

Measuring Instruments for Paper Machines

ECMK
PROCESS SOLUTIONS

Temperature
Relative Humidity
Air Flow



INSTRUMENT TEMPERATURE, HUMIDITY, AIR FLOW

Temperature Humidity Air Flow



Temperature ONLY!
SwemaTemp 20 is a display instrument for temperature and connects to SWT 315.



Temperature, Humidity and ventilation.
Swema 3000 is a powerful instrument that can connect a temperature, humidity or ventilation probe. There are four models, all with data storing and logging functions.

It is easy to transfer data to a computer and create a diagram in a spread sheet.

764.200 Swema 3000

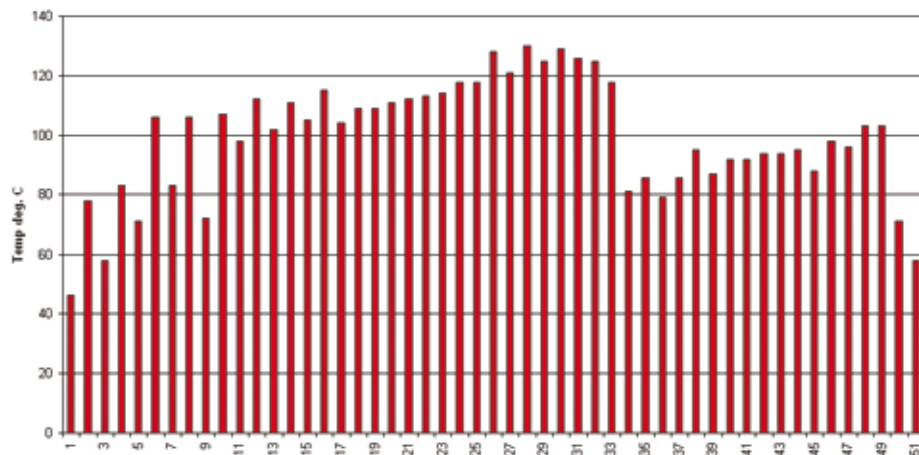
764.201 Swema 3000d with inbuilt barometer and a Type K connector for Thermo couple temperature

764.202 Swema 3000md with inbuilt barometer, Type K connector and -300....+1.500 Pa differential pressure sensor for air.

764.203 Swema 3000mdH+ with inbuilt barometer, Type K connector and ± 8000 Pa differential pressure sensor for air



SWT 315, measuring surface temperature of a drying cylinder. A 10m extension cable connects to a Swema 3000 or SwemaTemp 20.



Temperature profile of a 51 cylinder paper machine

CYLINDER TEMPERATURE



765.110
SwemaTemp 20

764.860
0,5m cable

- ✚ 764.760 Holder
- ✚ 764.760 Holder
- ✚ 764.870 Stop

762.222 10m elongation cable



760.660 SWT 315 temperature probe for
paper cylinders in paper machines.



Spare parts:
760.800 Contact element for SWT 315
923.201 Set of 4 wheels



764.200
Swema 3000*

759.950
0,5m cable

- ✚ 764.760 Holder
- ✚ 764.760 Holder
- ✚ 764.870 Stop

762.222 10m elongation cable



760.660 SWT 315 temperature probe for
paper cylinders in paper machines.



756.860 Case for SWT 315 & instrument

* or 764.201 Swema 3000d, 764.202 Swema3000md or 764.203 Swema 3000mdH+

Paper Machine cylinder SWT 315 surface temperature

SWT 315 is a contact temperature probe for the handheld instruments SwemaTemp 20 and Swema 3000.

SWT 315 runs on a 4-wheel wagon direct on the cylinder surface. SWT 315 is specially developed and tested for the paper industry in liaison with the Technical Institute of Lund, Sweden. It gives fast and accurate measurements of the surface temperature on drying cylinders in modern paper machines. The floating joint allows for a smooth run on the cylinder at different angles of the telescopic shaft. Due to the fact that the sensor is virtually in contact with the cylinder, with the protection for the sensor being a strong flexible metal wafer, the SWT 315 offers outstanding accuracy at high paper velocity. The sensor contact with the paper cylinder produces no adverse effects, the small amount of generated friction heat (1°C) is simply transferred to the air.

Technical data:

SWT 315:

Temperature: 0...200°C

Accuracy: $\pm 2^\circ\text{C}$ or $\pm 1,5\%$ R.V.

Max speed SWT 315: 2000 m/min

Response time: SWT 315: $T_{90} = 7$ sek,

Min cylinder diameter: 150 mm

Telescopic shaft: 1...2 m

RELATIVE HUMIDITY TEMPERATURE, DEW POINT, WATER CONTENT

764.200
Swema 3000*



762.140
0,2m cable



764.220 Holder



764.220 Holder

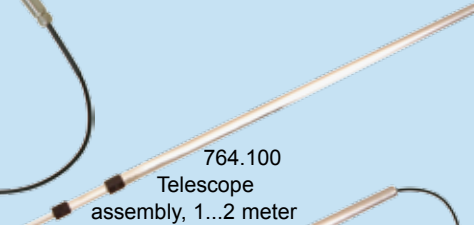
* or 764.201 Swema 3000d, 764.202 Swema3000md or 764.203 Swema 3000mdH+



859.777 SWA 16



859.875
Steel sinter filter



764.100
Telescope
assembly, 1...2 meter



SWA 16 with optional
telescope assembly and
steel sinter filter

SWA 16 is a probe for Swema 3000 specially developed for relative humidity measurements 0...100%RH up to 150°C inside paper machines. High humidity values indicates a humidity pocket with poor ventilation. It also calculates the dew point and the water content by weight.

Measurement protocols and loggings can be stored and transferred to a PC.



Technical data:

SWA 16 connects to Swema 3000 with two holders and a connection cable

Relative humidity 10...90 %RH

±1,5%RH at 23°C

± 2%RH at -10...+10°C, 30...50°C

± 2,5%RH at 50...70°C

± 3,5%RH at 70...150°C

± 3%RH at -20...-10°C

Relative humidity: 0...10, 90...100 %RH

± 2,5 %RH at <10, >90 %RH at 23°C

Temperature: -20...+150°C

± 0,3°C at 23°C

Length probe: 120 mm stainless steel

Ø probe: 15 mm

Cable length: 10m



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AIR FLOW, AIR VELOCITY

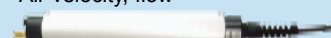
764.200
Swema 3000



764.201
Swema 3000d



761.430 SWA 10 -300...1500Pa
Air velocity, flow

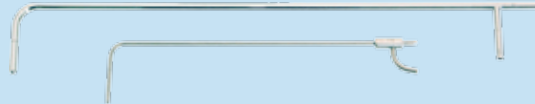


758.330 SWA 07 -7000...7000Pa
Air velocity, flow



- 764.760 Holder
- 764.760 Holder
- 764.870 Stop

762.470 Silicon-
hose -70...+250°C

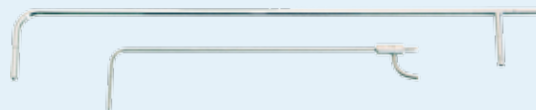


- 756.530 Pito static pipe length 500 Ø 7 mm
- 756.531 Pito static pipe length 750, Ø 7 mm
- 756.532 Pito static pipe length 1000, Ø 7 mm
- 756.533 Pito static pipe length 1500, Ø 7 mm

764.202
Swema 3000md



764.203
Swema 3000mdH+



Technical data:

Media: Clean air, Temperatur 0...50°C
resolution: adjustable down to 0,01 Pa

Swema 3000md, SWA 10:

Differential pressure: -300...1 500Pa
3000md: $\pm 0,3\%$ read value, minimum $\pm 0,3$ Pa
SWA 10: $\pm 1\%$ read value, minimum $\pm 0,3$ Pa
Max overload $\pm 20\ 000$ Pa
Air velocity 2...49 m/s

SWA07:

Differential pressure: $\pm 7\ 000$ Pa
After zeroing: $\pm 0,3$ Pa $\pm 2\%$ read value
Max load $\pm 35\ 000$ Pa
Air velocity approx. 2...100 m/s
Resolution: adjustable down to 0,01 Pa
Position dependency: approx. 5Pa

Swema 3000mdH+:

Differential pressure: $\pm 8\ 000$ Pa
Air velocity approx. 2...110 m/s
 $\pm 1\%$ read value, minimum $\pm 0,4$ Pa
Max overload $\pm 100\ 000$ Pa

By connecting a pito static pipe the instrument measures air velocity. The instrument can also automatically calculate the air flow when the area is known. Swema 3000md and SWA 10 measures pressure with high accuracy. An inbuilt valve automatically zero checks the pressure before saving the values. This function gives a fully position independent probe that makes them suitable for both field and laboratory measurements. Swema 3000mdH+ is a special version with higher pressure range: $\pm 8\ 000$ Pa.

SWA 07 has a wider pressure range than SWA 10 and Swema 3000md. However SWA 07 needs to be zero adjusted in its measuring position.

SWA 07 has no inbuilt valve and therefore the pressure needs to be disconnected before zeroing.

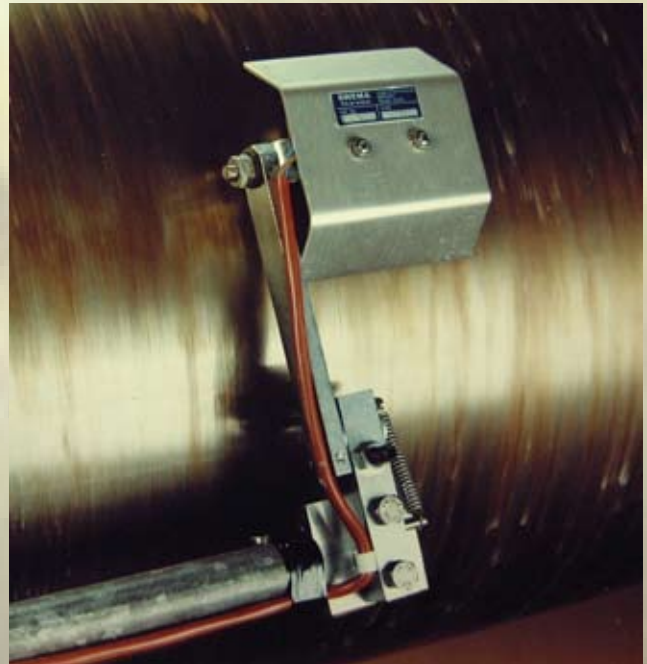


Surface Temperature on cylinders

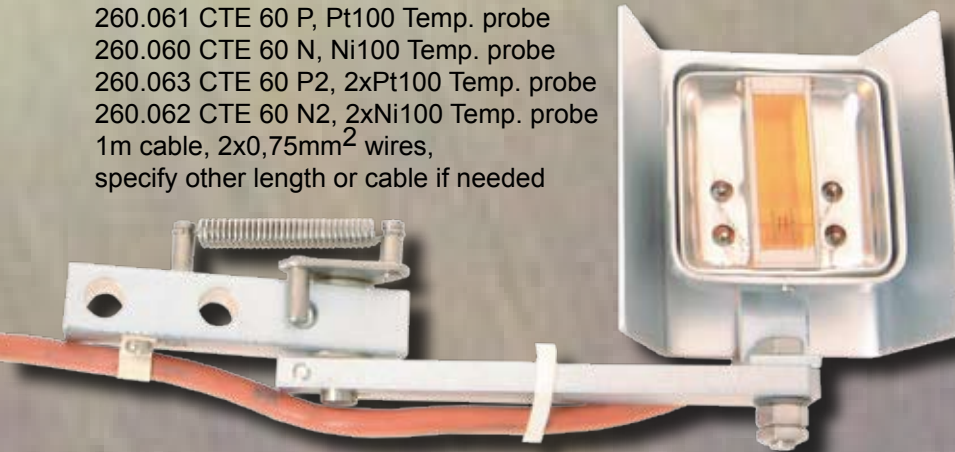
- Fixed installation - CTE 60

SwemaTemp 20 is a surface temperature sensor for running cylinders up to approx. 400 m/min. For continuous measuring on drying cylinders in paper machines, during production or test, CTE60 indicates the temperature and aid you in detecting condense water. Designed for fixed installation, CTE 60 works well on shiny or rough surfaces and works completely without contact.

The distance to the cylinder surface is adjusted to 1 to 2mm with a lockable screw on the sensor arm. The CTE 60 has a foldable arm with one position for measuring and one for maintenance.



260.061 CTE 60 P, Pt100 Temp. probe
 260.060 CTE 60 N, Ni100 Temp. probe
 260.063 CTE 60 P2, 2xPt100 Temp. probe
 260.062 CTE 60 N2, 2xNi100 Temp. probe
 1m cable, 2x0,75mm² wires,
 specify other length or cable if needed



Technical data:

Temperature: 0...200°C
 Max cable temperature: 180°C
 Max velocity: 400 m/min
 Min cylinder diameter
 800 mm as standard
 250 mm, modified on special order

Accuracy:

Pt 100: Class A: $\pm(0,15 + 0,002|t|^{*})$
 Ni 100: 1/2 DIN $\pm(0,2 + 0,0035|t|^{*})$
 t in °C

CTE 60 connects to transmitter for mA or
 Voltage output



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