



Base equipment for CDMA-450, IMT-2000, SkyLink

107497, Moscow Chernicinsky pr-d 7/1
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Model	Short description	Band, MHz
A6 UHF	Vertical, collinear, fiberglass, 3.2 m	400-485
D4 UHF	Four dipoles and power divider	400-490
DM4 UHF	Four dipoles on mast	400-490
RAO-2U-60, RAO-2U-120 RAO-3U-120, RAO-4U-120	Panel sector antennas, in horizontal plane 60°, 120°, ABS	380-500
RAV-2U-90, RAV-4U-90	Lowprofil, panel sector antennas, in horizontal plane 90°, ABS	400-470
RAX-2U-70, RAX-4U-70	2 inputs panel with X-polarization, ABS	400-430/440-470
DPS2-12U	Duplexer, 12 cavities, pass-reject, 2", -2,5 dB, -75 dB, 700 W	453-467,5

2009



400-490 MHz Vertical antennas A6 UHF (L-2,L-3,L-4,M-5,M-6,H-7,H-8)

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Electrical specifications

Model	A6 UHF						
	(L)-2	(L)-3	(L)-4	(M)-5	(M)-6	(H)-7	(H)-8
Operating frequency band, MHz	400-407	408-418	416-427	420-435	435-454	450-467	469-485
VSWR, not more than	1.5						
Gain, dBi	9.65						
Sector in vertical plane, -3dB	12°						
Impedance, Ohm	50						
Max. power input, W	400						
Lightning protection	yes						
Adjustable	no need						

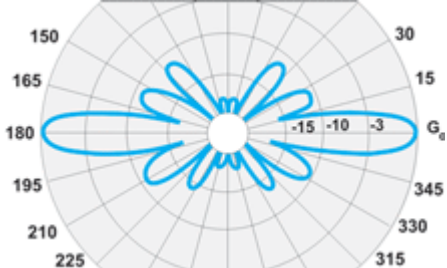
Mechanical specifications

Model	A6 UHF						
	(L)-2	(L)-3	(L)-4	(M)-5	(M)-6	(H)-7	(H)-8
Weight, kg	not more 5						
Height/Length, mm	4120	3250	3250	3250	3250	3250	3200
Mast diameter, mm	35-110						
Radome	fiberglass						
Rated wind velocity, m/s	40						
Wind loading area, m ²	0.16						
Load of side wind 40 m/s, H	180						
Temperature range, °C	from -50 to +50						
Connector	N-female, (7/16 DIN-optional)						

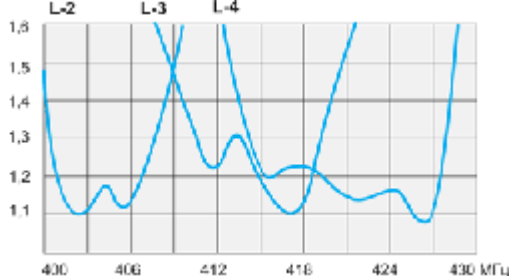
Antenna A6 UHF is a collinear construction of 11 transpositioning half-wave elements. It allows to achieve an ideally circular radiation pattern at high gain (9.65 dBi) and broad bandwidth of the frequencies of operation. Radio transparent weather-proof radome is made on the basis of fiberglass material. The radome has a polished coating which protects from UV irradiation and icing. The antenna has a DC grounding and does not need an additional adjustment. The model series of antennas A6 UHF

(covering the range of 408-485 MHz) is used in trunking commercial and departmental networks as well as in mobile networks of the communication standard NMT 450. The antenna's operation provides both the two-feeder type of antenna-feeder devices (AFD) (with separate feeders of receiving and transmitting channels of repeaters) and the one-feeder type that uses a duplexer. Recently a series of these antennas has been replenished by new models specially developed for the receiving and transmitting frequencies of the most popular UHF-sub-ranges. This has allowed to use the maximum possibilities of the gain in collinear antennas in the frequency ranges of interest, in spite of their scanning. For example, the model A6 UHF(L)-3 can be used in receiving channel of the "TETRA" systems while A6 UHF(M)-5 will be appropriate to be used as a transmitting one. In some cases, if the frequency scheme allows, one can apply A6 UHF(L)-4 successfully as a transceiver antenna and work through duplexer for one feeder. The multimedia reels in our CD catalog reflect rather well the peculiarities of these antennas.

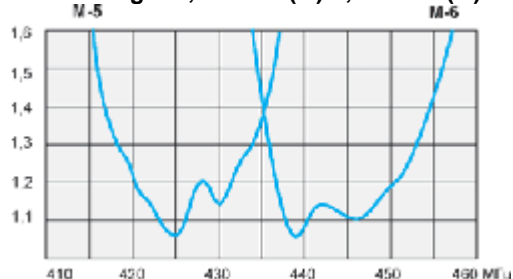
A6 UHF E-plane pattern



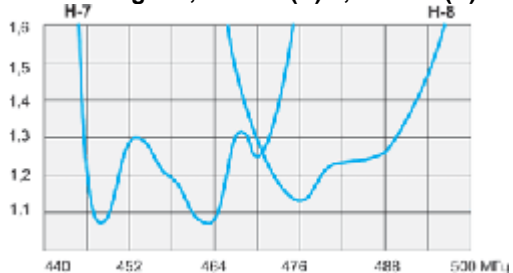
VSWR diagram, A6 UHF(L)-2, A6 UHF(L)-3, A6 UHF(L)-4



VSWR diagram, A6 UHF(M)-5, A6 UHF(M)-6



VSWR diagram, A6 UHF(H)-7, A6 UHF(H)-8





400-490 MHz Dipole antennas D1 UHF, D2 UHF, D4 UHF, D8 UHF

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D1 UHF



D2 UHF



D4 UHF



D8 UHF



Electrical specifications

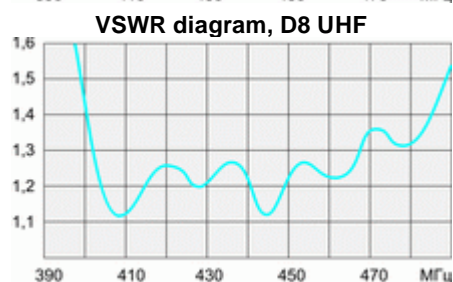
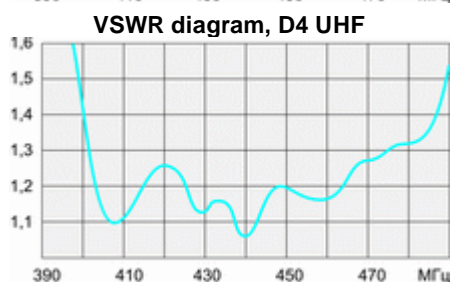
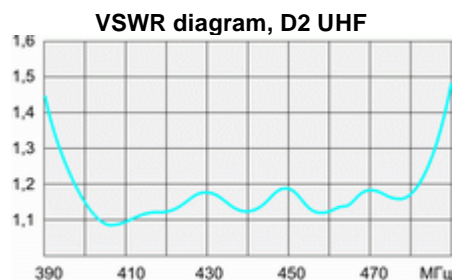
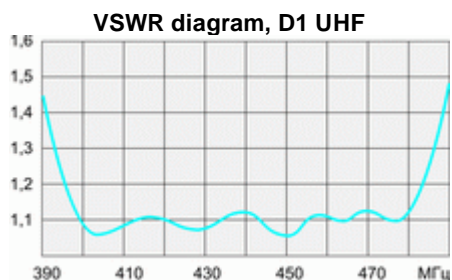
Model	D1 UHF	D2 UHF	D4 UHF	D8 UHF
Operating frequency band, MHz			400-490	
VSWR, not more than			1.5	
Gain OMNI, dBi	2.15	5.15	8.15	11.15
OFFSET, dBi	5.15	8.15	11.15	14.15
Sector in vertical plane , -3dB	70°	37°	18°	9°
Impedance, Ohm			50	
Max. power input, W			400	

Mechanical specifications

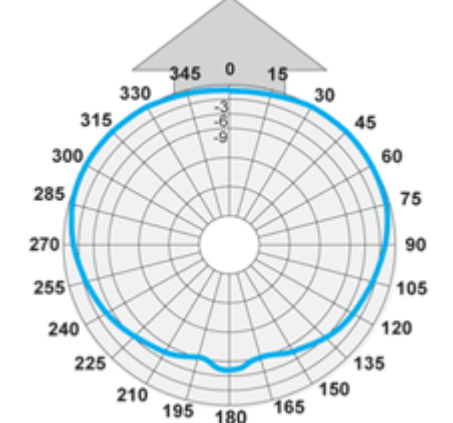
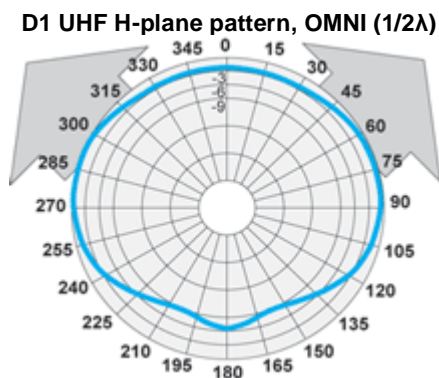
Model	D1 UHF	D2 UHF	D4 UHF	D8 UHF
Weight, kg	1.6	3.5	7.3	14.8
Height/Length, M	0.3	0.8	1.7	3.5
Construction material			Aluminium alloy	
Mast diameter, mm			38-65	
Rated wind velocity, m/s			55	
Wind loading area, m ²	0.028	0.056	0.112	0.225
Load of side wind 45 m/s, H	32	64	128	256
Rated wind velocity with 0.5" icing, m/s			28	
Temperature range, °C			from -50 to +50	
Connector			N-female	

Antenna D1 UHF represents folded Pistolcors dipole. Its primaries: wide operating band and nearly circular pattern. Welded

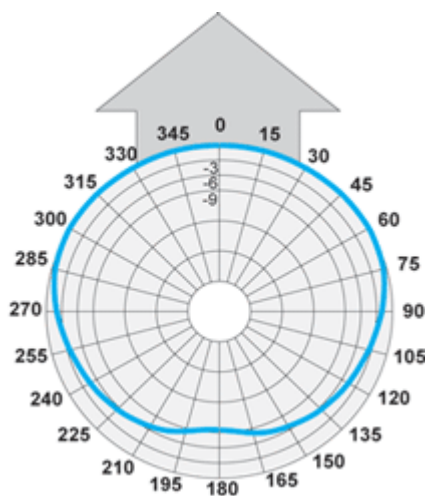
construction of dipole eliminates possibility of intermodulation. Emitting unit directional pattern can be slightly corrected by changing distance from it to mast. Collapsible construction provides easy antenna mounting and dismounting. Antenna has reliable polymeric coating, which protects from hostile environment and icing. D2, D4, and D8 antennas are built along parallel addition of two, four and eight collinear arranged active folded dipole powers principle.



D1 UHF H-plane pattern, OFFSET(1/4λ)



D1 UHF H-plane pattern, OFFSET (1/8λ)





400-490 MHz Dipole antennas DM4 UHF(L), DM4 UHF(H)

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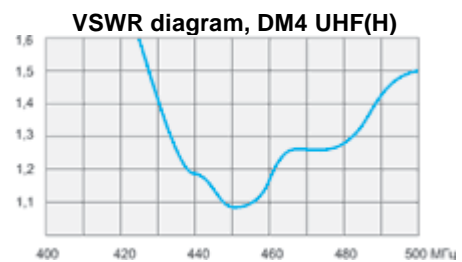
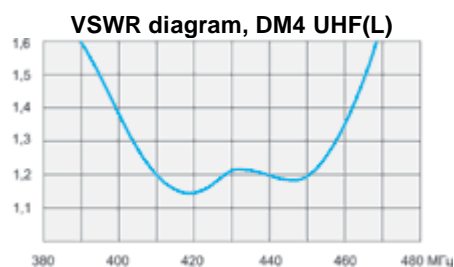
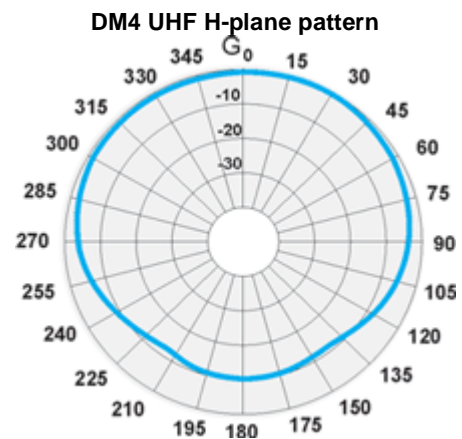
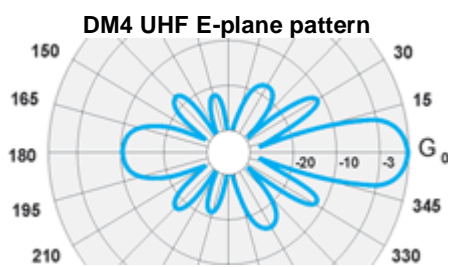
Electrical specifications

Model	DM4 UHF(L)	DM4 UHF(H)
Operating frequency band, MHz	400-460	440-490
VSWR, not more than		1.5
Gain OFFSET, dBi	11.15	11.15
Sector in vertical plane, °		18°
Impedance, Ohm		50
Max. power input, W		400

Mechanical specifications

Model	DM4 UHF(L)	DM4 UHF(H)
Weight, kg		6
Height, M		2.4
Construction material		Aluminium alloy
Mast diameter, mm		50-110
Rated wind velocity, m/s		55
Wind loading area, m ²		0.092
Load of side wind 45 m/s, H		104
Rated wind velocity with 0.5" icing, m/s		40
Temperature range, °C		from -50 to +60
Connector		N-female

In the conditions of increased demand for dipole four-element antennas DP4 UHF their modernization has been conducted with the aim to decrease the prime cost and to enhance the electrical reliability. As a result there were worked out the four-element all-welded antenna arrays - DM4-UHF(L) and DM4-UHF(H) which cover the range of 400-500 MHz. These antennas possess all the features of the panel antennas - high gain, broad operating bandwidth and elliptical shape of the radiation pattern. Nonseparable adder unit improves the reliability of antenna and facilitates its mounting. The construction of two such antennas placed on the opposite edges of the mast suggests the best solution at creating quasi-circular antenna system (the annular phased antenna array). A set of clamps CP-110 for mounting antenna to the mast is included into the antenna equipment and allows antenna's reliable fixing at the telecommunication towers





380-500 MHz
Panel antennas RAO-2U-60,
RAO-2U-120,
RAO-3U-120, RAO-4U-120

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RAO-2U-120



RAO-4U-120

Electrical specifications

Model	RAO-2U-60	RAO-2U-120	RAO-3U-120	RAO-4U-120
Operating frequency band, MHz	RAO-2UL-60 380-440 RAO-2UH-60 435-500	400-470	400-470	400-470
VSWR, not more than			1.5	
Gain, dBi	10	8	10.5	11
Sector in vertical plane , -3dB, ± 1°		36°	22°	17°
Sector in horizontal plane , -3dB, ± 5°	60°	120°	120°	120°
Impedance, Ohm			50	
Max. power input, W	500	400	400	400
Lightning protection			all-metal structure	

Mechanical specifications

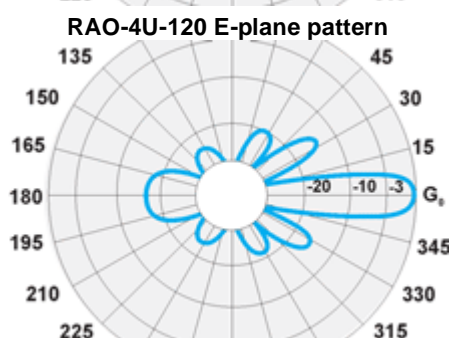
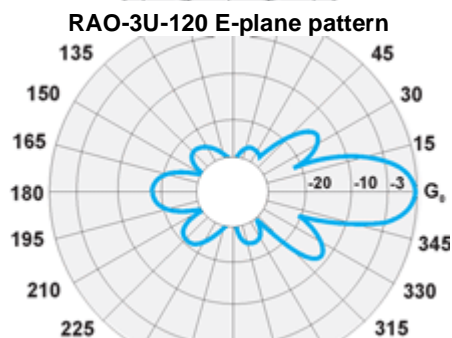
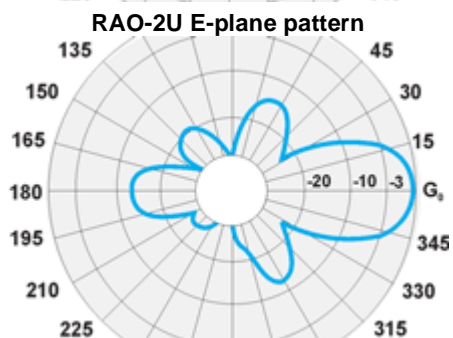
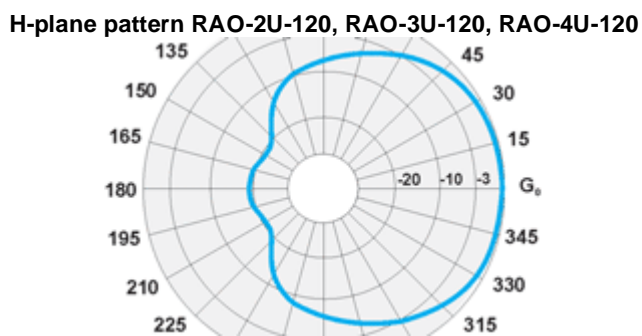
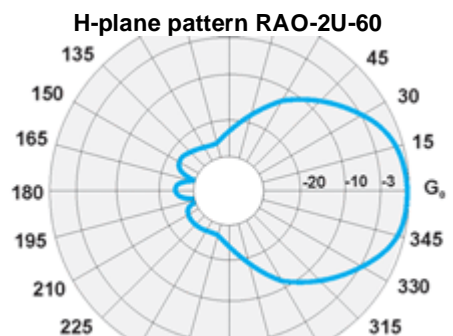
Model	RAO-2U-60	RAO-2U-120	RAO-3U-120	RAO-4U-120
Weight not more than , kg	9.5	7	11.7	15.6
Radiating unit construction material			aluminum	
Radome material			ABS	
Radome color			grey	
Standard mounting			to a 45-60 mm dia. tube	
Optional mounting			wall mount or frame side mount	
Rated wind velocity, m/s			40	

Wind loading area, m ²	0.8	0.46	0.64	0.84
Temperature range, °C			from -50 to +50	
Connector			7/16 DIN (N-female optional)	
Size, sm	80x113x26	41x113x26	41x155x26	41x205x26

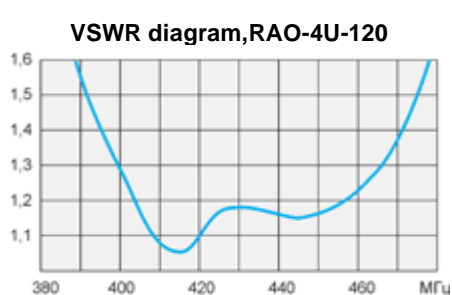
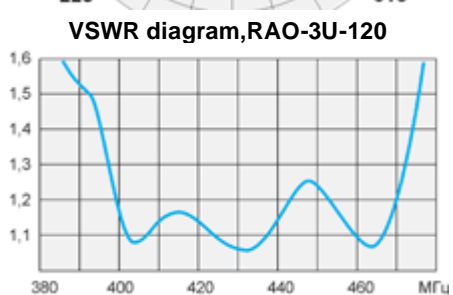
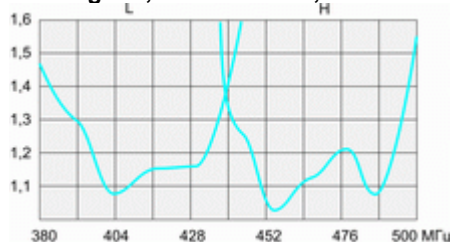
RAO 2U Series antennas are designed for using as transceiving antennas in trunking multichannel systems supporting Tetra and MPT1327 standards, as well as in NMT 450 and CDMA 450 cellular systems. The antennas can be used both as stand-alone sector antennas in telecommunication systems operating in cellular-segmented service zones and as the components of circular antenna arrays. The antennas of this type are of great demand due to enhanced gain factor.

The RAO 2U antenna represents a phased array comprising two broad passband components with parallel feeding. Specific form of the reflector element provides the necessary radiation sectors (60° and 120°).

The panel antennas of this class favorably differ from the classical folded dipole antenna arrays in that they have guaranteed standard width of the directional diagram, enhanced backfire suppression, as well as high degree of rainfall protection due to high-quality fiberglass radiotransparent radome. Its special ABS coating provides reliable protection from solar ultraviolet radiation.



VSWR diagram, RAO-2UL-120, RAO-2UH-120

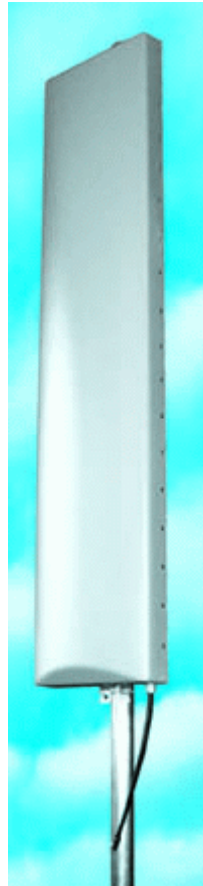




400-470 MHz Panel antennas RAV-2U-90, RAV-4U-90

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Antenna RAV-4UL-90



Antenna RAV-2UL-90



Electrical specifications

Model	RAV-2U-90	RAV-4U-90
Operating frequency band, MHz	RAV-2UL-90	RAV-4UL-90
		400-430
	RAV-2UH-90	RAV-4UH-90
		450-470
VSWR, not more than		1,5
Gain, dBi	8	11
Sector in vertical plane , -3dB, ± 1°	37°	18°
Sector in horizontal plane , -3dB, ± 5°		90°
Impedance, Ohm		50
Max. power input, W		400
Lightning protection		yes

Mechanical specifications

Model	RAV-2U-90	RAV-4U-90
Weight not more than , kg	9.5	20
Radiating unit construction material		aluminum
Radome material		ABS
Radome color		grey
Standard mounting		to 45-60 mm dia. tube
Optional mounting		wall mount or frame side mount
Rated wind velocity, m/s		40
Wind loading area, m ²	0.43	0.8
Temperature range, °C		from -50 to +50
Connector		7/16 DIN (N-female optional)

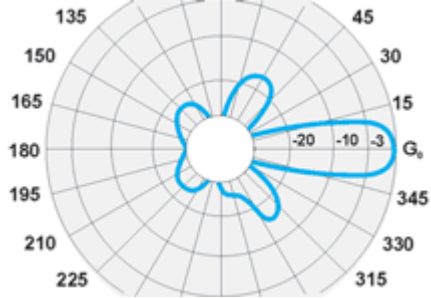
Size, mm

950x400x80

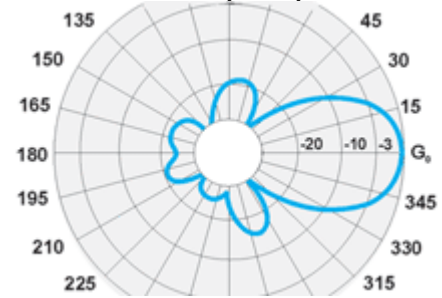
1900x400x80

Considered antenna provides guaranteed 90-degree half-power radiation sector and possesses high gain due to concentration of energy in horizontal and vertical plane. Patches, implemented in this array antenna, allowed us to create low-profile panel antenna with high gain factor, and forward/backward ratio. Antenna is protected by ABS radome with ultraviolet radiation resistant coating. Recommended for applications like Tetra and MPT1327 trunking systems, and IMT-2000 and NMT - 450 i cellular systems.

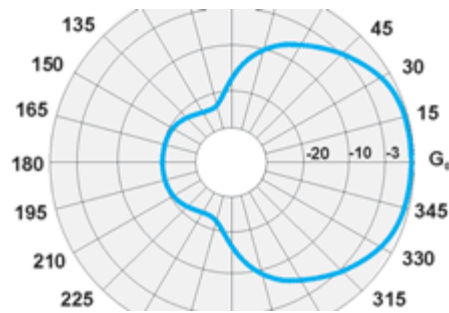
RAV-4U-90 E-plane pattern



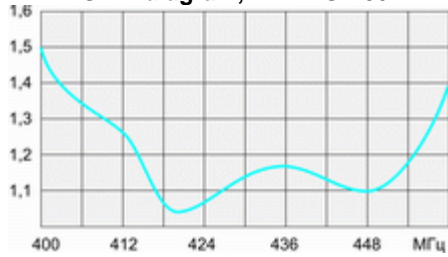
RAV-2U-90 E-plane pattern



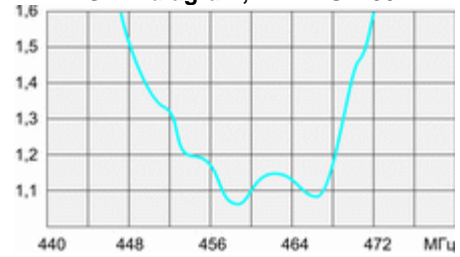
RAV-2(4)U-90 H-plane pattern



VSWR diagram, RAV-2UL-90



VSWR diagram, RAV-2UH-90





400-470 MHz Panel antennas RAX-2U- 70, RAX-4U-70

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Electrical specifications

Model	RAX-2U-70	RAX-4U-70
Operating frequency band, MHz	RAX-2UL-70	RAX-4UL-70 400-430
	RAX-2UH-70	RAX-4UH-70 440-470
VSWR, not more than		1.5
Gain, dBi	9	12
Sector in vertical plane, -3dB, $\pm 1^\circ$	38°	18°
Sector in horizontal plane, -3dB, $\pm 5^\circ$		70°
Isolation	> 25 dB	> 25 dB
Impedance, Ohm		50
Max. power input, W		400
Lightning protection		yes

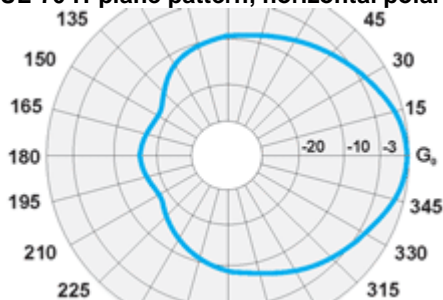


Mechanical specifications

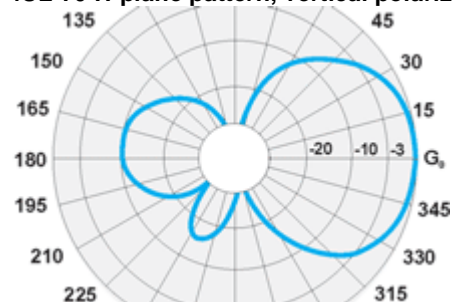
Model	RAX-2U-70	RAX-4U-70
Weight not more than, kg	9,5	20
Radiating unit construction material		aluminum
Radome material		ABS
Radome color		grey
Standard mounting		to a 45-60 mm dia. tube
Optional mounting		wall mount or frame side mount
Rated wind velocity, m/s		40
Wind loading area, m ²	0.43	0.8
Temperature range, °C		from -50 to +50
Connector		7/16 DIN (N-female optional)
Size, mm	950x400x80	1900x400x80

Modern standards for digital telecommunication require application of separated receiving, what results in switching two antennas or antenna arrays for receiving. For similar cause but in case of limited space for placement of antennas it is possible to use double-input panel antennas with cross polarization. We have developed effective low-profile patch panel antenna with tilted polarization of ± 45 degrees. Antenna is protected by ABS radome with resistant to ultraviolet radiation. Recommended for applications like Tetra trunking systems and IMT-2000 standard cellular systems.

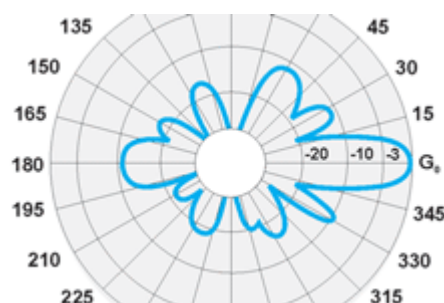
RAX-4UL-70 H-plane pattern, horizontal polarization

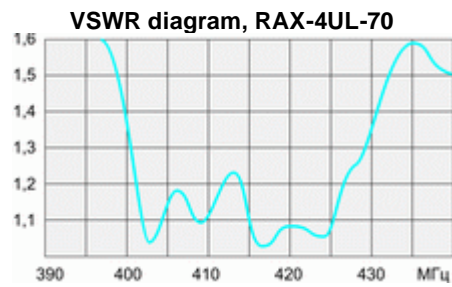
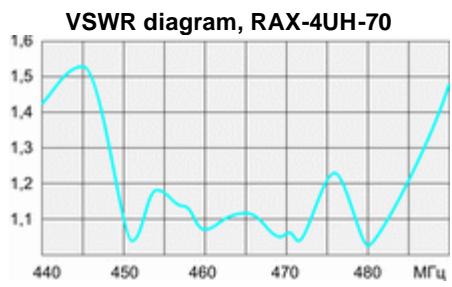


RAX-4UL-70 H-plane pattern, vertical polarization



RAX-4UL-70 E-plane pattern, vertical polarization





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453-467.5 MHz Mobile duplexer DPS2-12U

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Electrical specifications

Model	DPS2-12U
Operating Frequency band, MHz	453-467.5
Insertion loss not more, dB	1.3
Max. frequency bandwidth, RX, MHz	453-457,5
Max. frequency bandwidth, TX, MHz	463-467,5
Impedance, Ohm	50
Isolation, not less, dB	45
VSWR, not more than	1.3
Input power, not more, W	700
Temperature Range, °C	0 to +40

Mechanical specifications

Model	DPS2-12U
Weight, kg	7.8
Connector	7/16 DIN
Length/Width/Depth, mm	360x260x130

The appearance of a new communication standard CDMA-450 in the mobile communication systems has demanded from the operators of NMT-450 to release a part of antenna-feeder channel for implementation new projects. The application of DPS2-12U in the base stands (RS 4000) of the standard NMT-450 makes it possible to empty 1 antenna-feeder channel. At the present moment the duplexer has a peak carrying capacity around 700 Wt what corresponds to the simultaneous operation of 8 channels of NMT-450. The next project - the modification of this product for providing larger carrying capacity.

Typical DPS2-12U duplexer response curves

