(Line Stretchers) Coaxial Phaseshifters,

See Also: Line Stretchers W/G Phaseshifters

ATM manufactures a wide variety of Phase shifters to meet your design specifications. For more information feel free to call us and discuss your needs with one of our design engineers.

30°/GHz Phaseshifters - Series P140 & P240

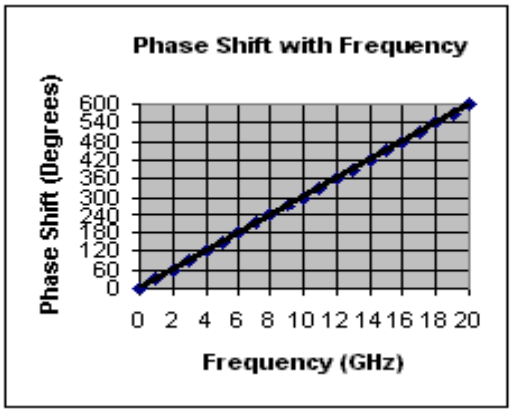
Standard Model has mechanical adjustment with screwdriver shaft and locknut.

For **Digital Counting Dial Option** add "D" suffix to the Model Number

Example P/N: P1403 becomes: P1404D

For **Direct Reading Option** add "DRE" suffix to the Model Number

Example P/N: P1403 becomes: P1404DRE



30°/GHz PHASESHIFTERS

GENERAL SPECIFICATIONS (All Options)

Electrical

RF Power: 100W average, 3kW peak

RF Connectors: SMA / Type-N, standard

Min. Adjustable Phase shift: 0 to 30°/GHz

Adjustable Group Delay min: 0 to 0.085 ns

Insertion Phase @ 1.0 GHz:

Applicable Mil-Specs

General:

Product Specific:

Mechanical

Size: 3.75" x 2.0" x 1.0"

Body: Aluminum

Connectors: Stainless Steel

Finish: Unique corrosion resistant 316 stainless steel epoxy coating IAW MIL-F-14072

30° Phaseshifters - Wide Band Models

Model No. (SMA)	Model No. (Type N)	Freq (GHz)	Min. Phase Adjust	I.L. dB max	VSWR Max
P1403	P2403	**DC - 2.3**	0 - 30°/GHz	0.5	1.5
P1404	P2404	**DC - 4.3**	0 - 30°/GHz	0.5	1.5
P1405	P2405	**DC - 8.2**	0 - 30°/GHz	0.6	1.5
P1406	P2406	**DC - 12.7**	0 - 30°/GHz	0.7	1.5
P1407	P2407	**DC - 18.6**	0 - 30°/GHz	1.0	1.6
P1408	N/A	**DC - 26.5**	0 - 30°/GHz	1.5	2.0
P1408-360	N/A	**18.0 - 26.5**	0° - 360°	1.5	1.8
P1409-360**	N/A	**18.0 - 40.0**	0° - 360°	2.5	2.0

Motor Drive Option available for remote applications - click here for Outline Drawing

** This unit supplied with K (2.9mm) connectors only.

Note: **0 - 30°/GHz Models** achieve 30° minimum of phase shift @ 1GHz, actual phase shift varies linearly, corresponding to the Frequency unit is operating at.

Example:

If operated @ 2GHz, the unit can achieve 60° phase shift min.,

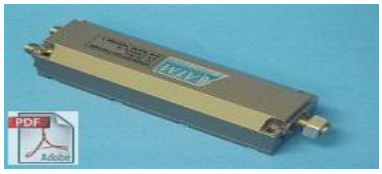
If operated @ 4GHz operation, the unit can achieve 120° phase shift min., and so on.

Use the "Phase Shift with Frequency" chart above for quick reference.

40° / GHz Phaseshifters - Series P130 & P230

• Low profile, compact design

- measures only: 4.0" x 1.25" x 1.0"



Detailed Phase Shift with Frequency chart coming soon

40°/GHz PHASESHIFTERS
GENERAL SPECIFICATIONS

Electrical

RF Power: 100W average, 3kW peak

RF Connectors: SMA/Type-N, standard

Min. Adjustable Phase shift: 0 to 40°/GHz

Adjustable Group Delay min: 0 to 0.112 ns

Insertion Phase @ 1.0 GHz:

Applicable Mil-Specs

General:

Product Specific:

Mechanical

Size: 4.0" x 1.25" x .88"

Body: Aluminum

Connectors: Stainless Steel

Finish: Unique corrosion resistant 316 stainless steel epoxy coating IAW MIL-F-14072

40° Phaseshifters - Wide Band Models

Model No. (SMA)	Model No. (Type N)	Freq (GHz)	Min Phase Adjust	I.L. dB max	VSWR Max
P1303	P2303	**DC - 2.3**	0° - 40°/GHz	0.5	1.5
P1304	P2304	**DC - 4.3**	0° - 40°/GHz	0.5	1.5
P1305	P2305	**DC - 8.2**	0° - 40°/GHz	0.6	1.5
P1306	P2306	**DC - 12.7**	0° - 40°/GHz	0.7	1.5
P1307	P2307	**DC - 18.6**	0° - 40°/GHz	1.0	1.6
P1308	N/A	**18.0 - 26.5**	0° - 40°	1.5	2.0

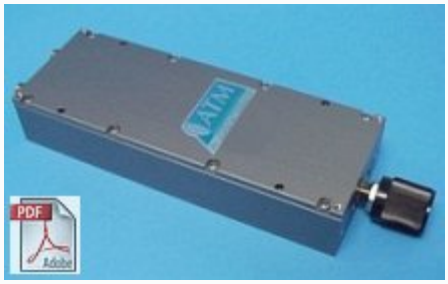
Note: **0 - 40°/GHz Models** achieve 40° minimum of phase shift @ 1GHz, actual phase shift varies linearly, corresponding to the Frequency unit is operating at.

Example:

If operated @ 2GHz, the unit can achieve 80° phase shift min.,

If operated @ 4GHz operation, the unit can achieve 160° phase shift min., and so on.

60°/GHz Phaseshifters - Series P150 & P250



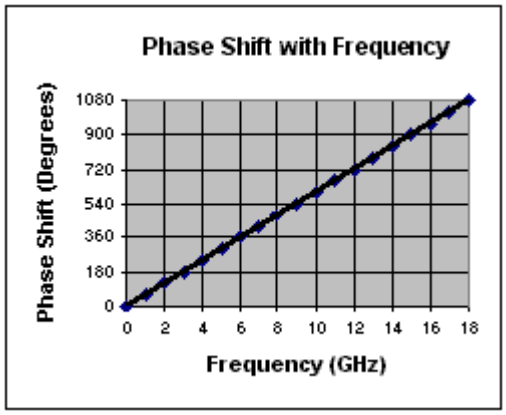
Standard Model has mechanical adjustment with screwdriver shaft and locknut.

For **Digital Counting Dial Option** add "D" suffix to the Model Number

Example P/N: P1503 becomes: P1503D

For **Direct Reading Option** add "DRE" suffix to the Model Number

Example P/N: P1503 becomes: P1503DRE



60°/GHz PHASESHIFTERS

GENERAL SPECIFICATIONS (All Options)

Electrical

RF Power: 100W average, 3kW peak

RF Connectors: SMA/Type-N, standard

Min. Adjustable Phase shift: 0 to 60°/GHz

Adjustable Group Delay min: 0 to 0.169 ns

Insertion Phase @ 1.0 GHz: 320° (min. setting)

Applicable Mil-Specs

Mechanical

Size: 5.5" x 2.0" x 1.0"

Body: Aluminum

Connectors: Stainless Steel

Finish: Unique corrosion resistant 316 stainless steel epoxy coating IAW MIL-F-14072

	General: **Product Specific:**	

60° Phaseshifters - Wide Band Models

Model No. (SMA)	Model No. (Type N)	Freq (GHz)	Min Phase Adjust	I.L. dB max	VSWR Max
P1503	P2503	**DC - 2.3**	0 - 60°/GHz	0.5	1.5
P1504	P2504	**DC - 4.3**	0 - 60°/GHz	0.5	1.5
P1505	P2505	**DC - 8.2**	0 - 60°/GHz	0.6	1.5
P1506	P2506	**DC - 12.7**	0 - 60°/GHz	0.7	1.5
P1507	P2507	**DC - 18.6**	0 - 60°/GHz	1.0	1.6
P1508	N/A	**18.0 - 26.0**	0 - 60°	1.5	2.0

Motor Drive Option available for remote applications - click here for Outline Drawing

Note: **0 - 60°/GHz Models** achieve 60° minimum of phase shift @ 1GHz, actual phase shift varies linearly, corresponding to the Frequency unit is operating at.

Example:

If operated @ 2GHz, the unit can achieve 120° phase shift min.,

If operated @ 4GHz operation, the unit can achieve 240° phase shift min., and so on.

Use the "Phase Shift with Frequency" chart above for quick reference.

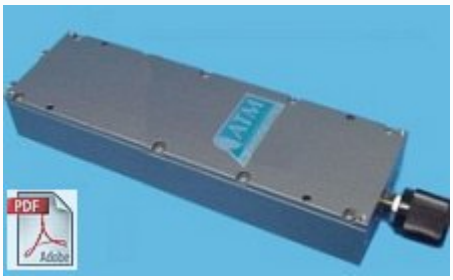
60° Phaseshifters - Special Band Models

Model No. (SMA)	Model No. (Type N)	Freq (GHz)	Min Phase Adjust	I.L. dB max	VSWR Max
P150C-180	P250C-180	**5.85 - 6.5**	0° - 180°	0.6	1.5
P150C-360	P250C-360	**5.85 - 6.5**	0° - 360°	0.6	1.5
P150X-180	P250X-180	**7.9 - 8.4**	0° - 180°	0.7	1.5
P150X-360	P250X-360	**7.9 - 8.4**	0° - 360°	0.7	1.5
P150K-180	P250K-180	**12.7 - 14.5**	0° - 180°	1.0	1.6
P150K-360	P250K-360	**12.7 - 14.5**	0° - 360°	1.0	1.6
P150K1-360	P250K1-360	**17.0 - 18.2**	0° - 360°	1.0	1.6
P150CK-180	P250CK-180	**5.85 - 14.5**	0° - 180°	**	**
P150CK-360	P250CK-360	**5.85 - 14.5**	0° - 360°	**	**

Motor Drive Option available for remote applications - click here for Outline Drawing

** These Models operate over a Tri-Band. From 5.85 -6.5 GHz unit specs the same as P150C-, from 7.9-8.4 GHz unit specs the same as P150X-, and from 14.0-14.5 unit specs the same as P150K–

90°/GHz Phaseshifters - Series P160 & P260

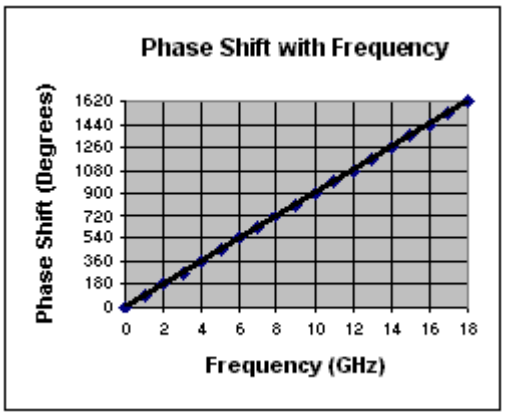


Standard Model has mechanical adjustment with screwdriver shaft and locknut.

For **Digital Counting Dial Option** add "D" suffix to the Model Number
Example P/N: P1603 becomes: P1603D

For **Direct Reading Option** add "DRE" suffix to the Model Number
Example P/N: P1603 becomes: P1603DRE

90°/GHz PHASESHIFTERS
GENERAL SPECIFICATIONS (All Options)



Electrical

RF Power: 100W average, 3kW peak

RF Connectors: SMA/Type-N, standard

Min. Adjustable Phase shift: 0 to 90°/GHz

Adjustable Group Delay min: 0 to 0.254 ns

Insertion Phase @ 1.0 GHz:

Applicable Mil-Specs

General:

Product Specific:

Mechanical

Size: 7.0" x 2.0" x 1.0"

Body: Aluminum

Connectors: Stainless Steel

Finish: Unique corrosion resistant 316 stainless steel epoxy coating IAW MIL-F-14072

90°/GHz Phaseshifters - Wide Band Models

Model No. (SMA)	Model No. (Type N)	Freq (GHz)	Min Phase Adjust	I.L. dB max	VSWR Max
P1603	P2603	**DC - 2.3**	0 - 90°/GHz	0.5	1.3
P1604	P2604	**DC - 4.3**	0 - 90°/GHz	0.5	1.3
P1605	P2605	**DC - 8.2**	0 - 90°/GHz	0.6	1.4
P1606	P2606	**DC - 12.7**	0 - 90°/GHz	0.7	1.5
P1607	P2607	**DC - 18.6**	0 - 90°/GHz	1.0	1.6
P1608	N/A	**DC - 26.5**	0 - 90°/GHz	1.7	2.0

Motor Drive Option available for remote applications - click here for Outline Drawing

Note: **0 - 90°/GHz Models** achieve 90° minimum of phase shift @ 1GHz, actual phase shift varies linearly, corresponding to the Frequency unit is operating at.

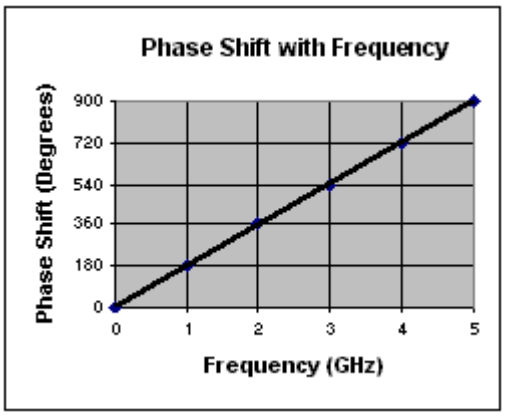
Example:
If operated @ 2GHz, the unit can achieve 180° phase shift min.,
If operated @ 4GHz operation, the unit can achieve 360° phase shift min., and so on.
Use the "Phase Shift with Frequency" chart above for quick reference.

180°/GHz Phaseshifters - Series P120 & P220

Standard Model has mechanical adjustment with screwdriver shaft and locknut.

For **Digital Counting Dial Option** add "D" suffix to the Model Number
Example P/N: P1213 becomes: P1213D

For **Direct Reading Option** add "DRE" suffix to the Model Number
Example P/N: P1213 becomes: P1213DRE



180°/GHz PHASESHIFTERS
GENERAL SPECIFICATIONS (All Options)

Electrical

RF Power: 100W average, 3kW peak

RF Connectors: SMA/Type-N, standard

Min. Adjustable Phase shift: 0 to 180°/GHz

Adjustable Group Delay min: 0 to 0.508 ns

Insertion Phase @ 1.0 GHz:

Applicable Mil-Specs

General:

Product Specific:

Mechanical

Size: 12.0" x 2.0" x 1.0"

Body: Aluminum

Connectors: Stainless Steel

Finish:

Unique corrosion resistant 316 stainless steel epoxy coating IAW MIL-F-14072

180°/GHz Phaseshifters - Wide Band Models

Model No. (SMA)	Model No. (Type N)	Freq GHz	Min Phase Adjust	I.L. dB max	VSWR Max
P1213	P2213	**DC - 2.3**	0 - 180°/GHz	0.6	1.3
P1214	P2214	**DC - 4.3**	0 - 180°/GHz	0.7	1.5

Motor Drive Option available for remote applications - click here for Outline Drawing

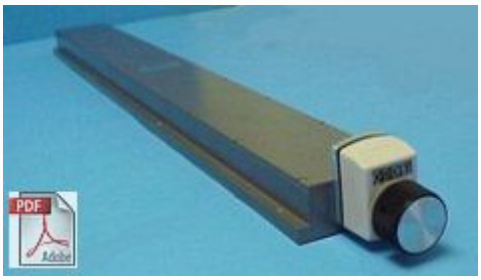
Note: **0 - 180°/GHz Models** achieve 180° minimum of phase shift @ 1GHz, actual phase shift varies linearly, corresponding to the Frequency unit is operating at.

Example:

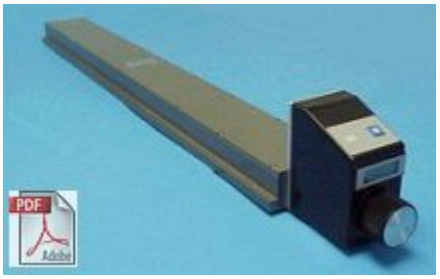
If operated @ 2GHz, the unit can achieve 360° phase shift min,
If operated @ 4GHz operation, the unit can achieve 720° phase shift min., and so on.
Use the "Phase Shift with Frequency" chart above for quick reference.

360°/GHz Phaseshifters - Series P1100 & P2100

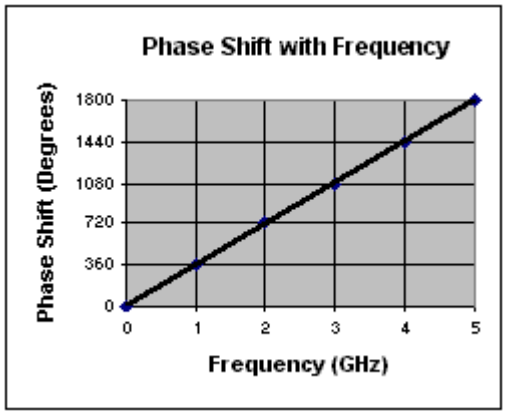
Standard Model has mechanical adjustment with screwdriver shaft and locknut.



For **Digital Counting Dial Option** add "D" suffix to the Model Number
Example P/N: P1102 becomes: P1102D



For **Direct Reading Option** add "DRE" suffix to the Model Number
Example P/N: P1102 becomes: P1102DRE



360°/GHz PHASESHIFTERS
GENERAL SPECIFICATIONS (All Options)

Electrical

RF Power: 100W average, 3kW peak

RF Connectors: SMA/Type-N, standard

Min. Adjustable Phase shift: 0 to 360°/GHz

Adjustable Group Delay min: 0 to 1.016 ns

Insertion Phase @ 1.0 GHz: 1375° (min setting)

Applicable Mil-Specs

General:

Product Specific:

Mechanical

Size: 24.0" x 3.0" x 1.2"

Body: Aluminum

Connectors: Stainless Steel

Finish:
Unique corrosion resistant 316 stainless steel epoxy coating IAW MIL-F-14072

360°/GHz Phaseshifters - Wide Band Models

Model No. (SMA)	Model No. (Type N)	Freq GHz	Min Phase Adjust	I.L. dB max	VSWR Max
P1102	P2102	**DC - 1.0**	360°/GHz	0.5	1.3
P1103	P2103	**DC - 2.5**	360°/GHz	0.8	1.3

Motor Drive Option available for remote applications - click here for Outline Drawing

Note: **0 - 360°/GHz Models** achieve 360° minimum of phase shift @ 1GHz, actual phase shift varies linearly, corresponding to the Frequency unit is operating at.
Example:
If operated @ 2GHz, the unit can achieve 720° phase shift min.

Use the "Phase Shift with Frequency" chart above for quick reference.

Motor Driven Phaseshifters

PDF Data Sheet

- ATM's motor driven phase shifters utilize DC motors with integrated, long life gear reductions ideal for High Reliability applications.
- The unit will operate with a set DC voltage between 18-30VDC, commonly found in most systems or by a separate DC power supply. Motor speed will vary based on Voltage used. Maximum running current is 250mA & 600mA max starting.
- To prevent motor damage, Micro switches are used to stop the motor at the minimum and maximum travel positions
- Units are provided with 9 pin D Sub Male connectors allowing for control voltage, end point indication if desired and follower potentiometer. See connector pin-out.
- These devices are best controlled by an external Double-Pole/Double-Throw (DPDT) switch or ATM optional control module.
- Any one of ATM's Phase Shifters can be mounted to a motor drive.

MOTOR SPEED / RESPONSE TIME			
ATM MODEL #	DEG/GHz	CASE LENGTH	* SPEED/TIME
P140/P240	30°	3.75"	30 sec.
P150/P250	60°	5.50"	14 sec.
P160/P260	90°	7.0"	20 sec.
P1210/P2210	180°	12.0"	40 sec.
P1100/P2100	360°	24.0"	30 sec.

- * SPEED/TIME is the approximate time to drive the phaseshifter from min to max. for given model.

- For Motor Drive Option add **-28** to *any* of the 30°, 60°, 90°, 180° or 360° phase shifters. *Example:* **P1604 = P1604-28**

The above photograph shows a P150 phase shifter mounted to a motor drive

Motor Drive Outline Drawings: 30°, 60°, 90°, 180°, 360°

Motor Characteristics:

1. Motor Control Voltage

Pins 2 and 7 of the nine pin D Sub male connector will have fixed DC voltage

Motor Pin-Out

between 18-30 volts applied. To increase pin 2 is + and pin 7 is -. To reverse the direction 2 is - and 7 is +. In both directions a stop is provided by means of Micro switches.

2. End Point Indicator *

The switch is also used to provide end point indication by means of pins 1 and 6 developing a voltage when the device has reached the maximum limit, (for 2+ and 7-). Pins will 3 and 8 will develop a voltage when a minimum limit is met. (for 2- and 7+). The developing voltage is equal to supply voltage used.

3. Follower Potentiometer **

A 10K Pot with an output proportional to the position of the motor drive mechanism is available at pins 4, 5, and 9.

Pin #	Function
+ 2	Increase Phase
- 7	
- 2	Decrease Phase
+ 7	
+ 1	* End Point Indicator (Max. Phase)
6	
- 3	* End Point Indicator (Min. Phase)
8	
** 10K Follower Potentiometer	
4	Pot End Points
9	
5	Wiper

Atm Optional Control Module:

An External Drive Module part number MCM-001 shown at right, is available for the motor drive as an optional accessory. It includes:

1. Crisp tactile switches to control drive.
2. Max/Min position indicator lights.
3. Follower potentiometer terminals.
4. Self-switching power supply with input of 120 VAC - 240VAC.*
5. 6 Ft, 9 pin cable to interconnect the control box to the motor driven device.

*If supplied power source is not used, an input of 18-30 VDC through the 9 pin connector may be substituted.