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ULTRASTAB 867-700PI Precision Current Transducer

The Ultrastab 867-700PI Current Transducer is the first true programmable high stability current transducer with on-board electronics. They are the third generation of current transducers from Danfysik with sensor and PCB integrated in one assembly, with programmable primary current input.

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 (programmable from 80A to 700A in steps of 10A) from DC to <100kHz with a temperature drift lower than 0.5 ppm/K (current mode). At the max programmed range (80A, 90A...700A primary current) powered with ±15V type 867-700PI has an analogue output current of 400mA.

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 400A primary current with 200mA output current
- Low noise on output signal
- Noise feed-back to main conductor <30µV
- Resolution better than 0.05ppm

Applications

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

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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 867-700PI transducer is fully self-contained, requiring only a +/-15V- voltage supply. All connections are via a 9-pole D-sub socket.

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

867-700PI is delivered with the programmable transfer ratio depending on the chosen measuring range. The range is set by the 25–pole D-sub factory programmed programming plug mounted on the front.

External burden resistors/shunts can be connected to the 867-700PI transducer. 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 Tc influence from the burden resistor(s) during the measurement. It is also recommended to keep the burden resistor(s) away from possible heat sources.

Standard features

The Ultrastab 867PI is equipped with opto insulator for status interlock reading. An LED on the front shows NORMAL OPERATION i.e. interlock status ok. Further more it 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 < 3ppm/°C
- Φ30 mm busbar

Ordering information standard

•	867-700PI current transducer	Part no. 81089075
•	866/867-BR2.5 Burden resistor	Part no. 81088325
•	867-700-SC, 2m shielded cable	Part no. 65889610
•	867-700-BB Φ30 mm busbar	Part no. 71089076
•	867-PPW pre-wired programming plug	Part no. 810890xx

Note: Instead of the xx, please insert the desired max nominal primary current. E.g. If 80A is required order replace xx with 08. At 90A the last two digits should be 09. At 100A the last two digits should be 10, etc. up to the digits 70 indicating the maximum programmable current of 700A.

Minimum order is the transducer & a programming plug.

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Ultrastab 867-700PI

Last update: 15.03.2007

Programable current transducer

Parameter	Symbol	Condition	Value	Unit
Primary current	I_p			
Nominal primary current			± 700	A
Programmable from			80	A
Programming steps			10	A
Polarity			Bipolar	
Secondary current	I_s			
Nominal secondary current			± 400	mA
External burden resistor	R_b			
Max.	$R_{b,\,max}$		2.5	Ω
Min.	$R_{b,\,min}$		0	Ω
Current transfer ratio	N		1750	
Overload capacity				
Max. nondestructive overload	$I_{p,\,max}$	@ 0.1s	500	%Ipn
Min. overload trip value	$I_{p,\,trip}$		110	%Ipn
DC accuracy				
Offset				
Initial	I_{so}		< 50	ppm
Drift vs. Temp.	$I_{so,\,temp}$		< 0.5	ppm / K
Drift vs. Time	$I_{so,\,time}$		< 0.5	ppm / month
Drift vs.supply voltage	$I_{so,\,supply}$		< 3	ppm / %
Linearity				
Deviation	X_d		< 3	ppm
Output noise	$I_{s,\,noise}$			
		0 - 10Hz	< 0.5	ppm (RMS)
		0 - 100Hz	< 1	ppm (RMS)
		0 - 1kHz	< 2	ppm (RMS)
		0 - 10kHz	< 3	ppm (RMS)
		0 - 50kHz	< 6	ppm (RMS)

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Programable current transducer

Parameter	Symbol	Condition	Value	Unit
Dynamic response				
Slew rate	dI/dt	10 - 90%	> 50	A / µS
Delay time	t_d		< 1	µS
Bandwidth	**f**			
±3dB		< 0.5% Ipn	100	kHz
Busbar noise	**U_b**			
Measured on primary cable, one turn		DC - 50kHz	< 30	µV RMS
Busbar free zone				
Lenght	l		140	mm
Radius	r		70	mm
Test voltages				
Busbar to GND	$V_{t, b}$		5000	VAC RMS
Power supply				
Supply voltage	V_s	± 5%	± 15	V
Maximum quiescent current	I_q		± 70	mA
Maximum current consumption	I_{max}		± 470	mA
Operating environment				
Temperature	T_a		10 - 50	°C
Humidity	RH_a	Noncondensing	20 - 80	%RH
Storage environment				
Temperature	T_s		−20 - 85	°C
Humidity	RH_s	Noncondensing	20 - 80	%RH

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Programable current transducer

| Parameter	Symbol	Condition	Value	Unit
Mechanical dimension				
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 and transducerhead programmed to maximum primary current

2: Specifications are subject to change without notice

67

60

30

109

WEIGHT APP. XXXg

106

85

128

90

104

⌀30

54
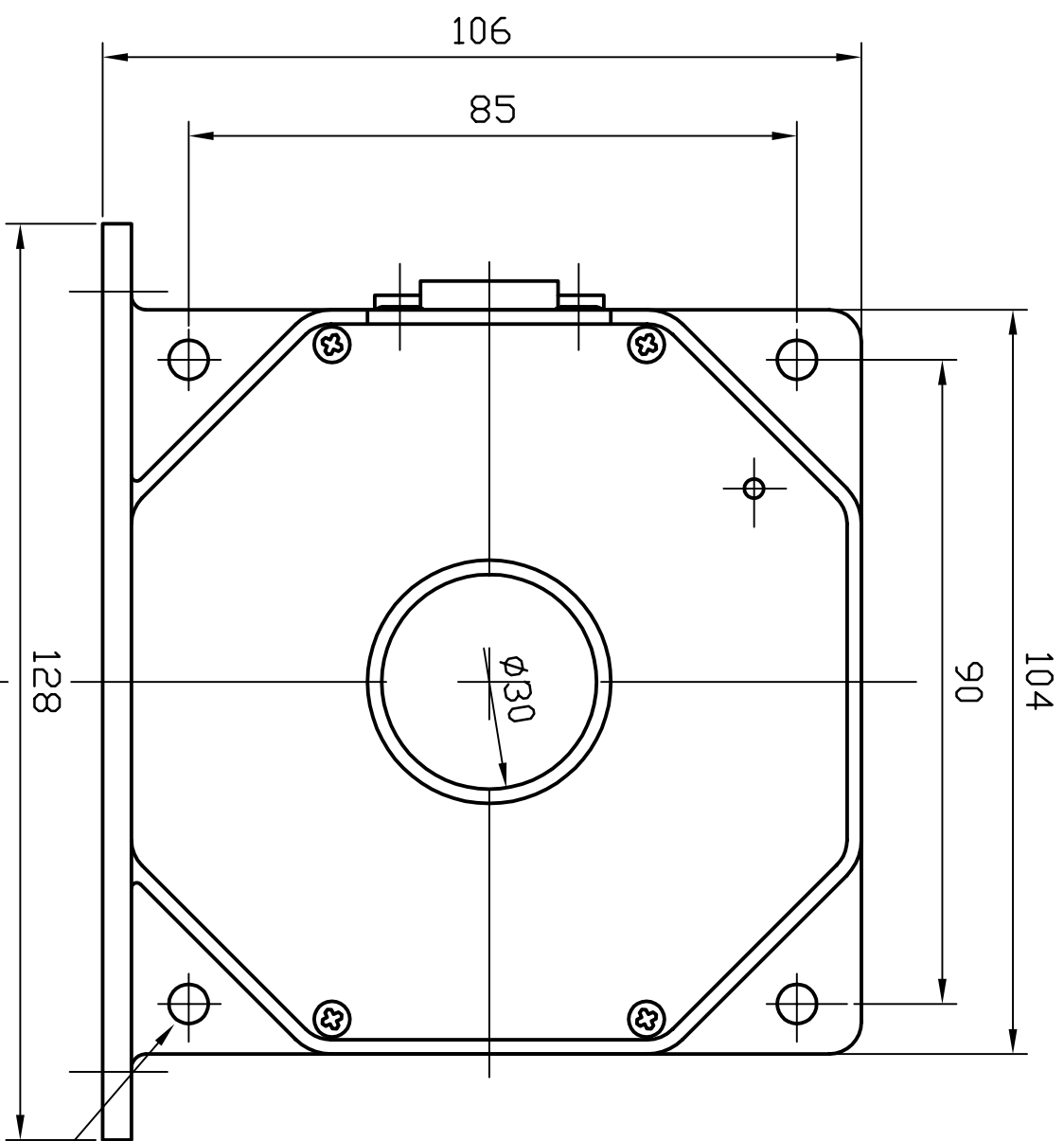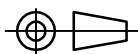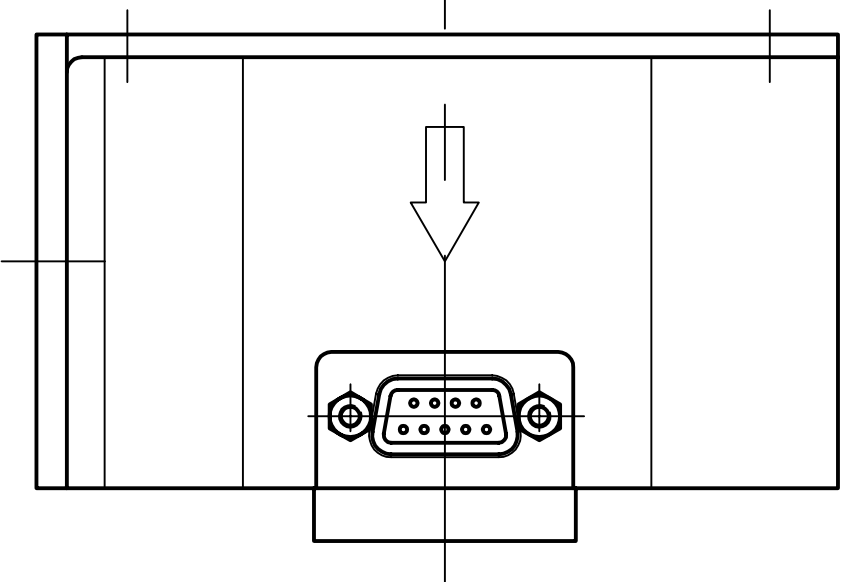
2×⌀6.5 MOUNTING HOLES

4×⌀5.5 MOUNTING HOLES
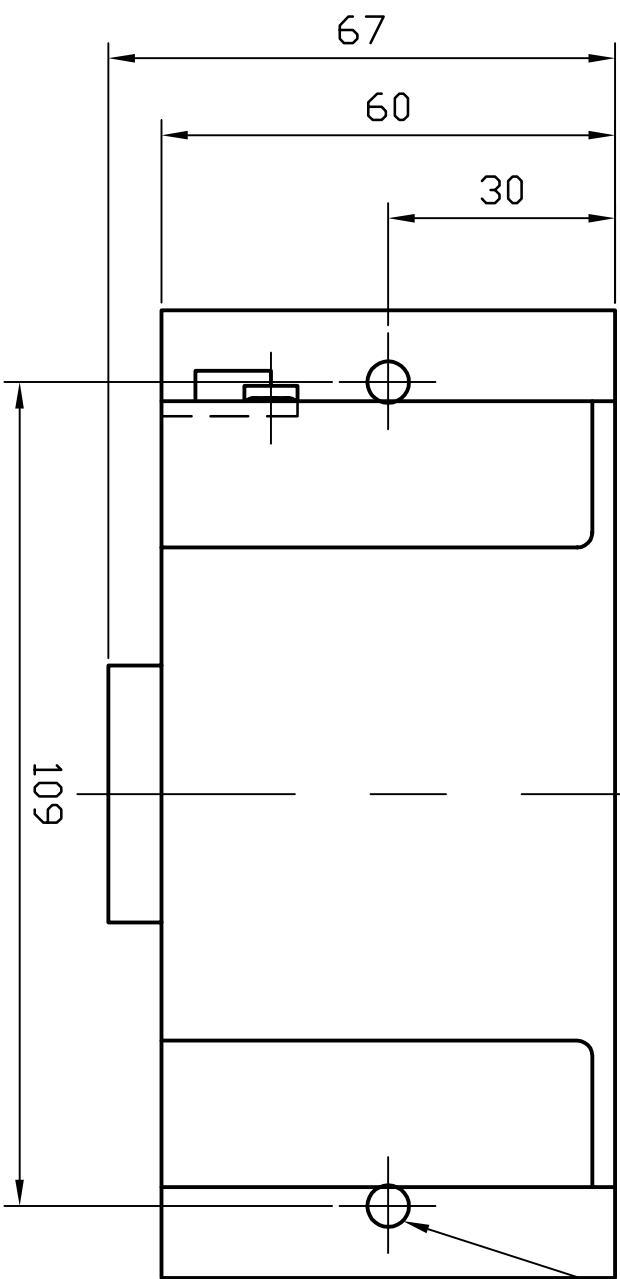
SCALE 1:1

CURRENT TRANSDUCER
ASSEMBLY
ULTRASTAB 867-700
ANGLE

CUSTOMER: .		FILE:	
PROJECT NO.	.		
DRAWN BY	MK 30.08.02		
DESIGN APP.	.		
PROD.APP.	.		
PROJ.ENGR.	AM		
DWG.NO.:			
REVISION:	A	DATE: MK 04.11.02	SIZE:
88937A		SHEET 1 OF 1	A3

ULTRASTAB 867-700PI

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User Side

D-SUB-9

Signal	Pin	D-SUB	Wire color	User Side
Current Output	6	6	White	Current Output (+/- 400mA)
Current Return	1	1	Brown	Current Return
+ 15 V	9	9	Green	+ 15 V (+/- 5%)
			Yellow	
- 15 V	5	5	Gray	- 15 V (+/- 5%)
GND	4	4	Pink	GND
Max. 1A	8	8	Blue	Status (max. 1A)
K1B	3	3	Red	Status (max. 1A)
Trim vinding	7	7		Trim vinding
Trim vinding	2	2		Trim vinding

Closed contacts = Normal Operation

Electrostatic shield

Shield

Ground
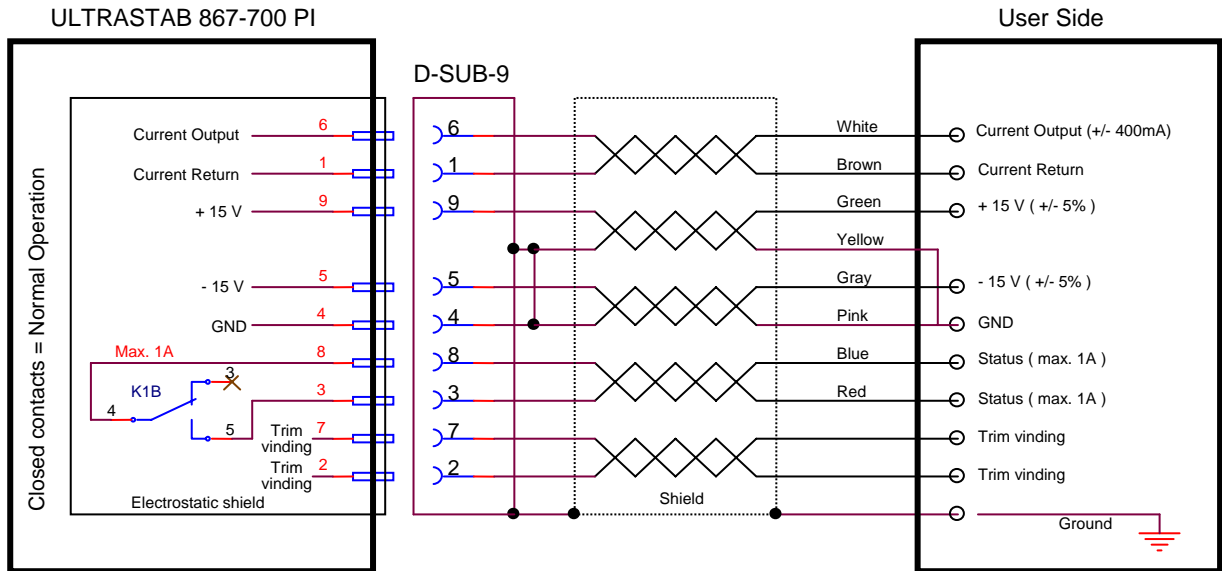
Pin configuration for 9 pole D_SUB :

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

Accessories :

- Programming plugs from 80 Amp to 700 Amp in steps of 10 Amp
- 2.5 Ω Burden Resistor (4 x 10 Ω) , 0.05% , Tc < 3 ppm/°C
- Ø 25mm busbar