

ULTRASTAB SATURN CURRENT TRANSDUCER

INTRODUCTION:

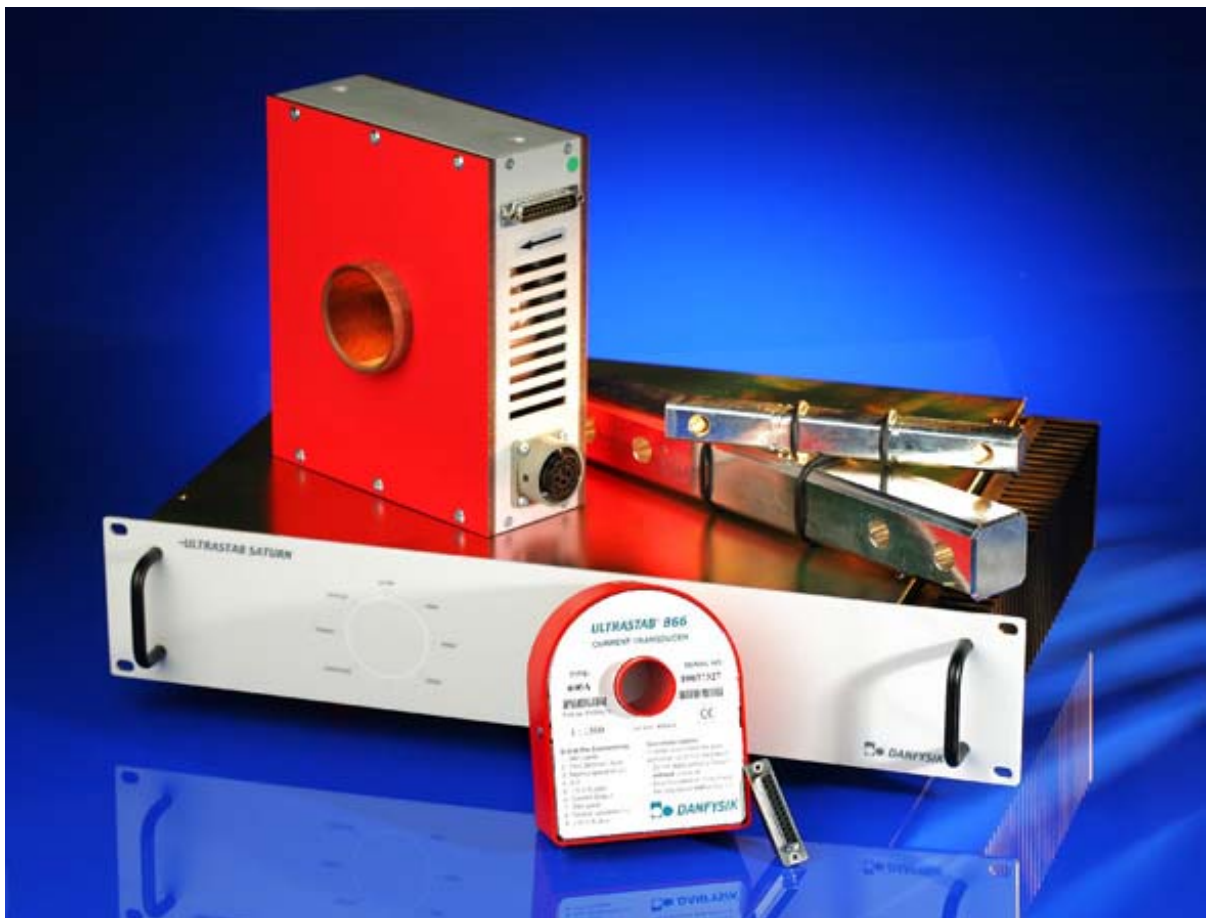
The *ULTRASTAB SATURN* Precision Current Transducer system is based upon the very proven *ULTRASTAB 860R*. In a combination of gained experience from a wide range of applications in the field and implementation of new technologies we have created the *ULTRASTAB SATURN* with significant advantages to 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 μ 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 galvanically 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, 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 cable), 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 it's 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:

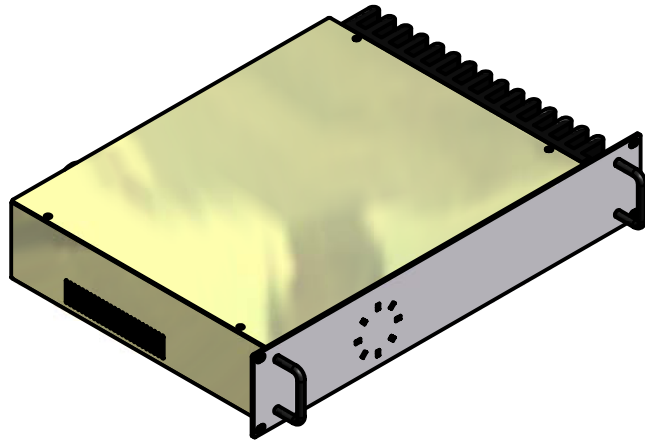
- * General failure interlock with floating contacts covering: Saturation, Overload warning, Zero current, and Normal Operation.
- * LOW current indicator when current is lower than ± 0.05 % of FS with floating contacts.
- * LED indication for transducer head connected
- * User programming of the maximum 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.

ULTRASTAB SATURN – SPECIFICATIONS

ULTRASTAB SATURN	Current Output			Voltage Output		
Primary Nominal current (I _{pn}) Programmable in steps of	600A 20A	2000A 125A	5000A 250A	600A 20A	2000A 125A	5000A 250A
Polarity	Bipolar			Bipolar		
Nom. output range	± 1.0 A	± 1.0 A	± 2.0 A	±10V		
Max. output load	1.5 Ω	1.5 Ω	0.75Ω	5mA		
Overload capacity (normal operation)	15 %	15 %	15 %	15 %	15 %	15 %
Overload capacity (Fault)	500 %(0.1s)	500 %(0.1s)	1000 %(0.1s)	500 %(0.1s)	500 %(0.1s)	1000 %(0.1s)
Absolute calibration (23°C amb.)				< 50 ppm	< 50 ppm	< 50 ppm
Linearity error	< 1 ppm	< 2 ppm	< 3 ppm	< 3 ppm	< 4 ppm	< 5 ppm
Gain accuracy	< 2 ppm	< 4 ppm	< 6 ppm			
Measuring/ratio stability - Vs. temp. - Vs. time	< 1 ppm/°C < 1 ppm/month	< 1 ppm/°C < 1 ppm/month	< 1 ppm/°C < 1 ppm/month	≤ 2 ppm/°C < 2 ppm/month	≤ 2 ppm/°C < 2 ppm/month	≤ 2 ppm/°C < 2 ppm/month
Offset - Initial - Drift vs. Temperature - Drift vs. time	< 2 ppm(adj.) < 0.5 ppm/°C < 1 ppm/month	< 2 ppm(adj.) < 0.5 ppm/°C < 1 ppm/month	< 2 ppm(adj.) < 0.5 ppm/°C < 1 ppm/month	< 2 ppm(adj.) < 0.6 ppm/°C < 1 ppm/month	< 2 ppm(adj.) < 0.6 ppm/°C < 1 ppm/month	< 2 ppm(adj.) < 0.6 ppm/°C < 1 ppm/month
Output noise (RMS) - DC - 10 Hz - DC - 10 KHz - DC - 50KHz	< 0.1ppm < 2 ppm < 4 ppm	< 0.1ppm < 2 ppm < 4 ppm	< 0.1ppm < 2 ppm < 4 ppm	< 0.1ppm < 2 ppm < 4 ppm	< 0.1ppm < 2 ppm < 4 ppm	< 0.1ppm < 2 ppm < 4 ppm
Noise feedback to main conductor - DC – 100KHz (RMS)	< 2 μV	< 10 μV	< 10 μV	< 2 μV	< 10 μV	< 10 μV
Dynamic response correctly followed to 0.1%	> 50 A / uS	> 20 A / uS	> 20 A / uS	> 50 A / uS	> 20 A / uS	> 20 A / uS
Delay time	< 1 uS	< 1 uS	< 1 uS	< 1 uS	< 1 uS	< 1 uS
Bandwidth (3 dB, small signal 0.5%)	0 – 500 KHz (<5% of I _p)	0 – 300 KHz (<5% of I _p)	0 – 50 KHz (<5% of I _p)	0 – 500 KHz (<5% of I _p)	0 – 300 KHz (<5% of I _p)	0 – 50 KHz (<5% of I _p)
Test voltages	5KV AC RMS			5KV AC RMS		
Operating temp. - Electronics - Measuring heads	10 - 40 °C 0 - 55 °C			10 - 40 °C 0 - 55 °C		
Supply voltages	100 / 115 / 230 VAC, +/-10% - 50/60 Hz			100 / 115 / 230 VAC, +/-10% - 50/60 Hz		
Supply current/power	50 VA	50 VA	100 VA	50 VA	50 VA	100 VA
Busbar free zone to be within linearity spec. - Cylinder shape (diameter x length)	ø150 x 150 mm	ø 220 x 220 mm	T.B.D	ø150 x 150 mm	ø 220 x 220 mm	T.B.D
Cable length - Standard - Optional	2.5 m 30 m	2.5 m 30 m	2.5 m 30 m	2.5 m 30 m	2.5 m 30 m	2.5 m 30 m
Electronics dimension and weight	Rack mount - 483 x 89 x 371 mm - 5 kg			Rack mount - 483 x 89 x 371 mm - 5 kg		
Transducer heads dimension and weight	122 x 98 x 65 mm With ø26 hole 1kg	165 x 200 x 50 mm With ø50 hole 3.5kg	250 x 250 x 62 mm With ø 140 hole 12kg Type 5000A-140 : 350 x 350 x 92 With ø150 hole 17kg	122 x 98 x 65 mm With ø26 hole 1kg	165 x 200 x 50 mm With ø50 hole 3.5kg	250 x 250 x 62 mm With ø 140 hole 12kg Type 5000A-140 : 350 x 350 x 92 With ø150 hole 17kg

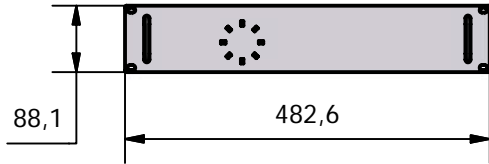
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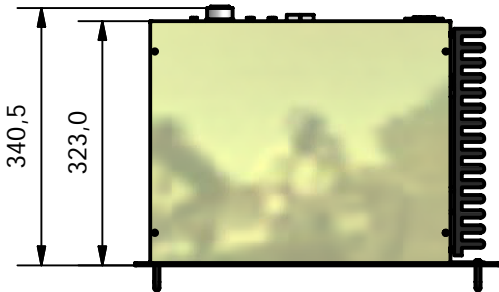
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Rear view



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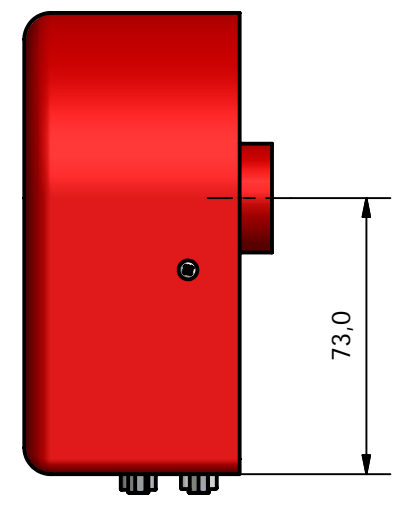
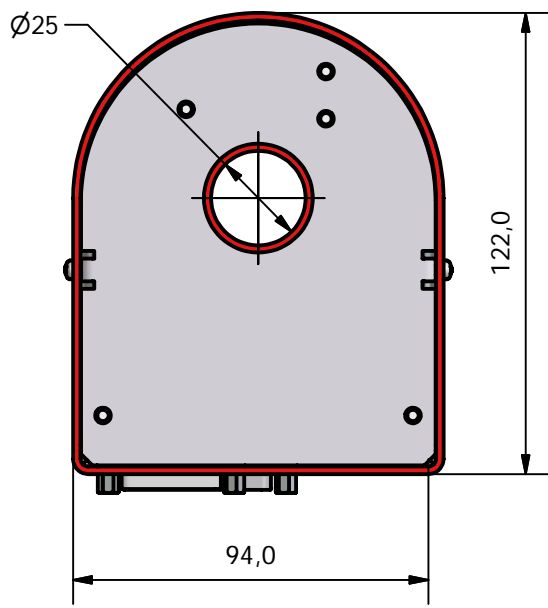
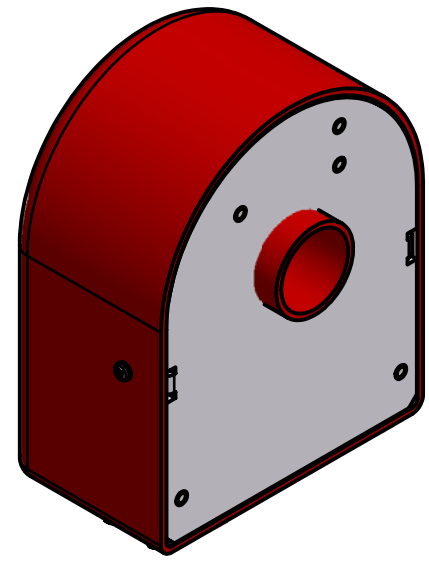
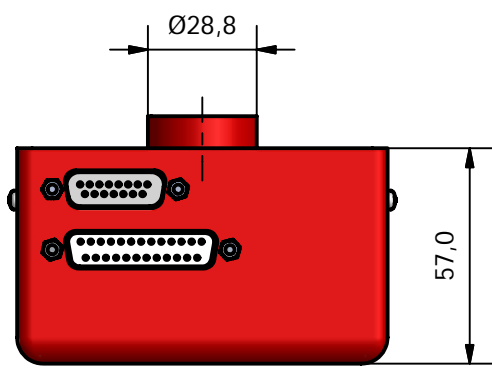
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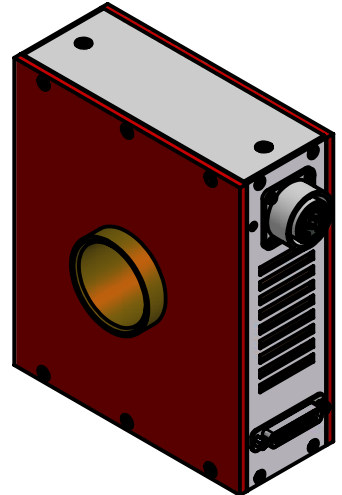
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FIRST ANGLE PROJECTION

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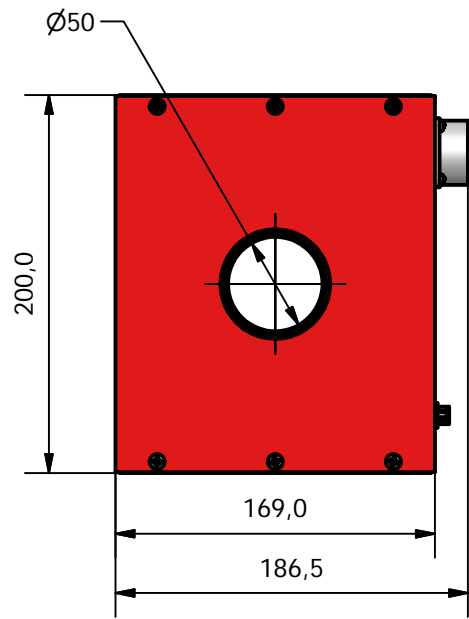
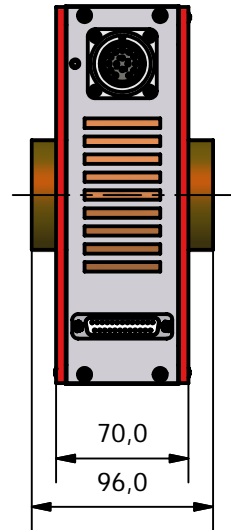
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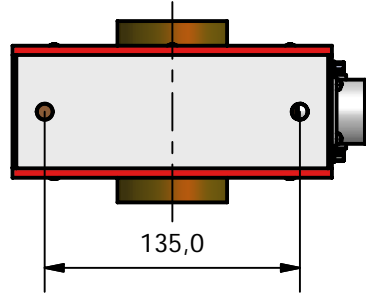
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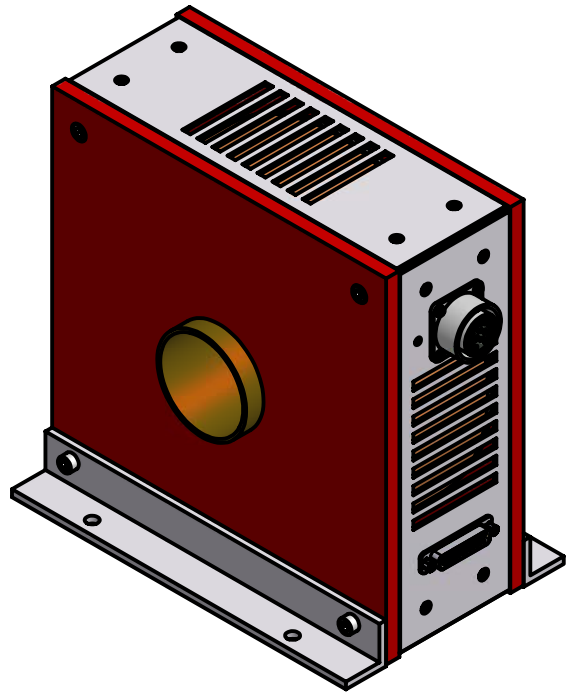
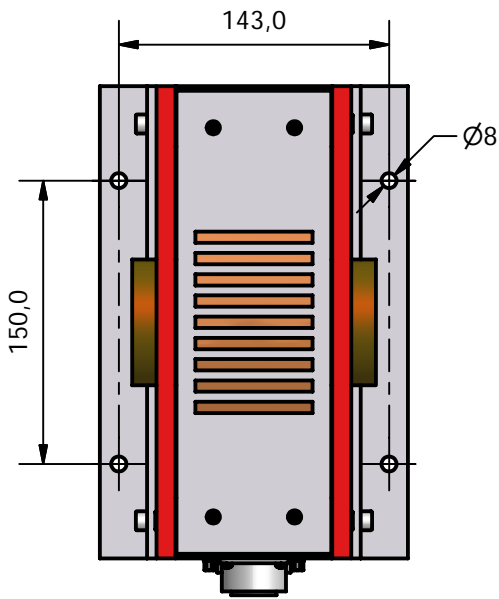
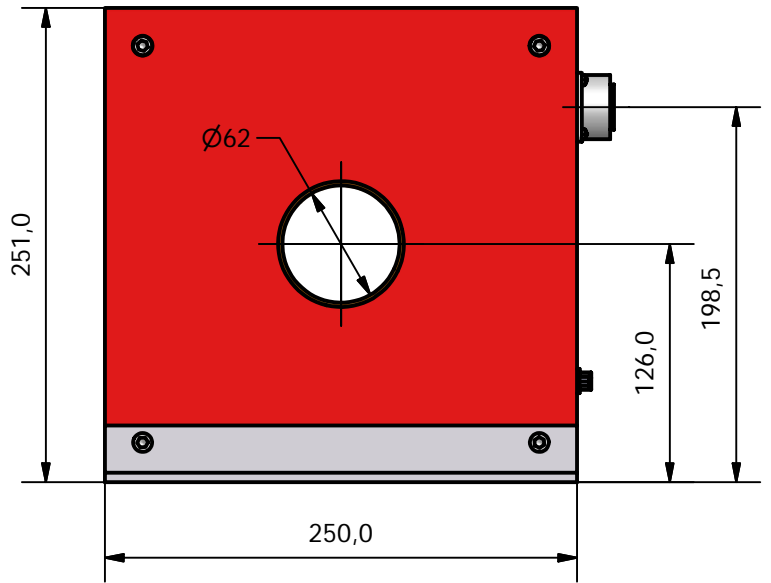
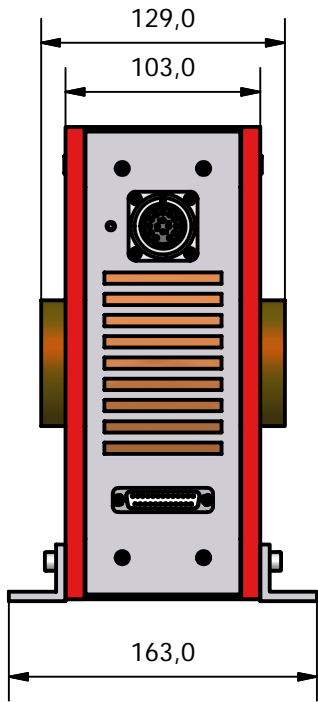
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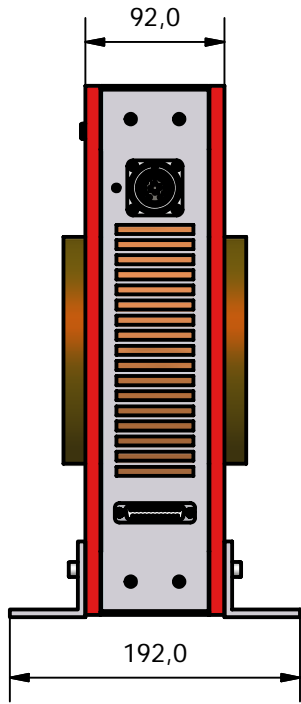
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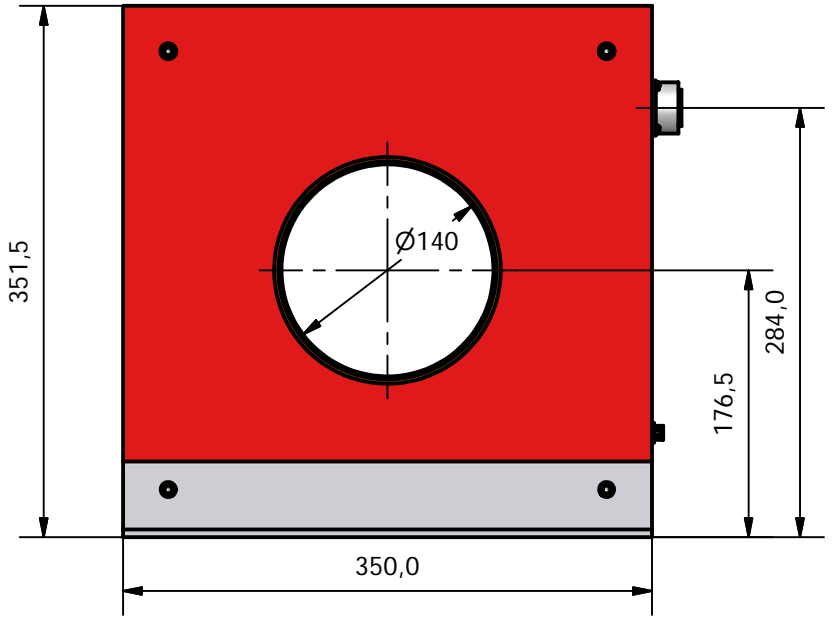
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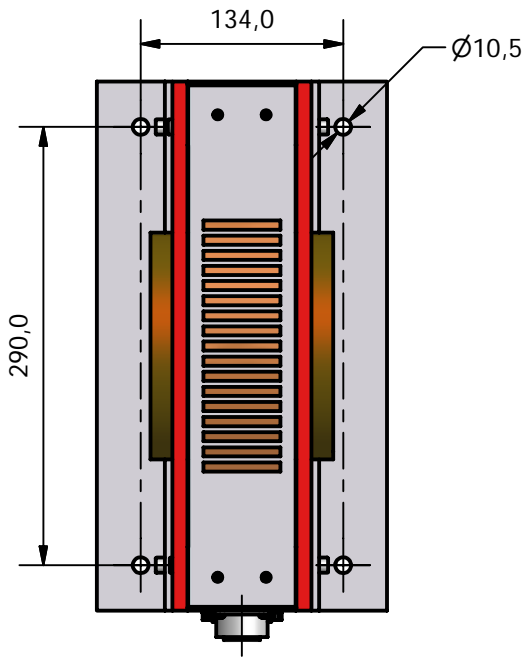


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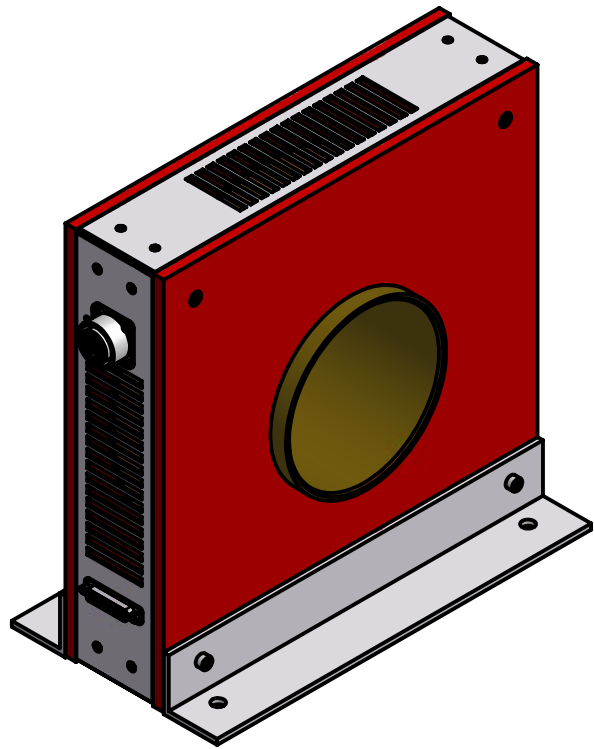
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