



# ANTENNAS for TV, FM and AM

## 50Ω 75Ω

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## SPECIFICATIONS

### FBE and UBE type

- |          |   |  |
|----------|---|--|
| <b>1</b> | <b>.BE .. -0 .</b>                      | no longer available  |
| <b>2</b> | <b>.BE .. -1.</b>                       | robust construction, balun with cable, 75 Ω<br>termination: 10 m cable RG 59 (ø 6.5 mm), without connector   |
| <b>3</b> | <b>.BE .. -2.</b>                       | robust construction, balun with cable, 75 Ω<br>termination: 10 m cable RG 11 (ø 10.5 mm), without connector  |
| <b>4</b> | <b>FWS type</b>                         | FWS-antennas are tuned to the specified channel or channel group<br>balun with cable, especially designed for collective antenna systems<br><br><b>IMPEDANCE</b> 50 or 75 Ω nominal<br><b>VSWR</b> 50 Ω <1.3 (or <1.5 for channel groups)<br>75 Ω <1.5<br><b>TERMINATION</b> 2m cable with ø 10.5 mm<br>50 Ω RG 213/U ending with N male<br>75 Ω RG 11 ending with N male<br><b>POWER</b> Band II: 200 Watts<br>(only for 50 Ω impedance ) |
| <b>5</b> | <b>FWS ... 02 ..<br/>without radome</b> | robust construction (similar FBE ...-2), electrical details as specified under <b>4</b>  |
| <b>6</b> | <b>FWS ... 03 ..<br/>with radome</b>    | heavy duty, with radome<br>The radome protects the antenna dipole from environmental influences, icing,<br>and increases the lightning protection. Other details specified under <b>4</b> .  |

- 
- |                 |  |
|-----------------|--|
| <b>MATERIAL</b> | aluminium, screws of stainless steel, radome of uv-stabilized polyethylene,<br>weather resistant plastics  |
| <b>MOUNTING</b> | clamp for mast ø 30 - 80 mm (standard)<br>clamp for mast ø 50 - 104 mm (option)  |
| <b>ORDER</b>    | Please give the following details when ordering:<br>type, channel, impedance, polarization<br>for ex.: - FWS 306 02, ch 12, 50 Ω, horizontal polarization<br>- FBE 311-112, ch 12, 75 Ω, vertical polarization |



## ANTENNAS WITH OR WITHOUT RADOME

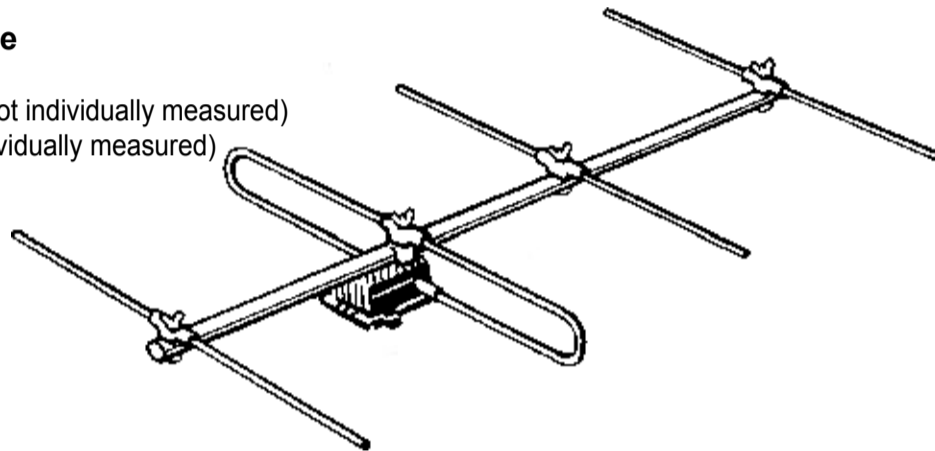
### Technical details of WIPIC antennas:

robust construction  
different types for various weather conditions  
no perforation of the antenna boom

illustration: four element band III yagi antenna, dipole without and with radome

### Type without radome

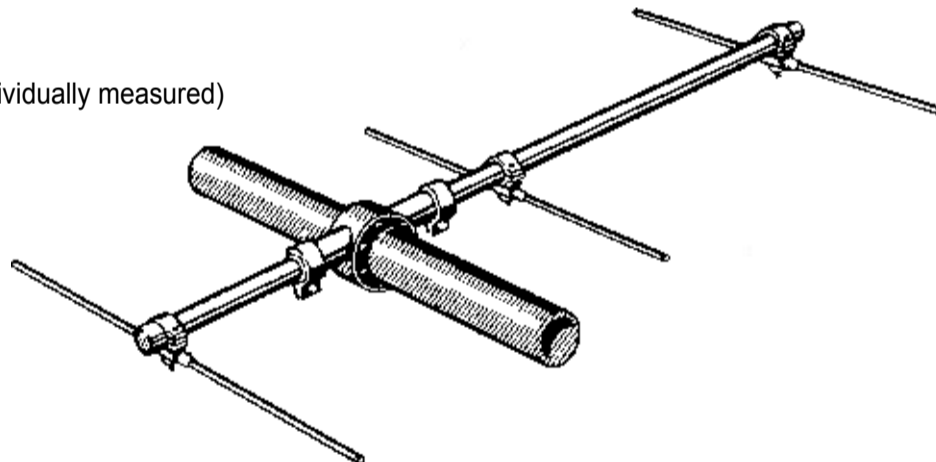
**FBE 304-0/1/2** (VSWR not individually measured)  
**FWS 304 02** (VSWR individually measured)



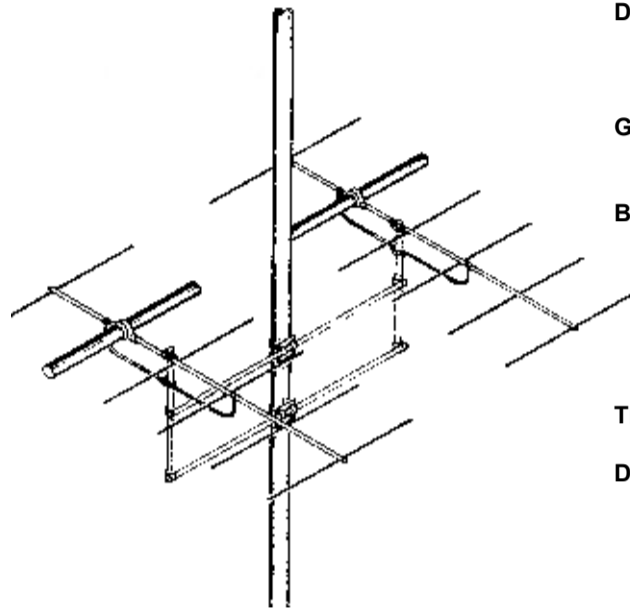
Wipic antennas without radome are solidly built for long maintenance free operation.  
All parts replaceable.

### Type with radome

**FWS 304 03** (VSWR individually measured)



WIPIC antennas with radome are solidly built for long maintenance free operation under severe weather condition, heavy duty  
The radome protects the antenna dipole from environmental influences, icing, and increases the lightning protection.


**TWIN, TWO-LEVEL AND QUADRO FWS ANTENNAS**


FM twin antenna consisting of  
two FWS 206 03  
distance 2800 mm

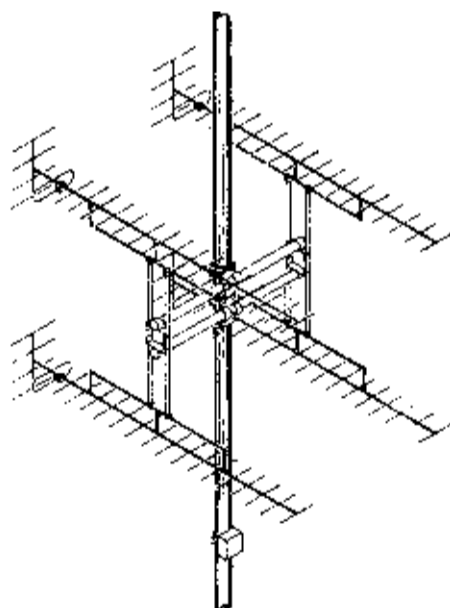
**DESCRIPTION** Coupling of identical FWS antennas into one group  
some examples are illustrated below

**GAIN** twin and two-level +3 dB  
quadro +5 dB

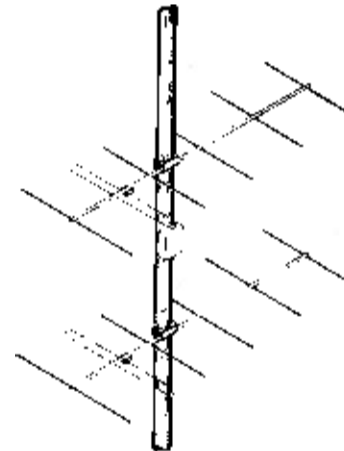
**BEAM WIDTH** Twin antennas reduce the horizontal beam width  
Two-level antennas reduce the vertical beam width  
Quadro antennas reduce the horizontal and vertical beam width

**TERMINATION** in the junction box ending with N male

**DELIVERY** antennas  
junction box [WAK 1](#)  
brackets with clamps for mast  $\varnothing$  30 - 80 mm (standard) or 50 - 104 mm (option)  
(see chapter: *Mounting Clamps*)



quadro antenna consisting of  
four FWS 421 02  
horizontal and vertical distance ~800 mm



two-level antenna consisting of  
two FWS 306 02  
distance 1800 mm

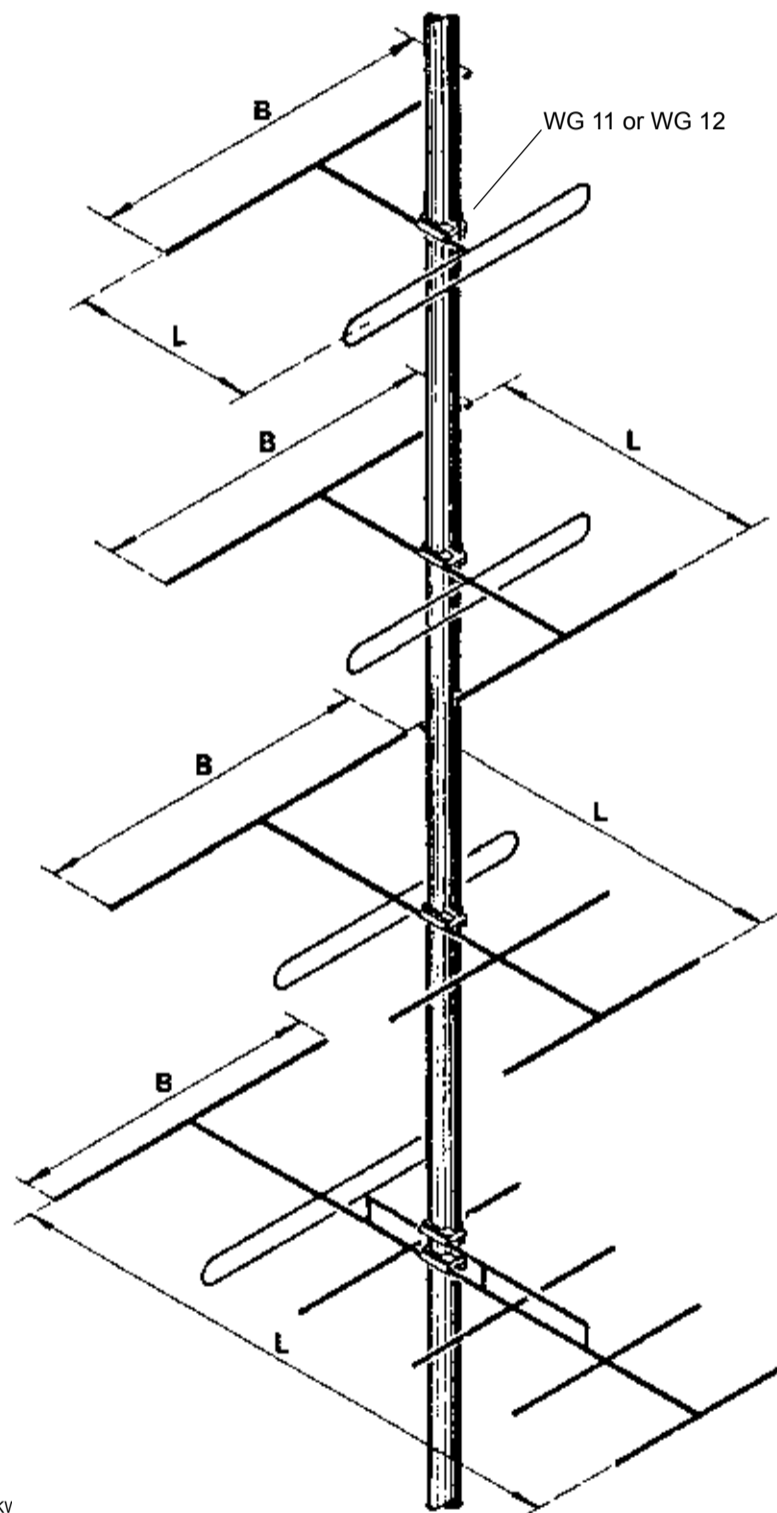
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**TV-ANTENNAS BAND I (48 - 68 MHz)**  
 For channel 2, 3 or 4  
 horizontal polarization

**FBE 102 -.**  
**FBE 103 -.**  
**FBE 104 -.**  
**FBE 106 -.**



**2-ELEMENT YAGI ANTENNA**

type no. **FBE 102-0**  
**FBE 102-1**  
**FBE 102-2**  
 gain 3.5 dB (ref.  $\lambda/2$  dipole)  
 F/B 9 dB

**3 dB beam** horizontal, E plane 80°  
**width** vertical, H plane 135°

**3-ELEMENT YAGI ANTENNA**

type no. **FBE 103-0**  
**FBE 103-1**  
**FBE 103-2**  
 gain 5 dB (ref.  $\lambda/2$  dipole)  
 F/B 14 dB

**3 dB beam** horizontal, E plane 80°  
**width** vertical, H plane 115°

**4-ELEMENT YAGI ANTENNA**

type no. **FBE 104-0**  
**FBE 104-1**  
**FBE 104-2**  
 gain 6 dB (ref.  $\lambda/2$  dipole)  
 F/B 16 dB

**3 dB beam** horizontal, E plane 60°  
**width** vertical, H plane 100°

**6-ELEMENT YAGI ANTENNA**

type no. **FBE 106-0**  
**FBE 106-1**  
**FBE 106-2**  
 gain 8 dB (ref.  $\lambda/2$  dipole)  
 F/B 20 dB

**3 dB beam** horizontal, E plane 80°  
**width** vertical, H plane 115°

amend specifications in the light of continuing development.

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**FBE 102 -. FBE 103 -. FBE 104 -. FBE 106 -.**

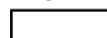
- FBE 10.-0** no longer available
- FBE 10.-1** balun with cable (for increased lightning protection)  
 termination: 10 m RG 59 (ø 6.5 mm), without connector  
 impedance: 75 Ω
- FBE 10.-2** similar FBE ...-1, but terminated with 10 m RG 11 (ø 10 mm)

	channel	weight <sup>1)</sup> [kg]	wind area[m <sup>2</sup> ]	wind load <sup>2)</sup> [N]	length L [m]	wide B [m]
<b>FBE 102.-</b>	2	1.7	0.094	53	1.1	3.3
	3	1.6	0.082	46	1.0	2.9
	4	1.6	0.073	41	0.9	2.6
<b>FBE 103.-</b>	2	2.1	0.118	67	2.1	3.3
	3	1.9	0.103	59	1.9	2.9
	4	1.8	0.091	52	1.7	2.6
<b>FBE 104.-</b>	2	2.3	0.142	80	2.5	3.3
	3	2.2	0.114	65	2.5	2.9
	4	2.1	0.100	57	2.2	2.6
<b>FBE 106.-</b>	2	4.2	0.195	110	3.8	3.3
	3	3.9	0.165	94	3.3	2.9
	4	3.6	0.146	83	2.9	2.6

1) **weight** with clamp, without cable  
 weight of the cable: ø 6.5 mm : 0.6 kg/10m  
 ø 10 mm : 1.6 kg/10m

2) **windload:** at 100 km/h  
 at 130 km/h: multiply windload at 100 km/h by 1.7  
 at 150 km/h: multiply windload at 100 km/h by 2.25

**mounting:** with clamp WG 11 for mast-ø 30-80 mm (standard)  
 with clamp WG 12 for mast-ø 50-104 mm (option)  
 connection box below the boom  
 pay attention to the label **DOWN**



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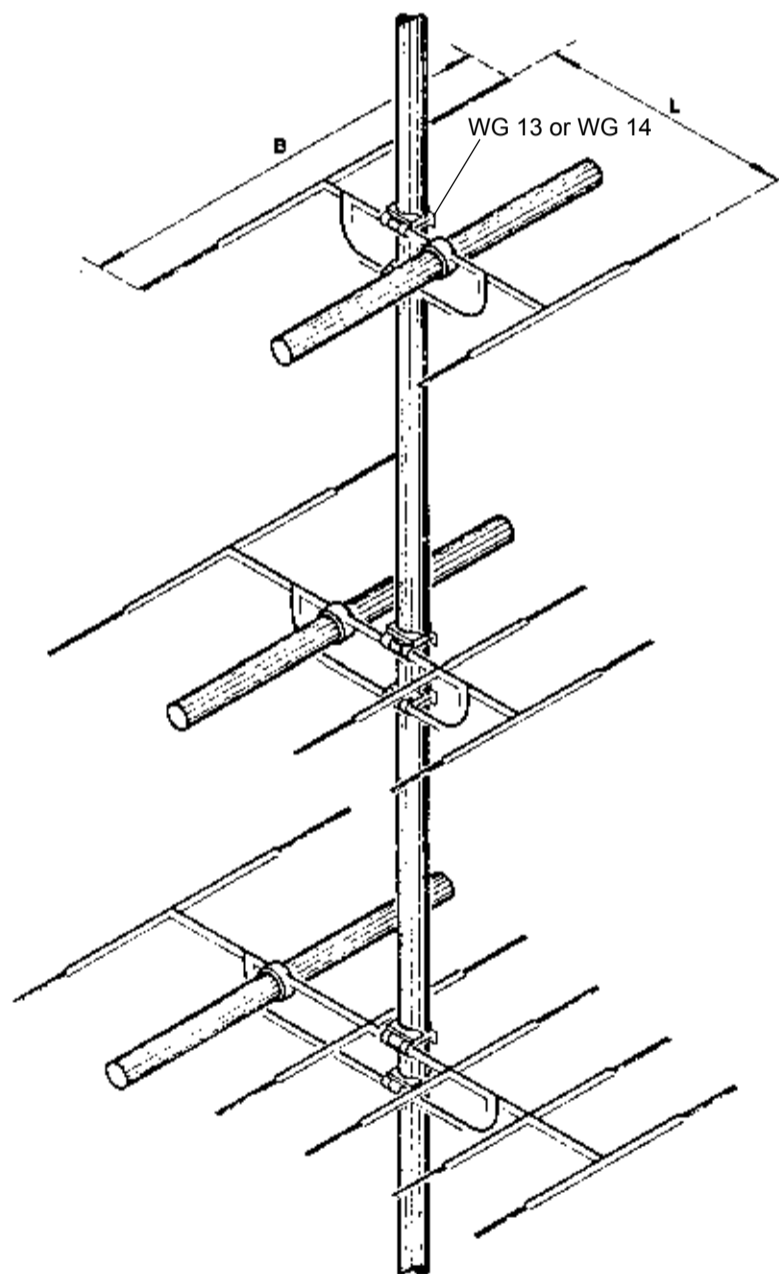
## TV-ANTENNAS BAND I (48 ... 68 MHz)

For channel 2, 3 or 4  
horizontal polarization  
type with radome

**FWS 103 03**

**FWS 104 03**

**FWS 106 03**



### 2-ELEMENT YAGI ANTENNA

type no. **FWS 103 03**  
gain 5 dB ref.  $\lambda/2$  dipole  
F/B 14 dB

3 dB beam width horizontal, E plane 70°  
vertical, H plane 115°

### 4-ELEMENT YAGI ANTENNA

type no. **FWS 104 03**  
gain 6 dB ref.  $\lambda/2$  dipole  
F/B 16 dB

3 dB beam width horizontal, E plane 60°  
vertical, H plane 100°

### 6-ELEMENT YAGI ANTENNA

type no. **FWS 106 03**  
gain 8 dB ref.  $\lambda/2$  dipole  
F/B 20 dB

3 dB beam width horizontal, E plane 50°  
vertical, H plane 80°

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**FWS 10. 03**

<b>Description</b>	heavy duty, dipole with radome The radome protects the antenna dipole from environmental influences, icing, and increases the lightning protection. SWR individually measured especially suited for MATV
<b>Polarization</b>	horizontal
<b>Frequency</b>	tuned to channel 2, 3 or 4 in the band I
<b>Impedance</b>	50 Ω or 75 Ω
<b>VSWR</b>	< 1.2 < 1.5 for the whole channel
<b>Termination</b>	50Ω: 2m cable RG 213/U ending with N male 75Ω: 2m cable RG 11/U ending with N male
<b>Material</b>	aluminium, screws of stainless steel, radome of UV-stabilized polyethylene
<b>Grounding</b>	all metal parts are DC grounded
<b>Mounting</b>	<i>mast-ø</i> <i>clamp</i> 30 - 80 mm                2x WG 13 (standard) 50 -104 mm               2x WG 14 (option) pay attention to the label <span style="border: 1px solid black; padding: 2px;">DOWN</span>
<b>max. wind velocity</b>	200 km/h

Type	channel CICR	weight kg	wind area m <sup>2</sup>	wind load [N]		length L [m]	wide B [m]
				130 km/h	150		
<b>FWS 103 03</b>	2	9.6	0.324	301	420	2.1	3.3
	3	9.0	0.290	280	376	1.9	2.9
	4	8.5	0.264	253	342	1.7	2.6
<b>FWS 104 03</b>	2	10.8	0.373	357	483	2.8	3.3
	3	10.3	0.337	323	436	2.5	2.9
	4	9.7	0.307	294	398	2.2	2.6
<b>FWS 106 03</b>	2	13.7	0.482	462	624	3.8	3.3
	3	12.5	0.429	411	556	3.3	2.9
	4	11.6	0.385	370	491	2.9	2.6

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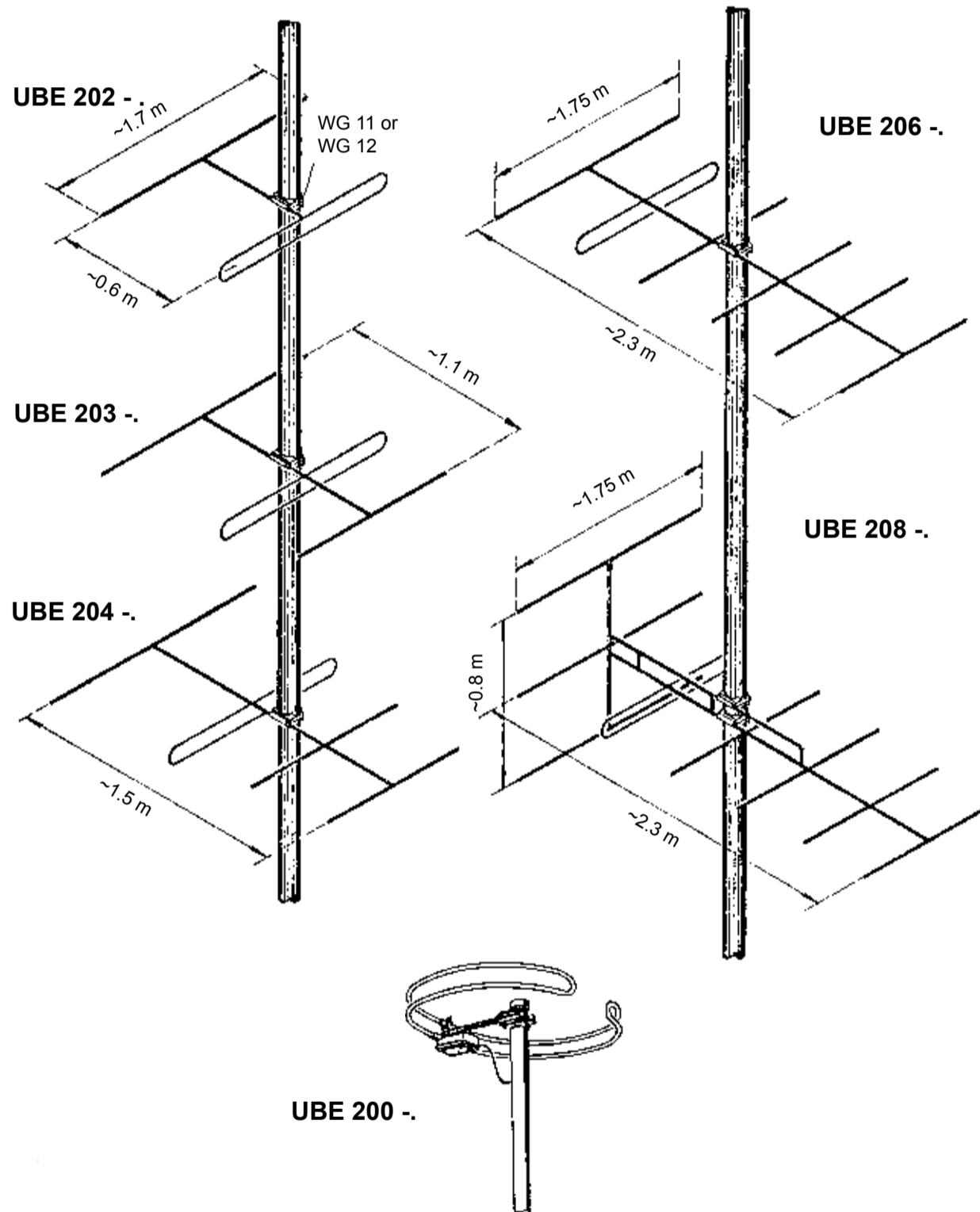
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**FM-ANTENNAS**  
 87.5 - 108 MHz  
 horizontal polarization

**UBE 20. -.**



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**UBE 20. -.**

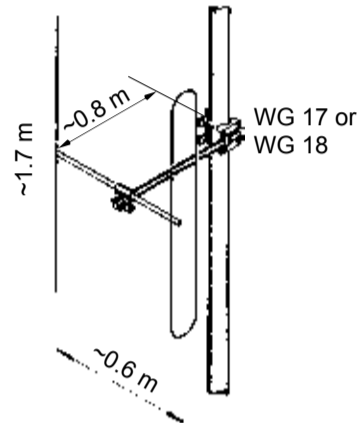
<b>TYPE</b>	<b>UBE 20. -0</b> : no longer available		
	<b>UBE 20. -1</b> : balun with cable (for increased lightning protection) termination 10 m RG 59 (ø 6.5 mm), without connector		
	<b>UBE 20. -2</b> : similar UBE 20. -1 but terminated with 10 m RG 11 (ø 10 mm)		
<b>POLARIZATION</b>	horizontal		
<b>FREQUENCY</b>	87.5 - 108 MHz		
<b>IMPEDANCE</b>	75 Ω		
<b>MATERIAL</b>	aluminium, screws of stainless steel, weather-proof plastics		
<b>GROUNDING</b>	all metal parts are DC grounded		
<b>MOUNTING</b>	<i>mast-ø</i>	<i>mounting clamp</i>	
	30 - 80 mm	WG 11 (standard)	2 clamps for UBE 208..
	50 - 104 mm	WG 12 (option)	2 clamps for UBE 208..
	104-138 mm	special order	
	> 138	special brackets	
	pay attention to the label <b>DOWN</b>		

TYPE	UBE 202..	UBE 203..	UBE 204..	UBE 206..	UBE 208..	UBE 200..
<b>GAIN (ref. to λ/2 dipole)</b>	3.5	5	6.5	8	9	-2
<b>F/B in dB &gt;</b>	9	14	16	20	25	
<b>3 dB BEAMWIDTH</b>						
horizontal, E plane	80°	70°	60°	50°	45°	360°
vertical, H plane	135°	115°	90°	72°	62°	
<b>WEIGHT [kg]</b>	1.3	1.6	1.8	2.5	4.0	1.5
<b>WIND AREA [m²]</b>	0.053	0.066	0.080	0.105	0.159	0.05
<b>WIND LOAD [N]</b>						
150 km/h	67	84	102	134	203	63
130 km/h	51	64	77	100	153	47

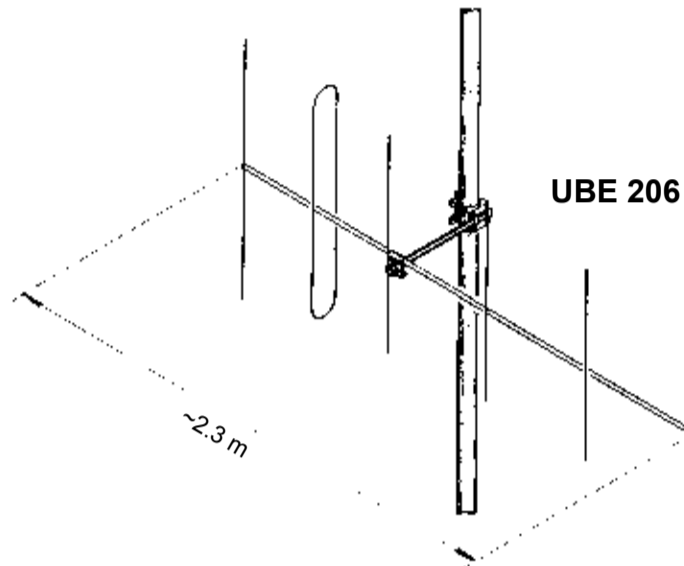
# wipic -Antennas

**FM-ANTENNAS**  
**87.5 - 108 MHz**  
 vertical polarization

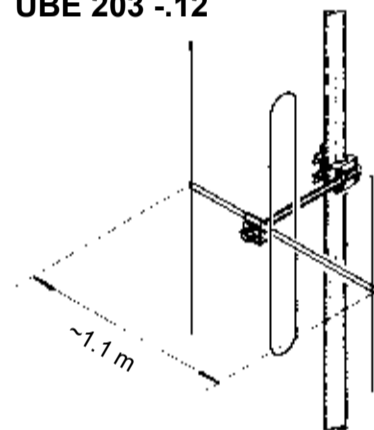
**UBE 202 -.12**



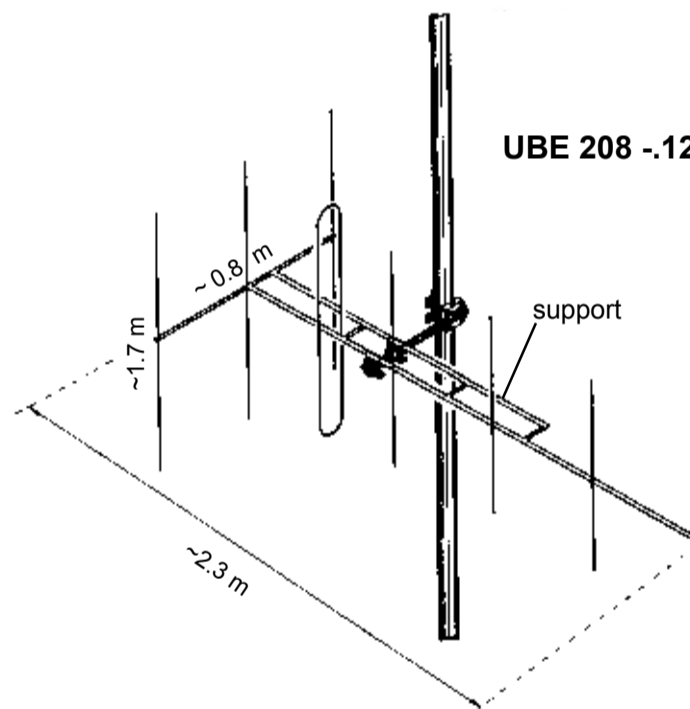
**UBE 206 -.12**



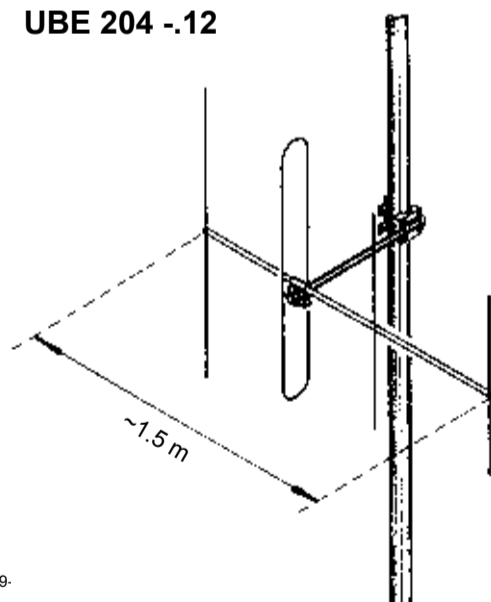
**UBE 203 -.12**



**UBE 208 -.12**



**UBE 204 -.12**



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**UBE 20. -.12**

<b>TYPE</b>	<b>UBE 20. -012</b> : no longer available <b>UBE 20. -112</b> : balun with cable (for increased lightning protection) termination 10 m RG 59 (ø 6.5 mm), without connector <b>UBE 20. -212</b> : similar UBE 20. -112 but terminated with 10 m RG 11 (ø 10 mm)	
<b>POLARIZATION</b>	vertical	
<b>FREQUENCY</b>	87.5 - 108 MHz	
<b>IMPEDANCE</b>	75 Ω	
<b>MATERIAL</b>	aluminium, screws of stainless steel, weather-proof plastics	
<b>GROUNDING</b>	all metal parts are DC grounded	
<b>MOUNTING</b>	<i>mast-ø</i> 30 - 80 mm 50 - 104 mm 104-138 mm pay attention to the label <b>DOWN</b>	<i>mounting clamp</i> WG 17 (standard) WG 18 (option) special order

TYPE	UBE 202..	UBE 203..	UBE 204..	UBE 206..	UBE 208..
<b>GAIN (ref. to λ/2 dipole)</b>	3.5	5	6.5	8	9
<b>F/B in dB &gt;</b>	9	14	16	20	25
<b>3 dB BEAMWIDTH</b>					
horizontal, E plane	80°	70°	60°	50°	45°
vertical, H plane	135°	115°	90°	72°	62°
<b>WEIGHT [kg]</b>	1.3	2.6	2.8	3.5	5.0
<b>WIND AREA [m²]</b>	0.08	0.093	0.11	0.132	0.186
<b>WIND LOAD [N]</b>					
150 km/h	102	118	136	168	237
130 km/h	76	89	102	126	178

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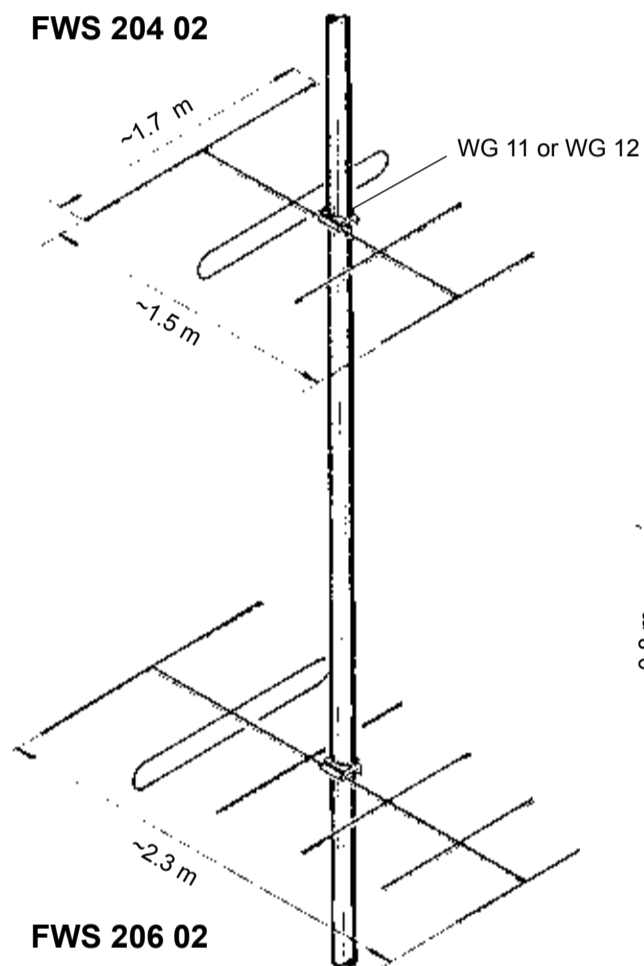
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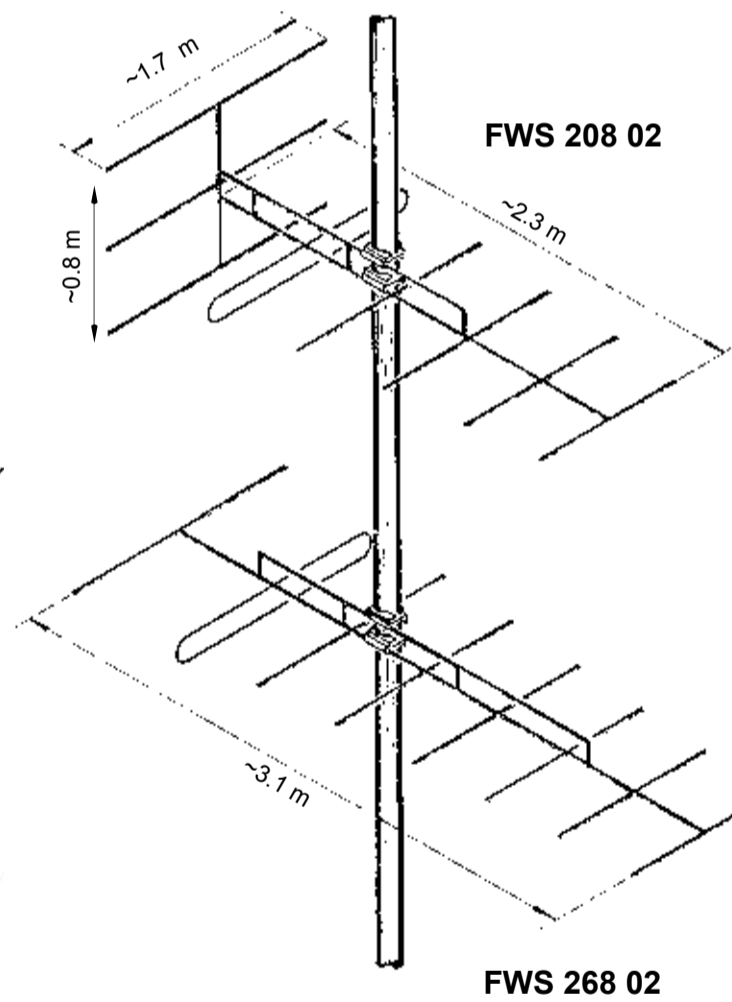
**FM-ANTENNAS 87.5 - 108 MHz**  
 horizontal polarization  
 type without radom

**FWS 2.. 02**

**FWS 204 02**



**FWS 206 02**



**FWS 268 02**

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**FWS 2.. 02**

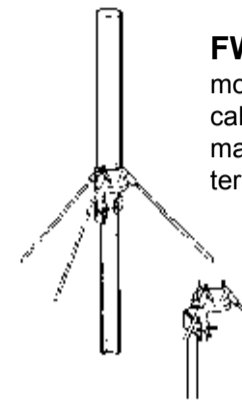
<b>Description</b>	robust construction SWR individually measured especially suited for MATV For exposed location (icing, environment, lightning) we recommend the type with radome (FWS 2.. 03).
<b>Polarization</b>	horizontal
<b>Frequency</b>	tuned to the specified frequency or for the FM band 87.5 - 108 MHz
<b>Impedance</b>	50 $\Omega$ or 75 $\Omega$
<b>VSWR</b>	< 1.2 on tuned frequency < 1.4, at the limits of the band < 1.5
<b>Termination</b>	50 $\Omega$ : 2m cable RG 213/U ending with N male 75 $\Omega$ : 2m cable RG 11/U ending with N male
<b>Material</b>	aluminium, screws of stainless steel, weather-proof plastics
<b>Grounding</b>	all metal parts are DC grounded
<b>Mounting</b>	<i>mast-<math>\emptyset</math></i> <i>clamp</i> 30 - 80 mm                      WG 11 (standard) 2x for FWS 2.8.. 50 -104 mm                      WG 12 (option) 2x for FWS 2.8.. pay attention to the label <span style="border: 1px solid black; padding: 0 2px;">DOWN</span>
<b>max. wind velocity</b>	160 km/h

Type	FWS 204 02	FWS 206 02	FWS 208 02	FWS 268 02
<b>Gain [dB] ref. <math>\lambda/2</math> dipole</b>	6.5	8	9	9
<b>F/B [dB]</b>	16	20	25	20
<b>3 dB beam width horizontal, E plane</b>	60°	50°	45°	45°
<b>vertical, H plane</b>	90°	72°	62°	62°
<b>Weight [kg]</b>	2.1	2.8	4.3	4.5
<b>Wind area [ m<sup>2</sup>]</b>	0.080	0.105	0.159	0.143
<b>Wind load [N]</b>				
150 km/h	104	136	206	185
130 km/h	76	100	152	137

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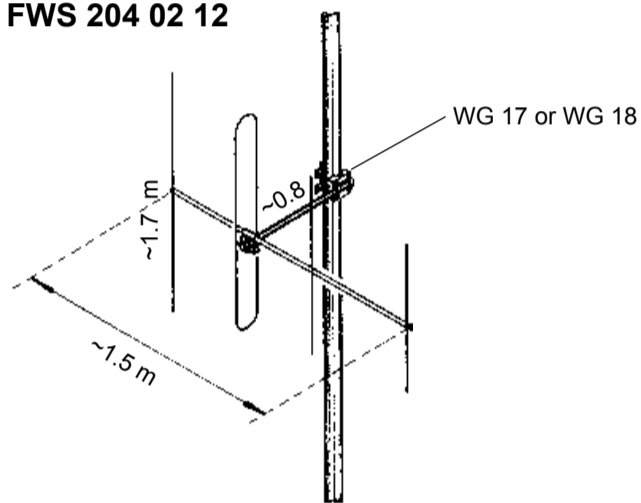
**FM-ANTENNAS 87.5 - 108 MHz**  
 vertical polarization  
 type without radom

**FWS 20. 02 12**

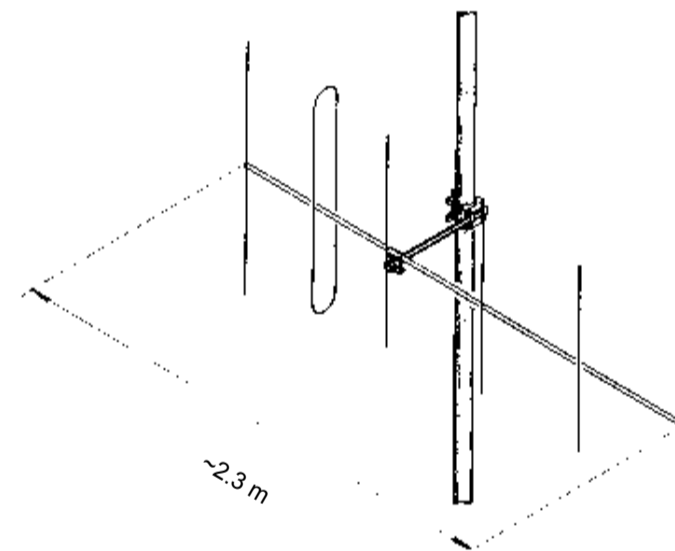


**FWS 200 84 1**  
 mounting to 30-66 mm ø mast  
 cable running inside or outside the mast  
 termination ~1m cable with N male

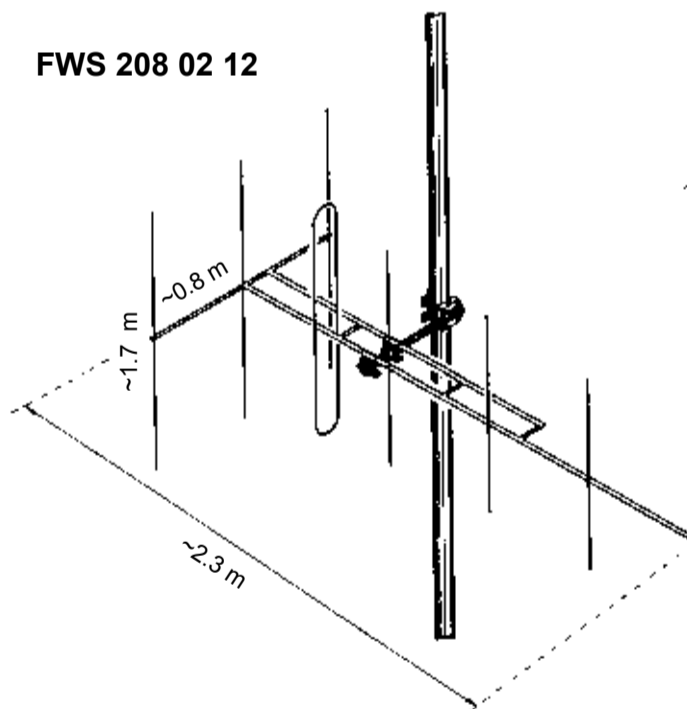
**FWS 204 02 12**



**FWS 206 02 12**



**FWS 208 02 12**



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**FWS 20. 02 12**

<b>Description</b>	robust construction SWR individually measured especially suited for MATV For special cases (icing, environment, lightning) we recommend the type with radome (FWS 2.. 03).
<b>Polarization</b>	vertical
<b>Frequency</b>	tuned to the specified frequency or for the FM band 87.5 - 108 MHz
<b>Impedance</b>	50 $\Omega$ oder 75 $\Omega$
<b>VSWR</b>	< 1.2 on tuned frequency < 1.4, at the limits of the band < 1.5
<b>Termination</b>	50 $\Omega$ : 2m cable RG 213/U ending with N male 75 $\Omega$ : 2m cable RG 11/U ending with N male
<b>Material</b>	aluminium, screws of stainless steel, weather-proof plastics
<b>Grounding</b>	all metal parts are DC grounded
<b>Mounting</b>	<i>mast-<math>\emptyset</math></i> <i>clamp</i> 30 - 80 mm                      WG 17 (standard) 50 -104 mm                      WG 18 (option) pay attention to the label    DOWN
<b>max. wind velocity</b>	160 km/h

Type	FWS 200 84 1	FWS 204 02 12	FWS 206 02 12	FWS 208 02 12
<b>Gain [dB] ref. <math>\lambda/2</math> dipole</b>	0	6.5	8	9
<b>F/B [dB]</b>	--	16	20	25
<b>3 dB beam width horizontal, E plane</b>	360°	60°	50°	45°
<b>vertical, H plane</b>	78°	90°	72°	62°
<b>Weight [kg]</b>	1.8	2.1	2.8	4.3
<b>Wind area [ m<sup>2</sup>]</b>	0.056	0.080	0.105	0.159
<b>Wind load [N]</b>				
150 km/h	72	104	136	206
130 km/h	54	76	100	152

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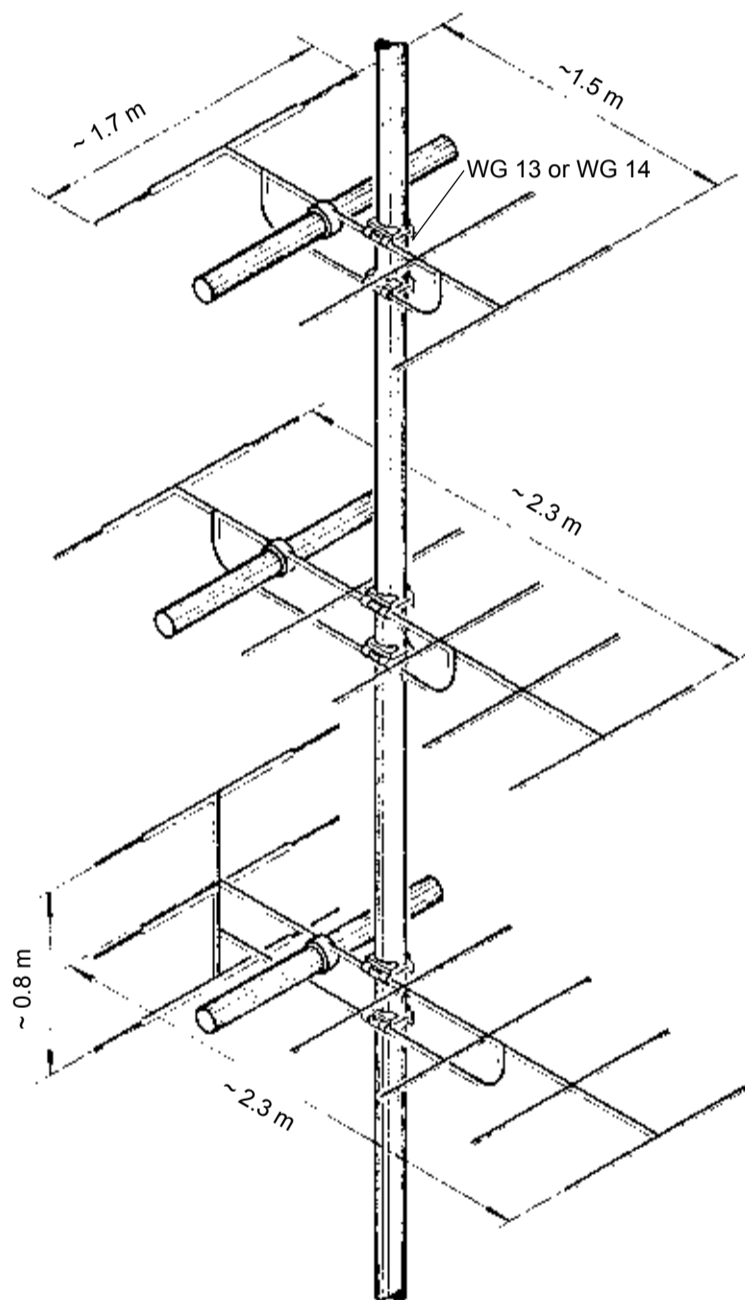
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# wipic -Antennas

**FM ANTENNAS 87.5 - 108 MHz**  
type with radome

**FWS 204 03**  
**FWS 206 03**  
**FWS 208 03**



**4-ELEMENT YAGI ANTENNA**

**type no.** FWS 204 03  
**gain** 6.5 dB ref.  $\lambda/2$  dipole  
**F/B** 16 dB

**3 dB beam width** horizontal, E plane 60°  
vertical, H plane 90°

**6-ELEMENT YAGI ANTENNA**

**type no.** FWS 206 03  
**gain** 8 dB ref.  $\lambda/2$  dipole  
**F/B** 20 dB

**3 dB beam width** horizontal, E plane 50°  
vertical, H plane 72°

**8-ELEMENT YAGI ANTENNA**

**type no.** FWS 208 03  
**gain** 9 dB ref.  $\lambda/2$  dipole  
**F/B** 25 dB

**3 dB beam width** horizontal, E plane 45°  
vertical, H plane 62°

KW 9-01

WIPIC reserves the right to amend specifications in the light of continuing development.

Section 9.7. 17/40

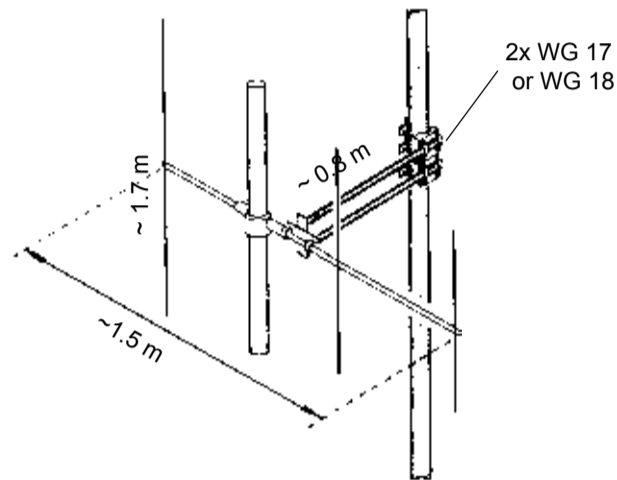

**FWS 20. 03**

<b>Description</b>	heavy duty, dipole with radome The radome protects the antenna dipole from environmental influences, icing, and increases the lightning protection. SWR individually measured especially suited for MATV
<b>Polarization</b>	horizontal
<b>Frequency</b>	tuned to specified frequency or for the FM band 87.5-108 MHz
<b>Impedance</b>	50 $\Omega$ oder 75 $\Omega$
<b>VSWR</b>	< 1.2 on tuned frequency < 1.5 for the whole band
<b>Termination</b>	50 $\Omega$ : 2m cable RG 213/U ending with N male 75 $\Omega$ : 2m cable RG 11/U ending with N male
<b>Material</b>	aluminium, screws of stainless steel, radome of UV-stabilized polyethylene
<b>Grounding</b>	all metal parts are DC grounded
<b>Mounting</b>	<i>mast-<math>\emptyset</math></i> <i>clamp</i> 30 - 80 mm                      2x WG 13 (standard) 50 -104 mm                      2x WG 14 (option) pay attention to the label <span style="border: 1px solid black; padding: 0 2px;">DOWN</span>
<b>max. wind velocity</b>	200 km/h

Type No.	FWS 204 03	FWS 206 03	FWS 208 03
<b>Weight [kg]</b>	7.2	8.9	10.6
<b>Wind area [m<sup>2</sup>]</b>	0.22	0.278	0.362
<b>Wind load [N]</b>			
<b>150 km/h</b>	286	360	469
<b>130 km/h</b>	212	266	374

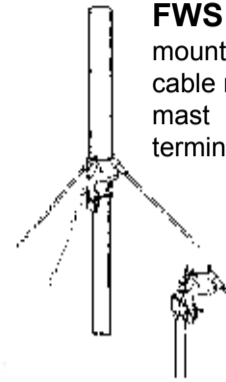
# wipic -Antennas

**FM ANTENNAS 87.5 - 108 MHz**  
 type with radome  
 vertical polarisation



**FWS 200 84 1**

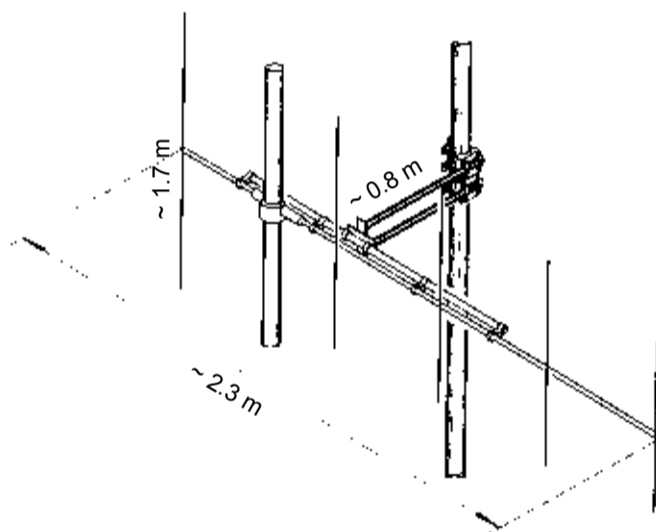
mounting to 30-66 mm  $\varnothing$  mast  
 cable running inside or outside the mast  
 termination ~1m cable with N male



**4-ELEMENT YAGI ANTENNA**

type no. **FWS 204 03 12**  
 gain 6.5 dB ref.  $\lambda/2$  dipole  
 F/B 16 dB

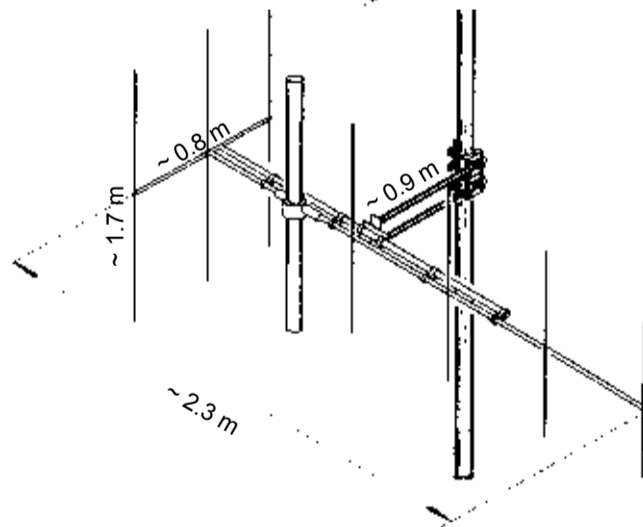
3 dB beam width horizontal, H plane 90°  
 vertical, E plane 60°



**6-ELEMENT YAGI ANTENNA**

type no. **FWS 206 03 12**  
 gain 8 dB ref.  $\lambda/2$  dipole  
 F/B 20 dB

3 dB beam width horizontal, H plane 72°  
 vertical, E plane 50°



**8-ELEMENT YAGI ANTENNA**

type no. **FWS 208 03**  
 gain 9 dB ref.  $\lambda/2$  dipole  
 F/B 25 dB

3 dB beam width horizontal, H plane 62°  
 vertical, E plane 45°

KW 9-01

WIPIIC reserves the right to amend specifications in the light of continuing development.


**FWS 20. 03 12**

<b>Description</b>	heavy duty, dipole with radome The radome protects the antenna dipole from environmental influences, icing, and increases the lightning protection. VSWR individually measured especially designed for collective antenna systems
<b>Polarization</b>	vertical
<b>Frequency</b>	tuned to specified frequency or for the FM band 87.5-108 MHz
<b>Impedance</b>	50 Ω oder 75 Ω
<b>VSWR</b>	< 1.2 on tuned frequency < 1.3 at the limit of the band <1.5
<b>Termination</b>	50 Ω: 2m cable RG 213/U ending with N male 75 Ω: 2m cable RG 11/U ending with N male
<b>Material</b>	aluminium, screws of stainless steel, radome of UV-stabilized polyethylene
<b>Grounding</b>	all metal parts are DC grounded
<b>Mounting</b>	<i>mast-ø</i> <i>clamp</i> 30 - 80 mm                2x WG 17 (standard) 50 -104 mm               2x WG 18 (option) pay attention to the label <span style="border: 1px solid black; padding: 0 2px;">DOWN</span>
<b>Max. wind velocity</b>	200 km/h

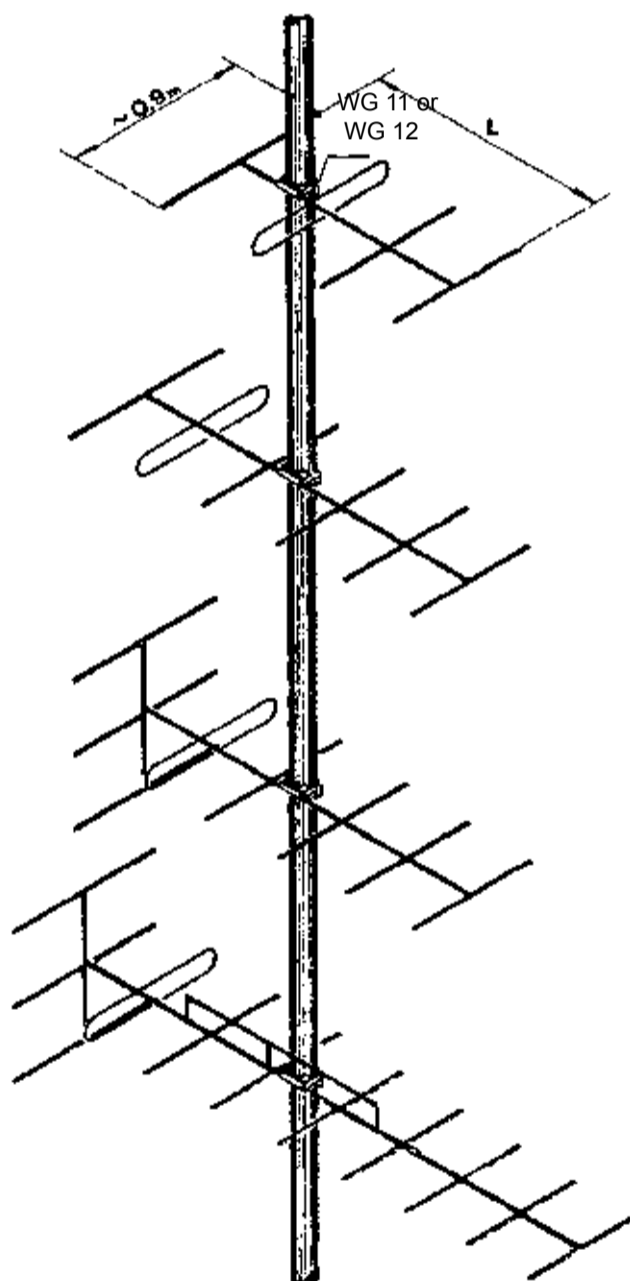
Type No.	<i>FWS 200 84 1</i>	<i>FWS 204 03 12</i>	<i>FWS 206 03 12</i>	<i>FWS 208 03 12</i>
<b>Weight [kg]</b>	0	7.2	8.9	10.6
<b>Wind area [m<sup>2</sup>]</b>	0.056	0.28	0.34	0.422
<b>Wind load [N]</b>				
<b>150 km/h</b>	72	357	434	540
<b>130 km/h</b>	54	268	326	404

# wipic -Antennas

## TV-ANTENNAS BAND III

For a channel group in the band III (175 - 230 MHz)  
channel 5 ..... 12  
horizontal polarization

**FBE 304 -.**  
**FBE 306 -.**  
**FBE 308 -.**  
**FBE 311 -.**



### 4-ELEMENT YAGI ANTENNA

type no. **FBE 304-0**  
**FBE 304-1**  
**FBE 304-2**  
gain 5-7 dB ref.  $\lambda/2$  dipole  
F/B 18 dB

3 dB beam horizontal, E plane 58°  
width vertical, H plane 90°

### 6-ELEMENT YAGI ANTENNA

type no. **FBE 306-0**  
**FBE 306-1**  
**FBE 306-2**  
gain 6-9 dB ref.  $\lambda/2$  dipole  
F/B 20 dB

3 dB beam horizontal, E plane 50°  
width vertical, H plane 66°

### 8-ELEMENT YAGI ANTENNA

type no. **FBE 308-0**  
**FBE 308-1**  
**FBE 308-2**  
gain 7-11 dB ref.  $\lambda/2$  dipole  
F/B 25 dB

3 dB beam horizontal, E plane 42°  
width vertical, H plane 56°

### 11-ELEMENT YAGI ANTENNA

type no. **FBE 311-0**  
**FBE 311-1**  
**FBE 311-2**  
gain 8-12 dB ref.  $\lambda/2$  dipole  
F/B 25 dB

3 dB beam horizontal, E plane 32°  
width vertical, H plane 45°

KW 9-01

WIPIIC reserves the right to amend specifications in the light of continuing development.


**FBE 304 -. FBE 306 -. FBE 308 -. FBE 311 -.** 

<b>Type</b>	
<b>FBE 3..-0</b>	no longer available
<b>FBE 3..-1</b>	balun with cable (for increased lightning protection) termination: 10 m RG 59 (ø 6.5 mm), without connector impedance: 75 Ω
<b>FBE 3..-2</b>	as FBE ...-1, but termination with 10 m RG 11 (ø 10 mm)

	channel	weight <sup>1)</sup> [kg]	wind area[m <sup>2</sup> ]	wind load <sup>2)</sup> [N]	length L [m]	gain dB <sup>3)</sup>
<b>FBE 304-.</b>	5-6	1.4	0.044	25	1.1	6.5
	7-8	1.4	0.041	23	1.0	6.5
	9-10	1.4	0.038	22	0.9	6.5
	11-12	1.4	0.036	21	0.9	6.5
	5-12	1.4	0.038	22	0.9	5-7
<b>FBE 306-.</b>	5-6	1.8	0.060	34	2.1	8.5
	7-8	1.8	0.056	32	2.0	8.5
	9-10	1.8	0.052	30	1.9	8.5
	11-12	1.8	0.048	27	1.7	8.5
	5-12	1.8	0.052	30	1.9	6-9
<b>FBE 308-.</b>	5-6	2.3	0.080	45	2.1	10
	7-8	2.2	0.076	43	2.0	10
	9-10	2.2	0.068	39	1.9	10
	11-12	2.2	0.063	36	1.7	10
	5-12	2.2	0.068	38	1.9	7-11
<b>FBE 311-.</b>	5-6	3.4	0.130	73	3.6	12
	7-8	3.3	0.128	72	3.5	12
	9-10	3.2	0.117	67	3.2	12
	11-12	3.1	0.110	63	2.9	12
	5-12	3.2	0.120	67	3.0	8-12

1) **weight** with clamp, without cable  
weight of the cable: ø 6.5 mm : 0.6 kg/10m  
ø 10 mm : 1.6 kg/10m

<sup>3)</sup> ref. λ/2 dipole

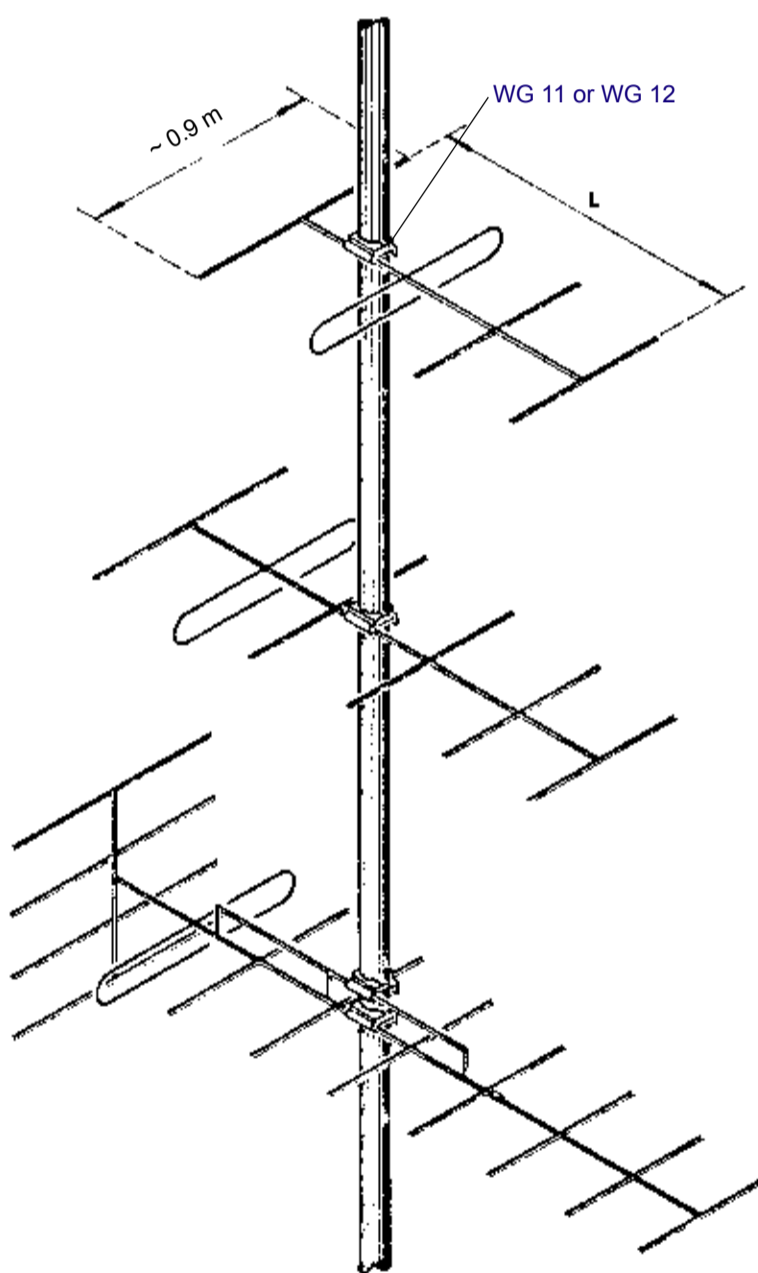
2) **windload:** at 100 km/h  
at 130 km/h: multiply windload at 100 km/hby 1.7  
at 150 km/h: multiply windload at 100 km/hby 2.25

**mounting:** with clamp WG 11 for mast-ø 30-80 mm (standard)  
with clamp WG 12 for mast-ø 50-104 mm (option)  
connection box below the boom  
pay attention to the label **DOWN**

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**TV ANTENNAS** (174 - 230 MHz)  
for a channel group in the band III  
channel 5 .....12  
type without radome

**FWS 304 02**  
**FWS 306 02**  
**FWS 312 02**



**4-ELEMENT YAGI ANTENNA**

**type no.** FWS 304 02  
**gain** 5-7 dB ref.  $\lambda/2$  dipole  
**F/B** 18 dB

**3 dB beam width** horizontal, E plane 58°  
vertical, H plane 90°

**6-ELEMENT YAGI ANTENNA**

**type no.** FWS 306 02  
**gain** 6-9 dB ref.  $\lambda/2$  dipole  
**F/B** 20 dB

**3 dB beam width** horizontal, E plane 50°  
vertical, H plane 66°

**12-ELEMENT YAGI ANTENNA**

**type no.** FWS 312 02  
**gain** 8-12 dB ref.  $\lambda/2$  dipole  
**F/B** 25 dB

**3 dB beam width** horizontal, E plane 32°  
vertical, H plane 45°

KW 9-01

WIPIC reserves the right to amend specifications in the light of continuing development.

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**FWS 3.. 02**

<b>Description</b>	robust construction VSWR individually measured especially suited for MATV For exposed locations (icing, environment, lightning) we recommend the type with radom (FWS 3.. 03)
<b>Polarization</b>	horizontal
<b>Frequency</b>	tuned to specified channel group, or for the band III
<b>Impedance</b>	50 Ω or 75 Ω
<b>VSWR</b>	< 1.3 on desired channel group < 1.5 for the whole band III
<b>Termination</b>	50 Ω: 2m cable RG 213/U ending with N male 75 Ω: 2m cable RG 11/U ending with N male
<b>Material</b>	aluminium, screws of stainless steel, weather-proof plastics
<b>Grounding</b>	all metal parts are DC grounded
<b>Mounting</b>	<i>mast-ø</i> <i>clamp</i> 30 - 80 mm                  WG 11 (standard) 2x for FWS 312 .. 50 -104 mm                WG 12 (option) 2x for FWS 312 .. mast-ø > 104 mm      special order pay attention to the label <b>DOWN</b>
<b>Max. wind velocity</b>	180 km/h

	channel group CCIR	weight [kg]	wind area [m <sup>2</sup> ]	wind load [N]		length L [m]	gain <sup>1)</sup> [dB]
				150 km/h	130 km/h		
<b>FWS 304 02</b>	5-6	1.7	0.044	56	42	1.1	6.5
	7-8	1.7	0.041	52	39	1.0	6.5
	9-10	1.6	0.038	48	36	0.9	6.5
	11-12	1.6	0.036	45	34	0.9	6.5
	5-12	1.6	0.038	48	36	0.9	5-7
<b>FWS 306 02</b>	5-6	2.1	0.060	76	57	2.1	8.5
	7-8	2.1	0.056	71	53	2.0	8.5
	9-10	2.0	0.052	66	49	1.9	8.5
	11-12	2.0	0.048	61	46	1.7	8.5
	5-12	2.0	0.052	66	49	1.9	6-9
<b>FWS 312 02</b>	5-6	3.8	0.080	102	76	3.6	12
	7-8	3.7	0.076	97	72	3.5	12
	9-10	3.6	0.068	86	65	3.2	12
	11-12	3.5	0.063	80	60	1.7	12
	5-12	3.6	0.068	86	65	3.0	8-12

<sup>1)</sup> ref. λ/2 dipole

**Prices in SFr, gross, ex work**

FWS 304 02	620.00
FWS 306 02	687.00
<sup>KW</sup> FWS 312 02	897.00

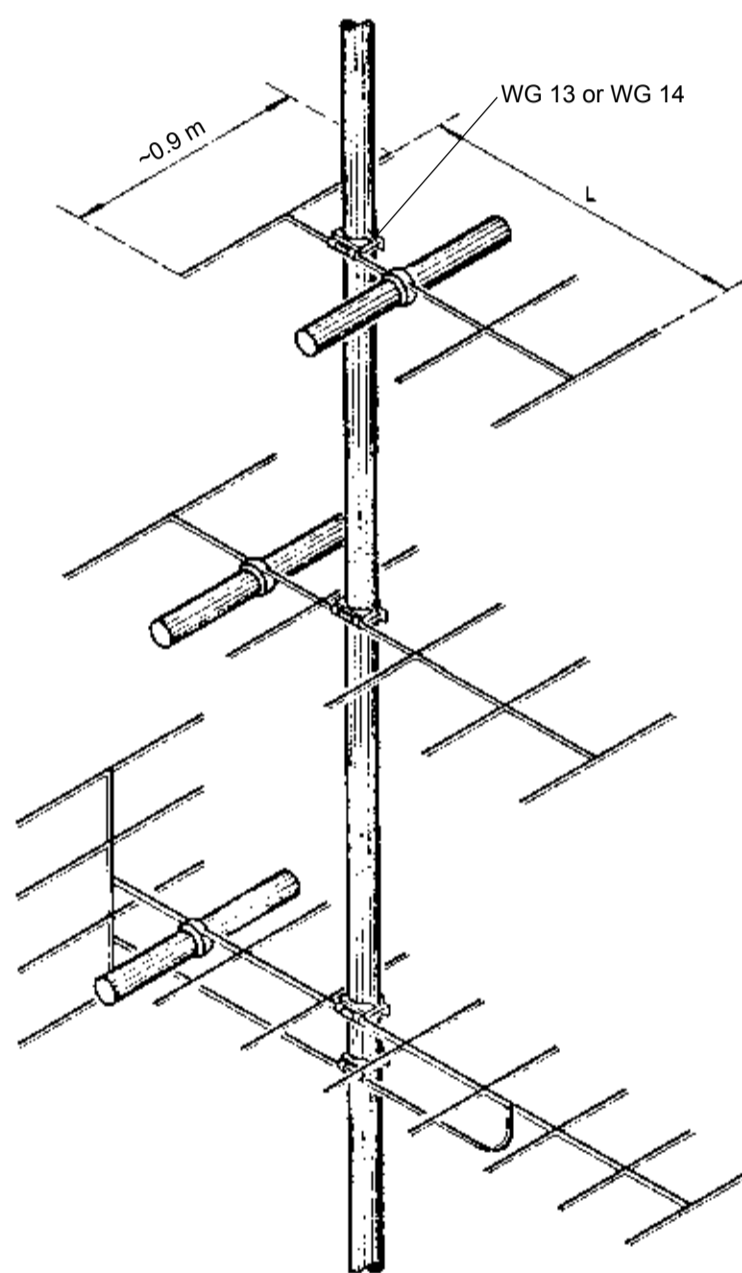
WIPIC reserves the right to amend specifications in the light of continuing development.



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**TV ANTENNAS** (175-230 MHz)  
for a channel group in the band III  
channel 5 .....12  
type with radome

**FWS 304 03**  
**FWS 306 03**  
**FWS 312 03**



**4-ELEMENT YAGI ANTENNA**

**type no.** FWS 304 03  
**gain** 5-7 dB ref.  $\lambda/2$  dipole  
**F/B** 18 dB

**3 dB beam width** horizontal, E plane 58°  
vertical, H plane 90°

**6-ELEMENT YAGI ANTENNA**

**type no.** FWS 306 03  
**gain** 6-9 dB ref.  $\lambda/2$  dipole  
**F/B** 20 dB

**3 dB beam width** horizontal, E plane 50°  
vertical, H plane 66°

**12-ELEMENT YAGI ANTENNA**

**type no.** FWS 312 03  
**gain** 8-12 dB ref.  $\lambda/2$  dipole  
**F/B** 25 dB

**3 dB beam width** horizontal, E plane 32°  
vertical, H plane 45°

KW 9-01

WIPIC reserves the right to amend specifications in the light of continuing development.

Section 9.7. 25/40


**FWS 3.. 03**

<b>Description</b>	heavy duty, with radome The radome protects the antenna dipole from environmental influences, icing, and increases the lightning protection. SWR individually measured especially suited for MATV										
<b>Polarization</b>	horizontal										
<b>Frequency</b>	tuned to specified channel group, or for the band III										
<b>Impedance</b>	50 Ω or 75 Ω										
<b>VSWR</b>	< 1.3 on desired channel group < 1.5 for the whole band III										
<b>Termination</b>	50Ω: 2m cable RG 213/U ending with N male 75Ω: 2m cable RG 11/U ending with N male										
<b>Material</b>	aluminium, screws of stainless steel, radome of uv-stabilized polyethylene										
<b>Grounding</b>	all metal parts are DC grounded										
<b>Mounting</b>	<table border="0"> <tr> <td><i>mast-ø</i></td> <td><i>clamp</i></td> </tr> <tr> <td>30 - 80 mm</td> <td>WG 13 (standard) 2x for FWS 312 ..</td> </tr> <tr> <td>50 -104 mm</td> <td>WG 14 (option) 2x for FWS 312 ..</td> </tr> <tr> <td>mast-ø &gt; 104 mm</td> <td>special order</td> </tr> <tr> <td colspan="2">pay attention to the label <span style="border: 1px solid black; padding: 2px;">DOWN</span></td> </tr> </table>	<i>mast-ø</i>	<i>clamp</i>	30 - 80 mm	WG 13 (standard) 2x for FWS 312 ..	50 -104 mm	WG 14 (option) 2x for FWS 312 ..	mast-ø > 104 mm	special order	pay attention to the label <span style="border: 1px solid black; padding: 2px;">DOWN</span>	
<i>mast-ø</i>	<i>clamp</i>										
30 - 80 mm	WG 13 (standard) 2x for FWS 312 ..										
50 -104 mm	WG 14 (option) 2x for FWS 312 ..										
mast-ø > 104 mm	special order										
pay attention to the label <span style="border: 1px solid black; padding: 2px;">DOWN</span>											
<b>max. wind velocity</b>	200 km/h										

	channel group CCIR	weight [kg]	wind area [m <sup>2</sup> ]	wind load		length L [m]	gain <sup>1)</sup> [dB]
				150 km/h	130 km/h		
<b>FWS 304 03</b>	5-6	4.1	0.088	112	84	1.1	6.5
	7-8	4.0	0.082	104	78	1.0	6.5
	9-10	3.9	0.077	98	70	0.9	6.5
	11-12	3.8	0.073	93	70	0.9	6.5
	5-12	3.9	0.077	98	70	0.9	5-7
<b>FWS 306 03</b>	5-6	5.0	0.110	140	105	2.1	8.5
	7-8	4.9	0.103	131	98	2.0	8.5
	9-10	4.8	0.097	123	93	1.9	8.5
	11-12	4.6	0.091	116	87	1.7	8.5
	5-12	4.8	0.096	122	92	1.9	6-9
<b>FWS 312 03</b>	5-6	8.8	0.203	259	194	3.6	12
	7-8	8.5	0.188	240	180	3.5	12
	9-10	8.2	0.176	224	168	3.2	12
	11-12	7.8	0.166	212	159	2.9	12
	5-12	8.2	0.175	223	167	3.0	8-12

<sup>1)</sup> ref. λ/2 dipole

KW 9-01

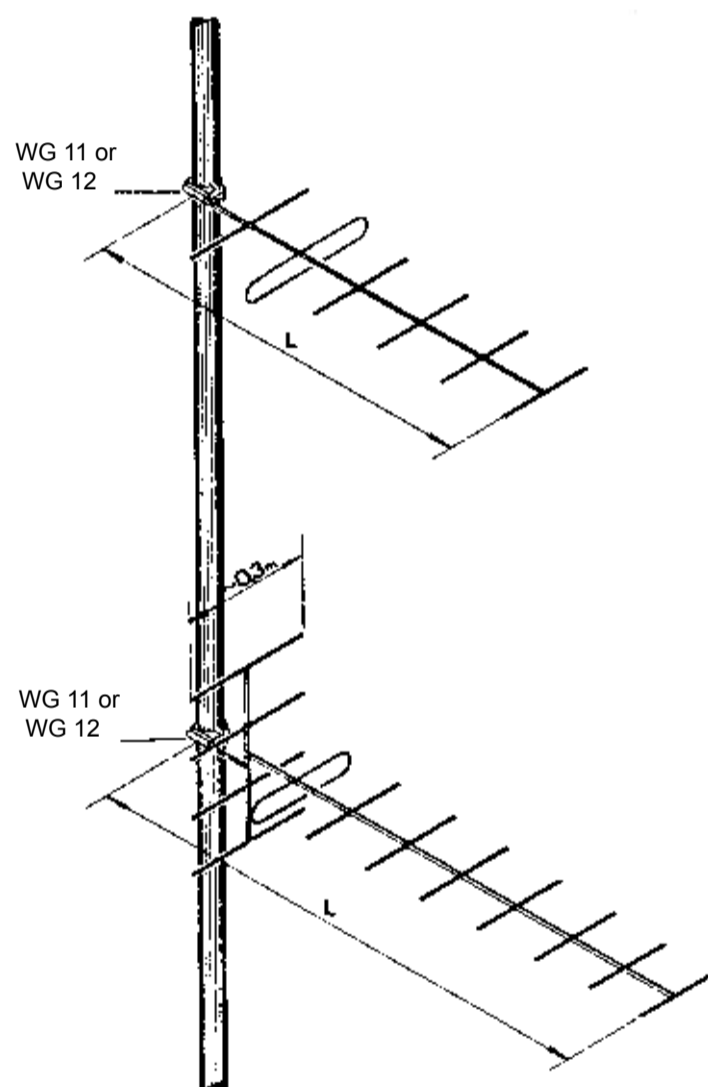
WIPIC reserves the right to amend specifications in the light of continuing development.

# wipic -Antennas

## TV-ANTENNAS BAND IV/V

For a channel group in the band IV/ V (471 - 862 MHz)  
channel 21 ... 69  
horizontal polarization

**FBE 406 -.**  
**FBE 412 -.**



### 6-ELEMENT YAGI ANTENNA

type no. **FBE 406-0**  
**FBE 406-1**  
**FBE 406-2**

gain 8 dB ref.  $\lambda/2$  dipole  
F/B 20 dB

3 dB beam horizontal, E plane 50°  
width vertical, H plane 66°

### 12-ELEMENT YAGI ANTENNA

type no. **FBE 412-0**  
**FBE 412-1**  
**FBE 412-2**

gain 11.5 dB ref.  $\lambda/2$  dipole  
F/B 25 dB

3 dB beam horizontal, E plane 35°  
width vertical, H plane 50°

KW 9-01

WIPIC reserves the right to amend specifications in the light of continuing development.

Section 9.7. 27/40


**FBE 406 -. FBE 412 -.** 

<b>Type</b>	
<b>FBE 4..-0</b>	no longer available
<b>FBE 4..-1</b>	balun with cable (for increased lightning protection) termination: 10 m RG 59 (ø 6.5 mm), without connector impedance: 75 Ω
<b>FBE 4..-2</b>	as FBE ...-1, but termination with 10 m RG 11 (ø 10 mm)

	channel <sup>3)</sup>	weight <sup>1)</sup> [kg]	wind area [m <sup>2</sup> ]	wind load <sup>2)</sup> [N]	length L [m]
<b>FBE 406-.</b>	21-30	1.1	0.021	12	0.9
	31-41	1.1	0.019	11	0.7
	42-54	1.0	0.017	10	0.7
	54-69	1.0	0.015	9	0.6
<b>FBE 412-.</b>	21-30	1.7	0.039	23	1.3
	31-41	1.6	0.035	21	1.1
	42-54	1.5	0.032	19	1.0
	54-69	1.4	0.028	17	0.9

**1) weight** with clamp, without cable

weight of the cable:   ø 6.5 mm : 0.6 kg/10m  
                                  ø 10 mm : 1.6 kg/10m

**2) windload:**       at 100 km/h  
                          at 130 km/h: multiply windload at 100 km by 1.7  
                          at 150 km/h: multiply windload at 100 km by 2.25

**3) other channel** groups on request

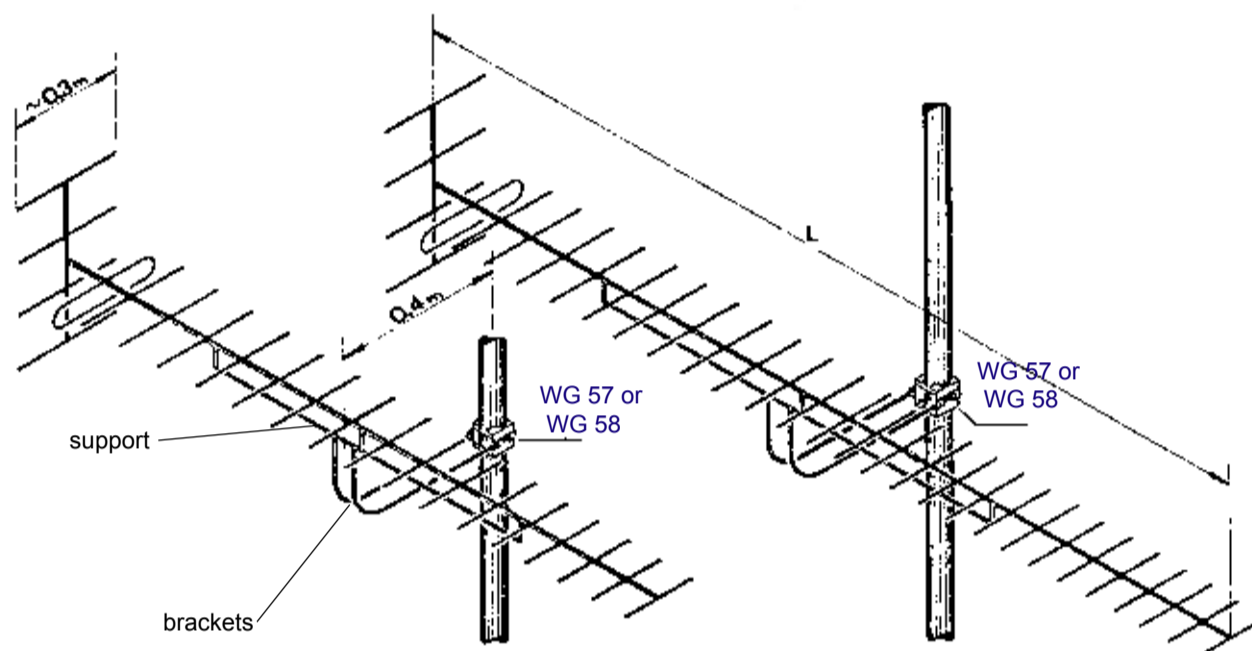
**mounting:**       with clamp WG 11 for mast-ø 30-80 mm (standard)  
                          with clamp WG 12 for mast-ø 50-104 mm (option)  
                          connection box below the boom  
                          pay attention to the label DOWN

# wipic -Antennas

## TV-ANTENNAS BAND IV/V

For a channel group in the band IV/ V (470 - 862 MHz)  
channel 21 ... 69  
horizontal polarization

**FBE 421 -.**  
**FBE 431 -.**  
**FBE 480 -.**



### 21-ELEMENT YAGI ANTIENNA

type no. **FBE 421-0**  
**FBE 421-1**  
**FBE 421-2**

gain 14 dB ref.  $\lambda/2$  dipole  
F/B 25 dB

**3 dB beam** horizontal, E plane 25°  
**width** vertical, H plane 30°

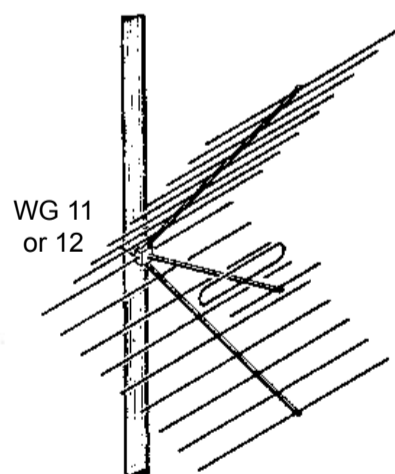
For channel 21 to 36: delivery with WG 57 or WG 58  
and support  
For channel 37 to 69: delivery with WG 65 or WG 66  
and support

### 31-ELEMENT YAGI ANTIENNA

type no. **FBE 431-0**  
**FBE 431-1**  
**FBE 431-2**

gain 16 dB ref.  $\lambda/2$  dipole  
F/B 25 dB

**3 dB beam** horizontal, E plane 20°  
**width** vertical, H plane 24°



### CORNERREFLECTOR ANTENNA CH. 21 - 69

type no. **FBE 480-0**  
**FBE 480-1**  
**FBE 480-2**

gain 8 - 11 dB ref.  $\lambda/2$  dipole  
F/B 18 - 25 dB

**3 dB beam** horizontal, E plane 55 - 45°  
**width** vertical, H plane 48 - 40°

KW 9-01

WIPIIC reserves the right to amend specifications in the light of continuing development.


**FBE 421 -. FBE 431 -. FBE 480 -.**

Type	Description
FBE 4..-0	no longer available
FBE 4..-1	balun with cable (for increased lightning protection) termination: 10 m RG 59 (ø 6.5 mm), without connector impedance: 75 Ω
FBE 4..-2	as FBE ...-1, but termination with 10 m RG 11 (ø 10 mm)

	channel <sup>3)</sup>	weight <sup>1)</sup> [kg]	wind area [m <sup>2</sup> ]	wind load <sup>2)</sup> [N]	length L [m]
<b>FBE 421-.</b>	21-30	3.8	0.115	66	2.5
	31-41	3.6	0.105	60	2.2
	42-54	2.4	0.061	34	1.9
	54-69	2.2	0.050	28	1.5
<b>FBE 431-.</b>	21-30	4.8	0.161	91	4.1
	31-41	4.6	0.145	82	3.6
	42-54	4.3	0.123	70	3.0
	54-69	4.0	0.103	59	2.3
<b>FBE 480 -.</b>	21-69	3.4	0.11	62	0.5

**1) weight** with clamp, without cable

weight of the cable: ø 6.5 mm : 0.6 kg/10m  
ø 10 mm : 1.6 kg/10m

**2) windload:** at 100 km/h  
at 130 km/h: multiply windload at 100 km/h by 1.7  
at 150 km/h: multiply windload at 100 km/h by 2.25

**3) other channel groups on request**

**mounting:** *FBE 421 .. and FBE 431 ..*  
WG 57 30-80 mm (standard), respective **WG 65** for ch. 37-69  
WG 58 50-104 mm (option); respective **WG 66** for ch. 37-69  
*FBE 480 ..*  
WG 13 30 - 80 mm (standard)  
WG 14 50 - 104 mm (option)  
other mounting on request  
pay attention to the label DOWN

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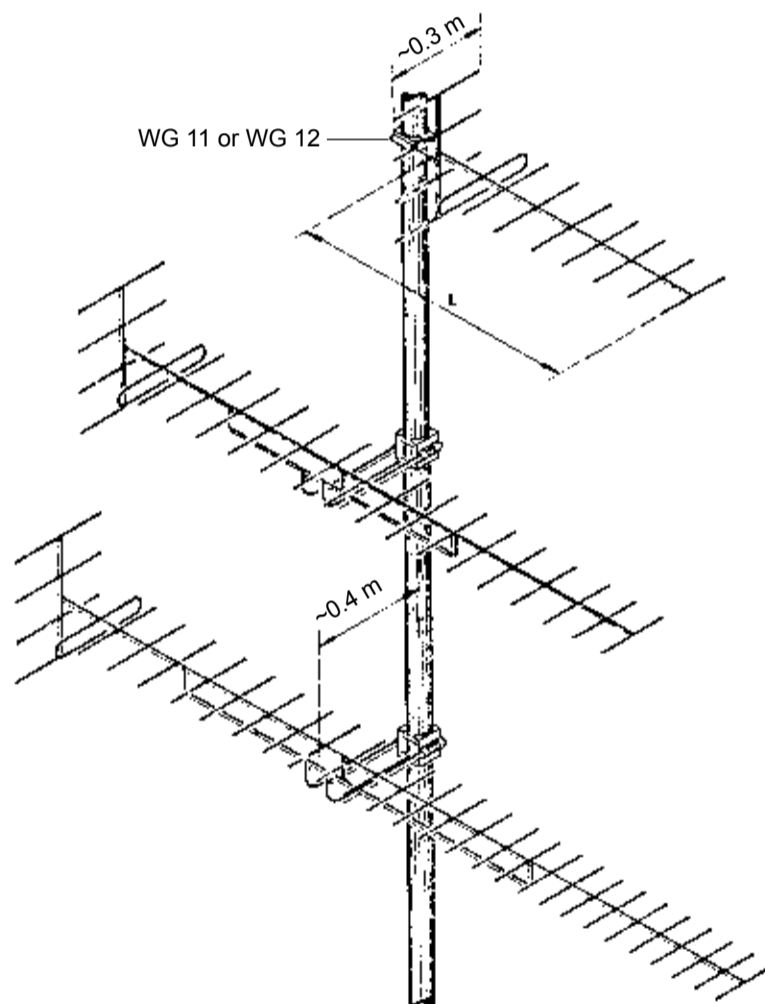
## TV ANTENNAS

for a channel group in the band IV/ V (470 - 862 MHz)  
channel 21 .... 69  
type without radome

**FWS 412 02**

**FWS 421 02**

**FWS 431 02**



### 12-ELEMENT YAGI ANTENNA

**type no.** FWS 412 02  
**gain** 12 dB ref.  $\lambda/2$  dipole  
**F/B** 25 dB

**3 dB beam width** horizontal, E plane 35°  
vertical, H plane 50°

### 21-ELEMENT YAGI ANTENNA

**type no.** FWS 421 02  
**gain** 14 dB ref.  $\lambda/2$  dipole  
**F/B** 25 dB

**3 dB beam width** horizontal, E plane 25°  
vertical, H plane 30°

### 31-ELEMENT YAGI ANTENNA

**type no.** FWS 431 02  
**gain** 16 dB ref.  $\lambda/2$  dipole  
**F/B** 25 dB

**3 dB beam width** horizontal, E plane 20°  
vertical, H plane 24°

KW 9-01

WIPIC reserves the right to amend specifications in the light of continuing development.

Section 9.7. 31/40


**FWS 4.. 02**

<b>Description</b>	robust construction VSWR individually measured especially designed for collective antenna systems for exposed locations (icing, environment, lightning) we recommend the type with radome (FWS 4.. 03)				
<b>Polarization</b>	horizontal				
<b>Frequency</b>	tuned to specified channel group				
<b>Impedance</b>	50 Ω or 75 Ω				
<b>VSWR</b>	< 1.5 on desired channel group				
<b>Termination</b>	50Ω: 2m cable RG 213/U ending with N male 75Ω: 2m cable RG 11/U ending with N male				
<b>Material</b>	aluminium, screws of stainless steel, weather-proof plastics				
<b>Grounding</b>	all metal parts are DC grounded				
<b>Mounting clamps</b>	<i>mast-ø</i>	<i>FWS 412</i>	<i>FWS 421 ch.21-36</i>	<i>FWS 421 ch. 37-69</i>	<i>FWS 431</i>
	30-80 mm	WG 11(stand.)	WG 57 (standard)	WG 65 (standard)	WG 57 (stand.)
	50 -104 mm	WG 12 (option)	WG 58 (option)	WG 66 (option)	WG 58 (option)
	mast-ø >104 mm	special order			
		pay attention to the label	DOWN		
<b>Max. wind velocity</b>	180 km/h				

	channel group CCIR	weight [kg]	wind area [m <sup>2</sup> ]	wind load [N]		length L [m]
				150 km/h	130 km/h	
<b>FWS 412 02</b>	21-29	2.0	0.040	51	38	1.3
	30-41	1.9	0.036	45	34	1.2
	42-54	1.8	0.033	42	31	1.0
	55-69	1.7	0.029	37	27	0.9
<b>FWS 421 02</b>	21-29	4.2	0.119	152	114	2.6
	30-41	4.0	0.108	137	103	2.3
	42-54	3.2	0.067	85	64	2.1
	55-69	3.1	0.061	77	58	1.6
<b>FWS 431 02</b>	21-29	5.2	0.185	236	177	4.3
	30-41	5.0	0.158	201	151	3.8
	42-54	4.8	0.136	173	130	3.4
	55-69	4.5	0.119	152	114	2.6

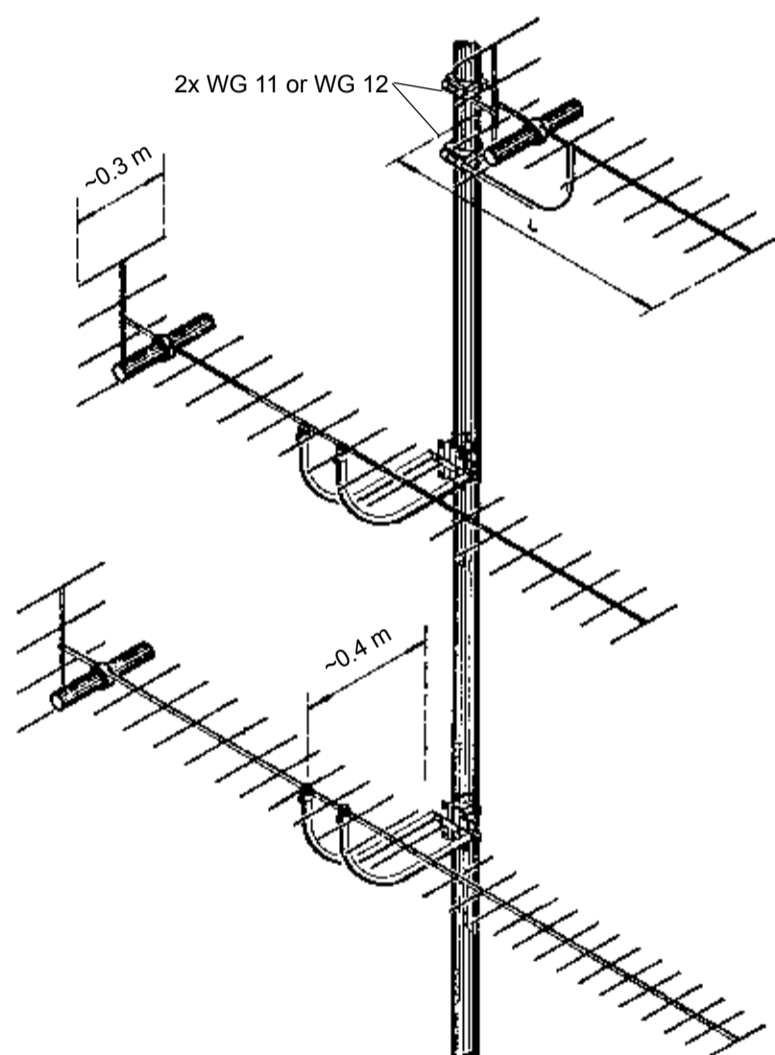


# wipic -Antennas

## TV ANTENNAS

for a channel group in the band IV/ V (470 - 862 MHz)  
channel 21 .... 69  
type with radome

**FWS 412 03**  
**FWS 421 03**  
**FWS 431 03**



### 12-ELEMENT YAGI ANTENNA

**type no.** FWS 412 03  
**gain** 12 dB ref.  $\lambda/2$  dipole  
**F/B** 25 dB

**3 dB beam width** horizontal, E plane 35°  
vertical, H plane 50°

### 21-ELEMENT YAGI ANTENNA

**type no.** FWS 421 03  
**gain** 14 dB ref.  $\lambda/2$  dipole  
**F/B** 25 dB

**3 dB beam width** horizontal, E plane 25°  
vertical, H plane 30°

### 31-ELEMENT YAGI ANTENNA

**type no.** FWS 431 03  
**gain** 16 dB ref.  $\lambda/2$  dipole  
**F/B** 25 dB

**3 dB beam width** horizontal, E plane 20°  
vertical, H plane 24°

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Section 9.7. 33/40



### FWS 4.. 03

<b>Description</b>	heavy duty, with radome The radome protects the antenna dipole from environmental influences, icing, and increases the lightning protection. VSWR individually measured especially designed for collective antenna systems															
<b>Polarization</b>	horizontal															
<b>Frequency</b>	tuned to specified channel group															
<b>Impedance</b>	50 $\Omega$ or 75 $\Omega$															
<b>VSWR</b>	< 1.5 on channel group															
<b>Termination</b>	50 $\Omega$ : cable RG 213/U ending with N male 75 $\Omega$ : cable RG 11/U ending with N male length of cable    FWS 412 .. and FWS 421..    2m FWS 431    3m															
<b>Material</b>	aluminium, screws of stainless steel, radome of uv-stabilized polyethylene															
<b>Grounding</b>	all metal parts are DC grounded															
<b>Mounting</b>	<table border="0" style="margin-left: 20px;"> <tr> <td style="padding-right: 20px;"><i>mast-<math>\emptyset</math></i></td> <td style="padding-right: 40px;"><i>FWS 412 ..</i></td> <td><i>FWS 421.. und 421 ..</i></td> </tr> <tr> <td>30 - 80 mm</td> <td>2x WG 11</td> <td>WG 57</td> </tr> <tr> <td>50 -104 mm</td> <td>2x WG 12</td> <td>WG 58</td> </tr> <tr> <td colspan="3">mast-<math>\emptyset</math> &gt; 104 mm special order</td> </tr> <tr> <td colspan="3">pay attention to the label <span style="border: 1px solid black; padding: 2px;">DOWN</span></td> </tr> </table>	<i>mast-<math>\emptyset</math></i>	<i>FWS 412 ..</i>	<i>FWS 421.. und 421 ..</i>	30 - 80 mm	2x WG 11	WG 57	50 -104 mm	2x WG 12	WG 58	mast- $\emptyset$ > 104 mm special order			pay attention to the label <span style="border: 1px solid black; padding: 2px;">DOWN</span>		
<i>mast-<math>\emptyset</math></i>	<i>FWS 412 ..</i>	<i>FWS 421.. und 421 ..</i>														
30 - 80 mm	2x WG 11	WG 57														
50 -104 mm	2x WG 12	WG 58														
mast- $\emptyset$ > 104 mm special order																
pay attention to the label <span style="border: 1px solid black; padding: 2px;">DOWN</span>																
<b>Max. wind velocity</b>	200 km/h															

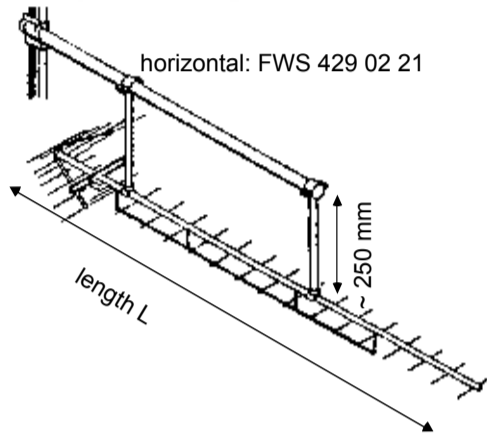
	channel group CCIR	weight [kg]	wind area [m <sup>2</sup> ]	wind load [N]		length L [m]
				150 km/h	130 km/h	
<b>FWS 412 03</b>	21-29	5.0	0.076	97	72	1.3
	30-41	4.9	0.074	94	70	1.2
	42-69	2.0	0.04	51	38	1.0
<b>FWS 421 03</b>	21-29	8.4	0.198	252	189	2.6
	30-41	8.2	0.188	240	180	2.5
	42-69	3.2	0.07	89	67	1.6
<b>FWS 431 03</b>	21-29	11.6	0.325	415	311	4.3
	30-41	11.3	0.305	389	292	4.1
	42-69	4.8	0.12	153	115	2.6

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**TV-ANTENNA  
FWS 429 02 .1  
Channel 21 ... 69 (470 ... 862 MHz)**

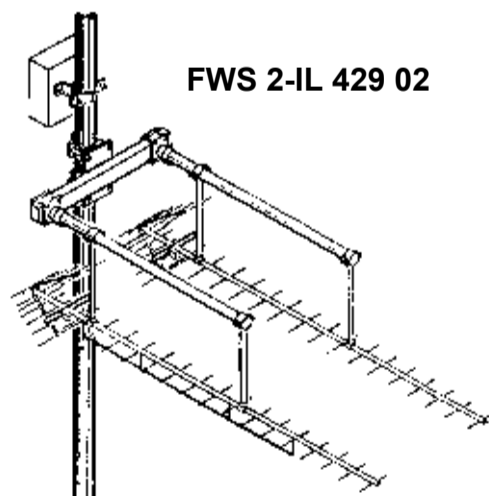


vertical: FWS 429 02 11 (by turning the antenna around the bracket)

<b>TYPE</b>	FWS 429 02 11 channel .... (vertical pol.) FWS 429 02 21 channel .... (horizontal pol.)	
<b>IMPEDANCE</b>	50 Ω or 75 Ω	
<b>GAIN</b>	15 dB (ref. λ/2 Dipol) F/B > 25 dB	
<b>VSWR</b>	< 1.5 on channel group	
<b>MAX. POWER</b>	150 watts	
<b>3 dB BEAM WIDTH</b>	in polarization, E-plane	23°
	rectangular to polarization, H-plane	27°
<b>TERMINATION</b>	50 Ω 2 m cable RG 213/U ending with N-male 75 Ω 2 m cable RG 11 ending with N male other termination on request	
<b>GROUNDING</b>	all metal parts are DC grounded	
<b>MOUNTING</b>	<i>mast-ø</i>	<i>clamp</i>
	30 - 80 mm	WG 17 (standard)
	50 - 104 mm	WG 18 (option)
	other clamps on request	
<b>MATERIAL</b>	aluminium, screws of stainless steel, weather-proof plastics	

channel CCIR	weight kg	length L mm	windarea m <sup>2</sup>	wind load (N)	
				130	150 km/h
21 - 29	6.5	2300	0.15	143	192
30 - 41	6.1	2100	0.148	141	189
42 - 54	5.7	1900	0.146	140	186
55 - 69	5.4	1700	0.144	138	182
other channel group on request					

**PRICE** 1171.00 SFr, gross, ex work



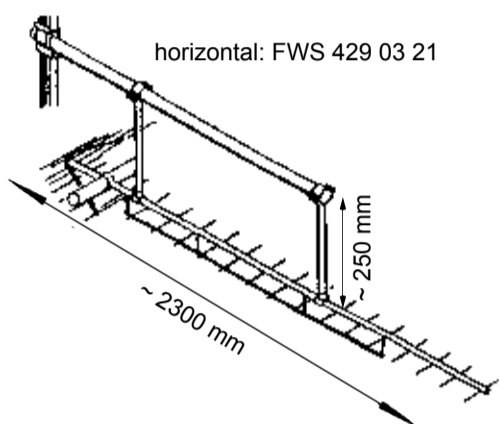
<b>DESCRIPTION</b>	coupling of two antennas increases the antenna gain variation of the distance produces zero roots at desired angles (see also: FWS 4 IL-429 02 )
<b>POLARIZATION</b>	horizontal
<b>GAIN</b>	~18 dB
<b>3 dB BEAM WIDTH</b>	horizontal, E plane 16° vertical, H plane 26°
<b>WEIGHT and WINDLOAD</b>	add the datas of the two single antennas plus weight or windload of bracket and the junction box WAK 1: W=15 kg, A=0.15 m <sup>2</sup> , WL=143/190 N
<b>PRICE</b>	3716.00 SFr , gross, ex work

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**TV ANTENNA**  
**FWS 429 03 .1**  
**Channel 21 .. 69 (470 ... 862 MHz)**



vertical: FWS 429 02 11 (by turning the antenna around the bracket)

<b>TYPE</b>	FWS 429 03 11 channel .... (vertical) FWS 429 03 21 channel .... (horizontal)	
<b>DESCRIPTION</b>	heavy duty, with radome The radome protects the antenna dipole from environmental influences, icing, and increases the lightning protection.	
<b>IMPEDANCE</b>	50 Ω or 75 Ω	
<b>GAIN</b>	15 dB (ref. λ/2 Dipol) F/B > 25 dB	
<b>VSWR</b>	< 1.5 for all channels of the group	
<b>MAX. POWER</b>	150 watts	
<b>3 dB BEAM WIDTH</b>	in polarization, E-plane	23°
	rectangular to polarization, H-plane	27°
<b>TERMINATION</b>	50 Ω 2 m cable RG 213/U ending with N male 75 Ω 2 m cable RG 11 ending with N male other termination on request	
<b>GROUNDING</b>	all metal parts are DC grounded	
<b>MOUNTING</b>	<i>mast-ø</i>	<i>clamp</i>
	30 - 80 mm	WG 17 (standard)
	50 - 104 mm	WG 18 (option)
	other clamps on request	
<b>MATERIAL</b>	aluminium, screws of stainless steel, radome of UV-stabilized polyethylene	

channel CCIR	weight kg	length L mm	windarea m <sup>2</sup>	wind load (N)	
				130 km/h	150 km/h
21 - 29	12	2300	0.2	191	255
30 - 41	11	2200	0.2	191	255

other channel groups on request

KW 9-01

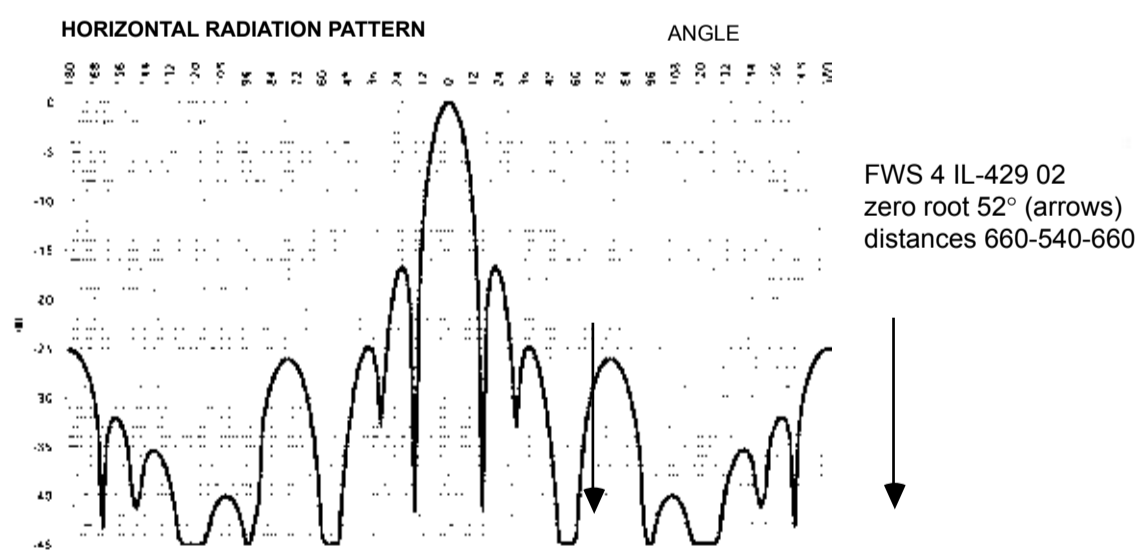
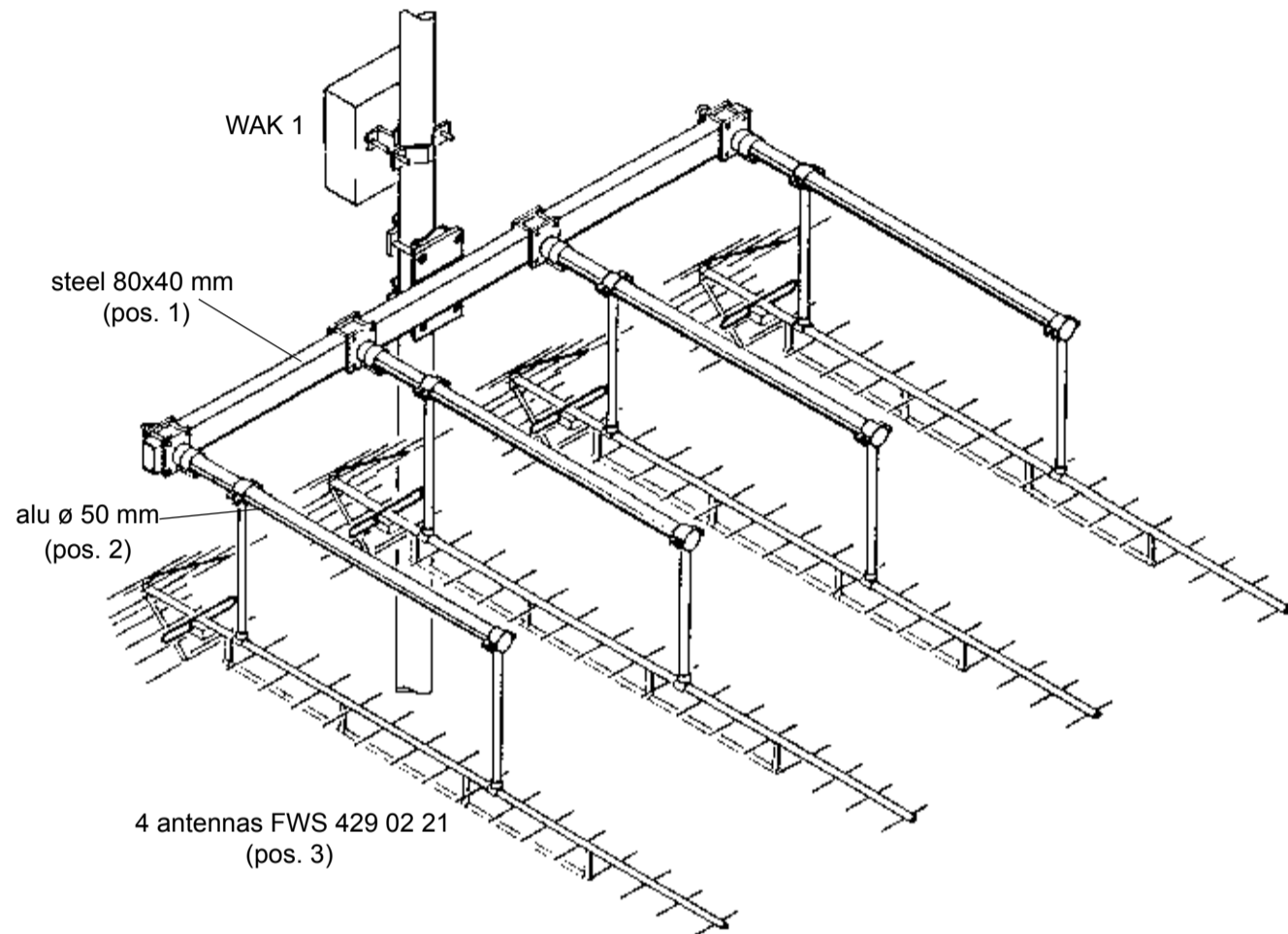
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# wipic -Antennas

## YAGI ANTENNA ARRAY

for a channel in the band IV/ V (470 - 862 MHz)  
channel 21 - 69

**FWS 4 IL-429 02**



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**FWS 4 IL-429 02**

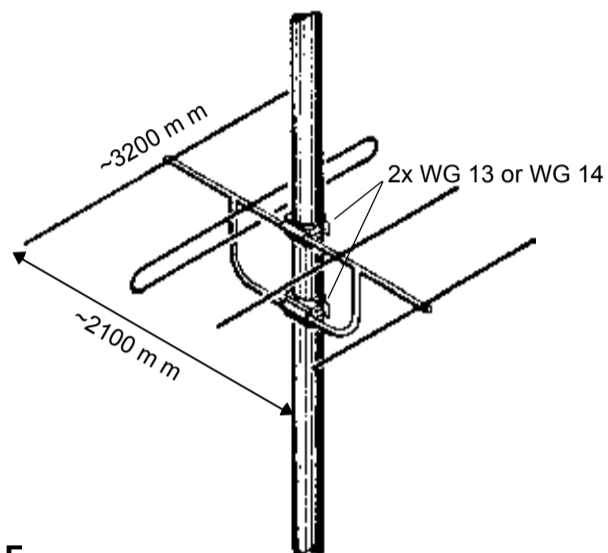
<b>Description</b>	variation of the distances between the antennas changes the angle of the zero roots which suppress undesired emitters
<b>Polarization</b>	horizontal
<b>Frequency</b>	tuned on a channel in the band IV/V (470 - 862 MHz) tuned on a channel group special order
<b>Impedance</b>	50 Ω or 75 Ω
<b>VSWR</b>	< 1.3 tuned to a channel < 1.5 tuned to a channel group
<b>3 dB beam width</b>	horizontal, E-plane 9° vertical, H-plane 25°
<b>Termination</b>	50Ω: in the junction box WAK 1 ending with N male 75Ω: in the junction box WAK 1 ending with N male
<b>Material</b>	aluminium, screws of stainless steel, hot dip galvanized steel
<b>Grounding</b>	all metal parts are DC grounded
<b>Mounting</b>	on mast with ø 50 - 104 mm mast-ø > 104 mm special order pay attention to the label <span style="border: 1px solid black; padding: 2px;">DOWN</span>

	dimensions [m]			weight [kg]	wind area [m <sup>2</sup> ]	wind load [N]	
	pos. 1	pos. 2	pos. 3			150 km/h	130 km/h
<b>channel 21</b>	2.9	1.6	2.7	64	0.91	1162	873
<b>channel 25</b>	2.7	1.6	2.5	62	0.88	1124	844
<b>channel 30</b>	2.5	1.4	2.3	59	0.81	1034	777
<b>channel 35</b>	2.4	1.4	2.2	58	0.78	996	748
<b>channel 40</b>	2.2	1.3	2.0	52	0.62	791	594
<b>channel 50</b>	2.0	1.3	1.8	50	0.59	753	566
<b>channel 60</b>	1.8	1.1	1.6	47	0.54	690	518

# WIPIC -Antennas

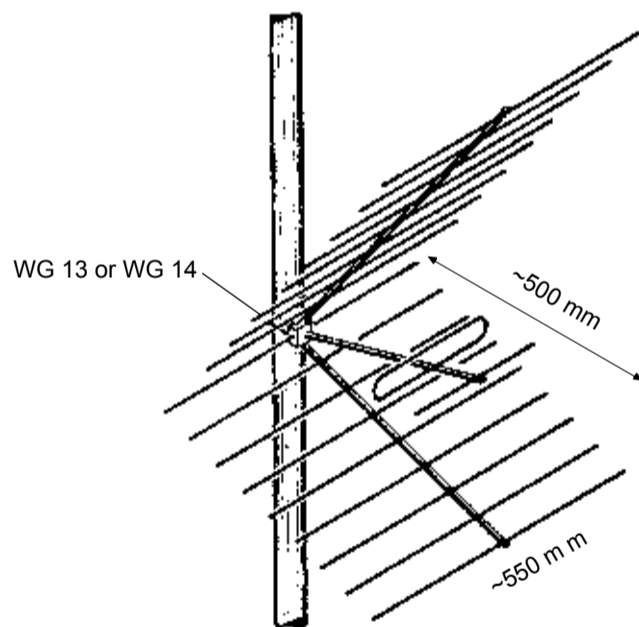
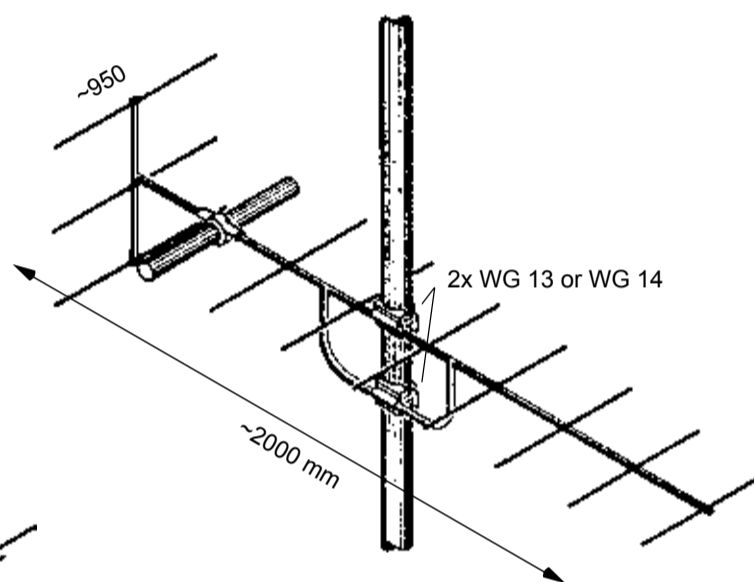
TV AND FM-ANTENNAS FOR SHIPS

## FWSE

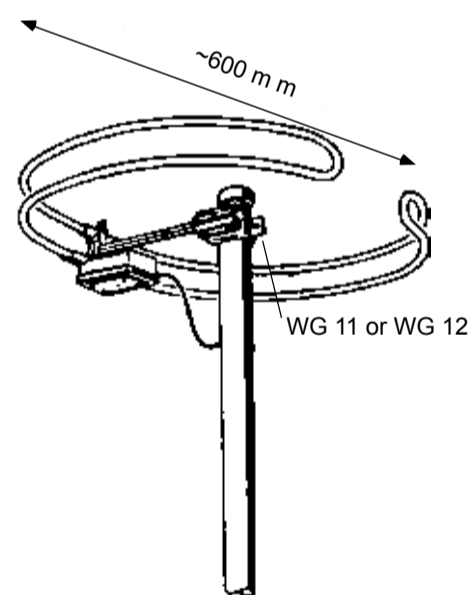


**FWSE 104**  
for the Band I (47 - 68 MHz)  
channel 2 - 4

**FWSE 311**  
for the Band III (174 - 230 MHz)  
channel 5-12



**FWSE 480**  
for the Band IV / V (470 - 862 MHz)  
channel 21 - 69



**UBEE 200 -2**  
for the FM Band II (87.5 - 108 MHz)

KW 9-01

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**FWSE .. and UBEE ..**

<b>DESCRIPTION</b>	specially rugged construction for ships seawater-proof aluminium alloy
<b>POLARIZATION</b>	horizontal
<b>IMPEDANCE</b>	75 $\Omega$
<b>TERMINATION</b>	FWSE 104, FWSE 311, FWSE 480 and UBEE 200-2 : 10 m cable RG 11/U, without connector UBEE 200-2: with 10 m cable RG 11/U without connector
<b>MATERIAL</b>	20 $\mu$ anodized aluminium-anticorodal , screws of stainless steel, weather-proof plastics, radome of UV-stabilized polyethylene
<b>GROUNDING</b>	all metal parts are DC grounded
<b>MOUNTING</b>	mounting clamps: see illustrations pay attention to the label DOWN

TYPE NO.	<i>FWSE 104</i>	<i>FWSE 311</i>	<i>FWSE 480</i>	<i>UBEE 200-2</i>
<b>FREQUENCY [MHz]</b>	47 - 68	174 - 235	470 - 860	87.5 - 108
<b>GAIN (ref. to <math>\lambda/2</math> dipole)</b>	4 - 5	7 - 11	8 - 11	-2
<b>F/B in dB &gt;</b>	10 - 15	17 - 25	18 - 25	
<b>3 dB BEAMWIDTH</b>				
horizontal, E plane	70 .. 65°	55 .. 40°	55 .. 45°	360°
vertical, H plane	105 .. 100°	60 .. 50°	48 .. 40°	
<b>WEIGHT [kg]</b>	11	9	5	1.5
<b>WIND AREA [m<sup>2</sup>]</b>	0.32	0.20	0.12	0.05
<b>WIND LOAD [N]</b>				
150 km/h	408	255	153	63
130 km/h	307	191	115	47