

28. 07. 2006

(43)

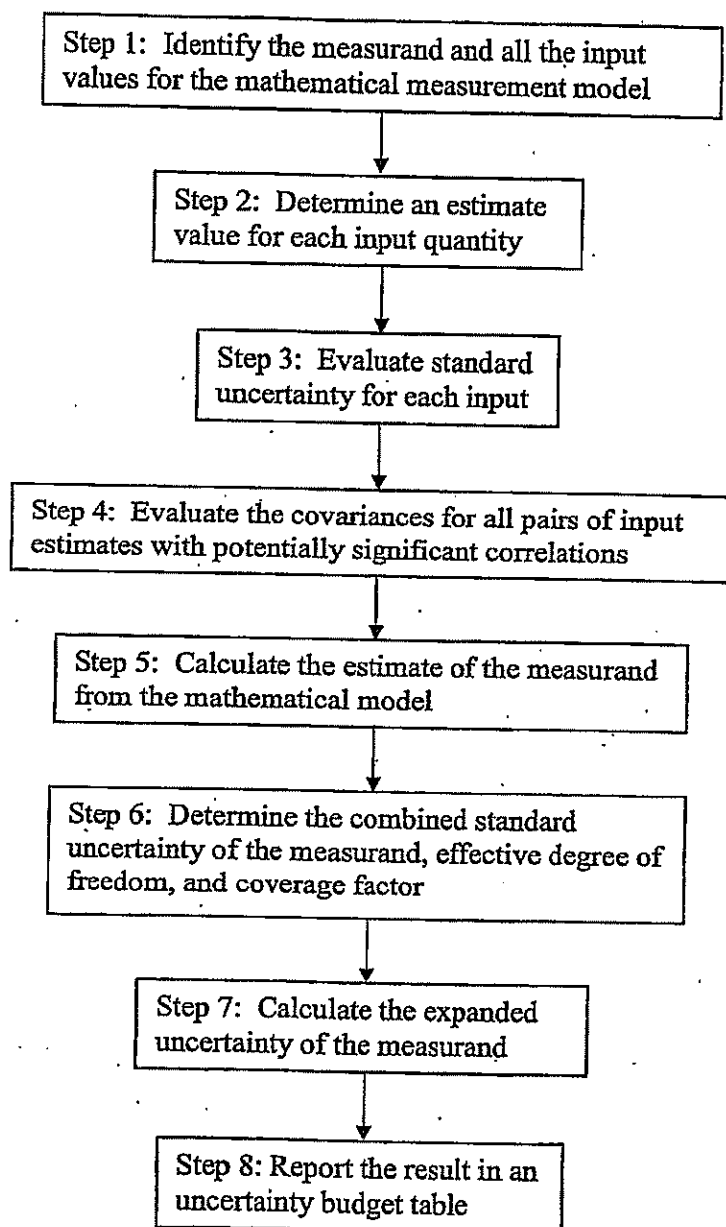
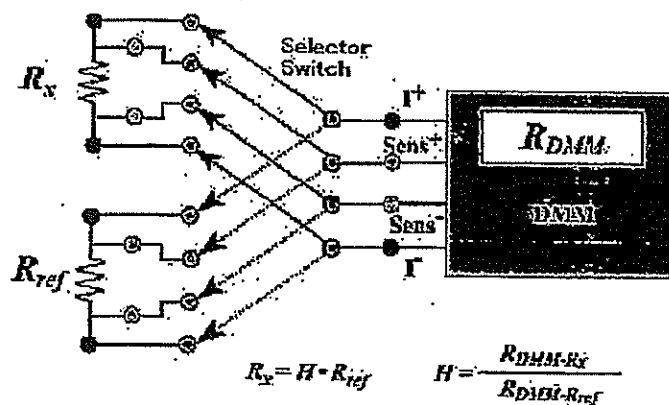


Figure 1



R_x : Resistance of unit under test (measurand)

R_{ref} : Resistance of reference (observable qty)

H : Resistance ratio of R_x to R_{ref} measured with DMM (observable qty)

[Principle of Measurement]

Figure 2

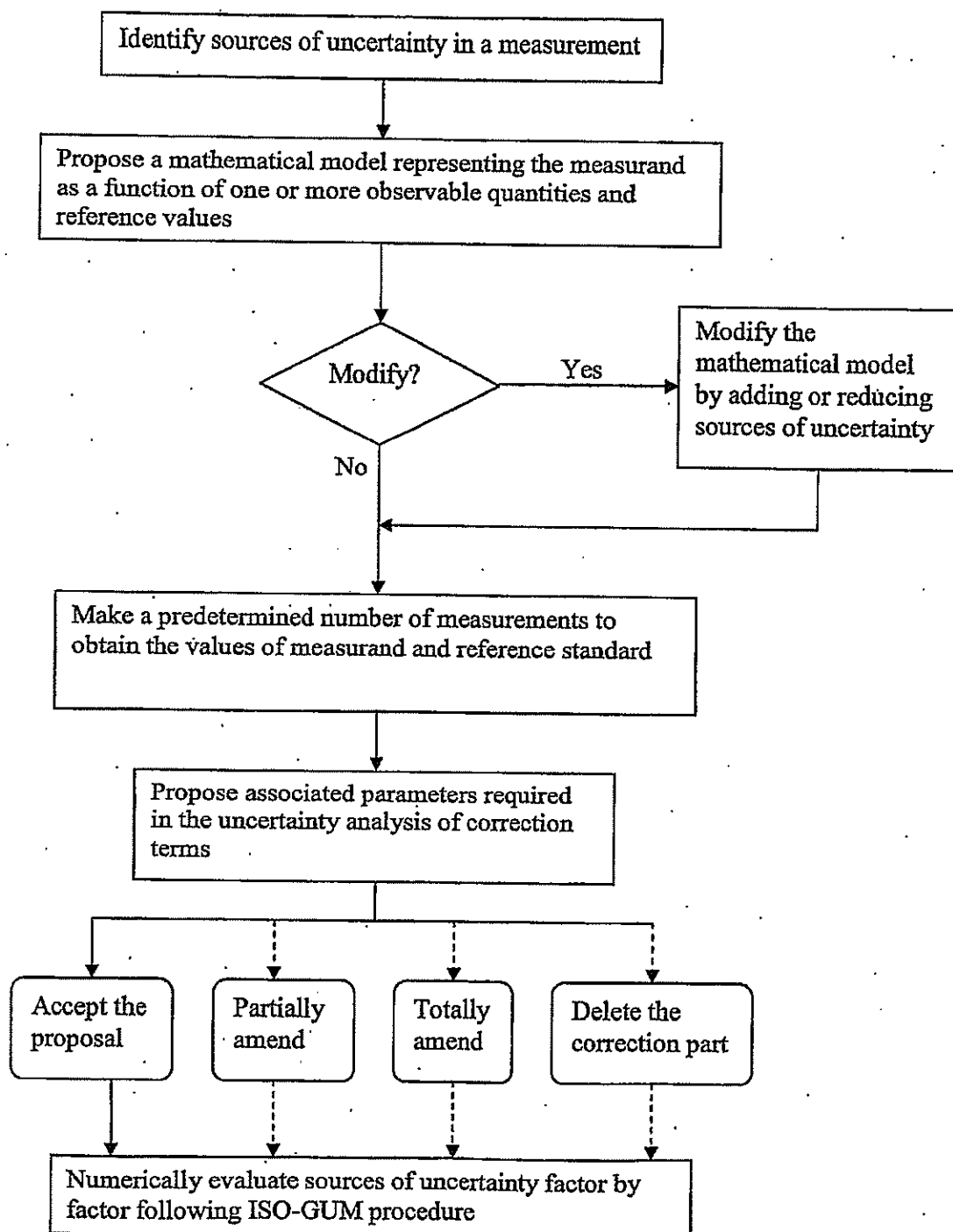


Figure 3

Model Component	Physical Meaning
R_x	Resistance of the unit under test
R_{ref}	Resistance of the reference calibrated by an upper organization
H	Ratio of R_x to R_{ref} directly obtained from DMM reading
ΔH_{riap}	Correction to H associated with DMM input resistance
ΔH_{resol}	Correction to H associated with DMM resolution
ΔH_{leak}	Correction to H associated with DMM circuit insulation
ΔH_{ther}	Correction to H associated with thermal electromotive force in the circuits
ΔH_{add}	Correction to H associated with other sources
$\Delta R_{ref,temp}$	Correction to R_{ref} associated with difference in temperature between R_x measurement and R_{ref} calibration
$\Delta R_{ref,power}$	Correction to R_{ref} associated with difference in power consumption between R_x measurement and R_{ref} calibration
$\Delta R_{ref,drift}$	Correction to R_{ref} associated with drift of reference resistance values in time
$\Delta R_{ref,trans}$	Correction to R_{ref} associated with transportation
$\Delta R_{ref,add}$	Correction to R_{ref} associated with sources other than above
$\Delta R_{x,add1}$	Correction to R_x associated with source 1 other than above
$\Delta R_{x,add2}$	Correction to R_x associated with source 2 other than above

Figure 4

Figure 5

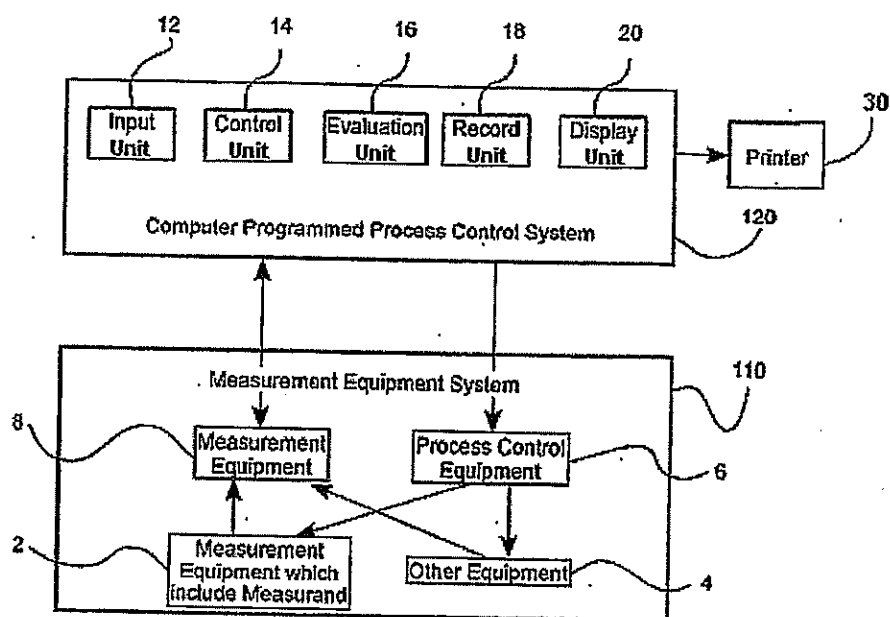


Figure 6A

The diagram shows a table with the following structure:

Sources of Uncertainty	Evaluation Method Type	Probability Density Function	Standard Uncertainty	...	Expanded Uncertainty
Temperature					
Humidity	x	y	z		
...					
Pressure					

Callouts and annotations:

- 41: Points to the first column (Sources of Uncertainty).
- 43: Points to the second column (Evaluation Method Type).
- 45: Points to the third column (Probability Density Function).
- 47: Points to the fourth column (Standard Uncertainty).

Figure 6B

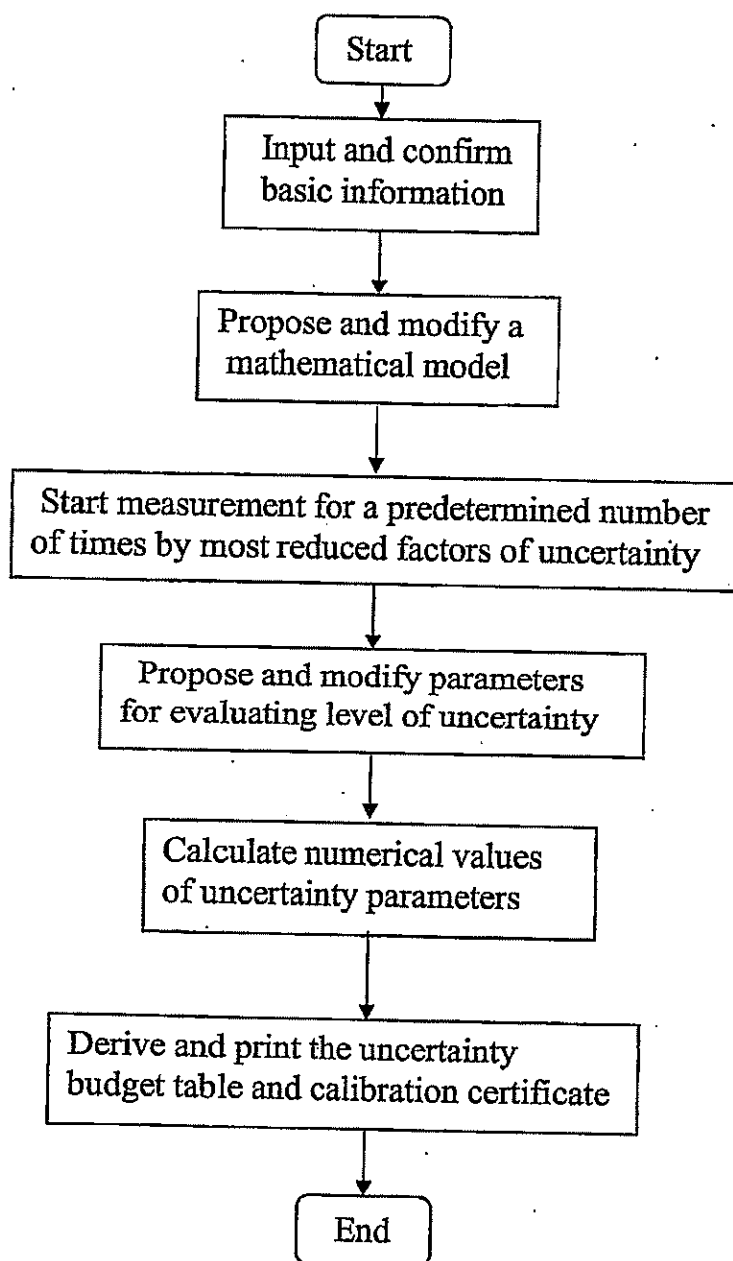


Figure 7

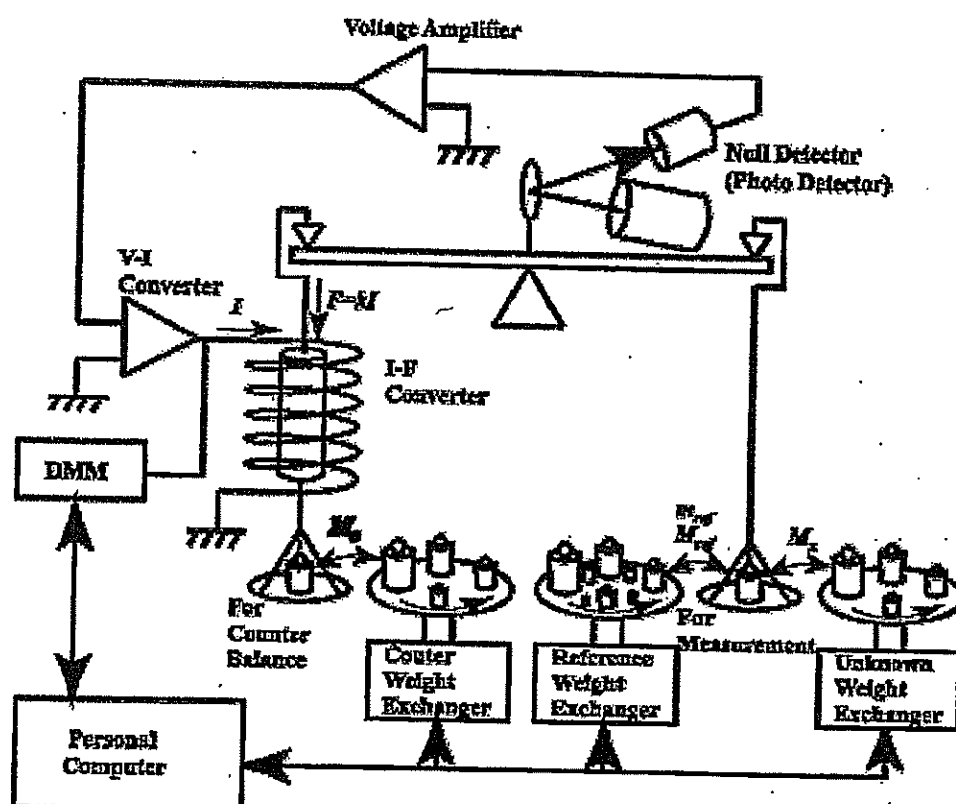


Figure 8

Model Component	Physical Meaning
M_x	Unknown weight mass under temperature $t_{temp} = T$
$(k/g)_0$	Electric current-mass conversion factor when external temperature $t = t_0$
$\Delta(k/g)_T$	Correction to $(k/g)_0$ based on the temperature difference between t_0 and T
$(I_x - I_{ref})_T$	Difference of feedback electric current of DMM when we put main reference weight and unknown weight on the balance table, respectively
$\Delta(I_x - I_{ref})_{lin.}$	Correction to non-linearity of DMM indication
ΔI_{res}	Resolution capability of DMM for electric current
M_c	Nominal value of counter weight mass
M_{ref}	Calibrated value of main reference weight by upper level calibration laboratory
ΔM_{buo}	Correction to the difference of buoyancy between main reference weight and unknown weight
m_{ref}	Mass of sub main reference weight to be used for the calibration
$(I_{cal} - I_{ref})_0$	Difference of feedback electric current when measuring electric current-mass conversion factor, adding sub-reference weight to main reference weight (external temperature $t = t_0$)

Figure 9