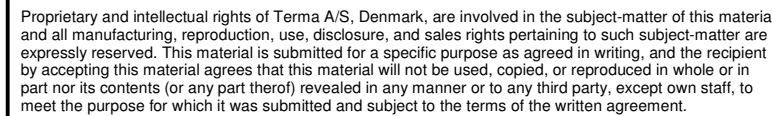



1

- A**



MATERIAL -	CHANGE ORDER/REVISION					PREP MSI	CHKD KHA	Terma A/S Hovmarken 4 DK-8520 Lystrup Denmark	
	REVISION J	J1	H	H1	H2	APVD CAK	CM		
GENERAL TOLERANCE ---	CO NO. 73984	74125	67324	69179	72733				
	APVD MDN	MDN	JGN	JONP	JONP				
	CM					DATE OF INITIAL RELEASE 040526	DATE OF THIS RELEASE 2018-10-05		
PROJECTION 	REVISION STATUS OF PAGES (OTHER THAN)					TITLE Antenna System, 21', HG	DOCUMENT NO. 259460-ZD		REV J1
	PAGE NO.								PAGE 1 OF 7
	REVISION								

D

C

B

A

A2 FORM 200000 FF Rev H

TABLE 1									
Part No.	Color	Type	Azimuth Output [ACP]	MAX SPEED (MAINS [V]	WEIGHT	Oil Sensor	Encoder Supply	Motor Output Power kW
259460-001	White	HP-F	1 * 8192	40	3x230/400	400	Optional	+5V ± 10%, max. 120mA	2.2
259460-002	Grey	HP-F	1 * 8192	40	3x230/400	400	Optional	+5V ± 10%, max. 120mA	2.2
259460-003	White	HP-F	1 * 8192	40	3x230/400	400	Yes	+5V ± 10%, max. 120mA	2.2
259460-011	White	HP-I	1 * 8192	40	3x230/400	400	Optional	+5V ± 10%, max. 120mA	2.2
259460-012	Grey	HP-I	1 * 8192	40	3x230/400	400	Optional	+5V ± 10%, max. 120mA	2.2
259460-013	White	HP-I	1 * 8192	40	3x230/400	400	Yes	+5V ± 10%, max. 120mA	2.2
259460-021	White	HP-C	1 * 8192	40	3x230/400	400	Optional	+5V ± 10%, max. 120mA	2.2
259460-022	Grey	HP-C	1 * 8192	40	3x230/400	400	Optional	+5V ± 10%, max. 120mA	2.2
259460-030	White	CP-F	1 * 8192	60	3x230/400	400	Optional	+5V ± 10%, max. 120mA	4.0
259460-031	White	CP-F	1 * 8192	40	3x230/400	400	Optional	+5V ± 10%, max. 120mA	2.2
259460-032	Grey	CP-F	1 * 8192	40	3x230/400	400	Optional	+5V ± 10%, max. 120mA	2.2
259460-040	White	CP-I	1 * 8192	60	3x230/400	400	Optional	+5V ± 10%, max. 120mA	4.0
259460-041	White	CP-I	1 * 8192	40	3x230/400	400	Optional	+5V ± 10%, max. 120mA	2.2
259460-042	Grey	CP-I	1 * 8192	40	3x230/400	400	Optional	+5V ± 10%, max. 120mA	2.2
259460-051	White	CP-C	1 * 8192	40	3x230/400	400	Optional	+5V ± 10%, max. 120mA	2.2
259460-052	Grey	CP-C	1 * 8192	40	3x230/400	400	Optional	+5V ± 10%, max. 120mA	2.2
259460-141	White	CP-I	2 * 8192	40	3x230/400	400	Yes	10-30V, max. 100mA	2.2
259460-142	Grey	CP-I	2 * 8192	40	3x230/400	400	Yes	10-30V, max. 100mA	2.2
259460-431	White	CP-F	2 * 8192	40	3x230/400	400	Yes	+5V ± 10%, max. 120mA	2.2
259460-432	Grey	CP-F	2 * 8192	40	3x230/400	400	Yes	+5V ± 10%, max. 120mA	2.2
259460-441	White	CP-I	2 * 8196	40	3x230/400	400	Yes	+5V ± 10%, max. 120mA	2.2
259460-442	Grey	CP-I	2 * 8196	40	3x230/400	400	Yes	+5V ± 10%, max. 120mA	2.2
259460-443	Orange	CP-I	2 * 8196	40	3x230/400	400	Yes	+5V ± 10%, max. 120mA	2.2
259460-502	Grey	HP-F, High Pow.	1 * 8192	40	3x230/400	400	Optional	+5V ± 10%, max. 120mA	2.2
259460-512	Grey	HP-I, High Pow.	1 * 8192	40	3x230/400	400	Optional	+5V ± 10%, max. 120mA	2.2
259460-522	Grey	HP-C, High Pow.	1 * 8192	40	3x230/400	400	Optional	+5V ± 10%, max. 120mA	2.2
259460-532	Grey	CP-F, High Pow.	1 * 8192	40	3x230/400	400	Optional	+5V ± 10%, max. 120mA	2.2
259460-542	Grey	CP-I, High Pow.	1 * 8192	40	3x230/400	400	Optional	+5V ± 10%, max. 120mA	2.2
259460-552	Grey	CP-C, High Pow.	1 * 8192	40	3x230/400	400	Optional	+5V ± 10%, max. 120mA	2.2
259460-632	Grey	CP-F	1 * 8192	40	3x230/400	400	Yes	+5V ± 10%, max. 120mA	2.2
259460-702	Grey	HP-F	2 * 8192	40	3x230/400	400	Optional	+5V ± 10%, max. 120mA	2.2
259460-712	Grey	HP-I	2 * 8192	40	3x230/400	400	Optional	+5V ± 10%, max. 120mA	2.2
259460-803	Grey	CP-F	2 * 8192	60	3x230/400	400	Yes	+5V ± 10%, max. 120mA	4.0
259460-832	Grey	CP-F	2 * 8192	60	3x230/400	400	Yes	+5V ± 10%, max. 120mA	4.0
259460-842	Grey	CP-I	2 * 8196	60	3x230/400	400	Yes	+5V ± 10%, max. 120mA	4.0
259460-843	Orange	CP-I	2 * 8196	60	3x230/400	400	Yes	+5V ± 10%, max. 120mA	4.0
259460-844	Grey	CP-C	2 * 8196	60	3x230/400	400	Yes	+5V ± 10%, max. 120mA	4.0
259460-931	White	CP-F	1 * 8192	40	3x230/400	400	Optional	+5V ± 10%, max. 120mA	2.2

D

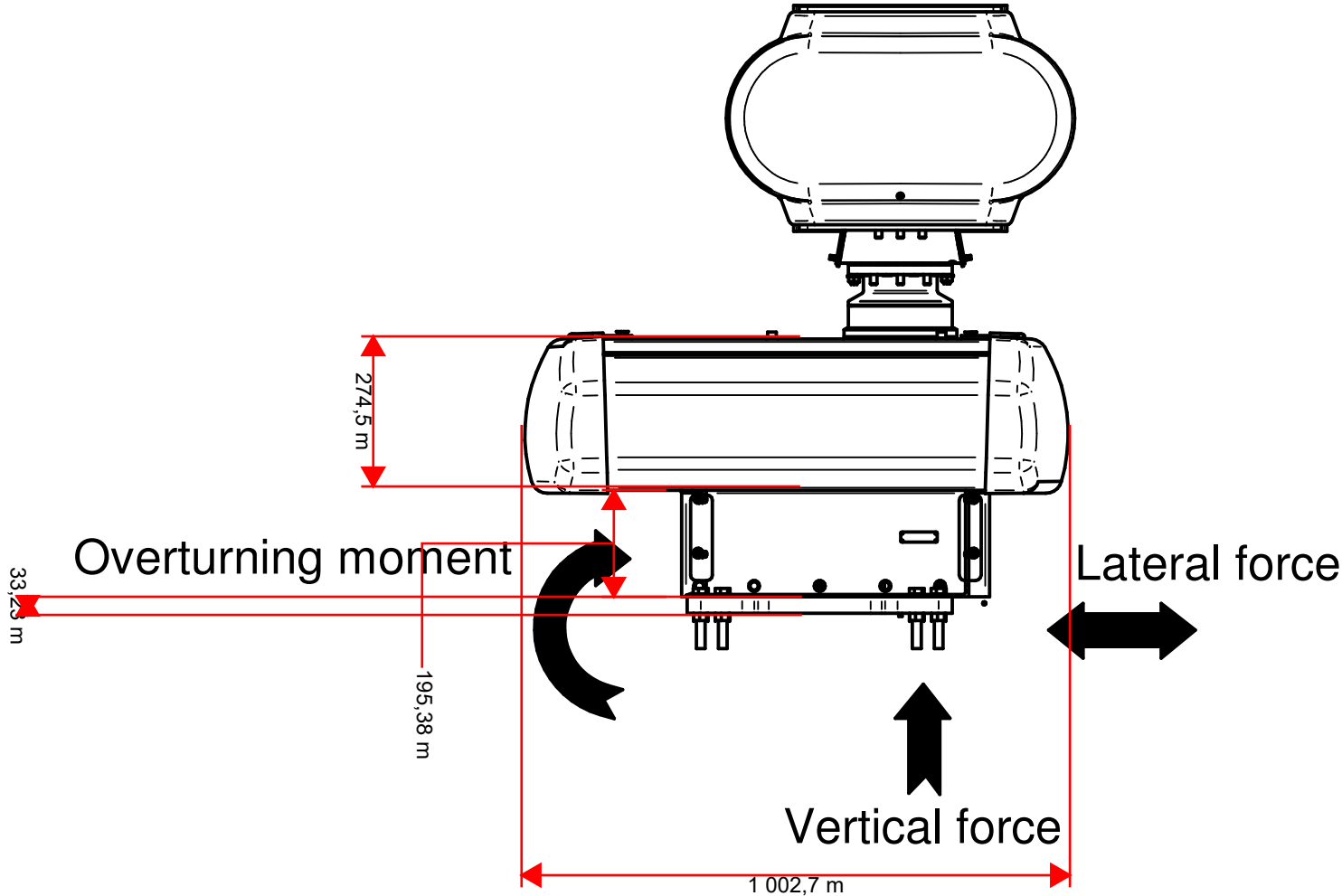
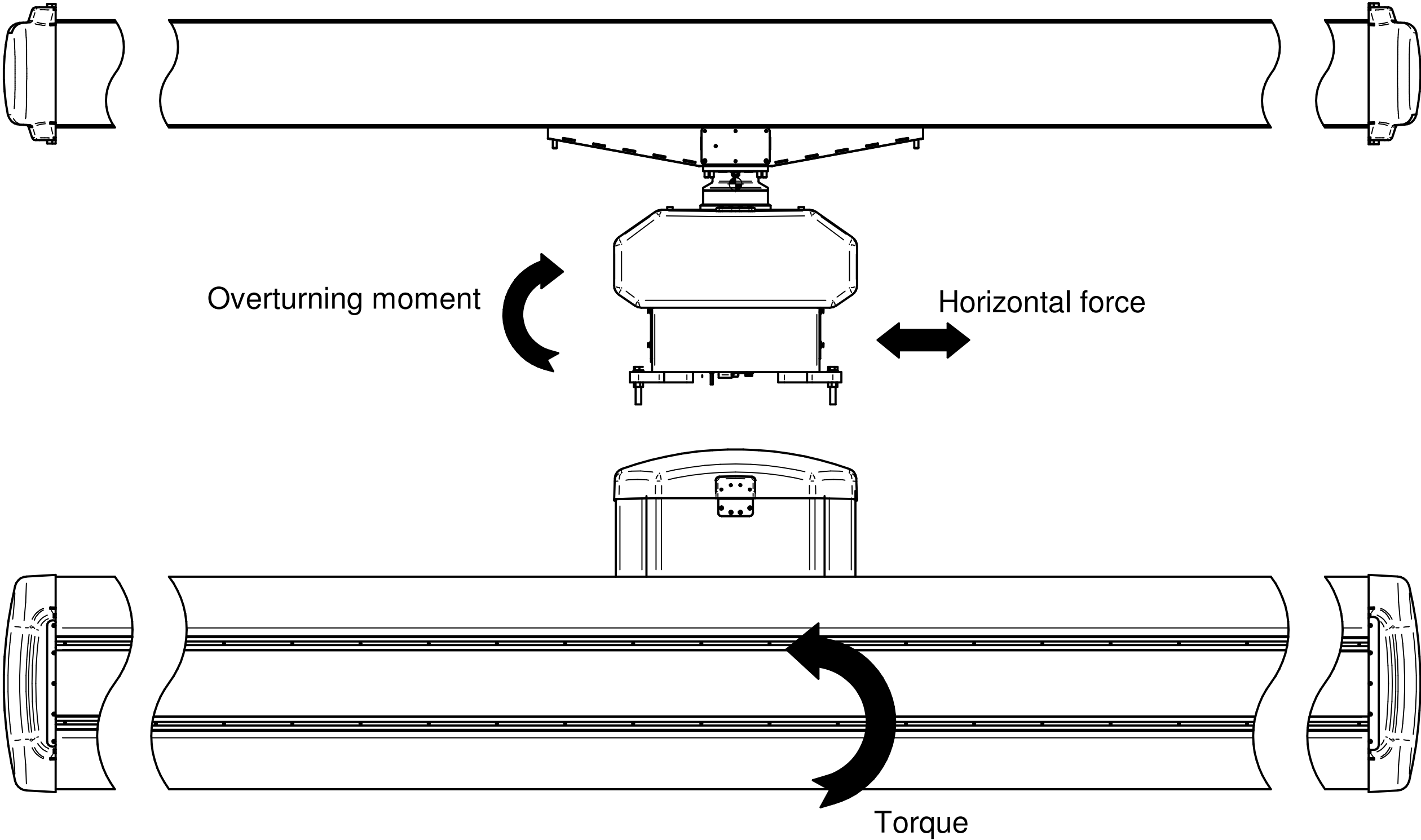
C

B

A

TABLE 2							
Loads 21' HG antenna							
Motor	Variant	Load	Reference	Condition	Unit	Value	Frequen cy (Hz) of load (between 20 to 60 RPM)
2.2kW and 4.0 kW	21'HG	Starting torque	Axis of rotation	Max	Nm	1930	-
		Cyclic torque	Axis of rotation	Max, operation al	Nm	1645	0.66 to 2
		Cyclic horizontal force	Bottom surface of pedestal	Max, operation al	N	4890	0.66 to 2
		Cyclic vertical force	Bottom surface of pedestal	Max / min operation al	N	+9867 / -15363	0.66 to 2
		Cyclic overturnin g moment	Bottom surface of pedestal	Max, operation al	Nm	5390	0.66 to 2
		Horizontal force	Bottom surface of pedestal	Survival, Free rotating	N	14130	-
		Overturnin g moment	Bottom surface of pedestal	Survival, Free rotating	Nm	10865	-
		Vertical force	Bottom surface of pedestal	Max +/-	N	+20846 / - 23320	-

Operational values are max values
Survival values at wind speed of 75m/s and antenna stopped
All loads are at bottom surface
Weigth of antenna included
Load safety factor of 1.5 included (Naturally occurring loads - Eurocode)



4

3

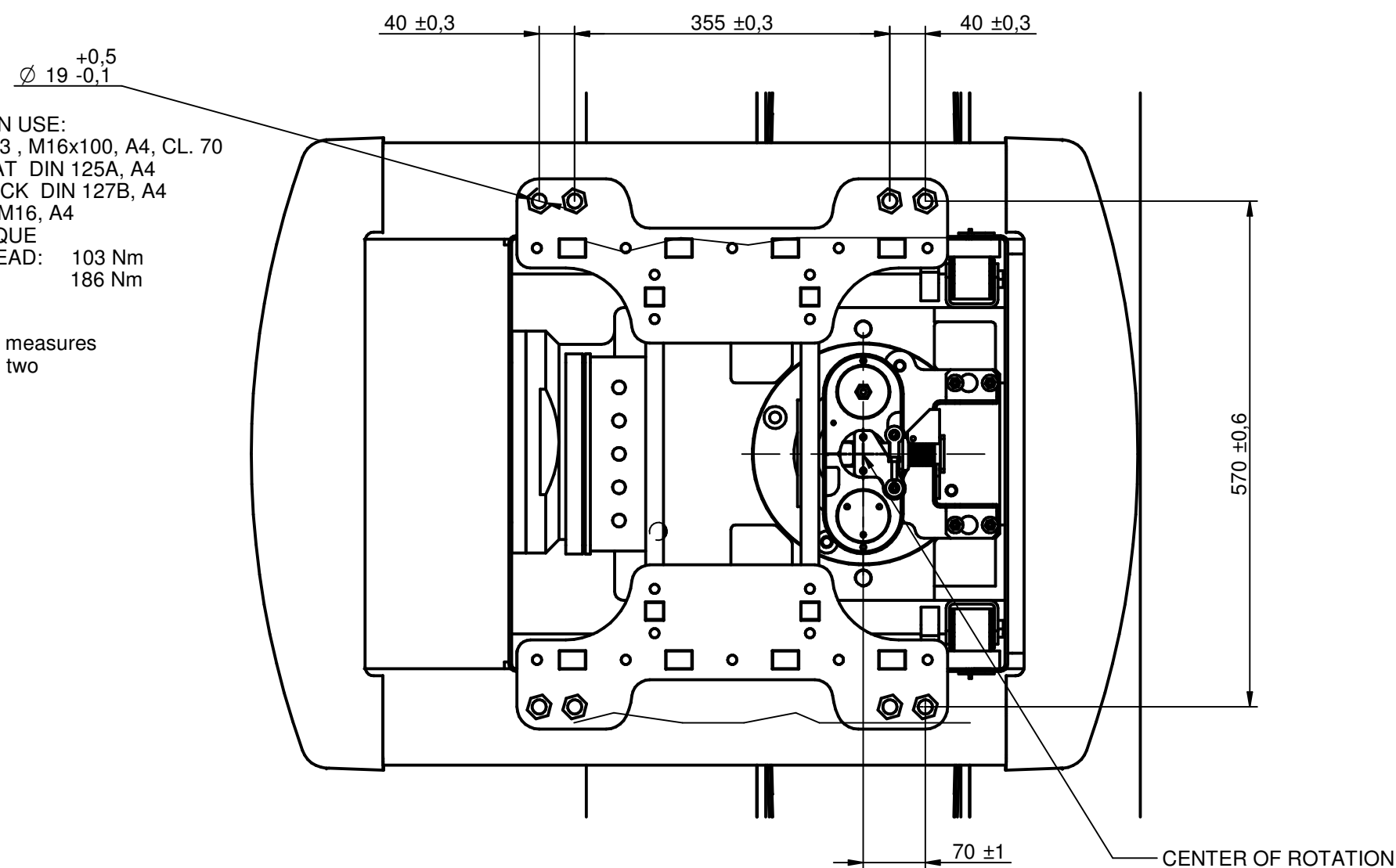
2

1

D

FOR INSTALLATION USE:
8 BOLTS DIN 933 , M16x100, A4, CL. 70
16 WASHERS, FLAT DIN 125A, A4
8 WASHERS, LOCK DIN 127B, A4
8 NUT DIN 934, M16, A4
TIGHTENING TORQUE
LUBRICATED THREAD: 103 Nm
DRY THREAD: 186 Nm

Corrosion protective measures
shall be taken to the two
grounding spots

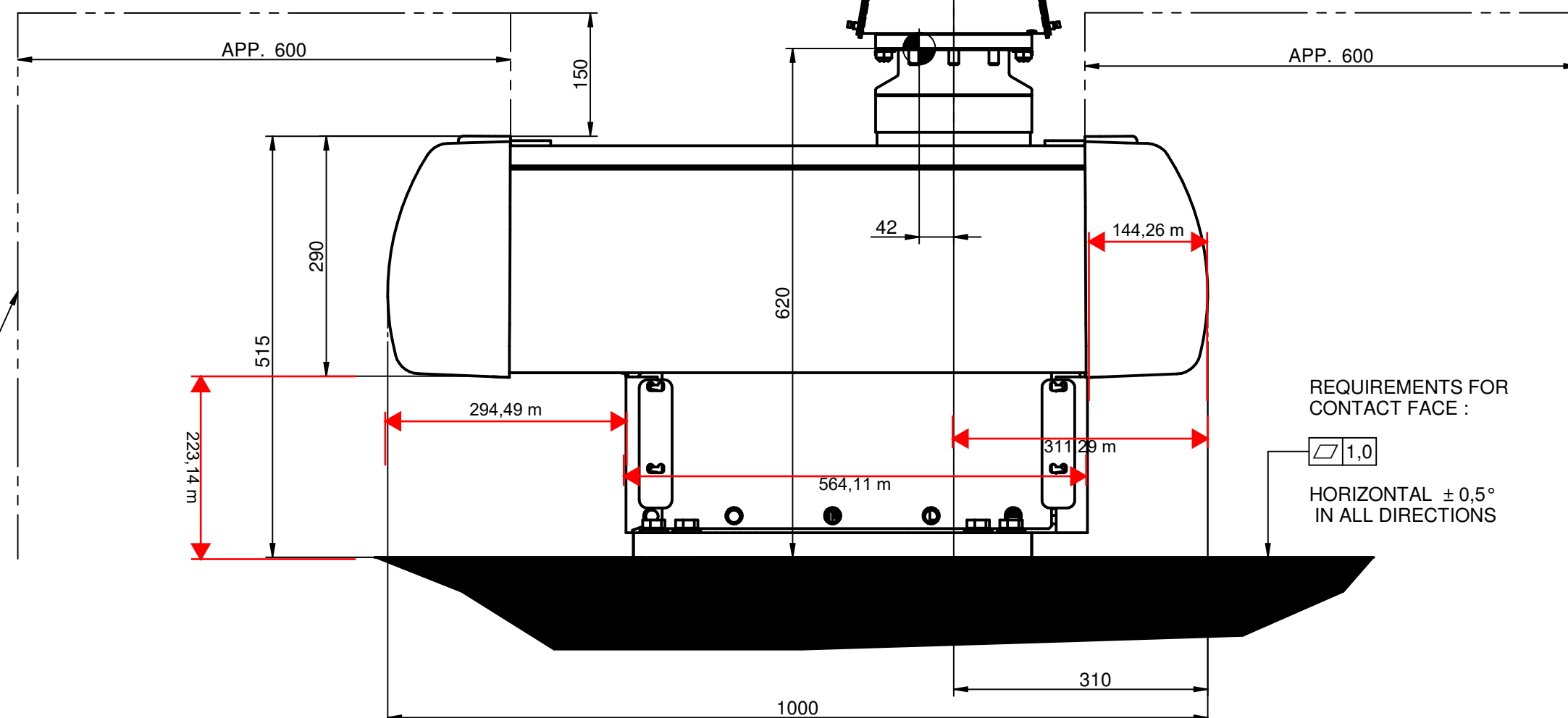


C

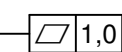
B

A

SERVICE SPACE



REQUIREMENTS FOR
CONTACT FACE :



HORIZONTAL ± 0,5°
IN ALL DIRECTIONS

SERVICE SPACE

Mounting interface materials and fasteners shall be, galvanically, compatible
with aluminium (recommended potential diff. < 0,25V).
If this is not possible, proper isolation and coating/surface treatment
of critical areas must be performed.
Stainless steel fasteners are acceptable.

4

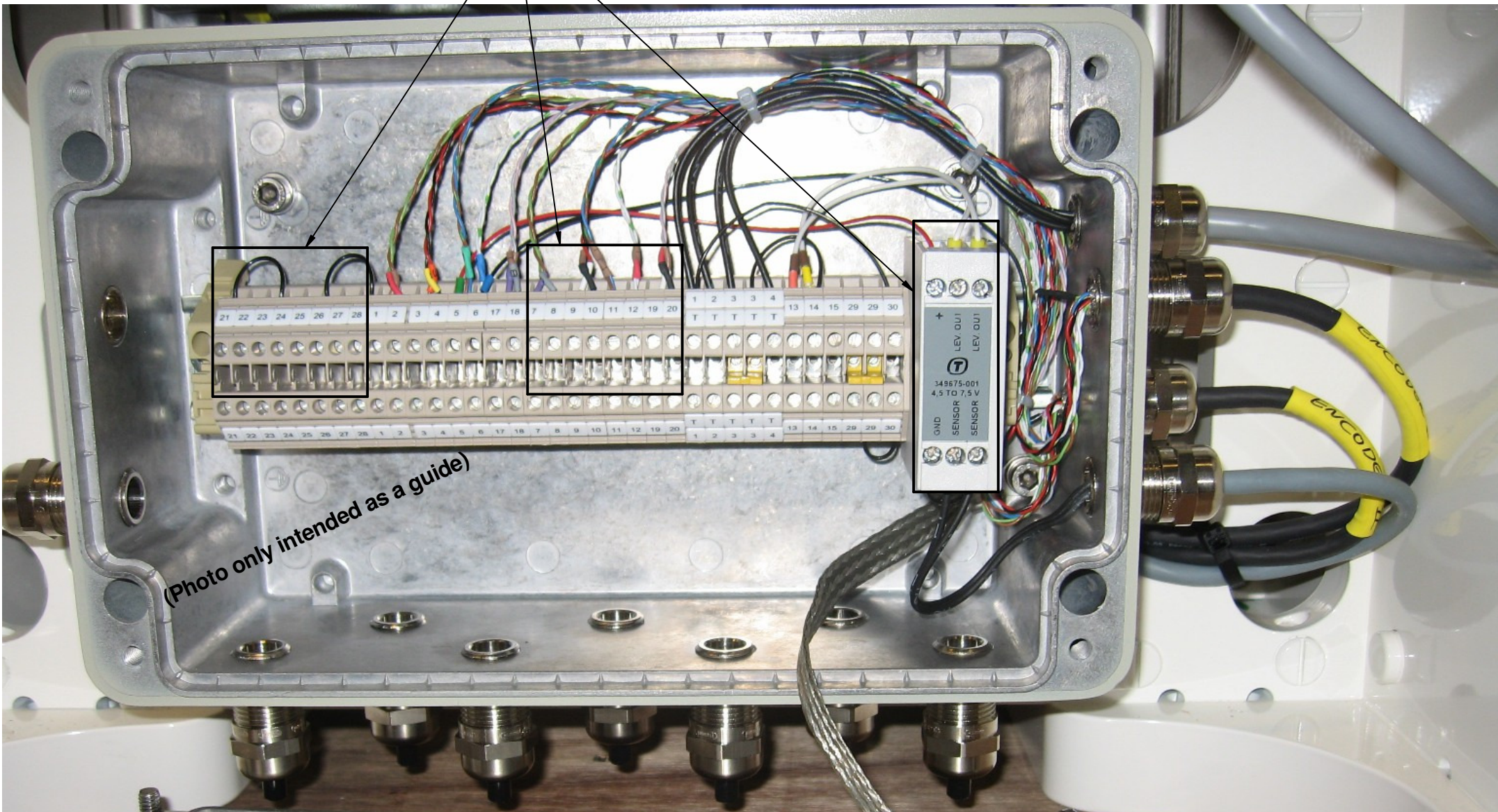
3

2

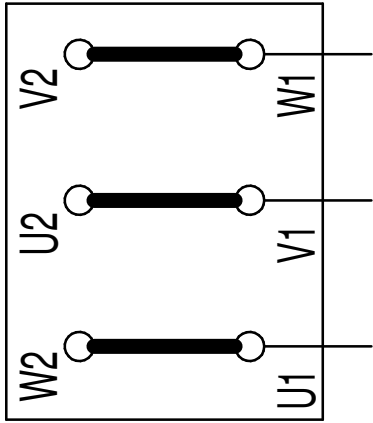
1

TB1 ENSURE THAT UNUSED CABLE INLETS ARE CLOSED WITH BLIND PLATES

OPTION

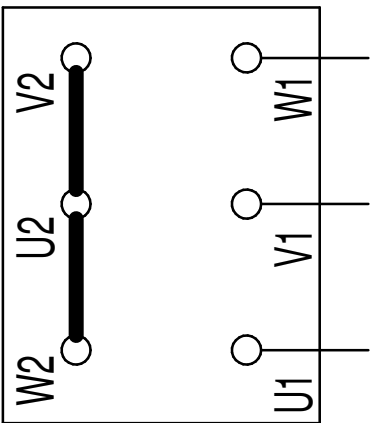


TB2 SCHEMATIC



Δ

3 x 230V/50Hz



Y

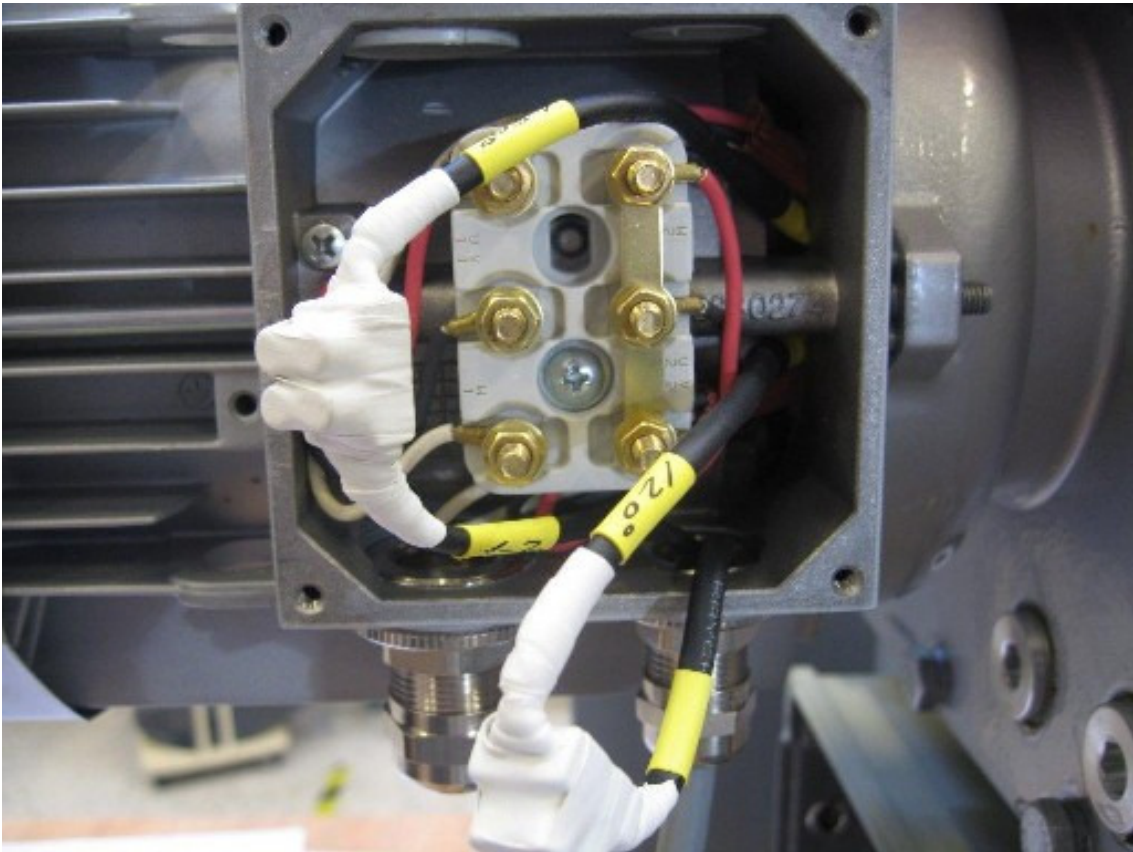
3 x 400V/50Hz

OR

TABLE 3 : TERMINATION

CABLE INLET	FUNCTION	REF DES	TERMINA L	WIRE FUNCTION	SPECIFICATION
M16 x 1,5 E2	Encoder azimuth	TB1	1	ACP2+	BAL 8192 PULSES/REV, RS422, PHASE 2
		TB1	2	ACP2-	
		TB1	3	ARP+	BAL 1 PULS/REV, RS422
		TB1	4	ARP-	
		TB1	5	+5V/+15V	+5V ± 10%, max.120mA, approx. 35mA, 10-30V, max. 100mA, approx. 20mA at 15 V
		TB1	6	GND	
		TB1	17	ACP1+	BAL 8192 PULSES/REV, RS422, PHASE 1
		TB1	18	ACP1-	
M16 x 1,5 E4	2nd Encoder Azimuth (259222-001 OPTION)	TB1	7	ACP2+	BAL 8192 PULSES/REV, RS422, PHASE 2
		TB1	8	ACP2-	
		TB1	9	ARP+	BAL 1 PULS/REV, RS422
		TB1	10	ARP-	
		TB1	11	+5V	+5V ± 10%, max.120mA, approx. 35mA 10-30V, max. 100mA, approx. 20mA at 15 V
		TB1	12	GND	
		TB1	19	ACP1+	BAL 8192 PULSES/REV, RS422, PHASE 1
		TB1	20	ACP1-	
M16 x 1,5 E3		TB1	T1	Normally	MOTOR PROTECTION 155 ± 10°C AUTOMATIC RESET. MAX 2,5A - 250VAC
		TB1	T2	Closed	
		TB1	T3	Normally	MOTOR OVERHEAT ALARM 120 ± 10°C AUTOMATIC RESET. MAX 2,5A - 250VAC
		TB1	T4	Closed	
M20 x 1,5		TB2	U1	MOTOR SUPPLY	PHASE 1
		TB2	V1		PHASE 2
		TB2	W1		PHASE 3
		TB2	GND	SHIELD	
M16 x 1,5 E5	Oil Sensor (304139-001 Option)	TB1	13	Normally closed	Current max.0,5A - 300VAC/DC (breakdown min. 600VDC) Switching Power 50VA
		TB1	T3		

TB2

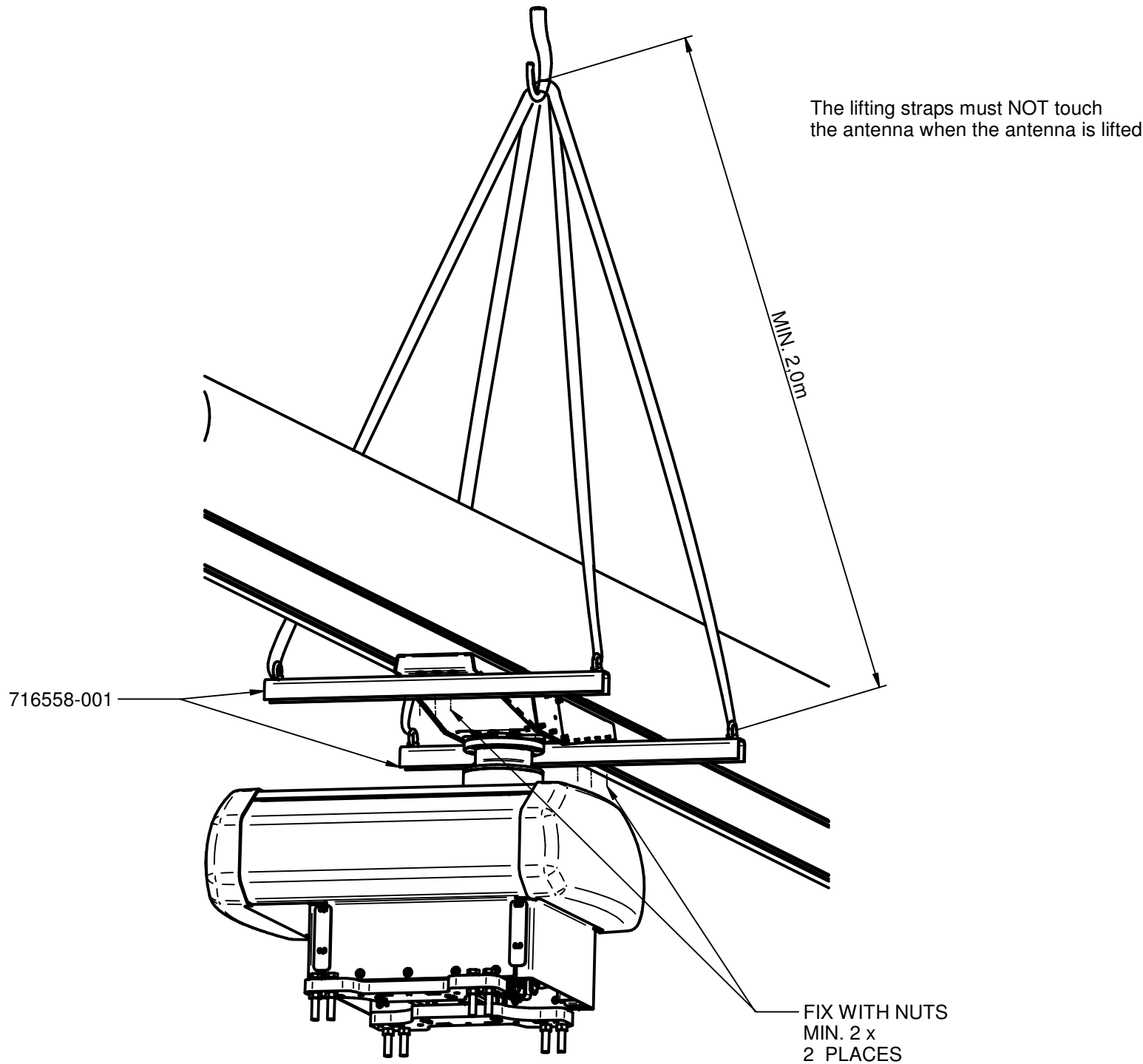


The use and/or disclosure, etc. of the contents of this document (or any part thereof) is subject to the restrictions referenced on the front page.

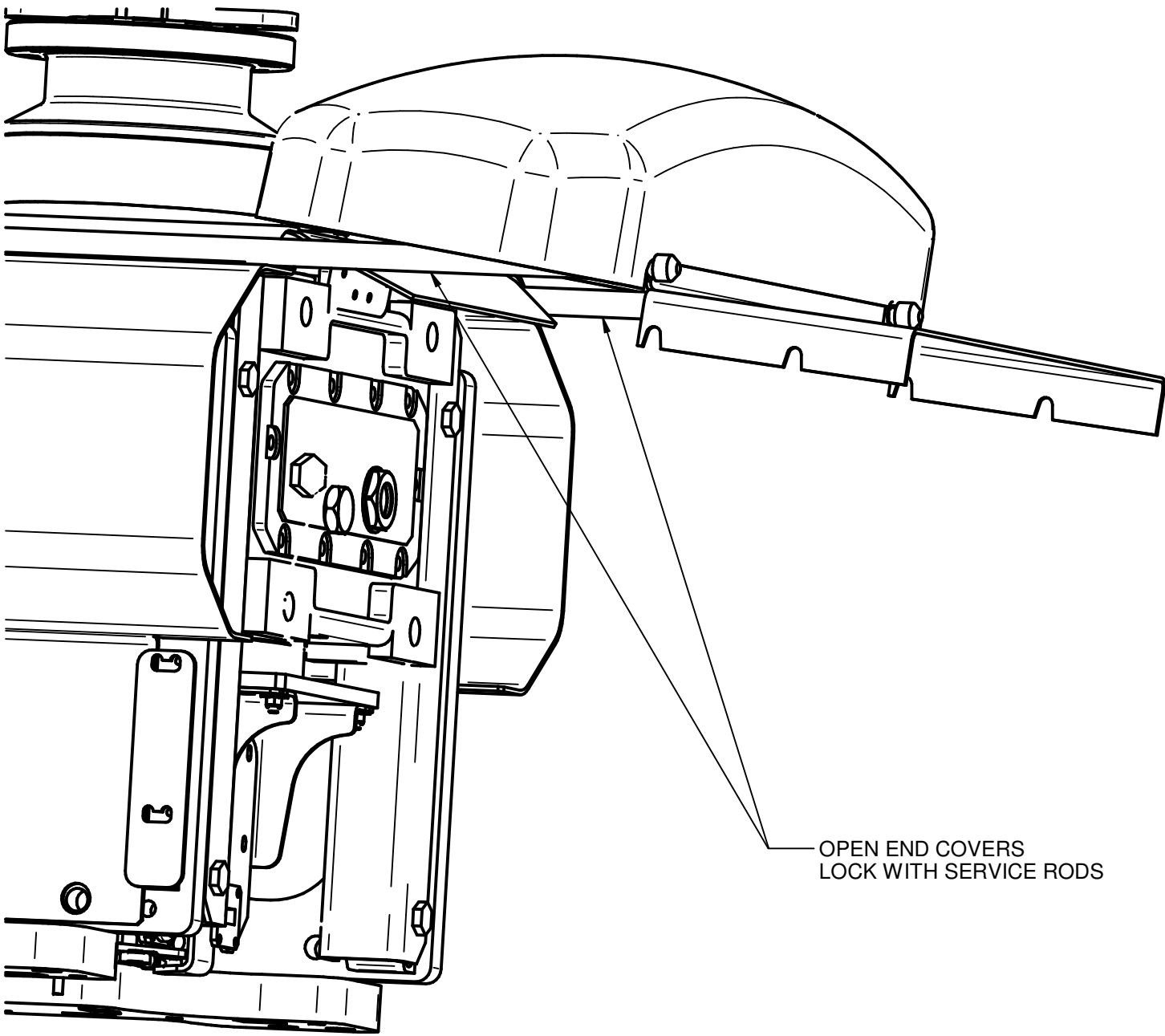
Lifting Instruction for
variant -931 see page 6

LIFTING INSTRUCTIONS

- USE LIFTINGYOKES
TERMA PART NO.:716558-001
- MOUNT LIFTING YOKES AS
SHOWN, AND FASTEN WITH NUTS
- MINIMUM SLING LENGTH: 2,0m
- REMOVE LIFTING YOKES
AFTER MOUNTING ANTENNA
- HANDBOOK DOC. 716558-HC



SERVICE



D

C

B

A

-931

Specific dimensions are shown in this view
(Otherwise, see sheet 1 - 2)

Only The lifting yoke 716558-002 is CE approved for this variant

LIFTING INSTRUCTIONS
for -931

- USE LIFTING YOKES
TERMA PART NO. 716558-002
- MOUNT LIFTING YOKES
AS SHOWN, AND FIX WITH Bolts
and NUTS M12
- MINIMUM SLING LENGTH: 2,5 m
- REMOVE LIFTING YOKES
AFTER MOUNTING ANTENNA

- 1 Place Bracket on the Antenna Arm as shown.
- 2 Avoid scratches on the antenna arm.
Place the rubber band on the yokes 4 places
- 3 Then mount the yokes to the bracket .

The lifting straps
must NOT touch
the antenna when
the antenna is lifted

Bracket
Rubber
Yoke