



FU Tiller

Type 105-105 NG001, NG002 and NG003
Type 105-105 NG010, NG011 and NG012

- 1 Description**
- 2 Technical Data**
- 3 First Putting into Operation**

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This equipment includes electromechanical devices such as relays, switches or potentiometers. Electromechanical devices are subject to wear and tear depending on operation cycles and environmental conditions.



Caution!
Use only original RAYTHEON Anschütz spare parts

FU STEUEREINSATZ

1

Description

The tiller - set into control desks or steering stands - serves as follow-up steering element on bridges (**FOLLOW UP**).

The standard scale division is $\pm 35^\circ$, the deflection angle of the knob is $\pm 60^\circ$. In the mechanical zero position the knob is slightly engaged. The scale is illuminated; the brightness is regulated automatically.

When the follow-up (FU) steering control is selected via the steering mode selector switch, the illumination of the scale is switched on.

Depending on the application, single-, twin- or fourfold potentiometers are used.

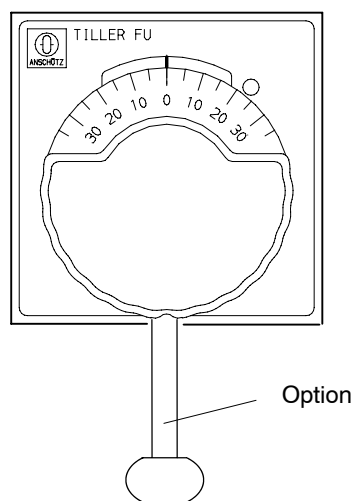
Optionally, a handle can be attached to the knob for use as a lever.

For a rudder angle change to starboard (STBD) the knob must be turned clockwise; if a lever is used, this must be turned toward STDB.

The steering control effect corresponds to that of a handwheel.

The difference between types NG001, NG002, NG003 and NG010, NG011, NG012 is an additional potentiometer for the types NG010, NG011 and NG012.

By this additional potentiometer the symmetry of the max. tiller position (PORT and STBD) can be adjusted.

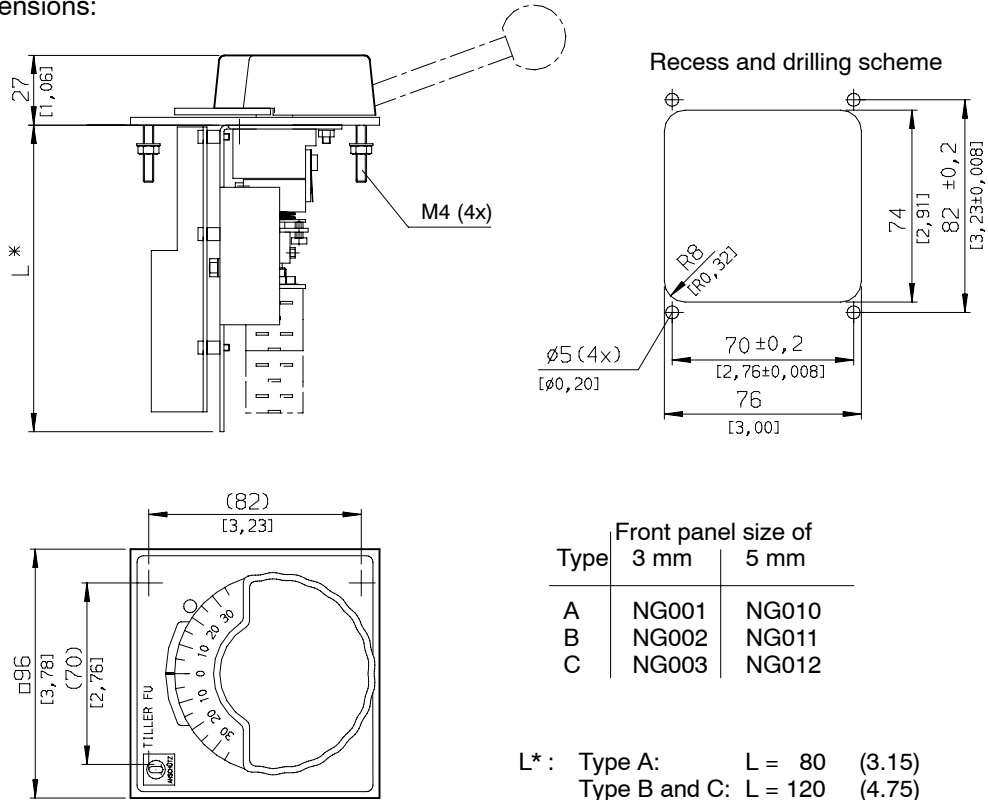


FU TILLER

2

Technical Data

Dimensions:



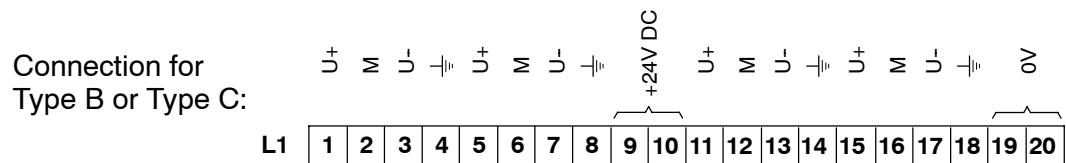
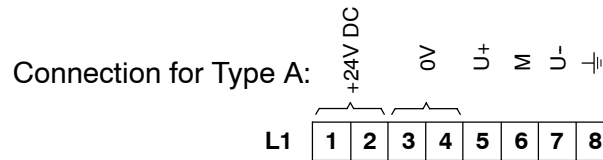
Type	Front panel size of	
	3 mm	5 mm
A	NG001	NG010
B	NG002	NG011
C	NG003	NG012

L* : Type A: L = 80 (3.15)
 Type B and C: L = 120 (4.75)

Weight:	approx. 1 kg
Scale range, standard:	±35°
other scales:	±45°, ±60°, ±90°
Supply voltage:	24 V _{DC}
Steering potentiometer:	5 kΩ for NG001, NG002, NG003 20 kΩ for NG010, NG011, NG012
Number of potentiometers, Type A:	1
Type B:	2
Type C:	4
max. wire cross section:	1.5 mm ²
Type of enclosure:	IP 23 EN 60529 after installation
Ambient temperature (operation):	-25 °C to +55 °C

Zero adjustment and setting of the slope via subordinate trim potentiometer.

3 First Putting into Operation



Adjustment: NG001, NG002 and NG003

Brightness of background:

Adjust brightness of background with potentiometer R2; be sure to adjust during night operation (when the bridge is dark)!

Offset / Zero:

Set tiller to 0°; move zero-potentiometer until 0° is shown on the rudder position indicator as well.

Gain:

Set tiller to 20° (PORT or STBD); move gain-potentiometer until 20° (PORT or STBD) is also shown on the rudder position indicator.

Adjustment: NG010, NG011 and NG012

Brightness of background:

Adjust brightness of background with potentiometer R2; be sure to adjust during night operation (when the bridge is dark)!

Offset / Zero:

Set tiller to 0°; move zero-potentiometer until 0° is shown on the rudder position indicator as well.

Gain:

Set tiller to 20° (PORT or STBD); move gain-potentiometer until 20° (PORT or STBD) is also shown on the rudder position indicator.

Symmetry:

Adjust tiller to max PORT (for example: 35°) and after that to max. STBD.

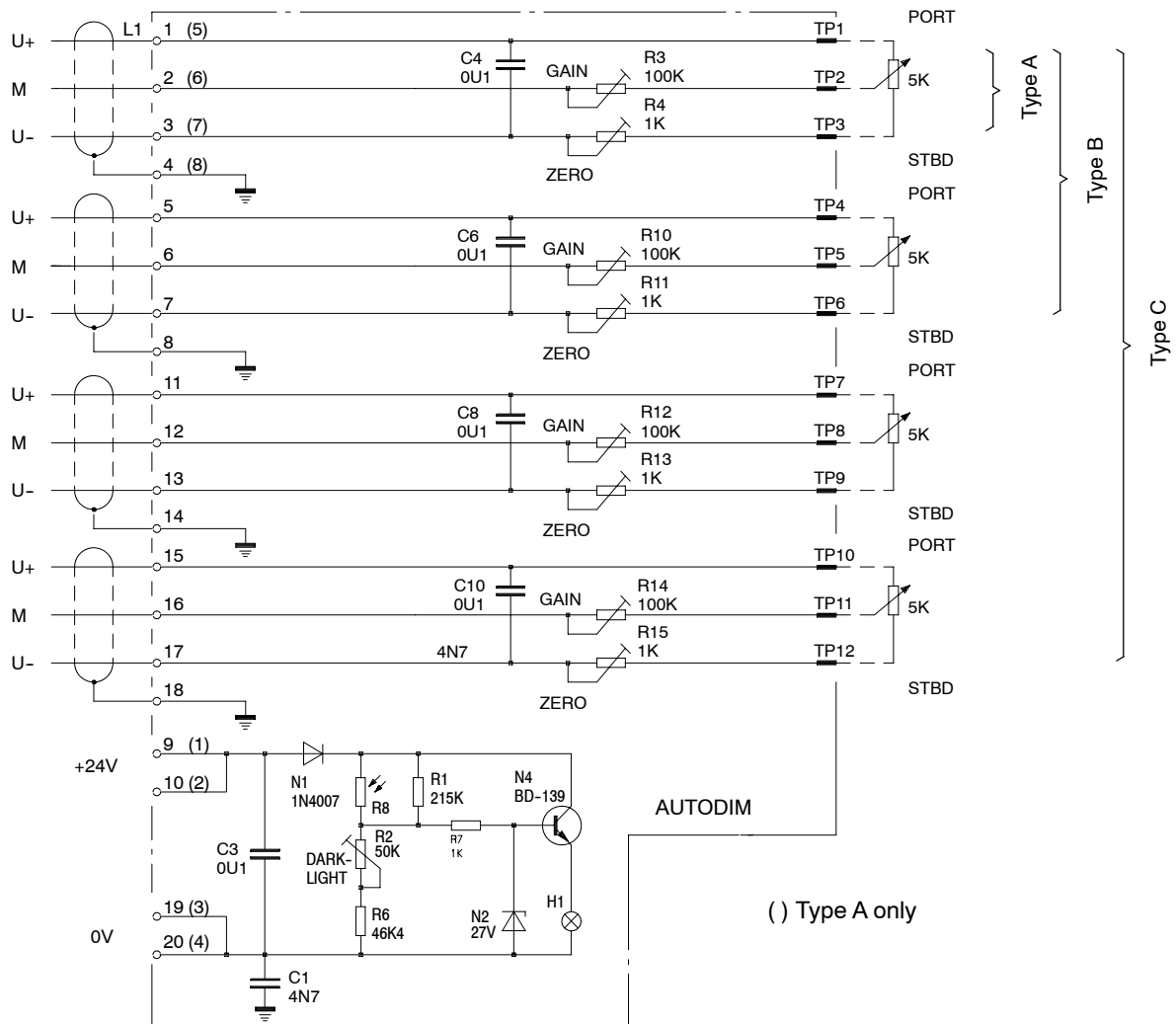
If there is a difference between both rudder position indicators, then adjust the difference with the potentiometer "SYM".

Check ZERO and GAIN adjustments again.

If necessary repeat the a.m. procedure in total.

FU TILLER

Circuit Diagram: NG001,NG003 and NG003

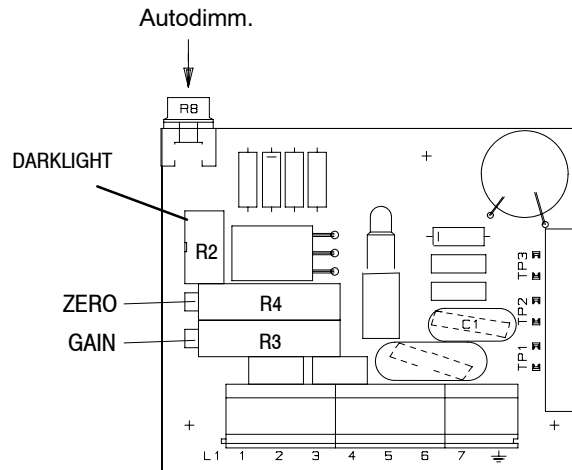


Circuit diagram NG010, NG011 and NG012 see annex:

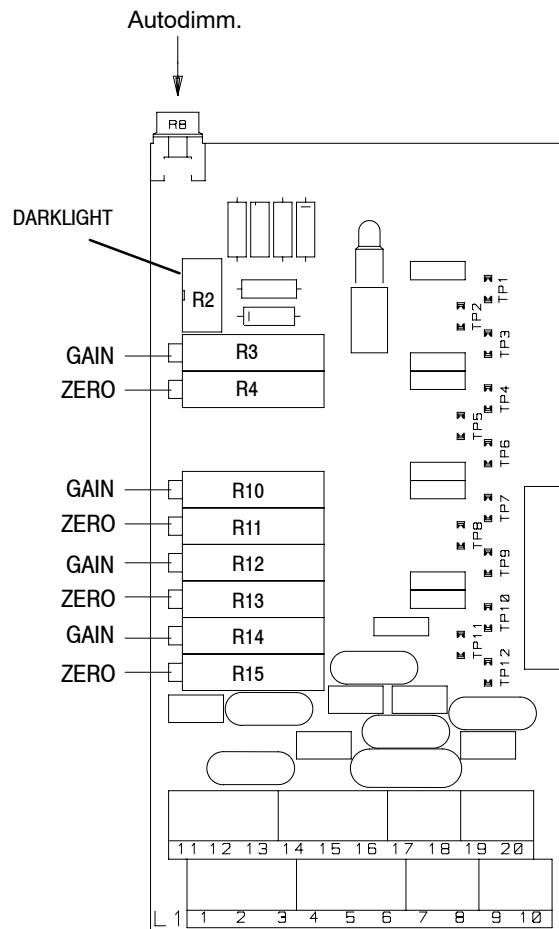
Drawing no. 105-105 HP037
105-105 HP039 (sheets 1 and 2)

Position of the potentiometers on the PCB for type NG001, NG002 and NG003:

for Type A:



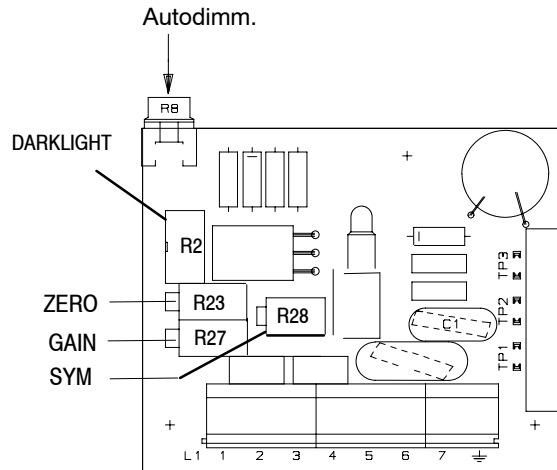
for Type B and C:



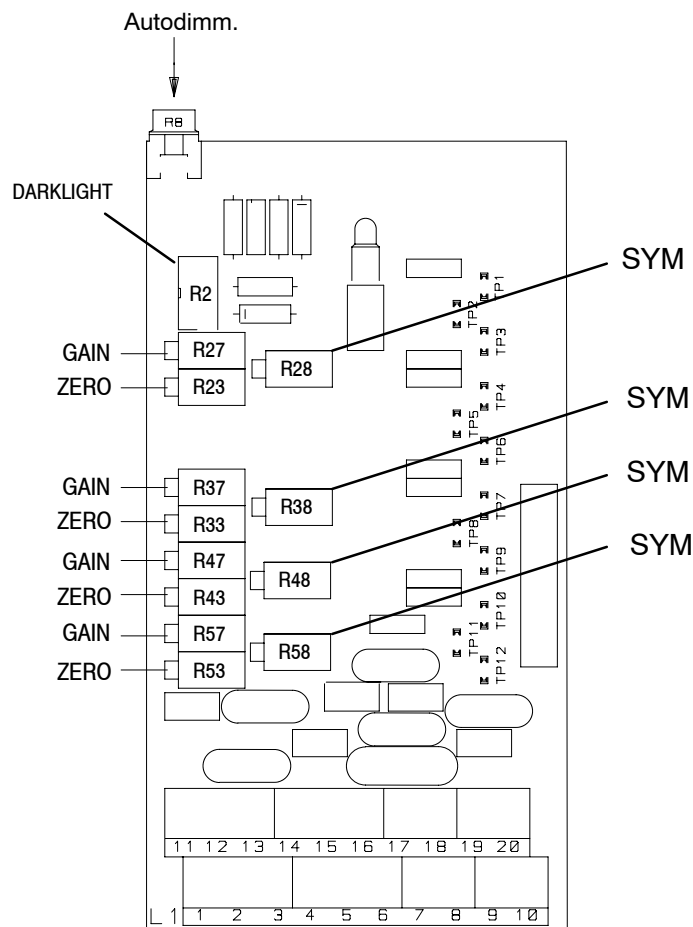
FU TILLER

Position of the potentiometers on the PCB for type NG010, NG011 and NG012:

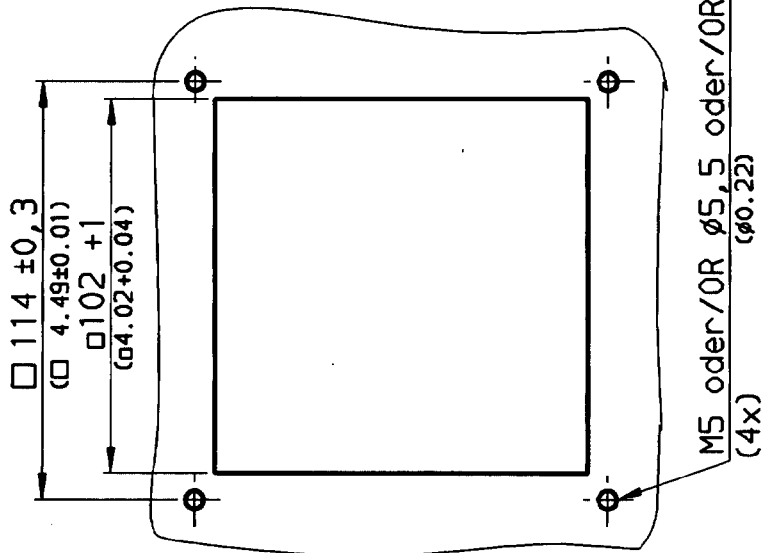
Type A:



Type B und C:



Bohrbild/DRILLING SCHEME

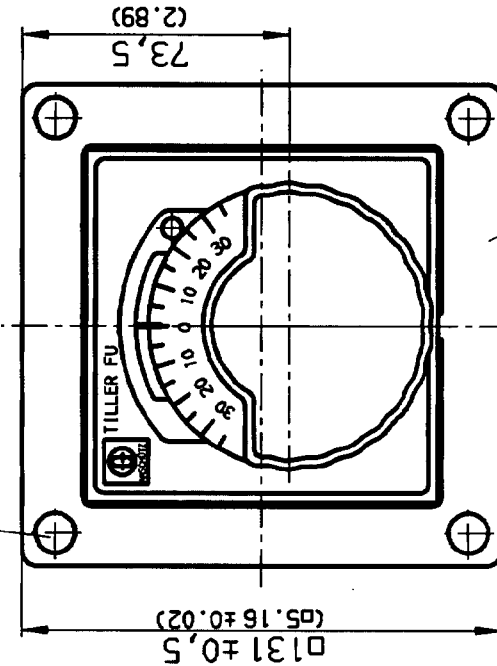


Schutzart
TYPE OF ENCLOSURE

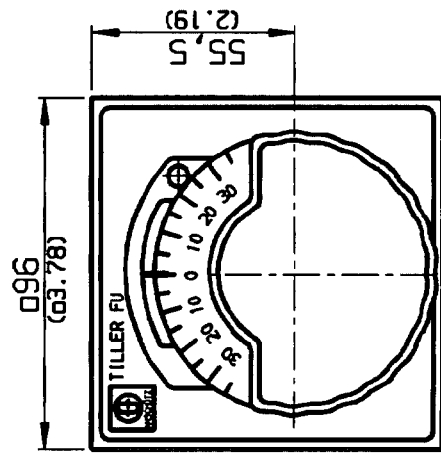
IP56 EN 60529 nach Einbau
AFTER INSTALLATION

für Einbau beigelagte Schrauben verwenden
FOR INSTALLATION PLEASE USE THE ENCLOSED SCREWS

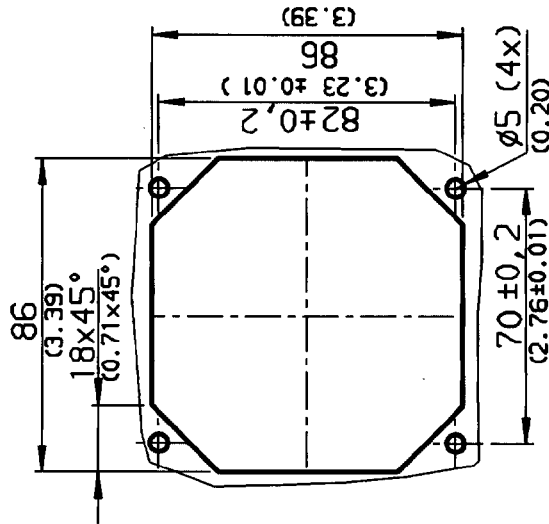
- a) M5x16 / (M5x0.63)
- ** b) Holzschraube 4x16
WOODSCREW (4mmx0.63)



optional 142-089.
OPTIONALLY



Bohrbild/DRILLING SCHEME



L** : NG010; L= 80mm [3.15]
NG011, NG012; L=120mm [4.75]

max. Anschlussquerschnitt 1,5mm²
MAX. WIRE CROSS SECTION

Schutzart: IP23 EN 60529 nach Einbau
TYPE OF ENCLOSURE: AFTER INSTALLATION
Umgebungstemperatur in Betrieb: -25° +55°C
AMBIENT TEMPERATURE IN OPERATION:

Maße ohne Toleranzangabe sind Größtmaße
DIMENSIONS WITHOUT TOLERANCES ARE MAX. DIMENSIONS

CAD

CAD

Arbeitspause		Datum		Name	
mm	(INCH)	Bearb.	08.03.00	Zm	
		Gepr.	8.3.00	HA	
		Norm	10.07.00	HA	
		Freigabe:	10.07.96	PL	

Zust.	Änderung	Datum	Name
b	2843.105	08.03.00	Zm
a	2810.105 n. urz.	12.11.98	Zm

Raytheon
Raytheon Marine GmbH
Germany

Maßzeichnung/DIMENSIONAL DRAWING

Tiller FU

Zeichnungsnummer:

105 D 105.HP005

Ers. für

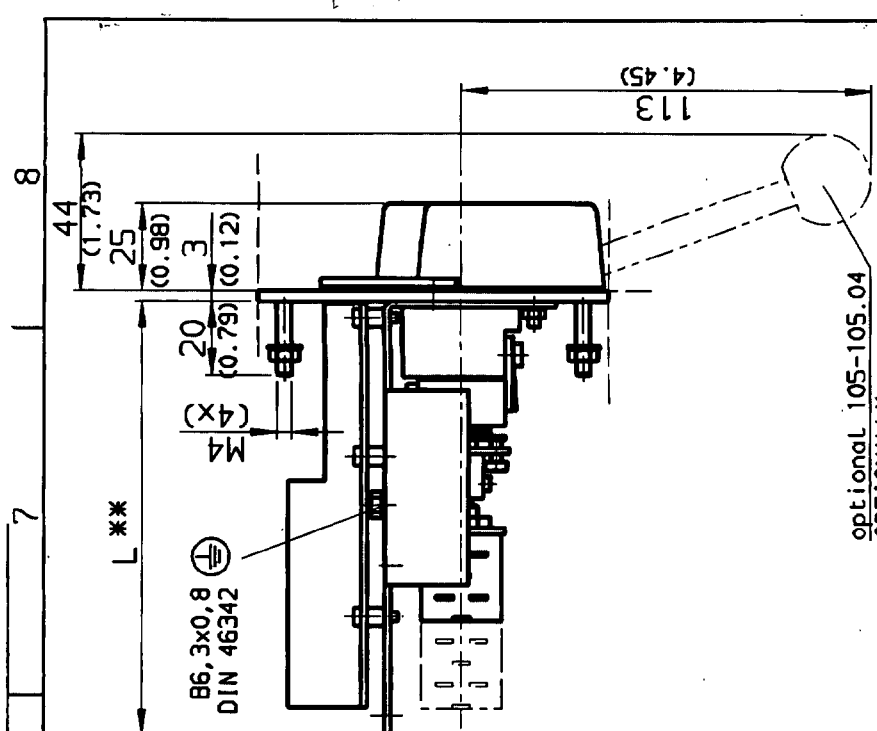
Bl. 1

von 1

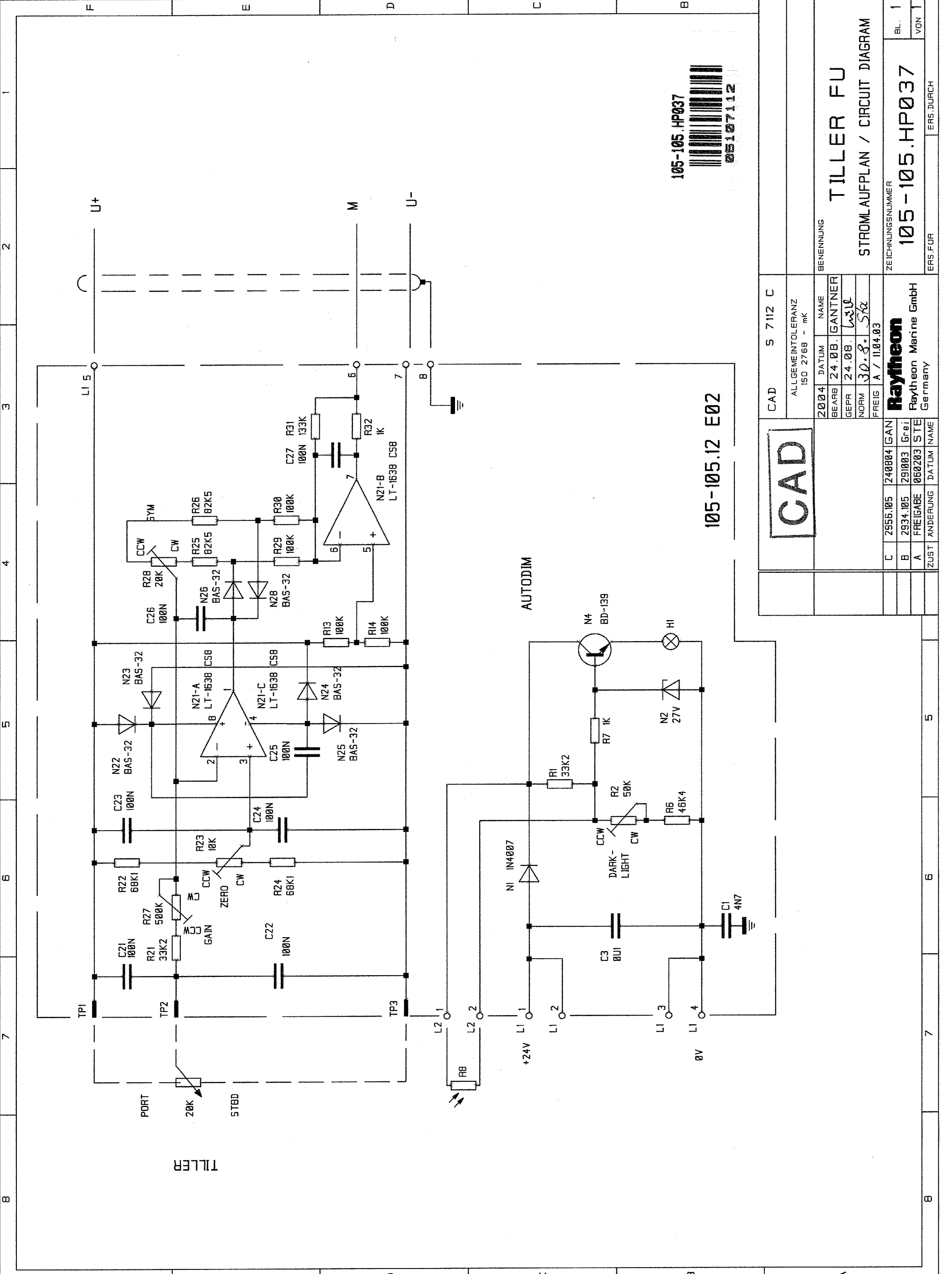
Ers. durch

Maßstab -
Gewicht: ≈ 1 Kg
WEIGHT:

Benennung:



optional 105-105.04
OPTIONALLY



105-105.12 E02

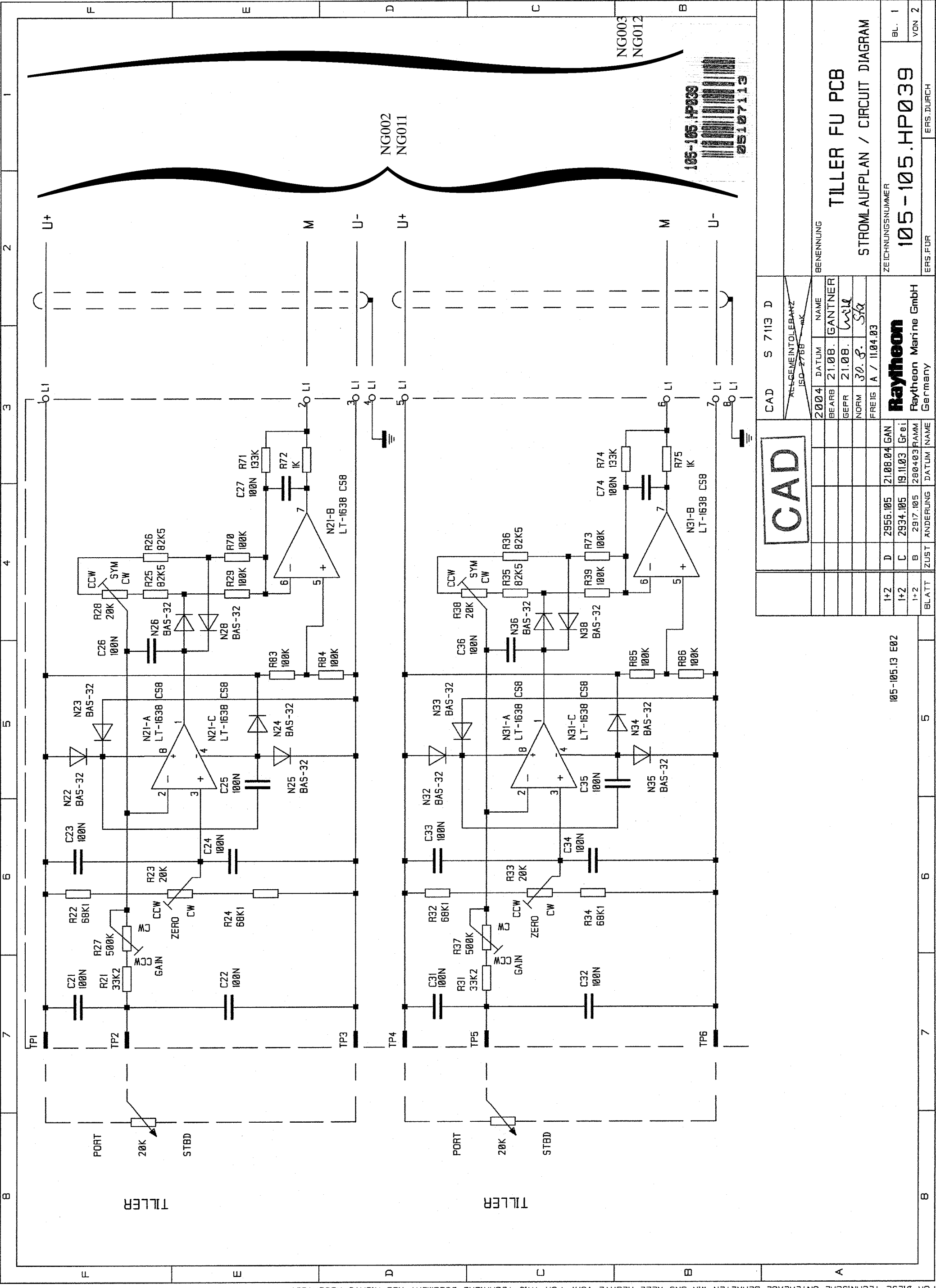
105-105.HP037

 05107112

CAD

CAD S 7112 C			
ALLGEMEINTOLERANZ ISO 2768 - mK			
2004	DATE		
BEARB.	NAME		
24.08.	GANTNER		
GEPR.	WJ		
24.08.			
NORM.	30.8. Stk		
FREIG.	A / 11.04.03		
Raytheon			
Raytheon Marine GmbH			
Germany			
C	2956.105	240804	GAN
B	2934.105	291003	Gre
A	FREIGABE	060203	STE
ZUST.ÄNDERUNG		DATE	NAME

BENENNUNG
TILLER FU
 STROMLAUFPLAN / CIRCUIT DIAGRAM
 ZEICHNUNGSNUMMER
105-105.HP037
 BL. 1
 VON 1
 ERS. DURCH



105-105.HP039

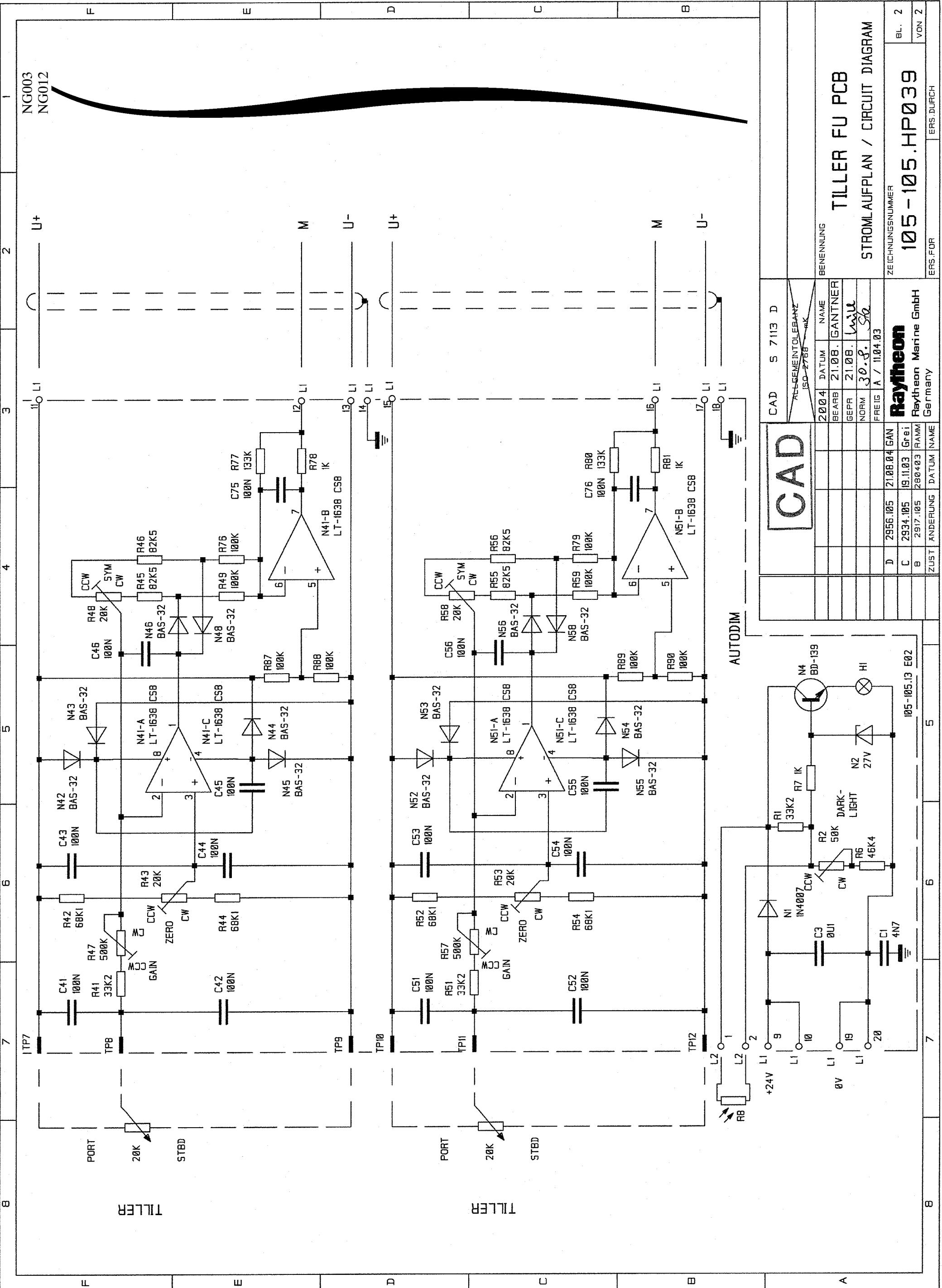
 05107113

NG002
 NG011

NG003
 NG012

CAD S 7113 D		BENENNUNG	
ALLGEMEINTOLERANZ ISO 2768-MK		TILLER FU PCB	
2004	DATUM	NAME	GANTNER
BEARB	21.08.	GEPR	WIL
NORM	30.8.	FREIG	A / 11.04.03
STROMLAUFPLAN / CIRCUIT DIAGRAM		ZEICHNUNGSNUMMER	
105-105.HP039		ERS.FÜR	
RAYTHEON		ERS.DURCH	
Raytheon Marine GmbH		BL. 1	
Germany		VON 2	

105-105.13 E02		STAB	
1+2	D	2956.105	21.08.04
1+2	C	2934.105	19.11.03
1+2	B	2917.105	28.04.03
BLATT	ZUST	ANDERUNG	DATUM
5			
6			
7			
8			



NG003
NG012

CAD

CAD S 7113 D	
ALLGEMEINTOLERANZ ISO 2768	
2004	DATE
BEARB	NAME
21.08.	GANTNER
BEPR	DATE
21.08.	WJW
NORM	DATE
30.8.	SK
FREIG	DATE
A	11.04.03

BENENNUNG
TILLER FU PCB
STROMLAUFPLAN / CIRCUIT DIAGRAM

ZEICHNUNGSNUMMER
105-105.HP039

ERS.FÜR
ERS.DURCH

BL. 2
VON 2

Raytheon			
Raytheon Marine GmbH			
Germany			
ZUST	ANDERUNG	DATE	NAME
D	2956.105	21.08.04	GAN
C	2934.105	19.11.03	Gre
B	2917.105	28.04.03	FRAMM

AUTODIM

105-105.13 E02