OPERATOR'S INSTRUCTION MANUAL

DANBRIDGE
DENMARK

CT 10

OPERATING INSTRUCTIONS CT10.

TABLE OF CONTENTS:

SECTION 1: Set-Up

SECTION 2: Switch-On

SECTION 3: Measurements

- A. Automatic Mode
- B. Keyboard Control
- C. Δ Mode
- C1. Nominal Value by Keyboard
- C2. Nominal Value by External Standard
- D. Limits
- D1. Limits on Absolute Measurements
- D2. Limits in Δ Mode

SECTION 1.

SET-UP:

Before switch-on, make sure that the Mains Voltage Selector on the rear panel is set to the appropriate voltage and the correct fuse is placed in the power socket housing.

SECTION 2.

SWITCH-ON:

Immediately after switch-on the digits in the main display will be flashing eights indicating the microprocessor is running an internal check and adjustment procedure.

The microprocessor will continuously update the zero readings of the various circuits during use to compensate for temperature effects. None the less it will be advisable to allow five to ten minutes warm-up time after switch-on to ensure the full accuracy of the measurements.

When the adjustment procedure is finished the display will show C (Capacitance) of the empty jig.

Before starting to measure two things must be done:

a: Select the measuring frequency by pushing the frequency switch [FRQ] on the keyboard. When the light emitting diode in the switch is on, 111.11 Hz is selected. At start-up 1 kHz is automatically selected.

b: The measuring jig should be adjusted to the size of the components and a jig calibration procedure called by pushing "Clear" [C] and "Zero" [0] in that order. If the jig configuration is altered later on, a new jig calibration is necessary. Make sure that the jig is empty when the calibration is done.

SECTION 3.

MEASUREMENTS:

A. Automatic Mode.

This mode is automatically selected at switch-on. Apply the unknown component to the jig and the display will tell you the type and value of the component: capacitance with loss factor as the secondary parameter, inductance with Q-factor, or resistance with either equivalent parallel capacitance or series inductance whichever is dominant. The main parameter capacitance or inductance is given as equivalent series value.

B. Keyboard Control.

The equivalent series mode can be changed to parallel mode (and back again) by the [S/P] key. The actual mode is shown in the displays by the indices to the parameters.

The secondary parameter, Q or D, can by interchanged by the [Q/D] key or altered to equivalent resistance (series or parallel) or conductance (Gp, parallel only) with the [R/G] key (ie. the first stroke will select R (s or p), the second Gp and the third back to R).

To revert to the Automatic Mode just press the clear key [C] twice.

C. Δ Mode.

The CT10 is capable of making deviation measurements from a nominal value displaying deviation in either absolute value or percentage.

The nominal value may be entered either by the keyboard or by measuring an external standard. Deviation measurements apply only to the primary parameter.

C1. Nominal Value using the Keyboard.

Operate the [Δ] key.

The display will be cleard and the % sign will flash to ask the operator whether % deviation is wanted. % is selected by operating the [%] key once and absolute value deviation by operating it twice.

Next the C,L and R parameter indicators in the primary display will be flashing in sequence, to ask the type of nominal component. C is selected by one stroke of the [C/L] key, L by two strokes and R by pressing the [R/G] key.

Now the value must be entered, and the first decimal point and digit flashes to ask for the decimal point (if wanted at that place) and the value of the first digit.

Whenever an appropriate key is operated the selected digit "freezes" and the next flashes. If a wrong entry has been made, you can always go back reselecting C,L or R, or even start from scratch by pushing the [Δ] key or the [C] key.

When the digit value has been entered the appropriate unit (Farad, Henry or Ohms) goes on and the exponent indicator Pico-, Nanno-, Micro-, Milli flashes in sequence ready for selection. Then the key [1] gives pF, μH or Ω, the key [2] gives nF, mH or KΩ and the key [3] gives F, H or MΩ.

The entering of the nominal value is completed by the key stroke [•] and it disappears from the primary parameter display, which will thus show the deviation value of any subsequent measurement, until the mode is erased.

C2. Nominal Value using the External Standard.

The standard should be placed in the jig and the [Δ] key pressed.

The primary parameter display is cleared, and as before the % sign starts flashing to ask for the type of deviation.

Next the series/parallel indicators flash in sequence to request the type of presentation. When this is done the measurement of the standard component will be displayed. Now the presentation of the secondary parameter must be chosen (eg. Rp or Gp instead of loss factor d for a capacitor) - if it is wanted - before the nominal value is entered and the sequence is completed on pressing the [•] key.

In Δ Mode the Nominal can be recalled for inspection at any time by operating the [Δ] key and reinserted by the [•] key.

If the operator wants to change from the Δ Mode (to the Automatic Mode) but retain the nominal value in the memory, the keyboard sequence [Δ], [C], [•] should be entered.

If the Δ Mode is no longer required (nominal value deleted from memory) the key sequence [C], [Δ], [•] should be entered.

D. Limits.

The CT10 has a separate limit display, a single digit high intensity LED display just above the jig.

By this it is possible to sort the components in ten classes, including high and low reject, on the primary parameter with an additional HIGH/LOW limit on the secondary parameter.

Limits can be set on both absolute measurements and in Δ Mode.

The limit-display serves as both a limit number indicator when entering limits and as a class indicator when operating with limit sorting.

Class 0 (zero) will always be low reject and class 9 always high reject. On the primary parameter limit 0 is the lowest limit between low reject (class 0) and class 1 and limit 8 is the highest limit between class 8 and high reject (class 9). Limit 9 is the HIGH/LOW limit on the secondary parameter and a HIGH is indicated by a flashing decimal point in the limit display.

The limits must be inserted in increasing order so that if the absolute measurement mode is being used, the lowest limit (zero) has the lowest value. Any number of limits from one to ten can be used.

When less than 9 limits (limit 0 to 8) are selected for the primary parameters class 9 is still the high reject class so that if no higher limits than eg. limits 5 are inserted, class 5 to 8 will not be used and every measurement above limit 5 will be denoted as class 9.

D1. Limits on Absolute Measurements.

The limits are inserted in sequence using the keyboard.

To start the sequence operate the [LIM] key. The limit display will light up and display a zero indicating that the lowest limit (between low rejcet and class 1) must be entered.

At the same time the measuring displays are cleared and C,L and R will be flashing in sequence in the primary display to request the type of display. The wanted parameter is "frozen" by the [C/L] or [R/G] keys (the last only for R), and the first decimal point and digit start flashing.

The decimal point is inserted by the [•] key or ignored by inserting the appropriate first digit, which will start the next decimal point and digit flashing.

If a faulty digit is inserted the sequence can be repeated by reselecting C/L or R. When the numerical value (with decimal point) has been correctly entered the exponents to the appropriate unit will flash in sequence and must now be entered. The key [1] gives pF, µH or Ω, the key [2] gives nF, mH or KΩ and the key [3] gives f, H or MΩ.

The insertion of limit zero is now complete and the next limit is called by the key [LIM]. The limit display now shows a one, the primary display shows the same parameter and unit and requests the first decimal point and digit of the second limit (limit one).

As many limits as required on the primary parameter are inserted, observing the rule that they must be increasing in value with increasing order.

When no more limits are required the key [•] is operated after the key [LIM].

The limit display now jumps to limit 9 which is the HIGH/LOW limit for the secondary parameter.

The secondary display now asks for type, value and unit in the same way as for limit zero.

The choice of type for the secondary parameter is limited by the fact that a resistor can only have Cp or Ls as it's secondary parameter and series conductance (Gs) for reactances is not available.

If limit 9 is not required simply press key [•] once more, alternatively insert the type, value and unit and finish with the key [•].

D2. Limits in Δ Mode.

When a nominal value has been inserted in the Δ Mode, limits on the deviation can be set up both in absolute value and in percentage, independent of the chosen display.

Operation of the key [LIM] initiates the limit set up sequence by displaying limit zero and clearing the measurement displays. The primary display will flash the % sign to ask whether % limits (one press of the [%] key) or absolute value limits (2 x [%]) relative to the nominal value are required.

Next the + and ÷ sign will alternate to request the sign of the deviation limit. The key [0] selects ÷ and the key [1] selects +.

Finally the value is inserted following the prompting of the display.

If absolute deviation limits are chosen, the unit will be the same as for the nominal value.

The key [LIM] completes insertion of the first limit (LIM zero) and calls the next, where only sign and value is required.

Remember that the limits must be of ever increasing signed value with respect to their order.

When the required number of limits for the primary parameter are inserted, the sequence is finished by pressing [LIM] [•] which changes to limit 9, the limit on the secondary parameter.

Though the secondary parameter is not in a Δ Mode (it does not exist for this parameter) the type and unit will be those chosen for the nominal value and only the limit value need be inserted if it is required.

The entire limit insertion sequence is finished by pressing the key [•] whether or not a limit 9 has been inserted.

After the final [•] key has been pressed the limits will be stored in the memory and should the operator want to inspect a particular limit, say limit X the following procedure must be followed:

Press the keys in the following sequence: [LIM] [X], and if it is correct reinsert it by [•]. If you want to inspect limit Y as will, just press [Y] after [X] and, if this limit is not correct, push [C] and you will get prompting from the display for a new value.

If a new value is not required just press [•] or insert the correct value and finish with [•] before anything else is done.

If a limit is deleted the corresponding higher class will disappear from the sorting sequence, ie. if limit 5 is deleted, class 5 will not appear separately but components between limit 4 and 6 will become class 4.

If the highest limit for the primary parameter is deleted the next lower limit inserted will be the high reject limit. If the lowest limit is deleted the next higher limit will be the low reject limit.

The secondary parameter limit is always limit 9.

When changing a limit value make sure that it is still lower than the value of the next higher numbered limit and higher than the next lower numbered limit, (this rule has of course, no bearing on limit 9).

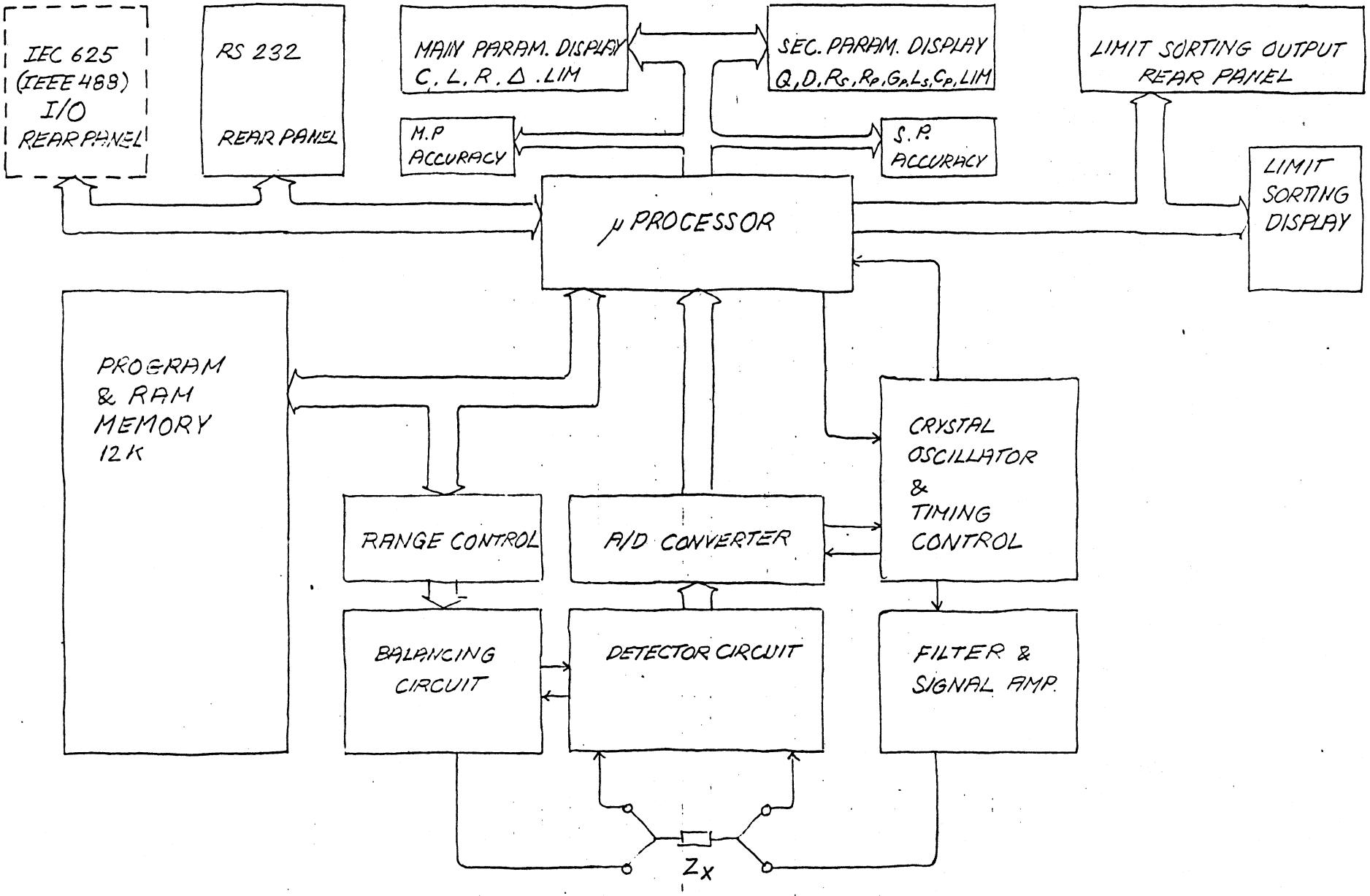
If the limit mode is to be disabled, but the limits retained in the memory, enter this sequence: [LIM] [C] [•].

The limits are reactivated by: [LIM] [•] or by inserting limits.

If the limits are to be removed permanently, enter [C] [LIM] [•].

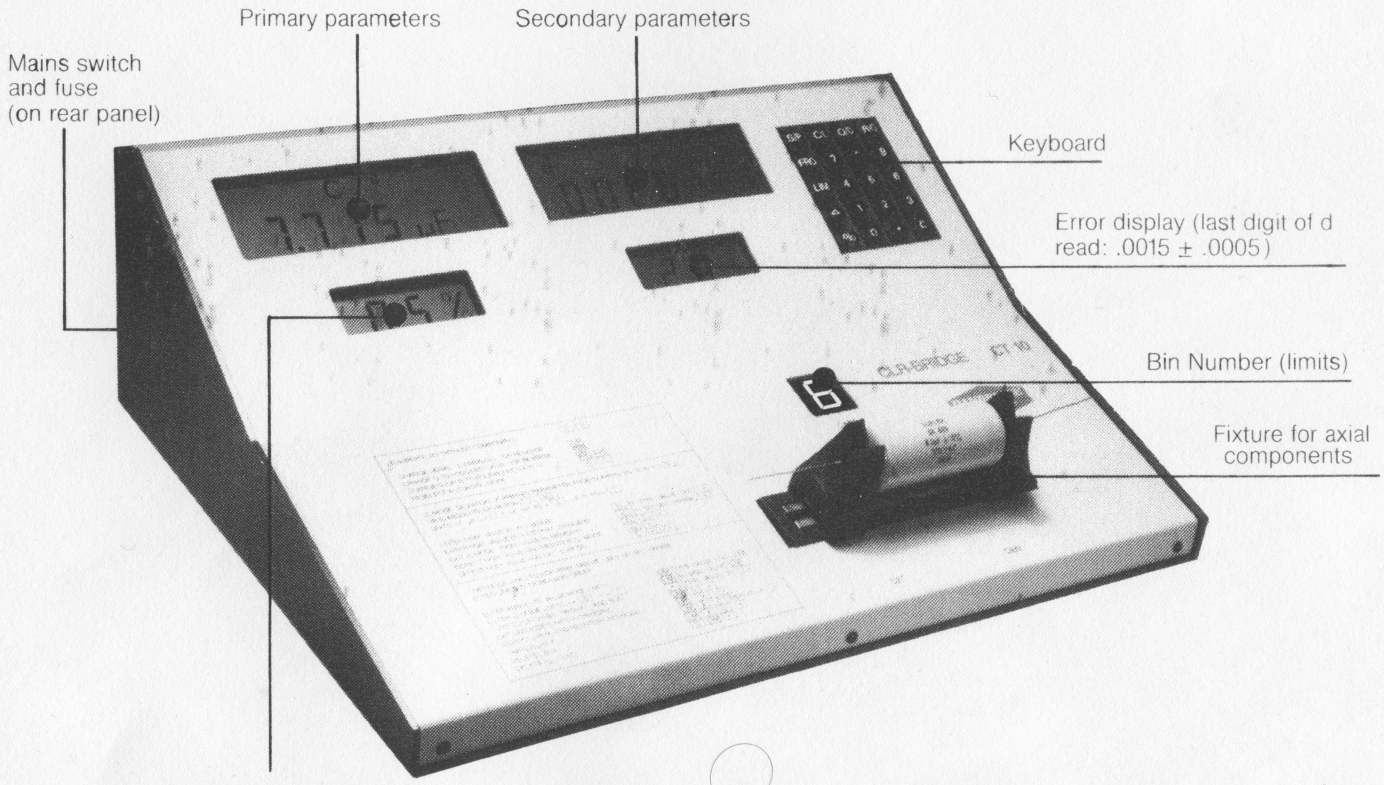
S/P	C/L	Q/D	R/G
FRQ	7	8	9
LIM	4	5	6
△	1	2	3
%	0	.	C

CALIBRATE JIG (WITHOUT COMPONENT)	[C] [0]
CHANGE SERIAL TO PARALLEL – OR REVERSE	[S/P]
CHANGE Q TO LOSS FACTOR (d) – OR REVERSE	[Q/D]
CHANGE Q (OR d) TO EQUIVALENT R (OR G_p)	[R/G] [R/G]
RESELECT AUTOMATIC MODE	[C] [C]
Δ-MODE. DEVIATION OF PRIMARY PARAMETER FROM NOMINAL VALUE IN % ([%]) OR IN ABSOLUTE DEVIATION ([%] [%]). UNITS: pF, μH, Ω = [1] ; nF, mH, KΩ = [2] ; μF, H, MΩ = [3]	
ENTER NOM. VALUE BY KEY-BOARD	[Δ] [%, TYPE, VALUE, UNIT] [•]
ENTER NOM. VALUE BY EXTERNAL STANDARD	[Δ] [%, S/P, SEC. PARAM.] [•]
EXIT Δ-MODE . (NOM. VALUE IN MEMORY)	[Δ] [C] [•]
INSPECT NOM. VALUE AND REENTER Δ- MODE	[Δ] [•]
DELETE NOM. VALUE AND EXIT Δ-MODE	[C] [Δ] [•]
LIMIT-MODE. LIM 0 TO 8 ON PRIM. PARAM., LIM 9 ON SEC. PARAM. ENTER LIMITS IN INCREASING ORDER	
ENTER ABSOLUTE VALUE MODE LIMITS	[LIM] [TYPE, VALUE, UNIT] [LIM] ...
ENTER Δ-MODE LIMITS (- = [0] , + = [1])	[LIM] [%, SIGN, VALUE] [LIM] ...
JUMP TO LIM 9 (SEC. PARAM.) – AND RUN	[•] [TYPE, VALUE, UNIT] [•]
EXIT LIM-MODE (LIMITS IN MEMORY)	[LIM] [C] [•]
INSPECT LIM (X) AND REENTER LIMIT-MODE	[LIM] ([X]) [•]
CHANGE LIM X	[LIM] [X] [C] [NEW VALUE] [•]
DELETE LIM X	[LIM] [X] [C] [•]
DELETE ALL LIMITS	[C] [LIM] [•]



CT-10 CLR BRIDGE

1 V RMS, 1 KHz / 111 Hz



*) For capacitors the formula looks like this:

$$\pm 1\%[(1+K_{cv}) \text{ or } \frac{Cx}{Cmax} \text{ or } \frac{Cmin}{Cx}] \ (1+|D|)\ (1+K_s+K_{fv})+0.01\%$$

Where K_{cv} is a function of voltage, K_s measurement rate and speed, K_{fv} frequency and RMS voltage for range.
D is numerical value of tgδ.

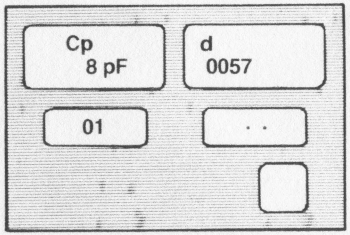
Start (1 kHz)
Jig empty

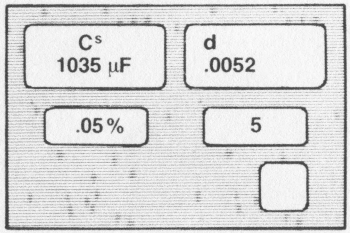
Calibrate jig

Display will show

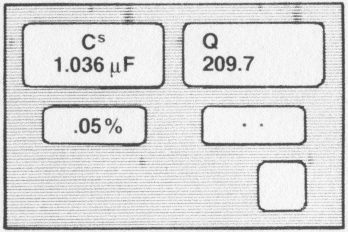
Put 1 µF capacitor in jig

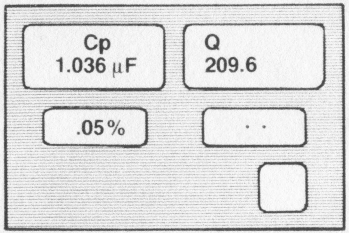
This is »Automatic Mode«

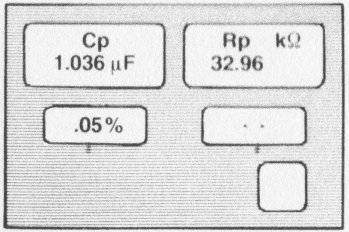


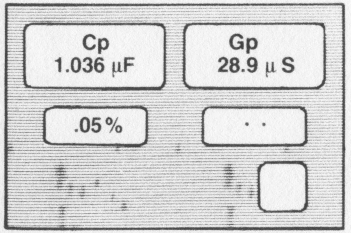


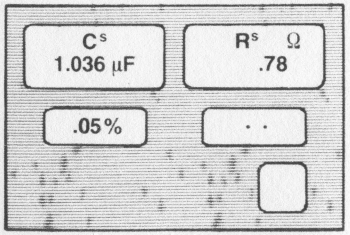
Keyboard control:





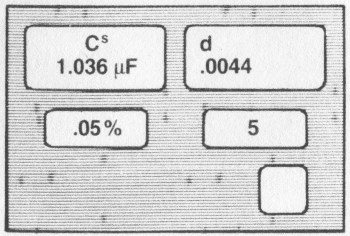




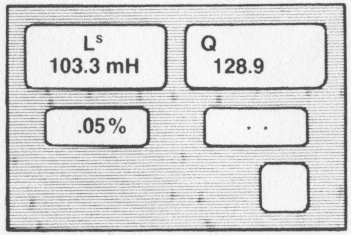


Return to aut. mode:

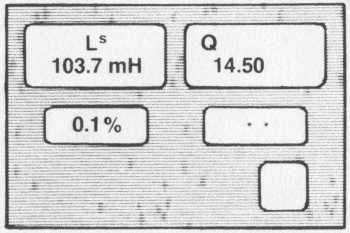
(1 µF capacitor in jig)
Remove capacitor now.

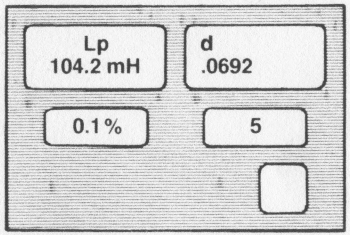


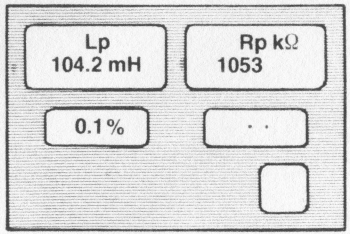
Put an inductor in jig



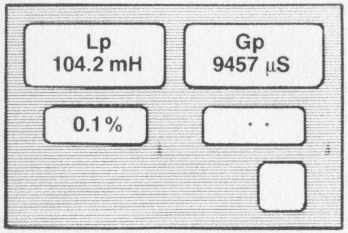
Now change freq. to 111 Hz
(Frq. now 111 Hz)





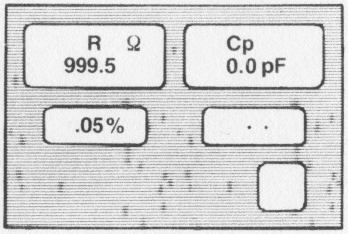


Remove inductor from jig
Insert a 1 kΩ resistor



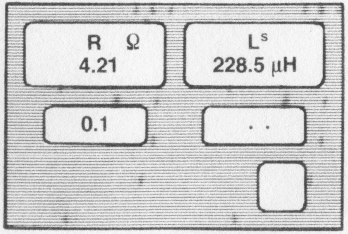
Note:
If you want to blank sec. display press R/G.
If you want to see C_p press Q/D.

Change freq. to 1 kHz



Remove 1 kΩ resistor
Insert a very small inductor in jig,
e.g. 220 µH.

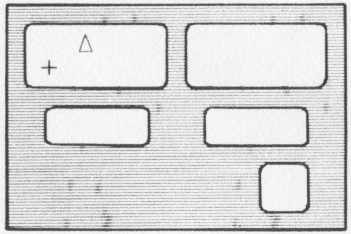
Note that the inductance (228,5 µH) is displayed as the secondary parameter because the most predominant impedance in this case (measured at 1 kHz or lower freq.) is the 4,21 Ω.



Note:
If sec. display shows C_p = 0.0 pF press Q/D.

Delta mode:

Jig empty. Freq. 1 kHz

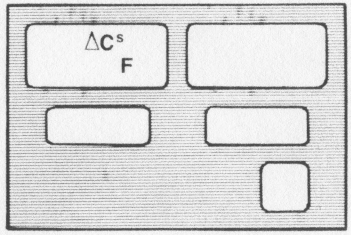


% is prompting.
Select % or absolute value

Absolute deviation

C, L, R are prompting, select!

Select C



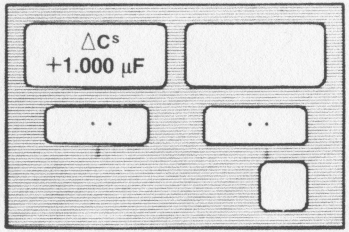
S and P are prompting

Select S
.0 is prompting

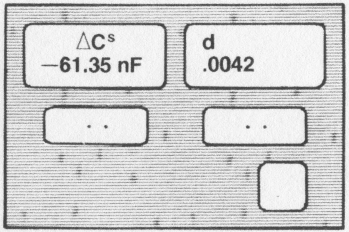
Enter nominal value by keyboard (1.000 μF)

Set up =μ

Enter



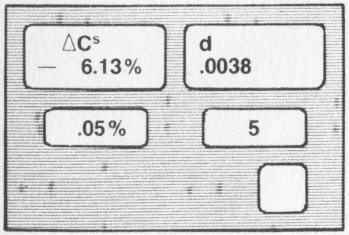
Insert capacitor (1 μF) in jig



If you want deviation in %

Note:
With empty jig the left-hand display will show
−99.99% or −999.9% nF

If you want to return to absolute deviation

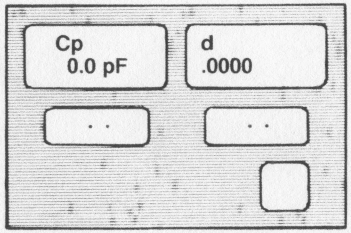


Now remove capacitor 1 µF.

If you want to escape and cancel the nom. value.

Nominal value using external standard

Clear jig and calibrate



Insert external standard in jig, e.g. a 1 µF capacitor.

% starts flashing

Select % or absolute deviation %

S and P flashing, select S or P
P

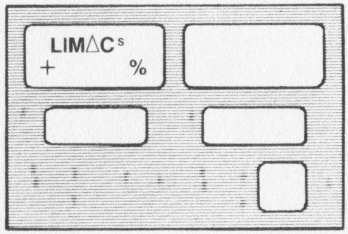
External standard value now displayed.
+ is prompting

Enter! Remove standard from jig, insert component to be compared

Change to absolute deviation, if wanted

Escape. Nominal value deleted

Limits in △ mode



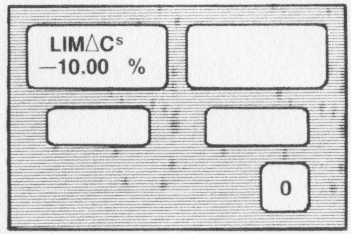
LIM

Jig empty, but nom. value entered
e.g. Cs=1.000 µF (freq. 1 kHz)

%

Select % or absolute deviation. %
±prompting

Enter **lowest** limit (−10%) (0=−, 1=+)



0 1 0 · 0 0

Set up
(LIM .0)

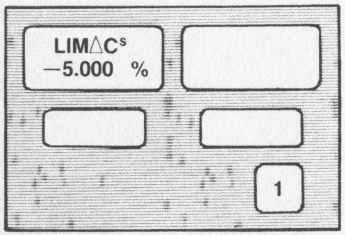
LIM

Enter (LIM 0)
Set next limit (−5%)

Error! (−50%)

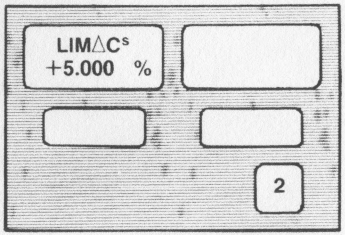
Clear. Set up again.
Still negative value.

Enter LIM 1



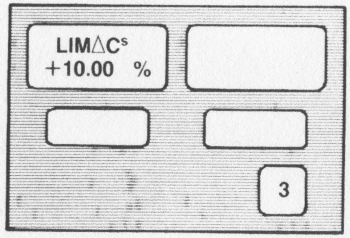
Set up LIM 2
(+5%)

Enter LIM 2



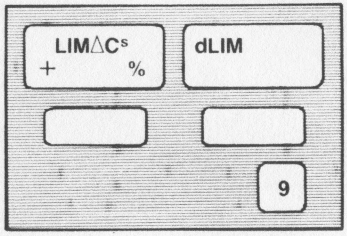
Set up LIM 3
(+10%)

Enter LIM 3



Jump to LIM 9 (if no more LIM wanted)
d, R, Ω prompting

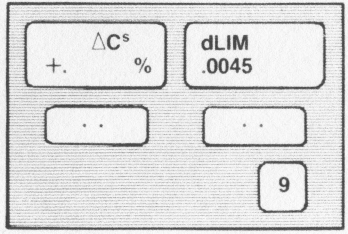
Select D
.0 prompting



Set up of D value

Enter

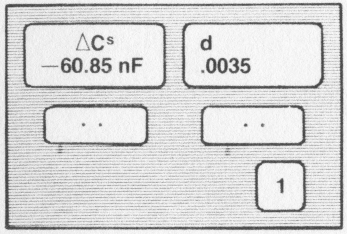
Note:
When the LIM display is flashing it means rejection of LIM 9



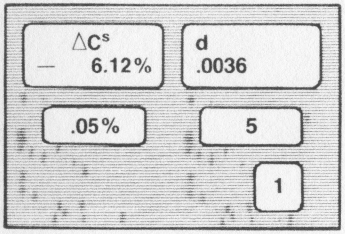
Insert components to be sorted (1 µF)

Absolute deviation −60.85 nF LIM 1

Deviation in %



Note:
If you change the freq. and press Q/D
Q is displayed as secondary parameter and LIM 9 will flash (reject signal).
This is also the case if you change to R/G without changing the LIM 9 value as prescribed:
LIM 9 C+new value.



Note:
If loss factor (selected as LIM 9) is too high, the LIM display will flash = rejected.

If you want to return to automatic mode, but keep all limits stored in the memory.

If you want to delete all limits.

Absolute limits

No nom. val. entered.

C, L, R prompting
Now select C

S and P prompting

Select P
.0 prompting

Now insert **lowest** value (e.g. 850 nF)

Set up =n

Enter

.0 prompting, insert next limit value
(e.g. 950 nF)

Set up
LIM prompting

Enter
.0 prompting. Insert next limit (e.g. 1100 nF)

Set up
LIM prompting

Enter
.0 prompting

If you do not want to insert more limits on primary parameters then jump to LIM 9 (secondary parameters)

If you want to by-pass LIM 9

Otherwise insert value for secondary parameters

Inspect limits inserted

Number of limits inserted are shown in sequence on the limit display

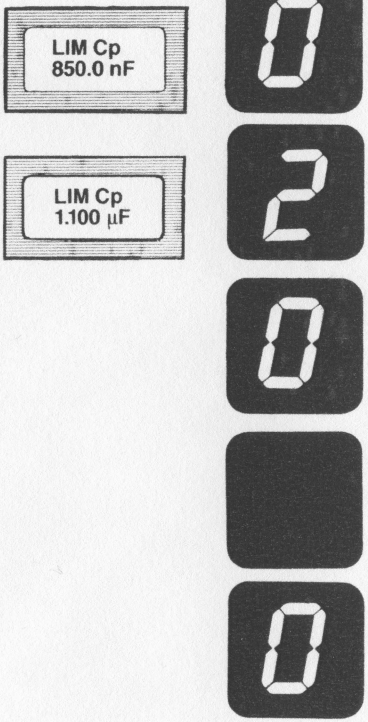
Inspect value of limit 0 (lowest)

Inspect value of limit 2

Return to limit mode

Exit limit mode but keep limits in memory

Re-enter limit mode (with no component in jig)



How to change a limit value

Call the limit number, you want to change
e.g. change LIM 2 from 1.100 µF to 1.200 µF

LIM prompting

.0 prompting

Enter

Basic CLR-Measurements

A. Properties of passive components:
Any actual component may be regarded as a combination of an ideal capacitance or an ideal inductance with an ideal resistance — as shown on the schematic drawing, fig. 1.
One pair of these values (e.g. C_s, R_s) provide a unique presentation of the properties of the component at the measuring frequency used.
In actual practice, the C_s or L_s values are used for the primary parameters.
For the secondary parameters we normally employ for capacitors the D value ($\frac{R_s}{X_c}$) and for inductors the Q value ($\frac{1}{D}$) as these provide a direct indication of the deviation from an ideal component, (the lower the D value or the higher the Q value, the "better" the component).
The above presentation is used on the CT10 for automatic measurements.
The Keyboard allows other presentations, e.g. C_p or L_p with R_p or G_p ($\frac{1}{R_p}$) as secondary parameters.
Note that for low D (high Q) values the C_p (or L_p) values will be nearly equal to the C_s (or L_s) values. At D values of 0.1 (Q=10) the difference will be only 1%.

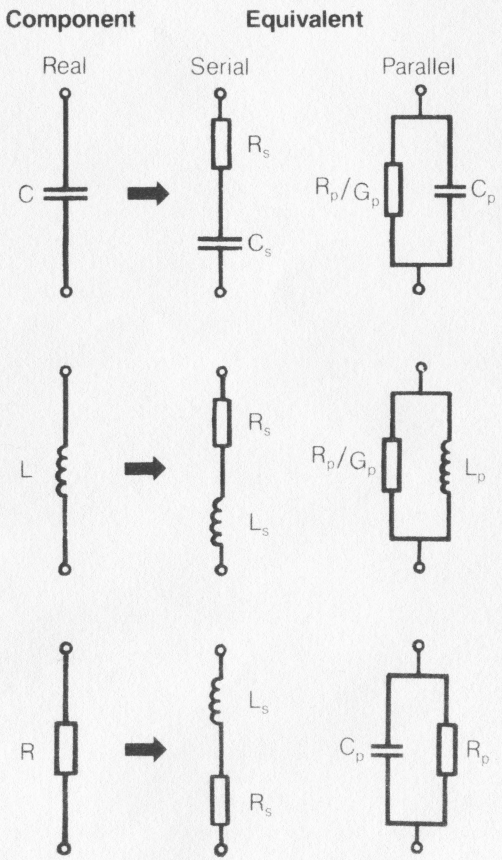


Fig. 1

B. Typical values of D (loss factor) for various types of capacitors:

1.
Foil capacitors:

Polystyrene:	0.0001 to 0.0005
Polypropylene:	0.0002 to 0.0005
Polycarbonate:	0.0010 to 0.0030
Polyester:	0.0060 to 0.0150
Paper:	0.0100 to 0.0200

2.
Ceramic capacitors:
Type 1: 0.005 to 0.0015 low K
Type 2: 0.0100 to 0.0500

3.
Electrolytic capacitors:
Tantalum: $<$ 100 µF: 0.0300 to 0.1000
Tantalum: $>$ 100 µF: 0.0500 to 1.0000
at (111 Hz)
Aluminium: 0.1000 to 0.3000 at 111 Hz

Note:
Aluminium capacitors may after prolonged storage display very large loss factors.

C. Display of parameters on CT10:

The CT10 always displays the most significant parameter on the left-hand display and the less significant one on the right-hand display.

If a component has a D value above 1 (or Q below 1) it will be measured as a resistor with parallel capacitance or series inductances as the secondary parameter. See fig. 2.
This may be the case when high-value electrolytic capacitors are measured at 1 kHz or when low-value inductors are measured.

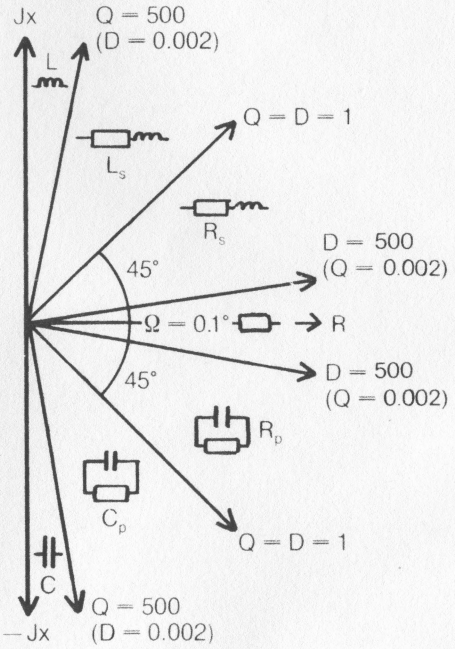


Fig. 2 Impedance vectors

D. Hints on set-up for measurements:

1. External bias:
An external bias voltage up to 3 V may be applied for capitance measurements e.g. on diodes and tantalum capacitors.

2. A guard terminal is provided on the CT10:
The guard voltage follows the detector voltage exactly, and by connecting this to the shield of a 3-terminal component (e.g. a decade box) the capitance to the shield may be eliminated and direct capacitance measurements are possible.

3. Low-value impedances:
When measuring high-value capacitors with large physical dimensions, be careful to use the shortest possible leads of large-gauge wire or, if possible, four-terminal leads to avoid errors in D measurement.

4. Measurements on Ferrite-cored Inductors:
Ferrite-cored inductors are affected by the current-flow in the windings.
The measuring-voltage of CT10 is 1 Volt for impedances greater than 40 Ω, which at 1 kHz is equal to an inductance of 6.4 mH. The measuring-voltage is reduced to 0.1 Volt for impedances between 4 and 40 Ω. At 1 kHz this corresponds to 640 μH and 6.4 mH. This should be taken into consideration when comparing measurements of Ferrite-cored inductances, as competitive instruments may use another measuring-voltage/current.

Limit sorting

The CT10 is capable of LIMIT sorting in three modes:

1. Absolute limits:
(e.g. 9.8 nF, 9.9 nF, 10.0 nF, 10.1 nF...)

2. DELTA limits:
(e.g. −0.2 nF, −0.1 nF, +0.1 nF, +0.2 nF...)

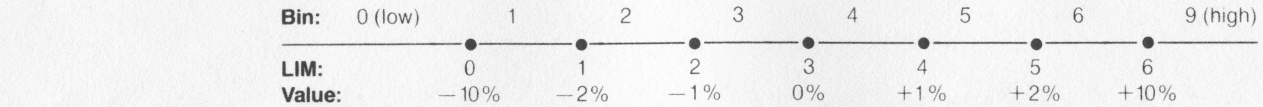
3. DELTA % limits:
(e.g. −20%, −10%, −5%, 0, +5%, +10%...)

The last two modes are relative to a NOMINAL VALUE, which must be inserted into the CT10 memory **before** entering the LIMITS.
Up to 9 main-parameter limits (LIM 0–8) may be inserted into the memory.
LIM 9 will give an ACCEPT/REJECT classification in the tanδ, Q, R_s, R_p or G_p of a capacitor or an indutance, if inserted, but not of the C_p or L_s of a resistor measurement, because the latter always selects the secondary parameter automatically.
The primary limits must always include LIM 0. The value of it may be changed later on, but never deleted separately.
During limit set-up, and when the limits are recalled for inspection, the limit display will show the actual limit number.
During limit sorting the limit display will show the class- or bin-number, which is the number corresponding to the first limit above the measurement.

Obviously the limit values must be of increasing value with increasing limit numbers, starting with the lowest negative value, if DELTA limits are used. Limits lower in value than a lower-numbered limit will be ignored by the computer.
Lowest class will thus be 0 (zero). The highest class (above the highest active limit) will always be denoted 9.
Secondary parameter values above its limit (if used: LIM 9) are indicated by flashing the limit display. The flashing digit will at the same time indicate the limit number for the primary parameter, e.g. LIM 2 flashing means the component belongs to limit 2, but is rejected on the secondary parameter, which for instance could be the loss factor.
Open-collector medium power switch outputs are available on the SC1 connector for driving lamps or relays in some bin sorting arrangement. An external power source is needed.

When setting limits, the accuracy of the measurement is of great importance, especially for close-tolerance sorting.
The accuracy of the measurement must be much better that the tolerance of the limits in order to guarantee the component values being sorted.
The good accuracy of the CT10 is therefore of benefit for the yield of such sorting, especially with respect to the tanδ, where a limit accept/reject often is used in quality assurance for low-loss types of components.

Example:
Percentage limits with nominal value = 100 nF capacitor inserted



Pin Connections

Connector SC1

Pin 1 LIM 2
Pin 2 LIM 3
Pin 3 LIM 4
Pin 4 LIM 5
Pin 5 LIM 6
Pin 6 Common Ground
Pin 7 LIM 7
Pin 8 LIM 8
Pin 9 LIM 1
Pin 10 LIM 0 (Low Reject)
Pin 11 Common +
Pin 12 Bias Ground
Pin 13 Bias (Max. 3 V)
Pin 14 LIMIT High/Low
Pin 15 LIM 9 (High Reject)

Connector SC2

See IEEE Option

Connector SC3	**In/Out**
Pin 1 Protective Ground	
Pin 2 Received Data	(I)
Pin 3 Transmitted Data	(0)
Pin 4 Not used	
Pin 5 Pseudo Clear to send	(0)
Pin 6 Data Terminal ready	(0)
Pin 7 Signal Ground	
Pin 8 Request to send	(0)
Pin 9 Not used	
Pin 10 Not used	
Pin 11 Reserved	(0)
Pin 12 Not used	
Pin 13 Not used	
Pin 14 Not used	
Pin 15 Not used	
Pin 16 Not used	
Pin 17 Not used	
Pin 18 Reserved	(I)
Pin 19 Not used	
Pin 20 Data Terminal ready	(I)
Pin 21 Not used	
Pin 22 Not used	
Pin 23 Not used	
Pin 24 Not used	
Pin 25 Trigger Input	(I)