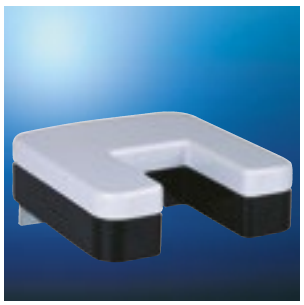
HUMIDITY · TEMPERATURE · PRESSURE

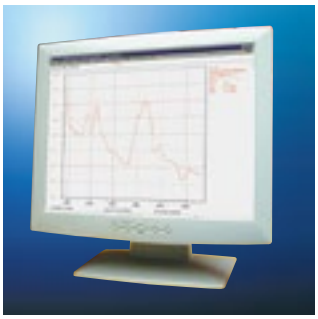
Thies CLIMA

THE WORLD OF WEATHER DATA

THE WORLD OF WEATHER DATA

Measurement and Documentation: Thies' range of service for meteorology, environmental protection and industry





Today more than ever the measurement, processing and analysis of meteorological data requires a high degree of measurement instrument precision and an optimal adaptation of the data acquired to the task at hand.

For more than 60 years, we have been developing, producing and supplying practical instruments and systems for the analysis of weather data. Today, we are one of the world's largest suppliers of such equipment.

Our close cooperation with scientific institutions and governmental agencies in many countries guarantees a constant and up-to-date flow of information about all aspects of individual national problems and projects and the rapid implementation of state-of-the-art developments and measurement techniques.

Our instruments and systems fulfil in all respects both to the requirements of national weather services as well as those of the World Meteorological Organization in Geneva.

Meteorological observations without computer-aided measurement and documentation systems are unthinkable today.

THIES develops complete ready-for-use-systems which include precision data transmitters, data loggers, power supply units and personal computers with adapted software.

Humidity, Temperature, Pressure
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Beyond the meteorology the measurement and regulation of air humidity is an essential element of the climatic technology. Humidity control in closed rooms as for example swimming baths, offices or living-rooms creates a comfortable atmosphere for man and helps considerably to save energy. The right humidity determines also the ideal climate for delicate goods in storerooms and dehumidifying plants, and improves by this the product quality and durability.

In the rural meteorology and environmental technique humidity measurements in the open field are undeniable for the planning of irrigation and humidifying, for the determination y of the optimum seed and planting as well as for the control of micro climate.

Humidity
Glossary

Absolute humidity	Indicates how many grams [g/m³] of water vapour are included in one cubic meter of air. (at 0 °C max. 5 g/m³, at 20 °C approx. 17 g/m³)
Capacitive measurement element	An arrangement in which a change in the relative humidity leads to a change in the electrical capacity. For example the capacity of a polymer film on a carrier material changes when water vapour is absorbed.
Dew point	Temperature [°C, K], to which the mixture of air and water vapour has to cool down, so that the air is just saturated with the available amount of water vapour, and condensation is starting. At 15 °C and 50% rel. humidity the dew point is about 5 °C, at 80% rel. humidity about 12 °C, and at a humidity of 100% the dew point corresponds to the current temperature of 15 °C.
Dry bulb temperature	The ambient temperature measured on the dry ventilated thermometer of a psychrometer.
Hygro transmitter	General term for humidity measurement instruments with an electrical measured value output.
Hygrograph	Measurement instrument which mechanically records the relative humidity as a function of time.
Hygrometer	General term for indicating humidity measuring instruments.
Hygrostat	Humidity-dependent switching instrument to regulate moistening or dehydrating devices or to trigger warning signals indicating too little or too much moisture in moisture-sensitive installations.
Measurement element H	Specially prepared human hairs expand under the influence of humidity, thus changing in length. This change in length is a measure of relative humidity. The range of application lies between 10 and 100% rel. humidity in temperatures ranging from -60 ... +70 °C. Hair measurement elements must be regenerated.
Measurement element K	Under the influence of humidity, specially prepared synthetic fibers change in length. This change in length is a measure of relative humidity. The range of application lies between 0 and 100% rel. humidity in temperatures ranging from 0 ... +100 °C.
Psychrometer	A measurement instrument with which the humidity of the atmosphere can be measured by measuring the dry bulb temperature, and the wet bulb temperature, and applying the psychrometric equation. Owing to the good measurement accuracy attainable, it is also used as a reference instrument.
Pt 100 Sensor	A temperature sensor with a measurement coil made of platinum wire. The temperature-dependent resistance-change of the platinum wire is used as measure for the temperature. 100 Ω for 0 °C is used as basic value. The resistance-change is defined in the DIN IEC 60751 standard. Pt 100 sensors are applied for ex. in psychro transmitters.
Relative humidity	Indicates the ratio in percent [%] of the instantaneous content of water vapour in the atmosphere to the maximum possible content of water vapour at the same temperature.
Tensiometer	Measurement instrument to measure the saturation potential of the soil (water requirement of soils). Important to determine irrigation requirements.
Wet bulb temperature	Temperature, arising from evaporation (humidity temperature). Wet bulb temperature is measured at the moisturized thermometer of a psychrometer. The wet bulb temperature results from the chilling because of the evaporation at the moisturized thermometer.

Humidity

Psychrometer

Aspiration Psychrometer
Model Assmann
Portable, handy, sturdy standard instrument for psychrometric humidity measurements. Used as a control instrument for humidity measuring instruments. The thermometers acc. to DIN 58661 can be calibrated. The thermometer capillary has a blue background and a clearly printed scale. The instrument is equipped with a moistening device and a psychrometer-table. Supplied in a case.

Order No. 1.0400.00.010

Technical Data	
Measuring range	-10 ... +60 °C
Accuracy	±0.2 K (thermometer)
Graduation	0.2 °C
Aspirator	spring-wound drive
Measuring time	approx. 8 min (4 ... 2 m/s)
Dimension	Ø 90 x 420 mm
Weight	3.5 kg

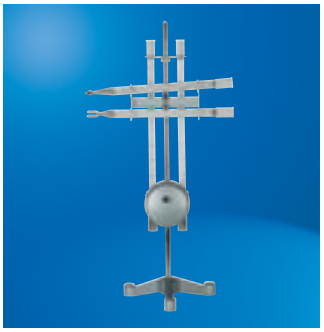
Replacement-Thermometer
for Aspiration-Psychrometer 1.0400.00.010

Order No. 502588

Wick 3.5 mm
Serves as **replacement** for used / soiled wicks at humidity thermometers of psychrometers, or as **adding**, for upgrading replacement thermometers to humidity thermometers.

Order No. 502578

Technical Data	
Diameter / Length	3.5 mm / 1 m
Suitable for:	
- Aspiration Psychrometer	1.0400.00.010
- Replacement Thermometer	502588



Standard Psychrometer
Model August
Standard instrument for use in weather huts and thermometer huts. The instrument consists of the following:
2 Psychrometric thermometers acc. to DIN 58660
1 Maximum thermometer acc. to DIN 58654
1 Minimum thermometer acc. to DIN 58653
1 Aspirator with spring-wound drive
1 Psychrometer table
1 Moistening device as well as a foot with stand and holder.

Order No. 1.0444.10.002

Type of thermometer	Measuring range
Psychrometer	-30 ... +50 °C (±0.2 K)
Max.-Thermometer	-30 ... +50 °C (±0.2 K)
Min.-Thermometer	-40 ... +40 °C (±0.3 K)
Graduation	0.2 °C / 0.5 °C
Total height	550 mm
Weight	2.6 kg

Replacement Thermometer
for Standard Psychrometer 1.0444.10.002

Minimum Thermometer
Order No. 2.0446.00.001

Maximum Thermometer
Order No. 2.0445.00.002

Standard Thermometer
Order No. 2.0447.00.002

Description	Order No.	Technical Data	
Wick 8 mm Serves as **replacement** for used / soiled wicks at humidity thermometers of psychrometers, or as **adding**, for upgrading replacement thermometers to humidity thermometers.	**502580**	Diameter / Length Suitable for: - Standard Psychrometer - Replacement Thermometer	8 mm / 1 m 1.0444.10.002 2.0447.00.002
Sling Psychrometer Simple, sturdy measuring instrument. The air ventilation required is attained by rotary centrifugal movement. The instrument is supplied with the required moistening device along with a psychrometric table.	**1.0450.00.010**	Measuring range Accuracy Graduation Dimension Weight	-10 ... +60 °C ±0.2 K 0.2 °C 305 x 60 x 22 mm 0.42 kg
Instrument Case Black synthetic material case, lined with foam material for the above instrument including accessories.	**1.0452.10.000**	Colour Dimension Weight	black 350 x 230 x 70 mm 0.25 kg
Replacement Thermometer for Sling Psychrometer 1.0452.10.000	**502591**		
Wick 3.5 mm Serves as **replacement** for used / soiled wicks at humidity thermometers of psychrometers, or as **adding**, for upgrading replacement thermometers to humidity thermometers.	**502578**	Diameter / Length Suitable for: - Sling Psychrometer - Replacement Thermometer	3.5 mm / 1 m 1.0450.00.010 502591

Humidity

Recording Instruments

Hygrograph

Instrument for measurement and recording of the relative humidity. Measurement results are recorded on a strip chart, which is clamped onto a hand wound drum clockwork acc. to DIN 8300 and DIN 58658 or a quartz clockwork.
Two models are available regarding the drum clockwork:

1. Mechanical drum clockwork with hand wound drive for the temperature range from -35 ... +80 °C (for model 1.0610/614)

2. Battery-operated quartz clockwork for the temperature range from -20 ... +60 °C (for model 1.0615...)

Included in delivery:
1 set (100 sheets) strip chats
1 piece felt pen

Order No.	Technical Data	
	Recording time	Thrust
1.0610.xx.xxx	1 day	11.45 mm/h,
1.0614.xx.xxx	7 days	40 mm/day
	14 days	20 mm/day,
1.0615.xx.xxx	31 days	9 mm/day
	1 / 7 / 31 days	s. above
	Measuring range	Measuring element
.10.	10 ... 100% rel. h.	H (-35 ... +70 °C)
.12.	0 ... 100% rel. h.	K (0 ... +80 °C)
.000	non lockable	
.900	lockable	
	Accuracy	
	Measuring element “H”	±2% rel. h. +1 scale division @ 65% rel. h. and room temperature
	Measuring element “K”	±3% rel. h. +1 scale division @ 65% rel. h. and room temperature
	Recording width	82 mm
	Graduation	5% rel. h.
	Ambient temp.	depending on measuring element and clockwork
	Dimension	280 x 140 x 214 mm
	Weight	2.2 kg

Accessories

Felt Pen

Order No.		
500847	Colour	violet

Recording Charts

(100 pcs.)

Meas. element H	1 day	7 days	14 days	31 days
10 ... 100% rel. h.	205079	205077	205082	205083

Meas. element K	1 day	7 days	14 days	31 days
0 ... 100% rel. h.	205080	205078	–	–

Console

To attach the hygrograph to a wall.

Order No.		
1.0598.10.000	Material	Varnished aluminium
	Surface	280 x 140 mm
	Weight	0.8 kg

Control Instruments

Room Hygrostat

The hygrostat serves as two-level-controller for the regulation of the relative air humidity in climate test chambers, offices, and computer rooms; it is suitable for the controlling of air humidifier or de-humidifier. Further fields of application are store rooms, cold storage rooms, green houses etc.

Order No. 1.0509.42.001

Technical Data	
Operating range	35 ... 95% rel. h.
Accuracy	± 3% rel. h.
Type of contact	1 x change over (micro switch)
Micro switch	
Switch difference	approx. 4% rel. h.
Switching capacity	max. 250 V AC and 0.1 ... 5 A with ohmic load for dehumidification 0.1 ... 2 A with ohmic load for humidification 0.1 ... 1 A with inductive load
Operating temperature	0 ... +60 °C
Housing	Plastic, grey
Protection	IP 20
Dimension	115 x 70 x 42 mm
Weight	approx. 0,12 kg

Duct Hygrostat

The hygrostat serves as two-level-controller for the regulation of the relative air humidity in climate ducts and climate test chambers, it is suitable for the controlling of air humidifier or de-humidifier. It is used in store rooms, cold storage rooms, green houses etc.

Order No. 1.0509.60.001

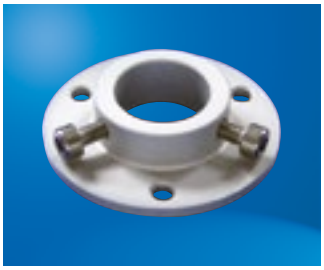
Technical Data	
Operating range	35 ... 95% rel. h.
Accuracy	±4% rel. h.
Type of contact	1 x switch over (micro switch)
Micro switch	
Switch difference	approx. 4% rel. h.
Switch capacity with ohmic load	15 A @ 230 V
Switch capacity with inductive load	2 A @ 230 V
Switch capacity with D/C voltage	0.25 A DC @ 230 V
Max. voltage	250 V AC
Switch capacity, minimum load	100 mA, 125 V AC
Operating temperature	0 ... +60 °C
Housing	Plastic, light grey
Protection	IP 64
Dimension	
Housing	80 x 120 x 72 mm
Stem length	L 220 mm, Ø 16 mm
Weight	approx. 0.7 kg

Mounting Flange

Serves for mounting the duct hygrostat 1.0506.60.001. The flange clamps the hygrostat to the stem, and allows, thus, an alternative mounting variant to the direct installation of the hygrostat housing at a duct wall.

Order No. 1.0509.81.000

Technical Data	
Material	Aluminum
Diameter for immersion tube	approx. 19 mm
Total diameter	50 mm
Weight	0.025 kg



Protective Gauze

The protective gauze is placed on the sensor tube of the duct hygrostat 1.0509.60.001, and protects, thus, the measuring element against coarse dust particles.

Order No. 500278

Technical Data	
Length	200 mm
Diameter	
inside	approx. 16 mm
outside	approx. 16.8 mm
Material	Stainless steel
Width of mesh	0.32 mm
Weight	0.011 kg

Humidity

Description	Order No.	Technical Data	
Wind screen Consisting of and dust shield. Both are placed on the sensor tube of the duct hygrostat 1.0509.60.001 and, thus, are protecting the measuring element against coarse dust particle, and faulty measurements with airflows › 3 m/s.	**1.0509.85.002**	Length Diameter inside outside Material Width of mesh Weight	200 mm approx. 16 mm approx. 19 mm Stainless steel, MS 0.32 mm 0.043 kg

Electrical Transmitters

Hygro-Transmitter Measures and indicates humidity. Equipped with electrical output for long-range transmission. Sturdy construction. The exposed parts such as the case head and the immersion stem are made of stainless steel.	**1.1000.50.xxx** **.015** **.515**	Electr. output 200 Ω linear 200 Ω linear Measuring range Accuracy Ambient temp. Scale graduation Measuring element Scale length Stem Stem length Protection Total length Weight	Connecting Lemosa plug 3 m cable 10 ... 100% rel. h. ±2% rel. h. @ 20 ... 100% rel. h. and room temperature -35 ... +70 °C 1% rel. h., non-linear H 94 mm (90°) Ø 22 mm 250 mm IP 65, case 350 mm 0.7 kg resp. 0.9 kg

Wind Protection Gauze- and wind protection protects the humidity measuring element from coarse dust (› 0.32 mm) and error measurements in case of wind velocities › 3 m/s. Suitable for above hygro transmitter.	**1.0509.85.006**	Diameter Length Mesh aperture Material Weight	24 mm 200 mm 0.32 mm Niro, Brass 0.05 kg

Weather and Thermal Radiation Shield Protective covering for the preceding hygro-transmitters for outdoor installation. Helps to prevent atmospheric influences and radiation errors from influencing the measured results.	**1.1025.51.000**	Installation pin Material Dimension Weight	Ø 22 x 27 mm Al, galvanised and varnished Ø 170 x 450 mm 2.2 kg

Description	Order No.	Technical Data		
Psychrogeber Measuring instrument to determine the air humidity values based on the dry and moist temperature An attached water container provides for the moistening of the psychro sensor. The double-walled protection tubes protect the sensor from radiation. A hanger, included in delivery, serves for the lateral mounting of the psychro-transmitter at a facade, wall etc.	**1.1130.xx.000** **.20.** **.22.**	Operating voltage Operating voltage Measuring range Measuring elements Accuracy Time constante Airflow Water container Type of switching Connection Dimension Psychro transmitter Hanger Weight Psychro transmitter Hanger	12 V AC / 6 W 24 V AC / 11 W 24 V DC / 8 W 12 V DC 0 ... +60 °C 2 x Pt 100, acc. to DIN IEC 60751 1/3 class B (±0.1 K) 17 s (90%) 4 ... 6 m/s 250 ml 4-wire circuit 2 x 4 pole plug connection Ø: 160 mm, H: 465 mm L: 310 mm 3.7 kg 1.0 kg	
Replacement-Sensor for Psychro-Transmitter 1.1130... compl., consisting of Pt 1000 ($^1/_3$ class B) casing and plug connection	**2.1266.10.001**			
Soil Moisture Probe Trime-Pico 32, serial Soil moisture sensor with integrated temperature sensor. The network-compatible instrument serves for the measurement of volumetric water content in the ground and the soil temperature. The data communication is carried out via an RS485 interface. It is used with • Hydrology, • Forestry, • Agriculture, • Environmental- and Geological science The electrical connection is carried out via a permanently connected cable.	**1.0231.00.000**	Humidity measuring range Accuracy Temperature measuring range Accuracy Operating voltage Power consumption Electr. output Connection Protection Dimension Probe Rod Weight	0 ... 100% volumetric water content ±2% @ 0 ... 40% ±3% @ 40 ... 70% -15 ... +50 °C ±1.5 °C 7 ... 24 V DC 100 mA @ 12V/DC during 2 ... 3 sec of measurement RS485 5 m cable with cable-end sleeves IP 68 Ø 32 x 155 mm Ø 3.5 x 110 mm approx. 0.12 kg	

Humidity

Description	Order No.	Technical Data	
Soil Moisture Probe Trime-Pico 32, analogue Instrument as above, however, the measuring value output occurs as analogue signal.	**1.0231.00.060**	Humidity measuring range Accuracy Temperature measuring range Accuracy Operating voltage Power consumption Electr. output Connection Protection Dimension Probe Pod Weight	0 ... 100% volumetric water content ±2% @ 0 ... 40% ±3% @ 40 ... 70% -40 ... +70 °C ±1.5 °C 7 ... 24 V DC 100 mA @ 12V/DC during 2 ... 3 sec of measurement 2 x 0 ... 1V 5 m cable with cable-end sleeves IP 68 Ø 32 x 155 mm Ø 3.5 x 110 mm Approx. 0.12 kg

Meteorological garden with weather huts

Temperature measurements are fundamentally important in the different fields of science, industry and environmental technique.
The legal requirements e.g. for the storing of food, get constantly stricter, and meanwhile lay down also official controls of climatic data.
Our instruments with calibration certi-ficate meet these requirements.
Reliable measurements and documentation of extreme temperature ranges and temperature fluctuations as well as high-precise measurements are problem-free possible with the different instrument components. Exactly acquired and recorded temperature values form the basis for effective energy optimising and energy saving.

Climatic measurement of the South Pole

Meteorological data for the road condition

Temperature
Glossary

Bimetallic measuring element
A strip composed of two different metals which are welded together. The two different heat expansion coefficients of these metals lead to a temperature-dependent curvature of the welded metal. This curvature respectively deflection is a measure of the upcoming temperature

Extreme Thermometer
Combination of a min.- and a max. -thermometer to measure the current, the lowest and the highest temperature of the preceding measurement period.

Max.-Thermometer
For the measurement of the current and highest temperature of the preceding measurement period.
A pin is pushed forward through the meniscus of the mercury filament by raising temperature, and remains with the maximum temperature value when the temperature drops.
The thermometer is used in horizontal position

Min.-Thermometer
For the measurement of the current and lowest temperature of the preceding measurement period.
A pin in the alcohol filament is pushed back by the surface tension of the alcohol, and remains with the minimum temperature value when the temperature increases.

Perceived Temperature
The ambient temperature as perceived by the human body affected by the wind. It is calculated from the "wind-chill" factor.

Pt 100 Sensor
Is a temperature sensor with a measurement coil made of platinum wire. The temperature-dependent resistance-change of the platinum wire is used as measure for the temperature.100 Ω for 0 °C is used as basic value. The resistance-change is defined in the DIN IEC 60751 standard.

Soil Surface Thermometer
Measurement instrument to measure the temperature above the soil, preferably at a height of 5 cm. The German Weather Service uses sensors without radiation protection only to measure the minimum temperature.

Soil Thermometer
Measurement instrument to measure the air temperature in soil at different depths.

Temperatur transmitter
Electrical temperature measurement instrument with an electrical measured value output.

Thermograph
Measurement instrument which mechanically records the temperature as a function of time

Thermometer
General term for a temperature measurement instrument

Units

Kelvin [K]	Used since 1976 as the legal unit of temperature. It starts at -273.15 °C
Celsius [°C]	Common temperature degree scale in which the melting point of ice is 0 °C and the boiling point of water is 100 °C on a thermometer at an air pressure of 1013.2 mbar.
Fahrenheit [°F]	Temperature scale frequently used in Anglo-Saxon countries. On this scale, the melting point of ice is 32 °F

Conversions

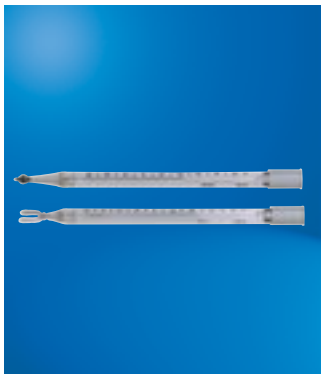
$°C = K - 273.15\ K$ $\qquad$ $K = °C + 273.15\ °C$

$°C = \frac{5}{9}(°F - 32)$ $\qquad$ $°F = 32 + \frac{9}{5}\,°C$

Windchill
The loss of heat by the human body [W/m²] through the wind
The "perceived temperature" is derived from this factor.

Temperature

Thermometers



Maximum-Thermometer

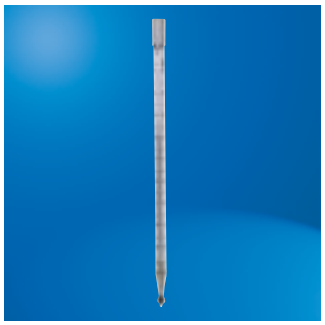
A mercury glass thermometer, can be calibrated. Employed to determine the highest air temperature.

Order No.	Measuring range	Graduation/Accuracy
2.0445.00.002	-30 ... +50 °C	0.5 °C / ±0.2 K
.010	-10 ... +60 °C	0.5 °C / ±0.5 K
.011	-10 ... +50 °C	0.2 °C / ±0.2 K
.017	0 ... +60 °C	0.2 °C / ±0.2 K
	Dimension	Ø 19 x 300 mm
	Weight	0.075 kg

Minimum-Thermometer

An alcohol glass thermometer, can be calibrated. Employed to determine the lowest air temperature.

Order No.	Measuring range	Graduation/Accuracy
2.0446.00.001	-40 ... +40 °C	0.5 °C / ±0.2 K
.002	-40 ... +40 °C	0.2 °C / ±0.2 K
.066	-30 ... +50 °C	0.2 °C / ±0.2 K
.067	-45 ... +40 °C	0.2 °C / ±0.2 K
.092	-40 ... +60 °C	0.5 °C / ±0.5 K
	Dimension	Ø 19 x 300 mm
	Weight	0.06 kg



Standard-Thermometer

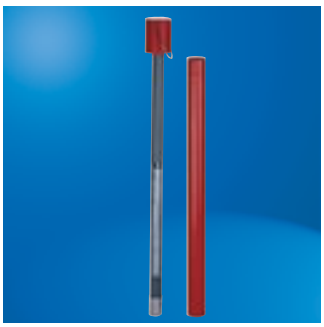
A mercury glass thermometer, can be calibrated. Designed for measuring the current ambient temperature. Also used as
a spare thermometer for psychrometers model August.

Order No.	Measuring range	Graduation/Accuracy
2.0447.00.002	-30 ... +50 °C	0.2 °C / ±0.2 K
.011	-10 ... +50 °C	0.2 °C / ±0.2 K
.056	-30 ... +60 °C	0.2 °C / ±0.2 K
	Liquid	Alcohol or mercury
	Dimension	Ø 16 x 370 mm
	Weight	0.06 kg

Soil Thermometer

A mercury glass thermometer, can be calibrated. Designed for measuring the soil temperature. Supplied with a holder. The immersion depth governs the depth of the measuring point in the soil.

Order No.	Measuring range	Immersion depth
2.2110.02.003	-25 ... +60 °C	20 mm
.03.003	-25 ... +60 °C	30 mm
.06.004	-25 ... +45 °C	60 mm
.11.006	-22 ... +40 °C	110 mm
.16.008	-15 ... +40 °C	160 mm
.21.009	-15 ... +35 °C	210 mm
.31.009	-15 ... +35 °C	310 mm
	Accuracy	±0.4 K (‹ 0 °C) ±0.2 K (0 ... 50 °C) ±0.3 K (› +50 °C)
	Graduation	0.2 °C
	Bending	150°
	Weight	approx. 0.95 kg



Soil Depth Thermometer

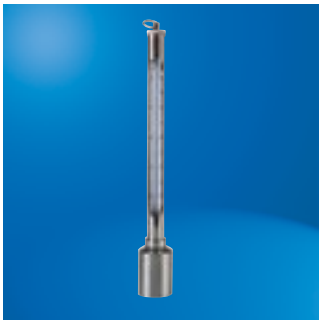
Consists of a mercury glass thermometer with a holder and a plastic guide tube. The immersion depth governs the depth of the measuring point in the soil.

Order No.	Immersion depth	500 mm 1000 mm
2.2115.03.013	Measuring range	-10 ... +30 °C
2.2116.03.013	Accuracy	±0.3 K (-10 ... -5 °C) ±0.15 K (-5 ... -30 °C)
	Graduation	0.1 °C
	Guide tube	Ø 40 mm
	Weight	0.9 kg resp. 1.4 kg

Description	Order No.	Technical Data	
Extreme Thermometer for use in soil Consists of a mercury glass thermometer with a bent immersion stem, determines the lowest and highest temperature of the soil. The immersion depth governs the depth of the measuring point in the soil.	**2.2121.xx.002** **2.2122.xx.002** **.02.** **.05.** **.10.** **.20.**	Type Immersion length Measuring range Accuracy Graduation Bending Weight	Min.-Thermometer Max.-Thermometer 20 mm 50 mm 100 mm 200 mm -25 ... +50 °C ±0.4 K / ±0.3 K 0.2 °C 95° 0.12 kg
Thermometer Stand not depicted Holds the extreme thermometer for use in soil, described in the preceding.	**2.2123.00.000**	Material Dimension Weight	Stainless steel 340 x 320 x 20 mm 0.7 kg
Extreme Thermometer Determines the lowest and highest ambient temperature. Consists of a maximum thermometer and a minimum thermometer with stand.	**2.2135.00.000**	Techn. data Total height Weight	see instrument no.: 2.0445.00.002 and 2.0446.00.001 (page 14) 320 mm 1.5 kg
Max.- and Min.-Thermometer Thermometer determines the current temperature as well as the lowest and the highest temperatures of the measuring period. There is an adjustment knob to set back the marker threads for extreme value identification.	**2.2004.00.079**	Measuring range Graduation Fluid Material of case Length of scale Dimension Weight	-38 ... +50 °C 1 °C Mercury white synthetic 110 mm 220 x 66 x 35 mm 0.17 kg

■ other thermometer-variants, measuring range and scales on request

Temperature



Water Thermometer

Thermometer determines the water temperature.

A glass mercury thermometer in a metal tube with a large perforated water container.

Order No.: **2.2141.00.064**

Technical Data	
Measuring range	-5 ... +40 °C
Accuray	±0.2 K
Graduation	0.5 °C
Fluid	Mercury
Container	Brass, nickel plated
Dimension	Ø 28 x 300 mm
Weight	0.4 kg

Recording Instruments

Thermograph

Instrument for measurement and recording of the ambient temperature. Measurement results are recorded on a strip chart, which is clamped onto a hand wound drum clockwork acc. to DIN 8300 and DIN 58658 or a quartz clockwork.
Two models are available regarding the drum clockwork:

1. Mechanical drum clockwork with hand wound drive for the temperature range from -35 ... +80 °C (for model 2.0600/604...)

2. Battery-operated quartz-clockwork for the temperature range form -20 ... +60 °C (for model 2.0605...).

Included in delivery:
1 set (100 sheets) strip chats
1 piece felt pen

Order No.	Technical Data	
	Recording time	Thrust
2.0600.10.xxx	1 day	11.45 mm/h,
	7 days	40 mm/day
2.0604.10.xxx	14 days	20 mm/day
	31 days	9 mm/day
2.0605.10.xxx	1 / 7 / 31 days	see preceding
.0xx	non-lockable	
.9xx	lockable	
	Measuring range	Graduation
.x00	-35 ... +45 °C	1 °C
.x05	-20 ... +60 °C	1 °C
.x11	-10 ... +50 °C	1 °C
.x14	0 ... +40 °C	0.5 °C
.x17	0 ... +80 °C	1 °C
	Accuracy	±1% of mr. +1 scale division @ 65% r.h and room temperature
	Measuring element	Bimetal
	Recording width	82 mm
	Dimension	280 x 138 x 214 mm
	Weight	2.2 kg

Console

Instrument for wall mounting of the thermograph described in the preceding.

Order No.: **1.0598.10.000**

Technical Data	
Material	Aluminium, varnished
Surface	280 x 140 mm
Weight	0.8 kg

Accessories

Felt Pen

Order No.: **500847**

Technical Data	
Colour	violet

Recording Charts

(100 pcs.)
For Thermograph

temp. range	1 day	7 days	14 days	31 days
-35 ... +45 °C	205060	205046	205063	205069
-20 ... +60 °C	205050	205036		205075
-10 ... +50 °C	205052	205038		205068
0 ... +40 °C	205054	205040	205064	205076
0 ... +80 °C	205057	205043		

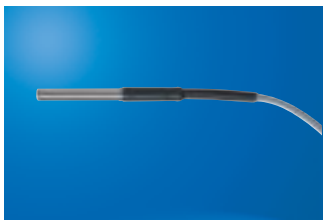
Electrical Transmitters

Temperature Transmitter
Water Temperature Transmitter

The measuring element is protected by a waterproof and stainless steel tube, it has a PVC cable resp. a FEP-cable.

Order No.: **2.1235.00.xxx**, **2.1235.01.xxx**

Technical Data		Order No.
Measuring range	-30 ... +100 °C (±0.1 K)	
	-50 ... +200 °C (±0.1 K)	
Cable length	5 m	**.000**
	10 m	**.010**
	20 m	**.020**
Measuring element	Pt 100 acc. to DIN IEC 60751	
Accuracy	1/3 class B (0.1 °C at 0 °C)	
Electr. connection	4-lead circuit	
Cable	LIYCY 4 x 0.25 mm²	
Sensor dimension	Ø 6 x 70 mm	
Weight	0.3 kg; 0.6 kg; 1.2 kg	

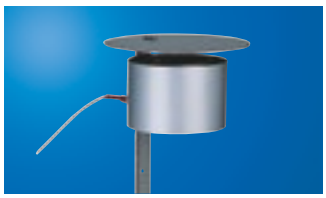


Soil Surface Temperature Transmitter

Instrument measures the temperature above the surface of the soil. The temperature sensor is protected by a well-ventilated double-walled tube with roofing plate.

Order No.: **2.1241.00.000**

Measuring range	-30 ... +50 °C
Measuring element	Pt 100 acc. to DIN IEC 60751
Accuracy	±0.1 K; 1/3 class B
Electr. connection	4-lead circuit
Cable	5 m, LiYCY 4 x 0.25 mm²
Protective shield	double tube, varnished
Dimension	Ø 177 x 100 mm
Weight	1 kg

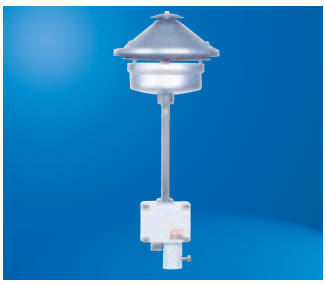


Air Temperature Transmitter with Thermal Radiation Shield

The instrument is designed to measure the temperature outdoor precisely. It has a specially constructed well-ventilated thermal radiation shield made of an anodized aluminium.

Order No.: **2.1260.00.000**

Measuring range	-30 ... +50 °C
Measuring element	Pt 100 acc. to DIN IEC 60751
Accuracy	±0.1 K; 1/3 class B
Electr. connection	4-lead circuit
Connection	4-pole clamp
Dimension	Ø 120 x 400 mm
Weight	0.8 kg



Ventilated Air Temperature Transmitter

This instrument is designed to measure the precise air temperature with the air of a ventilated sensor. The sensor is protected by a double thermal radiation shield. A built-in ventilator provides for the necessary air flow. A hanger, included in delivery, serves for the lateral mounting of the air temperature transmitter at a facade, wall etc.

Order No.: **2.1265.xx.000**, **.20.**, **.22.**

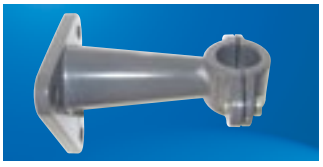
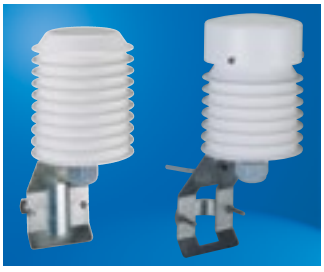
Operating voltage	12 V AC/ 6 W or 24 V AC/ 11 W or 24 V DC/ 8 W
Operating voltage	12 V DC/ 4 W
Measuring element	Pt 100 acc. to DIN IEC 60751
Accuracy	1/3 class B (±0.1 k)
Time constant	17 s (90%)
Air flow	4 ... 6 m/s
Type of switching	4-wire circuit
Connection	4 pole plug connection
Dimension	
Air temp. transmitter	Ø: 160 mm, H: 465 mm
Hanger	L: 310 mm
Weight	
Air temp. transmitter	3.5 kg
Hanger	1.0 kg

Replacement-Sensor

for Ventilated Air Temperature Transmitter 2.1265... compl. consisting of PT 100 (1/3 Class B), casing and plug connection

Order No.: **2.1266.10.001**

Temperature

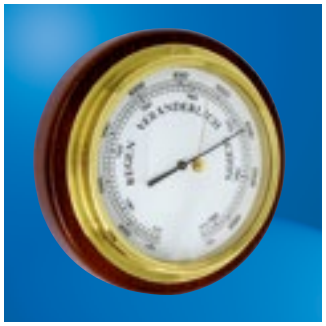
Description	Order No.	Technical Data	
 **Temperature Sensor compact** Electrical measured value receiver to measure the ambient temperature, The measured value is emitted as a resistance value in accordance with DIN IEC 60751 resp. as an analogue voltage or current signal.	**2.1280.00.xxx** **.000** **.141** **.160** **.161** **.173**	Electr. output Pt 100 acc. to DIN IEC 60751 4 ... 20 mA 0 ... 1 V 0 ... 10 V 0 ... 5 V Measuring range Time constant Ambient temp. Operating voltage I-output U-output (10 V) U-output 5 V) U-output (1 V) Int. power consump. Cable Dimension Weight	Accuracy 1/3 class B (±0.1 K) ±0.3 K ±0.2 K ±0.2 K ±0.2 K -30 ... +70 °C 20 s (90%) -40 ... +80 °C 12-30 V DC 15-30 V DC 10-30 V DC 6-30 V DC approx. 5 mA (10V) 5 m long Ø 20 x 138 mm 0.35 kg
Temperature Sensor compact • Plug type Model like 2.1280.00.1xx, however with plug and mating connector instead of von permanently connected cable.	**2.1280.00.xxx** **.700** **.761**	Electr Output Pt 100 acc. to DIN IEC 60751 0 ... 10 V Connection Dimension Weight	Accuracy 1/3 Class B (±0.1 K) ±0.2 K connector Ø 20 x 155 mm approx. 0.4 kg
 **Teflonfilter with gauze ZE 20** This hood is placed over the sensor and protects the measurement element from coarse dirt.	**1.1005.54.901**		
 **Sinter Filter ZE 21** made of metal. This basket is placed over the sensor and protects the measurement element from high wind speed (› 5 m/s) and increased dust. A necessity for sensors in use in exposed areas, eg. in marine climates, desert, mountains.	**1.1005.54.902**		
 **Wall Holder** - for mounting the Temperature Sensor 2.1280 onto a wall, - radiation- and precipitation-protected use (for ex. indoor)	**1.1005.54.903**	Clamping range Wall distance Material Mounting Dimension Weight	Ø 20 mm 83 mm (to transmitter centre) plastic, grey flange plate with 3 x 6.5 mm boring 96 mm long 0.075 kg
 **Weather and Thermal Radiation Shield, compact** Protective case for the preceding temperature sensor compact for outdoor installation. This case essentially eliminates the influence of weather and radiation errors which affect the measurement result.	**1.1025.55.00x** **.10x** **.xx0** **.xx1**	Without ventilator With ventilator Clamping Material Mounting Cable Dimension Weight	 12 V DC; 2.5 W Ø 35 ... 50 mm Ø 55 ... 60 mm syn. laminations, white non-corroding holder 5 m, for model ... 10x Ø 120 x 275/290 mm 0.8 kg

Remark: **For the putting into circulation of mercurial thermometers, see guideline 2007/51/EG of the European Parliament and Council and regulation (EG) No. 847/2012.**

The acquisition and recording of air pressure differences and areas of low and high pressure are the main tasks of the meteorology for precise weather forecasting. But also in the field of laboratorial and environmental technique the exact determination of air pressure is very important. The THIES instruments configuration with their varied forms of calculation and representation guarantee a high precision measurement according to requirements.

Air pressure (P)	The **air pressure** of any place in the earth's atmosphere is the pressure of the air, existing at this place. It indicates the weight power of the air column standing above a surface or body.
Barograph	is a measuring instrument which records the time course of the air pressure on a chart-stringed drum.
Barometer	is a measuring instrument for determination (display) of air pressure, and is used in a variety of different forms and types mostly in the field of meteorology.
Barometric Altitude Formula	indicates the vertical change of the air pressure with the altitude. Simplify you may assume that close to the sea level the air pressure declines by one hPa per 8 m altitude.
Barometric Unit	**Unit** of the air pressure is the Pascal. As the air pressure on sea level is, on average, 101325 Pa, thus approx. 100000 Pa, it is given mostly by the number about 1000 in hectopascal (1013.25 hPa) or by the same numerical value millibar (mbar). The air pressure is mostly measured through a barometer, where often obsolete units are used. Here is: 1 hPa = 1 mar = 0.75 Torr (= mm Hg or millimeter mercury column).
Baro transmitter	is a measuring instrument with electrical measuring value output
QFE	**QFE** means the air pressure of aerodrome/airport on the runway. If QFE is set at the altimeter (for ex. before start or landing) you achieve the barometric air pressure or height related to the airport height. On the airport the altimeter indicates then a height of 0 m or 0 ft.
QFF	**QFF** is the current air pressure at the measuring site (for ex. aerodrome/airport), reduced to the sea level. It is used in the field of meteorology in order to compare the air pressures of different places at different heights. The calculation is carried out with ASL (altitude above sea level) and data of the "current atmosphere" (pressure, temperature, and humidity).
QNH	The abbreviation **QNH** means the air pressure at the measuring station, reduced to sea level acc. to "standard atmosphere". It serves for setting an altimeter which displays the flight altitude above sea level. After landing of the aircraft, the altimeter displays the altitude of site above sea level.
Standard atmosphere	is a term used in aviation. Characteristics like pressure, temperature, or temperature course with the altitude are subject to special and time changes in the atmosphere. The standard atmosphere indicates an average state of the atmosphere.
TA	**Transition Altitude** is a term used in aviation. It indicates the altitude where the transition of the altimeter setting from standard air pressure to the currently existing air pressure QNH is carried out or vice versa.
TL	**Transition Level (TL)** is the lowest flight level available for use which has a minimum distance of 1000 ft above the transition altitude. Therefore the Transition Level is depending on the air pressure. In some regions of Germany the Transition Altitude is, generally, 5000 ft.

Pressure

	Description	Order No.	Technical Data	
	Aneroid Barometers			
	**Barometer** Indicating instrument for the barometric pressure. Scale with brass ring, housing made of mahogany.	**3.1503.00.010**	Measuring range Scaling Measuring system Dimension Scale Housing	965 ... 1055 hPa 730 ... 790 Torr 10 hPa, 1 Torr Aneroid capsule Ø 130 mm Ø 170 mm
	**Barometer** Indicating instrument with a mounting flange for wall mounting. Light grey varnished.	**3.1509.00.000**	Measuring range Graduation Accuracy Above sea level Measuring element Scale Dimension Weight	935 ... 1065 hPa 700 ... 800 Torr 1 hPa; 1 Torr ±3 hPa at 980-1030 hPa 0-1000 m Aneroid capsule Ø 100 mm Ø 120 x 45 mm 0.3 kg
	Mercury Barometers			
	**Mercury Station Barometer** An instrument designed to measure and test atmospheric air pressure in meteorological stations, laboratories etc. The instrument is equipped with an additional thermometer. Delivery in a wooden transport box	**3.1550.17.000 .001**	Measuring range Graduation Accuracy Temp. meas. range Dimension Weight	800 ... 1080 hPa 560 ... 1030 hPa 0.1 hPa, vernier scale ±0.3 hPa -15 ... +50 °C Ø 65 x 940 mm 4.8 kg
	Mounting Board For vertical installation of the mercury station barometer.	**3.1552.00.000 .001**	For measuring range Dimension Weight	800 ... 1080 hPa 560 ... 1030 hPa 1000 x 115 x 13 mm 2 kg

Recording Instruments

Barograph

The instrument serves for the measurement and recording of the barometric air pressure.
The recording is carried out on a strip chart which is clamped onto a hand wound drum clockwork acc. to DIN 8300 and DIN 58658 or onto a quartz clockwork.
The local altitude can be set by means of an adjusting screw.
As to the drum clockwork two models are available:

1. Mechanical drum clockwork with hand wound drive (for model 3.800../3.0804..)
2. Battery-operated quartz clockwork (for model 3.805..)

Included in delivery:
1 set (100 sheets) strip chats
1 piece felt pen

Order No.	Recording time	Thrust
3.0800.10.xxx	1 day	11.45 mm/h
	7 days	40 mm/d
3.0804.10.xxx	14 days	20 mm/d
	31 days	9 mm/d
3.0805.10.xxx	1 / 7 / 31 days	see preceding
.000	non lockable	
.900	lockable	

Measuring range	945 ... 1052 hPa
Graduation	1 hPa
Accuracy	±0.8 hPa +1 scale division @ 65% rel. h. and room temperature
Above sea level	0 ... 3000 m
Measuring element	Aneroid-capsules temperature compensated
Ambient temp.	-10 ... +45 °C
Recording width	82 mm
Dimension	280 x 138 x 214 mm
Weight	2.3 kg

Micro Barograph

Recording precision measuring instrument for the measurement of the atmospheric air pressure.
The local elevation is set at the measurement site by means of an adjusting screw.
The recording is carried out on a strip chart which is clamped onto a hand wound drum clockwork acc. to DIN 8300 and
DIN 58658.

Included in delivery:
1 set (100 sheets) strip chats
1 piece felt pen

3.0810.20.000

Recording time	1 / 7 days, switchable
Thrust	11.45 mm/h or 40 mm/d
Measuring range	965 ... 1050 hPa
Accuracy	±0.3 hPa +1 scale division @ 65% rel. h. and room temperature
Recording width	160 mm
Graduation	1 hPa
Above sea level	0 ... 2000 m, adjustable
Measuring element	2 Aneroid capsules, temperature compensated
Ambient temp.	-10 ... +45 °C
Dimension	280 x 138 x 285 mm
Weight	3 kg

Accessories

Felt Pen

500847

Colour	violet

Recording Charts

(100 pcs.)
for Barograph
3.080x.10.xxx

Meas. range	1 day	7 days	14 days	31 days
945 ... 1052 hPa	205184	205182	205185	205186

Recording Charts

(100 pcs.)
for Micro Barograph
3.0810.20.000

Meas. range	1 day	7 days	14 days	31 days
965 ... 1050 hPa	205188	205187	–	–

Pressure

Electrical Transmitter

Baro Transmitter

- Scalable
  - measuring range
  - Analogue output
- Configurable
  - mean value calculation
  - heating control,
  - energy saving mode,
  - baud rate

The baro transmitter measures the “absolute air pressure” of the atmosphere at the site. It is designed for application in the field of environmental protection, where high accuracy, quick responding behaviour, long-term stability and reliability are required.
The instrument is suited for in- and outdoor application.
A tempered piezo-ceramic sensor for absolute pressure is used, which is characterized by thermal and mechanical stability.
The electric connection is done via an 8-pole terminal strip and a special screwed cable gland with smoothing function for air pressure.

The following outputs are available:
1 x serial interface
1 x frequency output
1 x analogue output (U/I)

Order No.	Measuring range (factory settings)	Electr. output
3.1157.10.000	300 ... 1100 hPa	1 x RS485
	300 ... 1100 hPa	1x 300 ... 1100Hz
	800 ... 1060 hPa	1 x 0 ... 5 V
3.1157.10.040	300 ... 1100 hPa	1 x RS485
	300 ... 1100 hPa	1 x 300 ... 1100 Hz
	600 ... 1060 hPa	1 x 0 ... 20 mA
3.1157.10.041	300 ... 1100 hPa	1 x RS485
	300 ... 1100 hPa	1 x 300 ... 1100 Hz
	600 ... 1060 hPa	1 x 4 ... 20 mA
3.1157.10.061	300 ... 1100 hPa	1 x RS485
	300 ... 1100 hPa	1 x 300 ... 1100 Hz
	600 ... 1060 hPa	1 x 0 ... 10 V
3.1157.10.140	300 ... 1100 hPa	1 x RS485
	300 ... 1100 hPa	1 x 300 ... 1100 Hz
	800 ... 1060 hPa	1 x 0 ... 20 mA
3.1157.10.141	300 ... 1100 hPa	1 x RS485
	300 ... 1100 hPa	1 x 300 ... 1100 Hz
	800 ... 1060 hPa	1 x 4 ... 20 mA
3.1157.10.161	300 ... 1100 hPa	1 x RS485
	300 ... 1100 hPa	1 x 300 ... 1100 Hz
	800 ... 1060 hPa	1 x 0 ... 10 V

Accuracy with heating @ -40 ... +65 °C	±0,25 hPa
Accuracy w/o heating @ -20 ... +65 °C	±1 hPa
Long-term stability	±0.1 hPa/year
Operating voltage depending on mode of operation and model	5/8/12 ... 24 V DC
Current consumption (@12VDC)	
W/o heating	10 mA (max.)
With heating	115 mA (max.)
Connection	Screwed cable gland and terminal strip
Ambient temperature	-40 ... +65 °C
Dimension	approx. 110 x 82 x 57 mm
Weight	0.15 kg

Baro Transmitter B-278-1T
Baro Transmitter B-278-2T

Baro transmitters measure the barometric ambient pressure and emit the measured value as an electrical voltage value. Owing to its low current consumption, It is particularly suitable for use in combination with data loggers.
To be mounted preferably in data logger systems.

3.1158.00.075
3.1158.10.075

Measuring range	800 ... 1060 hPa 600 ... 1060 hPa
B- 278-1T	
Accuracy @ 20 °C	±0.30 hPa
Linearity	±0.25 hPa
Hysteresis	±0.03 hPa
S- 278-2T	
Accuracy @ 20 °C	±0.50 hPa
Linearity	±0.45 hPa
Hysteresis	±0.05 hPa
Resolution	0.01 hPa
Long term stabilty	0.1 hPa / Yr
Electr. output	0 ... 5 V DC
Operating voltage	9.5-28 VDC (3 mA)
Ambient temp.	-40 ... +60 °C
Dimension	61 x 91 x 25 mm
Weight	0.14 kg

Description	Order No.	Technical Data	
Digital Baro Transmitter Indicating measuring instrument with analogue output to determine the atmospheric pressure. An aneroid capsule with inductive displacement pickup serves as a sensor. The sensor signal is amplified electronically and displayed on a LC display. The analogue output is available for the connection of electronic recording and control instruments. Behind the front panel is a potentiometer to reduce the measured value to sea level. The instrument is in the form of a switch cabinet for panel installation.	**3.1159.00.xxx** **.040** **.041**	Electr. output Load Measuring range Accuracy Resolution Display Temp. range Above sea level Operating voltage Model Dimension Weight	0 ... 20 mA 4 ... 20 mA ≤ 250 Ω 913.3 ... 1113.3 hPa ±0.5 hPa (at NN) 0.1 hPa 4 1/2-digit LED red 0 ... +50 °C 0 ... 850 m 230 V AC or 115 V AC or 12 ... 28 V DC panel mounting 96 x 96 x 127 mm 0.6 kg
Baro Display Displaying measuring instrument for four air pressure parameters. Instrument with integrated pressure sensor. Analogue output and serial interface serve for output of measuring data to processing systems. **Display parameter:** • **QNH** air pressure relating to the sea level with standard atmosphere • **QFE** air pressure related to the runway • **P** absolute pressure • **TL** Transition-Level • Tendency **Measuring value output:** • The output of the displayed parameters is carried out via a serial interface. The interface specifications are settable. • The analogue output of absolute pressure P is done via an integrated analogue-interface (U/I is settable). **Operation:** through front side key button • Dimming display, storing brightness, setting baud rate, setting protocol format, function test • Editing parameter to **QNH, QFE,** offset correction for absolute pressure **P**	**3.1156.xx.000** **.00** **.01**	Operating voltage Measuring range Accuracy Resolution Digital interface Type Baud rate Parameter Analogue output Accuracy Display Temperature range Construction Dimension Protection Weight	230 V / 50Hz; 24 V AC 12-35 V DC 115 V / 50 Hz; 24 V AC 12-35 V DC 600 ... 1100 hPa ±0.25 hPa 0.1 hPa 1 x RS 422 1200, 2400, 4800, 9600, 19200, 57600 for ex. 8N1, 7E1 1 x 0 ... 5 V or 1 x 0 ... 10 V or 1 x 0(4) ... 20 mA ±0.3% of the end of measuring range @T_{amb} +20 °C 4 x 5-digit, LED red, 14 mm high -10 ... +50 °C switch panel mounting 144 x 144 x 135 mm IP 20 1.5 kg

Pressure

Description	Order No.	Technical Data	
Baro Display Displaying measuring instrument for four air pressure parameters with integrated pressure sensor. Analogue output and serial interface serve for the output of the measuring data to systems for further processing. **Display parameter:** • **QFF*,** - air pressure reduced to sea level at measuring site • **QFE** air pressure referred to runway • **Rel. humidity** (0 ...100% rel. h.) • **Temperature** (-40 ... +70 °C) **Measuring value output:** • The output of the displayed parameters is carried out via a serial interface. The interface specifications are settable. • The analogue output of absolute pressure **P** is done via an integrated analogue interface (U/I is settable) **Operation:** through front side key button • Dimming display, storing brightness, setting baud rate, setting protocol format, function test • Editing parameter to **QFF, QFE,** offset correction for absolute pressure **P** * display and output is possible only with connection of a suited Hygro-thermo transmitter (for ex.1.1005.54.000).	**3.1156.xx.001** **.00** **.01**	Operating voltage Measuring range Accuracy Resolution Digital interface Type Baud rate Parameter Analogue output Accuracy Analogue input for rel. humidity for temperature Display Temperature range Construction Dimension Protection Weight	230 V / 50 Hz; 24 V AC 12-35 V DC 115 V / 50 Hz; 24 V AC 12-35 V DC 600 ... 1100 hPa ±0,25 hPa 0.1 hPa 1 x RS 422 1200, 2400, 4800, 9600, 19200, 57600 for ex. 8N1, 7E1 1 x 0 ... 5 V or 1 x 0 ... 10 V or 0(4) ... 20 mA (= 600 ... 1100 hPa) ±0.3% of measuring range @T_{amb} +20 °C 0-1V(2V, 5V, 10V) or 0(4) ... 20mA Pt100 4 x 5-digit, LED red, 14 mm high -10 ... 50 °C Panel mounting 144 x 144 x 135 mm IP 20 1.5 kg

Remark

For the putting into circulation of mercury barometers, see guideline 2007/51/EG of the European Parliament and Council and regulation (EG) Nr. 847/2012.

Description	Order No.	Technical Data	
Indicators			
Hygro-Thermometer Combined indicating instrument designed to measure the ambient temperature and rel. humidity, as well as the representation of the normal climate acc. to DIN 50014, and of a comfort range	**1.0165.42.058** **1.0169.42.058**	Model	with feet and hook with flange for wall-mounting
		Humidity	
		Measuring range	20 ... 100% rel. h.
		Graduation	2% rel. h.
		Accuracy	±3% rel. h. @ room temperature
		Temperature	
		Measuring range	+5 ... +45 °C
		Graduation	1 °C
		Accuracy	±1 K
		Dimension	Ø 130 x 36 mm Ø 150 x 36 mm with model with mounting flange
		Weight	0.45 kg
Recording Instruments			
Hygro-Thermograph Recording instrument for rel. air humidity and air temperature The housing consists of a plastic-metal combination. The axes are supported by pivot bearings. Two different models are available regarding the drum clockwork drive:	**1.0660.xx.xxx** **1.0664.xx.xxx** **1.0665.xx.xxx**	Recording time 1 day 7 days 14 days 31 days 1 / 7 / 31 days	Thrust 11.45 mm/h 40 mm/d 20 mm/d 9 mm/d see above
	.00. **.02.**	Measuring range 10 ... 100% rel. h. 0 ... 100% rel. h.	Hum. meas. element **H** (-35 ... +70 °C) **K** (0 ... +80 °C)
1. Mechanical drum clockwork with hand wound drive for the temperature range from -35 ... +80 °C (for model 1.0660 / 664..)	**.0xx** **.9xx**	non lockable lockable	
		Temp. meas. range	Graduation
	.x00	-35 ... +45 °C * / **	1 °C
	.x05	-20 ... +60 °C **	1 °C
	.x11	-10 ... +50 °C **	1 °C
	.x12	-10 ... +40 °C **	1 °C
2. Battery-operated quartz clockwork for the temperature range from -20 ... +60 °C (for model 1.0665..)	**.x14**	0 ... +40 °C	0.5 °C
	.x15	0 ... +50 °C	0.5 °C
	.x16	0 ... +60 °C	1 °C
	.x17	0 ... +80 °C	1 °C
		Accuracy rel. humidity	
		H-meas. element	±2% rel. h. +1 scale division @ 65% rel. h. and room temperature
		K-meas. element	±3% rel. h. +1 scale division @ 65% rel. h. and room temperature
		Accuracy temperature	±1% of the m. r. +1 scale division @ 65% rel. h. and room temperature
		Recording width	2 x 82 mm
		Graduation	5% rel. h. / 1 resp. 0.5 °C
		Dimension	280 x 138 x 285 mm
		Weight	2.7 kg

Included in delivery:
1 set (100 sheets) strip chats
2 pieces felt pens

* the measuring range is possible only with mechanical clockwork

** the measuring range is possible only with measuring element „H“.

Humidity Temperature Pressure

Hygro-Thermograph

Recording instrument for rel. air humidity and air temperature.
The housing upper part consists of crystal-clear plastic. The axes are supported by pivot bearings.
Battery-operated (1.5 V) quartz drum clockwork mechanism. The recording time is switchable.

Included in delivery:
1 set (100 sheets) strip chats
2 pieces felt pens

* the measuring range is possible only with measuring element „H“.

Order No. **1.0680.xx.xxx**

	.10
	.12
	.011
	.014

Technical Data

Recording time	Thrust
1 day	11.45 mm/h
7 days	40 mm/d
31 days	9 mm/d
Humidity meas. range	Hum. meas. element
10 ... 100% rel. h.	H (-35 ... +70 °C)
0 ... 100% rel. h.	K (0 ... +80 °C)
Temp. meas. range	Graduation
-10 ... +50 °C *	1 °C
0 ... +40 °C	0.5 °C
Accuracy rel. humidity	
H-meas. element	±2% rel. h. +1 scale division @ 65% rel. h. and room temperature
K-meas. element	±3% rel. h. +1 scale division @ 65% rel. h. and room temperature
Accuracy temperature	±1% of the m. r. +1 scale division @ 65% rel. h. and room temperature
Recording width	2 x 82 mm
Graduation	5% rel. h. / 1 resp. 0.5 °C
Dimension	280 x 138 x 285 mm
Weight	2.7 kg

Accessories

Recording Charts

(100 pcs)

For Hygro-Thermograph

Attention: Pay attention to the measuring ranges !

Meas. element H	1 day	7 days	14 days	31 days
35 ... +45 °C	205142	205086	205153	205169
-20 ... +60 °C	205143	205088	205158	205168
-10 ... +50 °C	205138	205092	205155	205166
0 ... +40 °C	205123	205094	205150	205160
0 ... +80 °C	205126	205103	205280	205281
Meas. element K	**1 day**	**7 days**	**14 days**	**31 days**
0 ... +40 °C	205131	205097	205151	205161
0 ... +80 °C	205134	205112	205282	205283

Felt Pen

500847

colour	violet

Console

For wall-mounting of the hygro-thermographs, order no.. 1.0660... to 1.0665...

1.0598.10.000

Material	Aluminium, varnished
Surface	280 x 140 mm
Weight	0.8 kg

Description	Order No.	Technical Data	
Meteorograph A triple recording instrument for the most important meteorological data temperature, rel. humidity, and barometric air pressure. Approved sturdy model with mechanical drum clockwork and hand wound drive. The housing consists of metal and is white lacquered. The axis of the measuring systems are supported in pivot bearings. Included in delivery: 1 set (100 sheets) strip chats 3 pieces felt pens	**1.0840.00.xxx** **.000** **.005**	Measuring range temperature humidity pressure Accuracy humidity temperature pressure Graduation Recording time Advance Hum. meas. elem. Recording width Dimension Weight	 -35 ... +45 °C -20 ... +60 °C 10 ... 100% rel. h. 945 ... 1052 hPa ±2% rel. h. +1 scale division @ 65% rel. h. and room temperature ±1% of the m. r. +1 scale division @ 65% rel. h. and room temperature ±0.8 hPa +1 scale division @ 65% rel. h. and room temperature 5% rel. h. / 1 °C / 1 hPa 1 day / 7 days 11.45 mm/h; 40 mm/d H 3 x 82 mm 280 x 140 x 350 mm 4.5 kg

Accessories

Felt Pen	**500847**	colour	violet

Recording Charts
(100 pcs.)
For Meteorograph

temp. range	1 day	7 days
-35 ... +45 °C	205197	205192
-20 ... +60 °C	205073	205190

Humidity Temperature Pressure

Description	Order No.	Technical Data
Electronic Hand Instruments		
Hygro-Thermometer 625 Digital portable measuring instrument with integrated measuring sensor for the measurement of rel. humidity and temperature. Display: • Rel. humidity • Wet bulb temperature • Dew point temperature • Temperature • Max.- and min. values The instrument is equipped with a “hold function” for holding the displayed measuring instrument. Included in delivery: portable measuring instrument, pluggable sensor, battery, and calibration protocol.	**1.8625.10.000**	Measuring sensor Temperature: NTC Rel. humidity: capacitive Measuring range: -10 ... +60 °C; 0 ... 100% rel. h. Accuracy: ±0.5 K; ±2.5% rel. h. (5 ... 95% rel. h.) Display: LCD, approx. 14 mm high, illuminated Resolution: 0.1 °C / 0.1% rel. h. Supply: 9 V-block battery, 6F22 Operating time of battery: approx. 70 hours Housing: synthetic (ABS) Dimension: 182 x 64 x 40 mm Weight: 195 g
Accessories		
Hand grip for measuring sensor Hand grip for pluggable humidity sensor head for connection to hygro-thermometer 625 inclusive sensor cable.	**1.8625.11.725**	
Carrying Case For measuring instrument and sensor	**1.8625.20.210**	
Topsafe (protective cover) Protects against shock and dirt	**1.8625.20.221**	
DKD Certificate 11.3% and 75.3% rel. h. @ +25.0 °C	**1.8625.90.206**	
ISO Certificate 11.3% and 75.3% rel. h. @ +25.0 °C	**1.8625.90.006**	
Battery Charger For external charging of the accumulators	**1.8625.30.025**	
9 V Accumulator	**1.8625.30.515**	

Electrical Transmitter

Description	Order No.	Technical Data	
Hygro-Thermo Transmitter Instrument designed for measurement of temperature and air humidity. The data are output as electrical analogue signals. Humidity value is displayed additionally. The transmitters consist of a hair humidity element and a Pt 100 resistance thermometer. Sturdy construction, essential external parts are made of stainless steel. For outdoor installation we recommend the use of the weather- and thermal radiation shield order no. 1.1025.51.000. (see Accessories)	**1.1005.50.xxx** **.015** **.515**	Electr. output 200 Ω lin./ Pt 100 200 Ω lin./ Pt 100 Measuring range Accuracy Graduation Scale length Hum. meas. elem. Temp. meas. elem. Diameter of stem. Length of stem Protection Total length Weight	Electr. connection with Lemosa-plug with 3 m cable 10 ... 100% rel. h. ±3% rel. h. @ 20 ... 100% rel. h. and room temperature ±1 k 1% rel. h. not linear 94 mm H Pt 100, acc. to DIN IEC 60751 1/3 class B 22 mm 250 mm IP 65, display case 350 mm 0.7 kg resp. 0.9 kg
Hygro-Thermo Transmitter compact Instrument designed for measurement of temperature and air humidity The data are output as electrical analogue signals The transmitters consist of a capacitive humidity element and a Pt 100 resistance thermometer. For outdoor installation we recommend the use of the weather- and thermal radiation shield. Order no 1 1025 55 xxx	**1.1005.54.xxx** **.000** **.160** **.161** **.173** **.241**	Electr. output Humidity 0 ... 1 V 0 ... 1 V 0 ... 10 V 0 ... 5 V 4 ... 20 mA Measuring range Meas. element Rel. humidity Temperature Accuracy Rel. humidity Temperature Operating voltage Protection Connection Dimension Weight	Electr. output Temperature Pt 100 0 ... 1 V 0 ... 10 V 0 ... 5 V 4 ... 20 mA 0 ... 100% rel. h. -30 ... +70 °C Capacitive Pt 100 acc. to DIN IEC 60751 1/3 class B ±2% rel. h. (@ 5 ... 95% rel. h. and 10 ... 40 °C) ±0.1 K (Pt 100) ±0.2 K (V) ±0.3 K (mA) 6 ... 30 V DC (...000/160) 15 ... 30 V DC (...161) 10 ... 30 V DC (...173) 12 ... 30 V DC (...241) IP 30 for sensor IP 65 for electronic 5 m cable Ø 20 x 124(180) mm 0.45 kg
Hygro-Thermo Transmitter compact Model like 1.1005.54.xxx, however with extended temp. measuring range.	**1.1005.54.xxx** **.441** **.461**	Electr. output Rel. humidity 4 ... 20 mA (= 0 ... 100% rel. h.) 0 ... 10 V (= 0 ... 100% rel. h.)	Temperature 4 ... 20 mA (= -40 ... +60 °C) 0 ... 10 V (= -40 ... +60 °C)

1.1005.54.xxx 1.1005.54.241

Humidity Temperature Pressure

Hygro-Thermo-Transmitter compact

• Model with plug
Model like 1 1005 54 xxx, however with plug and socket instead of fixed cable

1.1005.54.xxx

.701
.761
.773

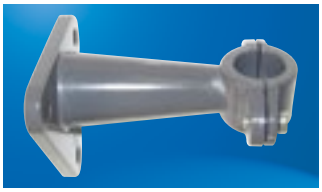
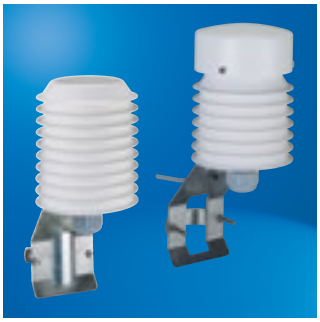
Technical Data	
Electr output	Electr. output
Rel. humidity	Temperature
0 ... 1 V	Pt 100 (±0.1 K)
0 ... 10 V	0 ... 10 V (±0.2 K)
0 ... 5 V	0 ... 5 V (±0.2 K)
Connection	Plug connection
Dimension	Ø 20 x 190 mm
Weight	0.45 kg

Hygro-Thermo Transmitter compact

The instrument serves for the measurement of temperature and air humidity.
The data communication is carried out via an RS485-interface with MODBUS RTU-protocol.
The sensors consist of a capacitive humidity element and a pt 100 resistance thermometer.
For outdoor installation we recommend to use the weather and thermal radiation shield order-no 1.1025.55.00x

1.1005.54.780

Measuring range	0 ... 100% rel. h. -40 ... +85 °C
Measuring element	
Rel. humidity	Capacitive
Temperature	Pt 100 1/3 class B acc to DIN IEC 751
Accuracy	
Rel. humidity	±1.5% rel. h. (@ 10...90% rel. h. and 23 °C)
Temperature	±0.2K (@ 23 °C)
Electr. output	RS485, MODBUS-RTU-protocol
Operating voltage	5 ... 30 VDC
Protection	IP 30 for Sensor element IP 67 for plug
Connection	7 pole connector
Dimension	Ø 20 x177 mm
Weight	0.45 kg

Description	Order No.	Technical Data		
Membrane Filter with gauze ZE 20 Is put on the sensor and protects the measuring element from coarse dust.	**1.1005.54.901**			
Sinter Filter ZE 21 made of metal. Is put on the sensor and protects the measuring element from high wind speeds (› 5 m/s) and coarse dust. Necessary for use in exposed areas (e.g. sea climate).	**1.1005.54.902**			
Wall Holder Serves for wall mounting of hygro-thermo transmitter 1.1005.54..., for use protected against radiation and precipitation (for ex. indoor).	**1.1005.54.903**	Clamping range Wall distance Material Mounting Dimensions Weight	Ø 20 mm 83 mm (to transmitter centre) plastic, grey flange plate with 3 x 6.5 mm boring 96 mm long 0.075 kg	
Weather and Thermal Radiation Shield Protective case for hygro-thermo transmitter compact with outdoor installation.	**1.1025.55.00x** **.10x** **.xx0** **.xx1**	W/o Ventilator with Ventilator Clamping range Material Montage cable Dimensions Weight	 12 V DC; 2 W Ø 35 ... 50 mm Ø 55 ... 60 mm Synthetic lamellas, white Non-corroding holder 5 m, for model. ...100 Ø 120 x 275 / 290 mm 0.8 kg	

Humidity Temperature Pressure

Clima Sensors D

Description	Order No.	Wind	Precipitation, Brightness Twilight	Temperature Air Humidity
Clima Sensor D, WTF	**4.9110.00.061**	X	X	X
Clima Sensor D, W	**4.9100.00.061**	X	X	
Clima Sensor D, TF	**4.9111.00.061**		X	X
Clima Sensor D	**4.9101.00.061**		X	

The Clima Sensor D serves for the measurement of environmental data. These are available as
- Serial RS 485/422 telegram and as
- Analogue outputs for further processing

The Clima Sensor D has an internal DCF77 receiver, which takes the time signal of an atomic clock, and integrates it into the data telegram.

Ranges of application are:
- Building control systems
- Control technique
- Green house technique
- Processing of the acquired data to recording or display instruments

Depending on the model, the following data can be measured by the Clima Sensor D:
- Wind velocity
- Precipitation (yes/no)
- Brightness in Eastern, Southern and Western direction
- Twilight
- Temperature
- Rel. humidity

The respective holder serves for the mounting at masts or plane surfaces, depending on the range of application.

Instrument with internal condensation shield

Technical Data		
Wind	Measuring range	1 ... 40 m/s
	Accuracy	±0.5 m/s or ±5% of measuring range
Precipitation	Measuring range	Precipitation yes/no
	Sensitivity	Fine drizzle
	Switch-off-delay	Approx. 2 minutes
Brightness for South East, West	Measuring range	0 ... 100 k Lux
	Spectral range	700 ... 1050 nm
	Accuracy	±10% of meas. value
Twilight	Measuring range	0 ... 250 Lux
	Spectral range	700 ... 1050 nm
	Accuracy	±10% of meas. value
Temperature	Measuring range	-20 ... +60 °C
	Measuring element	Pt 100 $^{1}/_{3}$ DIN
	Accuracy	±0.5 k at › 1 m/s
Air humidity	Measuring range	0 ... 100% rel. h.
	Accuracy	±3% in the range 10 ... 90% rel. h.
Output serial	Type	RS 422 / 485
	Output	1200-19200 baud 8N1, full-duplex/ half-duplex-operation
	Output parameter	Environmental data, housing, temperature, date, time, sensor status, checksum
analogue	Signal	
	0 ... 10 V	Depending on parameter
	0 V/10 V	With precipitation yes/no
	Load resistance	≥ 10 kΩ ≥ 100 kΩ with precipitation
General	Operating voltage	
	Current consumption	16-28 VDC or 24 V AC ≤ 150 mA w/o condensation shield, approx. 600 mA with condensation shield
	Ambient temperature	-40 °C ... +60 °C
	Connection	10 m cable; LiYCY 16 x 0.14 mm², UV-resistant
	Mounting	Retaining clamp, stainless steel
	Weight	max. 1.5 kg
Dimension	4.9110.00.061	Ø 130 x 430 mm
	4.9100.00.061	Ø 130 x 335 mm
	4.9111.00.061	Ø 130 x 310 mm
	4.9101.00.061	Ø 130 x 215 mm

Weather Stations

Description	Order No.	Wind	Temperature Humidity Pressure	Precipitation Brightness	Configuration
Clima Sensor US NHTFB	**4.9200.00.000**	X	X	X	10V/RS485/GPS
Clima Sensor US TFB	**4.9201.00.000**	X	X		10V/RS485
Clima Sensor US NH	**4.9202.00.000**	X		X	10V/RS485/GPS
Clima Sensor US	**4.9203.00.000**	X			10V/RS485

The Clima Sensor US serves for the measurement of environmental parameters. These are available for further processing as
- Serial telegram via an RS485/422 and /or as
- Analogue Signals via voltage output

Some models have a GPS receiver. It serves for determining position and time, here from, the sun position is calculated additionally. Position, time and sun position are output serially.

Compact design, easy mounting, and the various possibilities for data output are the basis for an application in many fields, such as.
- Building control, Traffic control system, Meteorology, Renewable energy, Agriculture.

Depending on model, the following parameters can be measured by the Clima Sensor US:
- Wind velocity
- Wind direction
- Precipitation intensity and kind
- Brightness
- Brightness direction
- Temperature
- Relative air humidity
- Air pressure

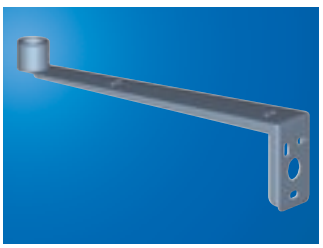
Wind Velocity	Measuring range	0 ... 60 m/s
	Accuracy	±0.2 m/s @ WV ‹5 m/s ±3% @ WV ›5 m/s
Wind Direction	Measuring range	0 ... 360°
	Accuracy	±2.0° @ WG ›2 m/s
Precipitation	Measuring range	0.001 ... 10 mm/min
Brightness	Measuring range	0 ... 150 kLux 3% from rel. meas. value
Air pressure	Measuring range	300 ... 1100 hPa
	Accuracy	±0.25 hPa @ +10 ... +35 °C
Temperature	Measuring range	-40 ... +80 °C
	Accuracy	±0.2 K @ 25 °C
Air humidity	Measuring range	0 ... 100% rel. h.
	Accuracy	±1.8% @ 10 ... 90% rel. h.
Output serial	Type	RS 422 / 485
	Baud rate	1200 ... 921600 baud
	Operating mode	full-duplex / half-duplex
	Protocol	ASCII / MODBUS RTU
	Output parameter	Div. meas. data, date, time, check sum etc.
analogue	Type	8 x 0 ... 10 V
	Output parameter	Wind velocity and direction, brightness, direction of brightness, precipitation, rel. humidity, temperature, air pressure
	Load resistance	≥ 2 kΩ
General	Operating voltage	5 ... 60 VDC or 10 ... 42 VAC 50/60 Hz
	Power consumption (Electronics fully equipped)	50 mA @ 24 V
	Heating at full power	24 V AC / DC 25VA
	Ambient temperature	-30 °C ... +70 °C
	Connection	19-pole connector
	Mounting	On tube (max. Ø 50 mm)
	Weight	0.9 / 0.7 kg
Dimension	4.9200(1).00.000	Ø 150 x 220 mm
	4.9202(3).00.000	Ø 150 x 175 mm

Humidity Temperature Pressure

Description	Order No.	Technical Data	
Cable Pre-assembled connecting cable for Clima Sensor US The cable with 16 leads serves for the connection of: • Serial interface • Analogue output • Instrument supply The cable with 8 leads serves for the connection of: • Serial interface • Instrument supply Equipment: • Plug at the instrument side, • Open cable end receiving side, • Shielded, • Halogen-free, • UV-resistant	**509311** **509427**	Length Number of leads Length Number of leads	10 m 16 10 m 8
Power Supply Unit Serves for power supply of the Clima Sensor US as well as for the connection and distribution of cable or cable wire resp. Equipment: toroidal transformer, series terminal, housing with screwed cable gland	**9.3389.20.000**	Primary Secondary Series terminals Housing Dimensions (LxWxH) Screwed cable gland Protection Weight	230 V AC / 115 V AC 24 V AC / 1.25 A 16 Plastic material 125 x 125 x 100 mm 3 x M 16 x 1.5 1 x M 20 x 1.5 IP 66 approx. 1.5 kg
Mounting set Serves for lateral mounting of power supply unit 9.3389.20.000 at a mast	**509436**	Clamping range Material Weight	Ø 48 ... 102 mm Stainless steel approx. 0.5 kg

Description	Order No.	Technical Data		
Weather Station Compact WSC11 The Weather Station Compact WSC11 is designed for the use in • Building automation (such as. shading control) The interface to the instrument is digital and consists of an • RS485 interface in half-duplex-mode Together with the ID-based communication the interface allows the operation of the weather station in a bus The instrument has a GPS receiver. It serves for determining the position and time. Herefrom, the sun position is calculated additionally The following parameters can be measured: • Wind speed • Wind direction • Brightness (in the North, East, South, West) • Twilight • Global radiation • Precipitation • Temperature • Relative humidity • Air pressure • Time / Date • Geostationary data -Longitude -Latitude • Sun position -Elevation -Azimuth	**4.9056.00.000**			
	Wind Velocity	Measuring range Accuracy	0 ... 40 m/s ±5% of meas. range	
	Wind Direction	Measuring range Accuracy	0 ... 360° ±10°	
	Precipitation	Measuring range	1 / 0 (yes/no)	
	Brightness	Measuring range Accuracy	0 ... 150 kLux ±3% of meas. range	
	Twilight	Measuring range Accuracy	0 ... 500 Lux ±10 Lux	
	Global radiation	Measuring range Accuracy	0 ... 1300 W/m² ±10% of meas. range	
	Air pressure	Measuring range Accuracy	300 ... 1100 hPa ±0.5 hPa @ 20 °C	
	Temperature	Measuring range Accuracy	-30 ... +60 °C ±1 °C @ -5 °C ... +25 °C, ›2m/s)	
	Air humidity	Measuring range Accuracy	0 ... 100% rel. h. ±5% rel. h. @ 0 ... 40 °C	
	Output serial	Type Baud rate Operating mode Protocol	RS 485 1200 ... 115200 Half-duplex ASCII / MODBUS RTU	
	General	Operating voltage Power consumption Ambient temperature Connection Mounting Weight Dimension	18 ... 30 VDC or 18 ... 28 VAC 50/60 Hz ‹300 mA @ 24 VDC -30 °C ... +60 °C connector On tube (max. Ø 25 mm) 0.2 Kg Ø130 x 70 mm	

Mounting angle Serves for the lateral mounting of the Weather Station Compact WSC11 at a vertical surface	**509276**	Length width Material	320 mm 60 mm Stainless steel 1.4301	



Cable Pre-assembled 5-pole connecting cable for Weather Station Compact WSC11. Equipped with: • Plug at the instrument side, • Open cable end receiving side, • Shielded	**509279**	Length	5 m	

Accessories

	Description	Order No.	Technical Data	
	Weather and Thermal Radiation Shield			
	**Weather and Thermal Radiation Shield** Serves as a protective case for - Hygro-Transmitter or - Hygro-Thermo Transmitter in outdoor use. This case essentially eliminates the influence of weather and radiation errors which affect the measurement result.	**1.1025.51.000**	Suitable for Installation pin Material Dimension Weight	1.1000.50... 1.1005.50... Ø 22 x 27 mm aluminium galvanised and varnished Ø 170 x 450 mm 2.2 kg
	**Weather and Thermal Radiation Shield, compact** Serves as a protective case for - Temperature -Sensor compact or - Hygro- Thermo Transmitter compact in outdoor use. This case essentially eliminates the influence of weather and radiation errors which affect the measurement result.	**1.1025.55.xxx** **1.1025.55.00x** **1.1025.55.10x** **1.1025.55.xx0** **1.1025.55.xx1**	Suitable for Without ventilator With ventilator Clamping range (holder) Material Lamella Holder Cable (execution only 1.1025.55.10x) Dimension Weight	1.1005.54... 2.1280... 12 V DC, 2 W Ø 35 ... 50 mm Ø 55 ... 60 mm Polycarbonat, white, UV-resistant Stainless steel 5 m Ø 120 x 275/290 mm 0.8 kg
	Measuring Transformer			
	**Universal Amplifier** The Universal Amplifier serves for the connection of various sensors with voltage-, or PT 100 output. It amplifies the measuring values, prepares them and outputs them as standardized voltages or currents analogical and digitally. Analogue outputs: Measuring values are, alternatively, output as current- or voltage signal. The scaling of the measuring values are settable. Digital output: An RS485/422 is available for serial communication (operation, scaling and telegram output). It can be operated in full- or resp. half-duplex mode. For the output of measuring values there are pre-defined telegrams available. All settings/programmings are carried out in the factory.	**7.1415.00.200**	Analogue inputs Analogue outputs Serial interface Operating voltage Ambient conditions Operating temperature Storage temperature Housing Type of connection Protection Dimension Weight	4 x -0.1 ... +1.0 V; resolution 1 µV switchable to -1 ... +10 V Alternatively, each channel is switchable to PT 100: max. -99.0 ... +99.0 °C PT100 resolution: 1/10, 1/100, 1/1000 °C, settable 0 ... 1 V, 0 ... 5 V, 0 ... 10 V, 4 ... 20 mA, 0 ... 20mA Resolution 1/10000 FS 1 x RS422/485 Baud rates: 1200, 2400, 4800, 9600(default), 115200Bd, 8N1 7 ... 42 V DC -40 ... +60° C -40 ... +85° C Polycarbonate Cable gland and terminal strip IP 65 120 x 80x 55 mm 0.25 kg

Digital Indicators

Description	Order No.	Technical Data	
Digital Indicator for panel installation Flat-section indicator for display of humidity, temperature or pressure values. The background of the indicator is black to facilitate reading of the red digits. Preferably switch panel or front panel installation.	**1.1044.00.xxx** **1.1044.02.xxx** **2.1044.00.xxx** **3.1044.00.xxx** **.000** **.040** **.041** **.061** **.073**	Display range Electr. input Resolution Display Operating voltage Model Protection Dimension Weight	10 ... 100% rel. h. 0 ... 100% rel. h. -100.0 ... +199.9 °C 945 ... 1053 hPa Pt 100 (only temp.) 0 ... 20 mA 4 ... 20 mA 0 ... +10 V 0 ... +5 V (only pressure) ±1 digit LED, red, 13 mm high 230 V / 50 Hz panel mounting IP 20 96 x 48 x 104 mm 0.3 kg
Digital Indicator for panel installation with 2 adjustable limit contacts Flat-section indicator for display of humidity, temperature or pressure values. Two setting knobs on the front panel serve for setting both the potential-free relay-contacts. The background of the indicator is black to facilitate reading of the red digits. Preferably switch panel or front panel installation.	**1.1045.00.xxx** **1.1045.02.xxx** **2.1045.00.xxx** **3.1045.00.xxx** **.000** **.040** **.041** **.061** **.073**	Display range Electr. input Resolution Display Type of contact Operating voltage Model Protection Dimension Weight	10 ... 100% rel. h. 0 ... 100% rel. h -100.0 ... +199.9 °C 945 ... 1052 hPa Pt 100 (only temp.) 4 ... 20 mA 0 ... 20 mA 0 ... +10 V 0 ... +5 V (only pressure) ±1 digit LED, red, 13 mm high throw over switch 230 V / 50 Hz panel mounting IP 20 96 x 48 x 104 mm 0.3 kg

Accessories

Weather Display LED

Displaying measuring instrument for four meteorological parameters (for ex. temperature, rel. humidity, global radiation, air pressure). Instrument with serial interface for the receipt of measuring data and output to processing systems.

- Operation and setting through front side keys.
- Display sequence and formatting of weather parameters are configurable acc. to customer's request.
- Display possible from instantaneous, min., max. and mean value for each parameter.
- Receipt of display parameters via a serial interface. For ex. for connection to THIES-datalogger systems or THIES-sensor interface.
- Output of display parameters via a serial interface.

Order No.: **9.2750.0x.900**
.00.
.01.

Technical Data	
Operating voltage	230 V / 50 Hz; 24 V AC 12-35 V DC
	115 V / 50 Hz; 24 V AC 12-35 V DC
Display range	-9:999 ... +99999
Display	4 x 5 digit, LED red, 14 mm high
	4 x min/max LED-arrow
Measuring range	depending on parameter
Resolution	depending on parameter
Digital-Interface	
Type	1 x RS 422
Baud rate	1200, 2400, 4800, 9600, 19200, 57600
Parameter	for ex. 8N1, 7E1,
Temperature range	-10 ... 50 °C
Construction	Switch panel mounting
Dimension	144 x 144 x 135 mm
Protection	IP 23
Weight	1.5 kg
EMC	EN 60945
	EN 61000-6-2
	EN 61000-6-3

Weather Display LED

Displaying measuring instrument for four meteorological parameters (for ex. temperature, rel. humidity, global radiation, air pressure). Instrument with integrated serial interface and analogue-interface for data input and -output
The instrument is optionally equipped with an integrated pressure sensor.

- Operation and setting through front side keys.
- Display sequence and formatting of weather parameters are configurable acc. to customer's request.
- Display possible from instantaneous, min., max. and mean value for each parameter.

Measuring value input:
- Receipt of display parameters via a serial interface
- Receipt and acquisition of the display parameters via an integrated analogue interface. The analogue IF is configurable acc. to customer's request.
- Serial output of the display parameters via a serial interface.
- Analogue output of max. two display parameters via an integrated analogue interface (U/I is selectable).

Order No.: **9.2750.xx.901**
.x0.
.x1.
.0x.
.1x.

Technical Data	
Operating voltage	230 V / 50 Hz; 24 V AC 12-35 V DC
	115 V / 50 Hz; 24 V AC 12-35 V DC
W/o integrated pressure sensor	
With integrated pressure sensor	
Display range	-9.999 ... +99999
Display	4 x 5 digit, LED red, 14 mm high
	4 x min/max LED-arrow
Measuring range	depending on parameter
Resolution	depending on parameter
Digital interface	
Type	1 x RS 422
Baud rate	1200, 2400, 4800, 9600, 19200, 57600
Parameter	for ex. 8N1, 7E1,
Analog input	3 (4) x 0 ... 10 V or 0 (4) ... 20 mA
	1 x Pt 100
Analog output	2 x 0 ... 10 V or 0 (4) ... 20 mA
Temperature range	-10 ... 50 °C
construction	Switch panel mounting
Dimension	144 x 144 x 135 mm
Protection	IP 23
Weight	1.5 kg
EMC	EN 60945
	EN 61000-6-2
	EN 61000-6-3
Pressure sensor	
Measuring range	750 ... 1100 hPa
Resolution	0.1 hPa
Accuracy	±0.5 hPa (at 25 °C)

Description	Order No.	Technical Data	

Hangers / Holders / Adapters

Hanger 1 m

For mast mounting of a measuring value transmitter. Bracket with adapter for hygro-thermo transmitter (1.1005.50..) in the weather and thermal radiation shield (1.1025.51...) or for air temperature transmitter (2.1260.00.000)

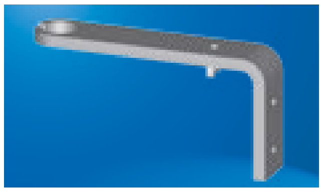
Order No.	Technical Data	
4.3185.xx.xxx.		
.00.	Clamping range	Ø 60-132 mm
.01.		Ø 40-80 mm
.02.		Ø 48-50 mm
.000	Suitable for	1.1005.50./ 1.1025.51.
.001		2.1260...
	Sensor distance	1 m from mast
	Dimension	1 m long
	Tube diameter	50 mm
	Material	Aluminium
	Weight	1.8 kg

Traverse 0,2 m compact

For storefront mounting of a measuring value transmitter.

For adapting of measuring value transmitter pivots (506350) and holders (506347) can be used.

Order No.	Technical Data	
4.3171.25.000	Length	200 mm
	Material	Aluminium
	Weight	0.3 kg

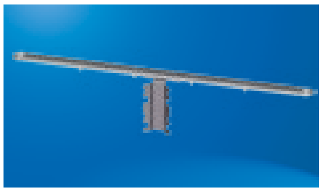


Traverse

For combined mounting of 2 measuring value transmitters onto a mast

For adapting of measuring value transmitter pivots (506350) and holders (506347) can be used.

Order No.	Technical Data	
4.3171.30.000	Clamping range	Ø 48 ... 102 mm
	Sensor distance	0.4 m from mast
	Dimension	0.8 m long
	Material	Aluminium / Stainless steel
	Weight	0.35 kg

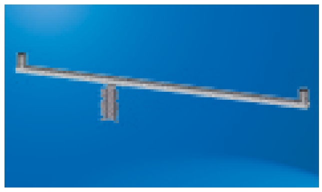


Traverse NS/TF – 04 m /0.8 m

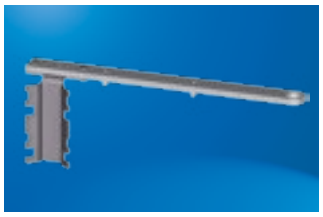
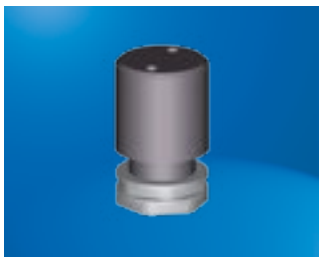
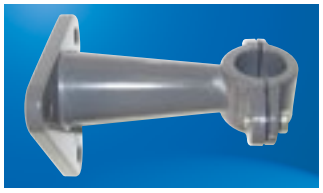
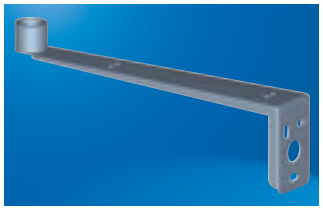
For combined mounting of 2 measuring value transmitters onto a mast.

Traverse with adapter for hygro-thermo transmitter (1.1005.54..) in weather and thermal radiation shield (1.1025.55...) and precipitation monitor (5.4103.. / 5.4105..)

Order No.	Technical Data	
4.3171.30.012	Clamping range	Ø 48 ... 102 mm
4.3171.31.012	Clamping range	Ø 116 ... 200 mm
	Transmitter distance	0.4 m and 0.8 m from mast
	Dimension	1.2 m long
	Material	Aluminium / Stainless steel
	Weight	1.1 kg

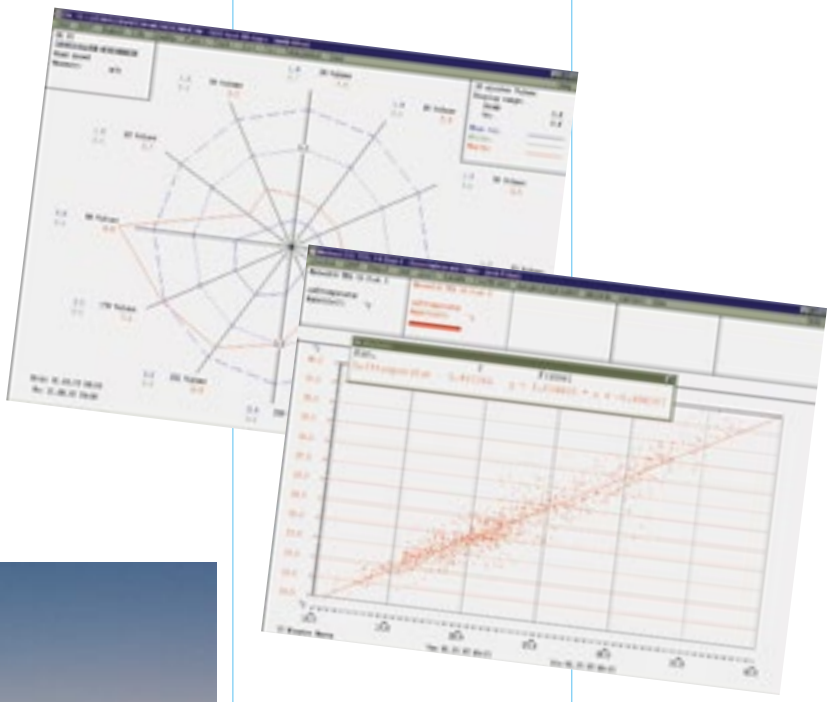


Accessories

	Description	Order No.	Technical Data	
	**Traverse short** For mast mounting of a measuring value transmitter. For adapting of measuring value transmitter pivots (506350) and holders (506347) can be used.	**4.3171.40.000**	Clamping range Transmitter distance Dimension Material Weight	Ø 48 ... 102 mm 0.4 m to the Mast 0.4 m long Aluminium / stainless steel 0.30 kg
	**Holder compact** For mounting of measuring value transmitter onto a mast, tube, traverse or at a storefront. For adapting of measuring value transmitter pivots (506350) and holders (506347) can be used.	**506347**	Clamping range Dimension Material Weight	35 ... 50 mm 80 x 150 mm Stainless steel 0.35 kg
	**Peg complete** For adapting of measuring value transmitters, for ex. for hygro-thermo transmitters (1.1005.54..) in weather and thermal radiation shield (1.1025.55...) at a/m traverses or holders	**506350**	Material Dimension Weight	POM Ø 40 x 65 mm 0.1 kg
	**Wall Holder** For mounting of a hygro-thermo transmitter (1.1005.54...) or temperature sensor (2.1280....) at a wall, radiation- and precipitation-protected application (for ex. in rooms)	**1.1005.54.903**	Clamping range Average wall distance Material Mounting Dimension Weight	Ø 20 mm 83 mm Plastic, grey Flange plate with 3 x 6.5 mm boring 96 mm long 0.075 kg
	**Mounting angle** Serves nfor the lateral mounting of the weather station COMPACT WSC 11 at a vertical surface	**509276**	Length Width Material	320 mm 60 mm Stainless steel 1.4301

Please contact us for other accessories, such as cables and cable connections as well as for additional constructions of masts or systems.
We will be pleased to submit an individual offer to you.

THIES –
as versatile as the international tasks require



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Climatic measurement and intelligent analysis are international tasks. They do not only demand a worldwide cooperation of the responsible authorities, but also a comprehensive network of sensors and analytical systems.

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Should you want to contact one of our foreign partners, please write or call us first in Göttingen. We will provide you with the exact address.

Information is everything. Please ask for our complete catalogue and product descriptions concerning all questions of weather data acquisition – or attend our internet page:
www.thiesclima.com

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