3 stoppers	
	T23 T090 1 moistening glass	



Large aspirator with electric drive and rechargeable accumulators

for spare parts please indicate with order:

Manufacturer	Psychrometer Type	Connection part
Lambrecht / Thies / Amarell	Assmann August	double adapting connector: - thread M22x0,75 - bayonet connection R22x1
Dr. Müller / R. FUESS - production before year 2021 - production after year 2021	Assmann	Art. No. TH47 BG04 - thread M22x0,5 - thread M22x0,75
Dr. Müller / R. FUESS	August	Art. No. T23 UG25E - bayonet connection R22x2 with screw
Ketterer		to clarify at time of order
Thermoschneider		to clarify at time of order

The power supply takes place through four pieces 1.2 V build-in rechargeable Ni/Mh accumulators. These can be loaded by a recharger on main connection for 100 - 240 V AC, 50-60 Hz. The electric aspirator for artificial ventilation is easy to assemble at the Psychrometer. It consists of an electric drive, which rotates a small blower, design of which latter guarantees the required speed of air flow past the thermometer bodies.

Material: Aluminium
 Surface: RAL9006, shiny
 Spring winding time: > 6 minutes
 Air speed: > 2 m/s (5-7 m/s)
 Weight: 0.6 kg
 Dimensions: Ø 9 cm, height 11cm
 incl. EU-Adapter (others available on request)
 protected against deep discharging



Fig. 1: August type Aspirator

The Psychrometric constant C for the calculation of humidity is independent from the speed of ventilation only from approximately 2 m/s onwards. For this reason, it is recommendable to use psychrometers with artificial ventilation, the aspirator of which ensures that the speed of ventilation does not drop to below 2 m/s, during measurement.

The aspirator is equipped with electrical driven fan, that grant a speed of at least 2 m/s, in reality it is quite higher, namely between 5 and 7 m/s. This value of at least 2 m/s is important for the measurement. A higher speed does not modify the results of measuring and has no influence on the results. We grant, that our psychrometer meet the requirements of the WMO and are used from the Weather Services to theirs full satisfaction. We can guarantee that the relevant airspeed at the place of the thermometer bulbs is higher than 5 m/s.

Large mechanical Aspirator for Psychrometer August and Assmann type

*(this type is out of production, please use the follow-up model with electrical aspirator
No. TH47 BG04 resp. T23 UG25E)*

The mechanical aspirator for artificial ventilation is easy to assemble at the Psychrometer August type. It consists of a spring drive, which rotates a small blower, design of which latter guarantees the required speed of air flow past the thermometer bodies.

Material: Aluminium

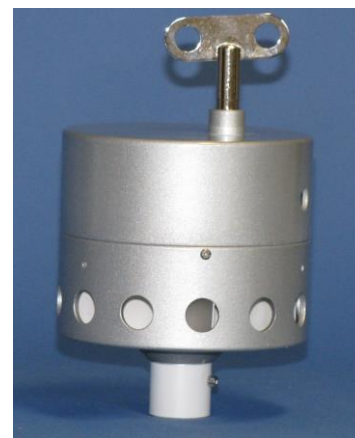
Surface: RAL9006, shiny

Spring winding time: > 6 minutes

Air speed: > 2 m/s (5-7 m/s)

Weight: 0.6 kg

Dimensions: Ø 9 cm, height 11cm



The Psychrometric constant C for the calculation of humidity is independent from the speed of ventilation only from approximately 2 m/s onwards. For this reason, it is recommendable to use psychrometers with artificial ventilation, the aspirator of which ensures that the speed of ventilation does not drop to below 2 m/s, during measurement. The aspirator T23 UG25 is equipped with mechanical clockwork and a fan, that grant a speed of at least 2 m/s, in reality it is quite higher, namely between 5 and 7 m/s.

This value of at least 2 m/s is important for the measurement. A higher speed doesn't modify the results of measuring and has no influence on the results. We grant, that our psychrometer meet the requirements of the WMO and are used from the Weather Services to their full satisfaction. We can guarantee that the relevant airspeed at the place of the thermometer bulbs is higher than 5 m/s.

Aspiration Psychrometer 32E (Assmann Type)

This type has been established and is acknowledged as meteorological standard instrument for decades. It obtains greatest possible accuracy at measurement of temperature and humidity of the atmosphere and, therefore, is suited also for control of other hygrometers. An aspirator ventilates both thermometers during measurement. This eliminates errors which, in the case of onesided aspiration, may be



caused by the difference in the individual lags of the two thermometers. In the open air the instrument is used on the side sheltered from the wind or is so held that aspiration is not diminished (suction openings turned into the wind).

The thermometers are protected against the influence of radiation by means of two, each, highly polished concentric enveloping tubes, which are thermically insulated against one another and against the body of the instrument, and which, likewise, are ventilated by the aspirator. This double protection against radiation enables accurate measurement, even under most powerful insolation of the instrument.

Specifications

32E: Aspiration Psychrometer, Assmann Type, with wetting device and holder, in transport-box
with electric drive aspirator No. TH47 BG04,
incl. 4 pcs. rechargeable batteries and main connection for 220 - 240 V
AC, 50-60 Hz

32E/40 range: -30 °C to +40 °C, division in 1/5°C

32E/60 range: -10 °C to +60 °C, division in 1/5°C
dimensions of case: 47 x 26 x 22 cm

Spare Thermometers

AS-35+40/0,2 range: -35 °C to +40 °C, division in 1/5°C

AS-10+60/0,2 range: -10 °C to +60 °C, division in 1/5°C

length: 280 mm

diameter: 8 mm

acc. DIN 58661

free of mercury with Propylen-Carbonat filling (colour blue)



All thermometers can be supplied with mercury-free filling except for the maximum thermometers.

Psychrometric Tables

For use with all of the types of aspirated psychrometers dealt with in this leaflet serves the collection of tables:

- 33t** “The Determination of Relative Humidity, Vapour Pressure and Dew Point, by Means of the Aspiration Psychrometer“.
Determination of Terms, Theoretic Bases, Psychrometric Tables 1 and 2, acc. to D. Sonntag; Table 3 for Pressure Correction of the Atmosphere and Instructions for Use of the Tables

The values for the above-named terms may, quickly and easily, be taken from two graphic tables, of which the one supplies the values “above water” and the other “above ice”. This new way of representing curves enables to obtain an accuracy, which corresponds appr. to the degree of accuracy of earlier extensive editions of tables.

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