E (Install Length) when using seamless steel tubes for DIN2448

Nominal Diameter	Outer Ø (mm)	Inner Ø D (mm)	Wall S (mm)	X* (mm)	E for Probe 250 mm	Probe Surface A mm²	E for Probe 120 mm	Probe Surface A mm²	Max volume flow at 60m/s Nm³/hr.
DN 50	**60.30**	**54.50**	**2.90**	**6.30**	**235**	**45**	**105**	**45**	**504**
DN 65	**76.10**	**70.30**	**2.90**	**8.10**	**234**	**52**	**104**	**52**	**839**
DN 80	**88.90**	**82.50**	**3.20**	**9.50**	**232**	**57**	**102**	**57**	**1155**
DN 100	**114.30**	**107.10**	**3.60**	**12.30**	**229**	**69**	**99**	**69**	**1947**
DN 125	**139.70**	**131.70**	**4.00**	**15.10**	**225**	**81**	**-**	**-**	**2944**
DN 150	**165.10**	**156.10**	**4.50**	**18.00**	**222**	**115**	**-**	**-**	**4135**
DN 200	**219.10**	**206.40**	**6.30**	**23.70**	**214**	**184**	**-**	**-**	**7230**
DN 250	**273.00**	**260.40**	**6.30**	**30.00**	**208**	**259**	**-**	**-**	**11508**
DN 300	**323.90**	**309.70**	**7.1**	**35.6**	**202**	**327**	**-**	**-**	**16278**

* Measure **x** shows the Aichelen point (position of the averaged flow velocity) at turbulent flow.

For calculation the following dimensions must be known

D = Inner pipe diameter [mm]
S = Wall thickness of the pipe [mm]
L = Sensor length [mm]

For the Aichelen point is valid:

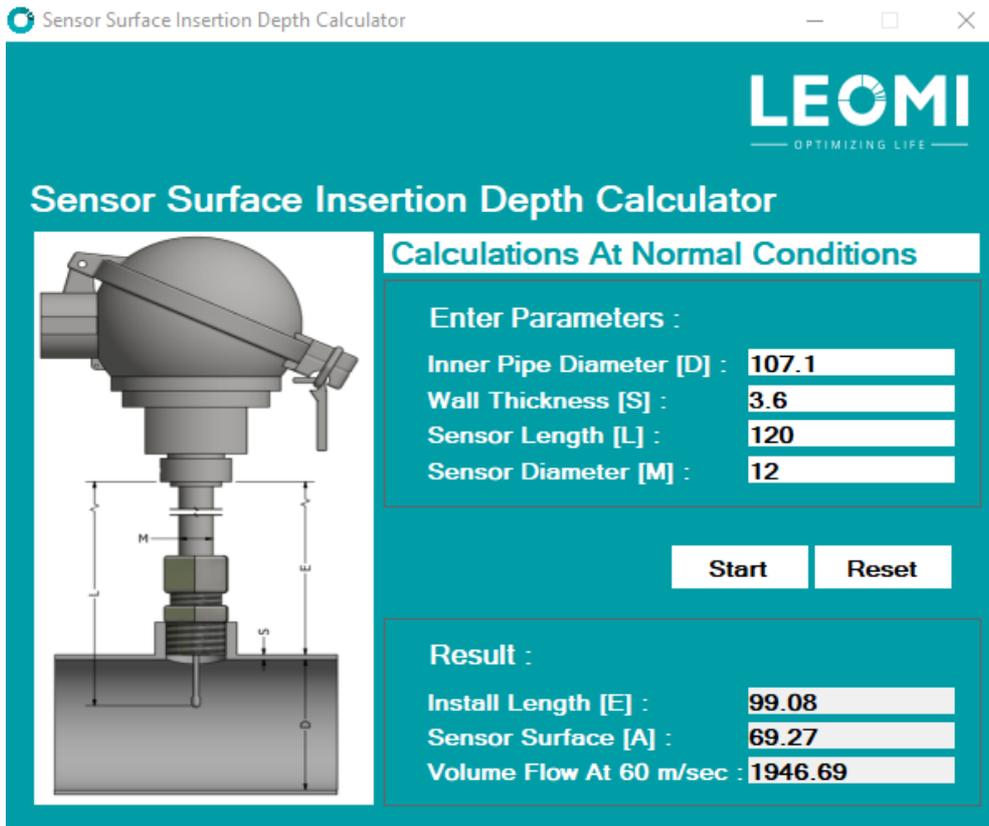**Z = (0.115 x D) – 15** inner length of the sensor housing [mm]

if Z ≥0 then A = 80 + (12 x Z) surface of housing and both sensors [mm²]
if Z < 0 then A = 80 + (4 x Z) surface only of both sensors [mm²]

E = L – Z – S – 20 install length according to the drawing [mm]

NOTE: FOR AUTOMATIC CALCULATION OF INSERTION DEPTH, USE CALCULATOR.

Calculation of Hydraulic Diameter for Rectangular Duct

For the calculation from a rectangle surface into a circular surface with the correct flow profile

The following formula is valid:
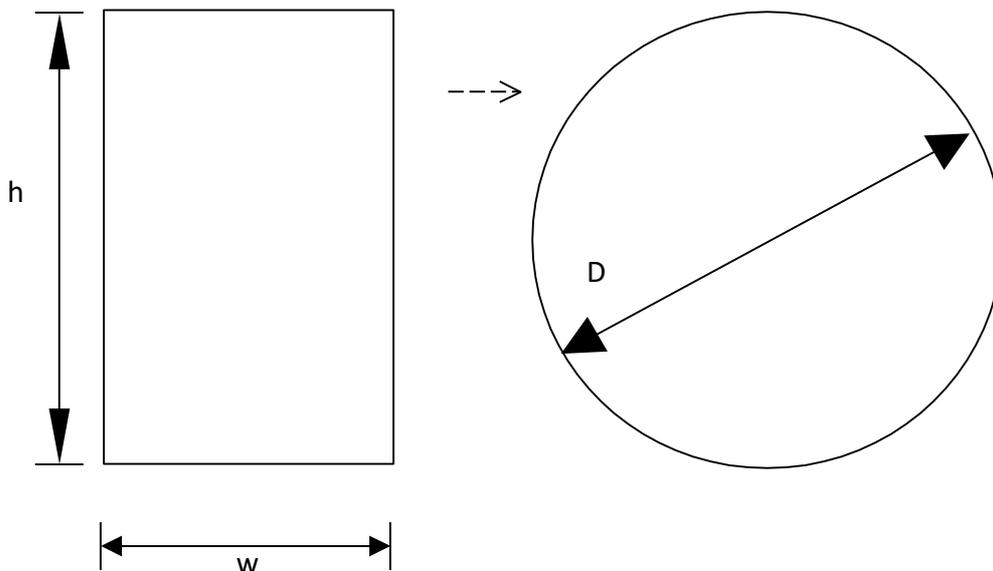
Dh= $\frac{4A}{P}$ (Dh= Hydraulic Diameter; A = Area of cross-section; P = Perimeter of wetted parts)

Dh = $\frac{2 \times w \times h}{w + h}$

IMPORTANT NOTE: Calculate Hydraulic Diameter for all other than Square and Circular Pipe / Duct Sections.

EXAMPLE:
Duct Size: w = 1000 mm and h = 1600 mm

Dh = $\frac{2 \times 1000 \times 1600}{1000 + 1600}$

Dh = 1230.7mm (Enter it in LEOMI Terminal programme in configurations)

CONFIGURATIONS	DIAMETER OF PIPE
Enter ← →	Enter + - ← → *
DIAMETER OF PIPE	1230.0 mm

Calculation of Sensor Surface and Insertion Depth for Rectangular Duct

When using a rectangle profiled tube, some calculations for the configuration of the LEOMI-586/587 are necessary. For better understanding we use the following *test-channel*.
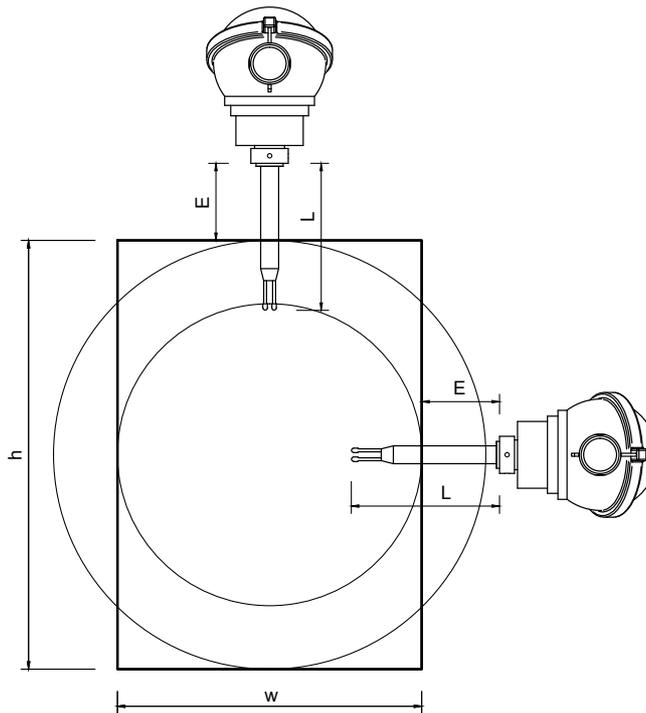
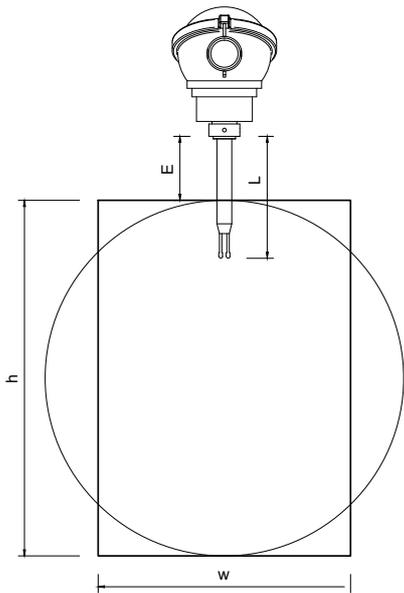Calculating the install length (example):

1. <u>Installing on the small side (W) - 1000 mm</u>
   Diameter of h - 1600mm insert in Calculator
   install length (E) = 306 mm
   Sensor surface (A) = 2108mm²
   The 2108 mm² is the input for the SENSORAREA-menu in the Leomi-586/587


```
CONFIGURATIONS
   Enter    ← →


SENSORAREA
```

```
  SENSORAREA
Enter + - ← → *


  02108 mm²
```
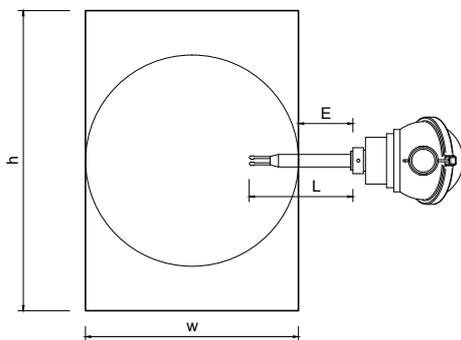
2. Installing on the long side (h)– 1600 mm
   Diameter of w 1000mm insert in calculator
   Install length (E) = 375 mm
   Sensor surface (A) = 1280 mm²
   The 1280 mm² is the input for the SENSORAREA-menu in the Leomi-586/587.

CONFIGURATIONS	SENSORAREA
Enter ← →	Enter + - ← → *
SENSORAREA	01280 mm²