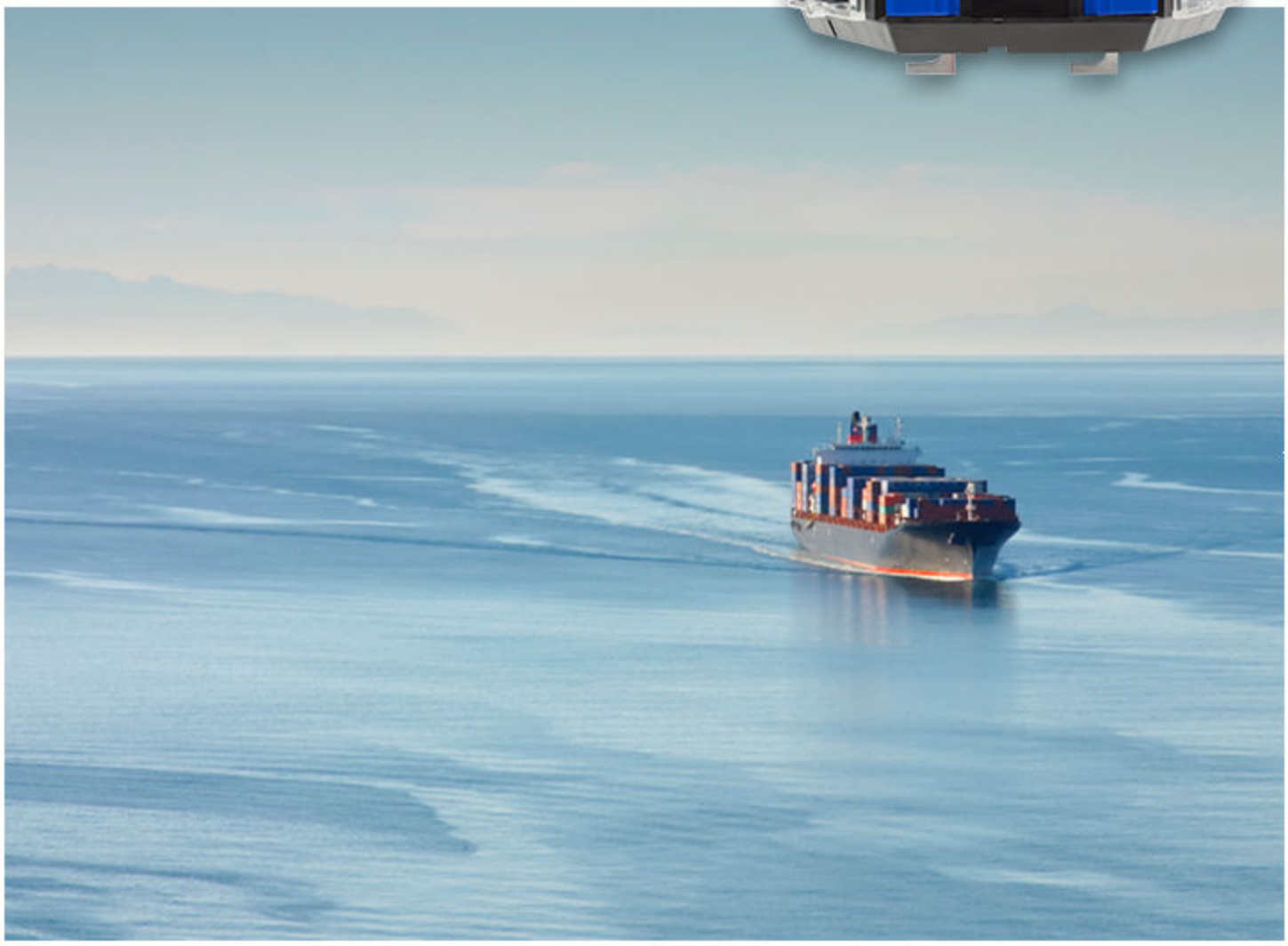
KSU and SUSK

4921210113G

Summation current transformers

Data sheet

Improve Tomorrow



1. About summation current transformers

1.1 About

The summation current transformers can be used to add up secondary currents from up to eight main transformers to one common secondary signal. It is possible for the secondary currents to have different nominal transmissions. This must be stated at the time of order, see **Order specifications** for more information.

The summation current transformers can summarise synchronised alternating currents with similar phases, but different load phase shifts. You can also use the transformers for the summation of currents with different nominal voltages, but similar phase positions. It is not possible to uses these measurements for tariff applications as the voltage diffferences are registred as errors.

To visually display the current measurements, use a measuring instrument with a measuring range similar to the secondary nominal current of the summation transformer.

DEIF offers two different sizes of measuring transformers:

- KSU: 2 or 3 inputs.
- SUSK: 3 to 8 inputs.

The transformer housing is made of impact-resistant thermoplastic and the transformer terminals are protected by a cover.

1.2 General technical specifications

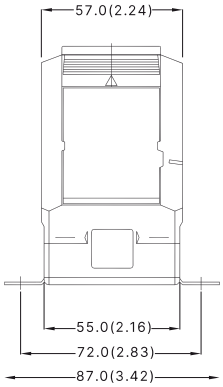
Category	Specification
Frequency	50/60 Hz (16 2/3 to 400 Hz on request)
Nominal voltage	≤ 720 V AC
Isolation class	E
Test voltage	3000 V, 1 min, 50 Hz (nominal voltage ≤ 720 V)
Continuous thermal current	Icth = 1.0 × In
Rated short-time thermal current	Ith = 40 × In, 1 sec (max. 100 kA)
Rated dynamic current	Idyn = 2.5 × Ith
Instrument security factor	FS 5 to 15 (see product label for specific value)
Operating temperature	-5° C to 50° C
Storage temperature	-25° C to 70° C
Standard references	IEC/DIN EN 61869/1/2 DIN 42600/1/2

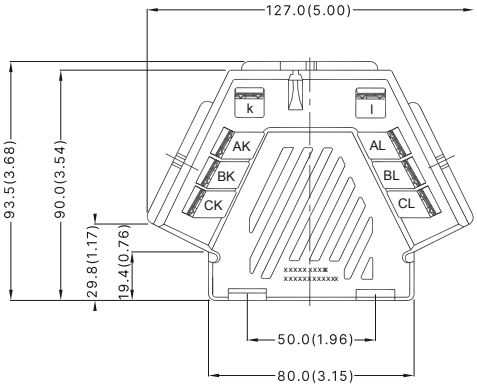
1.3 Overview of summation current transformers

Primary nominal current [A] ↓	KSU 2	KSU 3	SUSK 3	SUSK 4	SUSK 5	SUSK 6	SUSK 7	SUSK 8
1	•	•	•	•	•	•	•	•
5	•	•	•	•	•	•	•	•
Transf. width (mm)	57	57	65	65	65	65	65	65

2. Summation current transformers

2.1 KSU 2

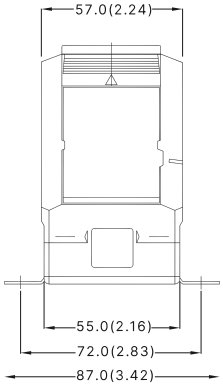


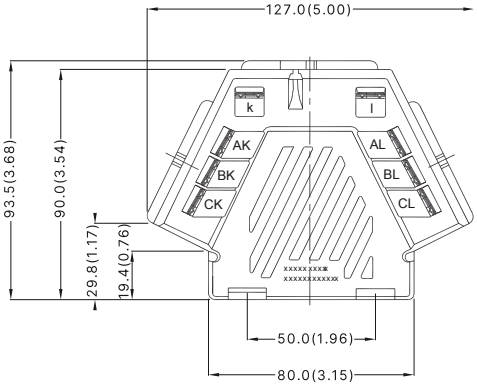


Specifications	
Weight	0.300 - 1.100 kg (0.66 - 2.43 lbs)
DIN rail mounting	Not available
Sealed shutter (primary)	2 x 2961900710.07

Secondary current →		5A		1A	
Primary current A ↓	Burden ↓	Accuracy class		Accuracy class	
		1	0.5	1	0.5
1 + 1	5	•	•	•	•
	10	•	•	•	•
	15	•	•	•	•
	20	•		•	
	25	•		•	
5 + 5	5	•	•	•	•
	10	•	•	•	•
	15	•	•	•	•
	20	•		•	
	25	•			

2.2 KSU 3

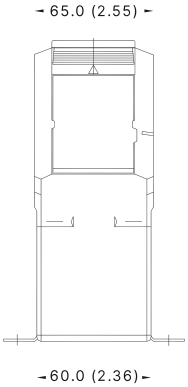


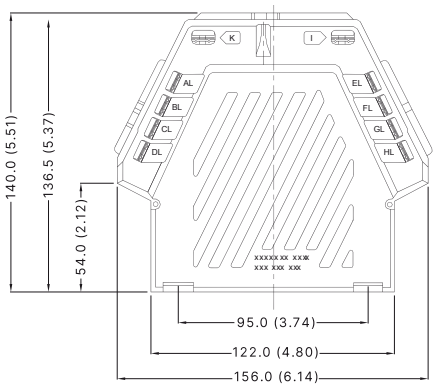


Specifications	
Weight	0.300 - 0.750 kg (0.66 - 1.65 lbs)
DIN rail mounting	Not available
Sealed shutter (primary)	2 x 2961900710.07

Secondary current →		5A		1A	
Primary current A ↓	Burden ↓	Accuracy class		Accuracy class	
		1	0.5	1	0.5
1 + 1 + 1	5	•	•	•	•
	10	•	•	•	•
	15	•	•	•	•
5 + 5 + 5	5	•	•	•	•
	10	•	•	•	•
	15	•	•	•	•
	30	•			

2.3 SUSK 3

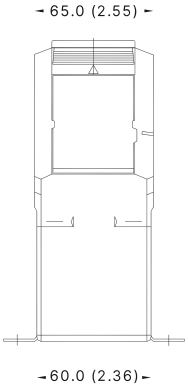


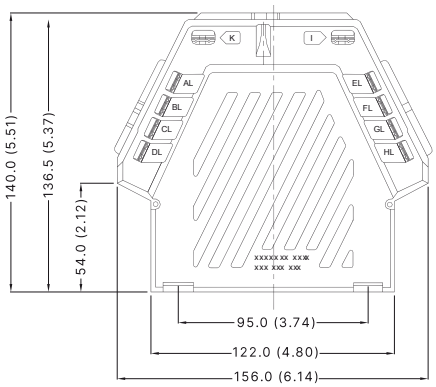


Specifications	
Weight	0.480 - 1.130 kg (1.06 - 2.49 lbs)
DIN rail mounting	Not available
Sealed shutter, primary	2 x 2961900710.07
Sealed shutter, secondary	2961900710.08

Secondary current →		5A		1A	
Primary current A ↓	Burden VA ↓	Accuracy class		Accuracy class	
		1	0.5	1	0.5
1 + 1 + 1	5	•	•	•	•
	10	•	•	•	•
	15	•	•	•	•
	30	•		•	
5 + 5 + 5	5	•	•	•	•
	10	•	•	•	•
	15	•	•	•	•
	30	•		•	

2.4 SUSK 4

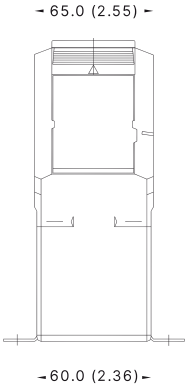


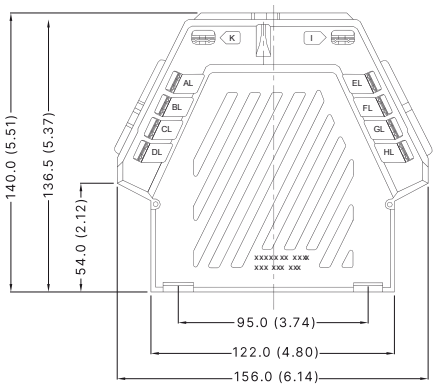


Specifications	
Weight	0.500 - 1.210 kg (1.10 - 2.67 lbs)
DIN rail mounting	Not available
Sealed shutter, primary	2 x 2961900710.07
Sealed shutter, secondary	2961900710.08

Secondary current →		5A		1A	
Primary current A ↓	Burden VA ↓	Accuracy class		Accuracy class	
		1	0.5	1	0.5
1 + 1 + 1 + 1	5	•	•	•	•
	10	•	•	•	•
	15	•	•	•	•
	25	•		•	
	30	•		•	
5 + 5 + 5 + 5	5	•	•	•	•
	10	•	•	•	•
	15	•	•	•	•
	25	•		•	
	30	•		•	

2.5 SUSK 5

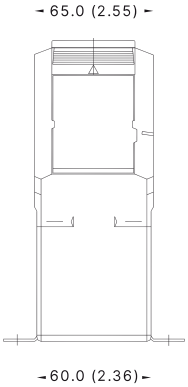


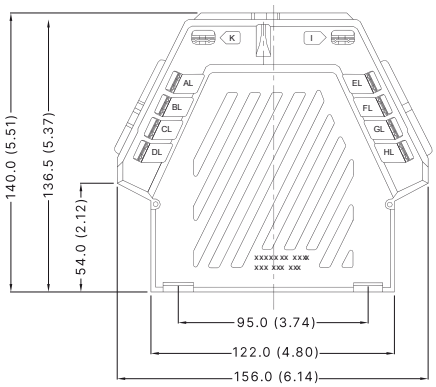


Specifications	
Weight	0.500 - 1.240 kg (1.10 - 2.73 lbs)
DIN rail mounting	Not available
Sealed shutter, primary	2 x 2961900710.07
Sealed shutter, secondary	2961900710.08

Secondary current →		5A		1A	
Primary current A ↓	Burden VA ↓	Accuracy class		Accuracy class	
		1	0.5	1	0.5
1 + 1 + 1 + 1 + 1	5	•	•	•	•
	10	•	•	•	•
	15	•	•	•	•
	30	•		•	
5 + 5 + 5 + 5 + 5	5	•	•	•	•
	10	•	•	•	•
	15	•	•	•	•
	30	•		•	

2.6 SUSK 6

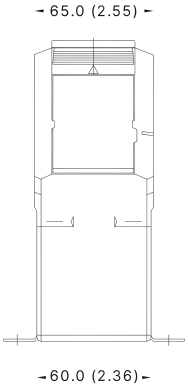


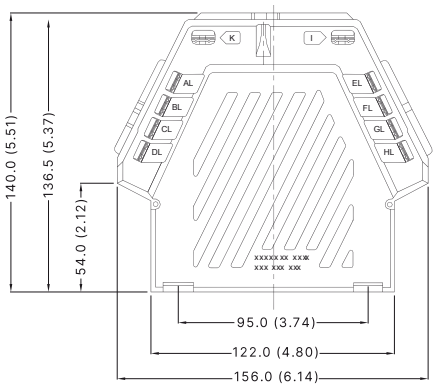


Specifications	
Weight	0.500 - 1.250 kg (1.10 - 2.76 lbs)
DIN rail mounting	Not available
Sealed shutter, primary	2 x 2961900710.07
Sealed shutter, secondary	2961900710.08

Secondary current →		5A		1A	
Primary current A ↓	Burden VA ↓	Accuracy class		Accuracy class	
		1	0.5	1	0.5
1 + 1 + 1 + 1 + 1 + 1	5	•	•	•	•
	10	•	•	•	•
	15	•	•	•	•
	30	•		•	
5 + 5 + 5 + 5 + 5 + 5	5	•	•	•	•
	10	•	•	•	•
	15	•	•	•	•
	30	•		•	

2.7 SUSK 7

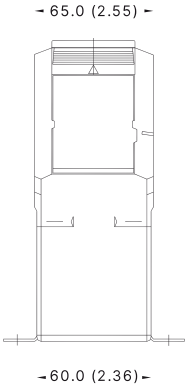


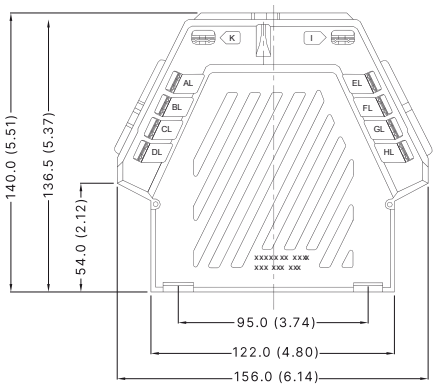


Specifications	
Weight	0.500 - 1.200 kg (1.10 - 2.65 lbs)
DIN rail mounting	Not available
Sealed shutter, primary	2 x 2961900710.07
Sealed shutter, secondary	2961900710.08

Secondary current →		5A		1A	
Primary current A ↓	Burden VA ↓	Accuracy class		Accuracy class	
		1	0.5	1	0.5
1 + 1 + 1 + 1 + 1 + 1 + 1	5	•	•	•	•
	10	•	•	•	•
	15	•	•	•	•
	30	•		•	
5 + 5 + 5 + 5 + 5 + 5 + 5	5	•	•	•	•
	10	•	•	•	•
	15	•	•	•	•
	30	•		•	

2.8 SUSK 8





Specifications	
Weight	0.710 - 1.280 kg (1.57 - 2.82 lbs)
DIN rail mounting	Not available
Sealed shutter, primary	2 x 2961900710.07
Sealed shutter, secondary	2961900710.08

Secondary current →		5A		1A	
Primary current A ↓	Burden VA ↓	Accuracy class		Accuracy class	
		1	0.5	1	0.5
1 + 1 + 1 + 1 + 1 + 1 + 1 + 1	5	•	•	•	•
	10	•	•	•	•
	15	•	•	•	•
	30	•		•	
5 + 5 + 5 + 5 + 5 + 5 + 5 + 5	5	•	•	•	•
	10	•	•	•	•
	15	•	•	•	•
	30	•		•	

3. Accessories and options for summation transformers

Accessories

Accessory	Description
Mounting	Foot angle for screw mounting and busbar mounting screws with isolating protection caps are supplied along with the current transformer. DIN rail mounting accessory is stated at the individual CT type if it is available.
Sealed shutter	Transparent plastic cover protects the current transformer. The type label remains visible. Not available for all current transformer types. The sealed shutter part number is stated at the individual CT type if it is available.

Options

Options must be selected at the time of order.

Option	Description
Test certificate	Test certificate for a specific current transformer.
Excitation curve	Excitation curve for a specific current transformer.
Optional frequency	Standard frequency range is 50 to 60 Hz. On request, DEIF can provide transformers with a frequency range of 16 2/3 to 400 Hz.
Cast resin	Standard for all current transformers with a nominal current of >4000A. Current transformers with a nominal current of <4000A can be produced with cast resin on request. The minimum and maximum weight specifications for each type refers to standard versions. The specification is different if cast resin is ordered for current transformers <4 000 A.

4. Order specifications

Mandatory information						Additional options to the standard variant	
Item no.	**Type**	**Primary current**	**Secondary current**	**Burden**	**Accuracy class**	**Option**	**Option**

If the CT ratios of the summation current transformers are not the same, each CT rations must be stated on the order. This is to make sure the summation current transformer is adjusted to the correct ratio.

For example, CT1: 1600/5 and CT2:1250/5. You can also state the relative ratio between the current transformers, which in this case would be 32/25.

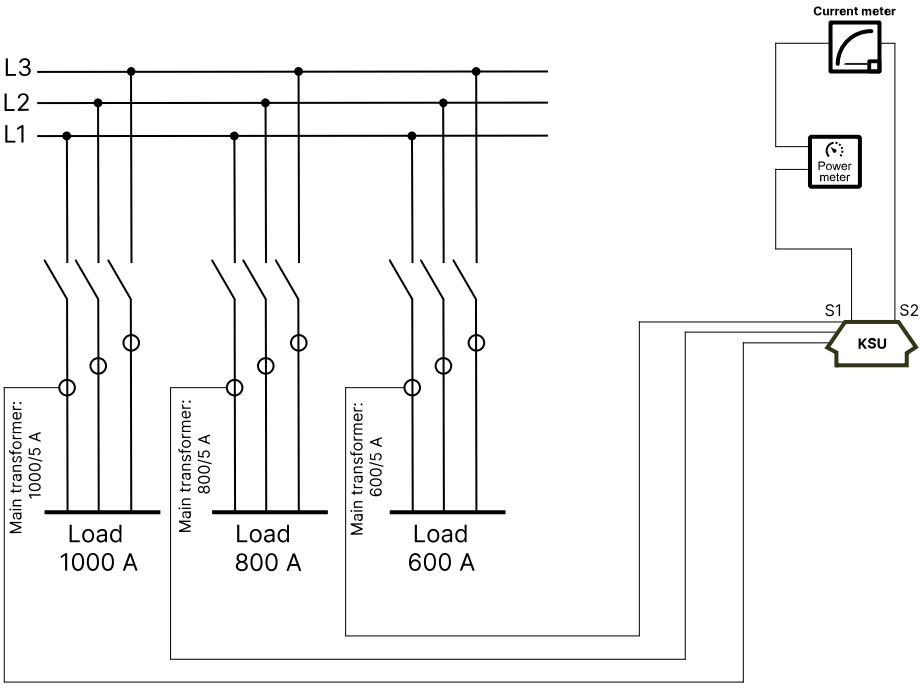
Ordering example

Mandatory information						Additional options to the standard variant	
Item no.	**Type**	**Primary current**	**Secondary current**	**Burden**	**Accuracy class**	**Option**	**Option**
2961990020.05	SUSK 5	5	5	10	1		
2961990020.02	KSU 3	1	5	15	0.5	Test certificate	Cast resin

4.1 Example: How to select measuring components for summation current transformers

You can use the summation current transformers in a wide variety of applications. This example shows a specific application with three different loads, a summation transformer, a performance meter, and a current meter.

Application setup



NOTE The summation current transformers are not shown for L2 and L3.

System information

Transmission ratio for the 3 main transformers:

- 1000/5 A
- 800/5 A
- 600/5 A
- **Total ratio: 2400/5 A**

Consumption and losses:

- Current meter: 1.5 VA
- Power meter: 7.0 VA
- Measurement conductor loss: 1.5 VA
- Consumption output power for the summation CT: 4.0 VA
- **Total consumption and loss: 14.0 VA**

Each main transformer needs to supply its share of the 14.0 VA required for the system to operate. This value is based on the transmission ratio of the main transformer.

VA power contribution from each main transformer

The amount of VA power each main transformer needs to supply to the system is calculated using these equations:

Main transformer 1000/5 A	$\frac{1000}{2400} \times 14 = 5.83 \text{ VA} + \text{additional losses}$
Main transformer 800/5 A	$\frac{800}{2400} \times 14 = 4.67 \text{ VA} + \text{additional losses}$
Main transformer 600/5 A	$\frac{600}{2400} \times 14 = 3.50 \text{ VA} + \text{additional losses}$

The calculations also include additional losses, such as power loss between the main transformer and the summation transformer. Round the VA values up to the nearest number in the DEIF chart.

NOTE The ratio of the primary current of one main transformer to the sum of the primary currents of all main current transformer must not be more than 1:8.

Underloading and overloading the current transformer

Underloading the current transformer creates positive deviations and generates a higher over-current limiting factor because of saturation behaviour. If a failure occurs, for example a short circuit, under-charging can damage the devices connected in the secondary circuit.

Overloading the current transformer can have a negative impact on measurement deviations and phase displacement errors. As a result, the current transformer can saturate before the rated current is reached, or the transformer fails to indicate high currents accurately.

5. Legal information

5.1 Disclaimer

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