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**NivuFlow 600**

**Transit Time Flow  
Measurement  
for clean to slightly  
polluted Media in  
Full Pipes**



## Perfect flow measurement in full pipelines Insert or clamp-on

The NivuFlow 600 system was developed particularly for flow measurement in full pipes. To meet the highest accuracy requirements it is possible to equip the transmitters with up to 4 measurement paths. There are pipe sensors as well as contactless clamp-on sensors available for the measurement system. It is not necessary to interrupt running processes to install both sensor types. The system is suitable for the detection of flow rates in various liquid media covering a wide range of applications.



## Flow measurement systems at the highest technical level

The enclosure is significantly smaller than earlier devices and can be easily integrated into switching cabinets saving space thanks to DIN rail mounting.

Moreover, the NivuFlow 600 units are available in a special field enclosure for use in rough environmental conditions. The transmitter's large graphic display allows quick and easy commissioning of the flow metering system.

It furthermore provides extended diagnostic options and enables in-depth analyses of running processes on site.

The transmitter software was newly developed from scratch. Using future-proof protocols and versatile options for communication and connections opens a wide variety of options to operators when it comes to integrate the instruments into higher systems such as SCADA or process conducting systems.

### Your benefits

- Ultrasonic transit time measurement
- Single or multi path measurement
- Intuitive, modern operating concept for quick and easy initial start-up
- Insert or clamp-on-sensors available
- Online connection/data transmission and remote maintenance via Internet
- Easy to integrate into existing control systems through universal interfaces
- Weatherproof version for outdoor use available



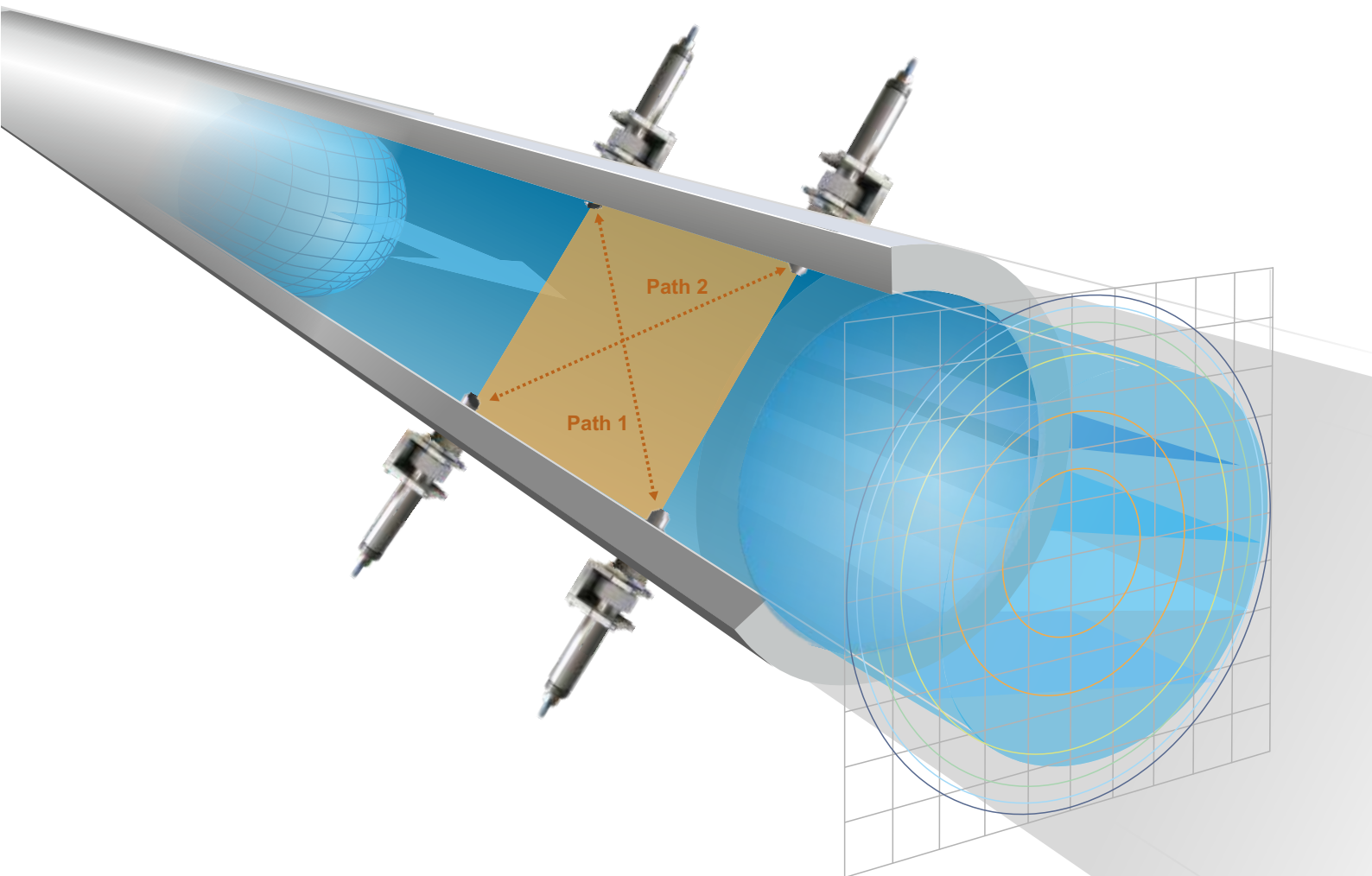
### Typical Applications

Process water in pipes, cooling water and circulation systems, hydropower plants, penstock monitoring, turbine efficiency monitoring

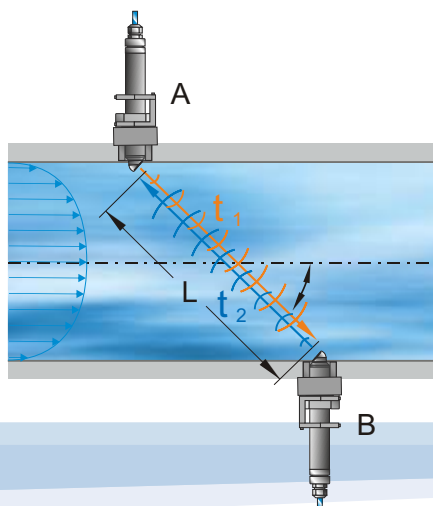




## Transit Time - How the NivuFlow 600 measures



The NivuFlow 600 measurement principle is based on detecting the transit time of ultrasonic signals between two sensors (A and B).



The transit time in flow direction  $t_1$  is shorter than it is against the flow direction  $t_2$ . The difference between both transit times is proportional to the average flow velocity along the measurement path  $v_m$ . The system calculates the average cross-sectional area velocity  $v_A$  from the path velocity  $v_m$  and indicates it directly on the display.

Flow in full pipes is calculated by using the general equation of continuity:

$$Q = A \cdot v_A$$

$A$  = cross-sectional area

$v_A$  = average flow velocity in cross-sectional area



The Nivu Flow 600 Transmitter is a handheld device with a large, high-resolution color display. The main screen shows flow data: Flow 283.5 l/s, Level 0.430 m, Flow velocity 1.578 m/s, Temperature 23.5 °C, and Sum 311.514 m³. It also features a graph and a menu button. The device has a large rotary knob and several buttons. Various icons are overlaid on the device, including a hand holding a probe, a summation symbol, a person with a hard hat, a globe with 'WWW', a bar chart, a calculator, and a magnifying glass over a 'V'.

**Screen display main screen**

**Screen display menu**

**Screen display measuring place**

**Screen display channel profile**

**The Nivu Flow 600 Transmitter**

The intuitive one-hand operation and the bright high-resolution colour display allow quick, easy and cost-efficient commissioning on site. Additional input devices or software are not required.





## The right sensor for your application

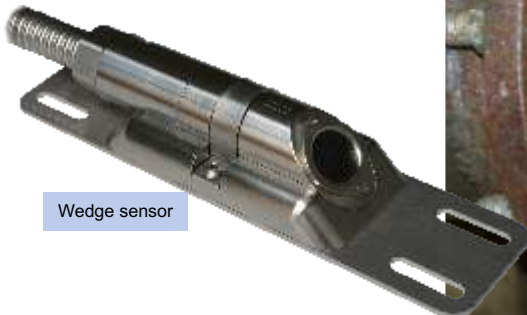
The complete flow measurement system consists of the NivuFlow 600 transmitter and the appropriate sensors for use in full filled pipes. The NivuFlow 600 can use up to 4 measurement paths.

### Your benefits

- Absolutely zero point stable and drift-free sensors
- Low installation expenses through perfectly matched mounting accessories
- Installation under process conditions
- Various sensor constructions guarantee the best solution for each application
- Digital signal transmission for error-free connections over long distances
- WRAS approved pipe sensors available



Clamp-on-Sensor



Wedge sensor



Pipe sensors



Pipe sensor for use in drinking water





## Perfect solutions



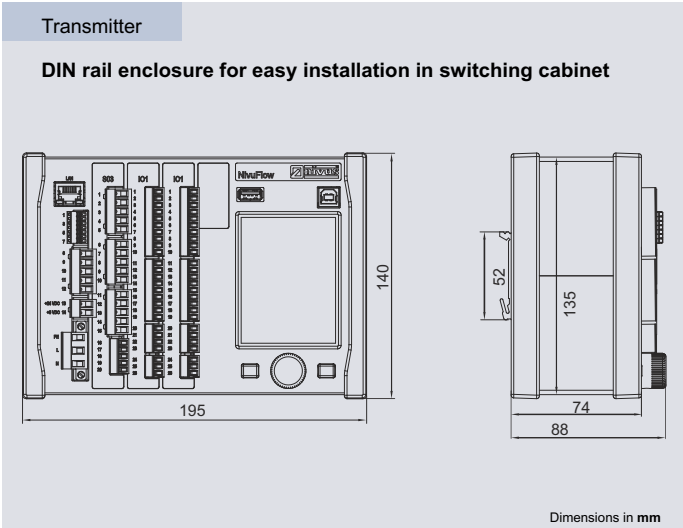
## On site from anywhere

- Integrated data logger for high data security
- Saved data can be recalled at any time
- Online operation and online setting of parameters (remote control)
- Quick and comprehensive remote diagnostics of entire measurement places

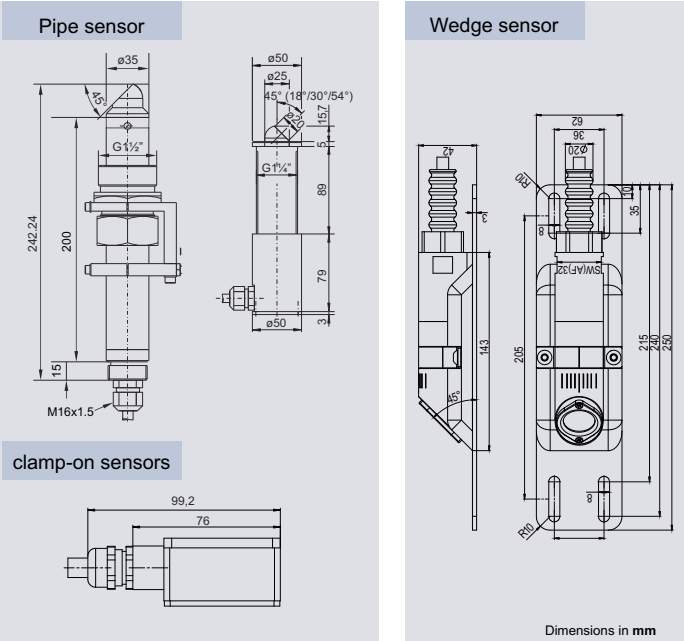
NivuFlow is available as unit for installation in control cabinets or with a robust field enclosure



# Specifications



Transmitter	
Power supply	100 - 240 V AC, -15 % / +10 %, 47 to 63 Hz or 10 - 35 V DC
Power consumption	1 relay energised, 230 V AC: (rounded) 14 W up to 8 sensors transit time 1 MHz
Enclosure	aluminium, plastic
Weight	approx. 1150 g
Protection	IP 20 (control cabinet), IP 68 (field enclosure)
Operating temperature	DC: -20°C to +70°C AC: -20°C to +65°C
Storage temperature	-30°C to +80°C
Max. humidity	80%, non-condensing
Display	240 x 320 pixel, 65536 colours
Operation	rotary pushbutton, 2 function keys, menus in English, German, French, Swedish ...
Connection	plug with cage clamp terminals
Inputs	2x (Type T2) 4-20 mA, with 12 Bit resolution for storage of data from external units, load 91 Ohm, 2 x (Type T2) digital input
Outputs	2 x ( Type T2) 0/4-20 mA, load 500 Ohm, 12 Bit resolution 1x (Type T2) bistable relay SPDT, load up to 230 V AC/2 A (cos 0.9), minimum switching current 100 mA 1x (Type T2) relay SPDT, load up to 230 V AC/2 A (cos φ 0.9), min. switching current 100 mA
Data memory	1.0 GB internal memory, readout on faceplate via USB stick
Communication	• Modbus TCP via network (LAN/WAN, Internet) • Modbus RTU via RS485 or RS232 • Ethernet TCP/IP
Measurement uncertainty	• flow (Q): ± 0.5 % depending on measurement and margin conditions • offset velocity < ± 5mm/s
Number of paths	1 up to 4 measurement paths



Sensor	
<b>Measurement principle: Ultrasonic transit time</b>	
Measurement range	flow velocity ±20 m/s
Inner pipe diameter	0.2 m to 12 m (DN200 to DN12000) <b>clamp-on:</b> 0.08 m to 6.0 m (DN80 to DN6000)
Measurement uncertainty	flow velocity ( $v_{average}$ ) ± 0.1 % of measurement value within the path
Measurement frequency	1 MHz
Protection	IP 68
Operating temperature	-20° C to +50° C, <b>clamp-on:</b> 0° C to +80° C
Operating pressure	pipe sensor: max. 16 bar (with retaining element)
Cable length	10/15/20/30/50/100 m (extension option: sensors connectable to adapter box, cable length between adapter box and transmitter max. 200 m)
Outer cable diameter	8.5 mm
Sensor types	• pipe sensor with retaining element • wedge sensor with ground plate • Clamp-on-Sensor
Medium contacting materials	• pipe sensor: stainless steel 1.4571, NBR, CFK (Carbon), HDPE • wedge sensor: stainless steel 1.4571, CFK (Carbon)

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