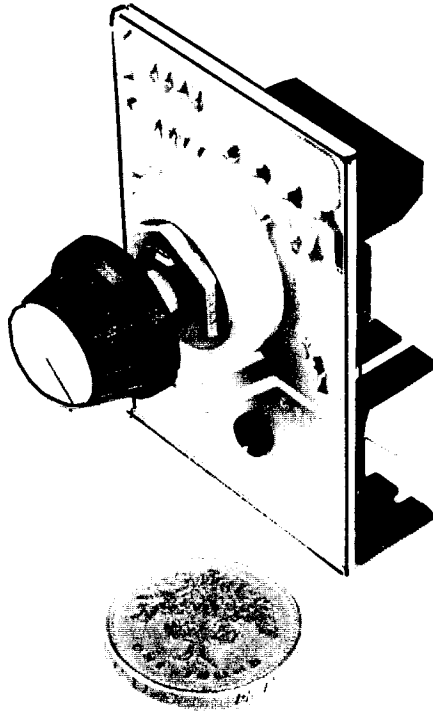


**Panel Mounted Variable Speed Voltage Regulator.**



## Features

- \* **Panel Mounted with external control knob.**
- \* **Allows infinitely variable R.P.M. to be set on MFA/Como Drills. 919D, 927D, 918D (12v), 940D, 941D & 950D series gearboxes and motors.**
- \* **Operates from inputs of 6-15 volt.**
- \* **Output 0 - input voltage.**
- \* **Pulse width modulated provides torque maintenance and proportional output control.**
- \* **Small - compact - robust construction for versatility and reliable service.**

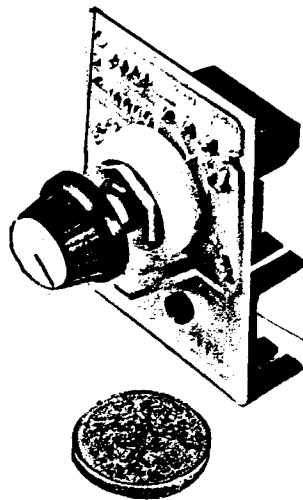
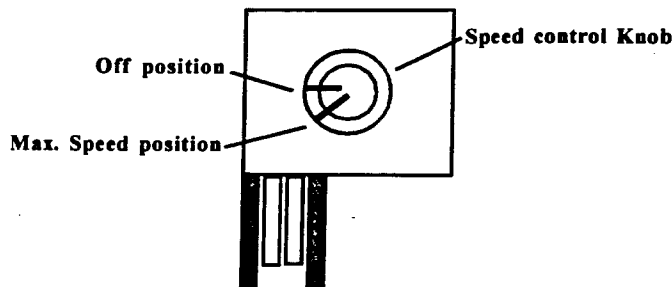
### Specification:

Min Input	6 volts	Dims 62mm x 41mm x 4mm (incl knob)
Max Input	15 volts	Weight 32 gms approx
Min Output	0 volts	
Max Output	3 amps	
Loading	3 amps continuous	
	5 amps peak only	

## PANEL MOUNTED VARIABLE VOLTAGE REGULATOR Part No. 919D2P

### INSTRUCTIONS

- (1) Drill 9.5mm hole in panel face to accommodate potentiometer shaft. Prepare suitable input and output leads with the appropriate connectors, noting that both input and output leads should be trimmed to 21cm to comply with EMC regulations.
- (2) Connect input and output leads as indicated on the rear of the unit (noting polarity). Remove knob, nut and metal washer, leaving the nylon spacer to act as an insulator. Insert spindle through the hole in the panel and re-assemble shaft components in reverse order. Turn speed control knob to full LHS Horizontal position (off position: see below).
- (3) Connect output leads to the appliance observing polarity. Connect the input leads to the power supply observing correct polarity, (either battery or full wave rectified transformer unit), and operate speed control as desired.
- (4) The unit has polarity protection and will not function if not connected correctly. It is designed to run at max 3 amps with a 5 amp peak current. In order to avoid overloading the unit, it is recommended that the positive input lead is fitted with a 3 amp fuse.



#### Features

- *Panel Mounted with external control knob.*
- *Allows infinitely variable R.P.M. to be set on MFA/Como Drills. 919D series gearboxes and motors.*
- *Operates from inputs of 6-15 volt.*
- *Output 0 - input voltage.*
- *Pulse width modulated provides torque maintenance and proportional output control.*
- *Small - compact - robust construction for versatility and reliable service.*

#### Specification:

Min Input	6 volts	Dims 62mm x 41mm
Max Input	15 volts	Weight 32 gms approx
Min Output	0 volts	
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Loading	3 amps continuous	
	5 amps peak only	

Test Name	EMC/2.1.1/MFA/
Date	22-02-1996
Unit under test	919D SAMPLE3+ 919D2 S1 SET 10.5V
Operators name	I.BUCKLE
Run number	1
Start frequency	30 MHz
Stop frequency	300 MHz
Pre-amplifier	on
Test limits	EN55013TVLF EN55014
Detector type	Q-peak

300 MHz

EMC/2.1.1/MFA/ 22-02-1996

300 MHz

EN55013 TVLF



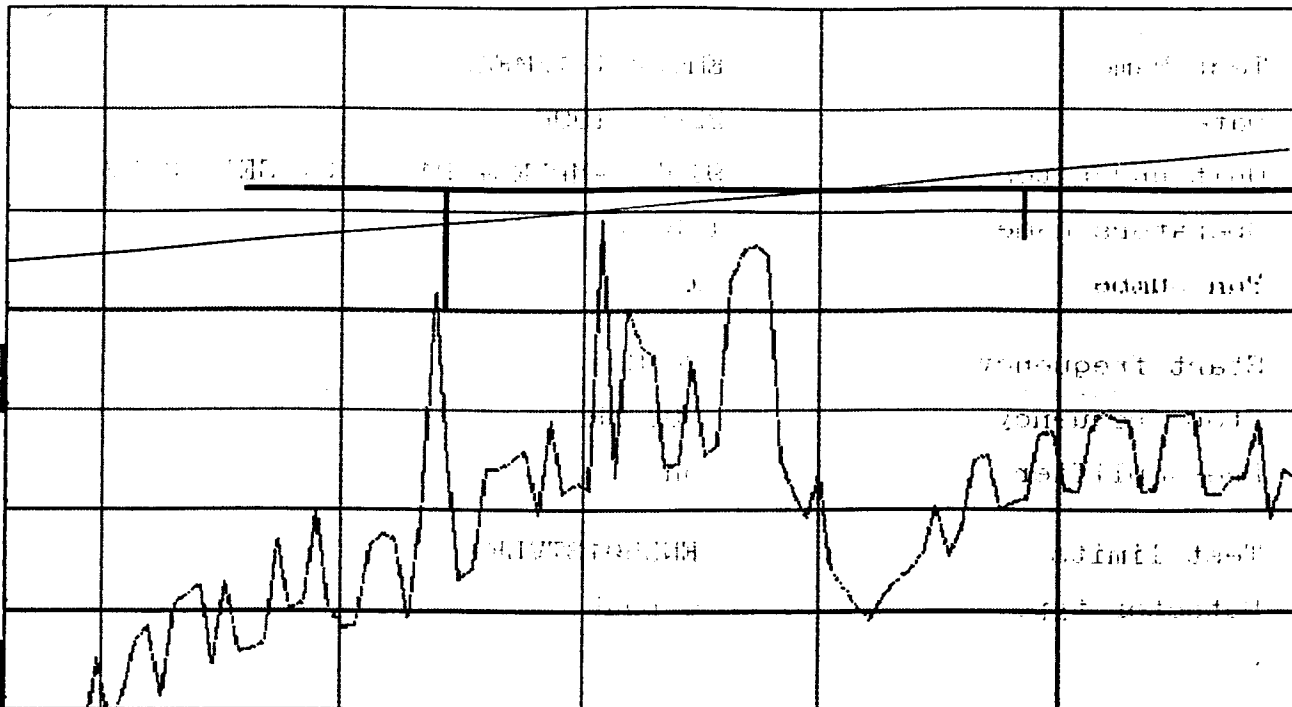
Start

Stop

Left

Right

Scale



30 MHz

EMC/2.1.1/MFA/ Date 22-02-1996

300 MHz

0 dBuV/m



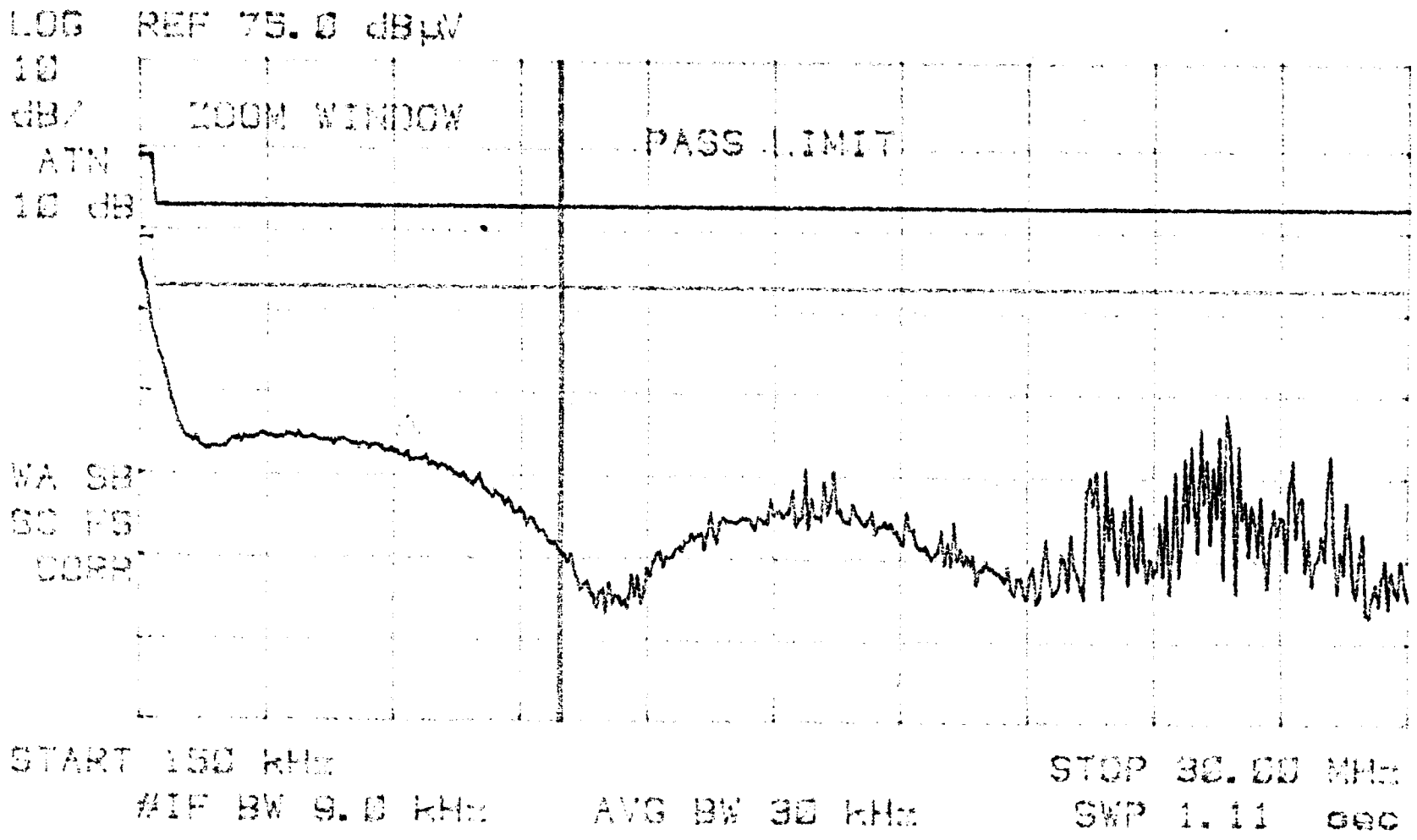
Conducted Emission 919D Gearbox with variable regulator.  
 Gearbox suppressed with 0.22 $\mu$ F  
 o/p of PWM Regulator has 1 $\mu$ F 16V tantalum bead  
 capacitor across it.

14:07:50 FEB 16, 1988

MARKER  
 6.42 MHz  
 27.39 dB $\mu$ V

ACTV DET: PEAK  
 MEAS DET: PEAK QP AVG  
 MKR 6.42 MHz  
 27.39 dB $\mu$ V

Regulator adjusted to  
 give maximum noise  
 o/p on peak measurement  
 $\approx$  9.9V average  
 measured at motor.



\* For info on modified  
 limits see data for  
 Marlin Motor.

Peak at 150kHz examined  
 using QPD.

QPD scans of near  
 peak all show < avg  
 limit.

## Summary of Results for 919D Motor and 919D2 regulator

The tests were carried out on 5 samples of the 919D Gearbox and 3 samples of the 919D2 variable regulator. The power input was a 12v Lead Acid Battery (Voltages are noted where appropriate).

The following conditions prevailed for all measurements

The 919D gearbox has a 0.22F $\mu$ F capacitor across the motor windings.

The 919D2 regulator has 1 $\mu$ F 16v Tantalum bead capacitor across the output pads. Both the input and output wires on the regulator assembly are reduced to 21cm.

### Results

Conducted Emissions	919D Motor	Peak and QP plots provided
“ “	919D Motor + 919D2 set for maximum conducted emission level	Peak and QP plots provided
Radiated Emissions	919D Motor	QP plots for all 5 sample motors provided. Note 1 & 2
	919D Motor + 919D2	QP plots for all 3 samples with 1 motor and 2 samples with a second motor. Note 2 & 3

Note 1: It will be noticed that there is a general trend in the plots which rises in the 160 - 180 MHz region. This is a known aberration in the measurement cabinet response. Under normal circumstances this is not a concern as the aberration makes the result closer to the limit (i.e. it will not make a bad result look good!). Also in order to become evident the response required significant excitation. Due to the broad band nature of the noise generated by the motor, the Quasi-peak measurement indicates a significant output in this region. Levels measured in this frequency span will be significantly reduced if the response were normalised. Thus peaks on the 919D motor curve which appear 'close' to the limit are in fact well within the specified levels.

Note 2: The situation described in Note 1 (above) is exacerbated by three known transmitter sources. One at 165 MHz is a local PMR transmitter. The second at 173 MHz is RF development at the test site. The third is a local supermarket paging system at 180 MHz

Note 3: It will be noticed that the general trend evident in the motor plots is less prominent here. This is due to the suppression of the broadband noise by the presence of the regulator.

0.22  $\mu$ F CAPACITOR FITTED