

Date	Prepared by	Approved by	Document nos	Revision
19 Nov 2021	Ray Ling	Pavel	MS-48F90-IM-001	0

INSTRUCTION MANUAL MS-48F90

TABLE OF CONTENTS:

1.00 BEAMS & CONNECTORS:

- 1.10 Plan View Resultant Beam Direction
 - 1.11 Beam 1-12 (Top Row 1) and Beam 25-36 (Third Row 3)
 - 1.12 Beam 13-24 (Second Row 2) and Beam 37-48 (Bottom Row 4)
- 1.20 Rear View Connector Layout
- 1.30 Connector Port Table (From Rear View)

2.00 BEAM PATTERN

- 2.10 Vertical Beam Pattern
- 2.20 Horizontal Beam Pattern (Row 1 & 3)
- 2.30 Horizontal Beam Pattern (Row 2 & 4)

3.00 TRANSPORTATION / INSTALLATION

- 3.10 Transportation (From Point to Point)
- 3.20 Bracket Mounting
- 3.30 Installation using a crane
 - 3.31 Lifting the Antenna
- 3.40 Antenna Installation
 - 3.41 Antenna Leveling
 - 3.42 Digital Level Gauge Calibration
 - 3.43 Adjustment Requirement

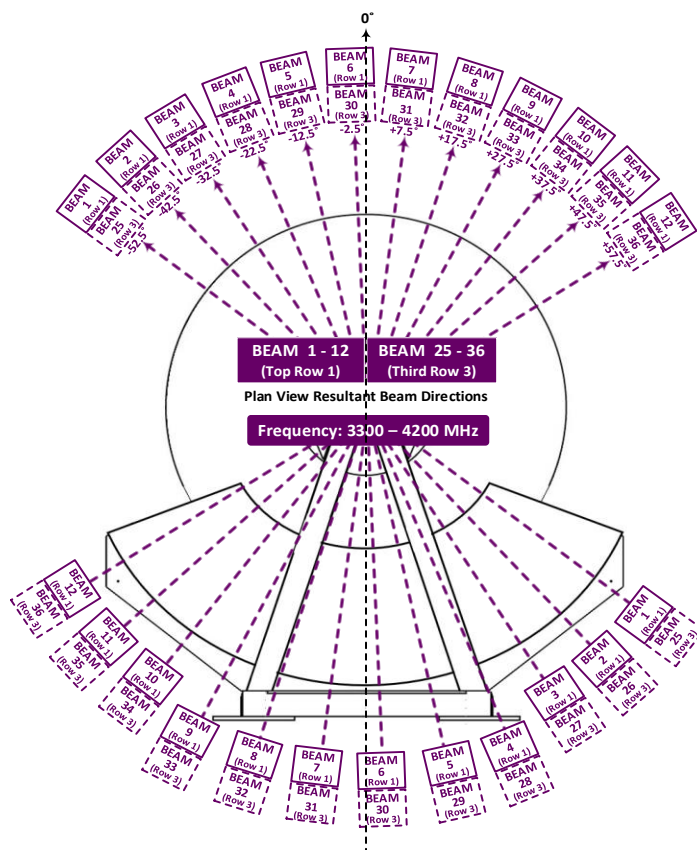
Revision History:

Date	Description	Revised by	Rev nos

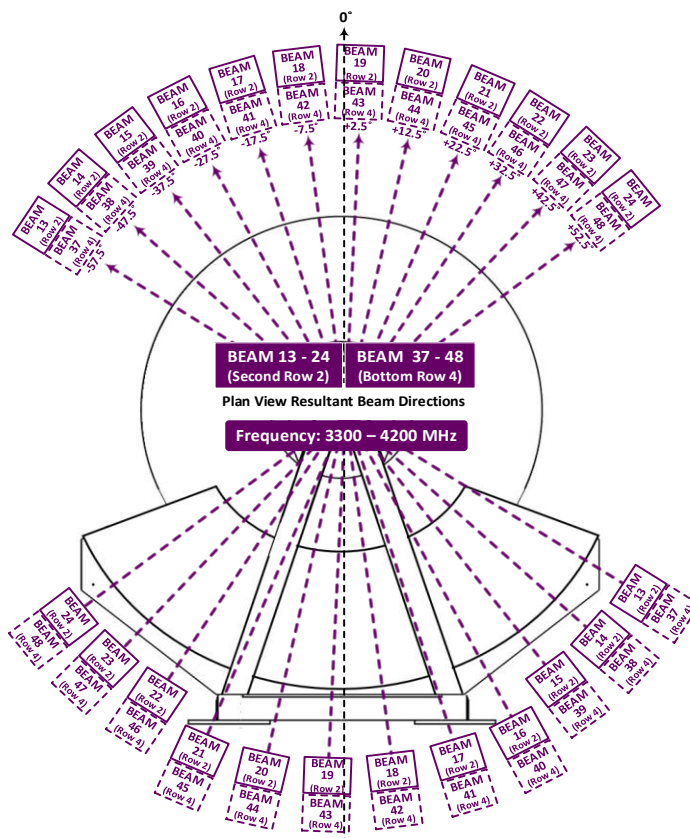
1.00 BEAMS & CONNECTORS:

1.10 Plan View Resultant Beam Direction

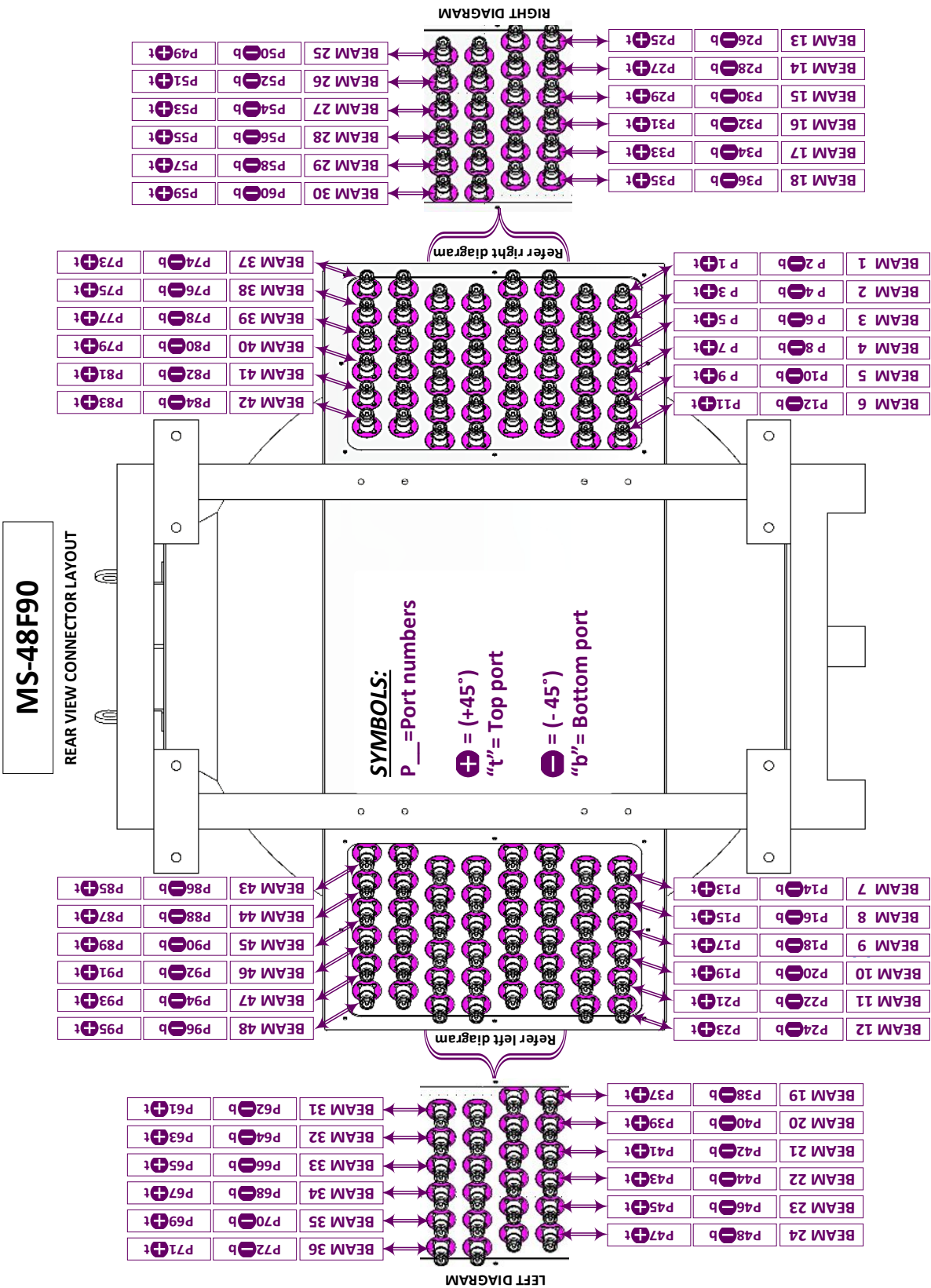
1.11 Beam 1-12 (Top Row 1) and Beam 25-36 (Third Row 3)



1.12 Beam 13-24 (Second Row 2) and Beam 37-48 (Bottom Row 4)



1.20 Rear View Connector Layout



1.30 Connector Port Table (From Rear View)

1.31 Beam 37-48

BEAM 48	BEAM 47	BEAM 46	BEAM 45	BEAM 44	BEAM 43
PORT 95 (+45°)	PORT 93 (+45°)	PORT 91 (+45°)	PORT 89 (+45°)	PORT 87 (+45°)	PORT 85 (+45°)
PORT 96 (-45°)	PORT 94 (-45°)	PORT 92 (-45°)	PORT 90 (-45°)	PORT 88 (-45°)	PORT 86 (-45°)

BEAM 42	BEAM 41	BEAM 40	BEAM 39	BEAM 38	BEAM 37
PORT 83 (+45°)	PORT 81 (+45°)	PORT 79 (+45°)	PORT 77 (+45°)	PORT 75 (+45°)	PORT 73 (+45°)
PORT 84 (-45°)	PORT 82 (-45°)	PORT 80 (-45°)	PORT 78 (-45°)	PORT 76 (-45°)	PORT 74 (-45°)

1.32 Beam 25-36

BEAM 36	BEAM 35	BEAM 34	BEAM 33	BEAM 32	BEAM 31
PORT 71 (+45°)	PORT 69 (+45°)	PORT 67 (+45°)	PORT 65 (+45°)	PORT 63 (+45°)	PORT 61 (+45°)
PORT 72 (-45°)	PORT 70 (-45°)	PORT 68 (-45°)	PORT 66 (-45°)	PORT 64 (-45°)	PORT 62 (-45°)

BEAM 30	BEAM 29	BEAM 28	BEAM 27	BEAM 26	BEAM 25
PORT 59 (+45°)	PORT 57 (+45°)	PORT 55 (+45°)	PORT 53 (+45°)	PORT 51 (+45°)	PORT 49 (+45°)
PORT 60 (-45°)	PORT 58 (-45°)	PORT 56 (-45°)	PORT 54 (-45°)	PORT 52 (-45°)	PORT 50 (-45°)

1.33 Beam 13-24

BEAM 24	BEAM 23	BEAM 22	BEAM 21	BEAM 20	BEAM 19
PORT 47 (+45°)	PORT 45 (+45°)	PORT 43 (+45°)	PORT 41 (+45°)	PORT 39 (+45°)	PORT 37 (+45°)
PORT 48 (-45°)	PORT 46 (-45°)	PORT 44 (-45°)	PORT 42 (-45°)	PORT 40 (-45°)	PORT 38 (-45°)

BEAM 18	BEAM 17	BEAM 16	BEAM 15	BEAM 14	BEAM 13
PORT 35 (+45°)	PORT 33 (+45°)	PORT 31 (+45°)	PORT 29 (+45°)	PORT 27 (+45°)	PORT 25 (+45°)
PORT 36 (-45°)	PORT 34 (-45°)	PORT 32 (-45°)	PORT 30 (-45°)	PORT 28 (-45°)	PORT 26 (-45°)

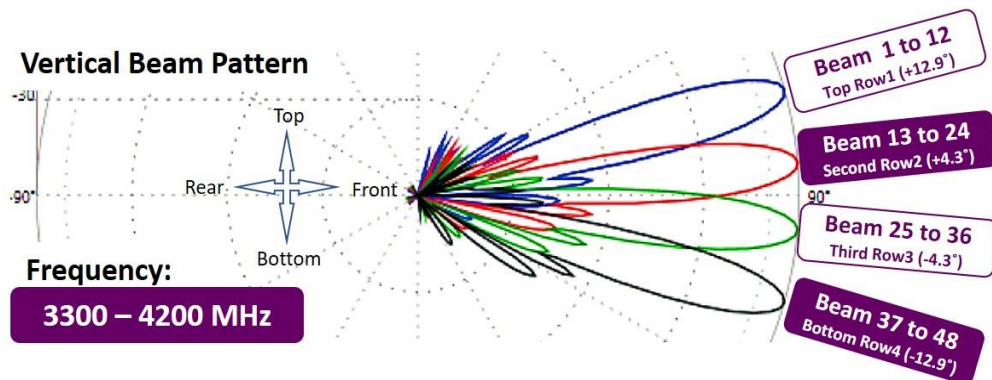
1.34 Beam 1-12

BEAM 12	BEAM 11	BEAM 10	BEAM 9	BEAM 8	BEAM 7
PORT 23 (+45°)	PORT 21 (+45°)	PORT 19 (+45°)	PORT 17 (+45°)	PORT 15 (+45°)	PORT 13 (+45°)
PORT 24 (-45°)	PORT 22 (-45°)	PORT 20 (-45°)	PORT 18 (-45°)	PORT 16 (-45°)	PORT 14 (-45°)

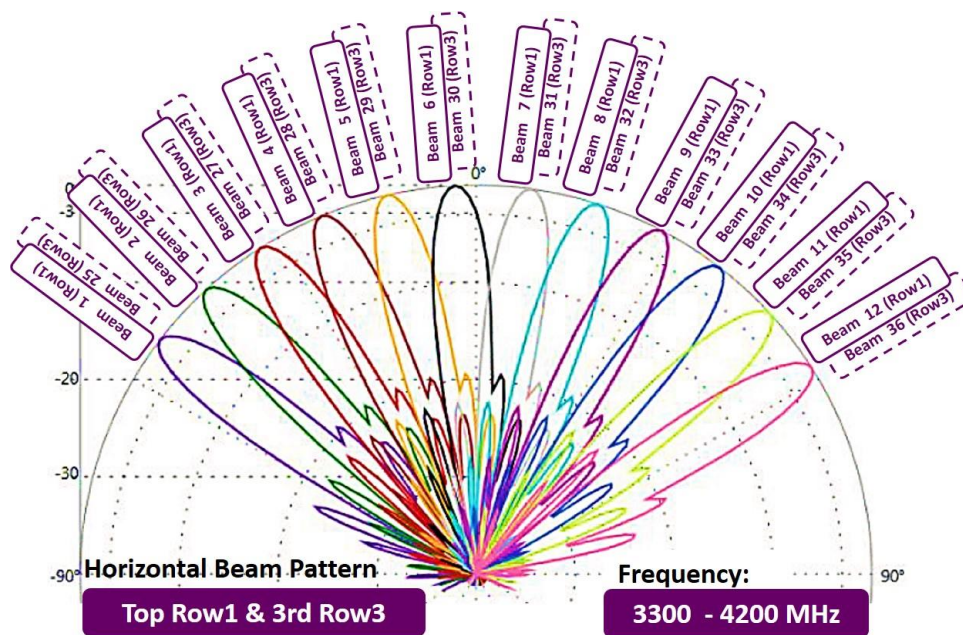
BEAM 6	BEAM 5	BEAM 4	BEAM 3	BEAM 2	BEAM 1
PORT 11 (+45°)	PORT 9 (+45°)	PORT 7 (+45°)	PORT 5 (+45°)	PORT 3 (+45°)	PORT 1 (+45°)
PORT 12 (-45°)	PORT 10 (-45°)	PORT 8 (-45°)	PORT 6 (-45°)	PORT 4 (-45°)	PORT 2 (-45°)

2.00 BEAM PATTERN

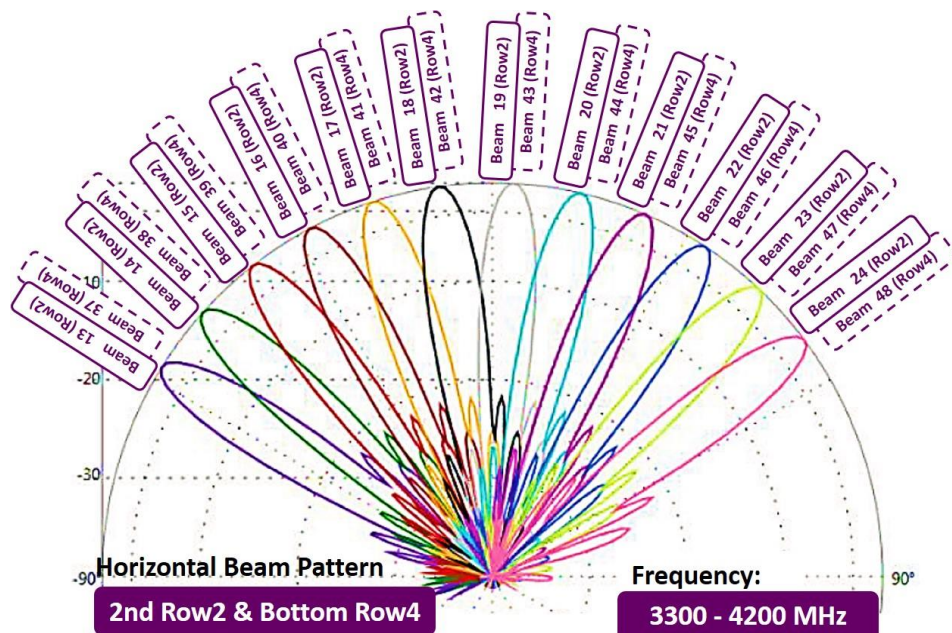
2.10 Vertical Beam Pattern



2.20 Horizontal Beam Pattern (Row 1 & 3)



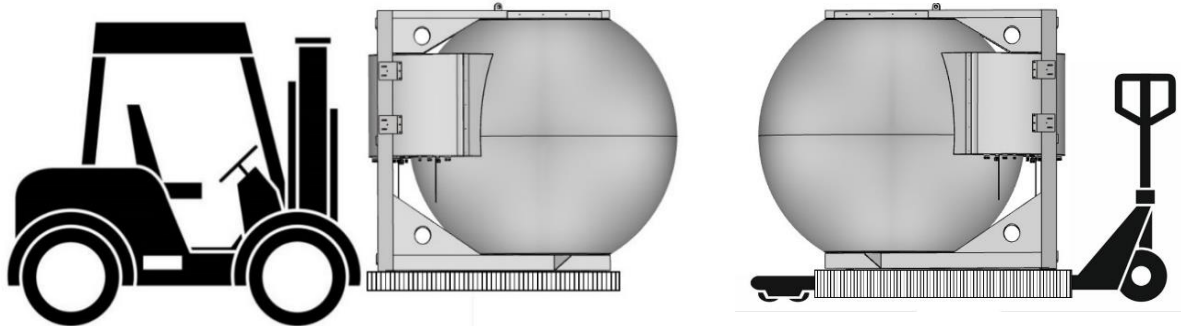
2.30 Horizontal Beam Pattern (Row 2 & 4)



3.00 TRANSPORTATION / INSTALLATION

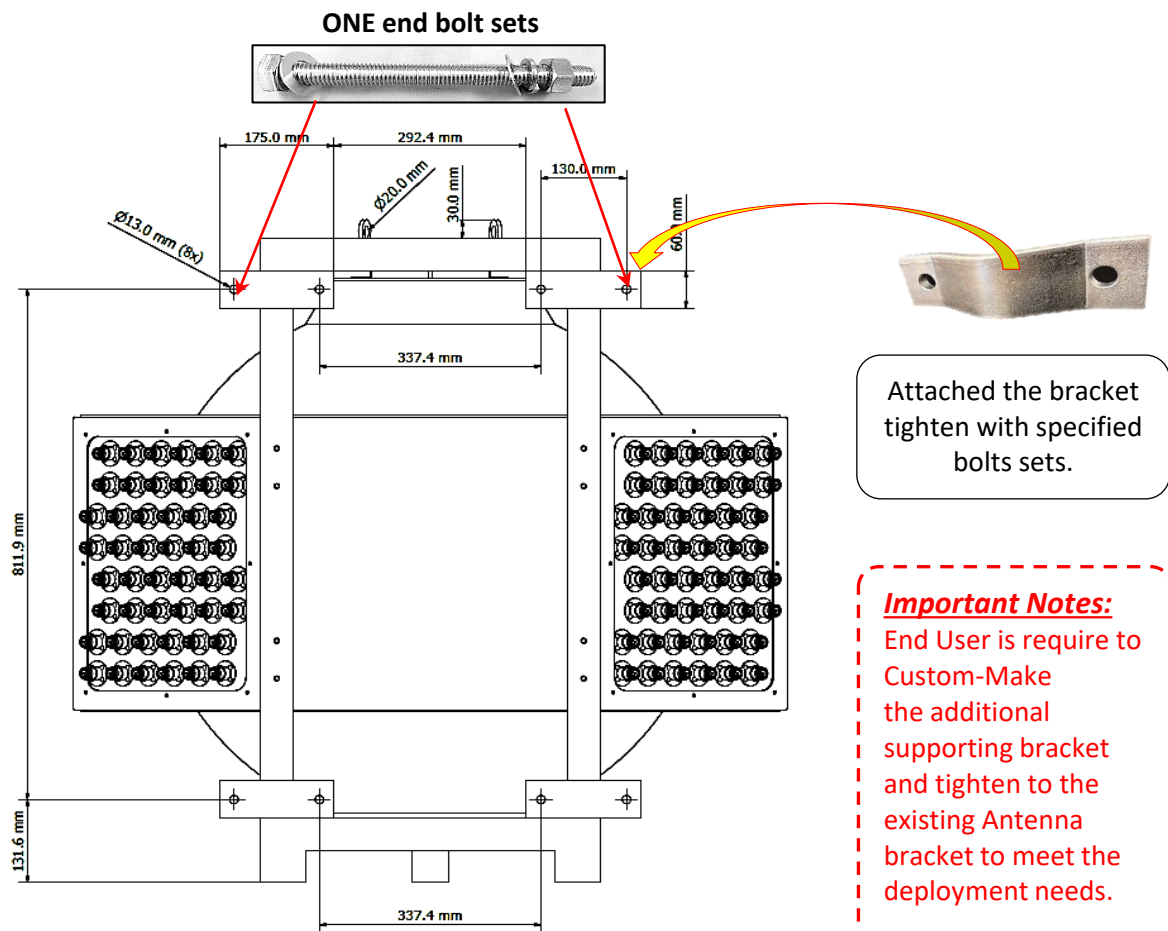
3.10 Transportation (From Point to Point)

Strictly comply to the Local authority and regulatory on Workplace Safety and Health Control and Measure when moving and transportation of large or heavy equipment, appropriate material handling machine should be use. **(Risk Assessment apply for Forklift or Pallet Truck Lifting)**



3.20 Bracket Mounting

Item	Lens/Types	Holes Size	Bracket Qty	<u>OPEN</u> end bolt & nuts sets
1	30cm to 120cm	Ø13mm x 8	4	M12 x 15cm=8sets



3.30 Installation using a crane

Strictly comply to the local authority and regulatory on Workplace Safety and Health Control and Measure when performing lifting of large or heavy equipment, appropriate material handling machine should be used and only certified personnel should perform the task.

(Risk Assessment requirement applies for both Up-Lifting and Down-Lifting.)

3.31 Lifting the Antenna

The antenna has 2 hook points installed on the top frame (located slightly behind the center of the sphere). These hooks are designed at the center of gravity point of the antenna. A cable, rope can be securely fastened to the hooks and the antenna can be lifted using a crane as pictured below.

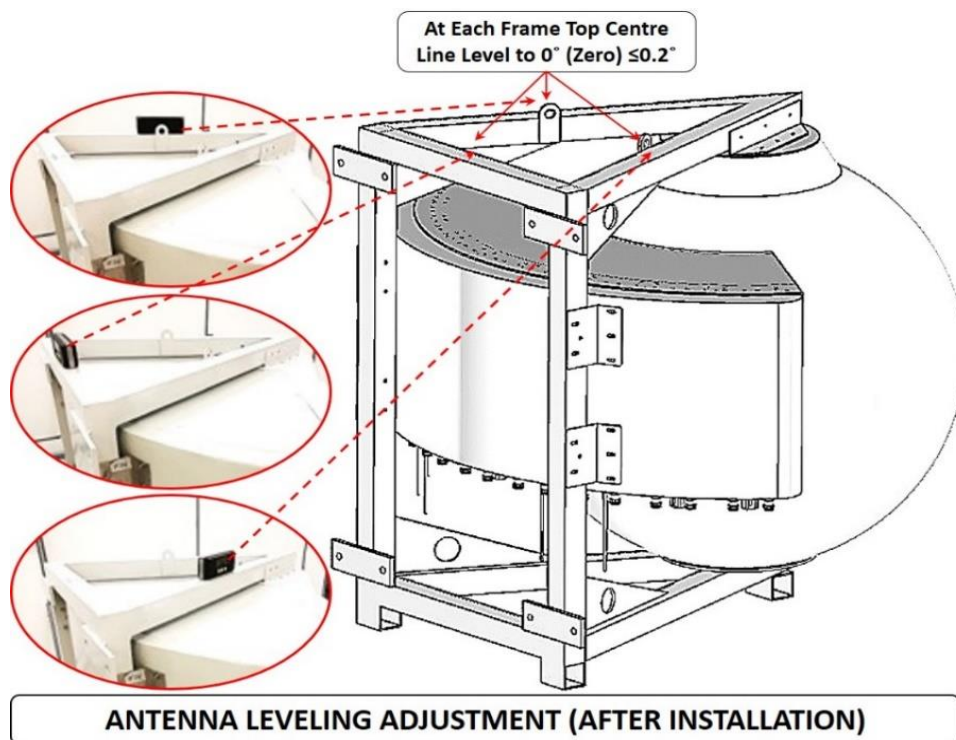


3.40 Antenna Installation

With reference to "**Bracket Mounting Procedure**", End user is required to Custom-Make the additional supporting bracket and tighten it to the existing Antenna bracket to meet the deployment needs.

3.41 Antenna Leveling

After the Antenna is mounted to the bracket, it is required to be adjusted to 0° (Zero Degree) with $\leq 0.2^\circ$ on 3 sides of the frame top level.(Rear, Right & Left=As shown in picture)



3.42 Digital Level Gauge Calibration



3.43 Adjustment Requirement

