CIS ELEKTROTECHNIK GMBH

Instruction Manual

Propeller Shaft
Earthing
System

PES

CIS Elektrotechnik GmbH * Wellseedamm 13
24145 Kiel * Germany
Tel. +49 431 / 71 97 003 * Fax +49 431 / 71 97 004 * e-Mail: info@cis-ship.com
www.cis-ship.com

1. General Description

The **P**ropeller Shaft **E**arthing **S**ystem **„PES”** can prevent the micro pitting marks at the propeller and the shaft bearings against spark erosion damages.
The high silver tracked slip ring and proven contact brushes ensure a short circuit between the rotating propeller shaft and ship’s hull.

The brushes ensure lubrication and long life. Standardized parts and a high prefabrication ensure an easy installation onboard by the technical crew without special tools.

The Slip Ring Cleaning Device prevents increase of the potential and keeps the system in good condition over a long period.

The remote indicator displays permanently the mV potential between shaft and hull to control the protection of the propeller.

As an option there is a remote indicator with alarm relay available. Alternative a 0(4)-20mA signal can be used to monitor the readings to the ships control system.

2. Selection Of Location

The location of the System should be clear of spray water and risk of oil and grease contamination. Remove soiling to get a metal clear surface at mounting place on the propeller shaft. The slip ring should not be placed under floor plates if possible to watch the system easily.

3. Installation Of The System

Assembly Of The Slip Rings:
Each tensioning band is already cut to the right length. Fit the two stainless steel bands loosely on the propeller shaft to provide a temporary support for the two slip ring halves. Place both slip ring halves below the securing bands edge to edge. The tensioning clamps should not be placed side by side and also not on the butt joints. To avoid excessive brush wear it is important, that a smooth track profile is achieved at the joints! If the slip ring joints are not meet satisfyingly, they have to be grinded. Fasten the securing bands and make sure that the tensioning bands are not positioned on the joints and that the slip ring fits tightly to the shaft over the whole length. Seal the sides of the slip rings with insulating material like silicon.

Mounting Of The Brush Holder:
The twin brush holder is to mount on the steel spindle PES 105, the single brush holder on the insulated spindle PES 202. Both bolt run parallel to the shaft, mounted to a suitable steel construction. (Drawing PES 001)
Drill a slotted hole into the steel construction to adjust the bolt according the distance table drawing PES 001. The distance between twin brush holder and slip ring surface should be 2 - 3mm. Ensure that the brush holder is securing on its bolt. Adjust the brush holder right over the middle of the silver track. (Drawing PES 002)
Make sure that the construction is not affected by vibration

Mounting Of The Remote Indicator:
The remote indicator should be installed at an easily visible, dry and clean place near the PES System. Use the drilling template (drawing PES 003) to mount the indicator to a foundation. Install the cables as mentioned on drawing PES 002

Mounting Of The Slip Ring Cleaning Device:
The cleaning device is to mount on the steel bolt of the twin brush holder. Adjust the felt roller right over the middle of the silver track. (Drawing PES 002)

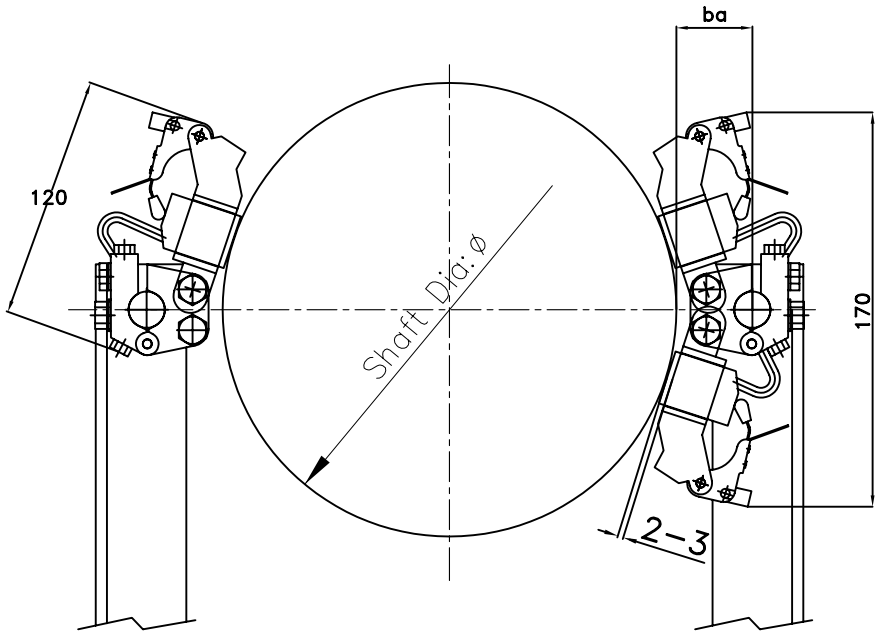
4. Maintenance And Readings

Check the cleaning of silver surface, the brushes for mobility and abrasion, the holder and bolts for tightens.

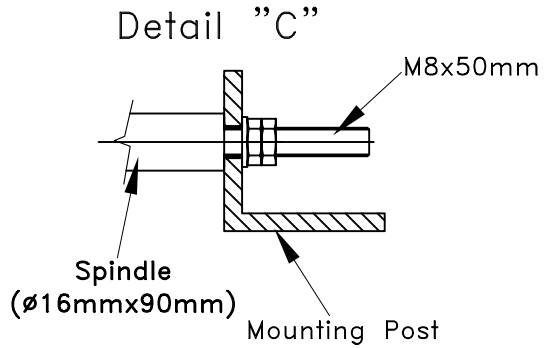
0- mV
Incorrect mounting of the system, wear brushes, defect meter, loosen cable
Up to 150mV
Correct working of equipment
Over 150mV
Clean the brushes and slip ring. Check the wear of the brushes, the silver surface of the slip rings for wear, the cables and the contacts, the voltage with a separate voltmeter

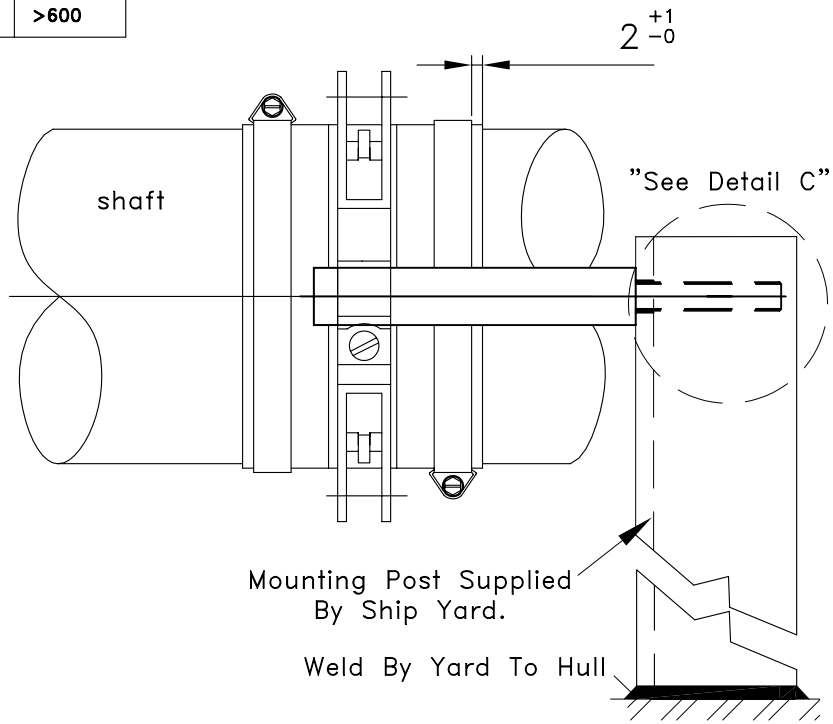
5. Spare Parts

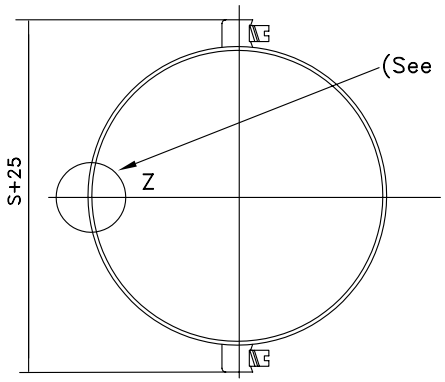
With the **P**ropeller shaft **E**arthing **S**ystem „**PES**" you will get an approved system on high quality standard. Over the last years the different parts were intensively developed and tested. We recommend therefore using only original spare parts.



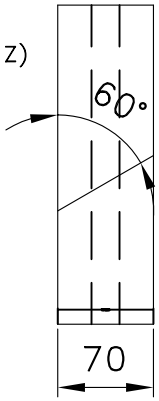
b_a [mm]	D [mm]
33,5	>200
33,0	>250
32,5	>300
32,0	>400
31,5	>500
31,5	>600







Details of Slip Ring Clamp Assembly.



Detail Z

CIS ELEKTROTECHNIK GMBH
Lise-Meitner-Straße 6
24223 Schwentinental
Germany
Tel.: +49-(0)4307-7791
Fax: +49-(0)4307-7896
E-mail: info@cis-ship.com
Web: www.cis-ship.com

Drawing-No.: PES 001

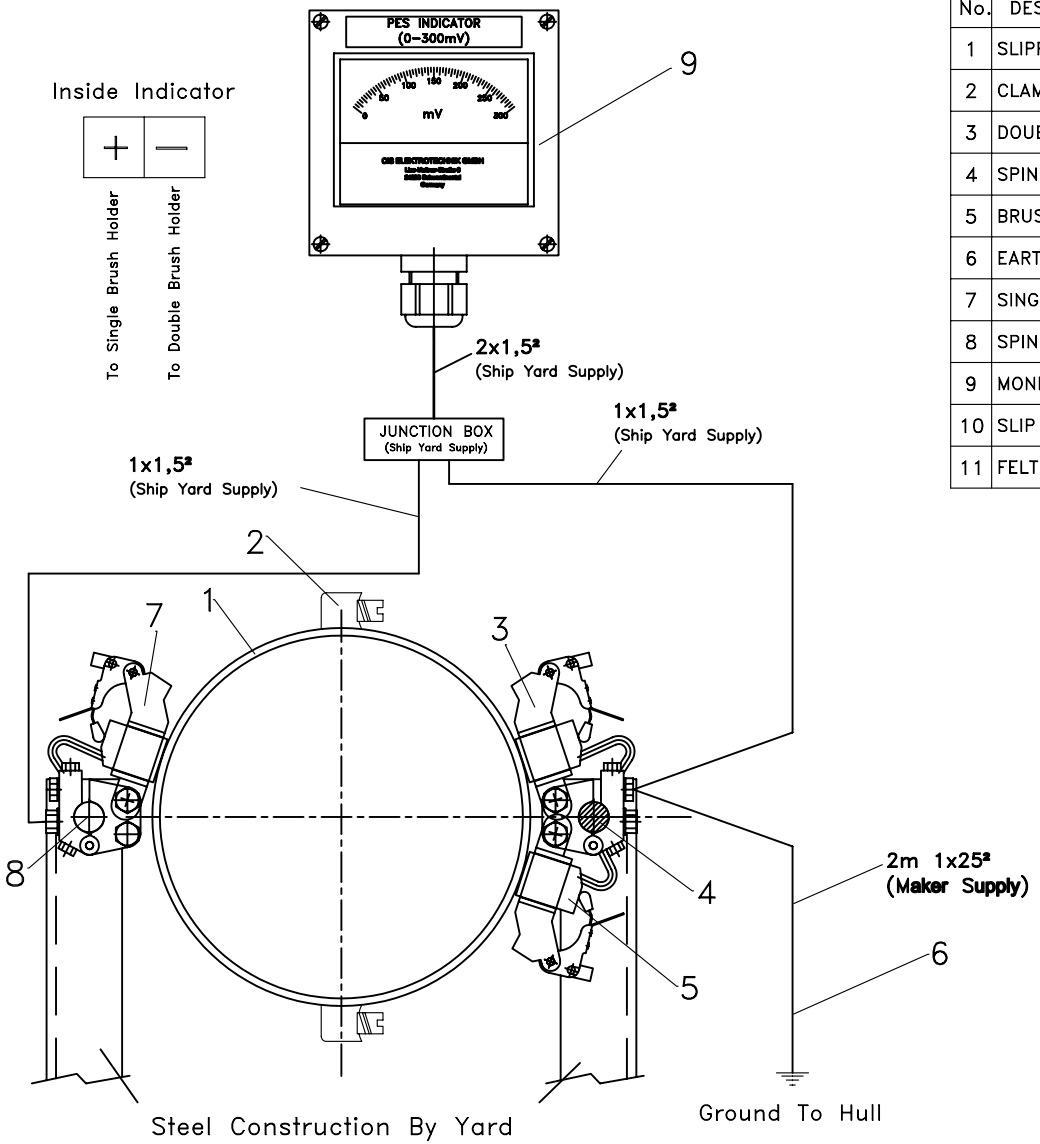
Modul: 0000 | Zone: 0000

PES GENERAL SYSTEM ARRANGEMENT 1

REV.: 2009/1

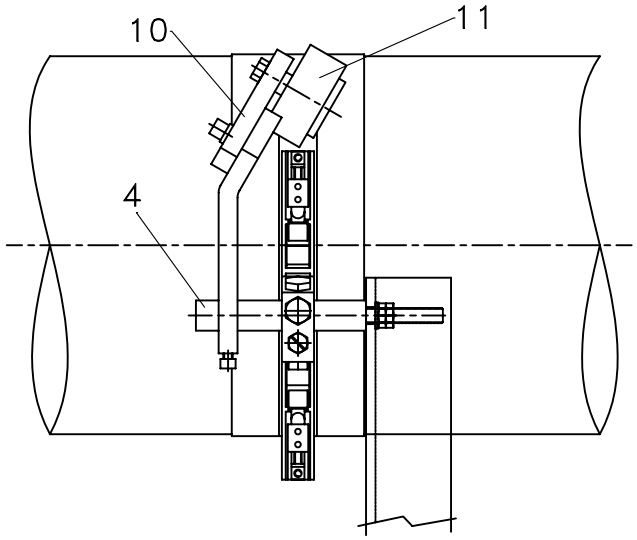
gez.:
Dat.:
gepr.:
Gruppe:

Zeichngs. Masstab
Kopie-MaBstab 1:1
Ausgangsdatum:



No.	DESCRIPTION	PART–No.	Q'TY	MATERIAL	WEIGHT (g)	REMARKS
1	SLIPRING	PES 101	1	COPPER/SILVER	650	per metre
2	CLAMP BAND	PES 102	2	STAINLESS STEEL	100	per metre
3	DOUBLE BRUSH HOLDER	PES 104	1	BRASS	350	
4	SPINDLE	PES 105	1	STEEL	100	
5	BRUSH	PES 106	3	SILVER/GRAPHITE	70	
6	EARTH CABLE	PES 107	1	COPPER	500	per metre
7	SINGLE BRUSH HOLDER	PES 201	1	BRASS	250	
8	SPINDLE INSULATED	PES 202	1	STEEL/RUBBER	100	
9	MONITORING PANEL	PES 204	1	POLYESTER	500	
10	SLIP RING CLEANING DEVICE	PES 301	1	ALUMINIUM	120	optional
11	FELT–ROLLER	PES 302	1	PLASTIC/FELT	30	optional

Slip Ring Cleaning Device Arrangement



CIS ELEKTROTECHNIK GMBH
Lise–Meitner–Straße 6
24223 Schwentinental
Germany
Tel.: +49–(0)4307–7791
Fax: +49–(0)4307–7896
E–mail: info@cis–ship.com
Web: www.cis–ship.com

Drawing–No.: PES 002

Modul: 0000 | Zone: 0000

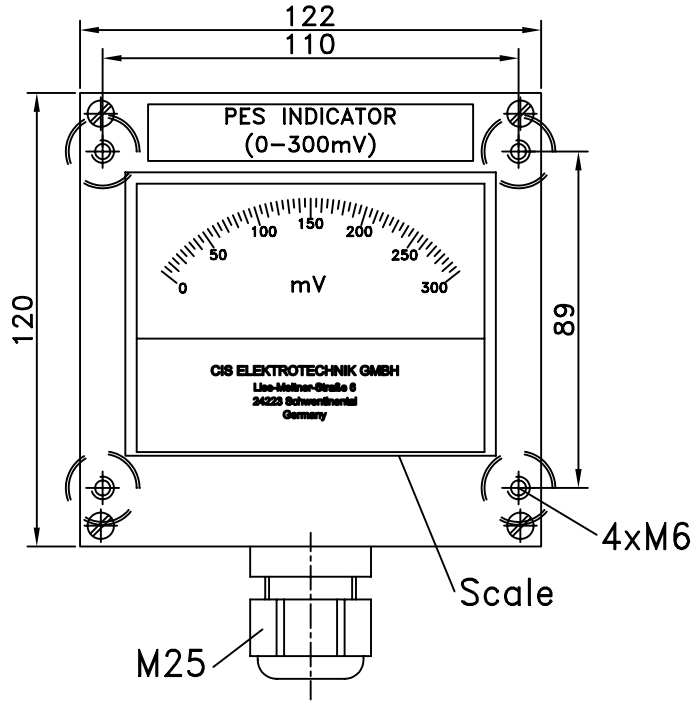
PES GENERAL SYSTEM ARRANGEMENT 2

REV.: 2009/1

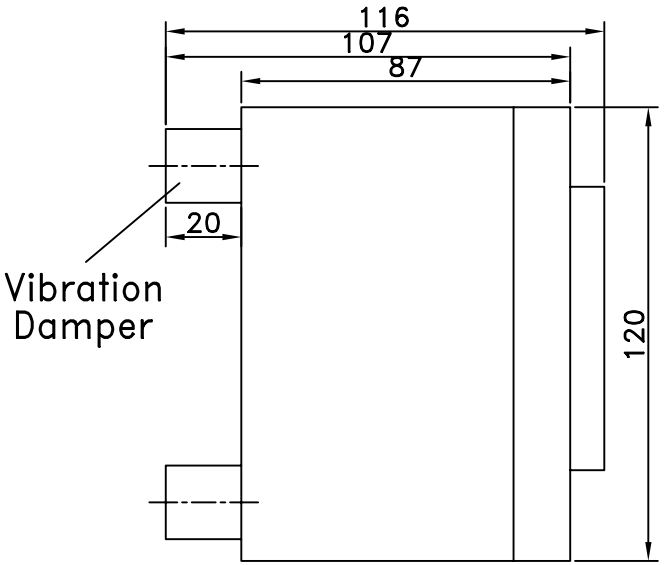
gez.:
Dat.:
gepr.:
Gruppe:

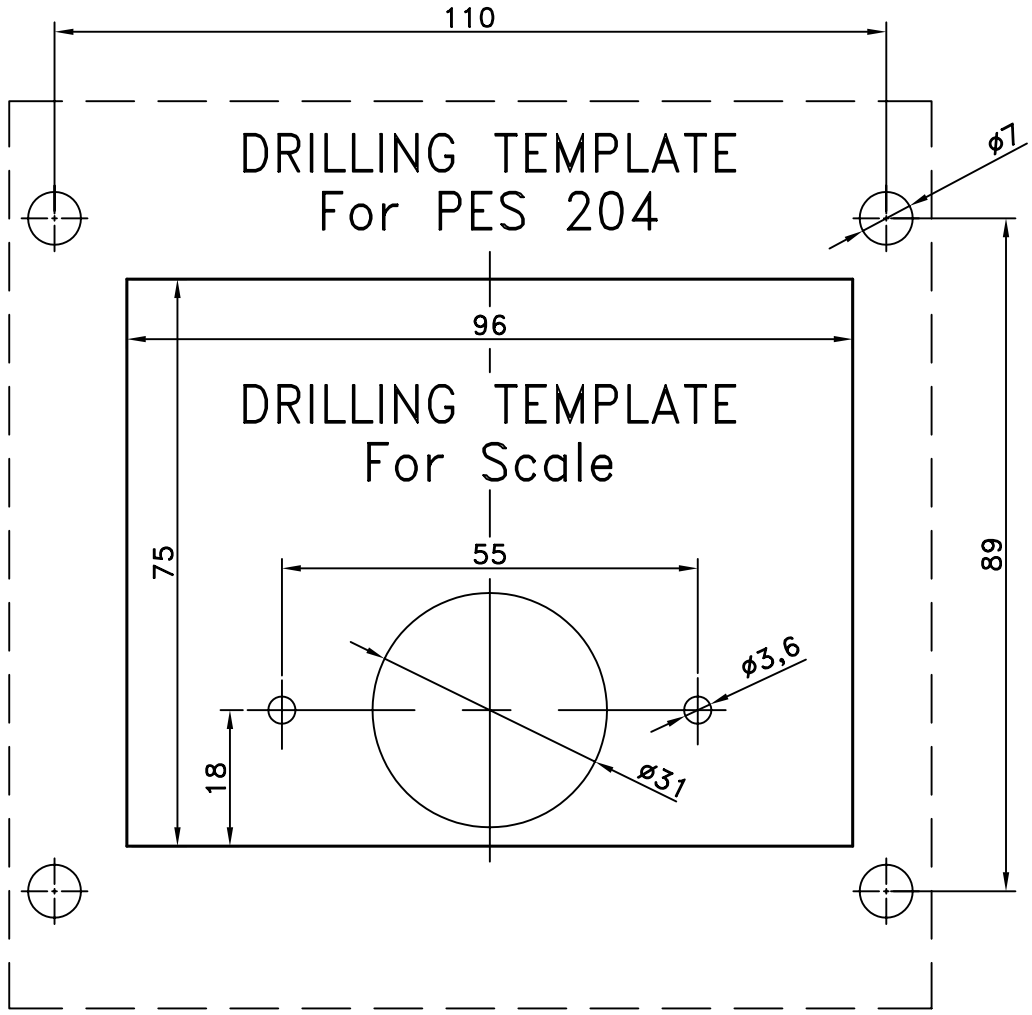
Zeichngs. Masstab
Kopie–MaBstab 1:1
Ausgangsdatum:

Front PES 204

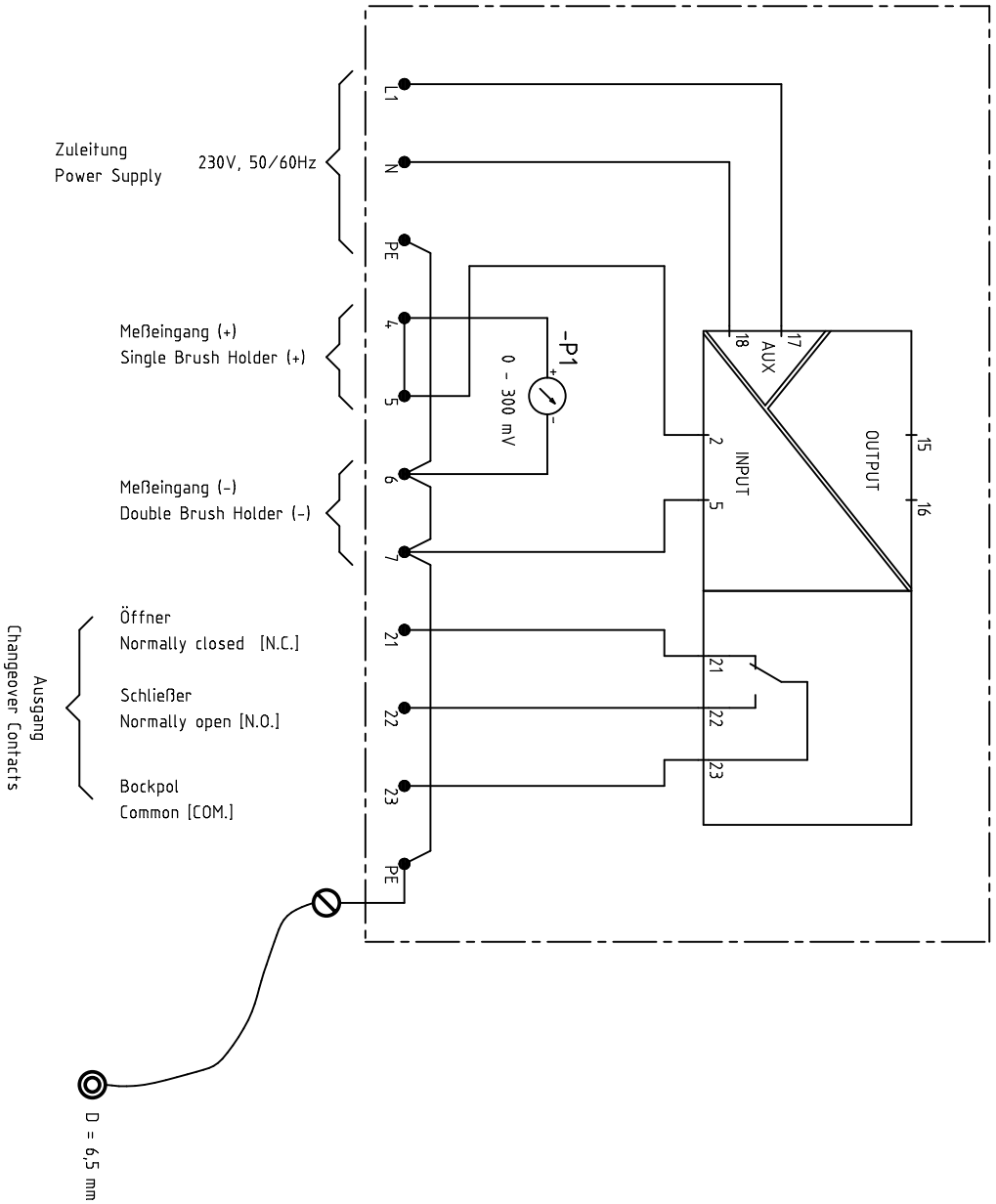


Side PES 204





CIS ELEKTROTECHNIK GMBH Lise–Meitner–Straße 6 24223 Schwentinental Germany	Tel.: +49–(0)4307–7791 Fax: +49–(0)4307–7896 E–mail: info@cis–ship.com Web: www.cis–ship.com	Drawing–No.:	
Modul: 0000	Zone: 0000	PES 003	
PES REMOTE INDICATOR ARRANGEMENT		gez.:	Zeichngs. Masstab
		Dat.:	Kopie–MaBstab 1:1
		gepr.:	Ausgangsdatum:
REV.: 2009/1		Gruppe:	



Schutzvermerk nach DIN 34 beachten !

Alle Leitungen ohne Querschnittsangabe sind mm²

Erstellt mit ELCAD/AUCOPLAN (R) 7.3.0

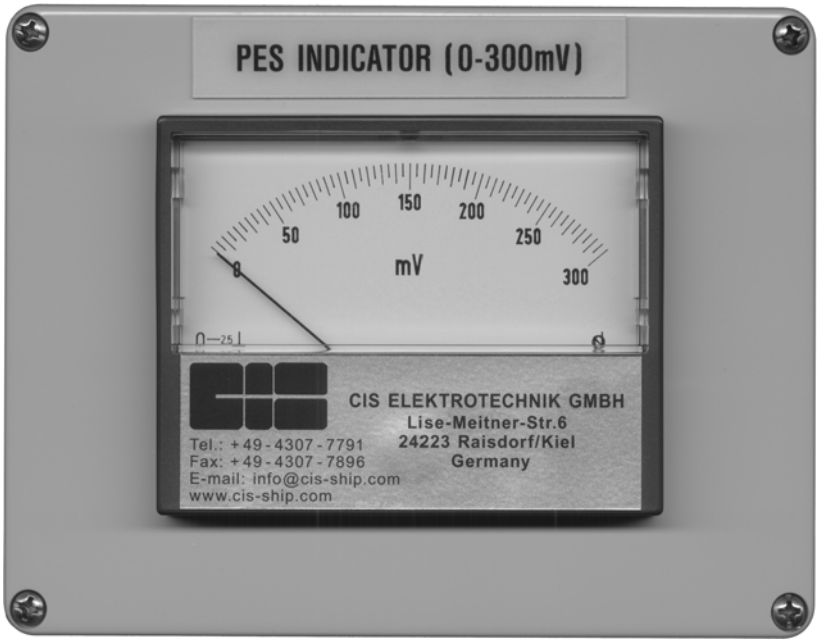
				Datum	07.01.2009	CIS Elektrotechnik GmbH	PES204/RC Stromlaufplan/Circuit Diagram	
				Bearbeiter	Petersen			
				Geprüft				
R.	Änderung	Datum	Name	Norm		Ursprung	Ersatz für	Ersatz durch

PES-Indicator

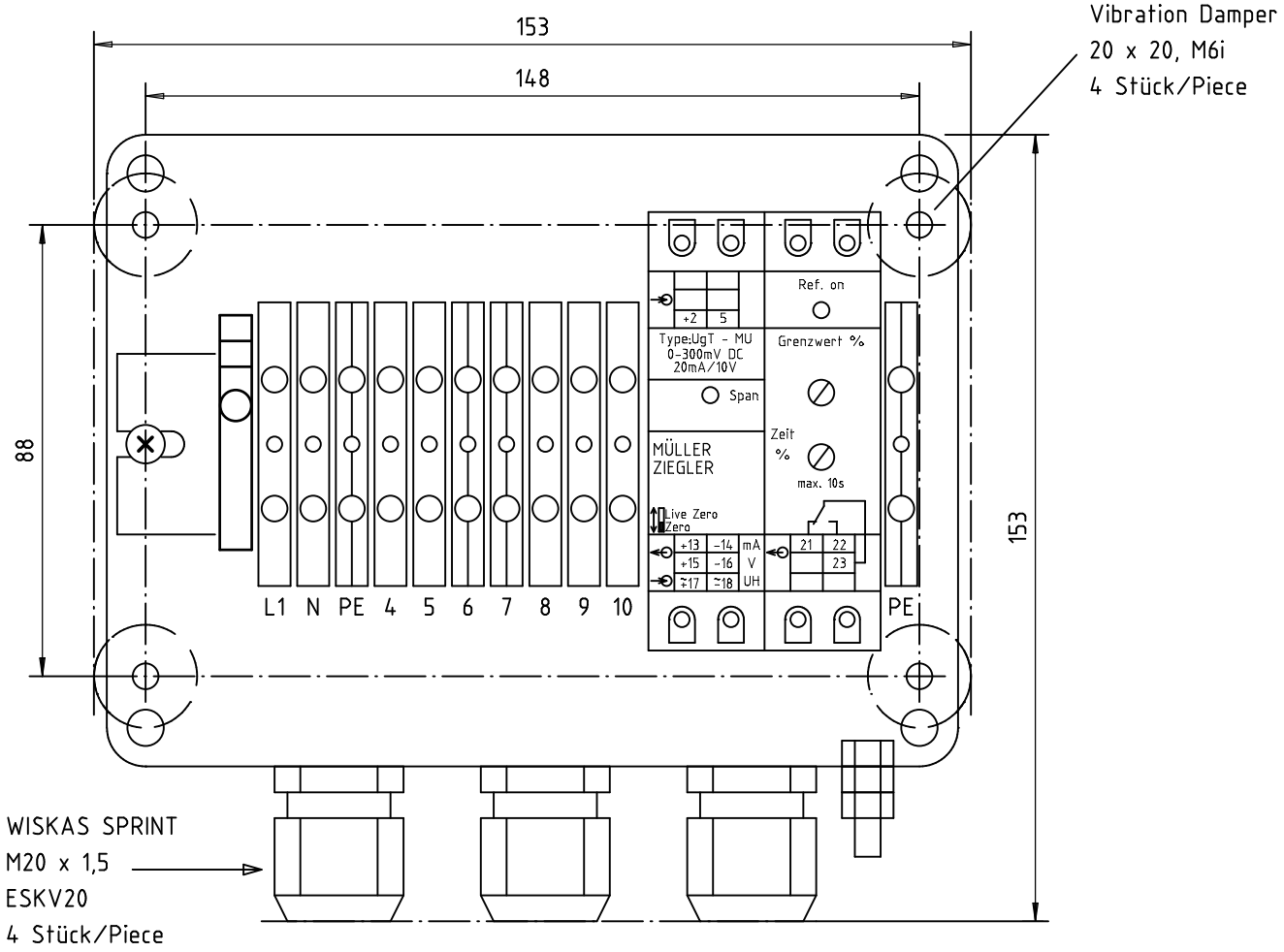
Blatt 1

Bl.

Frontansicht/Front View



Aufbauplan/Assembly



Tiefe/Depth 175 mm

Alle Leitungen ohne Querschnittsangabe sind mm²

Schutzvermerk nach DIN 34 beachten !

Erstellt mit ELCAD/AUCOPLAN (R) 7.3.0

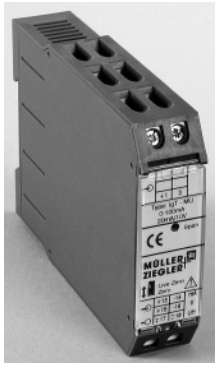
R.	Änderung	Datum	Name	Norm		
			Gepr.			
			Bearbeiter	Petersen	07.01.2009	Datum
			Ursprung			
			Ersatz für			
			Ersatz durch			

CIS Elektrotechnik GmbH

PES204/RC
Aufbauplan/Assembly

PES-Indicator

Bl. Blatt 2

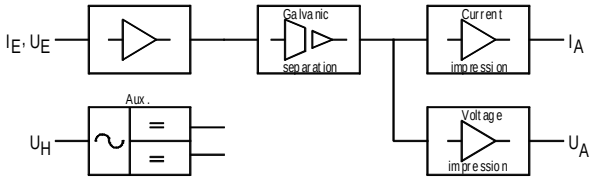


MEASURING TRANSDUCERS FOR DIRECT CURRENT AND DIRECT VOLTAGE

IgT-MU / UgT-MU

Application The measuring transducers IgT-MU and UgT-MU serve to convert and isolate a direct current or a direct voltage into a load-independent direct-current and direct-voltage signal. The calibrated double-outputs can be switched over between 0-20 mA / 0-10 V and 4-20 mA / 2-10 V.

Function The measurable variable gets via an input protective circuit to the amplifier or impedance transformer. The direct voltage obtained is converted into a load-independent direct-current and into an impressed direct voltage. The electrical isolation is effected by means of an optocoupler. Both outputs are no-load resistant and short-circuit proof. Any connection between both outputs will be unacceptable. An auxiliary voltage will be required for all types.



Technical data

Input	Input quantity	direct voltage or direct current
	Rated values	IgT-MU: 0-100 µA up to 0-5 A, voltage drop 60 mV UgT-MU: 0-5 mV up to 0-600 V, R_i = 100 kOhm up to 1 V, > 1 V 100 kOhm/V, max. 2 MOhm
	Option	• Transmission of both polarities
	Overload permanent	Current 2-fold, voltage 5-fold / max. 830 V
	Surge overload	Current 20-fold 1 sec., voltage 5-fold 1 sec.
Output	Output quantities	Load independent direct current and direct voltage
	Double-output	**0-20mA**/0-750 Ohm of load and **0-10V** max. load 20 mA as well as **4-20mA**/0-750 Ohm of load and **2-10V** max. laod 20 mA front-laterally switchable
	Option	• **bipolar output** (e.g.. –20 mA – 0 – +20mA and –10 V – 0 – +10V) • **Zero point rise** (e.g.. 0 – 10 mA – 20 mA and 0 – 5 V – 10 V) • **Frequency module -** a value of 0 – 5 Hz up to 0 – 10 kHz ○ „Open-collector" NPN, max. 30V 100 mA loadable, impulse/break 50/50 % ○ Square wave signal 5V, max. 10 mA loadable, impulse/break 50/50 %
Dynamic system behaviour	Accuracy	+/- 0,5 %
	Temperature range	-15°C up to +20°C up to +30°C up to +55 °C
	Temperature influence	< 0,1 % at 10 K
	Influence of aux.	none
	Load influence	none
	External magnetic field influence	none (up to 400 A/m)
	Residual ripple	< 15 mV_{ss}
	Response time	< 300 ms (with frequency module < 400 ms)
	Option	• < 200 µs
	No-load voltage	max. 24 V
	Current limitation	max. 2-fold in case of saturation
	Testing voltage	4 kV between input and output, input and aux., output and aux.

MÜLLER ZIEGLER Elektrische Messgeräte

MÜLLER + ZIEGLER GmbH & Co. KG, Industriestr. 23, D-91710 Gunzenhausen
Tel. +49 (0) 98 31.50 04 0, Fax +49 (0) 98 31.50 04 20
http://www.mueller-ziegler.de ,e-mail: info@mueller-ziegler.de

Adjustment

After taking off the plexiglass cover it is possible to adjust with the potentiometer which is named "SPAN" the final value and with the potentiometer which is named "ZERO" the zero-point.
With the slide switch the output can be changed over between "LIVE ZERO" (4-20 mA/2-10 V) and "ZERO" (0-20 mA/0-10 V).

Regulations

EMC	DIN EN 61326
Mechanical strength	DIN EN 61010 part 1
Electrical security	DIN EN 61010 part 1 Housing all insulated, protection class II, at a working voltage up to 300V (network to neutral conductor) degree of pollution 2, overvoltage category CAT III at a working voltage up to 600V (network to neutral conductor) degree of pollution 2, overvoltage category CAT II
Accuracy, overload	DIN EN 60688
Separation	DIN EN 61010 part 1, 3,52 kV 50 Hz 10 sec.
Air gaps and creep distances	DIN EN 61010 part 1
System of protection	DIN EN 60529 housing IP30, terminals IP20
Connection	DIN 43807

Auxiliary voltage

230 V AC ± 20 %, 45-65 Hz, 2,5 VA

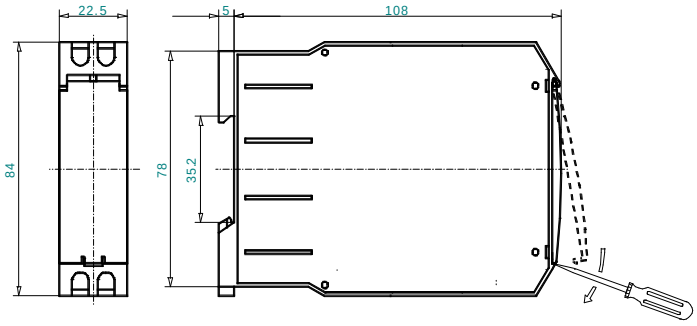
Option

- 110 V AC ± 20 %, 45-65 Hz, 2,5 VA
- 24 V DC, -15 % bis +25 %, 2 W, (EMC DIN EN 61326 class A)
- 6-30 V AC + DC or 36-265 V AC + DC, 2 VA, (EMC DIN EN 61326 class A)

Weight

170g

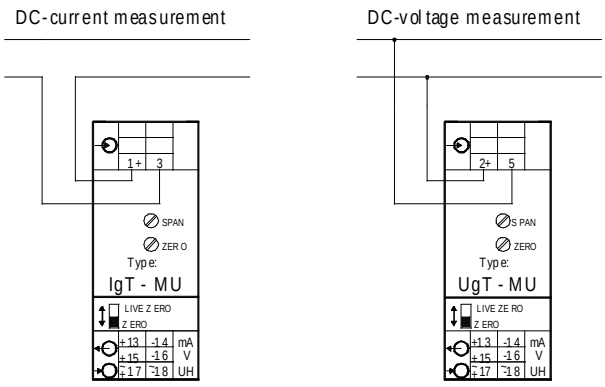
Dimensions



Installation

Attachement	snap-on mounting according to DIN EN 50 022
Electrical connection	threaded terminal end 4 mm² max.

Connection



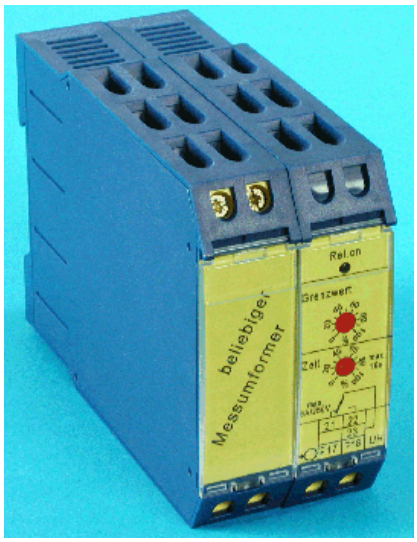
Transducers with frequency module have no further outputs and no "LIVE-ZERO"-switching.
At the clamps +13 and –14 the frequency output is available.

MÜLLER + ZIEGLER GmbH & Co. KG, Industriestr. 23, D-91710 Gunzenhausen
Tel. +49 (0) 98 31.50 04 0, Fax +49 (0) 98 31.50 04 20
http://www.mueller-ziegler.de ,e-mail: info@mueller-ziegler.de

MÜLLER ZIEGLER

RELAY MODULE FOR TRANSDUCER

- Home
- Transducer
- Current AC
- Voltage AC
- True RMS
- Frequency
- Phase angle
- Power
- Multi-MU
- Current/voltage,DC
- Isolating amplifier
- Standard signal
- Temperature-Pt
- Temperature-Th
- Temperature-configurable
- Resistance
- Pressure/force
- Relay-module
- Frequency output



Type	GWM
Input	Any transducer
Output	Relay contact (1 changeover contact)
Limit value	0 - 100% can be set with potentiometer
Delay	0.1 - 10 s can be set with potentiometer
Aux. supply	Only required if the associated transducer does not have its own UH but is connected to 230 V AC or 110 V AC +/-20%
Options	Auxiliary supply 24 V DC or 6 - 30 V AC+DC or 36 - 265 V AC+DC

The relay module can be used in conjunction with a transducer to monitor a set limit value so that a relay is triggered when that value is exceeded.

The module is hard-wired to the transducer.