

ULTRASTAB™ SATURN CURRENT TRANSDUCER

INTRODUCTION:

The *ULTRASTAB SATURN Precision Current Transducer* system is based upon the very proven *ULTRASTAB 860R*. In a combination of gained experience from a wide range of applications in the field and implementation of new technologies we have created the *ULTRASTAB SATURN* with significant advantages to its predecessor. The *ULTRASTAB SATURN* is designed for use as current feed back element in precision power supplies, and also as a current extender for power analysis applications and a variety of other applications, due to the versatile design of the system.

Its precision class combined with absolute calibration certification traceable to NIST makes it ideal as reference standard for metrology applications.

The *SATURN* offers an outstanding performance with a combination of brand new sensor designs, optimized for DC and AC applications with high bandwidth.

Four types of programmable transducer heads with the ranges 0-600 A, 0-2000 A and 0-5000 A from DC up to 500 kHz are now available.

Output noise and noise feed-back to the main conductor is exceptionally low, due to a new patented zero flux detector circuitry.



THE *SATURN* FEATURES:

- * Bandwidth DC to 500 kHz
- * Linearity better than 1 ppm
- * Absolute calibration traceable to NIST
- * Temperature coefficient less than 1 ppm/°C
- * Resolution 0.05 ppm
- * Bipolar ± 10 V full scale output or
- * Bipolar ± 1 A / ± 2 A full scale output
- * Programmable from 40 A to 5000 A
- * Four terminal outputs (± 10 V)
- * Low noise on the output signal
- * Noise feed-back to main conductor $< 10 \mu\text{V}$

APPLICATIONS:

- * Test and calibration of current sources
- * Absolute current standard reference
- * Current extender for power analysis
- * Feed-back element in high performance power supplies
- * Differential current measurement on power lines

WORKING PRINCIPLE:

The DANFYSIK *ULTRASTAB SATURN* Current Transducer system is a unique design, based on a new patented zero-flux principle for galvanic isolated current measurement.

With the primary current conductor through the transducer head center hole and current flowing, the electronics will generate a current in the built-in compensation winding counter-balancing the primary ampere turns.

A very sensitive and extremely low noise patented detector circuit will detect when zero-flux is obtained, and an analogue signal will be generated at the output terminals in direct proportion to the primary current.

ULTRASTAB SATURN can be delivered in a current version with ± 1 A / ± 2 A analogue output (output level is model dependent), as well as a voltage version with ± 10 V analogue output.

The *ULTRASTAB SATURN* electronics is designed to drive three types of transducer heads, described as the programmable type STH 600 (600A), or the type STH 2000 (2000A) or the types STH 5000-62 (5000 A, 62 mm hole) and STH 5000-140 (5000A, 140 mm hole). The LED's on the front panel will automatically indicate the type of transducer head connected.

In case several units are used in e.g. a current measurement set up, it is possible to synchronize the zero flux detector frequency, to further reduce the noise, by means of the RJ45 connector (category 5 cables), using one *ULTRASTAB SATURN* electronic as a master, or use an external clock frequency to drive the detector frequency of the zero-flux detector.

Unlike its predecessor, the *ULTRASTAB SATURN* does not have any fan, and consequently there are **no** moving parts in the system.

INSTALLATION:

The *ULTRASTAB SATURN* electronics is fully self-contained. For power requirements, please see detailed specifications.

The *ULTRASTAB SATURN* unit is designed with passive air cooling, and can be installed in any rack.

STANDARD APPLICATION FEATURES:

- * General failure interlock with floating contacts covering: Saturation, Overload warning, Zero current, and Normal Operation.
- * LOW current indicator when current is lower than ± 0.05 % of FS with floating contacts.
- * LED indication for transducer head connected
- * User programming of the maximum current in the transducer heads in steps from 40A to 5000A – range depending on transducer head connected – to obtain optimum application and performance matching over the full current range selected.

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