

CROSS BAR CURRENT DISTRIBUTION CONTROL CANE – LIGHT CCRA

INSTRUCTION MANUAL

- REV 0 -



ELECTRONIQUE INDUSTRIELLE

ZI François Horteur - 73660 SAINT REMY DE MAURIENNE - FRANCE

Tel : (33) 4 79 64 14 44 - Fax : (33) 4 79 64 47 97

E-mail : info@serem-electronics.com

CONTENTS

CROSS BAR CURRENT DISTRIBUTION CONTROL DEVICE

- Page 2: Function
Composition of the device
Remarks concerning use

CROSS BAR CURRENT DISTRIBUTION CONTROL CANE (CCRA)

- Page 3: Characteristics of the CCRA
Page 4: Presentation of the CCRA

INDICATOR FOR CROSS BAR CURRENT DISTRIBUTION CONTROL CANE (IN-CCRC)

- Page 5: Characteristics of the IN-CCRC
Page 6: Presentation of the IN-CCRC

TEST BENCH FOR CROSS BAR CURRENT DISTRIBUTION CONTROL CANE (BT-CCRC)

- Page 7: Characteristics of the BT-CCRC
Page 8: Presentation of the BT-CCRC

OPERATING PROCEDURE

- Page 9: Personnel required
Specific risks linked to operation
When should the measurement be taken?
Checking the device
 Zero adjust control
- Page 10: Full scale adjustment
- Page 11: Test on the pot
 Test operation
 Remark 1: cane position on cross bar
 Remark 2: precautions for using the device
- Page 12: ATTACHMENT 1
 Diagram describing the checking of the CCRA cane on the test bench
- Page 13: List of spare parts and accessories.

CROSS BAR CURRENT DISTRIBUTION CONTROL DEVICE

FUNCTION

This equipment can distinguish between three types of cross bar on a given pot:

- Those with rated current flowing through them
- Those with half the rated current flowing through them
- Those with no current flowing through them at all (cut bars)

COMPARAISON CCRT – CCRA

	CCRT	CCRA
Cross bar width	Adjustable 90 to130 mm	Fixed
Weight	3.4 kg	2.1 kg (-38%)
Measurement indicator	IN-CCRC	IN-CCRC
Test Bench	BT-CCRC	BT-CCRC

COMPOSITION OF THE DEVICE

The device consists of:

- A measurement probe with Hall effect sensors:
CROSS BAR CURRENT DISTRIBUTION CONTROL CANE - CCRA
- A digital-display measurement indicator:
INDICATOR FOR CROSS BAR CURRENT DISTRIBUTION CONTROL CANE - IN-CCRC
- A test bench:
TEST BENCH FOR CROSS BAR CURRENT DISTRIBUTION CONTROL CANE - BT-CCRC

REMARKS CONCERNING USE

This device is a measuring instrument; although it has been designed to withstand harsh measurement conditions (industrial context, high temperatures, measurement points accessible with difficulty, risks of electric shock), it must be handled with care.

The measurement probe (CCRA cane) is long and thin. It is made of materials that react in different ways to temperature stresses (aluminium and epoxy), so it is important to respect the following instructions:

- Avoid twisting and bending it while passing it through the grating.
- Avoid leaving the cane immobile on the cross bar for too long, since this causes it to become very hot and there is a risk of it being damaged.
- Cool the jumper (bottom part) with compressed air after having taken measurements on half a pot.

- Check the general condition of the probe frequently.

CROSS BAR CURRENT DISTRIBUTION CONTROL CANE

CCRA

MODEL: Cane – CCRA type

FUNCTION: Used in conjunction with an IN-CCRC type indicator, this cane measures the magnetic field generated by direct current flowing through a cross bar, operating from the gap between pots, through the grating.

CHARACTERISTICS:

- Nylon handle.
- Epoxy tube.
- Aluminium jumper.
- Push-pull connector for the digital indicator (IN-CCRC).
- Electrical insulation between top part and bottom part: > 5 kV.
- Instantaneous maximum temperature of use (at the bottom part): 300°C.
- Ambient temperature of use: 100°C.
- Max. thickness (tube and bottom part): 30 mm.
- Length : 2312 mm.
- Weight: ~ 2.1 kg.

Remarks:

This cane is a measuring instrument and must be handled with care.

To use it properly, it is important to respect the following instructions:

- Avoid twisting it while passing it through the grating.
- Avoid leaving the cane immobile on the cross bar for too long, since this causes it to become very hot and there is a risk of it being damaged.
- Cool it with compressed air after having taken measurements on a half-pot
- Check the general condition of the probe frequently

CROSS BAR CURRENT DISTRIBUTION CONTROL CANE CCRA

Fig 1 : Main view

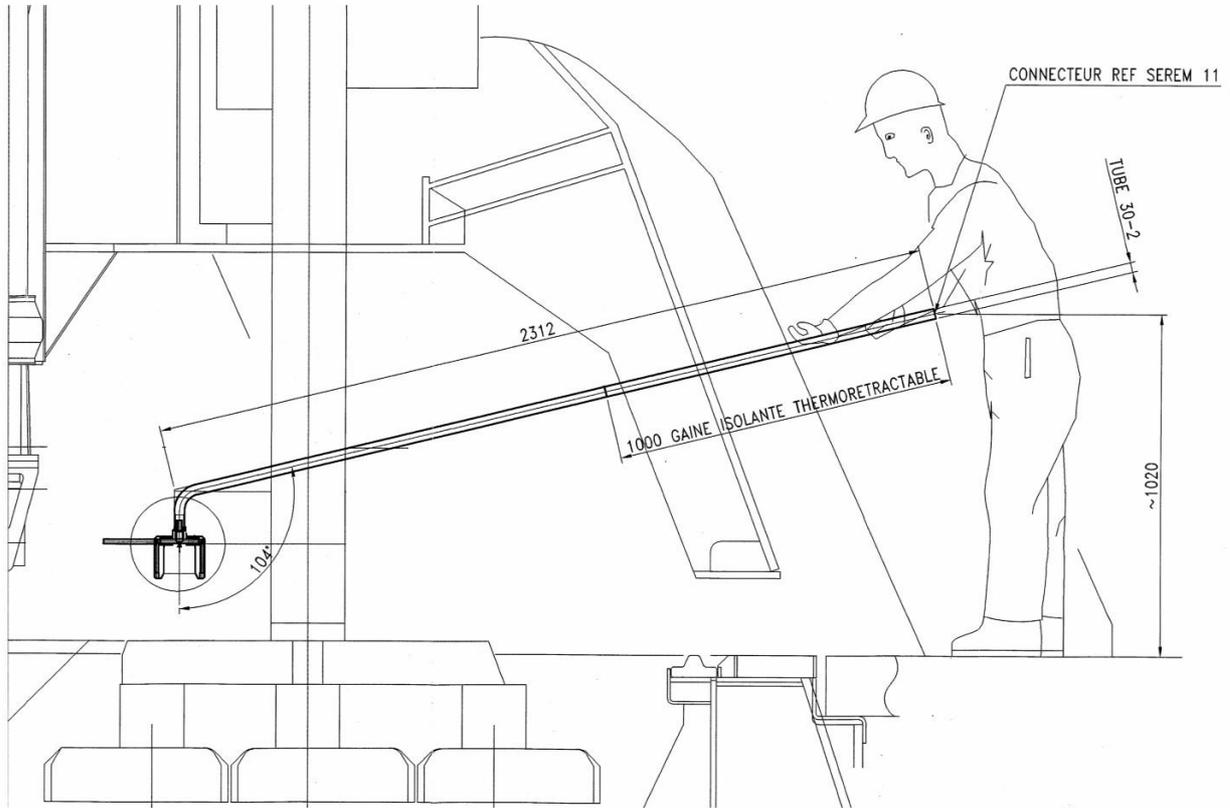
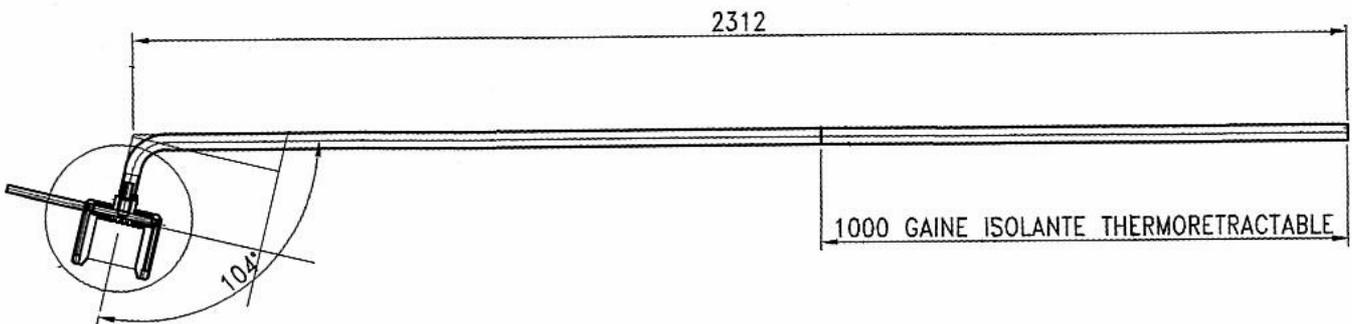


Fig 2 : Dimensions



INDICATOR FOR CROSS BAR CURRENT DISTRIBUTION CONTROL CANE IN-CCRC

MODEL: Digital indicator - IN-CCRC type

FUNCTION: Connected with a CCRA type cane, this indicator is used to control cross bar current distribution (measurement of magnetic fields up to 200 Gauss).

CHARACTERISTICS:

- Operating range: 0 to 200.0 Gauss
- Display: 3 1/2 digits, LCD, height: 14 mm, back-lighting possible
- Indicator precision: $\pm 0.1\%$
- Temperature stability: 100 ppm/°C
- Zero adjust control: by externally accessible potentiometer.
- Full scale adjustment: by externally accessible potentiometer
- Power supply: by Ni-Cd 6V/2, 4Ah storage battery, allowing over 8 hours of autonomous operation.
- Push buttons: "ON" to switch the device on (it switches off automatically)
"SIDE" to display the "Long Side" or "Short Side" measurement
- Operation indicators: red light-emitting diodes.
- Unit: black ABS, with carrying strap
- Dimensions: (H x W x D): 75 x 148 x 195
- Weight: 1 kg
- Accessories supplied with the IN-CCRC:
 - 1 IN/CCRC connector cable (0.3 kg)
 - 1 battery charger (0.4 Kg)

Remarks:

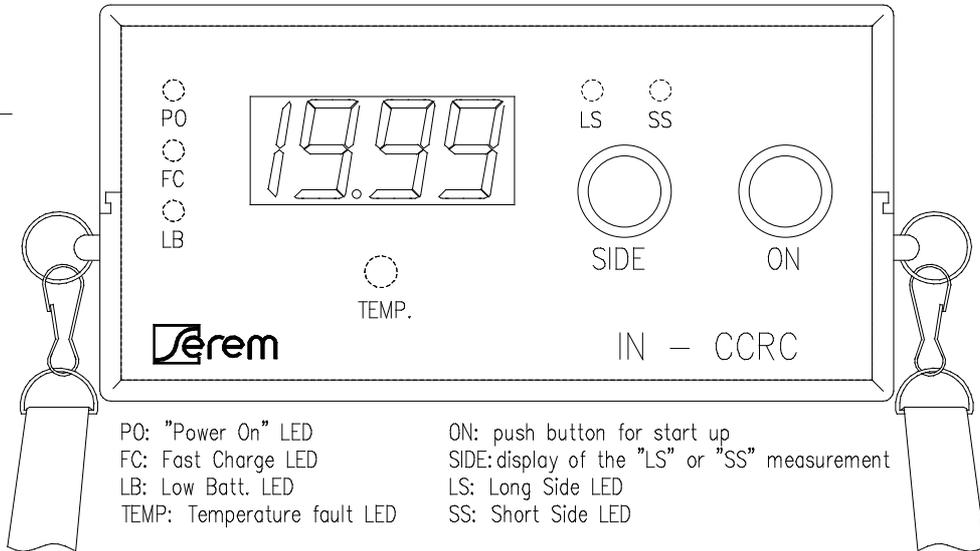
To ensure that the cane lighting functions correctly, do not forget to charge up the indicator.

The "TEMP" indicator lights up when the cane temperature is too high. If this happens, stop the measurements, remove the probe from the conductor and leave it to cool down until the indicator goes out.

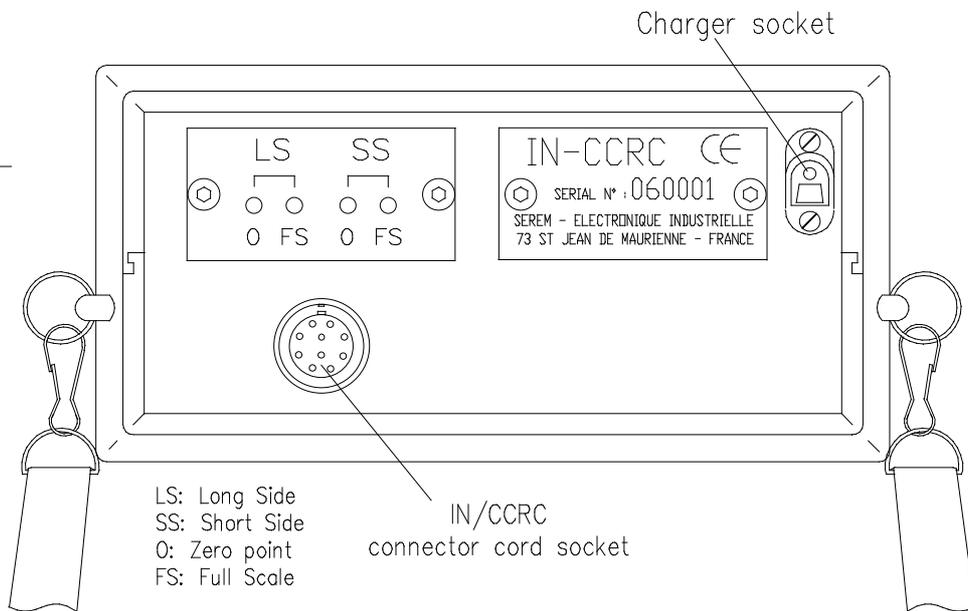
If these instructions are not respected, there is a risk of the measurement sensors and cane structure being damaged.

INDICATOR FOR CROSS BAR CURRENT DISTRIBUTION CONTROL CANE IN-CCRC

FRONT PANEL



BACK PANEL



CRONSA

TEST BENCH FOR CROSS BAR CURRENT DISTRIBUTION CANE BT-CCRC

MODEL: Test bench – type BT-CCRC

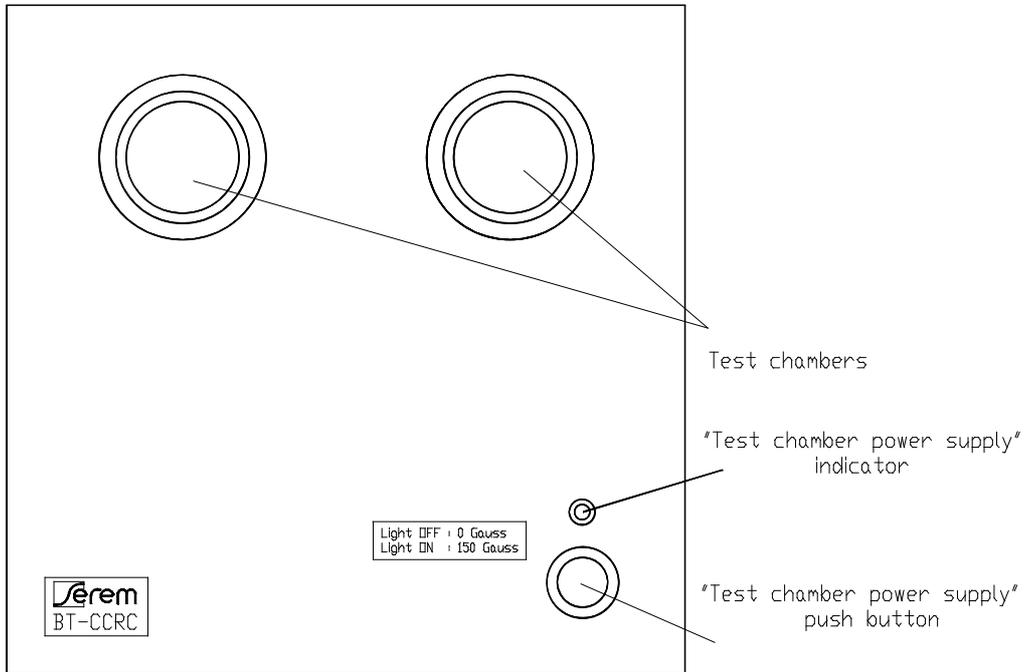
FUNCTION: This device is used to test the functioning of the “CCRA cane and IN-CCRC indicator” assembly.

CHARACTERISTICS:

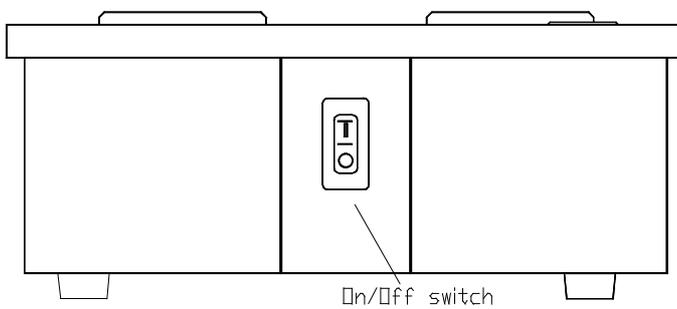
- 2 test chambers (150 gauss).
- Black ABS frame.
- Toggle switch.
- “Test chamber power supply” push button (3 min. time delay)
- Red “test chamber power supply” indicator
- Auxiliary power supply: 120 or 230 V AC. (-15/+10%), 30 VA max.
- Dimensions (WxDxH): 265 x 265 x 113 mm.
- Weight: 5.1 kg.

TEST BENCH FOR CROSS BAR CURRENT DISTRIBUTION CANE BT-CCRC

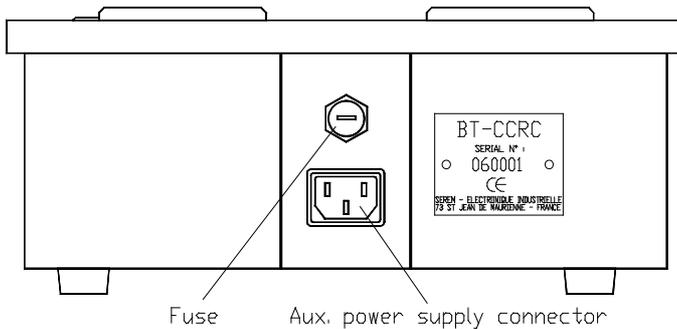
TOP PANEL



FRONT PANEL



BACK PANEL



OPERATING PROCEDURE

PERSONNEL REQUIRED

2 operators.

SPECIFIC RISKS LINKED TO OPERATION

No specific risk linked to operation.

WHEN SHOULD THE MEASUREMENT BE TAKEN?

The current must be stable.

When no other operations are being performed on the pot being measured (for safety reasons).

CHECKING THE DEVICE

Before going to the potline, check that the device is working correctly.

- Connect the digital indicator (IN-CCRC) to the cross bar current distribution control cane (CCRA) using the connector cable.
- Position the CCRA stirrup in the two test bench chambers (BT-CCRC).
- Switch on the test bench and the digital indicator.

ZERO ADJUST CONTROL

The test chamber power supply indicator must be unlit. If it is not, wait until the end of the time delay on the test chamber power supply (3 minutes).

- Push the "SIDE" button on the indicator (IN-CCRC); the "LS" (Long Side) indicator lights up.
- Take a reading from the digital indicator of the magnetic field value.
If the value recorded is not within the 0 ± 1 Gauss range, do the zero adjust control using the potentiometer marked "O", which is accessed via the back panel of the digital indicator.
- Push the "SIDE" button on the indicator (IN-CCRC); the "SS" (Short Side) indicator lights up.
- Take a reading from the digital indicator of the magnetic field value.
If the value recorded is not within the 0 ± 1 Gauss range, do the zero adjust control using the potentiometer marked "O", which is accessed via the back panel of the digital indicator.

FULL SCALE ADJUSTMENT

- Push the button located on the top of the test bench (BT-CCRC).
The test chamber power supply indicator lights up.
- Push the “SIDE” button on the indicator (IN-CCRC); the “LS” (Long Side) indicator lights up.
- Take a reading from the digital indicator of the magnetic field value.

If the value recorded is not within the range 150 ± 5 Gauss, set the full scale to 150 Gauss using the potentiometer marked “FS”, which is accessed via the back panel of the digital indicator.

- Push the “SIDE” button on the indicator (IN-CCRC); the “SS” (Short Side) indicator lights up.
- Take a reading from the digital indicator of the magnetic field value.

If the value recorded is not within the range 150 ± 5 Gauss, set the full scale to 150 Gauss using the potentiometer marked “FS”, which is accessed via the back panel of the digital indicator.

TEST ON THE POT

TEST OPERATION

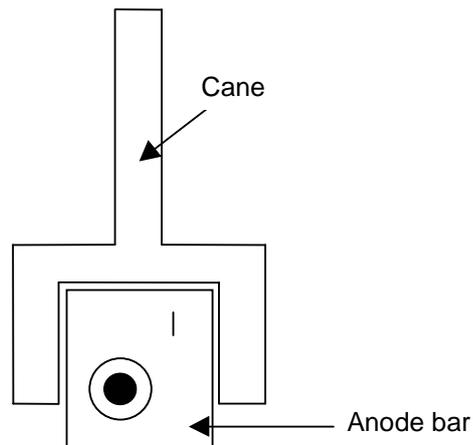
- Check cleanliness of the cross bars. The measurement cane cannot be positioned correctly if alumina is present on the cross bars.
- Lower the cross bar current distribution control cane through the grating, between 2 pot cradles.
- Position the aluminium stirrup “astride” the cross bar, against the pot shell stuffing box.
- Take a reading from the digital indicator of the magnetic field value between the two sensors (no sensor selected). Do not take account of the value sign.
- Note the results on the measurement sheet.
- Note the pot current at the time the measurements were taken.
- In order to be able to compare these measurements and monitor their changes over time, they must be expressed as equivalent values using a reference potline current.

REMARK 1:

POSITION OF THE CANE ON THE CROSS BAR

The measurement is very sensitive to the CCRA position on the cross bar: it must be ensured that the measurement cane stops well up against the cross bar.

The cane must always be turned the same way (unless it is impossible to do so).



REMARK 2:

PRECAUTIONS FOR USING THE DEVICE

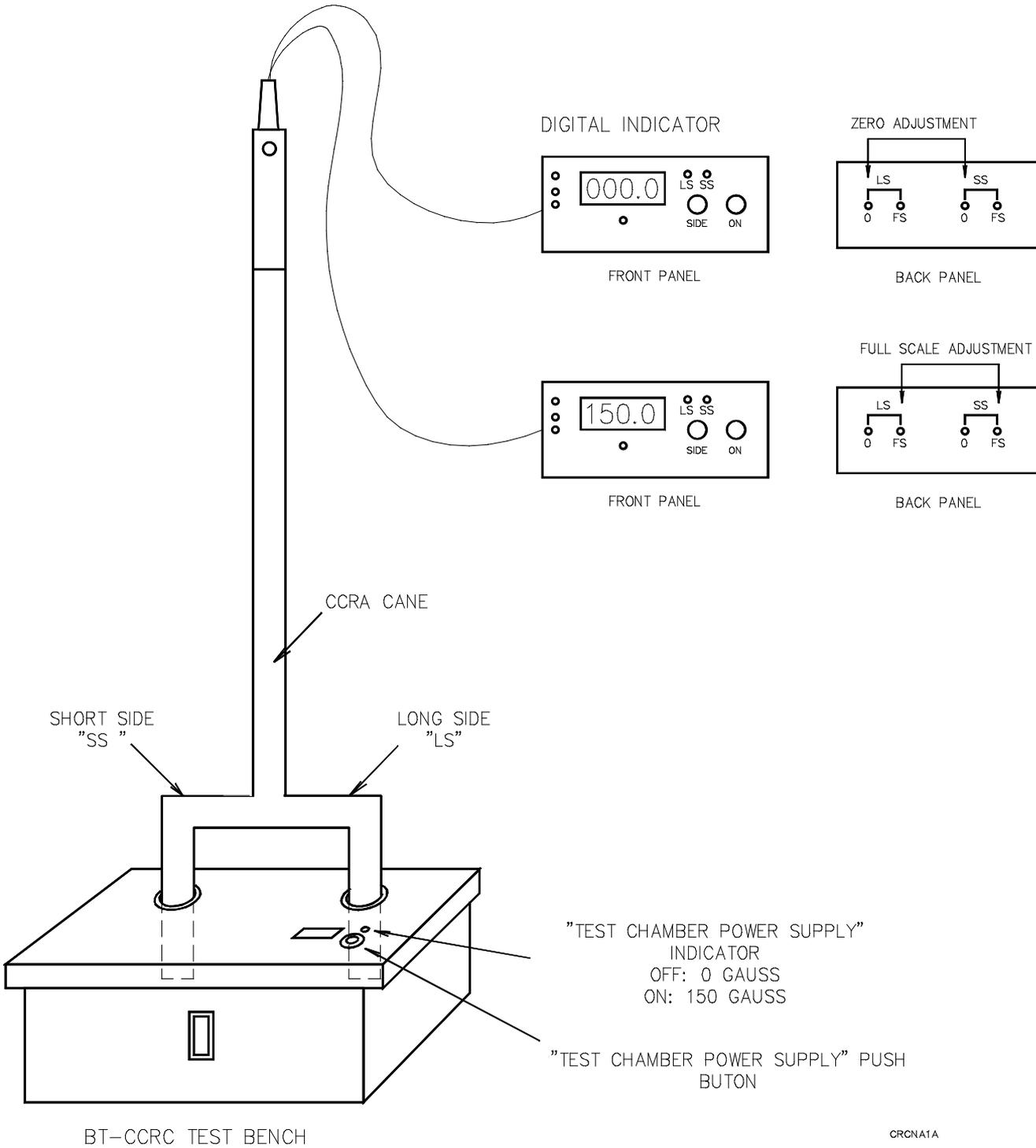
The CCRA must be cooled down using compressed air (for approx. 3 minutes) after measuring half a pot in order to reduce measurement deviations due to temperature.

If sensor temperature exceeds 80°C, an indicator on the front panel of the digital indicator lights up. Measurements must be stopped and the CCRA cooled down (for approx. 3 minutes) using compressed air.

If sensor temperature exceeds 100°C, the digital in dicator display blocks.

ATTACHMENT 1

DIAGRAM DESCRIBING THE CHECKING OF THE CCRA CANE ON THE BT-CCRC TEST BENCH



CRCA1A

LIST OF SPARE PARTS AND ACCESSORIES

SPARE PARTS

CCRA

DESCRIPTION

- "HALL EFFECT PROBE" UNIT
- Batch of 10 spring plates to position the jumper on the bar
- Lamp bodies
- Batch of 10 lamp covers
- Batch of 10 lamps

IN-CCRC

DESCRIPTION

- Display module.
- Storage battery, Ni-Cd 6V/2,4Ah

ACCESSORIES

- Wooden carrying case for control cane and indicator.
(Length : 320x2100x100 mm - Weight: 6 kg)