

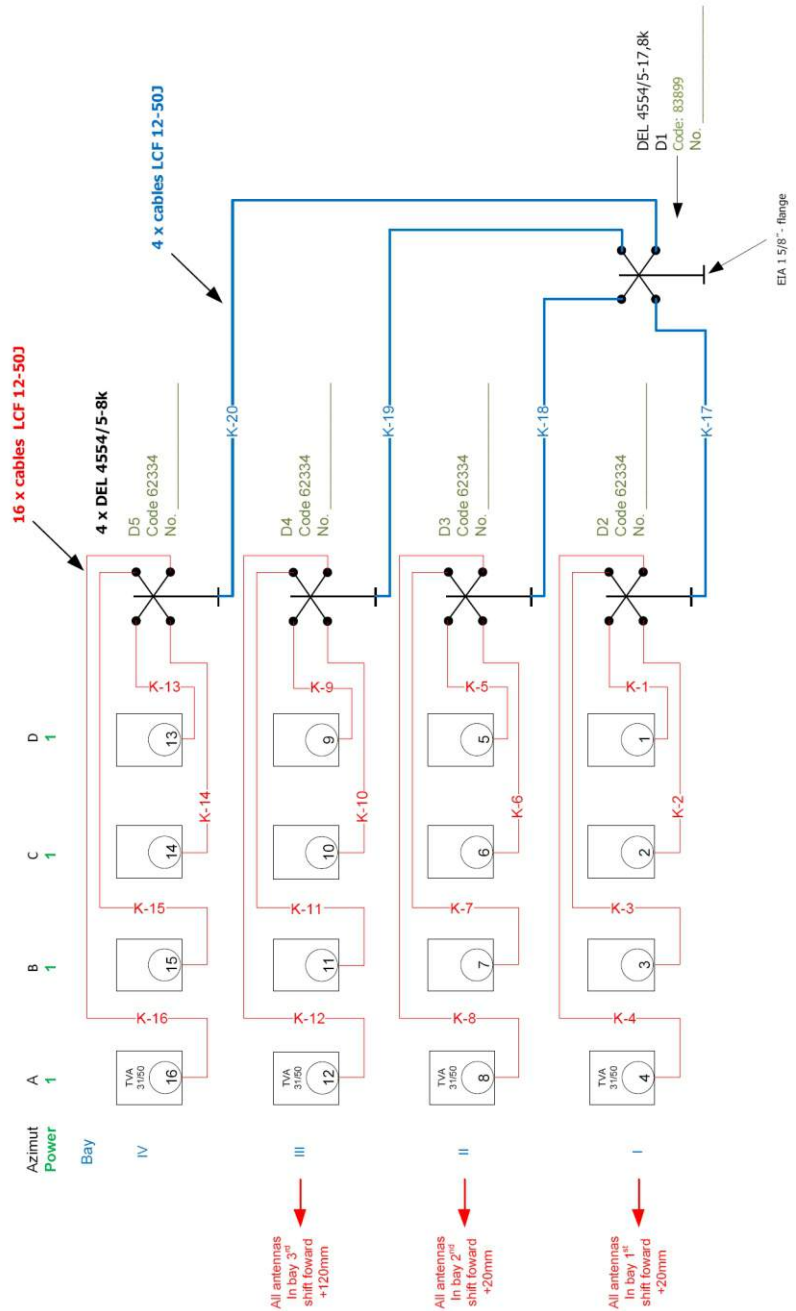
# ՏԵԽՆԻԿԱԿԱՆ ԲՆՈՒԹԱԳԻՐ


Հաղորդիչ անտենաների

## ELECTRICAL and MECHANICAL CHARACTERISTICS

Frequency range .....	470 - 862 MHz
Operating channels .....	CH 38 (610 MHz)
	(Other channels are not defined in project task)
Input impedance .....	50 ohm
Input connectors .....	EIA 1 5/8" – flange
(on the main power divider input)	
Expected input power in the antenna system .....	<b>1 x 100W RMS</b> (DVB-T)
(on the main feeder cable input)	with considerations
	Safety factor - power handling $\geq 1.5$
	Safety factor - voltage handling $\geq 1.5$
Expected V.S.W.R. ....	$\leq 1,15$ (in the whole UHF band)
Polarisation .....	horizontal
Number of bays .....	4
Antennas per bay .....	3
The GAIN of the antenna system in the direction of maximum radiation, <u>with null fill</u> in the vertical radiation pattern and without consideration of the attenuation in the cable, without attenuation on the coax. junctions, (referred to $\lambda/2$ dipole) .....	
	CH 38 = + 11,79 dB
The GAIN of the antenna system in the direction of maximum radiation, with null fill in the vertical radiation pattern and with consideration of the attenuation in the :	
<ul style="list-style-type: none"> <li>- antenna cables,</li> <li>- cables between dividers</li> <li>- attenuation on the coax. junctions</li> <li>- with attenuation in the main feeder cable, type AVA7-50, length 80m (1,3632dB/80m)</li> <li>- with attenuation in the jumper cable, between transmitter and main feeder cable, type LCF 12-50J, length 10m (0,552dB/10m)</li> </ul>	
(referred to $\lambda/2$ dipole) .....	CH 38 = + 9,54 dB (9,0 times)

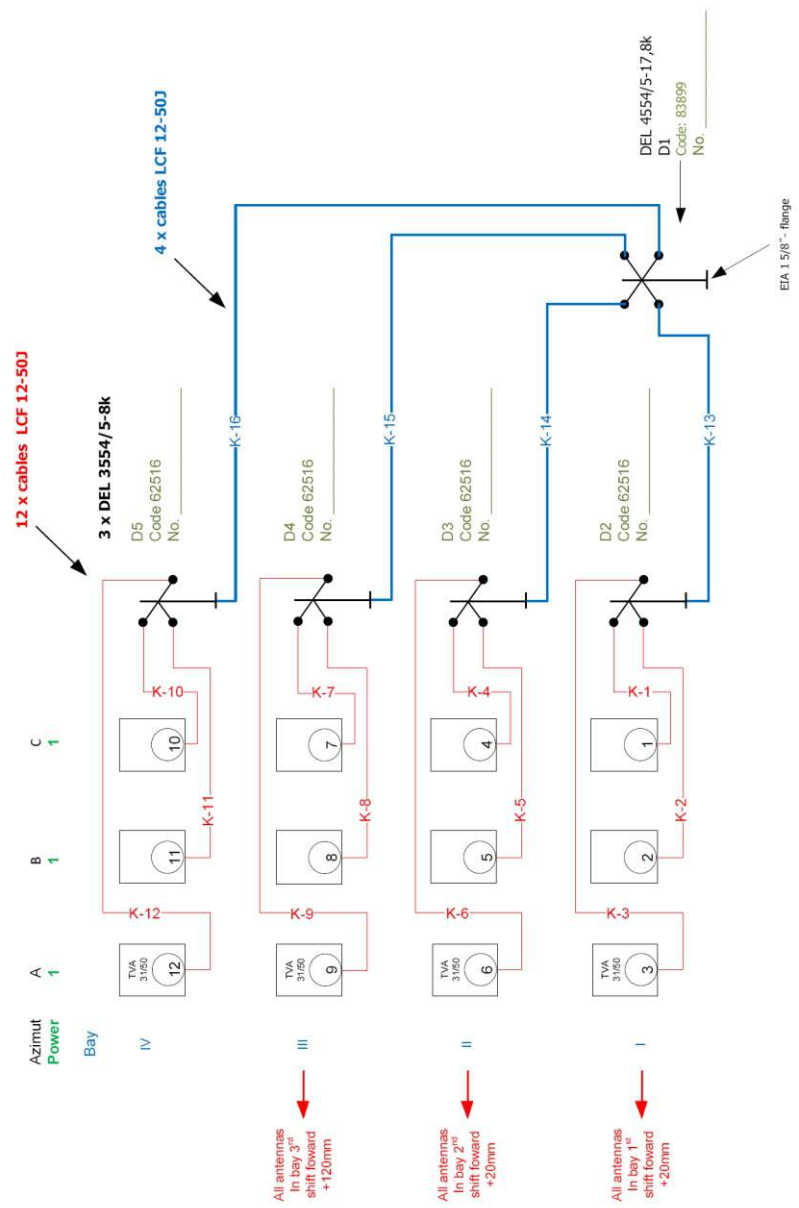
The antenna system must be pressurized with dry air ...	no
Split antenna system .....	no
Antenna system height .....	see the drawing "Layout of antennas on the tower - TOP VIEW and SIDE VIEW"
Horizontal radiation pattern .....	in enclosure
Vertical radiation pattern .....	in enclosure
Weight of the part of UHF antenna system, which is mounted on existing tower, without the weight of main feeder cable with accessories .....	aprox. 438 kg
Relative air humidity .....	to 100%
Operating temperature .....	of -40° to +80°




Id. No.: 43345			drwg. No: 3-53-AM168-2-00				
design	name	I. Hari	date	15.03.2014	UHF antenna system " Berd "		1 / 2
check		M. Vlašič		15.03.2014			
Connections of the antenna system BLOCK DIAGRAM							

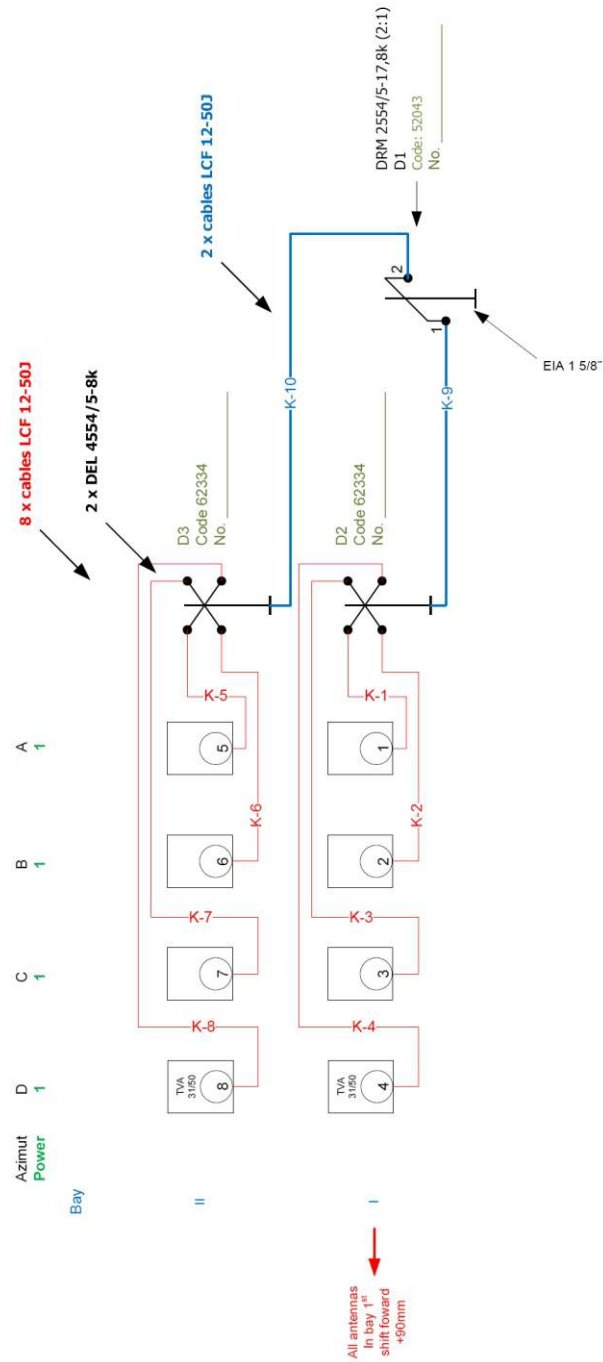
No:	Change:	Date:	Name:




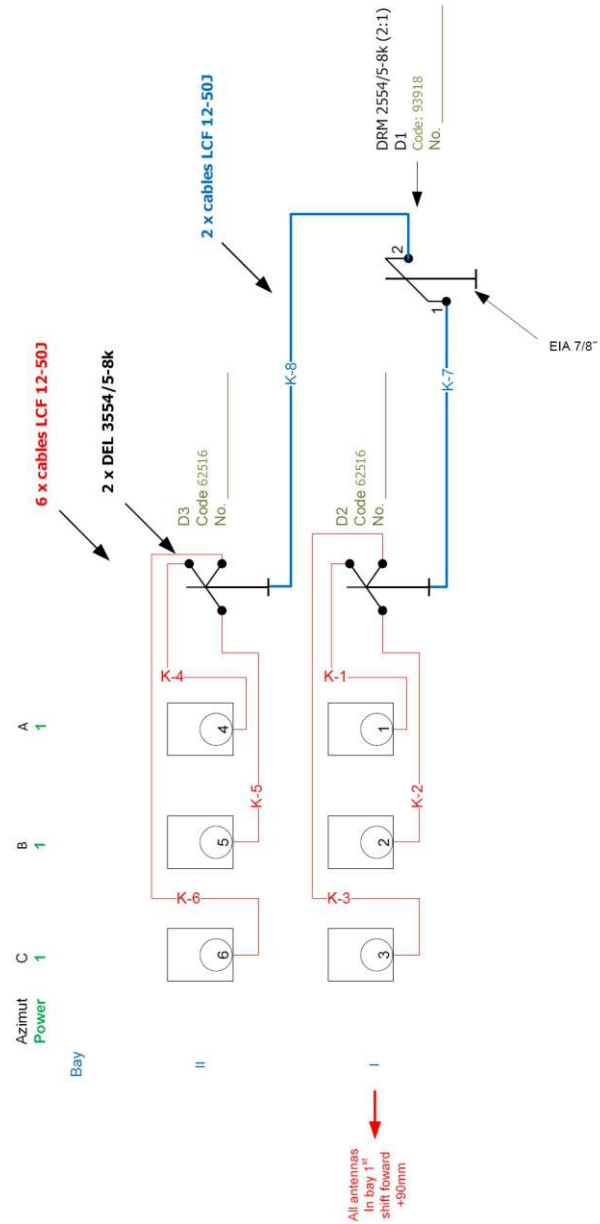


No:	Change:	Date:	Name:

Id. No.: 43616			drwg. No: 3-53-AM166-2-00				
design	name	I. Hari	date	17.03.2014	UHF antenna system "Ijevan"  Connections of the antenna system BLOCK DIAGRAM		1 / 2
check		M. Vlašič		17.03.2014			



Id. No.: 43346			drwg. No: 3-53-AK109-2-00				
design	name	J. Ferk	date	28.03.2014	UHF antenna system " Dilijan-1 " 2X4 50W TOP Connections of the antenna system BLOCK DIAGRAM		1 / 2
check		M. Vlašič		28.03.2014			



No:	Change:	Date:	Name:

Id. No.: 36730				drwg. No: 3-53-AK102-2-00			
design	name	J. Ferk	date	25.03.2014	UHF antenna system " Akhtala " 2X3 20W TOP Connections of the antenna system BLOCK DIAGRAM		1 / 2
check		M. Vlašič		25.03.2014			

### 3.4 INSTRUCTION FOR MOUNTING OF ANTENNA

Instruction for mounting of antenna TVA 31/50 .

The instruction refers to the drawing No. 1-64-C607-1-04.

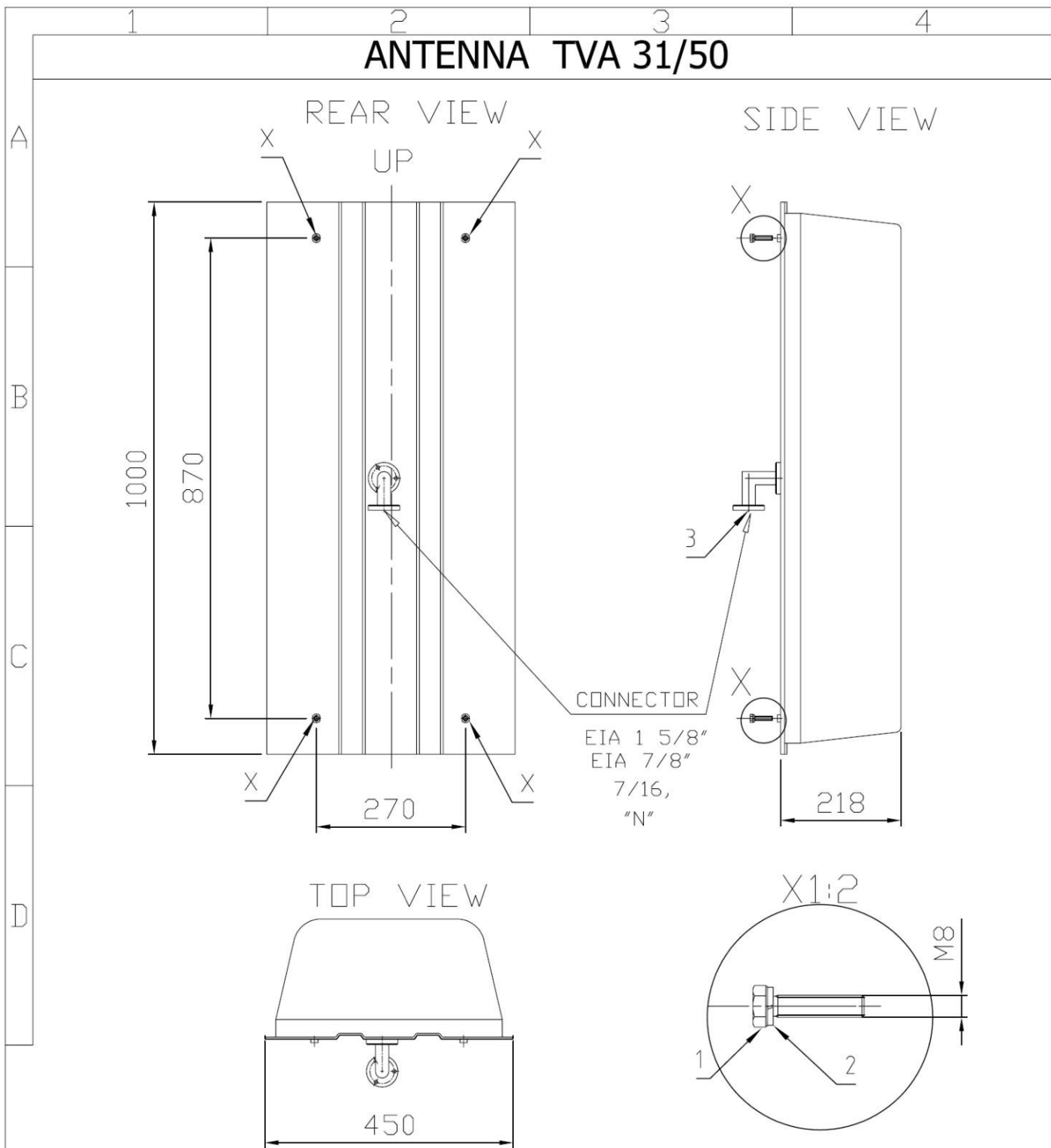
1. Antennas should be mounted in a way that connector on the antenna TVA 31/50 is on the left side of the antenna (reflector) looking from the center of the tower , as showed on the drawing No. 1-64-C607-1-04.
2. Fix the antenna to the mast in the points "X" with screws M8x35 (pos. 1 and 2).
3. Mount the antenna on the mast through the holes Ø 10.
4. Before cable mounting remove the protection covers (pos. 3) from the connectors.
5. When tighten the screws, consider the schedule of tightening moments (schedule 1)

Coil	Key size		Tightening moments for screws	
	Six-edge screw	Screw nut	(without oil)	(with oil)
M6	10 mm	5 mm	10,5 Nm	15 Nm
M8	13 mm	6 mm	26 Nm	36 Nm
M10	17 mm	8 mm	51 Nm	72 Nm
M12	19 mm	10 mm	89 Nm	125 Nm
M16	24 mm	14 mm	210 Nm	305 Nm
M20	30 mm	17 mm	410 Nm	590 Nm
M24	36 mm	19 mm	710 Nm	950 Nm
M30	46 mm	---	1450 Nm	2050 Nm

(schedule 1)

Drawing is our property.  
 Duplicating, every misuse,  
 third party or usage in not agreed  
 purposes, is not allowed!

Risba je naša last.  
 Razmnoževanje, vsaka zloraba načrta,  
 predaja tretjemu ali uporaba v namene,  
 ki niso dogovorjeni, ni dovoljena!



OPOMBA: Anteno montirati tako, da se priključni konektor na anteni TVA 31/50 nahaja na levi strani antene (reflektorja), gledano iz centra stupa.

PRIMJEDBA: Anteno montirati tako, da se priključni konektor na anteni TVA 31/50 nalazi sa ljeve strane antene (reflektora), gledano iz centra stupa.

REMARK: Antenna should be mounted the way that connector on TVA 31/50 is on the left side of antenna (reflector) if you look from the center of the tower.



## INSTRUCTION FOR MOUNTING OF ANTENNA

	Datum	Ime:
Kontr.		

Številka risbe:

1-64-C607-1-04

### 3.5 ANTENNA SYSTEM MOUNTING INSTRUCTIONS

1. Installation must be undertaken during clear dry weather. Until actual installation is required, keep all moisture seals in place.
2. Unpack the antenna system as written in the chapter UNPACKING.
3. Mounting the UHF antenna system (tube Ø 102mm with already mounted antennas, cables and dividers), with already prepared adapter on existing mast.

**ATTENTION:**

**For correct mounting see the drawing "Layout of antennas on the tower - TOP and SIDE VIEW", "Instruction for antenna system installation" and "Instructions for maintenance of antenna systems on the tube."**

4. Mount the main feeder cable.
5. Mount the connectors on main feeder cable.
6. With main feeder cable, rigid lines and elbows connect the antenna system with transmitter or combiner, as it's shown on the drawing »Connections of the antenna system«.
7. Mount the GROUNDING KIT on main feeder cable.
8. **After montage GROUNDING the ANTENNA SYSTEM.** For correct grounding see the chapter "Instruction for mounting the lightning conductor and the grounding of antenna system".
9. Between connectors with flange (EIA), do not forget to insert the gasket rings. Such rings must be properly lubricated with silicon grease. Fasten alternatively all nuts for a uniform contact pressure on flange periphery (see "INSTRUCTION FOR PROPERLY CONNECTIONS OF EIA FLANGED CONNECTORS" in attached).

**10. When tightening the screws (except the screws on EIA flanges), consider the schedule of tightening moments (schedule 1)**

Coil	Key size		Tightening moments for screws	
	Six-edge screw	Screw nut	(without oil)	(with oil)
M6	10 mm	5 mm	10,5 Nm	15 Nm
M8	13 mm	6 mm	26 Nm	36 Nm
M10	17 mm	8 mm	51 Nm	72 Nm
M12	19 mm	10 mm	89 Nm	125 Nm
M16	24 mm	14 mm	210 Nm	305 Nm
M20	30 mm	17 mm	410 Nm	590 Nm
M24	36 mm	19 mm	710 Nm	950 Nm
M30	46 mm	---	1450 Nm	2050 Nm

(schedule 1)

## PRECAUTIONS

Once the antenna system has been installed, before applying power verify that :

- A. Installation has been carried out properly as per enclosed documentation.
- B. Flanges and ring nuts are properly fastened.
- C. Electrical characteristics (VSWR for example) meets the listed performance data.
- D. Increase gradually the power of the transmitter.

### Warning

about the rotation of the output terminals (elbows) with all dividers types DEL and DRM in the antenna system.

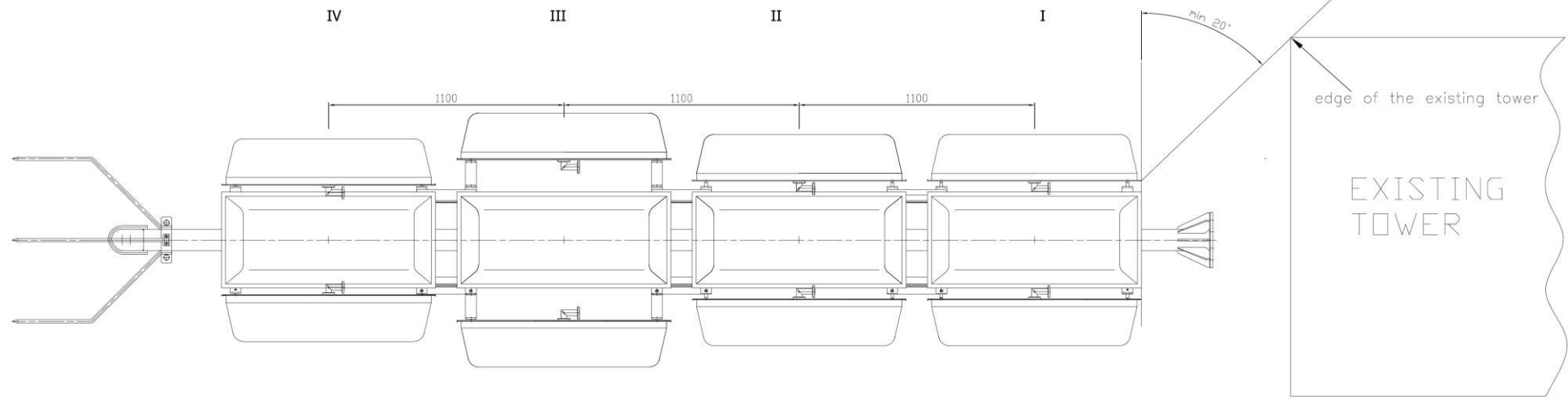
It is forbidden to intervene in the dividers as well as rotating output terminals (elbows) of all dividers type DEL and DRM in the antenna system.

The possible need for rotation of the output terminals (elbows) should be subject to authorization and instructions to given by the company Elti.

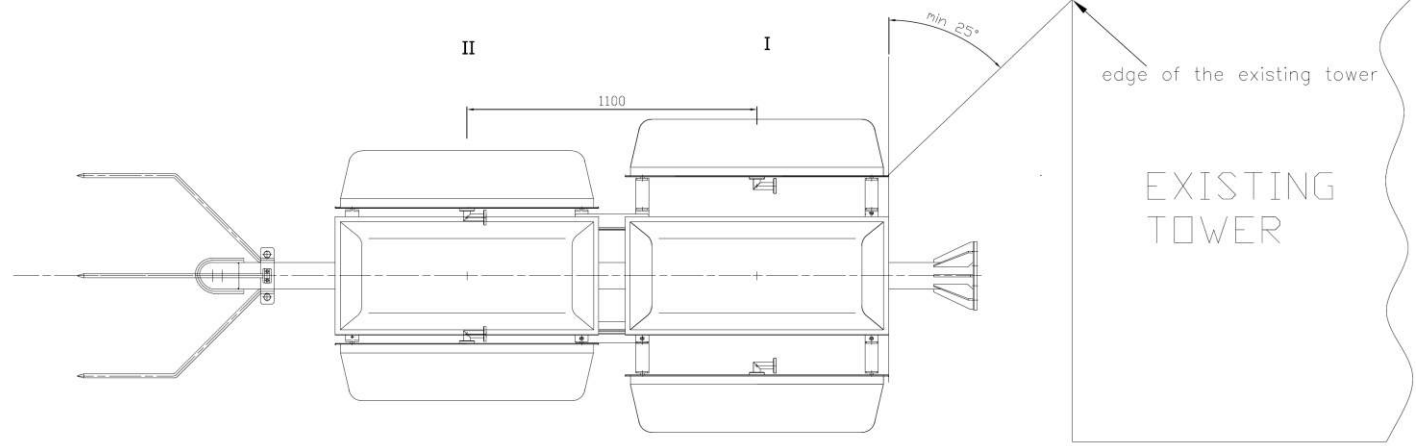
Without having the authorization and the instructions for divider rotation of the output terminals, ELTI assumes no liability for any errors or damage to the dividers and other equipment affected. Reclamation will not be accepted.

In. mm	mm	6	6	30	120	300	1000	2000
mm	mm	6	30	120	300	1000	2000	4000
mm	mm	6	30	120	300	1000	2000	4000

SIDE VIEW



SIDE VIEW



4 BAY ANTENNA SYSTEM

2 BAY ANTENNA SYSTEM

drawing is a symbolic

		Surface protection	Measurement	Material	Material code	Quantity
			1:10			
2011 Date: Name:		Description				
200314 Date: Name:		RECOMMENDEE MONTAGE OF UHF				
200314 Date: Name:		ANTENNA SYSTEM ON EXISTING TOWER				
200314 Date: Name:		B Drawing No:				
200314 Date: Name:		1-61-AG545-1-00				
200314 Date: Name:		Page				
200314 Date: Name:		1				

This drawing is property of company and shall not be used for any other purpose without written permission of the company. If used for any other purpose, the user shall be liable for all consequences.



### **3.6 INSTRUCTION FOR MOUNTING THE LIGHTNING CONDUCTOR AND THE GROUNDING OF ANTENNA SYSTEM**

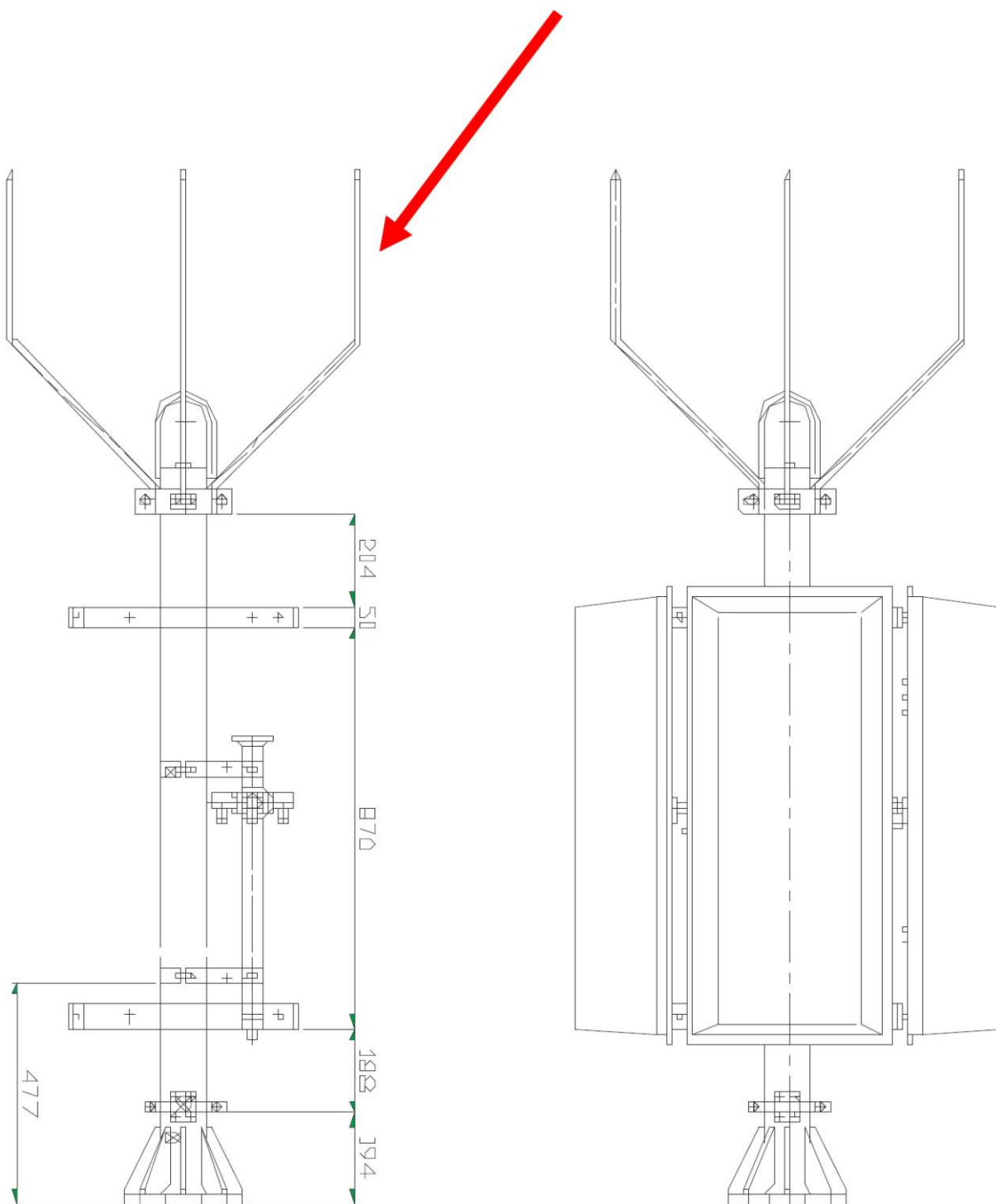
1.) On the ground should be remounted the lightning conductor (see picture 1).



Picture 1

(picture is symbolic)

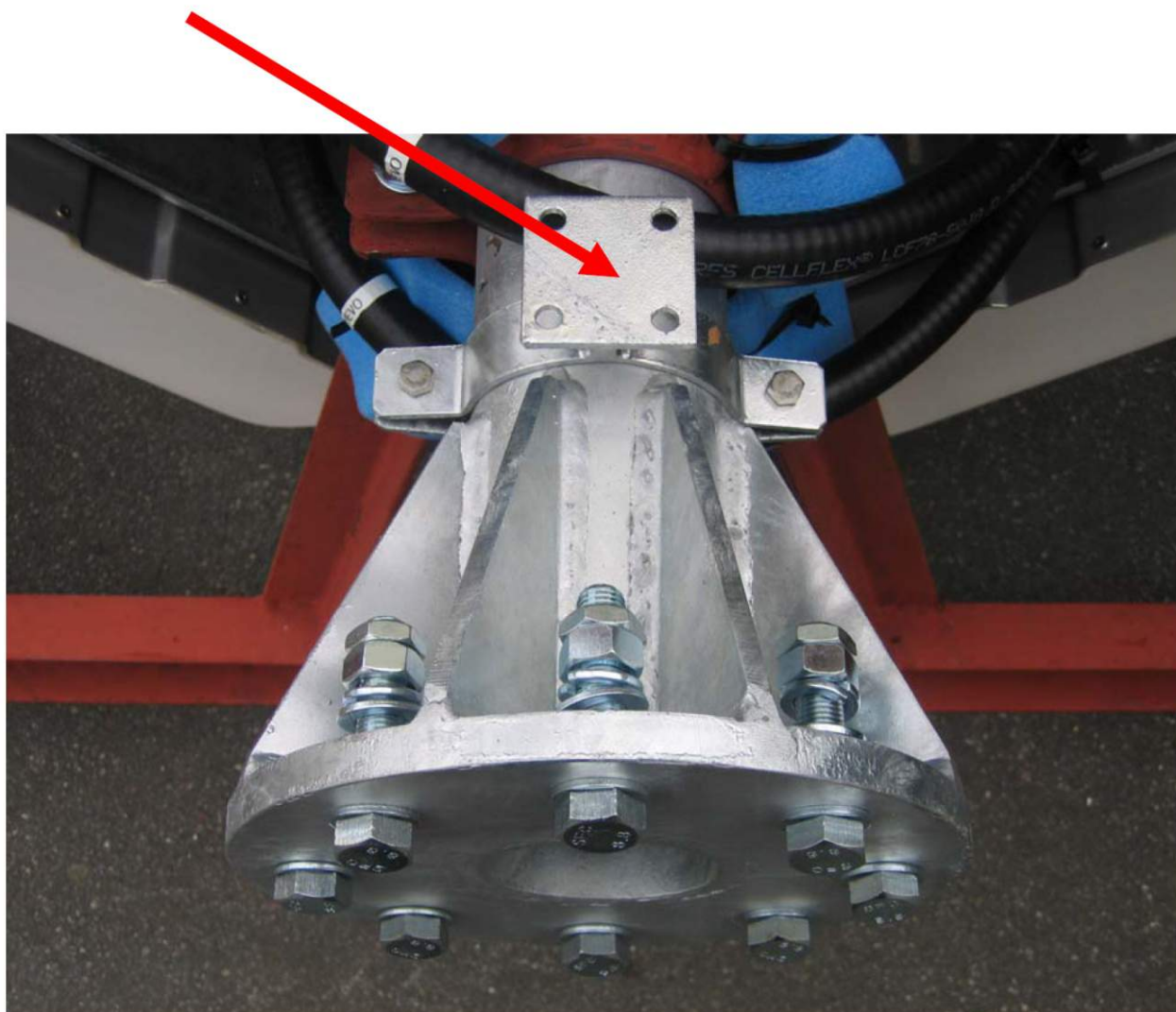
2.) Take off the lightning conductor part and install it under ladder (see picture 2).



Picture 2

(picture is symbolic)

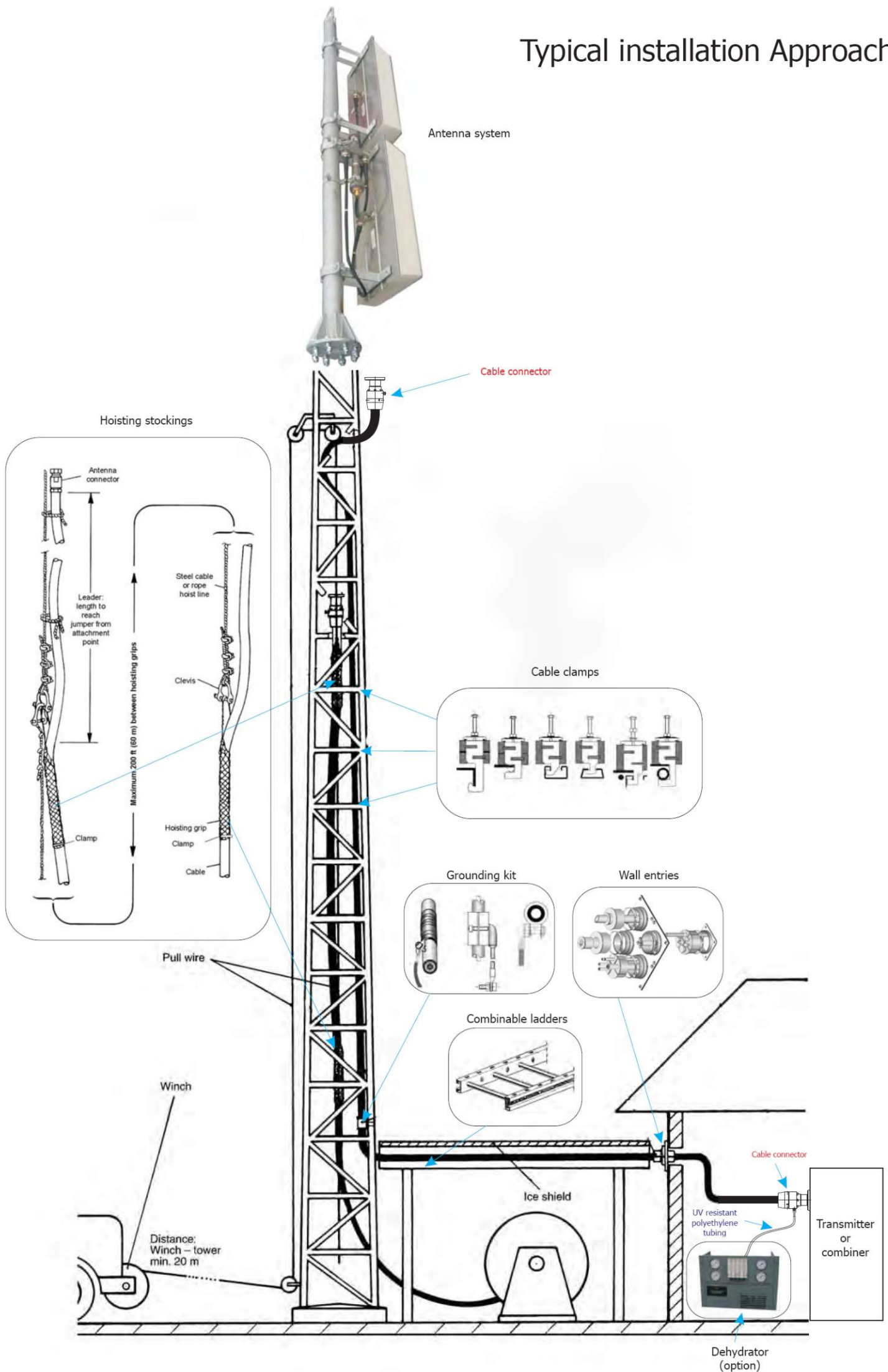
3.) Don't forget on the grounding. When the whole antenna system will be mounted on your tower, then you should connect the grounding copper wire or stainless steel grounding conductor to the grounding plate (see picture 3).



Picture 3

(picture is symbolic)

# Typical installation Approach



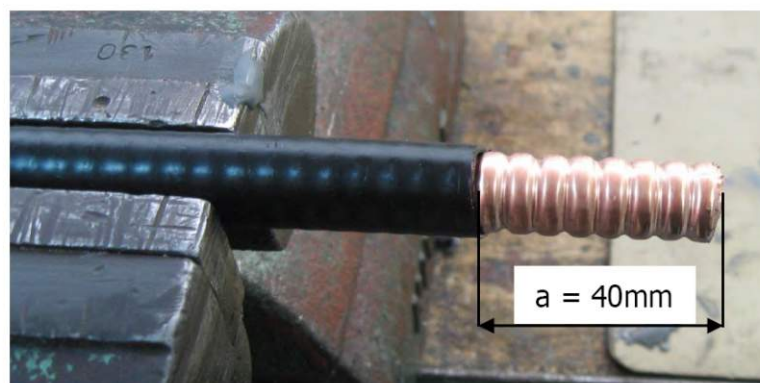


- 1) Cut off the end of the cable to get an even ending



Picture 1.: Even cut off cable

- 2) With a knife remove the plastic jacket like indicated on the picture 2 (length a = 40mm)



Picture 2.: Removed plastic jacket

- 3) Slide the body of the connector over the cut of cable to the end of the cut of plastic jacket (picture 3.)



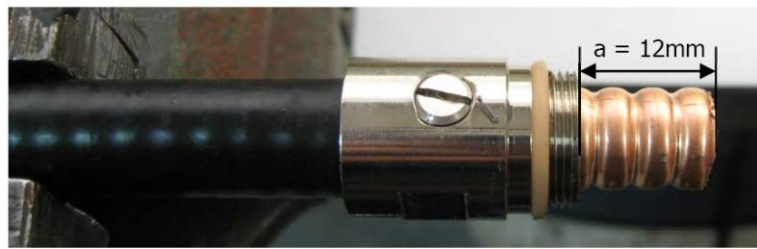
Picture 3.: Cable with the body of the connector

- 4) Put the contact ring on to the cable (picture 4.)



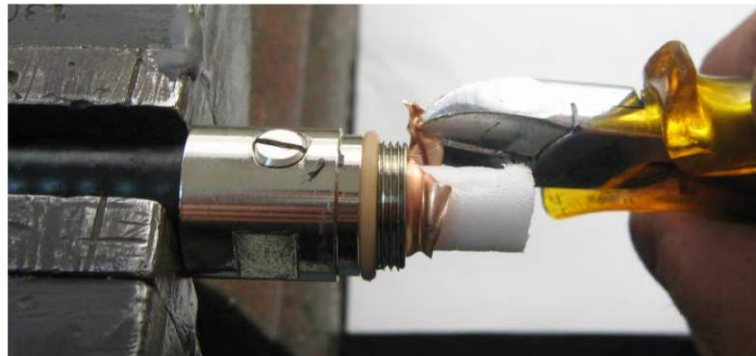
Picture 4.: Cable with contact ring

- 5) Slide the body of the connector over the ring and fixed it with a screw (picture 5.)



Picture 5.: Cable with the body fixed

- 6) With coat peg remove the cooper shield (picture 6).



Picture 6.: The bottom part with the pushed out outer conductor

- 7) With a screw driver smoothen the edge of the cooper shield (picture 7.)



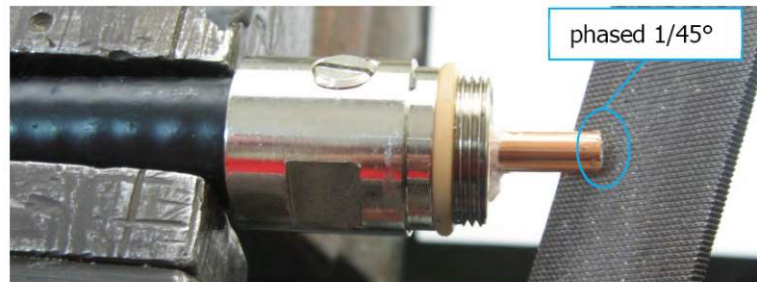
Picture 7.: smoothen the edge of the cooper shield

- 8) With a knife cut of the inner plastic shield and remove it (picture 8)



Picture 8.: cutting the inner shield of the cable

- 9) With a file smoothen the edge of the inner cable (picture 9)



Picture 9.: smoothening the inner cable with a file

- 10) CEL 50-22-700 (picture 10)



Picture 10.: CEL 50-22-700

- 11) Place the inner ring of the connector in to the main body (picture 11)



Picture 11.: inserting the inner ring in to the main body



Place the main body on to the cable (picture 12.)



Picture 12.: assembled connector on the cable LCF 1/2

- 12)\* Unscrew the screw plug and screw in the adapter (ELTI code 46838) for the PLAST 2000 70ccm (ELTI code 66967) (picture 13.)



ELTI ID:46838

Picture 13.: connector with the adapter for the PLAST 2000

- 13)\* Unscrew screw on the tube with the PLAST 2000 70ccm (ELTI code 66967) and fill up the connector (picture 14.)

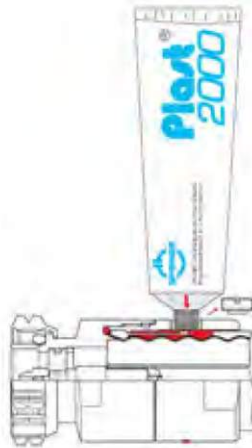


Picture 14.: The connector filed up with the past

\* OR



- 14) \* Unscrew the screw plug and screw in the PLAST 2000 20ccm (ELTI code 57978) and direct fill up the connector (picture 15.)



Picture 15.: The connector filled up with the past (picture is symbolic)

- 15) Screw back in the screw plug and tape the connector with the NAJ TAPE (picture 16.)



Picture 16.: Taped connector

- 16) Place the shrinking tube over the connector and worm it until it shrinks (picture 17.)



Picture 17.: Shrinking tube over the connector

## INSTRUCTION FOR PROPERLY CONNECTIONS OF EIA FLANGED CONNECTORS: 7/8", 1 5/8", 3 1/8", 4 1/2", 5" and 6 1/8"

### A.) Required tools:

- ❖ torque wrench with measuring span 5 - 50 Nm, for example:



or



- ❖ short coupling elements with gaskets and screws

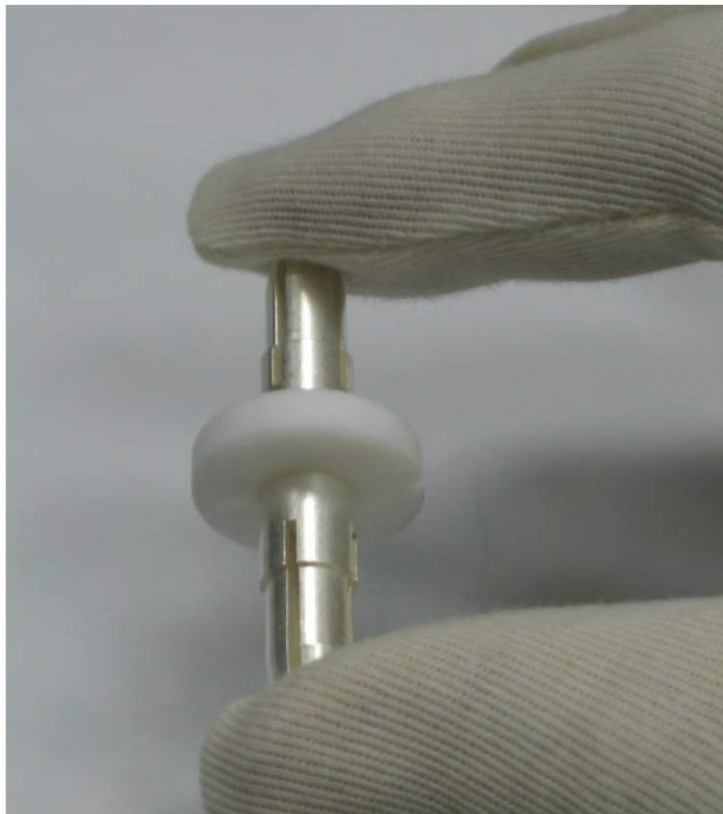
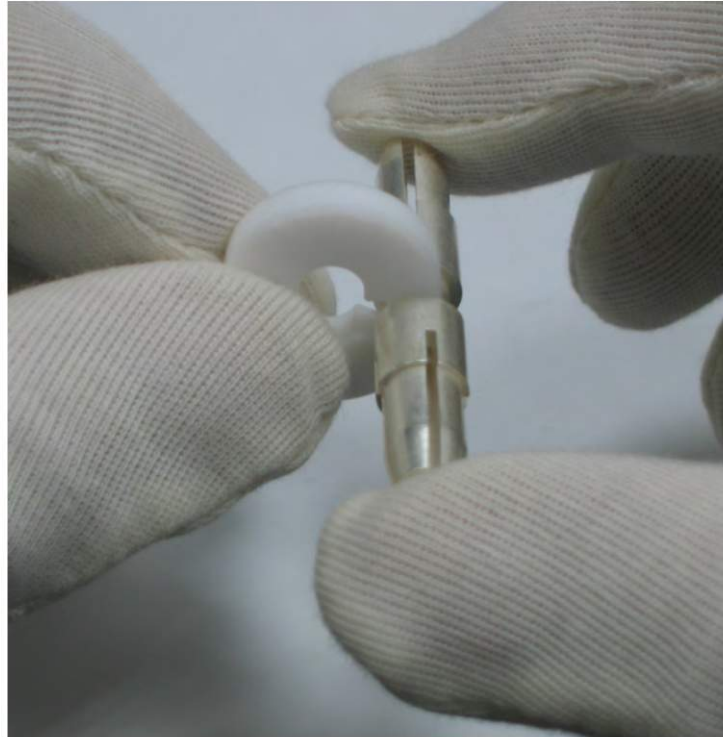


- ❖ silicone paste  
for example: wacker siliconpaste P4 or P8

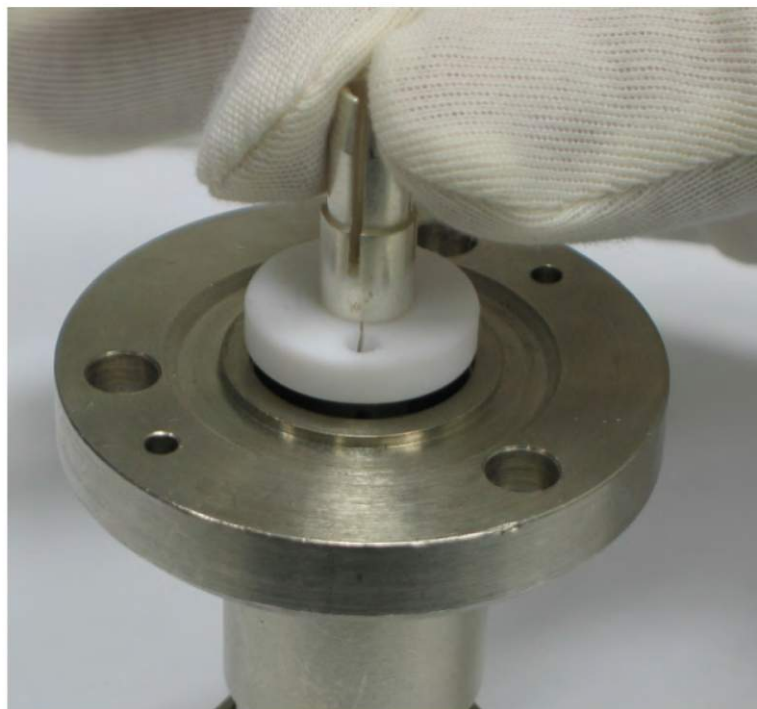


## **B.) Steps for proper connection of EIA flanged connectors:**

- 1.) Assemble short coupling element - inner. Because the inner body is silvered, it's necessary to use clean cotton gloves.



2.) Insert short coupling element – inner into connector.



- 3.) Put on the flange the gasket, which must be first lubricated with silicon paste. Pay attention that the paste will not get on the contact surface of the connector!



4.) Connect both connectors



5.) Insert adequate screws into the flange (see table 1).



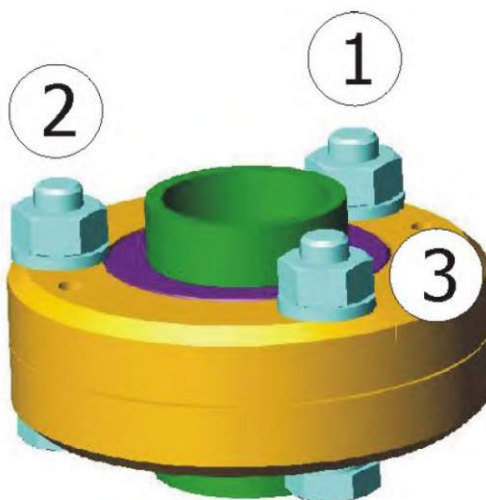


- 6.) Gradually pull tight the screws – **but not completely**.  
It's necessary to consider the steps of pulling tight the screws as it is shown on the pictures bellow.  
**THE PROCEDURE MUST BE REPEATED SEVERAL TIMES.**



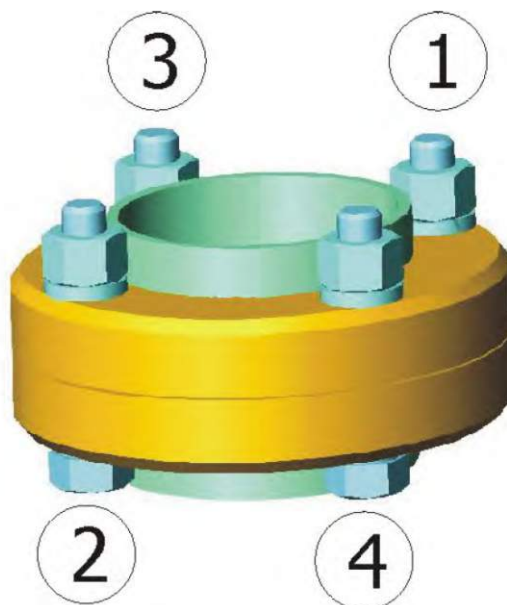
- **Connector EIA 7/8"**

The numbers in circles are marking the steps.  
**THE PROCEDURE MUST BE REPEATED SEVERAL TIMES.**



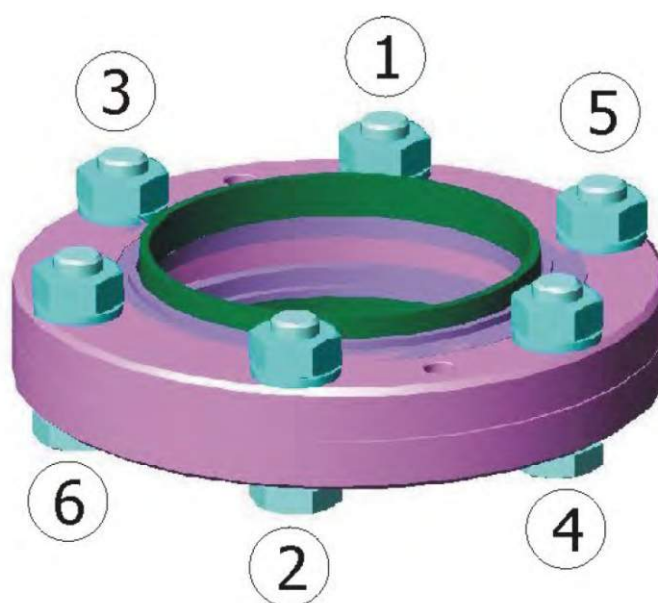
- **Connector EIA 1 5/8"**

The numbers in circles are marking the steps.  
THE PROCEDURE MUST BE REPEATED SEVERAL TIMES.



- **Connector EIA 3 1/8"**

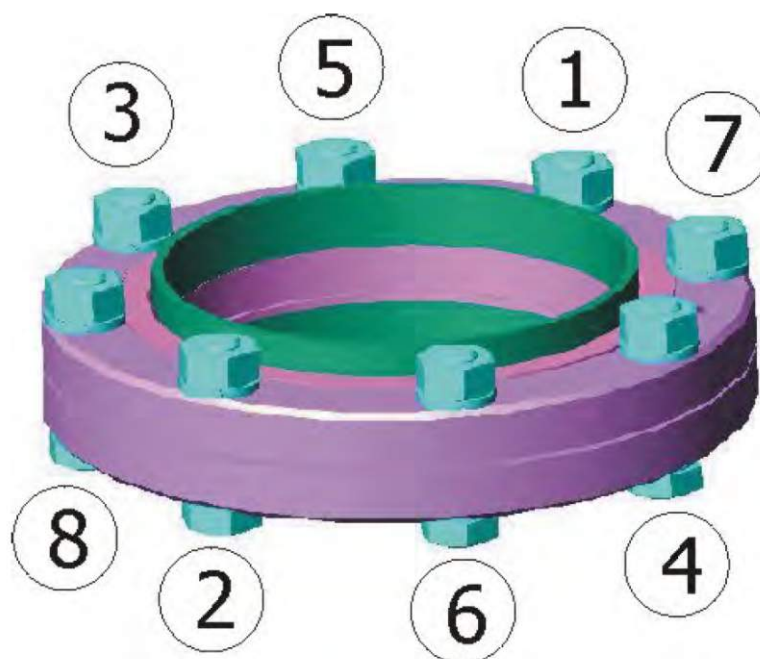
The numbers in circles are marking the steps.  
THE PROCEDURE MUST BE REPEATED SEVERAL TIMES.





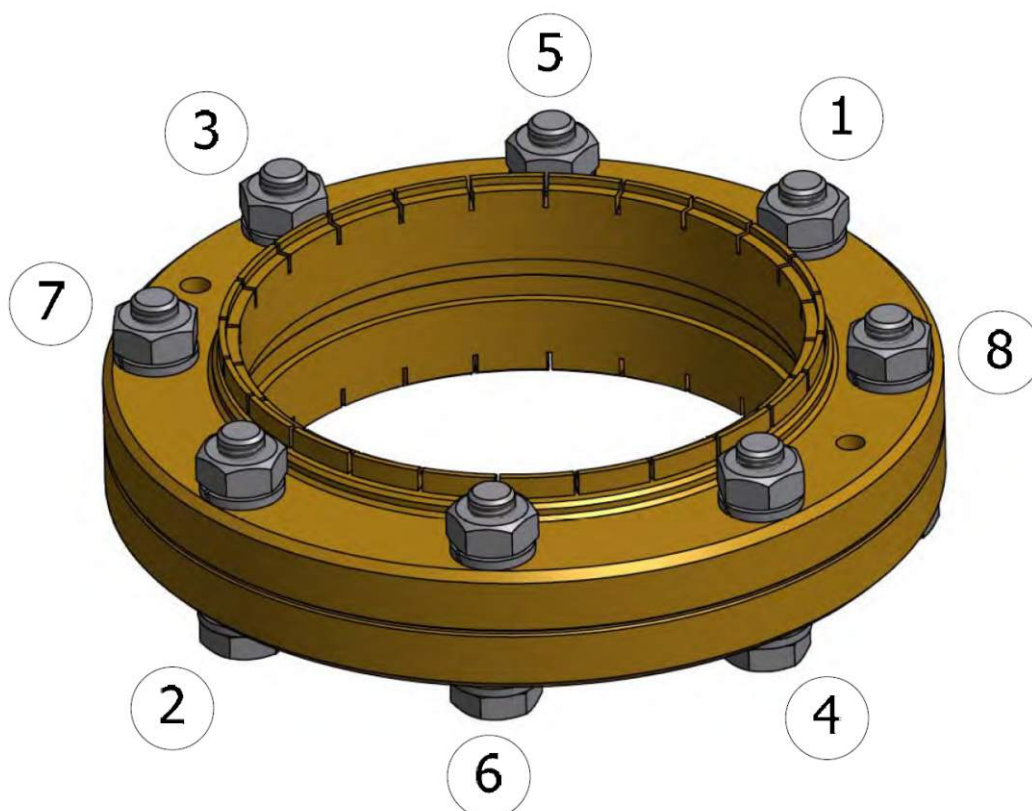
- **Connector EIA 4 1/2"**

The numbers in circles are marking the steps.  
THE PROCEDURE MUST BE REPEATED SEVERAL TIMES.



- **Connector EIA 5"**

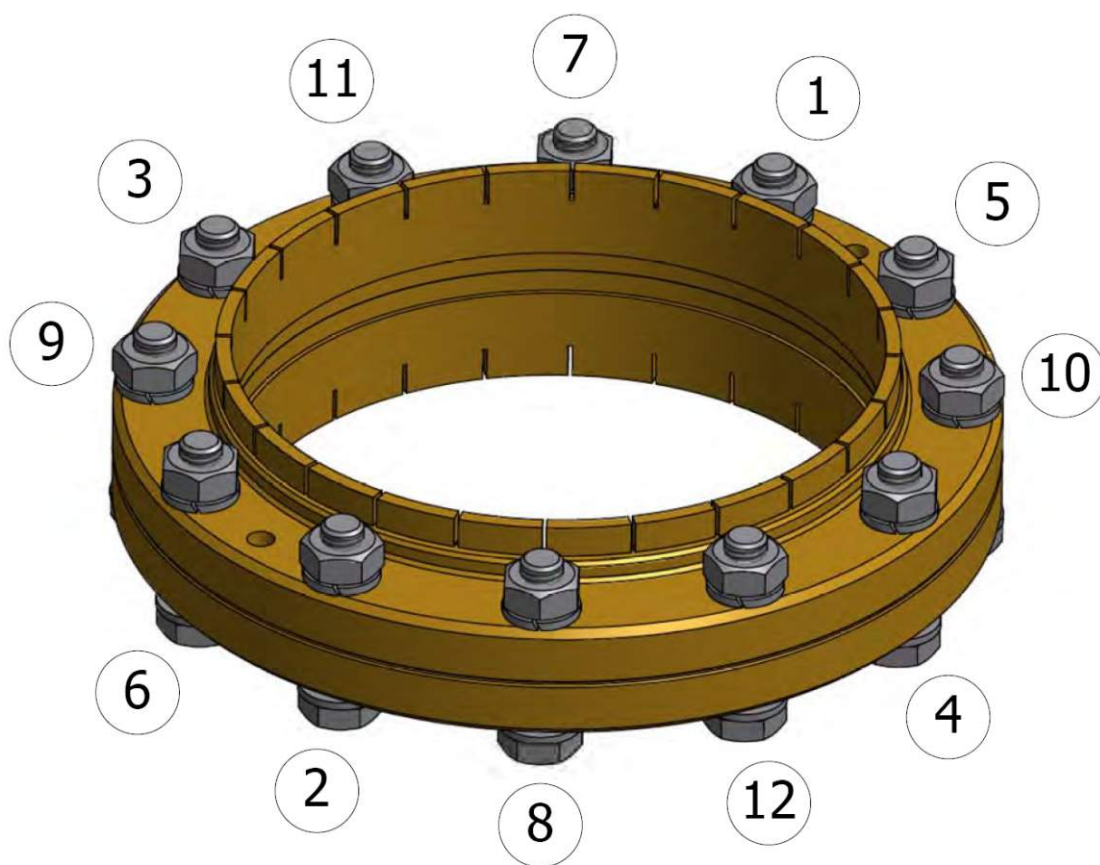
The numbers in circles are marking the steps.  
THE PROCEDURE MUST BE REPEATED SEVERAL TIMES.



- **Connector EIA 6 1/8"**

The numbers in circles are marking the steps.

THE PROCEDURE MUST BE REPEATED SEVERAL TIMES.



**7.) Final screws pull tight** is made with **torque wrench** with measuring span 5 - 50 Nm.

**Consider moments of stretching as in table 1. bellow.**



### **MOMENT OF STRETCHING:**

Type of flange	Nr. of screw	Size of screw	Moment of stretching
EIA 7/8"	3	M6x30	<b>6 Nm</b>
EIA 1 5/8"	4	M8x35	<b>14 Nm</b>
EIA 3 1/8"	6	M10x40	<b>26 Nm</b>
EIA 4 1/2"	8	M10x45	<b>26 Nm</b>
EIA 5"	8	M10x45	<b>26 Nm</b>
EIA 6 1/8"	12	M10x60	<b>26 Nm</b>

table 1.

### **3.10 INSTRUCTIONS FOR MAINTENANCE OF ANTENNA SYSTEMS ON THE TUBE.**

Maintenance instructions for UHF antenna system YEGHEGNADZOR.

Because of external influences (rain, snow, wind, stroke) on the construction of the antenna system, it's necessary to perform periodical reviews and abolish every time the damages, which are or should arise and cause the function fall out.

#### **1. MECHANICAL CONTROL**

- **Control of screws for fixation on the antenna system, according to attached table of tightening moments (Table 1).**
- ❖ Tightening control of all connecting screws for the fixation antennas WITHOUT DISTANCE on the antenna holders as shown in the drawing No. 1-61-U139-1 (instructions for maintenance of antenna system).
- ❖ Tightening control of all connecting screws for the fixation antennas WITH DISTANCE on HOLDER FOR DISTANCE as shown in the drawing No. 1-61-U139-1 (instructions for maintenance of antenna system).
- ❖ Tightening control of all connecting screws for the fixation HOLDER FOR DISTANCE on the antenna holders as shown in the drawing No. 1-61-U139-1 (instructions for maintenance of antenna system).
- ❖ Tightening control of all connecting screws for the fixation antenna holders on hot-dip galvanized steel pipe mast Ø 102mm, as shown in the drawing No. 1-61-U139-1.
- ❖ Tightening control of all connecting screws for the fixation of dividers on the divider holders as shown in the drawing No. 1-61-U139-1 (instructions for maintenance of antenna system).
- ❖ Tightening control of all connecting screws for the fixation of divider holders on the tube Ø102mm as shown in the drawing No. 1-61-U139-1 (instructions for maintenance of antenna system).
- ❖ Tightening control of all screws for the fixation lightning conductor and holder for lights on pipe mast Ø 102mm as shown in the drawing No. 1-61-U139-1 (instructions for maintenance of antenna system).
- ❖ Tightening control of all connecting screws for fixing the hot-dip galvanized steel pipe mast Ø 102mm on existing tower.

- **Sealing control of antenna system**
  - ❖ Sealing control of cables, connectors, antennas and dividers.
- **Fixation control of connectors and cables**
  - ❖ Control of fixation and tightening of connectors on antennas and dividers.
  - ❖ Control of cable fixation on whole construction of the UHF antenna system and on whole mast.
  - ❖ Control of possible cable damages
- **Control of mechanical damages on the antenna covers as a result of stroke of lightning or mechanical stroke**

## **2. ELECTRICAL CONTROL**

- **Control of return loss of the antenna system**

## **3. GROUNDING**

- **Control of lightning conductor fixation on the mast**
- **Control of grounding connections between the UHF antenna system and the existing mast**
- **Control of grounding resistance of whole antenna system**
- **Control of grounding connections on main feeder cable**

#### 4. CONTROL FLOW

##### REGULAR CONTROL:

The first control has to be made after first 3 months after start up of antenna system and then every 6 months.

##### SPECIAL CONTROL:

Special review has to be made after every special circumstances which could affect the certainty and functionality of antenna system, such as big snow, ice, unusual strong wind, extra low, respectively high temperature, earthquake, stroke of lightning, etc and after every change of load of antenna system. Special survey should be performed as regular survey.

**Company ELTI must be informed in written about performed controls.**

**Regular reports are composing parts of guarantee protocol.**

Table 1:

Coil	Key size		Tightening moments for screws	
	Six-edge screw	Screw nut	(without oil)	(with oil)
M6	10 mm	5 mm	10,5 Nm	15 Nm
M8	13 mm	6 mm	26 Nm	36 Nm
M10	17 mm	8 mm	51 Nm	72 Nm
M12	19 mm	10 mm	89 Nm	125 Nm
M16	24 mm	14 mm	210 Nm	305 Nm
M20	30 mm	17 mm	410 Nm	590 Nm
M24	36 mm	19 mm	710 Nm	950 Nm
M30	46 mm	---	1450 Nm	2050 Nm



to scale	1	2	3	4	5	6	7	8	9	10	11	12
mm	1	2	3	4	5	6	7	8	9	10	11	12
cm	10	20	30	40	50	60	70	80	90	100	110	120
m	100	200	300	400	500	600	700	800	900	1000	1100	1200

LIGHTNING CONDUCTOR,  
HOLDER FOR ANTENNA  
A (1:5)

LIGHTNING CONDUCTOR

SCREWS M8 A4 DIN 931  
WASHER 8 A4 DIN 125,127

SCREW M16X75 ZN DIN 931  
NUT M16 DIN 934  
WASHER 16 DIN 125,127

HOLDER BETWEEN BAYS  
G (0,13:1)

VERTICAL HOLDERS 98000  
Dr.No.:1-14-D805-1-  
6 PIECES OF BETWEEN BAYS

HOLDER FOR ANTENNA OFFSET-DISTANCE  
B (1:5)

HOLDERS FOR DISTANCE  
OF ANTENNA

SCREWS M8 ZN DIN 931  
NUT M8 ZN DIN 934  
WASHER 8 ZN DIN 125,127

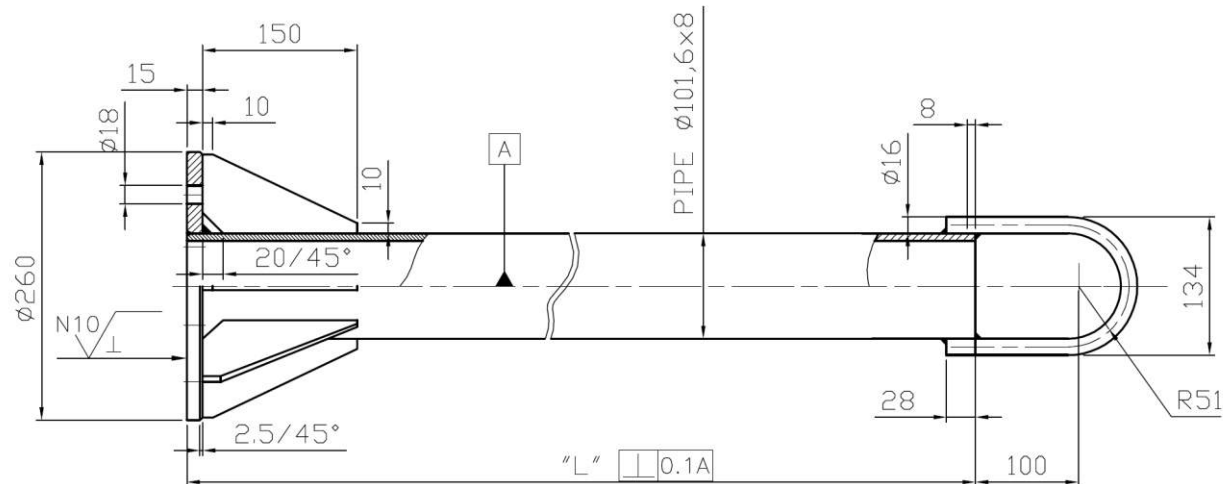
F (1:5)

HOLDER FOR DEVIDER  
E (1:5)

PICTURE AND CONFIGURATION IS SYMBOLIC!

	Surface protection:	Assessment:	Material:	Material code:	B.mass/Al.mass
	dm2	1:15			/N/A
	Date:	Name:	Description:		
	Drawn by: 14.10.2011 klemenc	Drawn by: 14.10.2011 klemenc	DESCRIPTION FOR MAINTENANCE		
	Checked by:	Checked by:	FOR A.S.Y. ON TUBE		
	Constructed by:	Constructed by:	Drawing No:	1-61-U139-1-01	Page:
No Change:	Date:	Name	File name:	1-61-U139-1-01.dwg	

Risba je last podjetja ELTI d.o.o.  
Razmnoževanje, predaja tretjemu  
ali uporaba v namene, ki niso  
dogovorjeni, ni dovoljena!



3D MODEL INVENTOR

QUANTITY:

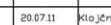
Description:								
--------------	--	--	--	--	--	--	--	--

UPPER RIDE 101 / 10 / 11 /UPPER PIPE 101,6/8X-LWITH FLANGEWITH TIEING

Drawing No:	Page
-------------	------

1-13-I402-1-03

1-13-I402-1-03	
----------------	--

[illegible]

02-02-09	Klemer
----------	--------

Date:	Name:
-------	-------

1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053	2054	2055	2056	2057	2058	2059	2060	2061	2062	2063	2064	2065	2066	2067	2068	2069	2070	2071	2072	2073	2074	2075	2076	2077	2078	2079	2080	2081	2082	2083	2084	2085	2086	2087	2088	2089	2090	2091	2092	2093	2094	2095	2096	2097	2098	2099	2100	2101	2102	2103	2104	2105	2106	2107	2108	2109	2110	2111	2112	2113	2114	2115	2116	2117	2118	2119	2120	2121	2122	2123	2124	2125	2126	2127	2128	2129	2130	2131	2132	2133	2134	2135	2136	2137	2138	2139	2140	2141	2142	2143	2144	2145	2146	2147	2148	2149	2150	2151	2152	2153	2154	2155	2156	2157	2158	2159	2160	2161	2162	2163	2164	2165	2166	2167	2168	2169	2170	2171	2172	2173	2174	2175	2176	2177	2178	2179	2180	2181	2182	2183	2184	2185	2186	2187	2188	2189	2190	2191	2192	2193	2194	2195	2196	2197	2198	2199	2200	2201	2202	2203	2204	2205	2206	2207	2208	2209	2210	2211	2212	2213	2214	2215	2216	2217	2218	2219	2220	2221	2222	2223	2224	2225	2226	2227	2228	2229	2230	2231	2232	2233	2234	2235	2236	2237	2238	2239	2240	2241	2242	2243	2244	2245	2246	2247	2248	2249	2250	2251	2252	2253	2254	2255	2256	2257	2258	2259	2260	2261	2262	2263	2264	2265	2266	2267	2268	2269	2270	2271	2272	2273	2274	2275	2276	2277	2278	2279	2280	2281	2282	2283	2284	2285	2286	2287	2288	2289	2290	2291	2292	2293	2294	2295	2296	2297	2298	2299	2300	2301	2302	2303	2304	2305	2306	2307	2308	2309	2310	2311	2312	2313	2314	2315	2316	2317	2318	2319	2320	2321	2322	2323	2324	2325	2326	2327	2328	2329	2330	2331	2332	2333	2334	2335	2336	2337	2338	2339	2340	2341	2342	2343	2344	2345	2346	2347	2348	2349	2350	2351	2352	2353	2354	2355	2356	2357	2358	2359	2360	2361	2362	2363	2364	2365	2366	2367	2368	2369	2370	2371	2372	2373	2374	2375	2376	2377	2378	2379	2380	2381	2382	2383	2384	2385	2386	2387	2388	2389	2390	2391	2392	2393	2394	2395	2396	2397	2398	2399	2400	2401	2402	2403	2404	2405	2406	2407	2408	2409	2410	2411	2412	2413	2414	2415	2416	2417	2418	2419	2420	2421	2422	2423	2424	2425	2426	2427	2428	2429	2430	2431	2432	2433	2434	2435	2436	2437	2438	2439	2440	2441	2442	2443	2444	2445	2446	2447	2448	2449	2450	2451	2452	2453	2454	2455	2456	2457	2458	2459	2460	2461	2462	2463	2464	2465	2466	2467	2468	2469	2470	2471	2472	2473	2474	2475	2476	2477	2478	2479	2480	2481	2482	2483	2484	2485	2486	2487	2488	2489	2490	2491	2492	2493	2494	2495	2496	2497	2498	2499	2500	2501	2502	2503	2504	2505	2506	2507	2508	2509	2510	2511	2512	2513	2514	2515	2516	2517	2518	2519	2520	2521	2522	2523	2524	2525	2526	2527	2528	2529	2530	2531	2532	2533	2534	2535	2536	2537	2538	2539	2540	2541	2542	2543	2544	2545	2546	2547	2548	2549	2550	2551	2552	2553	2554	2555	2556	2557	2558	2559	2560	2561	2562	2563	2564	2565	2566	2567	2568	2569	2570	2571	2572	2573	2574	2575	2576	2577	2578	2579	2580	2581	2582	2583	2584	2585	2586	2587	2588	2589	2590	2591	2592	2593	2594	2595	2596	2597	2598	2599	2600	2601	2602	2603	2604	2605	2606	2607	2608	2609	2610	2611	2612	2613	2614	2615	2616	2617	2618	2619	2620	2621	2622	2623	2624	2625	2626	2627	2628	2629	2630	2631	2632	2633	2634	2635	2636	2637	2638	2639	2640	2641	2642	2643	2644	2645	2646	2647	2648	2649	2650	2651	2652	2653	2654	2655	2656	2657	2658	2659	2660	2661	2662	2663	2664	2665	2666	2667	2668	2669	2670	2671	2672	2673	2674	2675	2676	2677	2678	2679	2680	2681	2682	2683	2684	2685	2686	2687	2688	2689	2690	2691	2692	2693	2694	2695	2696	2697	2698	2699	2700	2701	2702	2703	2704	2705	2706	2707	2708	2709	2710	2711	2712	2713	2714	2715	2716	2717	2718	2719	2720	2721	2722	2723	2724	2725	2726	2727	2728	2729	2730	2731	2732	2733	2734	2735	2736	2737	2738	2739	2740	2741	2742	2743	2744	2745	2746	2747	2748	2749	2750	2751	2752	2753	2754	2755	2756	2757	2758	2759	2760	2761	2762	2763	2764	2765	2766	2767	2768	2769	2770	2771	2772	2773	2774	2775	2776	2777	2778	2779	2780	2781	2782	2783	2784	2785	2786	2787	2788	2789	2790	2791	2792	2793	2794	2795	2796	2797	2798	2799	2800	2801	2802	2803	2804	2805	2806	2807	2808	2809	2810	2811	2812	2813	2814	2815	2816	2817	2818	2819	2820	2821	2822	2823	2824	2825	2826	2827	2828	2829	2830	2831	2832	2833	2834	2835	2836	2837	2838	2839	2840	2841	2842	2843	2844	2845	2846	2847	2848	2849	2850	2851	2852	2853	2854	2855	2856	2857	2858	2859	2860	2861	2862	2863	2864	2865	2866	2867	2868	2869	2870	2871	2872	2873	2874	2875	2876	2877	2878	2879	2880	2881	2882	2883	2884	2885	2886	2887	2888	2889	2890	2891	2892	2893	2894	2895	2896	2897	2898	2899	2900	2901	2902	2903	2904	2905	2906	2907	2908	2909	2910	2911	2912	2913	2914	2915	2916	2917	2918	2919	2920	2921	2922	2923	2924	2925	2926	2927	2928	2929	2930	2931	2932	2933	2934	2935	2936	2937	2938	2939	2940	2941	2942	2943	2944	2945	2946	2947	2948	2949	2950	2951	2952	2953	2954	2955	2956	2957	2958	2959	2960	2961	2962	2963	2964	2965	2966	2967	2968	2969	2970	2971	2972	2973	2974	2975	2976	2977	2978	2979	2980	2981	2982	2983	2984	2985	2986	2987	2988	2989	2990	2991	2992	2993	2994	2995	2996	2997	2998	2999	3000	3001	3002	3003	3004	3005	3006	3007	3008	3009	3010	3011	3012	3013	3014	3015	3016	3017	3018	3019	3020	3021	3022	3023	3024	3025	3026	3027	3028	3029	3030	3031	3032	3033	3034	3035	3036	3037	3038	3039	3040	3041	3042	3043	3044	3045	3046	3047	3048	3049	3050	3051	3052	3053	3054	3055	3056	3057	3058	3059	3060	3061	3062	3063	3064	3065	3066	3067	3068	3069	3070	3071	3072	3073	3074	3075	3076	3077	3078	3079	3080	3081	3082	3083	3084	3085	3086	3087	3088	3089	3090	3091	3092	3093	3094	3095	3096	3097	3098	3099	3100	3101	3102	3103	3104	3105	3106	3107	3108	3109	3110	3111	3112	3113	3114	3115	3116	3117	3118	3119	3120	3121	3122	3123	3124	3125	3126	3127	3128	3129	3130	3131	3132	3133	3134	3135	3136	3137	3138	3139	3140	3141	3142	3143	3144	3145	3146	3147	3148	3149	3150	3151	3152	3153	3154	3155	3156	3157	3158	3159	3160	3161	3162	3163	3164	3165	3166	3167	3168	3169	3170	3171	3172	3173	3174	3175	3176	3177	3178	3179	3180	3181	3182	3183	3184	3185	3186	3187	3188	3189	3190	3191	3192	3193	3194	3195	3196	3197	3198	3199	3200	3201	3202	3203	3204	3205	3206	3207	3208	3209	3210	3211	3212	3213	3214	3215	3216	3217	3218	3219	3220	3221	3222	3223	3224	3225	3226	3227	3228	3229	3230	3231	3232	3233	3234	3235	3236	3237	3238	3239	3240	3241	3242	3243	3244	3245	3246	3247	3248	3249	3250	3251	3252	3253	3254	3255	3256	3257	3258	3259	3260	3261	3262	3263	3264	3265	3266	3267	3268	3269	3270	3271	3272	3273	3274	3275	3276	3277	3278	3279	3280	3281	3282	3283	3284	3285	3286	3287	3288	3289	3290	3291	3292	3293	3294	3295	3296	3297	3298	3299	3300	3301	3302	3303	3304	3305	3306	3307	3308	3309	3310	3311	3312	3313	3314	3315	3316	3317	3318	3319	3320	3321	3322	3323	3324	3325	3326	3327	3328	3329	3330	3331	3332	3333	3334	3335	3336	3337	3338	3339	3340	3341	3342	3343	3344	3345	3346	3347	3348	3349	3350	3351	3352	3353	3354	3355	3356	3357	3358	3359	3360	3361	3362	3363	3364	336
------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	-----

---

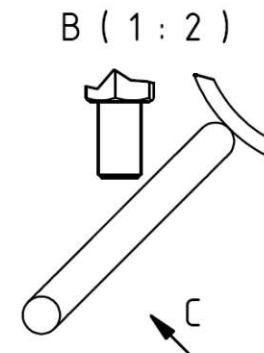
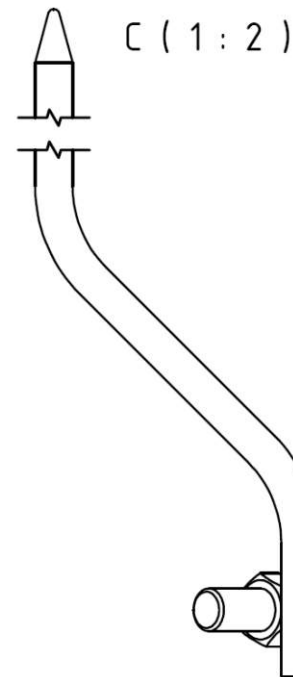
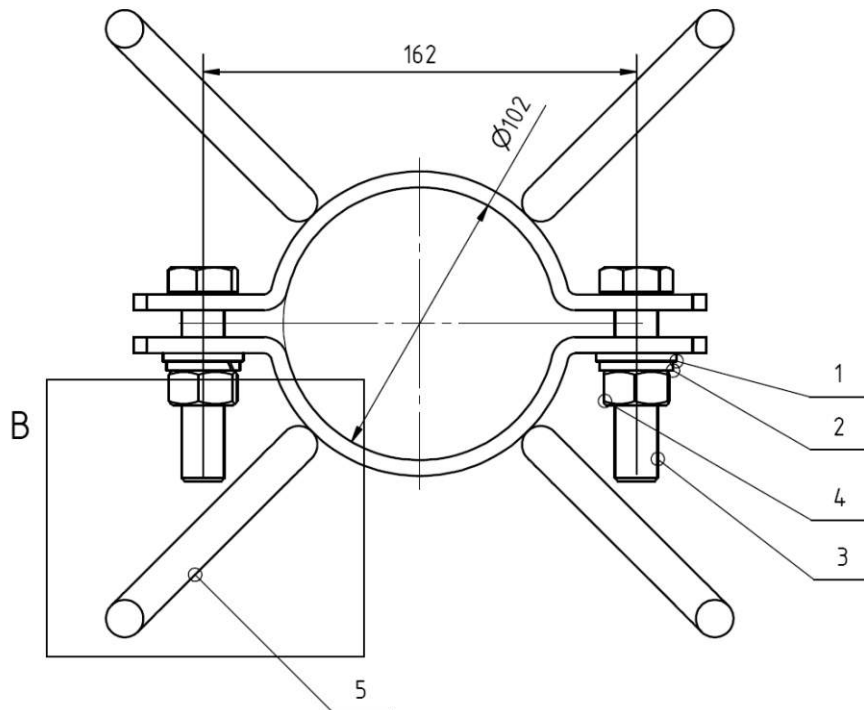
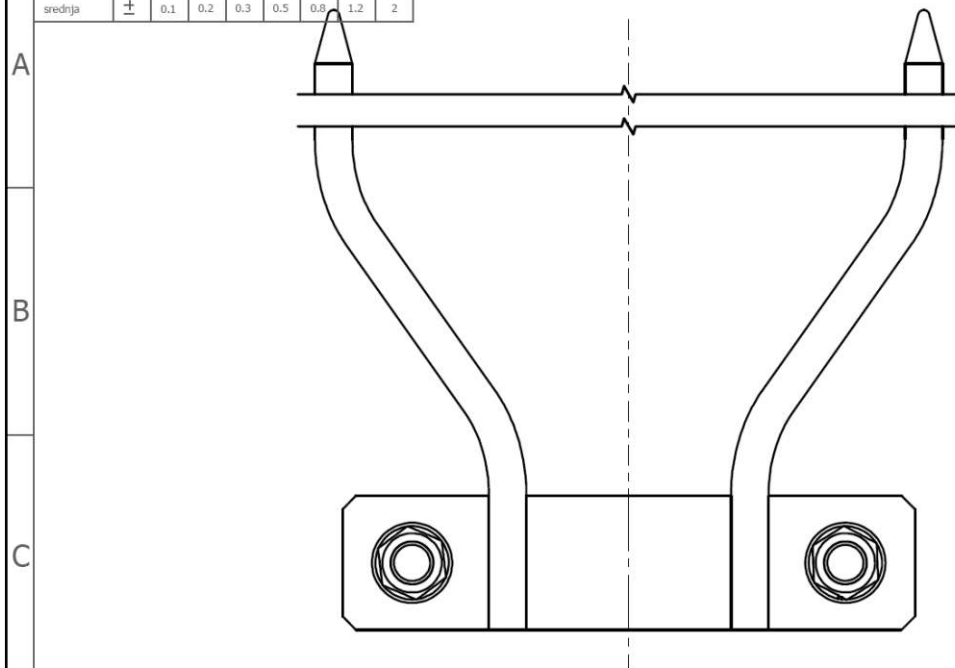
1-13-I402-1-03

1-13-I402-1-03

1-13-I402-1-03



Im. mera	nad	0	6	30	120	315	1000	2000
Stopnja natanč.	do	6	30	120	315	1000	2000	4000
srednja	±	0.1	0.2	0.3	0.5	0.8	1.2	2



	03	sprememba načrta	20.11.2012	Klemenčič
	02	Inventor risba	23.9.2011	Klemenčič
Lega	Št.	Sprememba	Datum	Ime
Zgodovina sprememb				

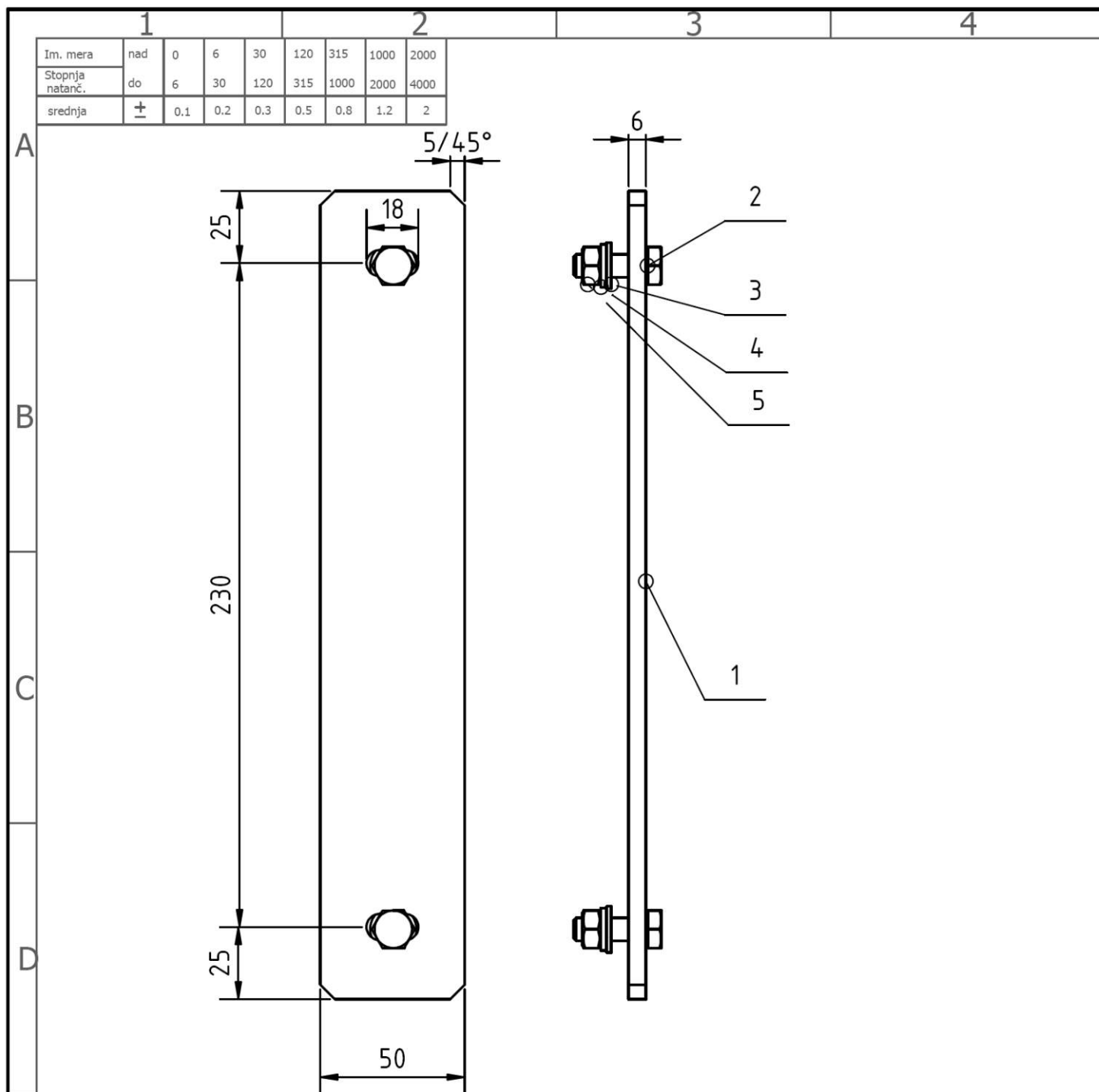
5	1	STRELOVOD 4S	86386	1-13-U371-1-01	
4	2	MATICA DIN 934 - M16	93971		
3	2	VIJAK DIN 933 - M16 x 70	97936		
2	2	PODLOŽKA DIN 127 - A 16	93939		
1	2	PODLOŽKA DIN 125 - A 17	93972		
POZ	KOS	NAZIV	ŠIFRA	ŠT. RISBE / ST	OPOMBA

KOSOVNICA					
		Pov.zaščita: FeTzn150 vroče Zndm2	Merilo: 1:2	Material:	B.masa/N.masa
		Datum	Ime:	Šifra mat.	/5,305 kg
		Risal 23.9.2011	Klemenčič	<b>LIGHTNING CONDUCTOR 4X</b> za cev 102	
		Pregl. 23.9.2011	Vlašič M.		
		Konstruiral			
		86384		Številka risbe:	Stran
				1-23-D812-1-03	
Št.	Sprememba	Datum	Ime	Datoteka: 1-23-D812-1-03.idw	

This drawing is property of company ELTI d.o.o.  
Copying, delivery to third party or any other use for not  
allowed purposes is prohibited!

Risba je last podjetja ELTI d.o.o.  
Razmnoževanje,  
predaja tretjemu ali uporaba v namene,

KOSOVNICA												
		Pov.zaščita:		Merilo:		Material:		Šifra mat.		B.masa/N.masa		
		dm2								/7,610 kg		
		Datum		Ime:		Naziv:  NOSILEC ANTENE 89-102						
		Risal 26.9.2011		I.Vrsic								
		Pregl. 26.9.2011		Vlašič M.								
		Kontrj				Številka risbe:  1-32-J095-1-02						
		Konstruiral										
		44105										
Št. Sprememba		Datum		Ime		Datoteka: 1-32-J095-1-02.idw		Stran:				



5	2	MATICA DIN 934 - M8	48480		
4	2	VZMETNA PODLOŽKA DIN 127 - A 8	71355		
3	2	PODLOŽKA DIN 125 - A 8,4	63386		
2	2	VIJAK DIN 933 - M8 x 25	63385		
1	1	VERTICAL HOLDER	86385	1-14-L792-1-00	
POZ	KOS	NAZIV	ŠIFRA	ŠT. RISBE / ST	OPOMBA

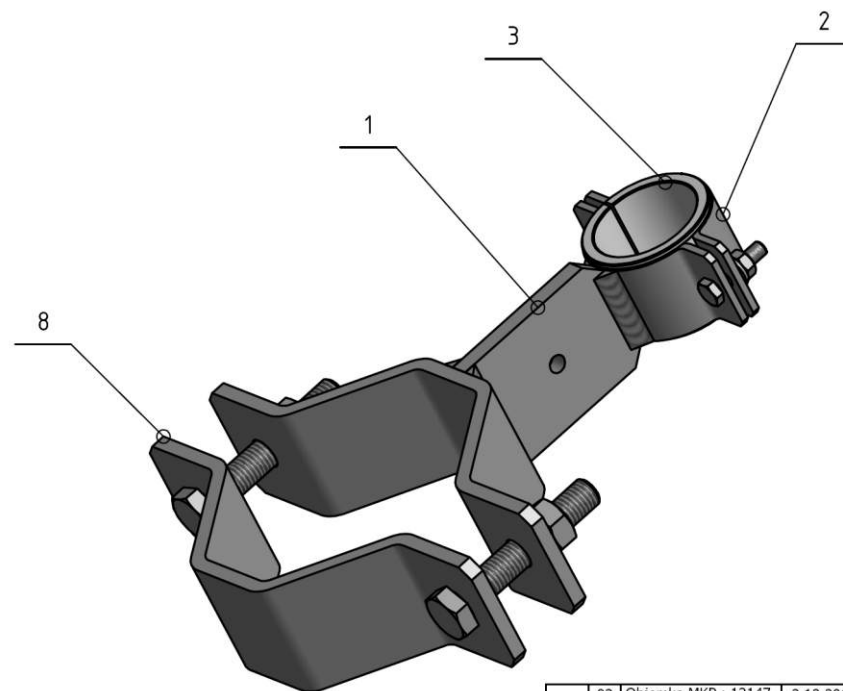
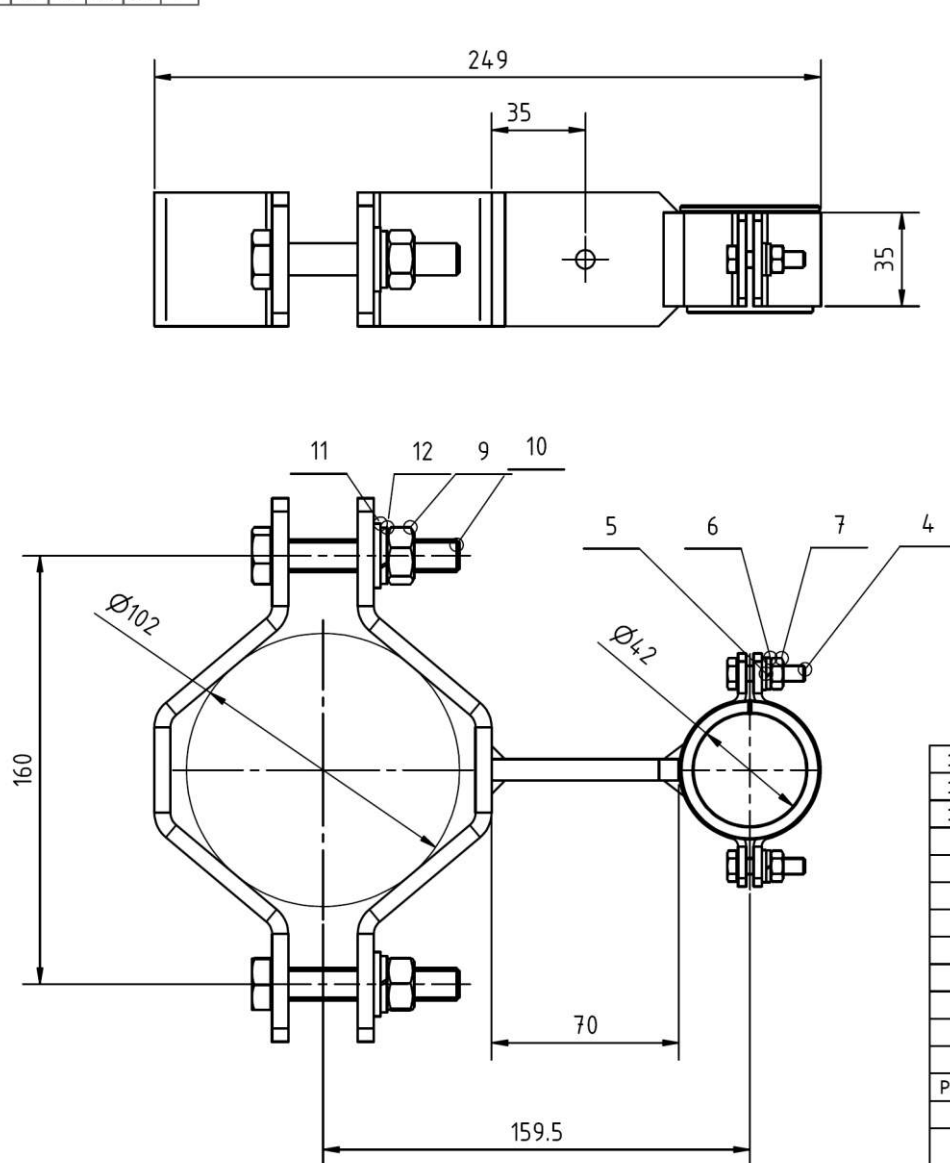
#### KOSOVNICA

		Pov.zaščita: galvanizirati vroče dm2	Merilo: 1:2	Material: Ploščato 50x6 St37-2	Šifra mat. 97935	B.masa/N.masa 0,7 / 0,692 kg
		Datum 6.9.2011	Ime: Klemenčič	<b>VERTICAL HOLDER</b>		
		Risal 6.9.2011	Vlašič M.			
		Pregl.				
		Kontr.				
		Konstruiral		Številka risbe: 1-14-L792-1-00		
				Stran		
Št.	Sprememba	Datum	Ime	Datoteka: 1-14-L792-1-00.idw		

This drawing is property of company ELTI d.o.o.  
Copying, delivery to third party or any other use for not  
allowed purposes is prohibited!

Risba je last podjetja ELTI d.o.o.  
Razmnoževanje,  
predaja tretjemu ali uporaba v namene,  
ki niso dogovorjeni, ni dovoljena!

Im. mera	nad	0	6	30	120	315	1000	2000
Stopnja natanč.	do	6	30	120	315	1000	2000	4000
srednja	±	0.1	0.2	0.3	0.5	0.8	1.2	2



03	Objemka MKP.: 12147	2.12.2013	Klemenčič
Lega	Št.	Sprememba	Ime

Zgodovina sprememb				
12	2	Podložka DIN 127 - A 12	39600	
11	2	Podložka DIN 125 - A 12	39599	
10	2	Vijak DIN 933 - M12 x 70 A4	39724	
9	2	Matica DIN 934 - M12	48482	
8	1	OBJEMKA ZA CEV 89-102 (M12)	44713	1-14-AL112-1-00
7	2	MATICA DIN 934 - M6 A4	48479	
6	2	PODLOŽKA DIN 127 - A 6 A4	44362	
5	2	PODLOŽKA DIN 125-2 - B 6,4 A4	46708	
4	2	VIJAK DIN 933 - M6 x 25 A4	46706	
3	1	VLOŽEK OBJEMKE 42 PA	48865	1-14-T819-1-00
2	1	OBJEMKA 42/35/3	59499	1-14-H587-1-01
1	1	NOSILEC DEL 102-108 za 42-zvarjenec	39429	1-13-AG028-1-01
POZ	KOS	NAZIV	ŠIFRA	ŠT. RISBE / ST
				OPOMBA

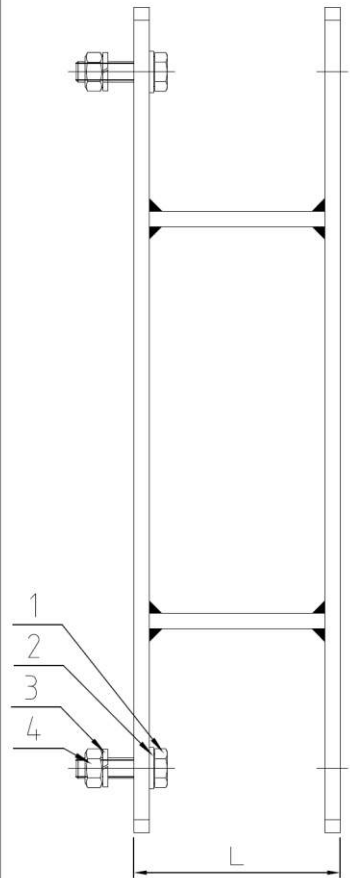
KOSOVNICA				
	Surface protection:	Measurement:	Material:	Material code:
	T.FeZn130	1:2		
	12 dm2			
	Date:	Name:	Description:	
	Drawing by: 7.9.2012	zdenko.klemencic	NOSILEC DEL. 102-108 ZA 42 sklop	
	Verifid by: 7.9.2012	Vlašič M.		
	Control by:			
	Constructed by:			
			Drawing No:	Page:
			47010 / 86067	1-13-K545-1-03
No.	Change:	Date:	Name:	File name: 1-13-K545-1-03.idw

This drawing is property of company  
ELTI d.o.o. Copying, delivery to third  
party or any other use for not  
allowed purposes is prohibited

Risba je last podjetja ELTI d.o.o.  
Razmnoževanje, predaja tretjemu  
ali uporaba v namene, ki niso  
dogovorjeni, ni dovoljena

In. mera	nad	0	6	30	120	315	1000	2000
Stopnja način	do	6	30	120	315	1000	2000	4000
srednja	±	0.1	0.2	0.3	0.5	0.8	1.2	2

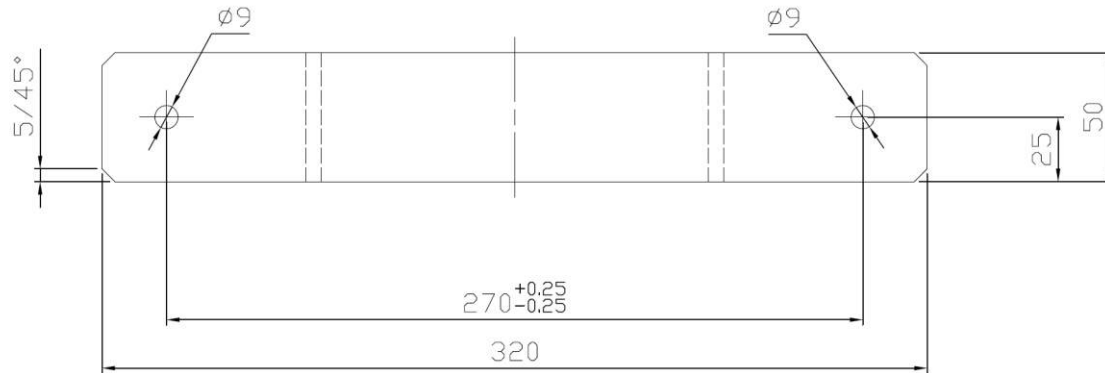
# KOMPLETIRANJE POLIZDELKA Z VIJAČNIM MATERIALOM



## OPOMBA:

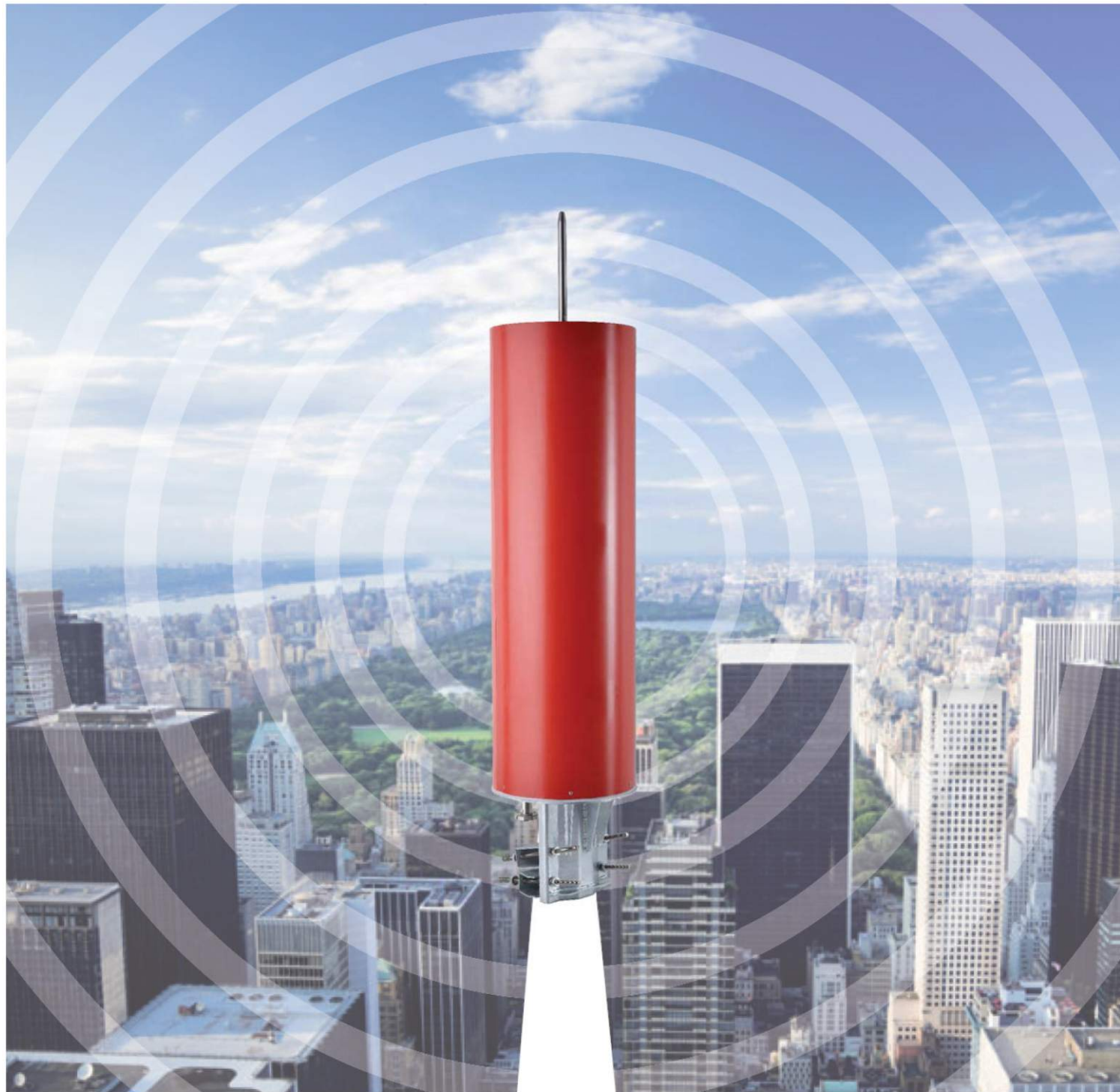
- Ostre robove posneti,
- Pazi na točnost mere izmika (L),
- Po vročem cinkanju odstraniti odvečni cink.
- Vijačni material po kosovnici.

03	130 mm	DISTANČNIK ANTENE 130mm	86015
03	120 mm	DISTANČNIK ANTENE 120mm	86004
06	115 mm	DISTANČNIK ANTENE 115mm	86206
02	110 mm	DISTANČNIK ANTENE 110mm	58936
02	100 mm	DISTANČNIK ANTENE 100mm	58935
04	90 mm	DISTANČNIK ANTENE 90mm	48617
03	80 mm	DISTANČNIK ANTENE 80mm	44131
05	75 mm	DISTANČNIK ANTENE 75mm	86205
	70 mm	DISTANČNIK ANTENE 70mm	44132
	60 mm	DISTANČNIK ANTENE 60mm	44151
>> L <<		NAZIV	ŠIFRA



4	2	MATICA M8 A4 DIN 934	DIN 934	48480
3	2	VZMETNA PODLOŽKA 8 DIN 127	DIN 127	44363
2	2	PODLOŽKA 8 DIN 125	DIN 125	44364
1	2	VIJAK M8 x 30 A4 DIN 933	DIN 933	46873
Item	Qty	Description	Standard	Šifra
		Pov.zaščita:	Merilo:	Material:
		vroče cinkati	1:2	Ploščato 50x6
		2009	Datum	Ime:
		Risal	19-08	Klement
		Pregledal	19-08	Koren
		Kontr.		
		Konstruiral		
07	Dopolnjena tabela	13-11-2012	Klement	
06	Odprave luknj	26-10-2011	Benko	
05	Dopolnjena tabela	26-04-2011	Klojcnik	
04	Dopolnjena tabela	21-07-2010	Benko	
03	Dopolnjena tabela	30-03-2010	Klojcnik	
02	Dopolnjena tabela	23-10-2009	Klojcnik	
01	Dopolnjena tabela	19-10-2009	Klement	
Št. Sprememba:		Datum:	Ime:	Ime datoteke: 1-13-J120-1-07
		GLEJ TABELO		Številka risbe:
				1-13-J120-1-07
				Stran

DISTANČNIK ANTENE  
ZA ANTENE 31/50, 51/50



## ***TVA OMNI***



### **UHF Omni-Directional Antenna**

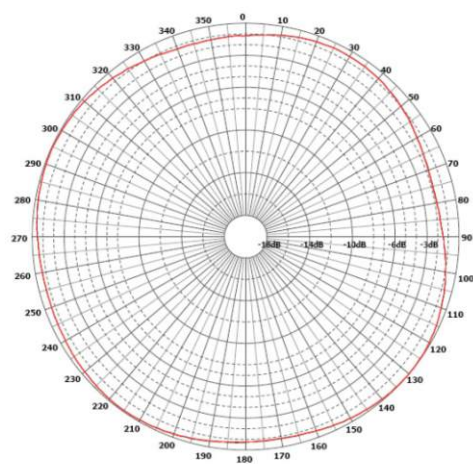
ELTI family of UHF antennas now include a NEW state-of-the-art UHF Omni-Directional Antenna with exceptional horizontal and vertical radiation patterns based on a very low weight design. TVA OMNI antenna has been developed for easy rooftop installation for special requirements of dense city coverage offering 1 or 2 bay solution to meet all customer demands.



## SPECIFICATIONS:

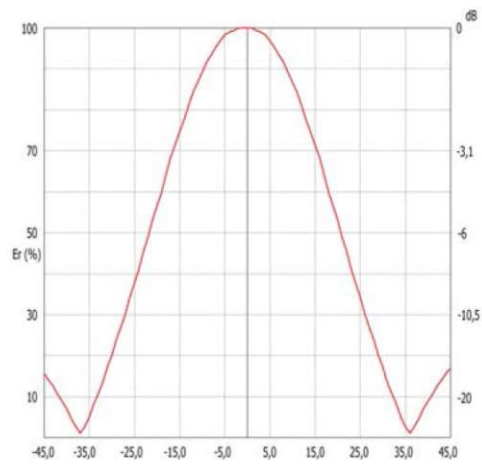
	type OM-1	type OM-2
Input connector	EIA 7/8"	EIA 1 5/8"
Impedance	50 $\Omega$	
VSWR	$\leq 1.12$ (25 dB)	
Frequency range	470 – 862 MHz	
Gain (ref. to half wave dipole)	4,5 dB	7,5 dB
Polarization	Horizontal	
Max. input power	2,5 kW	3,5 kW
Elevation pattern	25°	11°
Material:		
- dipoles and feeders	Aluminum and brass with protection	
- radome	Polyester	
Mounting	A holder with 2 clamps for pipe $\Phi$ (80-120mm)	
Icing protection	An efficient anti-frost polyester protection covering	
Lightning protection	All metal parts of antenna are DC grounded	
Weight	29 kg	50kg
Wind load	330 N at 160 km/h	590 N at 160 km/h
Max. wind velocity	225 km/h	
Dimensions (mm) *without lightening rod (250mm)	1.352 x 340	2.546 x 340

Typical horizontal radiation pattern

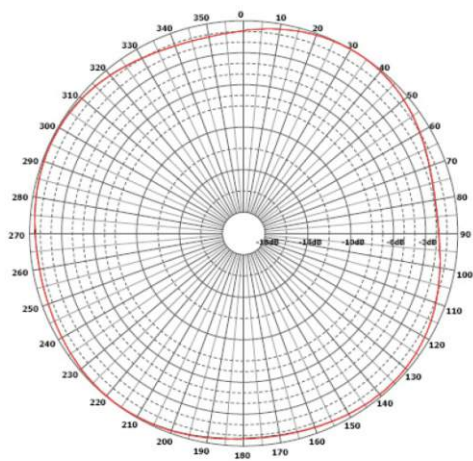


type OM-1

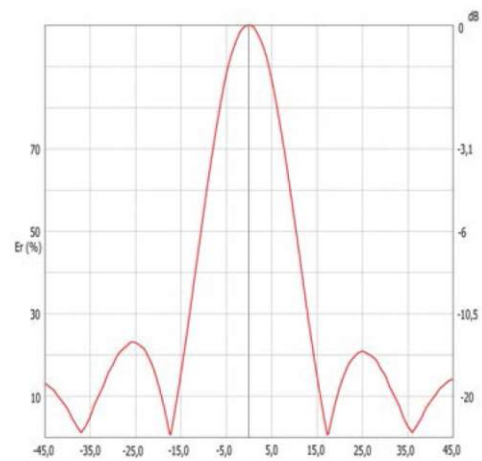
Typical vertical radiation pattern



type OM-1



type OM-2



type OM-2