



## ULTRASTAB 867-700I 867-700U Precision Current Transducer

The Ultrastab 867-700I and 867-700U Current Transducers, are the latest models of the Ultrastab Current Transducers.

They are the third generation of current transducers from Danfysik with sensor and PCB integrated in one assembly.

The 867-700 sensors features a new type of zero flux detector with extreme low noise level, compact in size and competitive in price.

Measuring range is 0-700A from DC to <100kHz with a temperature drift lower than 0.5 ppm/°C (current mode). At 700A primary current powered with  $\pm 15V$  type 867-700I has an analogue output current of 400mA. 867-700U has an analogue output of  $\pm 10V$ .

Output noise and noise feed back to the main conductor are both extremely low, and electrostatic shielding ensures maximum immunity against external electrostatic fields.

### The 867 features

- Bandwidth DC to 100kHz
- Linearity better than 3ppm
- Traceable absolute calibration
- Temperature drift less than 0.1ppm/°C
- Bipolar - up to 700A primary current with output of 400mA (867-700I) and output of 10V (867-700U)
- Low noise on output signal
- Noise feed-back to main conductor <5 $\mu V$
- Resolution better than 0.05ppm

### Applications

- Feed back element in high performance gradient amplifiers for MRI
- Feed back element in precision current regulated power supplies

**North American Distributor:** GMW Associates • 955 Industrial Rd • San Carlos, CA 94070 • USA  
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## Working principle

The Ultrastab 867 Current Transducer system is a unique design, based on the zero flux principle for galvanically isolated current measurement.

Ultrastab 867 has a built-in free-running oscillator, which drives the zero flux detector circuitry.

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 counterbalancing the primary ampere-turns.

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

## Installation

The Ultrastab 867-700 transducers are fully self-contained, requiring only a  $\pm 15\text{V}$ -voltage supply. All connections are via a 9-pole D-sub socket.

The transducers can be installed in any orientation and have a high immunity against external magnetic and electrostatic fields.

867-700I and 867-700U are both delivered with the standard transfer ratio of 1750:1

External burden resistors/shunts can be connected to the 867-700I version, however it is important not to use a bigger load than specified. Please refer to the technical specifications under "External burden resistor" where the max values of the burden resistors are listed.

We recommend to keep the power loss as low as possible, in the burden resistor(s), in order to minimise the  $T_c$  influence from the burden resistor(s) on the measurement.

## Standard features

The Ultrastab 867 is equipped with opto insulator for status interlock reading. An LED on the front shows NORMAL OPERATION i.e. interlock status ok.

The Ultrastab has a built-in "scanning/lock in circuit" for automatic recovery to normal operation after overload condition.

## Accessories

- 9-pol D-sub with 2m shielded cable
- 2.5 Ohm Burden resistor (4 x 10 Ohm), 0.1%,  $T_c < 3\text{ppm}/^\circ\text{C}$
- $\Phi 30$  mm busbar

## Ordering information standard

- |                                  |                                   |
|----------------------------------|-----------------------------------|
| • 867-700I current transducer    | Part no. currently under revision |
| • 867-700U current transducer    | Part no. 81089073                 |
| • 866/867-BR2.5 Burden resistor  | Part no. 81088325                 |
| • 867-700-SC, 2m shielded cable  | Part no. 65889610                 |
| • 867-700-BB $\Phi 30$ mm busbar | Part no. 71089076                 |

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## Ultrastab 867-700I

Last update: 15.03.2007

### Current transducer

Parameter	Symbol	Condition	Value	Unit
<b>Primary current</b>	$I_p$		$\pm 700$	A
Nominal primary current				
Polarity			Bipolar	
<b>Secondary current</b>	$I_s$		$\pm 400$	mA
Nominal secondary current				
<b>External burden resistor</b>	$R_b$		2.5	$\Omega$
Max.		$R_{b, \max}$		
Min.	$R_{b, \min}$		0	$\Omega$
<b>Current transfer ratio</b>	N		1750	
<b>Overload capacity</b>				
Max. nondestructive overload	$I_{p, \max}$	@ 0.1s	500	% $I_{pn}$
Min. overload trip value	$I_{p, \text{trip}}$		110	% $I_{pn}$
<b>DC accuracy</b>				
Offset				
Initial	$I_{so}$		< 50	ppm
Drift vs. Temp.	$I_{so, \text{temp}}$		< 0.5	ppm / K
Drift vs. Time	$I_{so, \text{time}}$		< 0.5	ppm / month
Drift vs. supply voltage	$I_{so, \text{supply}}$		< 3	ppm / %
Linearity				
Deviation	$X_d$		< 3	ppm
<b>Output noise</b>	$I_{s, \text{noise}}$	0 - 10Hz	< 0.05	ppm (RMS)
		0 - 100Hz	< 0.5	ppm (RMS)
		0 - 1kHz	< 1	ppm (RMS)
		0 - 10kHz	< 3	ppm (RMS)
		0 - 50kHz	< 6	ppm (RMS)

## Ultrastab 867-700I

Last update: 15.03.2007

### Current transducer

Parameter	Symbol	Condition	Value	Unit
<b>Dynamic response</b>				
Slew rate	$di/dt$	10 - 90%	> 100	A / $\mu$ S
Delay time	$t_d$		< 1	$\mu$ S
<b>Bandwidth</b>				
$\pm 1$ dB	<b>f</b>	<0.5% $I_{pn}$	10	kHz
$\pm 3$ dB		< 0.5% $I_{pn}$	100	kHz
<b>Busbar noise</b>				
Measured on primary cable, one turn	<b><math>U_b</math></b>	DC - 50kHz	< 5	$\mu$ V RMS
<b>Busbar free zone</b>				
Length	<b>l</b>		140	mm
Radius	<b>r</b>		70	mm
<b>Test voltages</b>				
Busbar to GND	<b><math>V_{t,b}</math></b>		5000	VAC RMS
<b>Power supply</b>				
Supply voltage	<b><math>V_s</math></b>	$\pm 5\%$	$\pm 15$	V
Maximum quiescent current	<b><math>I_q</math></b>		$\pm 70$	mA
Maximum current consumption	<b><math>I_{max}</math></b>		$\pm 470$	mA
<b>Operating environment</b>				
Temperature	<b><math>T_a</math></b>		10 - 50	$^{\circ}$ C
Humidity	<b><math>RH_a</math></b>	Noncondensing	20 - 80	%RH
<b>Storage environment</b>				
Temperature	<b><math>T_s</math></b>		-20 - 85	$^{\circ}$ C
Humidity	<b><math>RH_s</math></b>	Noncondensing	20 - 80	%RH

## Ultrastab 867-700I

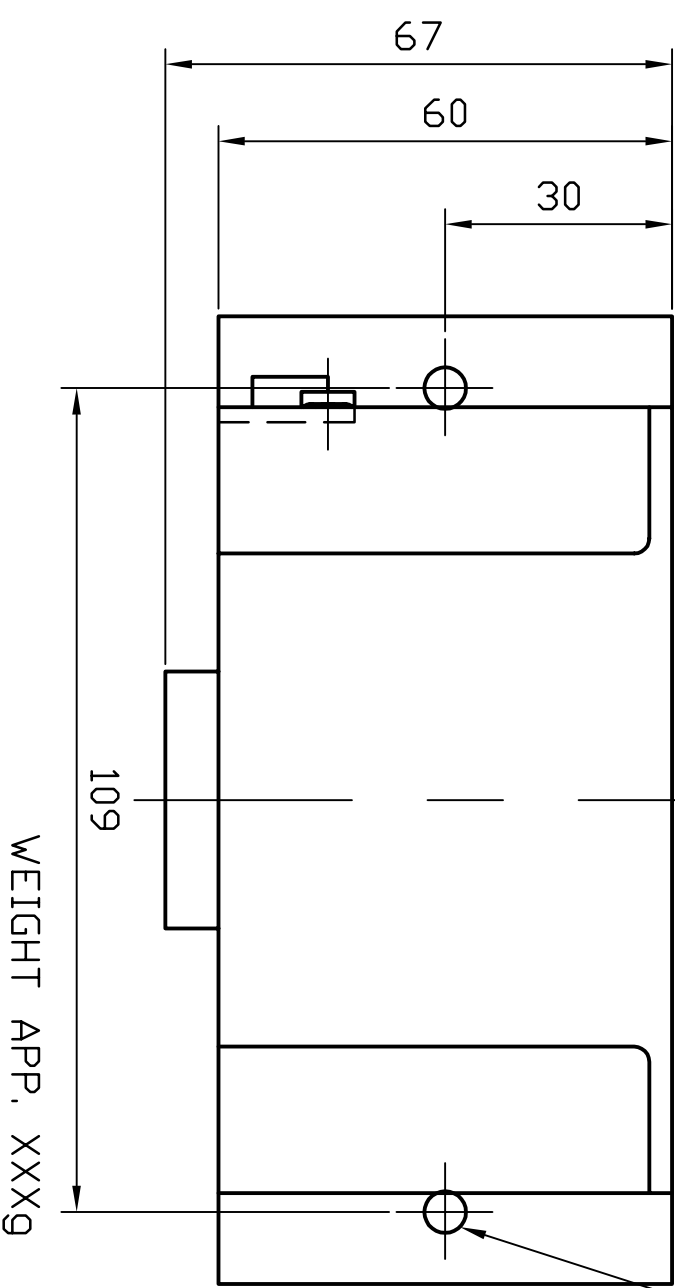
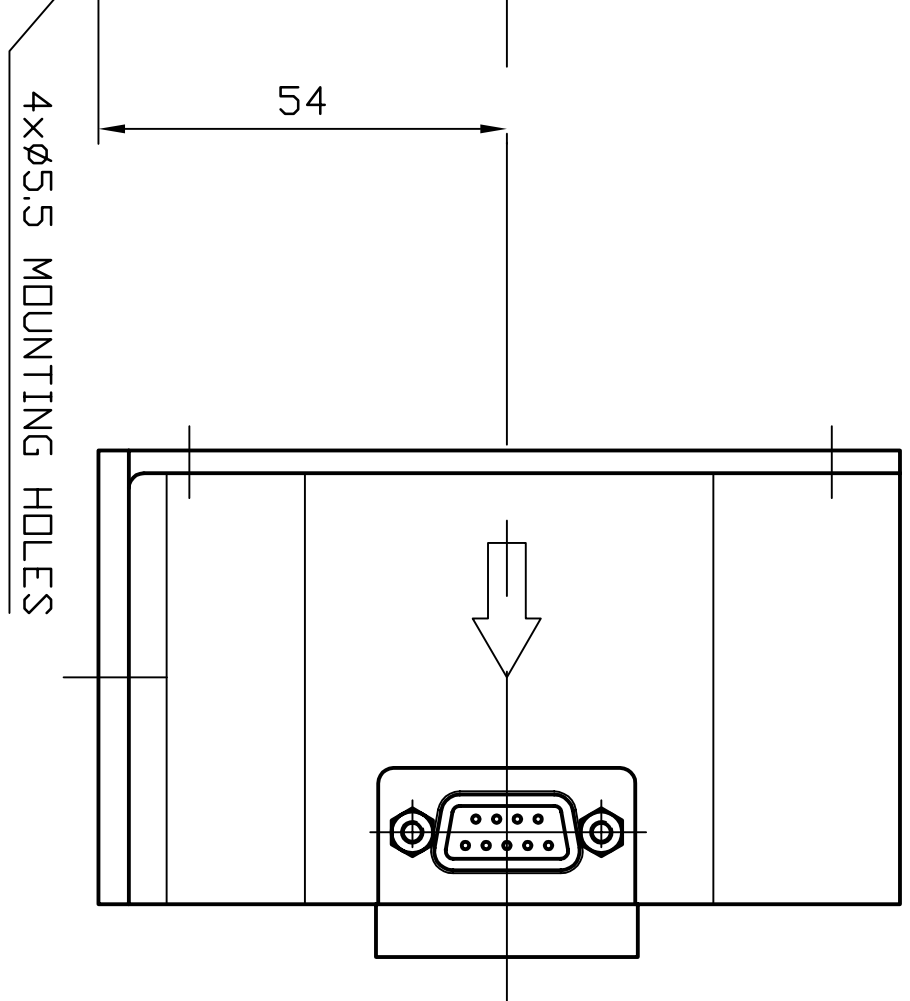
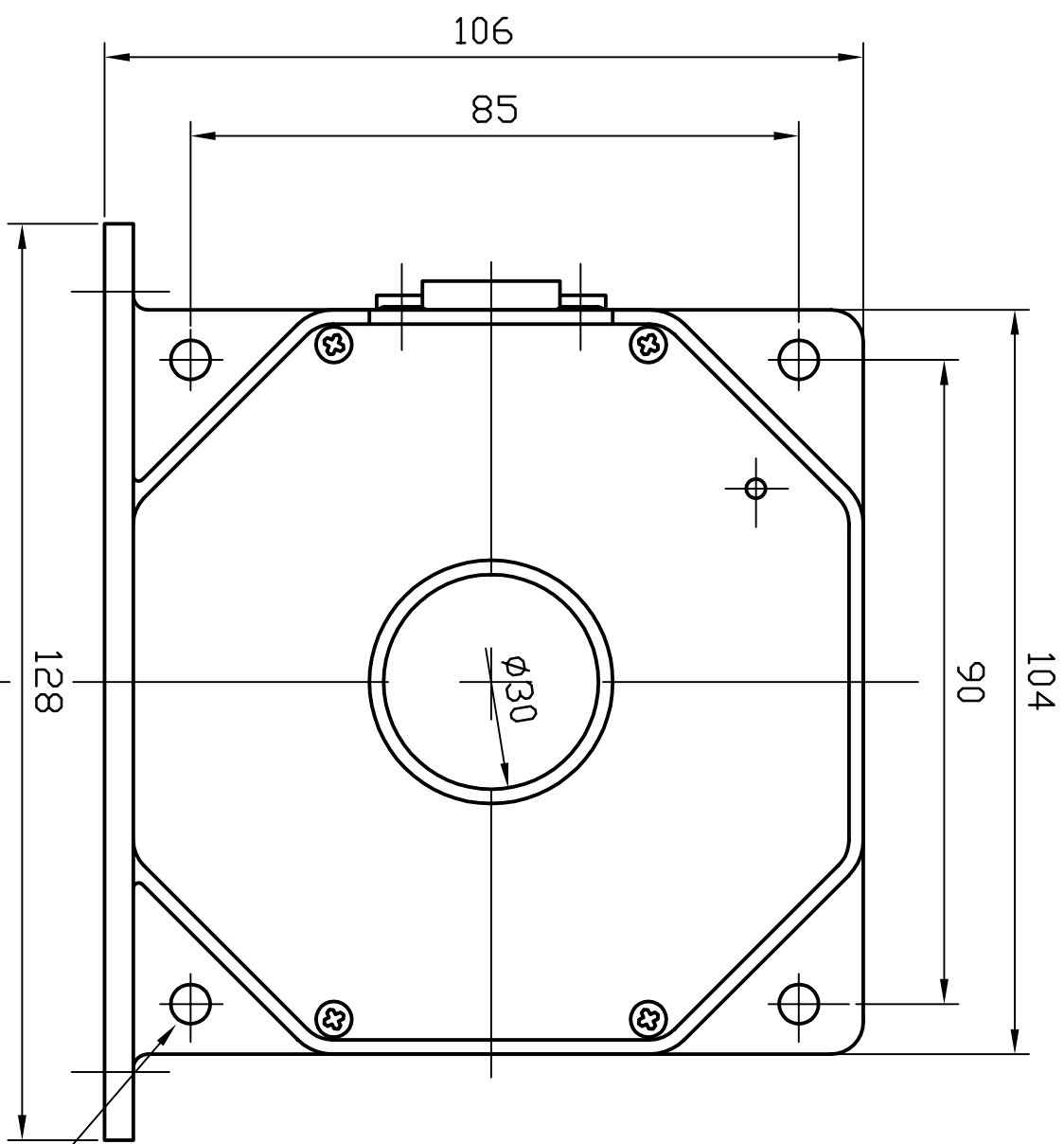
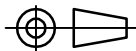
Last update: 15.03.2007

### Current transducer

Parameter	Symbol	Condition	Value	Unit
<b>Mechanical dimension</b>				
Width	W		128	mm
Height	H		106	mm
Depth	D		67	mm
Weight (approx.)	m		0.8	kg
Inner hole diameter	O		30	mm

#### Notes:

- 1: All ppm figures refer to nominal current
- 2: Specifications are subject to change without notice



WEIGHT APP. XXXg

2xØ6.5 MOUNTING HOLES

4xØ5.5 MOUNTING HOLES

SCALE 1:1

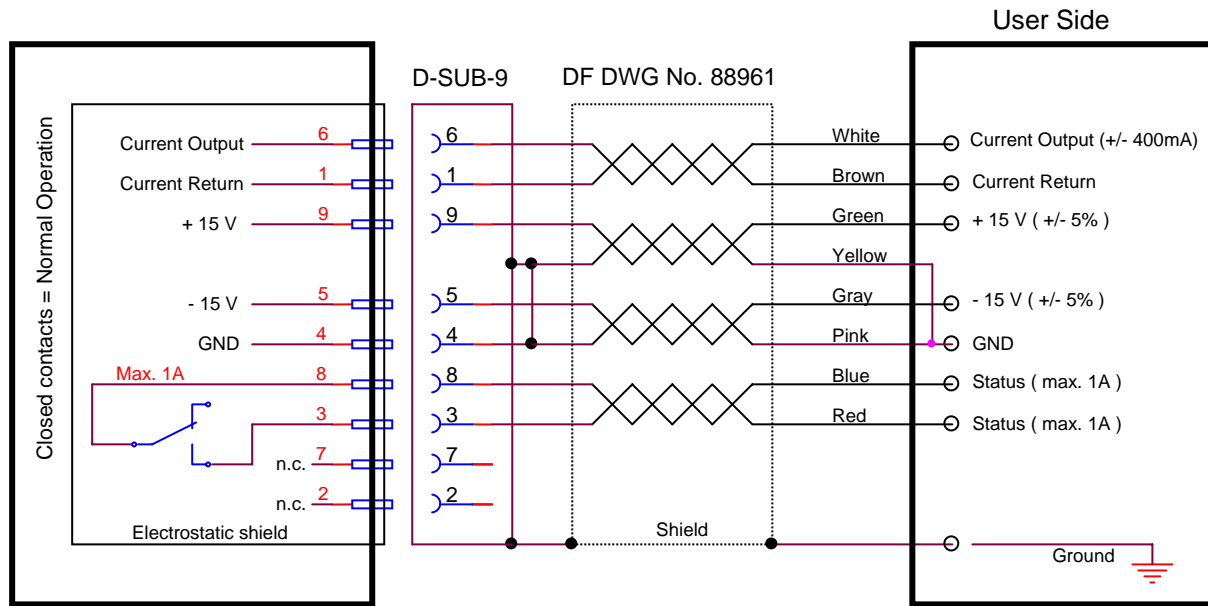
CURRENT TRANSDUCER  
ASSEMBLY  
ULTRASTAB 867-700  
ANGLE

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DRAWN BY MK 30.08.02  
DESIGN APP. . .  
PROD.APP. . .  
PROJ.ENGR. AM  
DWG.NO.: 88937A

CUSTOMER: . . .	PROJECT NO. . .
FILE: . . .	DATE: MK 04.11.02
REVISION: A	SHEET 1 OF 1
DATE: MK 04.11.02	SIZE: A3

## ULTRASTAB 867-700I - INSTALLATION



### Pin configuration for 9 pole D\_SUB :

Pin 1	Current return	Pin 6	Current output
Pin 2	N.C.	Pin 7	N.C.
Pin 3	Normal operation status	Pin 8	Normal operation status
Pin 4	GND	Pin 9	+15V supply voltage
Pin 5	-15V supply voltage	House	Electrostatic shield

### Electrical specification - power :

Supply voltage pin 9 to pin 4	:	+ 15 V +/- 5 %
Supply voltage pin 5 to pin 4	:	- 15 V +/- 5 %
Supply current pin 9 to pin 4	:	+ 70 mA + output current ( 400 mA nom. )
Supply current pin 5 to pin 4	:	- 70 mA - output current ( 400 mA nom. )
Test voltage secondary (pin 4) to shield	:	200 VDC

### Electrical specification – status signal :

Fault level ( off-state )	:	$I_p > 110 \%$
Max. voltage pin 8 to pin 3 , off-state	:	100 V
Max. current pin 8 to pin 3 , on-state	:	1 A
Contact resistance pin 8 to pin 3	:	50 mOhm typ.
Test voltage secondary (pin 4) to pin 8	:	500 VDC

### Accessories :

- 9 pole D-sub plug with 2m shielded cable ( Part No. 65889610 )
- 2.5  $\Omega$  Burden Resistor ( 4 x 10  $\Omega$  ) , 0.05% ,  $T_c < 3 \text{ ppm}/^\circ\text{C}$
- $\varnothing$  25mm busbar

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