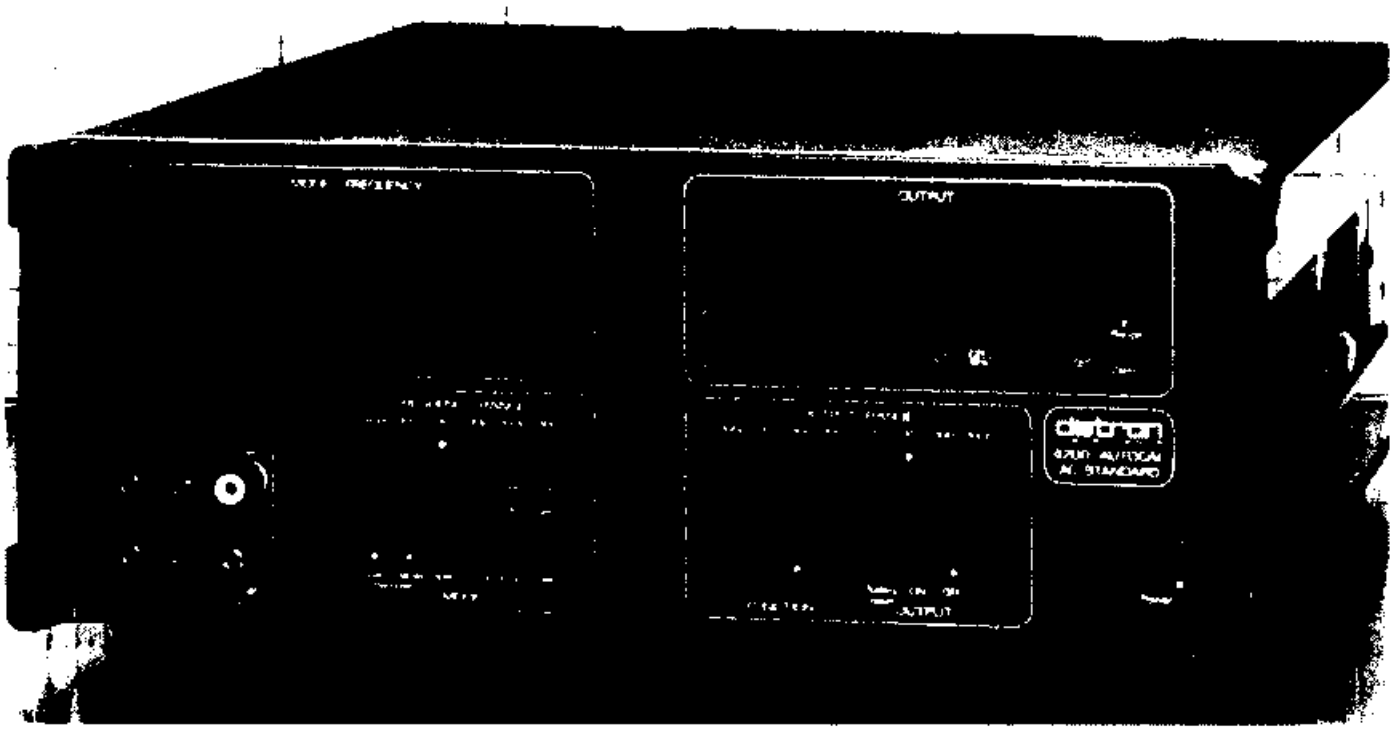
SECTION 1 THE DATRON 4200 AC AUTOCAL STANDARD



General View of Datron 4200 Autocal AC Standard

Introduction

The Datron 4200 Autocal AC Standard is a high-precision AC calibrator which features exceptionally high stability and full systems capability. It is characterized by a wide-range coverage of AC Voltage and AC Current functions in a single unit.

The 4200 incorporates a reference module containing precision temperature-compensation elements, maintaining a high accuracy specification over the ambient temperature range of 23°C ± 5°C. A high level of stability is achieved by use of super-selected reference components and ultra-stable gain-defining resistors. The 'Autocal' feature ensures that its 24-hour specifications are usable; not merely figures of merit.

The 4200 uses a microprocessor for control management, simplifying its use in complex manual operations, such as calibration of high-quality digital multimeters. The IEEE 488 interface provides a comprehensive remote programming capability, allowing programmed calibration of the 4200 itself.

Standard Facilities

AC Voltage Ranges

The basic instrument provides AC Voltage calibration facilities in seven decade ranges from 1mV to 1000V. 100% overrange is available on all but the 1000V Range (see Section 3 page 3-6).

Resolution and Accuracy

The resolution is 6½ digits (100nV, 100pA), with a unique facility for displaying the specified accuracy of any output voltage. The 4200 specifications are in Section 6.

Frequency
The output frequency of the 4200 extends from 10Hz to 1MHz in five overlapping decade ranges, at a resolution of 1% of nominal Frequency Range. Any five frequency values within the range of the instrument can be stored in volatile memory. For higher accuracy, five 'Spot Calibrated' frequency values per Output Range can be recalled from non-volatile memory storage.

Autocal
All Datron AUTOCAL instruments are designed to make the removal of the covers for calibration unnecessary, as full routine calibration of all ranges and functions can be carried out from the front panel or over the IEEE-488 bus.

Accidental or unauthorised use of the calibration routine is prevented by a key-operated switch on the instrument rear panel. The procedure for calibrating this instrument is contained in Section 8.

Output Deviation
A user may deviate the output voltage from the output display value by introducing a gain 'Error' within the range ±9.9999%.

Remote Sense
The specified output voltage may be sensed at the load, using 4-wire connections. Remote or Local Sense is selectable from the front panel.

Remote Guard
This facility allows the instrument's internal guard shields to be externally connected.

Self-test
On power-up, the internal calibration memory is automatically checked. At any time when the output is off, a user may conduct a sequenced test of the displays, keyboard, safety circuitry and Safety Reset function.

Message Readout
Messages to the user are presented on the MODE display;
The two main groups are:

Fail
An internal fault condition has been detected.

Error
A user has selected a task which is outside the instrument's capability.

Systems Use
The instrument can form part of a system by means of the IEEE 488 standard digital interface. The method of connecting to the system controller and the command codes are described in Section 5.

SAFETY

For protection of the user, safety trip circuits are incorporated to switch the OUTPUT OFF, in the event of instrument failures which might generate dangerous output voltages.

UNDER NO CIRCUMSTANCES SHOULD USERS TOUCH ANY OF THE OUTPUT, SENSE OR GUARD TERMINALS UNLESS THEY ARE FIRST SATISFIED THAT NO DANGEROUS VOLTAGE IS PRESENT.