

# DCR-M / HDR-M

## CIRCULARLY POLARIZED FM ANTENNA

The DCR-M/HDR-M has been used extensively for high power broadband applications. The "M" series antennas are circularly polarized with a power rating of 18 kW for a single bay and is available in stacked arrays of up to 16 bays with an input rating to 40 kW. For situations where ice formation is common, the arrays can be equipped with optional electrical deicers or radomes. The antenna is DC grounded and does not require shorting stubs. Each array is supplied with an input fine matcher for field optimization. For reduced downward radiation, the use of a custom feed design allows for shorter spacings in a series fed configuration.

### High Power Input Capability

The "M" series antenna is available with optional 4-1/16" feed system having a power input rating (for five or more bays) of 70 kW. Arrays w/ 6-1/8" inputs are also available.

### Multi-Station Operation

The wide bandwidth of high power input capability of the "M" series antenna permits optional multi-station operation.

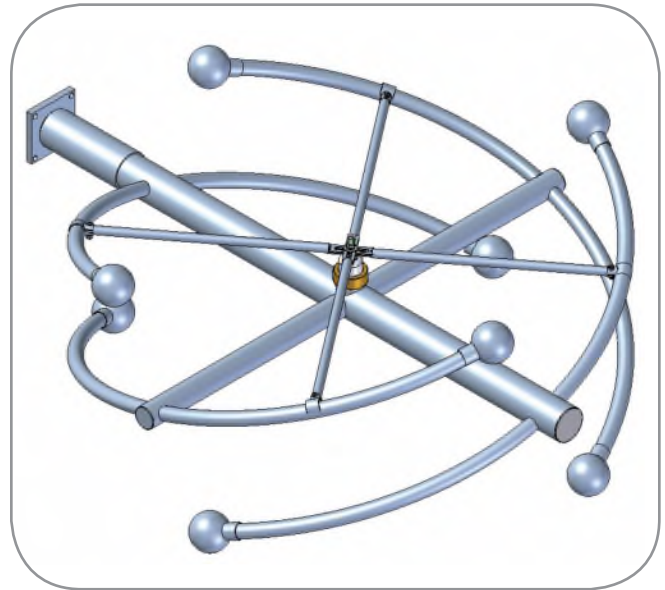
### Beam Tilt and Null Fill

Beam tilt and/or null fill are available options. These options are ordinarily specified for arrays of 8 bays or more. Even numbered arrays of six sections and fewer may include one or both options and typically are designed as a center-fed array. The "M" series antenna is available in directional arrays which are custom-built to the needs of the station.

### Quadrupole Design

The four-dipole-per-element design offers the advantage of more symmetrical azimuth pattern performance and H/V ratio than dual dipole designs, providing more robust coverage.

*Low downward radiation options available — contact factory.*



**DCR-M: Right Hand Circularly Polarized**

**HDR-M: Left Hand Circularly Polarized**

- DCR-M/HDR-M IBOC compatible
- Interleaved provides -40dB of isolation
- Stainless steel elements
- Ideal for Class B and C stations
- 18 kW for a single bay
- Fine matcher included
- Radomes or integral deicers optional
- VSWR field adjustable

### General Specifications

<b>Polarization:</b>	Circular
<b>Pattern Circularity in Free Space:</b>	$\pm 1$ dB
<b>VSWR (max) @ Input, without field trim:</b>	
<b>Top Mount:</b>	1.2:1
<b>Side Mount:</b>	1.5:1
<b>VSWR (max) @ Input, with field trim (Top or Side Mount):</b>	
<b>(<math>\pm 200</math> KHz):</b>	1.05:1
<b>(<math>\pm 400</math> KHz):</b>	1.10:1
<b>Input:</b>	3-1/8" EIA
<b>Bay Dimensions (without Radome):</b>	
<b>Diameter:</b>	36" (915 mm)
<b>Height:</b>	29" (737 mm)
<b>Bay Dimensions (with Radome):</b>	
<b>Diameter:</b>	44" (1118 mm)
<b>Height:</b>	34" (864 mm)

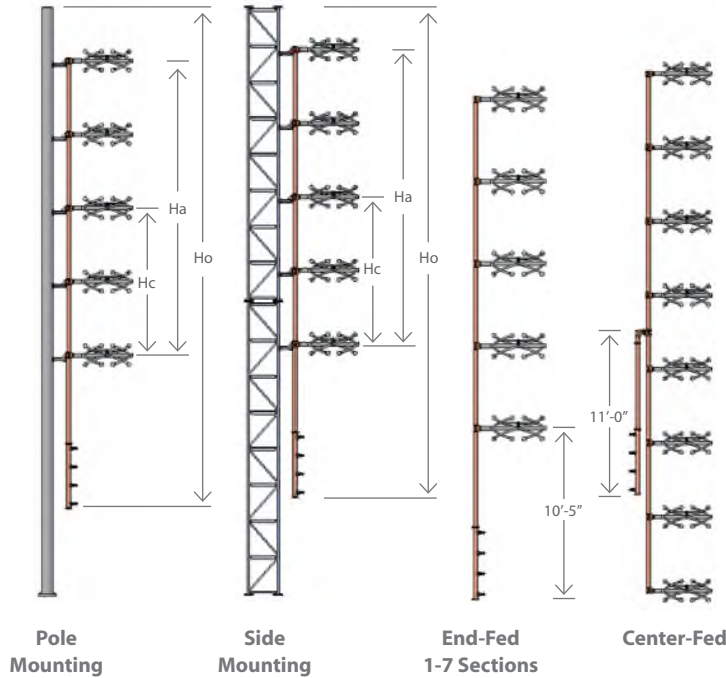
**Dielectric<sup>®</sup>**  
AN SPX DIVISION

22 Tower Road  
Raymond, Maine 04071 USA  
800.341.9678  
Email: [dcsales@spx.com](mailto:dcsales@spx.com) • [www.dielectric.com](http://www.dielectric.com)

# DCR-M / HDR-M

CIRCULARLY POLARIZED FM ANTENNA

## Mounting Dimensions



Ha = Antenna aperture length  
Hc = Antenna center of radiation  
Ho = Antenna overall length needed for mounting  
 $Ha = 984/f \times [s(x-1)]$   
 $Hc = Ha/2$   
 $Ho_{\text{end-fed}} = Ha + 5'_{\text{top}} + 10' - 5''_{\text{bottom}}$   
 $Ho_{\text{center-fed}} = Ha + 5'_{\text{top}} + 5'_{\text{bottom}}$

All dimensions in feet  
f = frequency in megahertz (MHz)  
s = bay spacing in fraction of wavelengths  
example:  $\frac{1}{2}$  wavelength = .5  
x = number of antenna bays

Note: Antennas ordered w/beam tilt and/or null fill are supplied with center feed and require an even number of bays

### DEICER SPECIFICATIONS:

Power (nominal per bay): 1200 W

Voltage: may be wired for 208 V or 240 V service, single or three phase.

Optional: Ice sensor and deicer controller

## Electrical Specifications

ANTENNA TYPE (DCR-M OR HDR-M)	GAIN POLARIZATION <sup>1</sup>				POWER RATING kW <sup>3</sup>
	$\lambda$ SPACING POWER GAIN	$\lambda$ SPACING dB	$\frac{1}{2} \lambda$ SPACING POWER GAIN	$\frac{1}{2} \lambda$ SPACING dB	
DCR-M1 HDR-M1	0.46	-3.37			18
DCR-M2 HDR-M2	1.0	0	0.7	-1.55	36
DCR-M3 HDR-M3	1.5	1.76	1.0	0	40
DCR-M4 HDR-M4	2.1	3.22	1.3	1.14	40
DCR-M5 HDR-M5	2.7	4.31	1.6	1.76	40
DCR-M6 HDR-M6	3.2	5.05	1.8	2.55	40
DCR-M7 HDR-M7	3.8	5.80	2.1	3.22	40
DCR-M8 HDR-M8	4.3	6.34	2.3	3.62	40
DCR-M10 HDR-M10	5.5	7.40	2.9	4.62	40
DCR-M12 HDR-M12	6.6	8.2	3.5	5.44	40

### NOTES

- RMS gain data is given relative to dipole. Values are for midband and include standard harness configurations. Actual gain will vary depending on feed system, frequency, null fill, and beam tilt.
- Average power ratings are nominal @ 40°C ambient. Assumes constant pressurization with dry air or nitrogen. Ratings may vary based on specific feed system design and local conditions.
- Higher power ratings and custom feed systems may be available on request.
- Antenna components and feed harnesses are optimized for FM channels of interest.
- Specs. are for a single DCR-M antenna array or HDR-M antenna array, not both.

## Mechanical Specifications

ANTENNA TYPE (DCR-M OR HDR-M)	# OF BAYS	WITHOUT RADOMES				WITH RADOMES				WITH DEICERS			
		WEIGHT LBS (KG)	CaAc ft <sup>2</sup> (m <sup>2</sup> )	WEIGHT LBS (KG)	CaAc ft <sup>2</sup> (m <sup>2</sup> )	WEIGHT LBS (KG)	CaAc ft <sup>2</sup> (m <sup>2</sup> )	WEIGHT LBS (KG)	CaAc ft <sup>2</sup> (m <sup>2</sup> )	WEIGHT LBS (KG)	CaAc ft <sup>2</sup> (m <sup>2</sup> )	WEIGHT LBS (KG)	CaAc ft <sup>2</sup> (m <sup>2</sup> )
DCR-M1 HDR-M1	1	160 (73)	6.6 (0.6)	303 (137)	11.2 (1.0)	165 (75)	7.1 (0.7)						
DCR-M2 HDR-M2	2	258 (117)	12.9 (1.2)	543 (246)	20.6 (1.9)	268 (122)	13.9 (1.3)						
DCR-M3 HDR-M3	3	355 (161)	19.2 (1.8)	783 (355)	30.0 (2.8)	370 (168)	20.7 (1.9)						
DCR-M4 HDR-M4	4	453 (205)	25.5 (2.4)	1023 (464)	39.9 (3.7)	473 (215)	27.5 (2.6)						
DCR-M5 HDR-M5	5	550 (250)	31.8 (3.0)	1263 (573)	48.9 (4.5)	575 (261)	34.3 (3.2)						
DCR-M6 HDR-M6	6	648 (294)	38.1 (3.5)	1503 (682)	58.3 (5.4)	678 (308)	41.1 (3.8)						
DCR-M7 HDR-M7	7	745 (338)	44.3 (4.1)	1743 (791)	67.6 (6.3)	780 (354)	47.8 (4.4)						
DCR-M8 HDR-M8	8	886 (402)	50.9 (4.7)	1983 (899)	77.3 (7.2)	926 (420)	54.9 (5.1)						
DCR-M10 HDR-M10	10	1081 (490)	63.5 (5.9)	2433 (1104)	96.5 (9.0)	1131 (513)	68.5 (6.4)						
DCR-M12 HDR-M12	12	1276 (579)	76.1 (7.1)	2883 (1308)	115.0 (10.6)	1336 (606)	82.1 (7.6)						

### NOTES

- CaAc and weight includes bays and standard extension brackets for mounting. Excludes custom mounts. For antennas that include pattern studies, contact factory for additional information.
- Dimensions are for antennas at 98.0 MHz and can vary  $\pm 10\%$  across the band.
- Ice shields are strongly recommended for areas subject to icing conditions. Dielectric is not responsible for antenna damage caused by impact from falling ice.
- Calculated area (CaAc) expressed in TIA/EIA-222-F standard.
- Specs. are for a single DCR-M antenna array or HDR-M antenna array, not both.