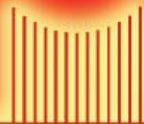


Electronically Controlled Phase Shifter DC to 18 GHz

*Phase easily adjusted by your PC,
Software will be supplied with the unit.*



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when Quality is needed

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CCPhaseShifterE1

Phase Adjusters - Computer Controlled

INTRODUCTION: The computer controlled Phase Adjusters are subsystems, using one or more phase adjusters, allowing the adjustment of the electrical separation between components in increments and cycles, set by individual software, as needed in the project or the test station. Normally, a PC is used to design, drive and control the software, interfacing with driver circuits, operating stepper motor drives, providing a precision mechanical movement for smooth and accurate adjustment over the entire frequency range of the Phase Adjusters.

Practically any of the mechanical Phase Adjusters, shown in this section, can be used and built into subsystems using computer controlled circuits, sometimes with redesigned or modified mechanical or electrical configuration.

PHASE ADJUSTMENT: The Phase Adjustment depends on the increments and lengths changes as set by the software and the mechanical properties of the phase devices used in the subsystem.

FREQUENCY RANGE: The frequency range of the subsystem depends on the frequency range of the Phase Adjusters. They are available for different frequency ranges, DC-2.0 GHz, DC-12.4 GHz, DC-18.0 GHz, DC-26.5 GHz, DC-40.0 GHz, D*C-50.0 GHz, and DC-63 GHz. For economical reasons the components have been engineered for these different frequency bands. A rather simple design will meet all the requirements at lower frequency ranges, while usually only a most precise and sometimes also most complicated design needs to be used at higher frequencies. For special requirements, standard units may be redesigned, or components engineered exactly to the customer's needs can be offered.

CONNECTOR CONFIGURATION: Most of the Phase Adjusters of Spectrum Elektrotechnik GmbH are available with different connector configurations, providing that the frequency range of the connectors do not limit the frequency range of the application. 7mm, N, SMA and TNC connectors can be used to 18.0 GHz, 3.5mm connectors to 26.5 GHz, or respectively to 35.0 GHz, K* connectors to 40.0 GHz, 2.4mm connectors to 50.0 GHz, and 1.85 mm connectors to 63 GHz. For the subsystem, almost any connector configuration will be possible, as the subsystem in general will be a custom design anyway. Therefore subsystems could also be supplied with BNC, C, HN, SC or any other connector configuration, assuming that the connectors are still manufactured by Spectrum Elektrotechnik GmbH or are at least available from other sources in the configuration needed.

POWER: Phase Adjusters are usually designed for low or moderate power applications. For higher power systems units as specials can be supplied, engineered exactly to the customer's needs.

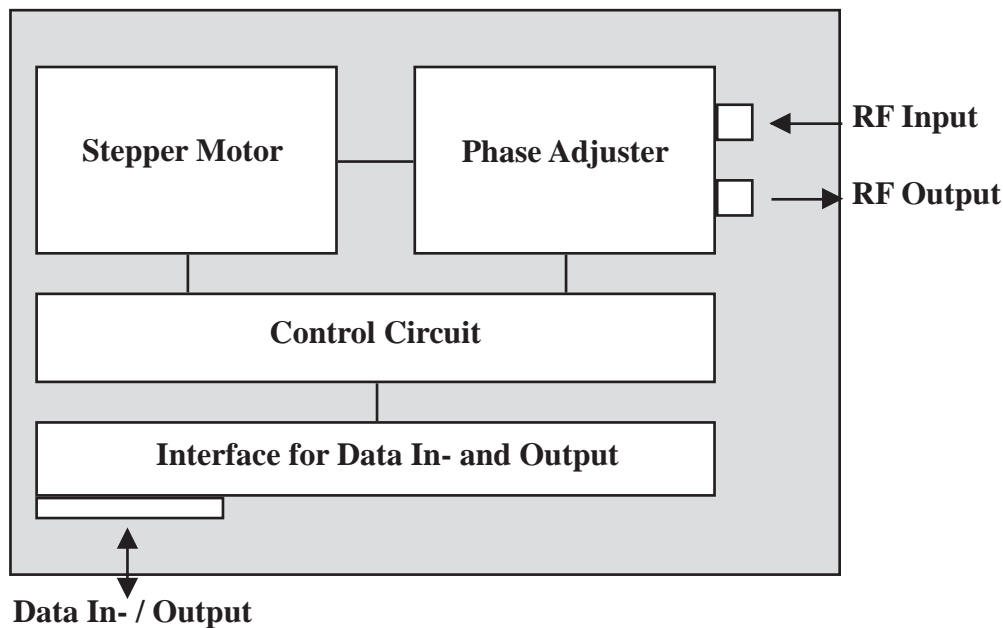
VSWR: Every microwave component shows reflections and discontinuities within the circuit, as no design can be perfect, and manufacturing tolerances unfortunately do not allow theoretical results. VSWR is the ratio of the reflected signal and the incident signal. Phase Shifters are usually using a high number of parts. Therefore the tolerances on the dimensions of the piece parts need to be as tight as possible, not only for mechanical purposes, but also for electrical reasons, in order to assure that reflections cannot build up or increase after some time of operation.

Phase Adjusters - Computer Controlled

Custom Units: Computer controlled Phase Adjusters are mainly custom made subsystems, designed and manufactured to the customer's needs, exactly to his specification. Spectrum Elektrotechnik GmbH is a very innovative Company. It employs a strong and successful team of experienced engineers who always do their best to propose something that will perfectly fit the customer's needs.

Life: The life expectancy of the subsystem will depend in the first place on the operating environment versus unit design. Secondly, it will depend on the lifetime of the ball bearings, seals, and contact junctions, and of the lifetime of the stepper motor drives itself. Other parameters that are limiting life, are rotational speed, and external mechanical loading, or pressurizing the unit. Harsh environment, subjecting the component to vibrations, shock, extremely low or high temperatures, humidity, etc. may further shorten the lifetime as well. It is therefore of utmost importance to identify in detail the environment in which the device is supposed to operate .

Applications: Computer controlled Phase Adjusters are needed in test stations for accurate and repeatable testing where the adjustment of the phase has to be repeated for many times, either in steps, or in cycles, as defined in a program. Subsystems usually work in a lab environment.

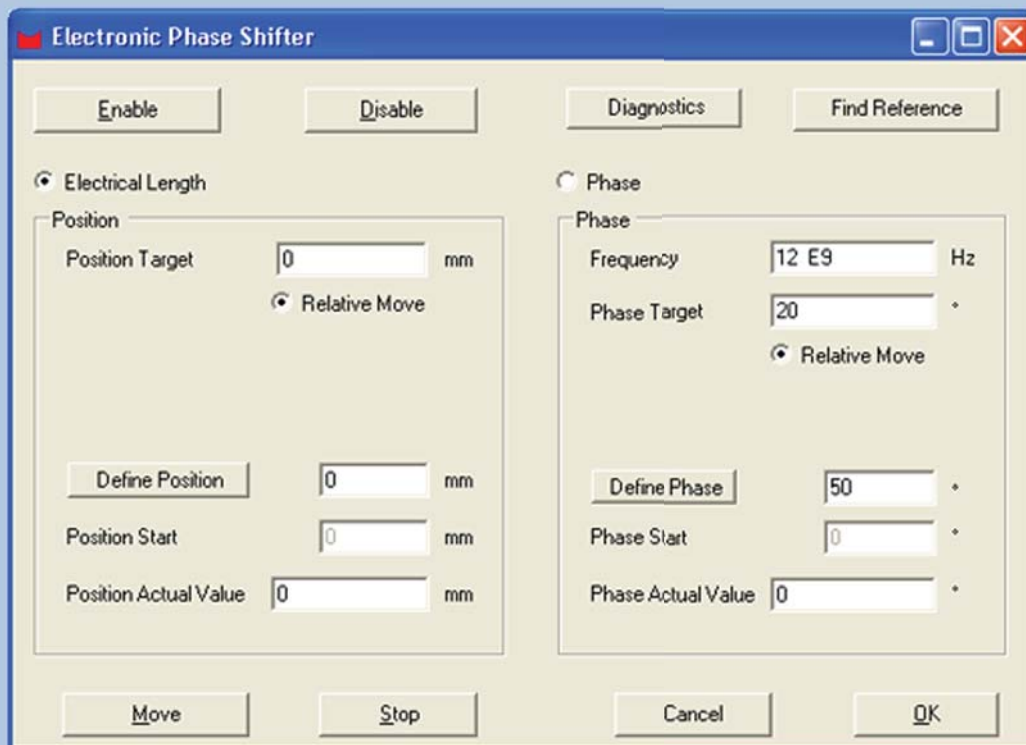


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Specifications:

Frequency Range: DC to 18 GHz
Phase adjustable range: 700° at 18 GHz
Delay Time min.: ~400ps@18GHz
Delay Time max.: ~510ps@18GHz
Step Size (Resolution): ~0.2ps
Setting Time (relatively 0 ps to 110ps at 1ps step) : less than 30 seconds
Repeatability : less than 0.1 ps when moving in the same direction
Insertion Loss max.: 1dB@18GHz
Return Loss : -14dB@18GHz
Life Time: tbd
Operating Temperature : 0°C to +55°C
Storage Temperature : 0°C to +55°C
RF input/output connectors: SMA fem., other connector styles on request
Interface: RS232
Supply Voltage: 12V



PhaseAdjusterDC-18

Outline Drawing

Dimensions are in mm

