Data Sheet 10/30-1.68-EN Rev. A

Special indicators and accessories

Twin indicator with moving coil mechanism

Vibrating reed frequency meters

Phase sequence indicator

Elapsed time meters

Synchronizing indicators

Field indicators

Shunts

Current transformers

Power and productivity
for a better world™

General data

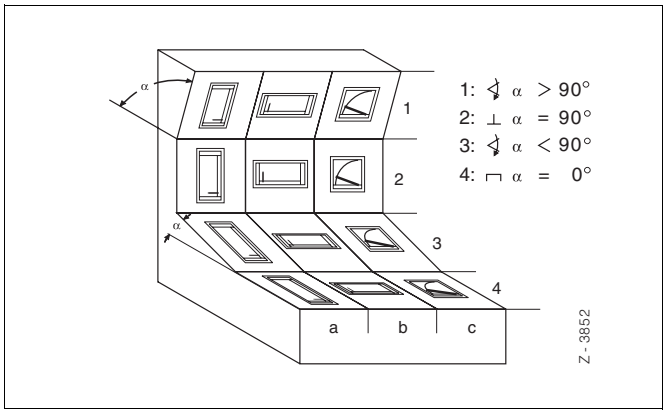
Standards
The indicators comply with DIN EN 60051 and with the safety regulations according to DIN EN 61010-1.

In the sections below you can find a short description of the most important parts of these regulations regarding the construction and the characteristics of electrical measuring instruments.

Measured error
The measured error of an indicator or its accessories is given by the limits through basic errors and effects.

The indicators and contact indicators comply with Class 1.5, if no other measured error rating has been given for specific types. Optionally, indicators can also be supplied for higher class measured errors, if this is possible. The class involved is always stated on the scale.

Mounting orientation
Generally, the nominal position is indicated by a position symbol. For indicators without such a position identification, the reference range is any vertical or horizontal position. The nominal mounting orientation is 5° in every direction of the reference position. Note that the effect (in addition to the indicated error) must not be greater than 50 % of the respective classified error.



General technical specifications

Scale and pointer design
The scales and pointers for square, circular, vertical or horizontal scales comply with DIN 43802, Parts 2 and 4.

Temperature effect
If not otherwise stated, the reference temperature is 23 °C ± 2 K for indicators of Class 0.5 to 5. The additional error for a nominal range of ± 10 K within this temperature range must not exceed the classified error.

Type of protection
If not otherwise specified, the indicators comply with DIN EN 60529.

IP 52 for case
IP 00 for terminals

Narrow front panel to DIN 43700

Standard model
dull black, RAL 9005

Environmental conditions to DIN EN 60721-2-1, 2, 5

Conditions	Permissible variables	
	Normal measuring instruments → H, Y, G	Relatively tropicalized instruments → H, V, F
Operating temperature	-25...+40 °C	-25...+55 °C
Relative humidity	max. 85 %, but not more than 60 days per year, otherwise 75 %, annual average 65% (max. temperature +27 °C)	max. 95 %, but not more than 30 days per year, otherwise 85 %, annual average 75% (max. temperature +25 °C)
Condensation	none	none

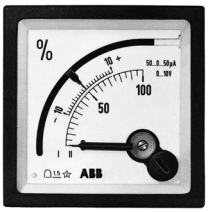
Mechanical category to DIN EN 60068

Vibration = Part 2-6
normal version

frequency range	5...55 Hz
acceleration	max. 2.5 g

Mounting orientation
vertical, if not otherwise specified, according to 2c in the illustration

Twin indicator with moving coil mechanism HH48-W



Application

The twin moving coil indicator is designed for direct current and direct voltage measurement, e.g. for determining the control deviation and the position of the final control elements in control loops.

Device specifications

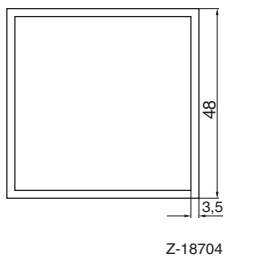
Front dimensions (mm) Type	48 x 48 HH48-W
Scale length (mm) MI/MII	31/28
Class	1.5
Weight (kg)	0.09
Operating voltage	according to DIN 61010
Measuring voltage category	CAT III
Degree of pollution	2
Front panel protection	IP 52
Mounting	Screwed brackets
Housing material	Plastic (self-extinguishing)

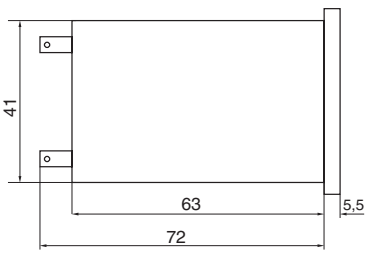
Mechanical construction

Front dim. (mm)	Rated dim. a1 x a2	Rated dim. h	Cutout dimensions l1 x l2	Mounting depth t	Connectors Tab connector
48 x 48	48 x 48	5.5	$45^{+0.6}$ x $45^{+0.6}$	72	6.3 x 0.8 mm

Dimensional drawings

Basic dimensions (mm)





Vibrating reed frequency meters Q72-NW, Q96-NW, Q144-W

Appication

Vibrating reed frequency meters have a vibrating mechanism. The frequency is measured according to the type of vibration shown by the reeds.

Mounting orientation: any

Rated voltage

between 100 V and 600 V

Voltage effect

Voltage fluctuations up to ± 20 % of the rated voltage do not influence the vibration

Device specifications

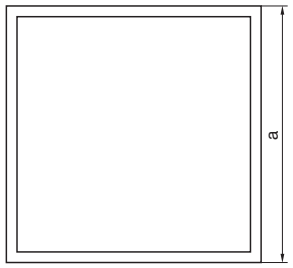
Front dimensions (mm) Type	72 x 72 Q72-NW	96 x 96 Q96-NW	144 x 144 Q144-W
Class	0.5	0.5	0.5
Weight (kg)	0.3	0.4	0.8
Own consumption	0.4...3 VA		
Operating voltage	according to DIN 61010		
Measuring voltage category	CAT III		
Degree of pollution	2		
Front panel protection	IP 52		
Mounting	Screwed brackets		
Housing material	Sheet metal		

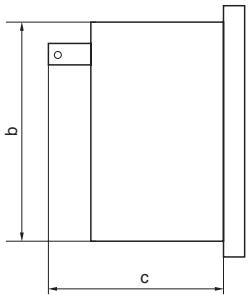
Mechanical construction

Front dim. (mm)	Rated dim. a	Cutout dimensions b	Mounting depth c	Connectors
72 x 72	72 x 72	$68.4^{+0.4}$ x $68.3^{+0.4}$	52	M3
96 x 96	96 x 96	$92^{+0.8}$ x $92^{+0.8}$	58	M3
144 x 144	144 x 144	138^{+1} x 138^{+1}	58	M3

Dimensional drawings

Basic dimensions (mm)





Phase sequence indicator DFR96

Application

Phase sequence indicators are designed for determining directly the phase sequence in a three-phase mains of up to 500 V.

If the phase sequence is correct, the rotating disk will rotate clockwise upon actuation of the push button. If the disk should rotate counterclockwise, exchange any two phases.

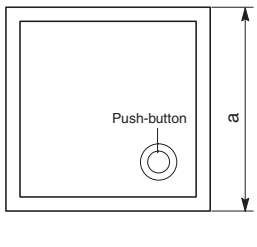
Device specifications

Front dimensions (mm)		96 x 96
Weight (kg)		0.4
Frequency range		50...100 Hz
Voltage range		100...500 V
Type of protection	Housing Terminals	IP 52 IP 00
Mounting		Screwed brackets
Housing material		Sheet metal
Mounting depth		62 mm
Connection		M3
Own consumption	with 100 V with 500 V	0.5 VA/phase 2 VA/phase
Operating temperature		-25...+40 °C
Operating voltage		according to DIN 61010
Measuring voltage category		CAT III
Degree of pollution		2

Mechanical construction

Front dim.	Rated dim.		Cutout dimensions	Mounting	Connectors
(mm)	a	h	b	depth c	Tab connector
96 x 96	96 x 96	5,5	$92^{+0,8}$ x $92^{+0,8}$	62	M3

Dimensional drawings



Dimensions (in mm)	DFR96
a	96
b	90
c	62

Elapsed time meters Z72, Z96

Application

Elapsed time meters are used for monitoring and keeping maintenance and warranty periods.

Display

7-digit for 99999.99 operating hours

Mounting orientation: any

Ambient temperature: -10...+60 °C

Device specifications

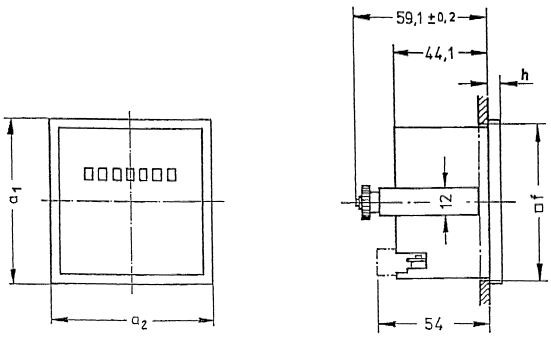
Front dimensions (mm) Type	72 x 72 Z72	96 x96 Z96
Weight (kg)	0.12	0.14
Indication range	99999.99	99999.99
Drive	Synchron. motor	Synchron. motor
Rated frequency	50 Hz	50 Hz
Power consumption	2 VA	2 VA
Operating voltage	according to DIN 61010	
Front panel protection	IP 52	IP 52
Measuring voltage category	CAT III	CAT III
Degree of pollution	2	2
Mounting	Metal brackets	Metal brackets

Mechanical construction

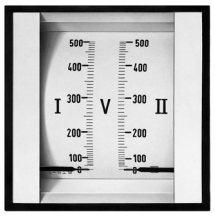
Front dim.	Rated dim.		Cutout dimensions	Mount. depth	
(mm)	a1 x a2	h	f	w. brackets	
72 x 72	72 x 72	5.4	$68^{+0.7}$ x $68^{+0.7}$	54	$59.1^{+0.2}$
96 x 96	96 x 96	5.4	$92^{+0.8}$ x $92^{+0.8}$	54	$59.1^{+0.2}$

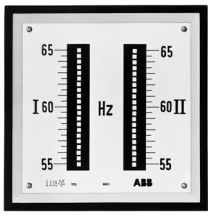
Dimensional drawings

Basic dimensions (mm)



Synchronizing indicators FVV, QQ, GSE





Application

If an alternating current generator is to be switched in parallel with the mains system, the voltage, frequency and phase relationship must match. The synchronizing indicators are the appropriate tool for determining whether or not this match exists. Usually, three single indicators are installed in a wall bracket for this purpose.

Twin voltmeters

consist of two moving iron mechanisms which are physically separated from each other.

Twin vibrating reed frequency meters

consist of two vibration mechanisms which are physically separated from each other.

Synchronoscopes

are non-ferrous quotient mechanisms with a round dial. The pointer can move in both directions. It remains on the mark only when the fequency and phase relationship of both current circuits match.

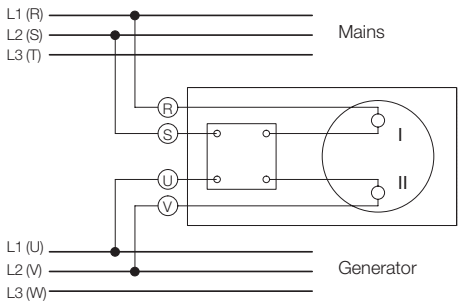
Device specifications

Front dimensions (mm) Type	96 x 96 FVV96	144 x 144 FVV144	96 x 96 QQ96	144 x 144 QQ144	96 x 96 GSE96	144 x 144 GSE144
Scale length (mm)	60	97				
Class	1.5	1.5	0.5	0.5		
Weight (kg)	0.6	0.7	0.65	1.0	1.0	1.1
Own consumption	approx. 1.8...2.5 VA	approx. 2.3...4.5 VA	1...3 VA	1...3 VA	0.7...6.7 VA	0.7...6.7 VA
Operating voltage	according to DIN 61010					
Measuring voltage category	CAT III	CAT III	CAT III	CAT III	CAT III	CAT III
Degree of pollution	2	2	2	2	2	2
Front panel protection	IP 52	IP 52	IP 52	IP 52	IP 52	IP 52
Mounting	Screwed brackets	Screwed brackets	Screwed brackets	Screwed brackets	Screwed brackets	B
Housing material	Sheet metal	Sheet metal	Sheet metal	Sheet metal	Sheet metal	Sheet metal
Mounting orientation	vertical ± 1°					
Ambient temperature	23 °C ± 1 K					

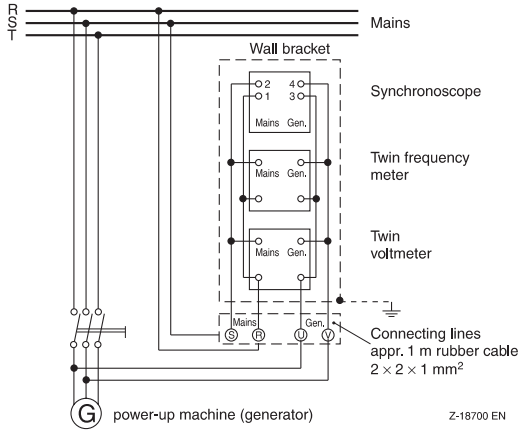
Mechanical construction

Front dimensions (mm)	Type	Rated dimensions a	Cutout dimensions b	Mounting depth c	Connectors
96 x 96	GSE96	96 x 96	$92^{+0.8}$ x $92^{+0.8}$	110	M3
144 x 144	GSE144	144 x 144	138^{+1} x 138^{+1}	105	M3
96 x 96	FVV96	96 x 96	$92^{+0.8}$ x $92^{+0.8}$	115	M3
144 x 144	FVV144	144 x 144	138^{+1} x 138^{+1}	121	M3
96 x 96	QQ96	96 x 96	$92^{+0.8}$ x $92^{+0.8}$	66	M3
144 x 144	QQ144	144 x 144	138^{+1} x 138^{+1}	58	M3

Connection diagram

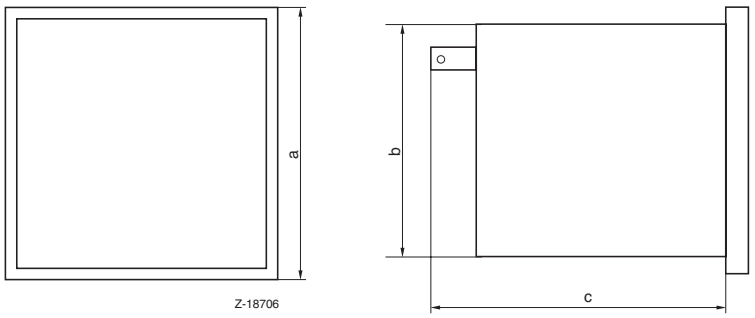


Connectin diagram for twin voltmeter resp. twin frequency meter

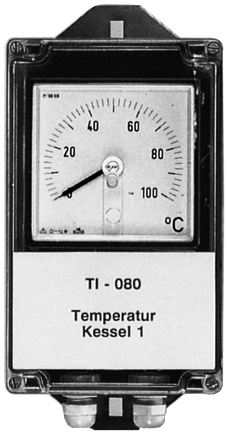


Dimensional drawings

Basic dimensions (mm)



Field indicators F96, F96-E



Application

F96 for standard applications
F96-E for applications in the hazardous area

A standard indicator with 90° or 240° pointer travel is installed in a rugged polycarbonate case with transparent cover. The field indicator is designed for wall, standard rail or pipe mounting.

Technical data

Indicator

Mechanism
moving-coil mechanism
Class 1.5

Scale lenght
94 mm for 90° scale
161 mm for 240° scale

Test voltage
2 kV

Case

Material
Macrolon, gray, similar to RAL 7035

Type of protection
IP 65 to DIN 40050

Screws
CrNiMo steel (1.4571)

Cable gland
1 or 2 × PG 9

Connectors
terminals for 0.5...4 mm² cables

Weight
1...1.4 kg

Mounting
wall mounting with 2 pairs of elbows
mounting on standard 30 mm rails
pipe mounting with 2 pipe clamps for ½...1“ pipes

Environmental capabilities

Climate category
JVR to DIN 40040

Ambient temperature
-10...+55 °C

Transport and storage temperature
-25...+65 °C

Relative humidity
≤ 90 % annual average, condensation possible

Explosion protection

For field indicator F96-E

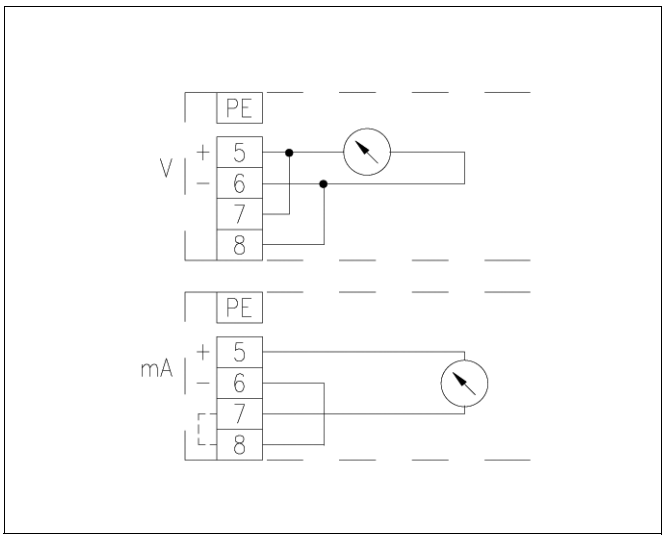
As passive two-pole unit for connection to intrinsically safe current circuits outside or within the hazardous area.

R_i (Ω)	L_i (µH)	C_i		
2.7	4	0	0...20 mA	90° scale
2.4	6	0	4...20 mA	90° scale
4.3	230	0	0...20 mA	240° scale
3.8	370	0	4...20 mA	240° scale

Application

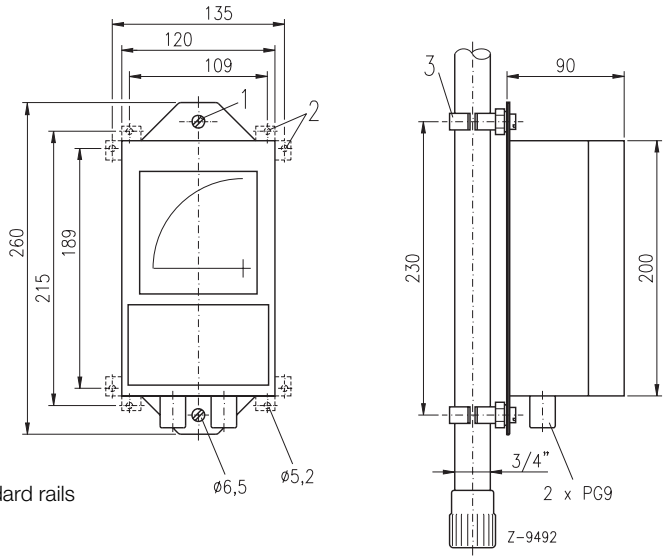
EEx ib IIC T6	I_{max} = 140 mA
EEx ib IIC T5	I_{max} = 190 mA

Connection diagram



Dimensional drawings for field indicators

Basic dimensions (mm)



1 Mounting to standard rails
2 Wall mounting
3 Pipe mounting

Shunts

Application

Shunts are designed for extending the measuring range of direct current indicators. They can be integrated directly into the line of the direct current system.

The current flowing through the shunt causes a voltage drop which is measured by the meter connected downstream. Shunts are balanced such that the rated current produces a defined voltage drop (60 mV, 150 mV). The error limit defined for the shunt refers to an exactly defined load of the shunt through the meter connected downstream, including the supply lines.

Two different shunt design types are available, depending on the rated current and the rated voltage drop.

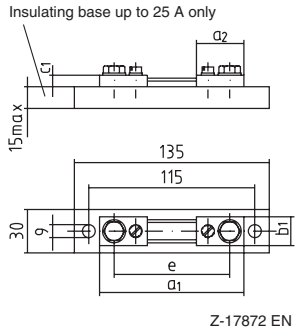
The isolating base for screw-mounting and snap-mounting on 35 mm top hat rails to DIN 50022 is suitable for the range from 1 A to 150 A.

Measuring error

Class 0.5 to DIN EN 60051. For rated currents from 1 A to 4 A a current consumption capacity of 6 mA for the indicator has to be taken into account for balancing.

Dimensional drawings

(Dimensions in mm)



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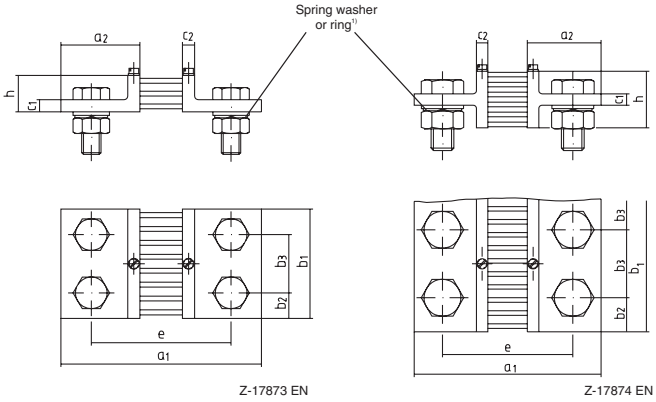


Z-17873 EN Z-17874 EN

Voltage drop (mV)	Rated current A	Version acc. to fig.	a1	a2	b1	b2	b3	c1	c2	e	h	Qty.	Hex. screw DIN 933-5.8	Washer DIN 125-St	Nut DIN 934-5	Voltage connectors	Weight (kg)
60	1 1.5 2.5 4 6 10 15 25	1	90	28	20	–	–	8	–	78	–	2 × 1	M5 × 12	5.3	–	2 pan head screws, each. M5 × 8 DIN 84-4.8 and 2 washers 5.3 DIN 433-St	0.11
	40 60 100 150	1	100	33	20	–	–	8	–	80	–	2 × 1	M8 × 16	8.4	–		0.12
	250	2	145	55	30	15	–	10	10	105	30	2 × 1	M12 × 40	13	M12		0.51
	400 600				40	20	–						M16 × 45	17	M16		0.78
	1000	2	165	65	60	30	–	10	10	115	30	2 × 1	M20 × 50	21	M20		1.4
	1500				90	21	48					2 × 2	M16 × 45	17	M16		1.9
	2500	2	165	65	120	30	60	10	10	115	30	2 × 2	M20 × 50	21	M20		2.0
150	1 1.5 2.5 4 4 6 15 25	1	90	28	20	–	–	8	–	78	–	2 × 1	M5 × 12	5.3	–		0.11
	40 60 100 150	1	225	33	25	–	–	8	–	205	–	2 × 1	M8 × 16	8.4	–		0.2
	250	2	270	55	30	15	–	10	10	230	50	2 × 1	M12 × 40	13	M12		0.72
	400 600				40	20	–						M16 × 45	17	M16		1.1
	1000	2	290	65	70	35	–	10	10	240	60	2 × 1	M20 × 50	21	M20		2.5
	1500				90	21	48	15				2 × 2	M16 × 60	17	M16		3.5
	2500	2	290	65	120	30	60	10	10	240	60	2 × 2	M20 × 60	21	M20		5.2

Details not provided should be selected as need be.
Name of a shunt for 60 mV voltage drop
and 25 A rated current: Shunt 60-25 DIN 43703

1) Place spring washer (e.g. to DIN 137) or ring (to DIN 127) between washer and nut for a balanced contact pressure.

Current transformers WSK40, TAS70, TAS110

Application
Current transformers are small-capacity transformers with their secondary windings practically short-circuited over the connected measuring instruments.

They separate measuring circuits from the primary input voltage and protect the connected measuring instruments from being overloaded, in accordance with the overvoltage behaviour of the transformer.

Current transformer are used for displaying, writing and counting measuring instruments and comply with DIN EN 60044-1.

Operating voltage (serial voltage)
The transformers are suitable for networks systems with a maximum effective voltage of 660 V between the mains cables. They are insulated in accordance with the standard dimension 0.5.

Rated frequency
50...60 Hz

Measuring error (current error)
For rated currents, the max. current error corresponds to 1.2fold overload of the classified 0.5.

Rated current
Refer to the ordering information for the primary rated currents. The secondary rated current for all types is 5 A; 1 A can be supplied optionally.

Rated load
The impedance of the auxiliary connected instruments, including supply line is expressed in ohms. The fixed specification on error limits refer to the rated load.

Rated power
This is the product of the rated load and the square of the secondary rated current.

Primary thermal threshold current I_{1th}
This is the RMS value of the primary current in kA, whose thermal effect can be borne by the primary winding for 1 s without suffering damage.

Sedoncary thermal current limit I_{2th}
This is the RMS value of the output current, whose thermal effect can be borne by the output winding for 1 s without suffering damage.

Dynamic current limit I_{dyn}
Value of the 1st current amplitude in kA, whose effective power can be borne by a current transformer in case of short-circuit output winding without suffering damage.

Rated overcurrent factor M
States the magnitude of the primary rated current of transformers with a total error greater than 15%, to protect the connected instrument. The overcurrent factor of all transformers is maximally 5.

Common characteristics of all transformers

Short-circuit immunity	$I_{th} = 60\ I_n$: $I_{dyn} = 150\ I_n$
Operating voltage	≤ 660 V
Contructional requirements	nach DIN EN 60044-1
Rated frequency	50...60 Hz
Test voltage	3 kV
Rated overcurrent factor	M5
Secondary rated current	5 A

Insert-type current transformer TAS70

Technical data

Connection

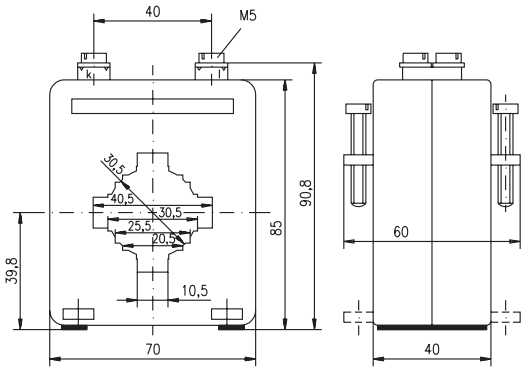
bus bars up to 40 mm x 10 mm
round cables up to max. 30 mm Ø

Weight

approx. 0.6 kg

Dimensional drawings

Dimensions in mm



Rated current	Rated power (VA)		
A	Class 0.5	Class 1	Class 3
50	–	1.0	1.5
60	–	1.0	1.5
75	–	1.5	2.5
100	–	3.0	5
150	–	3.75	5
200	2.5	5	7.5
250	3.75	5	7.5
300	3.75	5	7.5
400	5	7.5	10
500	5	10	10
600	7.5	15	20
800	7.5	15	20
1000	7.5	15	20

Insert-type current transformer WSK40

Technical data

Connection

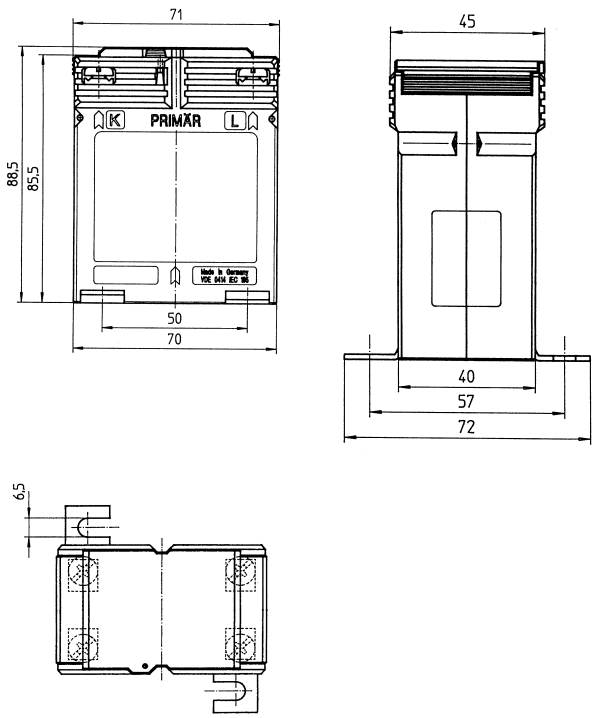
M5 x 10 (primary/secondary)
integrated covers

Weight

approx. 0.3 kg

Dimensional drawings

Dimensions in mm



Rated current	Rated power (VA)	
	Class 0.5	Class 1
5	2.5	10
10	2.5	10
15	2.5	10
20	2.5	10
25	2.5	5
30	2.5	2.5
40	2.5	5

Insert-type current transformer TAS110

Technical data

Connection

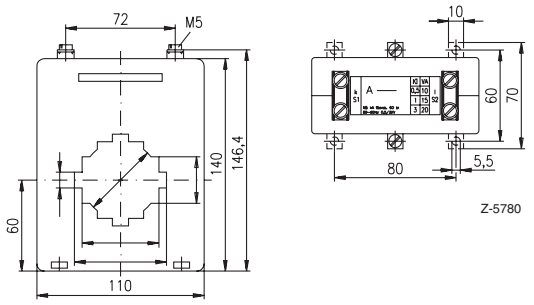
bus bars up to 60 mm x 10 mm
double bus bars up to 50 mm x 10 mm
round cable up to max. 50 mm Ø

Weight: approx. 0.6 kg

Rated current	**Rated power (VA)**		
A	Class 0.5	Class 1	Class 3
200	10	15	20
250	10	15	20
300	10	15	20
400	10	15	20
500	10	15	20
600	10	15	20
800	10	15	20
1000	10	15	20
1200	10	15	20
1500	10	15	20

Dimensional drawings

Dimensions in mm



Ordering information

Twin Indicator with Moving Coil mechanism	Variant digit No.	1- 8	9	10	11	12	13	14	Code			
HH48-W	Catalog No.	**V30342A-**										
Measuring Range of System 1 (outer scale)												
-20…0…+20 µA	Ri = 6 kΩ		1									
-20…0…+20 µA	Ri = 13 kΩ		2									
-20…0…+20 µA	Ri = 50 kΩ		3									
-50…0…+50 µA	Ri = 2 kΩ		4									
4…20 mA	Ri = 3 Ω		5									
0…0.6 mA	Ri = 325 Ω		6									
0…20 mA	Ri = 3 Ω		7									
0…3 V	Ri = 30 kΩ		8									
0…10 V	Ri = 100 kΩ		9									
As specified	ZVA code No.		0									
Scale of System 1												
-10…0…+10	Pointer travel ± 22.5°			1								
-20…0…+20	Pointer travel ± 22.5°			2								
0…100 %	Pointer travel 90°			3								
As specified	ZVB code No.			0								
Measuring Range of System 2 (inner scale)												
0…0.6 mA	Ri = 325 Ω				5							
0…20 mA	Ri = 3 Ω				6							
0…3 V	Ri = 30 kΩ				7							
0…10 V	Ri = 100 kΩ				8							
4…20 mA	Ri = 3 Ω				9							
As specified	ZVE code No.				0							
Scale of System 2												
0…100%	Pointer travel 90°					3						
As specified	ZVF code No.					0						
Installation												
Installation in H&B Uniblock rack							1					
Installation in Mauell rack							4					
Installation in panel							5					
Front Panel Color												
Front panel dull black	(RAL 9005)							1				
Front panel dust gray	(RAL 7037)							2				
Front panel pebble gray	(RAL 7032)							3				
Special Features												
System 1	Measuring range	(in clear text)							ZVA			
	Scale	(in clear text)							ZVB			
	Pointer travel	(in clear text)							ZVK			
System 2	Measuring range	(in clear text)							ZVE			
	Scale	(in clear text)							ZVF			
General	Extra scale inscription	(in clear text)							ZZA			
	Category 2/3 (vibration-proof)								ZAA			
	Climate group 2								ZAK			
	Low-reflection pane								ZGB			
	Mounting orientation	(in clear text)							ZGE			

Ordering information

Vibrating Reed Frequency Meter		Variant digit No.	1 - 8	9	10	11	12	13	14	15	Code			
Q72-NW	72 x 72 mm	Catalog No.	**V31221A-**			0	0	0	0	0				
Q96-NW	96 x 96 mm		**V31222A-**			0	0	0	0	0				
Q144-W	144 x 144 mm		**V31223A-**			0	0	0	0	0				
Measuring Range														
47…50…53 Hz				1										
57…60…63 Hz				2										
Other measuring range	(see ZAM code No.)			0										
Rated Voltage														
100 V					1									
110 V					2									
230 V					3									
400 V					4									
500 V					5									
600 V					6									
Other rated voltage	(see ZAN code No.)				0									
Special Features														
Special measuring range			(in clear text)								ZAM			
Special rated voltage			(in clear text)								ZAN			
Red mark at: ….			(in clear text)								ZPR			
Additional labelling			(in clear text)								ZZA			
Climate group 2 (relatively tropicalized)											ZAK			
Category 2/3 (vibration-proof)											ZAA			
Low-reflection pane											ZGB			
Front panel RAL 7037			(dust gray)								ZGG			
Front panel RAL 7032			(pebble gray)								ZGH			
Terminal cover IP 20											ZOK			
Case identification with: …			(in clear text)								ZGK			

Ordering information

Phase Sequence Indicator	Variant digit No.	1 - 8	9	10	11	12	13	14	15	Code			
DFR96	Catalog No.	**V30996A-**	**2**	**0**	**0**	**0**	**0**	**0**	**0**				
Rated voltage 100...500 V													

Ordering information

Elapsed Time meters		Variant digit No.	1 - 8	9	10	11	12	13	14	15	Code			
Z72	72 x 72 mm	Catalog No.	**V31312A-**		**0**	**0**	**0**	**0**	**0**	**0**				
Z96	96 x 96 mm		**V31313A-**		**0**	**0**	**0**	**0**	**0**	**0**				
Rated Voltage														
110…125 V	50 Hz			1										
110…125 V	60 Hz			2										
230 V	50 Hz			3										
230 V	60 Hz			4										
400 V	50 Hz			5										
400 V	60 Hz			6										
Other rated voltage on request	(see ZAN code No.)			9										
Special Features														
Rated Voltage as specified	(in clear text)										ZAN			

Ordering information

Synchronizing Indicator	Variant digit No.	1 - 8	9	10	11	12	13	14	15	Code			
Twin Voltage Indicator	Catalog No.												
FVV96 96 x 96 mm		**V30092A-**				0	0	0	0				
FVV144 144 x 144 mm		**V30094A-**				0	0	0	0				
Type of Connection													
Direct connection			1										
Connection to transformer	add Code No. 2 _ _		2										
Measuring Range													
2 x 150 V	AC direct		1	1									
2 x 250 V	AC direct		1	2									
2 x 500 V	AC direct		1	3									
2 x 600 V	AC direct		1	4									
2 x x/100 V	AC to transformer		2	8									
2 x x/110 V	AC to transformer		2	9									
As specified	(see special features ZAM)			0									
Mechanical Capabilities													
Category 1/2					9								
Category 2/3					1								
Transformer Voltage													
500 V										272			
600 V										282			
1 kV										213			
3 kV										253			
5 kV										273			
6 kV										283			
10 kV										214			
15 kV										224			
20 kV										234			
25 kV										244			
30 kV										254			

Ordering information

Synchronizing Indicator	Variant digit No.	1-8	9	10	11	12	13	14	15	Code			
Twin Vibrating Reed Frequency Meter	Catalog No.												
QQ96 96 x 96 mm		**V31211A-**				0	0	0	0				
QQ144 144 x 144 mm		**V31212A-**				0	0	0	0				
Measuring Range													
45…50…55Hz			3										
55…60…65 Hz			4										
Other measuring range	(see special features ZAM)		9										
Rated Voltage													
100 V				1									
110 V				2									
230 V				3									
400 V				4									
500 V				5									
600 V				6									
Other rated voltage	(see special features ZAN)			9									
Mechanical Capabilities													
Category 1/2					9								
Category 2/3					1								
Reeds													
Horizontal (standard version)										ZFQ			
Vertical										ZFH			
Special Features													
Other measuring range		(in clear text)								ZAM			
Other rated voltage		(in clear text)								ZAN			

Ordering information													
Synchronizing Indicator	Variant digit No.	1-8	9	10	11	12	13	14	15	Code			
Synchronoscope	Catalog No.												
GSE96 96 x 96 mm		**V30990A-**				0	0	0	0				
GSE144 144 x 144 mm		**V30991A-**				0	0	0	0				
Rated Voltage													
100 V			1										
110 V			2										
230 V			3										
400 V			4										
440 V			5										
500 V			6										
Other Rated Voltage	(see special features ZAM)		9										
Rated Frequency													
50 Hz				1									
60 Hz				2									
Other Rated Frequency	(see special features ZAN)			9									
Mechanical Capabilities													
Category 1/2					9								
Category 2/3					1								

Additional ordering information						
			Code			
Other measuring range / rated voltage		(in clear text)	ZAM			
Other frequency		(in clear text)	ZAN			
Red mark at:…	(not for type GSE)	(in clear text)	ZPR			
Additional labelling		(in clear text)	ZZA			
Climate group 2 (relatively tropicalized)			ZAK			
Low-reflection pane			ZGB			
Front panel RAL 7037		(dust gray)	ZGG			
Terminal cover			ZOK			

Ordering information

Field Indicator	Variant digit No.	1 - 8	9	10	11	12	Code			
F96	Catalog No.	**V31442A-**								
with moving coil mechanism										
for direct current, direct voltage										
Instrument Type / Explosion Protection										
F96	for non-hazardous areas		1							
F96-E	for hazardous areas, measuring range 0/4...20 mA only		2							
Measuring Range										
0...20 mA				1						
4...20 mA				2						
0...50 mA				3						
0...10 V				4						
As specified	(in clear text, ZAM)			9						
Indicator										
90° pointer travel					1					
240° pointer travel					2					
Mounting										
Wall mounting						1				
Pipe mounting						2				
Mounting to standard rails						3				
Wall, pipe and standard rail mounting						4				
Scale										
Same as measuring range							ZSA			
Scale 0...100 %							ZSP			
Scale linear according to standard dimensions	(in clear text)						ZEJ			
Scale as specified	(in clear text)						ZEM			
Special Features										
Other measuring range	(in clear text)						ZAM			
Red mark at: …	(in clear text)						ZPR			
2nd. graduation without scaling	(in clear text)						ZZT			
1-line inscription, (max. 14 characters)	(in clear text)						370			
Multiple-line inscription (1st. line)	(in clear text)						371			
Multiple-line inscription (2nd. line)	(in clear text)						372			
Multiple-line inscription (3rd. line)	(in clear text)						373			

Standard dim. 1 - 1.2 - 1.5 - 2 - 2.5 - 3 - 4 - 5 - 6 - 8
and their decimal multiples, with any dimension

Ordering information

	Variant digit No.	1- 8	Code			
Shunt 60 mV	Catalog No.	**V31910A-**				
(indicate code No. of meas. range)	1 A		616			
	1.5 A		626			
	2.5 A		646			
	4 A		666			
	6 A		686			
	10 A		617			
	15 A		627			
	25 A		647			
	40 A		667			
	60 A		687			
	100 A		618			
	150 A		628			
	250 A		648			
	400 A		668			
	500 A		678			
	600 A		688			
	1000 A		619			
	1500 A		629			
	2500 A		649			
Shunt 150 mV	Catalog No.	**V31911A-**				
(indicate code No. of meas. range)	1 A		616			
	1.5 A		626			
	2.5 A		646			
	4 A		666			
	6 A		686			
	10 A		617			
	15 A		627			
	25 A		647			
	40 A		667			
	60 A		687			
	100 A		618			
	150 A		628			
	250 A		648			
	400 A		668			
	500 A		678			
	600 A		688			
	1000 A		619			
	1500 A		629			
	2500 A		649			

Additional ordering information					
		Code			
Rated current > 1 A and < 2500 A	(on request)	301			
Accuracy rating (deviation from 0.5)		302			
Voltage drop (deviation from 60/150 mV)	(on request)	303			

Ordering information

Current Transformer			Variant digit No.	1 - 8	Code			
			Catalog No.					
TAW70	Currents of 5...40 A	(indicate code No. for primary current)	1)	**V31857A-**				
TAS70	Currents of 50...1000 A	(indicate code No. for primary current)		**V31853A-**				
TAS110	Currents of 200...1500 A	(indicate code No. for primary current)		**V31865A-**				
Special features								
Base mounting (2 rails)			2)		411			
Terminal cover IP 20			2)		430			
Secondary rated current 1 A					440			
Tropicalized			2)		460			
Primary rail for TAS70 or TAS110 on request								

Transformer Primary Current (TAS70, TAS110)			
Meas. range	Code No.	Meas. range	Code No.
50 A	**374**	400 A	**365**
60 A	**384**	500 A	**375**
75 A	**358**	600 A	**385**
100 A	**315**	800 A	**395**
150 A	**325**	1000 A	**316**
200 A	**335**	1200 A	**318**
250 A	**345**	1500 A	**326**
300 A	**355**		

Current Transformer TAW70 1) 3)			
		Rated power VA	
Meas. range	Code No.	Class 0.5	Class 1
5 A	**373**	2.5	10
10 A	**314**	2.5	10
15 A	**324**	2.5	10
20 A	**334**	2.5	10
25 A	**344**	2.5	5
30 A	**354**	2.5	2.5
40 A	**364**	2.5	5

1) Phase out 30. 6. 2004
2) TAS70 and TAS110 only
3) Class must be indicated with Code-No. 470 (in clear text)

Contact us

ABB Ltd.
Process Automation
Howard Road, St. Neots
Cambridgeshire, PE19 8EU
UK
Phone: +44 (0)1480 475321
Fax: +44 (0)1480 217948

ABB Inc.
Process Automation
125 E. County Line Road
Warminster PA 18974
USA
Phone: +1 215 674 6000
Fax: +1 215 674 7183

ABB Automation Products GmbH
Process Automation
Borsigstr. 2
63755 Alzenau
Germany
Phone: +49 551 905-534
Fax: +49 551 905-555

www.abb.com

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