

# Antenna system design with TA III/03-R

## TYPES

1 bay, 4 sides  
2 bays, 4 sides  
4 bays, 4 sides  
6 bays, 4 sides  
8 bays, 4 sides

1 bay, 3 sides  
2 bays, 3 sides  
4 bays, 3 sides  
6 bays, 3 sides  
8 bays, 3 sides

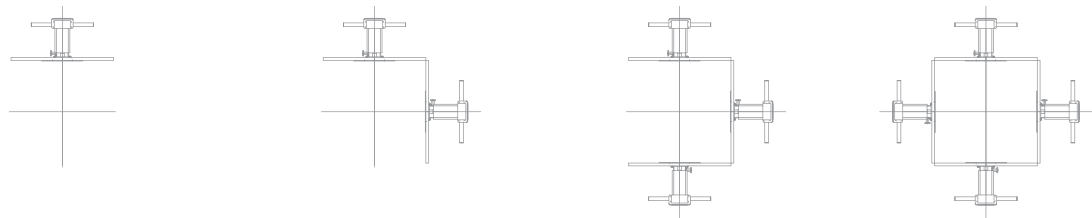
1 bay, 2 sides  
2 bays, 2 sides  
4 bays, 2 sides  
6 bays, 2 sides  
8 bays, 2 sides

1 bay, 1 side  
2 bays, 1 side  
4 bays, 1 side

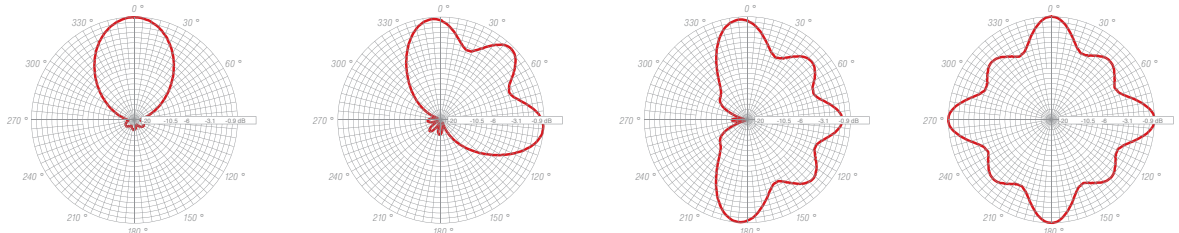
## ELTI turn key solution...

Elti offer typical antenna systems on a turnkey basis with antenna panel TA III/03-R. Especially suitable for mounting on square masts for different radiation patterns (omni-directional, directional, custom designed). Feeding of antennas is made with coaxial power dividers and connecting cables all produced by Elti.

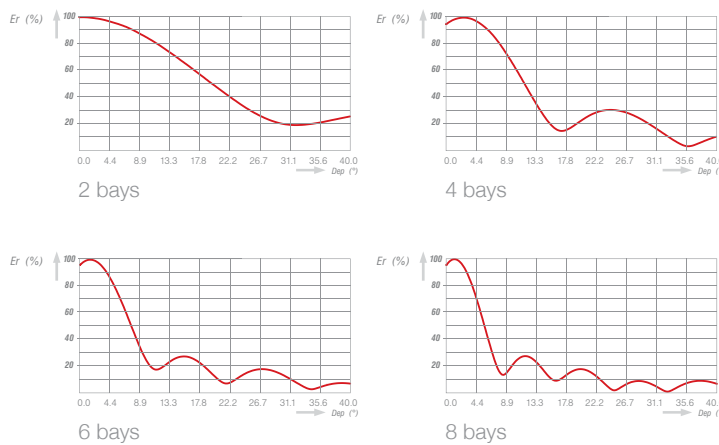
Antenna systems can be divided into 2 halves; as well pressurization with dry air is available on request.



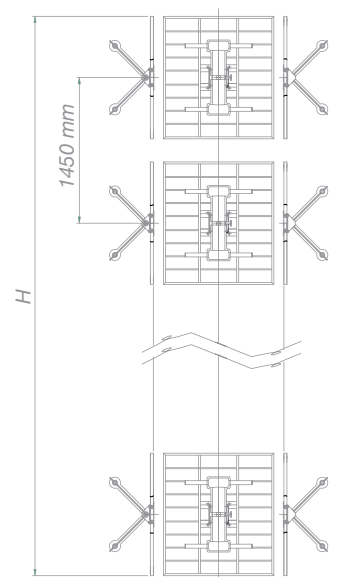
### Horizontal diagrams



### Vertical diagrams



### Preferred tower dimensions



## specifications

		Omni 1 bay	Omni 2 bays	Omni 4 bays	Omni 6 bays	Omni 8 bays
Design	Bays	1	2	4	6	8
	Directions	4	4	4	4	4
Antenna type		TA III/03-R horizontal or vertical polarization				
Number of antennas		4	8	16	24	32
Frequency range (MHz)		174 – 230 MHz				
Maximum input power (kW) <sup>1</sup>		16	32	64	96	128
Gain at 200 MHz (dBd) <sup>2</sup>		2,03	5,04	8,05	9,81	11,06
V.S.W.R. – no offset <sup>3</sup>		≤ 1,15	≤ 1,15	≤ 1,15	≤ 1,15	≤ 1,15
With horizontal offset <sup>4</sup>		≤ 1,10	≤ 1,10	≤ 1,10	≤ 1,10	≤ 1,10
Wind load - at 160 km/h (kN)		1,3	2,6	5,2	7,8	10,4
Weight (kg)		95	220	420	720	920
Input connector <sup>1</sup>		DIN 7/16 EIA 7/8" EIA 1 5/8"	DIN 7/16 EIA 7/8" EIA 1 5/8"	EIA 1 5/8" EIA 3 1/8" EIA 4 1/2"	EIA 3 1/8" EIA 4 1/2" EIA 6 1/8"	EIA 3 1/8" EIA 4 1/2" EIA 6 1/8"
Pressurization with dry air <sup>5</sup>		No	No	No / Yes	No / Yes	No / Yes
Split system <sup>6</sup>		No	No / Yes	No / Yes	No / Yes	No / Yes
Antenna system height H (m)		1,20	2,65	5,55	8,45	11,35

Presented information is valid for omni-directional antenna systems. Non-directional and custom designs of antenna systems are available on request. Null filling and beam tilt upon request.

### Notes:

- <sup>1</sup> Maximum power and input connector is designed according to customer's requirements.  
<sup>2</sup> Referred to  $\lambda/2$  dipole. Attenuation of the internal cabling and the decrease of gain in case of null fill in the vertical radiation pattern are not considered. Cable attenuation: 0,2 – 0,5 dB; null fill: 0,3 – 1,0 dB  
<sup>3</sup> broadband  
<sup>4</sup> in working channels  
<sup>5</sup> pressurization with dry air is available on request  
<sup>6</sup> see details in the chapter patch panels



TA III/03 R

### Approximate coverage calculation with analogue at the input:

10 W	Radiated power (W)	16	32	64	96	128
	Coverage (km)	6,2	7,6	9,1	10,1	10,8
50 W	Radiated power (W)	80	160	319	479	638
	Coverage (km)	9,7	11,4	13,4	14,7	15,7
100 W	Radiated power (W)	160	319	638	957	1.276
	Coverage (km)	11,4	13,4	15,7	17,2	18,3
200 W	Radiated power (W)	319	638	1.276	1.914	2.553
	Coverage (km)	13,4	15,7	18,3	19,9	21,2
500 W	Radiated power (W)	798	1.596	3.191	4.786	6.382
	Coverage (km)	16,5	19,2	22,2	24,1	25,6
1.000 W	Radiated power (W)	1.596	3.191	6.383	9.572	12.764
	Coverage (km)	19,2	22,2	25,6	27,8	29,5

Calculation for radiated power does not include losses in the feeder cable and combiner's losses.

Coverage is an estimation on the following circumstances: Approximate coverage at antenna height of 50 m calculated according to ITU-R P.1546-1 with 54 dB $\mu$ V/m field strength.

# Antenna system design with TAN III/10

## TYPES

- 1 bay, 4 sides
- 2 bays, 4 sides
- 4 bays, 4 sides
- 6 bays, 4 sides
- 8 bays, 4 sides
- 10 bays, 4 sides
- 12 bays, 4 sides

- 1 bay, 3 sides
- 2 bays, 3 sides
- 4 bays, 3 sides
- 6 bays, 3 sides
- 8 bays, 3 sides
- 10 bays, 3 sides
- 12 bays, 3 sides

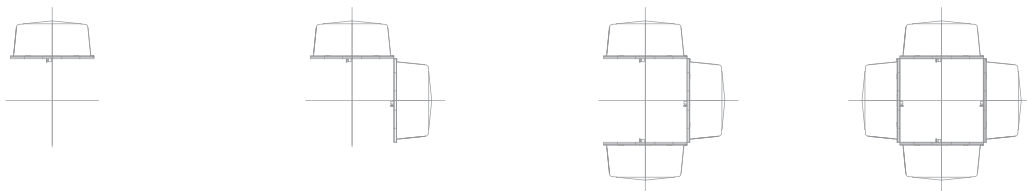
- 1 bay, 2 sides
- 2 bays, 2 sides
- 4 bays, 2 sides
- 6 bays, 2 sides
- 8 bays, 2 sides

- 1 bay, 1 side
- 2 bays, 1 side
- 4 bays, 1 side

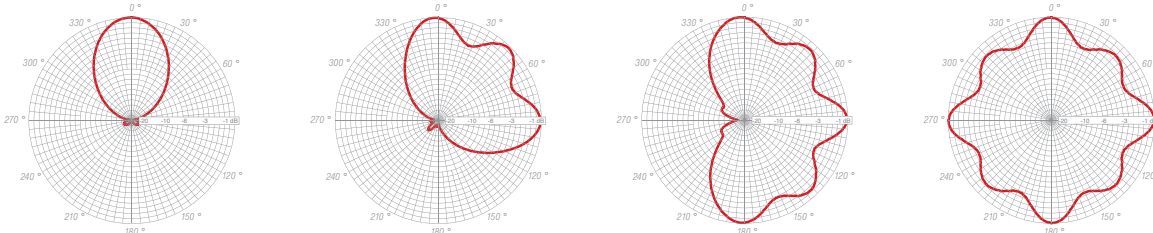
## ELTI turn key solution...

Elti offer typical antenna systems on a turnkey basis with antenna panel TAN III/10. Especially suitable for mounting on square masts for different radiation patterns (omni-directional, directional, custom designed). Feeding of antennas is made with coaxial power dividers and connecting cables all produced by Elti.

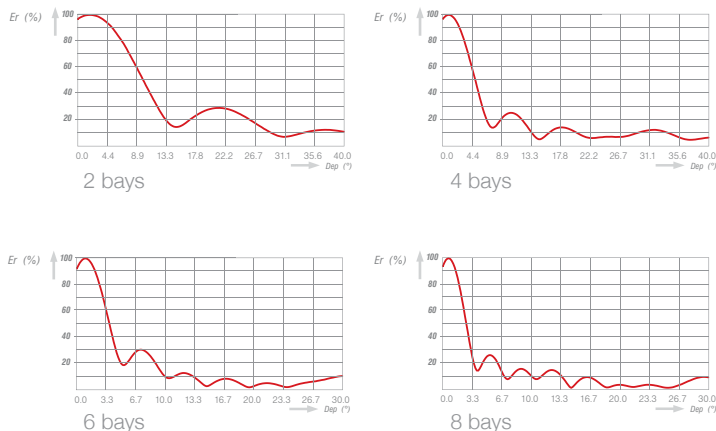
Antenna systems can be divided into 2 halves; as well pressurization with dry air is available on request.



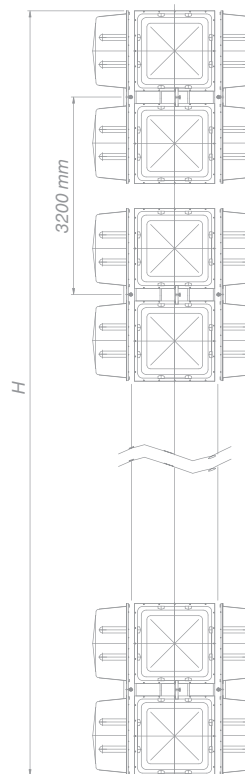
Horizontal diagram



## Vertical diagram



## Preferred tower dimensions



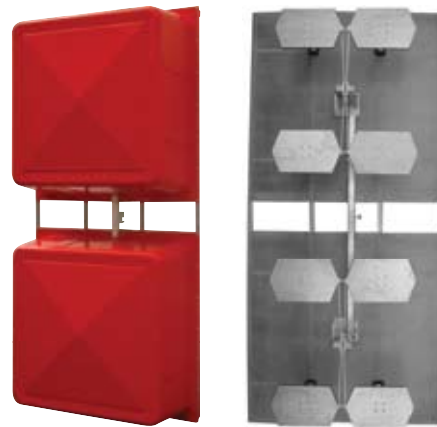
## specifications

		Omni 1 bay	Omni 2 bays	Omni 4 bays	Omni 6 bays	Omni 8 bays
Design	Bays	1	2	4	6	8
	Directions	4	4	4	4	4
Antenna type		TAN III/10 horizontal polarization				
Number of antennas		4	8	16	24	32
Frequency range (MHz)		174 – 230 MHz				
Maximum input power (kW) <sup>1</sup>		16	32	64	96	128
Gain at 200 MHz (dBd) <sup>2</sup>		4,21	7,22	10,23	12,00	13,24
V.S.W.R. – no offset <sup>3</sup>		≤ 1,15	≤ 1,15	≤ 1,15	≤ 1,15	≤ 1,15
With horizontal offset <sup>4</sup>		≤ 1,10	≤ 1,10	≤ 1,10	≤ 1,10	≤ 1,10
Wind load - at 160 km/h (kN)		8	16	32	48	64
Weight (kg)		560	1.150	2.290	3.520	4.650
Input connector <sup>1</sup>		EIA 7/8" EIA 1 5/8" EIA 3 1/8"	EIA 7/8" EIA 1 5/8" EIA 3 1/8"	EIA 3 1/8" EIA 4 1/2" EIA 6 1/8"	EIA 3 1/8" EIA 4 1/2" EIA 6 1/8"	EIA 3 1/8" EIA 4 1/2" EIA 6 1/8"
Pressurization with dry air <sup>5</sup>		No	No	No / Yes	No / Yes	No / Yes
Split system <sup>6</sup>		No	No / Yes	No / Yes	No / Yes	No / Yes
Antenna system height H (m)		2,8	6,0	12,4	18,8	25,2

Presented information is valid for omni-directional antenna systems. Non-directional and custom designs of antenna systems are available on request. Null filling and beam tilt upon request.

### Notes:

- <sup>1</sup> Maximum power and input connector is designed according to customer's requirements.
- <sup>2</sup> Referred to  $\lambda/2$  dipole. Attenuation of the internal cabling and the decrease of gain in case of null fill in the vertical radiation pattern are not considered. Cable attenuation: 0,2 – 0,5 dB; null fill: 0,3 – 1,0 dB
- <sup>3</sup> broadband
- <sup>4</sup> in working channels
- <sup>5</sup> pressurization with dry air is available on request
- <sup>6</sup> see details in the chapter patch panels



TAN III/10

### Approximate coverage calculation with analogue at the input:

10 W	Radiated power (W)	26	53	105	158	211
	Coverage (km)	7,2	8,7	10,3	11,4	12,2
50 W	Radiated power (W)	132	264	527	791	1.054
	Coverage (km)	10,9	12,9	15,1	16,5	17,5
100 W	Radiated power (W)	264	527	1.054	1.581	2.109
	Coverage (km)	12,9	15,1	17,5	19,1	20,3
200 W	Radiated power (W)	527	1.054	2.109	3.162	4.217
	Coverage (km)	15,1	17,5	20,3	22,1	23,5
500 W	Radiated power (kW)	1,3	2,6	5,3	7,9	10,5
	Coverage (km)	18,4	21,3	24,6	26,8	28,4
1.000 W	Radiated power (kW)	2,6	5,3	10,5	15,8	21,1
	Coverage (km)	21,3	24,6	28,4	30,8	32,7

Calculation for radiated power does not include losses in the feeder cable and combiner's losses.

Coverage is an estimation on the following circumstances: Approximate coverage at antenna height of 50 m calculated according to ITU-R P.1546-1 with 54 dB $\mu$ V/m field strength.

# Antenna system design with TVA 31/50

## TYPES

- 1 bay, 4 sides
- 2 bays, 4 sides
- 4 bays, 4 sides
- 6 bays, 4 sides
- 8 bays, 4 sides
- 10 bays, 4 sides
- 12 bays, 4 sides
- 16 bays, 4 sides

- 1 bay, 3 sides
- 2 bays, 3 sides
- 4 bays, 3 sides
- 6 bays, 3 sides
- 8 bays, 3 sides
- 10 bays, 3 sides
- 12 bays, 3 sides
- 16 bays, 3 sides

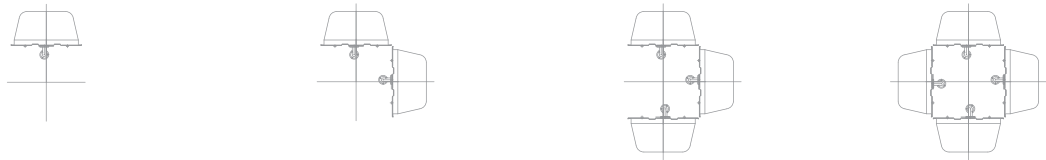
- 1 bay, 2 sides
- 2 bays, 2 sides
- 4 bays, 2 sides
- 6 bays, 2 sides
- 8 bays, 2 sides

- 1 bay, 1 side
- 2 bays, 1 side
- 4 bays, 1 side
- 6 bays, 1 side
- 8 bays, 1 side

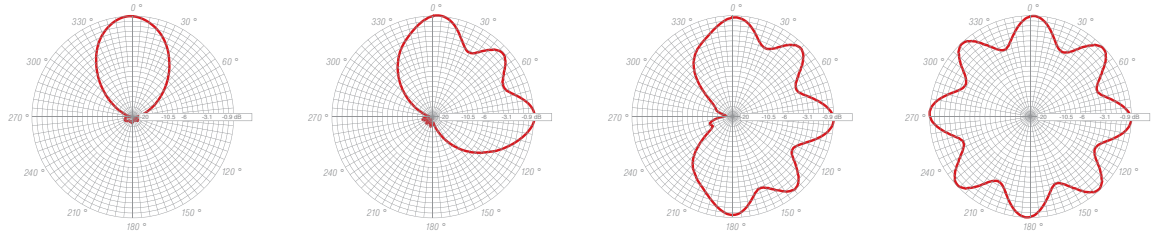
## ELTI turn key solution...

Elti offer typical antenna systems on a turnkey basis with antenna panel TVA 31/50. Especially suitable for mounting on triangular masts for different radiation patterns (omni-directional, directional, custom designed). Feeding of antennas is made with coaxial power dividers and connecting cables all produced by Elti.

Antenna systems can be divided into 2 halves; as well pressurization with dry air is available on request.



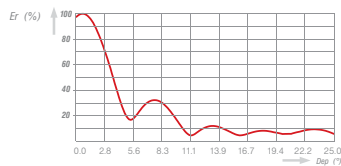
Horizontal diagram



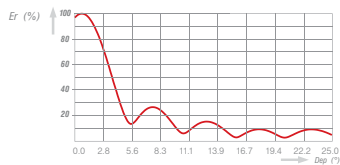
## Vertical diagram



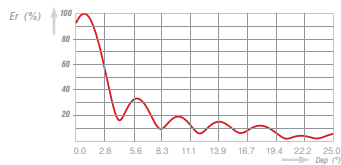
2 bays



4 bays

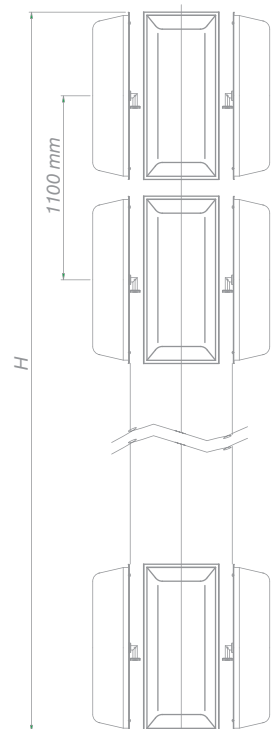


6 bays



8 bays

## Preferred tower dimensions



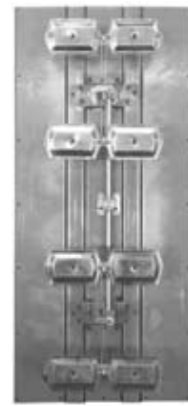
## specifications

		Omni 1 bay	Omni 2 bays	Omni 4 bays	Omni 6 bays	Omni 8 bays
Design	Bays	1	2	4	6	8
	Directions	4	4	4	4	4
Antenna type		TVA 31/50 for horizontal polarization				
Number of antennas		4	8	16	24	32
Frequency range (MHz)		470 – 862 MHz				
Maximum input power (kW) <sup>1</sup>	Analogue	10	20	40	60	80
	Digital	8	16	32	48	64
Gain at 665 MHz (dBd) <sup>2</sup>		4,87	7,88	10,89	12,65	13,90
V.S.W.R. – no offset <sup>3</sup>		≤ 1,12	≤ 1,12	≤ 1,12	≤ 1,12	≤ 1,12
With horizontal offset <sup>4</sup>		≤ 1,05	≤ 1,05	≤ 1,05	≤ 1,05	≤ 1,05
Wind load - at 160 km/h (kN)		1,6	3,2	6,4	9,6	12,8
Weight (kg)		65	150	290	500	640
Input connector <sup>1</sup>		DIN 7/16 EIA 7/8" EIA 1 5/8"	DIN 7/16 EIA 7/8" EIA 1 5/8"	EIA 1 5/8" EIA 3 1/8" EIA 4 1/2"	EIA 3 1/8" EIA 4 1/2" EIA 6 1/8"	EIA 3 1/8" EIA 4 1/2" EIA 6 1/8"
Pressurization with dry air <sup>5</sup>		No	No	No / Yes	No / Yes	No / Yes
Split system <sup>6</sup>		No	No / Yes	No / Yes	No / Yes	No / Yes
Antenna system height H (m)		1,0	2,1	4,3	6,5	8,7

Presented information is valid for omni-directional antenna systems. Non-directional and custom designs of antenna systems are available on request. Null filling and beam tilt upon request.

### Notes:

- <sup>1</sup> Maximum power and input connector is designed according to customer's requirements.
- <sup>2</sup> Referred to  $\lambda/2$  dipole. Attenuation of the internal cabling and the decrease of gain in case of null fill in the vertical radiation pattern are not considered. Cable attenuation: 0,2 – 0,5 dB; null fill: 0,3 – 1,0 dB
- <sup>3</sup> broadband
- <sup>4</sup> in working channels
- <sup>5</sup> pressurization with dry air is available on request
- <sup>6</sup> see details in the chapter patch panels



TVA 31/50

### Approximate coverage calculation with analogue or digital power at the input:

5 W	Radiated power (W)	15	31	61	92	123
	Coverage (km)	5.8	6.9	8.2	9	9.7
10 W	Radiated power (W)	31	61	123	184	245
	Coverage (km)	6.9	8.2	9.7	10.6	11.3
50 W	Radiated power (kW)	0.15	0.31	0.61	0.92	1.23
	Coverage (km)	10.2	11.9	13.8	15.1	16
100 W	Radiated power (kW)	0.31	0.61	1.23	1.84	2.45
	Coverage (km)	11.9	13.8	16	17.4	18.6
200 W	Radiated power (kW)	0.61	1.23	2.45	3.68	4.91
	Coverage (km)	13.8	16	18.5	20.1	21.3
400 W	Radiated power (kW)	1.23	2.46	4.91	7.36	9.82
	Coverage (km)	16	18.5	21.3	23.1	24.5
600 W	Radiated power (kW)	1.84	3.68	7.36	11.04	14.73
	Coverage (km)	17.4	20.1	23.1	25.1	26.5
800 W	Radiated power (kW)	2.46	4.91	9.82	14.73	19.64
	Coverage (km)	18.5	21.3	24.5	26.5	28.1
1200 W	Radiated power (kW)	3.68	7.37	14.73	22.09	29.46
	Coverage (km)	20.1	23.1	26.5	28.7	30.4
1600 W	Radiated power (kW)	4.91	9.82	19.64	29.45	39.28
	Coverage (km)	21.3	24.5	28.1	30.4	32.2

Calculation for radiated power does not include losses in the feeder cable and combiner's losses.

Coverage is an estimation on the following circumstances: Approximate coverage at antenna height of 50 m calculated according to ITU-R P.1546-1 with 54 dB $\mu$ V/m field strength.

# Antenna system design with TVA 51/50

## TYPES

- 1 bay, 4 sides
- 2 bays, 4 sides
- 4 bays, 4 sides
- 6 bays, 4 sides
- 8 bays, 4 sides
- 10 bays, 4 sides
- 12 bays, 4 sides
- 16 bays, 4 sides

- 1 bay, 3 sides
- 2 bays, 3 sides
- 4 bays, 3 sides
- 6 bays, 3 sides
- 8 bays, 3 sides
- 10 bays, 3 sides
- 12 bays, 3 sides
- 16 bays, 3 sides

- 1 bay, 2 sides
- 2 bays, 2 sides
- 4 bays, 2 sides
- 6 bays, 2 sides
- 8 bays, 2 sides

- 1 bay, 1 side
- 2 bays, 1 side
- 4 bays, 1 side
- 6 bays, 1 side
- 8 bays, 1 side

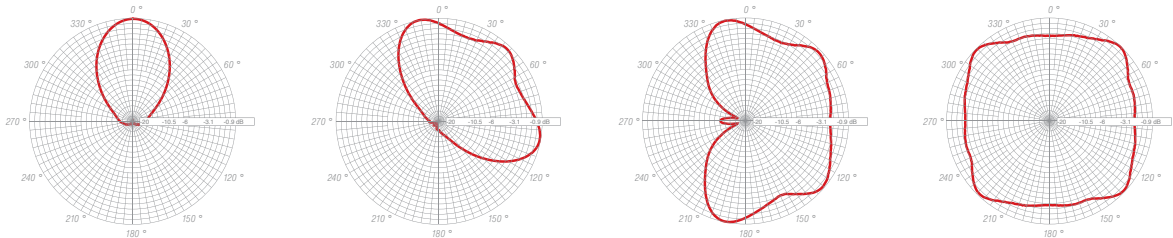
## ELTI turn key solution...

Elti offer typical antenna systems on a turnkey basis with antenna panel TVA 51/50. Especially suitable for mounting on square masts for different radiation patterns (omni-directional, directional, custom designed). Feeding of antennas is made with coaxial power dividers and connecting cables all produced by Elti.

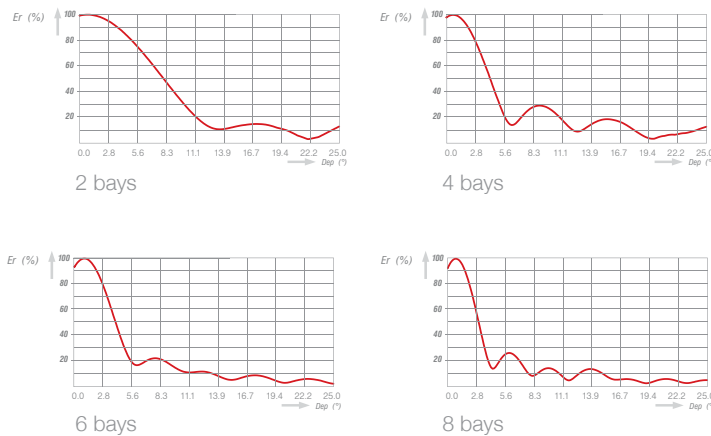
Antenna systems can be divided into 2 halves; as well pressurization with dry air is available on request.



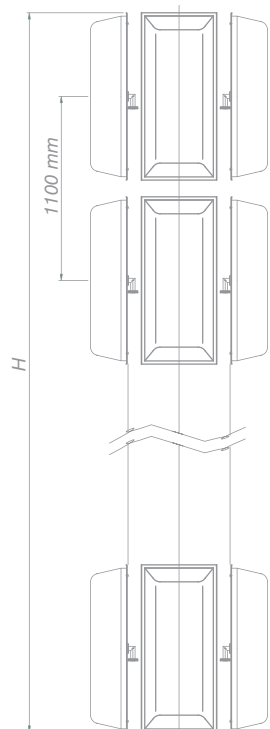
### Horizontal diagram



### Vertical diagram



### Preferred tower dimensions



## specifications

		Omni 1 bay	Omni 2 bays	Omni 4 bays	Omni 6 bays	Omni 8 bays
Design	Bays	1	2	4	6	8
	Directions	4	4	4	4	4
Antenna type		TVA 31/50 for vertical polarization				
Number of antennas		4	8	16	24	32
Frequency range (MHz)		470 – 862 MHz				
Maximum input power (kW) <sup>1</sup>	Analogue	10	20	40	60	80
	Digital	8	16	32	48	64
Gain at 665 MHz (dBd) <sup>2</sup>		4,57	7,58	10,60	12,36	13,61
V.S.W.R. – no offset <sup>3</sup>		≤ 1,12	≤ 1,12	≤ 1,12	≤ 1,12	≤ 1,12
With horizontal offset <sup>4</sup>		≤ 1,05	≤ 1,05	≤ 1,05	≤ 1,05	≤ 1,05
Wind load - at 160 km/h (kN)		1,6	3,2	6,4	9,6	12,8
Weight (kg)		65	150	290	500	640
Input connector <sup>1</sup>		DIN 7/16 EIA 7/8" EIA 1 5/8"	DIN 7/16 EIA 7/8" EIA 1 5/8"	EIA 1 5/8" EIA 3 1/8" EIA 4 1/2"	EIA 3 1/8" EIA 4 1/2" EIA 6 1/8"	EIA 3 1/8" EIA 4 1/2" EIA 6 1/8"
Pressurization with dry air <sup>5</sup>		No	No	No / Yes	No / Yes	No / Yes
Split system <sup>6</sup>		No	No / Yes	No / Yes	No / Yes	No / Yes
Antenna system height H (m)		1,0	2,1	4,3	6,5	8,7

Presented information is valid for omni-directional antenna systems. Non-directional and custom designs of antenna systems are available on request. Null filling and beam tilt upon request.

### Notes:

- <sup>1</sup> Maximum power and input connector is designed according to customer's requirements.
- <sup>2</sup> Referred to  $\lambda/2$  dipole. Attenuation of the internal cabling and the decrease of gain in case of null fill in the vertical radiation pattern are not considered. Cable attenuation: 0,2 – 0,5 dB; null fill: 0,3 – 1,0 dB
- <sup>3</sup> broadband
- <sup>4</sup> in working channels
- <sup>5</sup> pressurization with dry air is available on request
- <sup>6</sup> see details in the chapter patch panels



TVA 51/50

### Approximate coverage calculation with analogue or digital power at the input:

5 W	Radiated power (W)	14	29	57	86	115
	Coverage (km)	5.7	6.8	8.1	8.9	9.5
10 W	Radiated power (W)	29	57	115	172	230
	Coverage (km)	6.8	8.1	9.5	10.4	11.2
50 W	Radiated power (kW)	0.14	0.29	0.57	0.86	1.15
	Coverage (km)	10	11.7	13.6	14.9	15.8
100 W	Radiated power (kW)	0.29	0.57	1.15	1.72	2.3
	Coverage (km)	11.7	13.6	15.8	17.2	18.2
200 W	Radiated power (kW)	0.57	1.15	2.3	3.44	4.59
	Coverage (km)	13.6	15.8	18.2	19.8	21
400 W	Radiated power (kW)	1.15	2.29	4.59	6.89	9.18
	Coverage (km)	15.8	18.2	21	22.8	24.2
600 W	Radiated power (kW)	1.72	3.44	6.89	10.33	13.78
	Coverage (km)	17.2	19.8	22.8	24.7	26.2
800 W	Radiated power (kW)	2.29	4.58	9.19	13.77	18.37
	Coverage (km)	18.2	21	24.2	26.2	27.7
1200 W	Radiated power (kW)	3.44	6.87	13.78	20.66	27.55
	Coverage (km)	19.8	22.8	26.2	28.4	30
1600 W	Radiated power (kW)	4.58	9.16	18.37	27.55	36.74
	Coverage (km)	21	24.2	27.7	30	31.7

Calculation for radiated power does not include losses in the feeder cable and combiner's losses.

Coverage is an estimation on the following circumstances: Approximate coverage at antenna height of 50 m calculated according to ITU-R P.1546-1 with 54 dB $\mu$ V/m field strength.