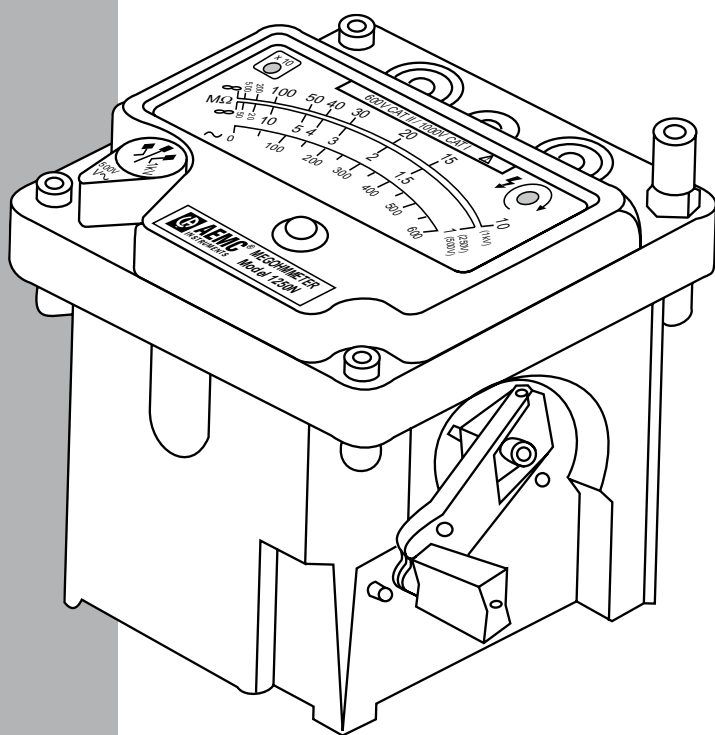


■ MEGOHMMETER

1210N

1250N



ENGLISH

User Manual

 **AEMC**[®]
INSTRUMENTS

Statement of Compliance

Chauvin Arnoux®, Inc. d.b.a. AEMC® Instruments certifies that this instrument has been calibrated using standards and instruments traceable to international standards.

We guarantee that at the time of shipping your instrument has met its published specifications.

An NIST traceable certificate may be requested at the time of purchase, or obtained by returning the instrument to our repair and calibration facility, for a nominal charge.

The recommended calibration interval for this instrument is 12 months and begins on the date of receipt by the customer. For recalibration, please use our calibration services. Refer to our repair and calibration section at www.aemc.com.

Serial #: _____

Catalog #: 1326.01 / 1326.02

Model #: 1210 / 1250

Please fill in the appropriate date as indicated:

Date Received: _____

Date Calibration Due: _____



AEMC®
INSTRUMENTS

Chauvin Arnoux®, Inc.
d.b.a AEMC® Instruments
www.aemc.com

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INTRODUCTION



These safety warnings are provided to ensure the safety of personnel and proper operation of the instrument.

- Read the instruction manual completely and follow all safety information before operating this instrument.
- Safety is the responsibility of the operator!
- Tests are to be carried out only on dead circuits! Check for live circuits before making resistance measurements (safety check).
- The Megohmmeter Models 1210N/1250N are sources of high voltage, as is the sample connected to them. All persons performing or assisting in the tests must employ all safety precautions to prevent electrical shock to themselves and to others.
- AEMC® Instruments considers the use of rubber gloves to be an excellent safety practice even if the equipment is properly operated and correctly grounded.
- When testing capacitance samples, make sure that they have been properly discharged and that they are safe to touch. Dielectric insulation samples should be short-circuited for at least five times the amount of time they were energized.
- Use the leads supplied with the megohmmeter. If defective or used, replace before testing.

1.1 International Electrical Symbols



This symbol signifies that the instrument is protected by double or reinforced insulation. Use only specified replacement parts when servicing the instrument.



This symbol on the instrument indicates a WARNING and that the operator must refer to the user manual for instructions before operating the instrument. In this manual, the symbol preceding instructions indicates that if the instructions are not followed, bodily injury, installation/sample and product damage may result.



Risk of electric shock. The voltage at the parts marked with this symbol may be dangerous.

PRODUCT FEATURES

2.1 Description

The AEMC® Models 1210N and 1250N are compact, self-contained hand-cranked megohmmeters. They are practical and dependable instruments designed for a broad range of plant and field service applications, such as acceptance testing and preventive maintenance of wiring, cables, switchgear, and motors. The easy hand-cranked operation provides a steady rectified DC voltage output across the entire range for consistently reliable readings.

These megohmmeters incorporate a built-in, sealed alternator and a constant DC voltage circuit to provide a stable output and give direct insulation resistance reading.

They are ruggedly built and use an O-ring-sealed, cast aluminum case with a polycarbonate front panel designed for harsh, heavy-duty use and protection against dust and water.

The Models 1210N/1250N have a unique auto-ranging feature which expands the scale by x10 and almost doubles the scale length. When the pointer reaches near the end of scale, the auto-ranging feature activates, returning the pointer to the beginning of the scale with the x10 red LED indicator on.

Insulation resistance is indicated with a rugged taut-band meter movement on a logarithmic scale. The indicator scale is easy to read.

SPECIFICATIONS

3.1 Model 1210N Specifications

3.1.1 Electrical Specifications

INSULATION TESTS

DC Test Voltage: 500V

(test voltage generated in full across the entire measurement range)

Megohm Range (Auto-ranging): 0.5 to 5.5M Ω ; 5.5 to 200M Ω

Short Circuit Current: 5mA (max)

Accuracy: 2.5% of full scale length

Charging Time: 0.5 s/ μ F

Discharging Time (Auto): 5 s/ μ F

RESISTANCE TESTS

DC Test Current: 1mA constant, 600V max

Kilohm Range (Auto-ranging): 0 to 45k Ω ; 45 to 500k Ω

Accuracy: 2.5% full scale length

Charging Time: 0.5 s/ μ F

Discharging Time (Auto): 5 s/ μ F

CONTINUITY TESTS

DC Test Current: 5mA constant, 10V max

Ohm Range (Auto-ranging): 0 to 9 Ω ; 9 to 100 Ω

Accuracy: 2% of full scale length

Fuse Protection: 0.2A, 250V, fast-blow, 5x20mm

VOLTAGE TESTS (Safety Check):

Voltage Range: 0 to 600VAC

Frequency: 45 to 450Hz

Accuracy: 3% of full scale

Input Impedance: 100k Ω (approx)

3.1.2 Mechanical Specifications

Test Voltage Indicator:

Amber LED indicates proper test voltage and crank speed

Scale: Direct readings on all ranges; 3" (76mm), black on white

Autorange Indicator:

Red LED indicates Auto-range; multiply resistance readings x 10

Power Supply:

Hand-cranked, heavy duty brushless alternator and solid state rectification and amplification for stable voltage; test voltage reached at 140 rpm (approx)

Dielectric Test: 2000V 50/60 Hz, between (-), (+), and ground terminals

Meter Movement: Rugged taut band suspension

Dimensions: 4.7 x 4.7 x 5.1" (120 x 120 x 130mm)

Weight: 3.3 lbs (1.5 kg)

Temperature Range:

Reference range: 64 to 75°F (18 to 24°C), 30-50% RH

Operating range: 14 to 122°F (-10 to 50°C), 0-80% RH

Storage range: -4 to 176°F (-20 to 80°C), 0-90% RH

Case:

Cast aluminum alloy case and lid painted safety yellow, with heavy duty gray polycarbonate front panel; O-ring seal between front panel and case; sealed against water and dust; folding crank

Terminals:

"+" Line (red); "-" earth (black); accepts standard 4mm safety banana plugs; ground accepts 4mm banana plug or spade lugs

3.1.3 Safety Specifications

Sealed: IP54 with lid, IP52 without lid

Insulation Tester: VDE 413 part 1/4 except f

Safety: IEC1010-1; 600V CAT II; 1000V CAT I

Envelope Protection: IEC529

Vibration: MIL-T-38800D

Shock: IEC51

Autorange Indicator:

Red LED indicates autorange; multiply resistance readings x 10

Dielectric Test:

2000V 50/60 Hz, between (-), (+), guard and ground terminals

Power Supply:

Hand-cranked, heavy duty brushless alternator and solid state rectification and amplification for stable voltage; test voltage reached at 140 rpm (approx)

Meter Movement: Rugged taut band suspension

Dimensions: 4.7 x 4.7 x 5.1" (120 x 120 x 130mm)

Weight: 3.3 lbs (1.5 kg)

Temperature Range:

Reference range: 64 to 75°F (18 to 24°C), 30-50% RH

Operating range: 14 to 122°F (-10 to 50°C), 0-80% RH

Storage range: -4 to 176°F (-20 to 80°C), 0-90% RH

Case:

Cast aluminum alloy case and lid painted safety yellow, with heavy duty gray polycarbonate front panel; O-ring seal between front panel and case; sealed against water and dust; folding crank

Terminals:

"+" Line (red); "-" earth (black); "G" guard (blue); accepts safety 4mm banana plugs; ground accepts 4mm banana plugs or spade lug

3.2.3 Safety Specifications

Sealed: IP54 with lid, IP52 without lid

Insulation Tester: VDE 413 part 1/4 except f

Safety: IEC1010-1; 600V CAT II; 1000V CAT I

Envelope Protection: IEC529

Vibration: MIL-T-38800D

Shock: IEC51

**All specifications are subject to change without notice*

Figures 4 and 5 show the connections for testing insulation from a supply conductor to ground (motor frame).

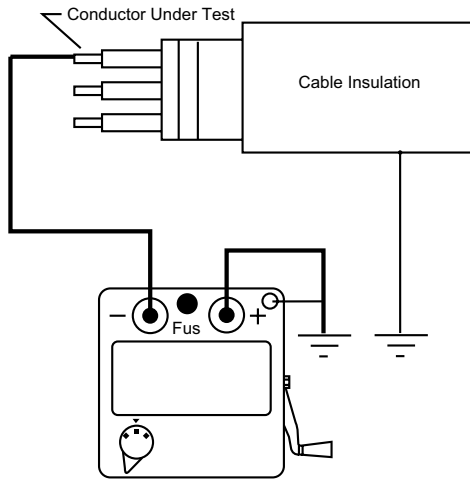


Figure 4

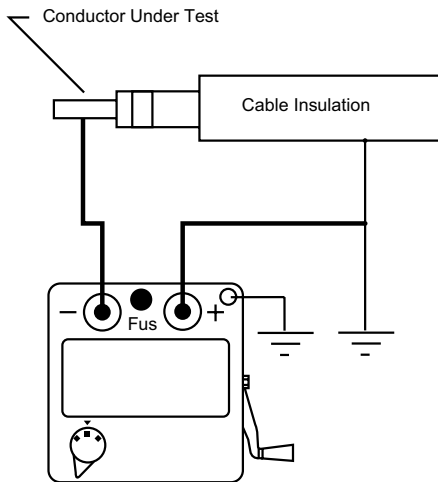


Figure 5

Figure 6 shows the connections to a transformer (lighting or distribution). Make sure that the switches and/or circuit breakers on both sides are open. Check the high voltage winding to ground, low voltage to ground, and the resistance between them with no winding ground.

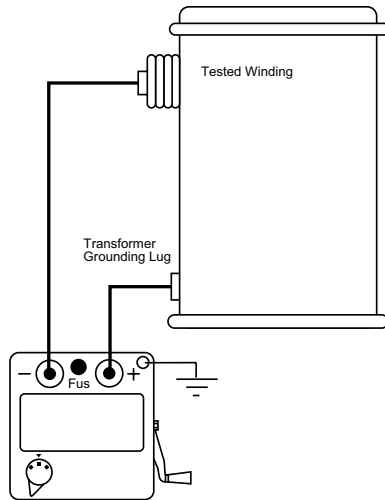


Figure 6

Figure 7 shows the connections for measuring the insulation of a three-phase line to ground by connecting the jumpers between phases. This gives a reading of all conductors at once. If a load such as a motor, heater, etc., is attached to the other end of the line, it will read the load resistance to ground at the same time. By removing the jumpers, readings can be made between the individual conductors and ground.

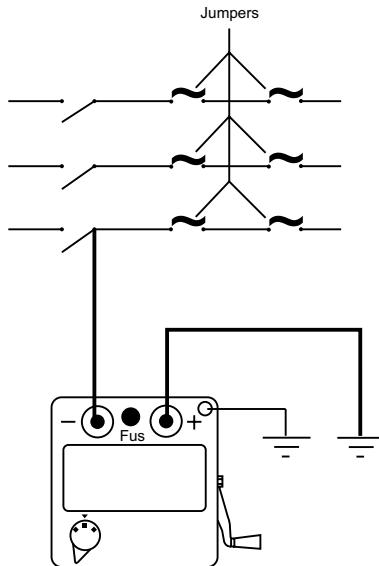


Figure 7

4.1.7 Insulation Resistance Measurements on Motors

Figure 8 shows reading the resistance to ground of a three-phase motor winding. Since the three-phase motors are internally connected, it is only necessary to connect one lead to the motor lead and the other lead to the motor frame as shown.

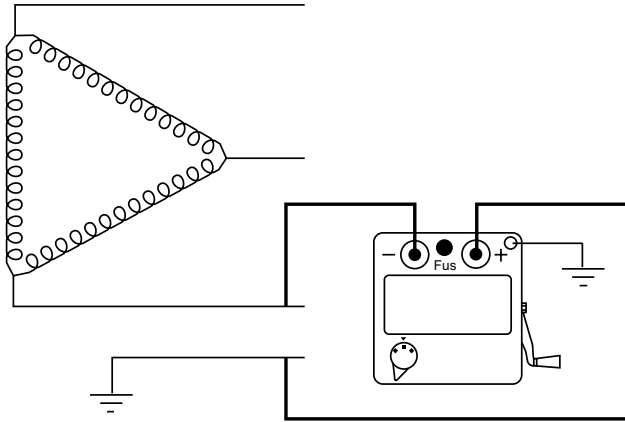


Figure 8

Figure 9 shows the windings of a three-phase motor separated. Sometimes this can be done at the lead terminals, while other times the end bells must be removed to get at the lead wires of the coils. By connecting the megohmmeter as shown, the phase insulation resistance value can now be determined. Read between phases "A" and "B", then "B" and "C", then "C" and "A".

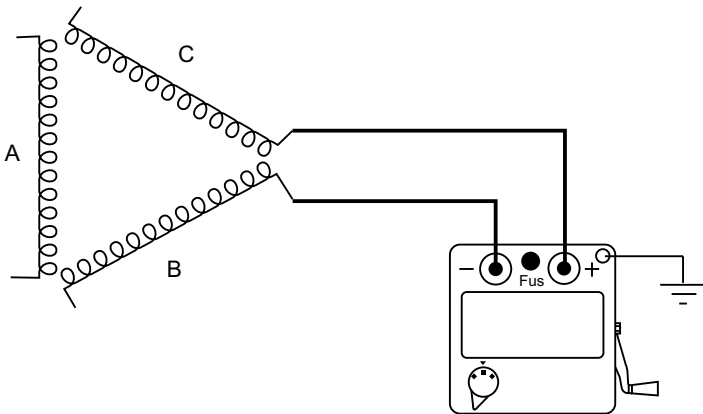


Figure 9

Figure 10 shows connections for testing insulation from a supply conductor in a switchbox to ground (motor frame). An identical test may be carried out from the motor starter.

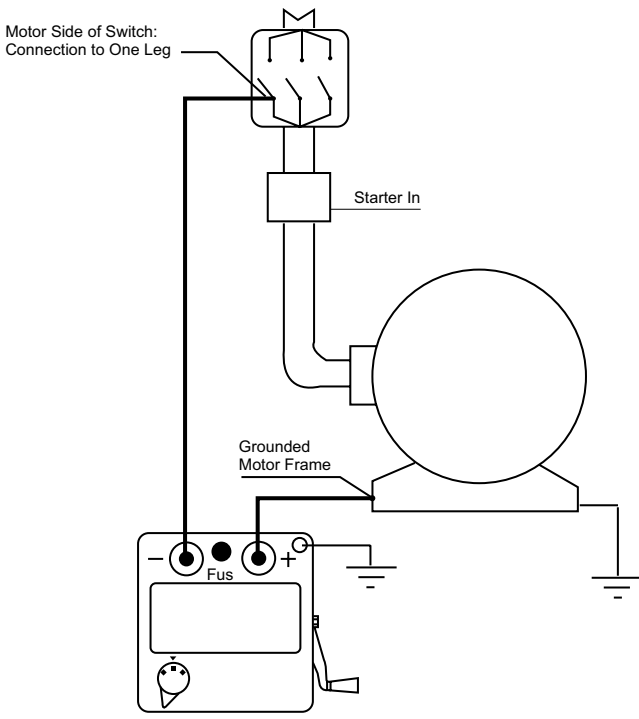


Figure 10

4.2.8 Insulation Resistance Measurements on Motors

Figure 18 shows reading the resistance to ground of a three-phase motor winding. Since the three-phase motors are internally connected, it is only necessary to connect one lead to the motor lead and the other lead to the motor frame as shown.

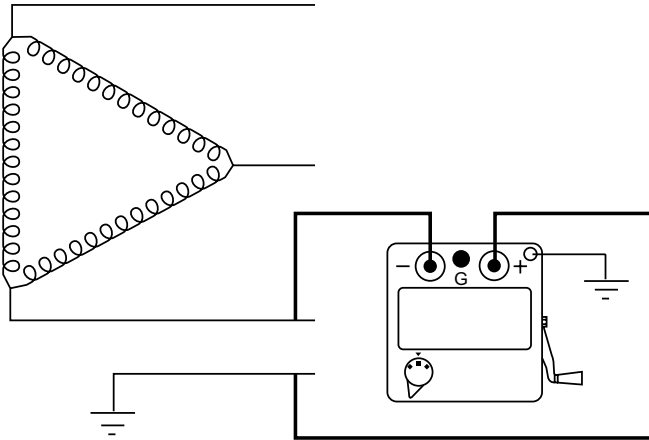


Figure 18

Figure 19 shows the windings of a three-phase motor separated. Sometimes this can be done at the lead terminals while other times the end bells must be removed to get at the lead wires of the coils. By connecting the megohmmeter as shown, the phase insulation resistance value can now be determined. Read between phases "A" and "B", then "B" and "C", then "C" and "A".

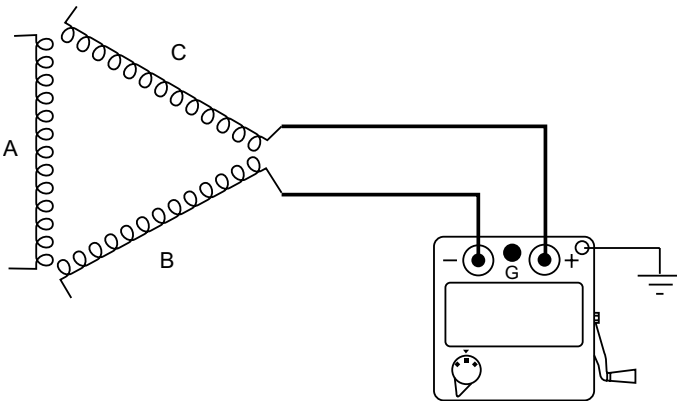


Figure 19

Figure 20 shows connections for testing insulation from a supply conductor in a switchbox to ground (motor frame). An identical test may be carried out from the motor starter.

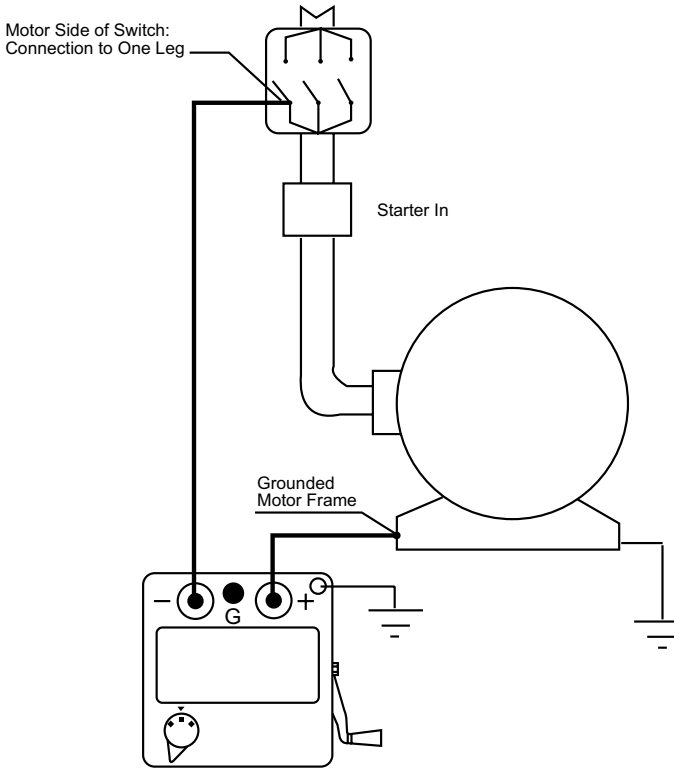


Figure 20

MAINTENANCE

5.1 Warning

- For maintenance use only original factory replacement parts.
- To avoid electrical shock, do not attempt to perform any servicing unless you are qualified to do so.
- Do not perform any service while the Megohmmeter Model 1210N/1250N is on any circuit.
- To avoid electrical shock and/or damage to the instrument, do not let water or other foreign agents into the electronic module.



Warning: If the crank speed LED is not ON during testing, the reading is not valid.

5.2 Cleaning

The megohmmeter may be gently cleaned with a soft cloth, soap and water. Dry immediately after cleaning. Avoid water penetration into the electronic module.

Make sure the megohmmeter and all leads are dry before further use.

Repair and Calibration

To ensure that your instrument meets factory specifications, we recommend that it be scheduled back to our factory Service Center at one-year intervals for recalibration, or as required by other standards or internal procedures.

For instrument repair and calibration:

You must contact our Service Center for a Customer Service Authorization Number (CSA#). This will ensure that when your instrument arrives, it will be tracked and processed promptly. Please write the CSA# on the outside of the shipping container. If the instrument is returned for calibration, we need to know if you want a standard calibration, or a calibration traceable to N.I.S.T. (Includes calibration certificate plus recorded calibration data).

Ship To: Chauvin Arnoux®, Inc. d.b.a. AEMC® Instruments
15 Faraday Drive
Dover, NH 03820 USA
Phone: (800) 945-2362 (Ext. 360)
(603) 749-6434 (Ext. 360)
Fax: (603) 742-2346 or (603) 749-6309
E-mail: repair@aemc.com

(Or contact your authorized distributor)

Costs for repair, standard calibration, and calibration traceable to N.I.S.T. are available.

NOTE: You must obtain a CSA# before returning any instrument.

Technical and Sales Assistance

If you are experiencing any technical problems, or require any assistance with the proper operation or application of your instrument, please call, mail, fax or e-mail our technical support team:

Chauvin Arnoux®, Inc. d.b.a. AEMC® Instruments
200 Foxborough Boulevard
Foxborough, MA 02035 USA
Phone: (800) 343-1391
(508) 698-2115
Fax: (508) 698-2118
E-mail: techsupport@aemc.com
www.aemc.com

NOTE: Do not ship Instruments to our Foxborough, MA address.

Limited Warranty

The Models 1210N and 1250N are warranted to the owner for a period of two years from the date of original purchase against defects in manufacture. This limited warranty is given by AEMC® Instruments, not by the distributor from whom it was purchased. This warranty is void if the unit has been tampered with, abused or if the defect is related to service not performed by AEMC® Instruments.

For full and detailed warranty coverage, please read the Warranty Coverage Information, which is attached to the Warranty Registration Card (if enclosed) or is available at www.aemc.com. Please keep the Warranty Coverage Information with your records.

What AEMC® Instruments will do:

If a malfunction occurs within the warranty period, you may return the instrument to us for repair, provided we have your warranty registration information on file or a proof of purchase. AEMC® Instruments will, at its option, repair or replace the faulty material.

**REGISTER ONLINE AT:
www.aemc.com**

Warranty Repairs

What you must do to return an Instrument for Warranty Repair:

First, request a Customer Service Authorization Number (CSA#) by phone or by fax from our Service Department (see address below), then return the instrument along with the signed CSA Form. Please write the CSA# on the outside of the shipping container. Return the instrument, postage or shipment pre-paid to:

Ship To: Chauvin Arnoux®, Inc. d.b.a. AEMC® Instruments
15 Faraday Drive • Dover, NH 03820 USA
Phone: (800) 945-2362 (Ext. 360)
(603) 749-6434 (Ext. 360)
Fax: (603) 742-2346 or (603) 749-6309
E-mail: repair@aemc.com

Caution: To protect yourself against in-transit loss, we recommend you insure your returned material.

NOTE: You must obtain a CSA# before returning any instrument.



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