Low Scattering Pylons

Support structures designed to minimize backscatter

Unique ogival shape

Extremely low backscatter

mvg
Microwave Vision Group

A broad selection of pylons, combined with the choice of rotator types, allows for a custom fit between pylon and DUT (Device Under Test). As a result of the unique ogival shape, front and rear sharp edges, and surface accuracy, MVG pylons demonstrate extremely low backscatter performance.

Our pylons can be installed on a concrete base, adapter plate, MVG positioner, linear slide, elevator or any combination of the above.

SOLUTION FOR

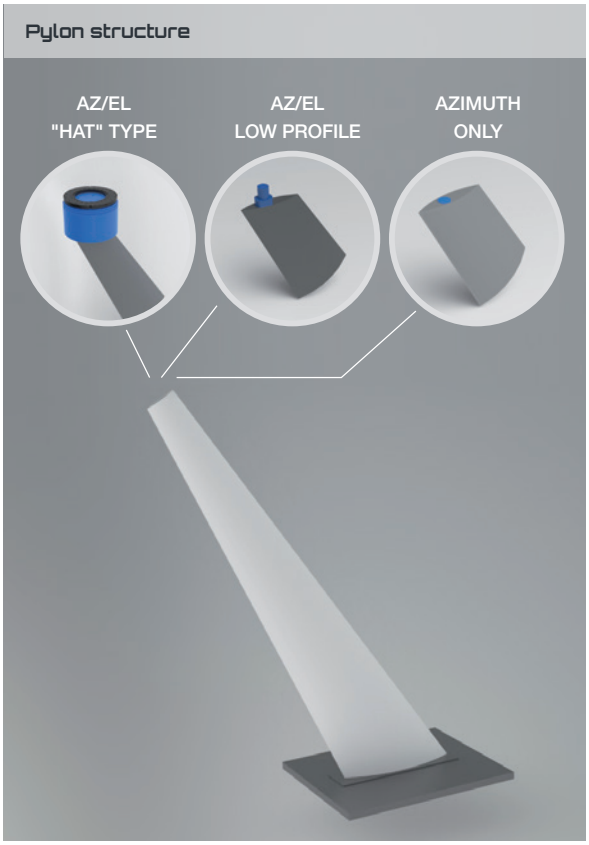
- **Low scattering measurements**
- **R&D applications**
- **Far-field measurements**

KEY FEATURES

- Ogive ratio: 1:4 standard, 1:6 and 1:7 available for most models
- Positioning system suitable for multiple measurement applications
- Height: standard from 3 to 70 feet (1 to 21 meters), or custom order
- Interchangeable tips (Optional)
- Three types of rotator heads: two AZ/EL and one AZ only
- Load capacity: From 500 - 80,000 lbs.
- Sharp edges: 0.004 - 0.008 inch
- Surface finish – 63 microinch
- Optimal power-to volume ratio
- Position feedback readout: synchro or rotary encoders

SYSTEM CONFIGURATION

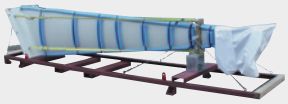
- Pylon structure: steel, aluminum or combination of steel and aluminum
- Rotators: AZ/EL and AZ only
- Environment: indoor (standard), outdoor (optional)
- Mini model tower (optional)
- Storage fixture
- Cover and edges protection kit
- Lifting device for installation



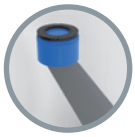
MVG offers three types of DUT rotation mechanisms (heads): two Azimuth-over-Elevation (AZ/EL) rotators and one Azimuth (AZ) - only rotator.

Storage fixture

Lifting device

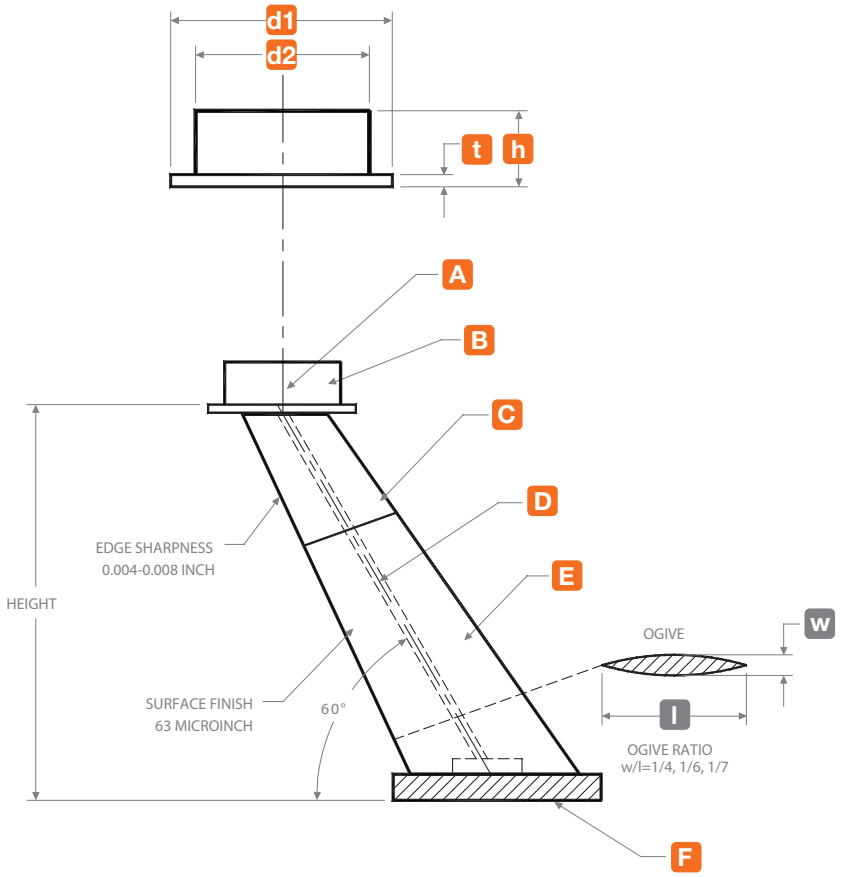


Edges protection kit



Rotators / AZIMUTH - OVER - ELEVATION (AZ/EL)

"HAT" type rotator with pylon



- **d1** Rotator turntable diameter (flange)
- **d2** Rotator base diameter
- **h** Rotator height
- **t** Flange thickness
- **A** Rotator (head)
- **B** AZ & EL drive and control system
- **C** Tip
- **D** Through hole for cables
- **E** Pylon structure
- **F** Support base

The **"HAT" type** pylon rotators are used for heavy duty DUT measurement.

This unique hat-shaped rotator is positioned on top of the pylon and provides a mounting interface on its bottom flange to allow the rotator to fit inside the DUT.

Fitting the rotator inside the DUT minimizes the rotator's interference in the measurement results.

Above a 20 ton DUT load, the mounting interface is on top of the rotator.

Pylon with "HAT" type rotator

AZ/EL Rotator "HAT" Type and Pylon Specifications

COMPLETE PYLON ASSEMBLY MODEL 		AL-28005-50	AL-28007-150	AL-28010-300	AL-28013-600	AL-28014-1200	AL-28014-2000	AL-28015-2750	AL-28015-3000	AL-28016-5000	AL-28017-8000
TIP & ROTATOR ONLY[1] 		AL-28205-50	AL-28207-150	AL-28210-300	AL-28213-600	AL-28214-1200	AL-28214-2000	AL-28215-2750	AL-28215-3000	AL-28216-5000	AL-28217-8000
DUT Weight (max)	kg	225	681	1,362	2,724	5,448	9,080	12,485	13,620	22,700	36,300
	lbs	500	1,500	3,000	6,000	12,000	20,000	27,500	30,000	50,000	80,000
Delivered Torque (EL)	kg-m	70	104	415	1,078	1,659	3,042	9,678	9,678	20,738	29,034
	ft-lbs	500	750	3,000	7,800	12,000	22,000	70,000	70,000	150,000	210,000
Delivered Torque (AZ)	kg-m	27.5	36	100	173	207	691	4,148	4,148	5,530	6,913
	ft-lbs	200	260	720	1,250	1,500	5,000	30,000	30,000	40,000	50,000
Side Bending Moment	kg-m	40	51	142	346	346	1,383	4,148	4,148	5,530	8,295
	ft-lbs	283	370	1,030	2,500	2,500	10,000	30,000	30,000	40,000	60,000
Travel (EL)	deg	+ 5, - 45	+ 5, - 45	+ 5, - 45	+ 5, - 30	+ 5, - 30	+ 5, - 30	+ 10, - 30	+ 10, - 30	+ 10, - 30	+ 10, - 30
Travel (AZ)	deg	360 Continuous									
Accuracy (EL)[2]	deg	± 0.05	± 0.05	± 0.05	± 0.05	± 0.05	± 0.05	± 0.05	± 0.05	± 0.05	± 0.05
Accuracy (AZ)[2]	deg	± 0.05	± 0.03	± 0.03	± 0.03	± 0.03	± 0.03	± 0.03	± 0.03	± 0.03	± 0.03
Readout Resolution (EL)	deg	0.01	0.01	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
Readout Resolution (AZ)	deg	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
Backlash (EL)[2]	deg	0.07	0.07	0.07	0.07	0.07	0.07	0.04	0.04	0.04	0.04
Backlash (AZ)[2]	deg	0.04	0.04	0.04	0.04	0.05	0.05	0.04	0.04	0.04	0.04
Rotation Speed (EL)[2] (± 20 %)[3]	deg/min	6.5	10	6	5	4	4	20	20	20	2
Rotation Speed(AZ)[2] (± 20 %)[3]	deg/min	42	36	35	30	30	30	20	20	20	12
Rotator Height (h)	mm	127	152	183	305	508	635	584	851	1219	1422
	in	5	6	7.2	12	20	25	23	33.5	48	56
Turntable Diameter (d1) (Flange)	mm	254	327	406	660	559	864	1524	1524	1880	2413
	in	10	12.9	16	26	22	34	60	60	74	95
Base Diameter (d2)	mm	228.6	279	358	597	508	813	1394	1397	1778	2311
	in	9	11	14.1	23.5	20	32	54.9	55	70	91
Flange Thickness (t)	mm	25.4	8.1	8.1	15.9	25.4	25.4	30	30.0	38.1	
	in	1	0.32	0.32	0.63	1	1	1.2	1.2	1.5	

(1) Possible to order a tip and rotator only

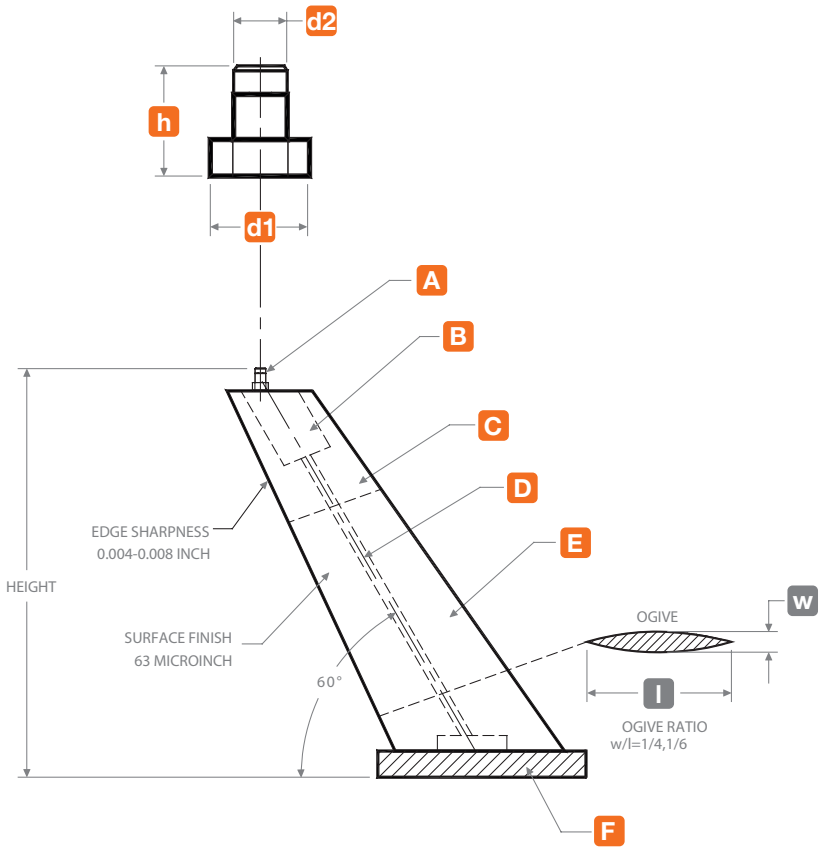
(2) Data is based on testing in "No Load" position

(3) (+/-20%) reflects a speed deviation

* Encoder / synchro are applicable for standard models

Rotators / AZIMUTH - OVER - ELEVATION (AZ/EL)

Low profile rotator with pylon



- **d1** Rotator base diameter
- **d2** Rotator turntable diameter
- **h** Rotator height
- **A** Rotator (head)
- **B** AZ & EL drive and control system
- **C** Tip
- **D** Through hole for cables
- **E** Pylon structure
- **F** Support base

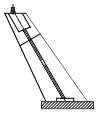
The **Low profile** pylon rotators are used for overall small size and light weight DUT measurement.

The rotator's drive and position feedback components (i.e. synchro and encoder) are installed inside the tip structure and only the "small" head protrudes from the top.

The DUT is secured to the top of the rotator.

Pylon with low profile rotator

AZ/EL Rotator Low Profile Type and Pylon Specifications

COMPLETE PYLON ASSEMBLY MODEL		AL-28063-60	AL-28062-110	AL-28061-220	AL-28060-600
TIP & ROTATOR ONLY[1]		AL-28263-60	AL-28262-110	AL-28261-220	AL-28260-600
DUT Weight (max)	kg lbs	270 600	500 1,100	1,000 2,200	2,724 6,000
Delivered Torque (EL)	kg-m ft-lbs	50 360	44 320	120 865	830 6,000
Delivered Torque (AZ)	kg-m ft-lbs	5 33	12 87	25 181	97 700
Side Bending Moment	kg-m ft-lbs	7 50	17 123	35 253	140 1,020
Travel (EL)[2]	deg	+ 5,- 40	+ 5,- 40	+ 5,- 40	+ 5,- 40
Travel (AZ)	deg	360 Continuous			
Readout Accuracy (EL)[3]	deg	± 0.13	± 0.13	± 0.13	± 0.12
Readout Accuracy (AZ)[3]	deg	± 0.05	± 0.06	± 0.06	± 0.06
Readout Resolution (EL)	deg	0.02	0.02	0.02	0.02
Readout Resolution (AZ)	deg	0.001	0.001	0.001	0.001
Backlash (EL)[3]	deg	0.06	0.06	0.06	0.06
Backlash (AZ)[3]	deg	0.03	0.06	0.03	0.03
Rotation Speed (EL)[3] (± 20 %)[4]	deg/min	1	2	1	1
Rotation Speed (AZ)[3] (± 20 %)[4]	deg/min	22	44	22	22
Rotator Height (h)	mm in	119 4.7	140 5.5	140 5.5	234 9.2
Base Diameter (d1)	mm in	90 3.6	116 4.6	116 4.6	201 7.9
Turntable Diameter (d2)	mm in	60 2.36	88 3.46	88 3.46	136 5.36

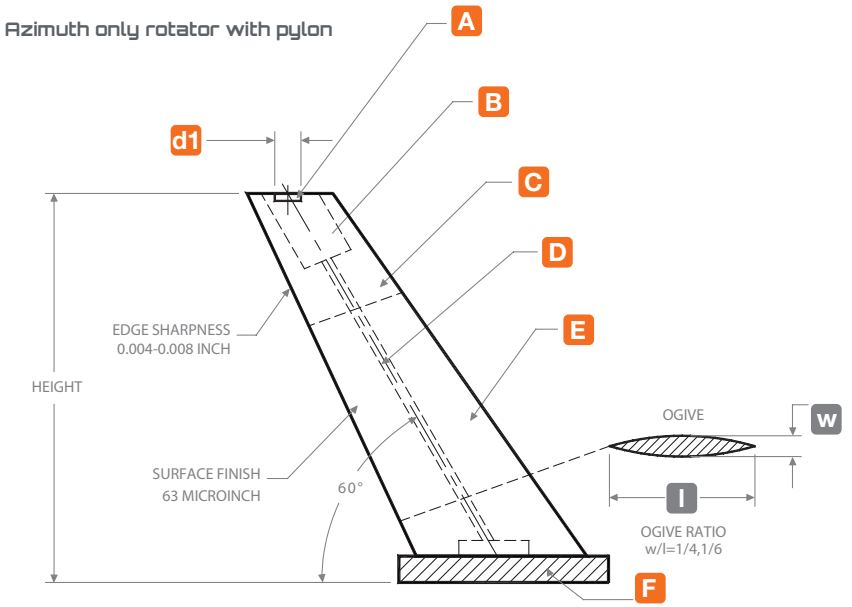
(1) For orders concerning tip & rotator only, contact our specialists with interface details.

(2) Typical elevation travel is from + 5 to - 40 degrees. For other standard travel options, consult our specialists.

(3) Data is based on testing in “No Load” position.

(4) (+/-20%) reflects a speed deviation

+ Rotators / AZIMUTH ONLY



- **d1** Rotator turntable diameter
- **A** Turntable
- **B** AZ & EL drive and control system
- **C** Tip
- **D** Through hole for cables
- **E** Pylon structure
- **F** Support base

The **Azimuth only** pylon rotators are used for an overall small size and light weight DUT in single axis measurement. They incorporate a positioner located in the tip of the pylon. The rotator seamlessly mates with the device under test, preserving the integrity of the DUT's test evaluation. DUT elevation adjustments can be implemented manually or via a motorized elevation positioner/leveling device at the base of the pylon.


Pylon with azimuth only rotator

AZ only Rotator and Pylon Specifications

COMPLETE PYLON ASSEMBLY MODEL		AL-28053-50	AL-28055-100	AL-28057-220
TIP & ROTATOR ONLY[1]		AL-28253-50	AL-28255-100	AL-28257-220
DUT Weight (max)	kg lbs	227 500	454 1,000	1,000 2,200
Delivered Torque (max)	kg-m ft-lbs	2.8 20	4.1 30	6.9 50
Bending Moment (max)	kg-m ft-lbs	41.5 300	138.3 1,000	248.9 1,800
Backlash[2]	deg	0.03	0.03	0.03
Readout Accuracy[2]	deg	+/- 0.05	+/- 0.05	+/- 0.05
Readout Resolution	deg	0.001	0.001	0.001
Speed	deg/min	30	15	12
Azimuth Travel	deg	360 continuous		
Turntable Diameter (d1)	mm in	70 2.75	70 2.75	159 6.25

(1) For orders concerning tip & rotator only, contact our specialists with interface details
(2) Data is based on testing in "No Load" position

+ PYLON ORDERING INFORMATION

Pylons can be ordered from our selection of standard models or can be customized to suit customer specific requirements.

To order a complete pylon assembly follow the example in the table below. Note the series number of the pylon model, the number representing the ogive aspect ratio, and the number of feet for the height of the pylon.

OPTIONS

- Slip rings with up to 30 contacts on the azimuth axis (depends on rotator's size)
- Rotary joints for "HAT" type rotators: 12 GHz, 18 GHz, 26 GHz and 40 GHz
- Service connector with static cover on top of the "HAT" type rotators
- Special mounting holes and interfaces are available upon request
- Special tilting device for installation or removal of the pylon

Basic models:

- 28xxx-xxx – complete pylon assembly, hat type
- 282xx-xxx – tip and rotator only, hat type
- 2806x-xxx – complete low profile pylon rotator
- 2826x-xxx – tip and rotator only, low profile

Aspect ratios:

- 4 – 1:4 ogive ratio
- 6 – 1:6 ogive ratio
- 7 – 1:7 ogive ratio

Pylon heights:

- Pylon heights from 3 ft to 70 ft are available in standard sizes in 1 ft increments.
- Pylon heights requiring ½ ft increments start from 3 ft are available upon request

BASIC MODEL SERIES	ASPECT RATIO	PYLON HEIGHT
AL-28007-150	7	11
Example: AL-28007-150-7-11		