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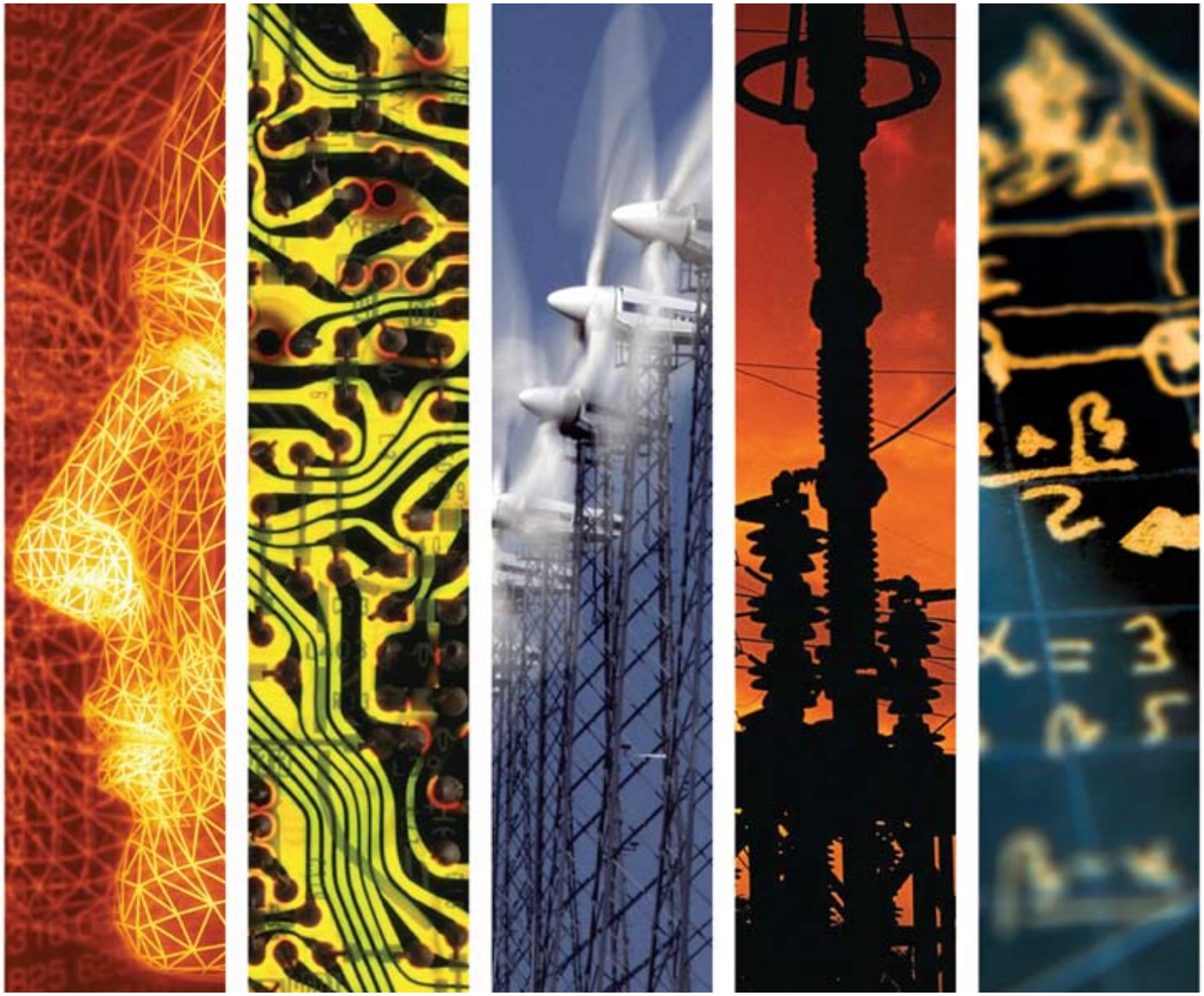
# Inspec numerical indexing on **Dialog**



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# Numerical Data Indexing on Dialog



## *Introduction*

Numerical Data Indexing is applied to Inspec records when numerical data appear in the original title or abstract, or are encountered in the normal processing of the original document, and where they appear important for computer-assisted retrieval.

Data are likely to be important for computer-assisted retrieval if they fall into any of the following categories:

a) Relevant and essential operating characteristics of actual or potential devices, instruments, equipment, machines or systems for which subject headings are assigned. Characteristics of particular importance include frequency, wavelength, power and energy.

b) Relevant and important criteria of effects, phenomena and processes for which subject headings are assigned. This is likely to be the experimental or operating conditions, measured values or observations. Temperature, pressure and frequency or wavelength are criteria of particular importance.

Only actual numbers are indexed. No attempt is made to index implied ranges such as “millimetre waves”, “UV region”, “VHF”, etc.

Inspec Numerical Data Indexing can be searched within records from 1987 onwards. Numerical information in the format used within the original document can also be found within the Inspec Free Indexing (or supplementary terms, uncontrolled terms, etc) field.

Each Numerical Data Indexing term has the following format:

Quantity Value (to Value) Unit where:

quantity represents the physical quantity, for example temperature,
unit is of the SI (**International System of Units)** type, for example metre (m),
value is the actual value or range expressed in floating point format.

## Numerical Data Indexing Thesaurus

The Numerical Data Indexing Thesaurus is used as an authority file to control the quantities and units appearing in the Inspec database. This booklet contains:

- The Inspec Numerical Data Indexing Thesaurus,
- An explanation of its entries,
- A table of multiplying prefixes.

The information in this booklet is intended to aid users in determining:

- which quantities to search for,
- which units their search data should be in,
- how to convert data to these units should their data be in other units, and
- how to use Inspec Numerical Data Indexing with each Inspec vendor search system.

## *1.0 Thesaurus Entries*

There are two types of entry within the Numerical Data Thesaurus:

### 1.1 Preferred Quantity/Unit

These are of the form:

Quantity : Unit (Name)
*Scope Note*
Unit Information

Where 'Quantity : Unit' is the preferred quantity and unit combination,
'Name' is the full name where 'unit' is an abbreviation,
'Scope Note' is any additional information on the use of this quantity,
'Unit Information' is information about units other than the preferred unit and how to convert data in these units to the preferred unit.

e.g. temperature : K (kelvin)
*Used for absolute temperatures and not temperature differences*
C *use* K [K = C + 273.15]
degC *use* K [K = degC + 273.15]
F *use* K [K = (F + 459.67) x 0.5555556]
degF *use* K [K = (degF + 459.67) x 0.5555556]
degK *use* K

All quantities were introduced at the start of 1987 unless a later start date is given, e.g. see Byte rate... 1989-.

Unit information can be of two types:

a) Unit Synonym Information: These point to preferred units from numerically identical units for preferred quantities. They are of the form:

Unit *use* Unit P

where Unit P is the preferred unit, e.g. degC *use* K.

b) Unit Conversion Information: These point to preferred units from other units for given quantities. The numerical relationship between the two units is given. These are of the form:

Unit L *use* Unit P [Unit P = F(Unit L)]

Where Unit L is the listed unit and Unit P is the preferred unit and [F(Unit L)] is the equation for converting Unit L into Unit P, e.g. degC *use* K [K = degC + 273.15]

### 1.2 Lead-in Entries

These entries point to preferred quantities from either units or non-preferred quantities. They are of the form either:

Quantity *use* Quantity P, e.g. electric potential use voltage, or,

Unit *see* Quantity P, e.g. hour *see* time

## *2.0 Thesaurus*

**age : yr** (year)
*Used for cosmological, geological, archaeological and biological time scales.*
**altitude : m** (metre)
*Measured from surface (liquid or solid) for Earth and all planetary bodies. Measured from photosphere for Sun. For negative values use depth.*
feet *use* m [m = feet x 0.3048]
yard *use* m [m = yard x 0.9144]
mile *use* m [m = mile x 1609.344]
amp *see* current
**apparent power : VA** (volt-amps)
*Used for power apparatus, equipment, etc. when power ratings or levels are given in VA.*
astronomical unit *see* heliocentric distance
atmosphere *see* pressure
**bandwidth : Hz** (hertz)
*Use frequency where specific ranges are given.*
bar *see* pressure
becquerel *see* radioactivity
bit *see* storage capacity or word length
**bit rate: bit/s** (bits per second)

*Used for digital communication rates given in bit/s.*

breadth *see* size

Byte *see* memory size

**byte rate : byte/s** (bytes per second)

*Used for digital communication rates given in Byte/s; 1989-*

calorie *see* energy

**capacitance : F** (farad)

celsius *see* temperature

centigrade *see* temperature

characters per second *see* printer speed

cm Hg *see* pressure

communications rate *use* bit rate or byte rate

**computer execution rate: IPS** (instructions per second)

**computer speed : FLOPS**

*Used for floating point operations per second.*

**conductance : S** (siemen)

*mho use S*

conductivity, electrical *use* electrical conductivity

coulomb per kilogram *see* radiation exposure

critical dimensions *use* size

curie *see* radioactivity

**current: A** (amp)

*Not used for accelerator beam currents.*

day *see* time

decibel *see* gain, loss or noise figure

degrees C, F, or K *see* temperature

**depth : m** (metre)

*Measured from surface (liquid or solid) for Earth and all planetary bodies. Measured from the photosphere (optical depth 1) for Sun. For negative values use "altitude".*

feet *use* m [m=feet x 0.3048]

yard *use* m [m = yard x 0.9144]

fathom *use* m [m=fathom x 1.8288]

mile *use* m [m=mile x 1609.344]

diameter *see* size

**distance : m** (metre)

feet *use* m [m=feet x 0.3048]

yard *use* m [m = yard x 0.9144]

fathom *use* m [m=fathom x 1.8288]

mile *use* m [m=mile x 1609.344]

Earth radii *see* geocentric distance

**efficiency : percent** (%)

*Not used for quantum efficiency.*

electric current *use* current

electric potential *use* voltage

**electrical conductivity : S/m** (siemens per metre)

mho/m *use* S/m

ohm $m^{-1}$ *use* S/m

electrical resistivity *use* resistivity

**electron volt energy : eV** (electron volt)

Used:
a) for atomic and molecular parameters,
b) for high energy cosmic radiation,
c) in nuclear and particle physics for device parameters, i.e. accelerators, beam transport equipment, etc.
Not used:
a) for projectile energies,
b) for level energies,
c) for particle masses.

emf *use* voltage

**energy : J** (joule)

cal *use* J [J = cal * 4.1868]
kWh *use* J [J = kWh * 3600000]

energy, electron volts *use* electron volt energy

eV energy *use* electron volt energy

farad *see* capacitance

fathom *see* depth

fahrenheit *see* temperature

feature size *use* size

feet *see* altitude, depth, distance or size

floating point operations per second *see* computer speed

flops *see* computer speed

**frequency : Hz** (hertz)

*Used for all waves: electromagnetic, acoustic, gravitational, etc.*

**gain : dB** (decibel)

*For negative values use loss.*

**galactic distance : pc** (parsec)

*Used for interstellar distances measured from solar system, not from galactic centre (not galactocentric distances), and for intergalactic distances. Within the solar system, use heliocentric distance.*

ly *use* pc [pc = ly * 0.3066]

gauss *see* magnetic flux density

**geocentric distance : m** (metre)

*Used for magnetospheric scale out to about 100 Earth radii. For atmospheric scale use altitude.*

AU *use* m [m = AU * 149597870000]
Earth radii *use* m [m=Earth radii * 6378140]

geological age *use* age

gram *see* mass

gray *see* radiation absorbed dose

heat *use* energy

height *use* size

**heliocentric distance : AU** (astronomical unit)

*For distances beyond the solar system use galactic distance.*

solar radii *use* AU [AU = solar radii * 0.00465424]

hertz *see* bandwidth or frequency

horsepower *see* power
hour *see* time
inch *see* distance or size
instructions per second *see* computer execution rate
joule *see* energy
joule per kilogram *see* radiation absorbed dose
K *see* memory size or temperature
kayser *see* wavelength
kelvin *see* temperature
kilogram force/m2 *see* pressure
kWh *see* energy
length *use* size
light year *see* galactic distance
**loss : dB** (decibel)
*Used for attenuation. For negative values use gain.*
**magnetic flux density : T** (tesla)
*1989-*
gauss *use* T [T = gauss * 0.0001]
Wb/m2 *use* T
**mass : kg** (kilogram)
*1989-*
oz *use* kg [kg = oz * 0.028349]
lb *use* kg [kg = lb * 0.45359237]
ton *use* kg [kg = ton * 1016.05]
tonne *use* kg [kg = tonne * 1000]
**memory size : byte**
K *use* byte [byte = K * 1024]
metre *see* altitude, depth, distance, geocentric distance, size or wavelength
mho *see* conductance
mho/m *see* electrical conductivity
mile *see* altitude, depth, distance or size
minute *see* time
mm Hg *see* pressure
newtons per square metre *see* pressure
**noise figure : dB** (decibel)
ohm *see* resistance
ohm metre *see* resistivity
ohm m-1 *see* electrical conductivity
optical loss *use* loss
ounce *see* mass
parsec *see* galactic distance
pascal *see* pressure
percent *see* efficiency
**picture size : pixel** (picture element)
pound *see* mass
**power : W** (watt)
hp *use* W [W = hp * 745.7]
power, apparent *use* apparent power

power, reactive *use* reactive power
**pressure : Pa** (pascal)
*Not used for partial pressure.*
atm *use* Pa [Pa = atm * 101325]
bar *use* Pa [Pa = bar * 100000]
cm Hg *use* Pa [Pa = cm Hg * 1333.22]
kgf/m2 *use* Pa [Pa = kgf/m2 * 9.80665]
lbf/in2 *use* Pa [Pa = lbf/in2 * 6894.76]
mm Hg *use* Pa [Pa = mm Hg * 133.322]
N/m2 *use* Pa
psi *use* Pa [Pa = psi * 6894.76]
torr *use* Pa [Pa = torr * 133.322]
**printer speed : cps** (characters per second)
psi *see* pressure
rad *see* radiation absorbed dose
**radiation absorbed dose : Gy** (gray)
J/kg *use* Gy
rad *use* Gy [Gy = rad * 0.01]
**radiation dose equivalent : Sv** (sievert)
rem *use* Sv [Sv = rem * 0.01]
**radiation exposure : C/kg** (coulomb per kilogramme)
roentgen *use* C/kg [C/kg = roentgen * 0.000258]
**radioactivity : Bq** (becquerel)
curie *use* Bq [Bq = curie * 37000000000]
radius *use* size
**reactive power : VAr** (volt-amp (reactive))
*Used for power apparatus, equipment, etc. when power ratings or levels are given in VAr.*
rem *see* radiation dose equivalent
**resistance : W** (ohm)
**resistivity : ohmm** (ohm metre)
roentgen *see* radiation exposure
sampling rate *use* frequency
second *see* time
siemens *see* conductance
siemens per metre *see* electrical conductivity
sievert *see* radiation dose equivalent
signal to noise ratio *use* noise figure
**size : m** (metre)
*Not used for elementary particle or nuclei size.*
inch *use* m [m = inch * 0.0254]
feet *use* m [m = feet * 0.3048]
yard *use* m [m = yard * 0.9144]
size, memory *use* memory size
size, picture *use* picture size
solar mass *see* stellar mass
solar radii *see* heliocentric distance
speed *use* velocity

**stellar mass : Msol** (solar mass)
*Used for stars only, i.e. not nebulae, star clusters, galaxies, etc.*
**storage capacity : bit**
**temperature : K** (kelvin)
*Used for absolute temperatures and not temperature differences.*
degC *use* K [K = degC + 273.15]
C *use* K [K = C + 273.15]
degF *use* K [K=(degF+459.67) * 0.5555556]
F *use* K [K = (F + 459.67) * 0.5555556]
degK *use* K
tesla *see* magnetic flux density
thickness *use* size
**time : s** (second)
minute *use* s [s = minute * 60]
hour *use* s [s = hour * 3600]
day *use* s [s = day * 86400]
week *use* s [s = week * 604800]
year *use* s [s = year * 31557600]
ton *see* mass
tonne *see* mass
torr *see* pressure
transmission speed *use* bit rate or byte rate
transconductance use conductance (if units are in S) or electrical conductivity (if units are in S/length)
**velocity : m/s** (metres per second)
*1989-*
volt-amp *see* apparent power
volt-amp (reactive) *see* reactive power
**voltage : V** (volt)
watt *see* power
wave number *see* wavelength
**wavelength : m** (metre)
*Used for all waves: electromagnetic, acoustic, gravitational, etc.*
*Used for fibre optical communications and related devices/equipment including the wavelengths of optical emitters and detectors.*
*If a wavelength is given as a wave number either in cm-1 or in kayser, then use the following to convert to wavelength in m:*
$cm^{-1}$ *use* m [m = $(1/cm^{-1})$ * 0.01]
kayser *use* m [m = (1/kayser) * 0.01]
webers per square metre *see* magnetic flux density
week *see* time
width *use* size
**word length : bit**
*Not used for ADC resolution.*
yard *see* altitude, depth, distance or size
year *see* age or time

## 2.1 Multiplying Prefixes

| Prefix | Abbrev. | Factor | Prefix | Abbrev. | Factor |
|---|---|---|---|---|---|
| exa | E | $10^{18}$ | deci | D | $10^{-01}$ |
| peta | P | $10^{15}$ | centi | c | $10^{-02}$ |
| tera | T | $10^{12}$ | milli | m | $10^{-03}$ |
| giga | G | $10^{09}$ | micro | mu | $10^{-06}$ |
| mega | M | $10^{06}$ | nano | n | $10^{-09}$ |
| kilo | k | $10^{03}$ | pico | p | $10^{-12}$ |
| hecto | h | $10^{02}$ | femto | f | $10^{-15}$ |
| deca | da | $10^{01}$ | atto | a | $10^{-18}$ |

The exception to this rule is in the area of computer memories, where their physical and logical layout means that their sizes are powers of 2. Thus, in specifications of memory size or storage capacity, the multiplying prefixes ‘K’, ‘M’ and ‘G’ have non-standard meanings as follows:

| Prefix | Multiplying Factor | As a power of 2 |
|---|---|---|
| K | 1,024 | $2^{10}$ |
| M | 1,048,576 | $2^{20}$ |
| G | 1,073,741,824 | $2^{30}$ |

Thus, a 64 KB memory will be numerically indexed as:

*memory size 6.6E+04 bytes*

because 6.6E+04 is 65536 to two significant figures.

# *3.0 Inspec Numerical Data Indexing Search Guide*

## 3.1 Table of Vendor Search Examples

| Inspec Vendor | Inspec Database including Numerical Data Indexing | Numerical Data Indexing Search Field | Numerical Data Indexing Search Examples |
|---|---|---|---|
| **Dialog** | 2 (1898 ->)<br>3 (1969 ->)<br>4 (1983 ->) | *Property*<br>use NI=<br><br>*Values/Ranges*<br>use individual fields* | S NI=WAVELENGTH<br><br>S TE=3.73E2<br>S TE=5.0E-02<br>S TE=3.73E2:5.33E2<br>S TE<5.33E02 (also >=, <=, >)<br>S LO=3.73E2(S)HI=5.33E2(S)NI=TEMPERATURE |

** For individual numerical indexing search fields, see the Table below, or the individual Vendor data sheet for Inspec.*

## 3.2 Table of Vendor-Specific Numerical Data Indexing Search Fields

| Quantity | Unit | Dialog |
|---|---|---|
| **age** | yr | AG= |
| **altitude** | m | AL= |
| **apparent power** | VA | AP= |
| **bandwidth** | Hz | BW= |
| **bit rate** | bit/s | BI= |
| **byte rate** | Byte/s | BY= |
| **capacitance** | F | CA= |
| **computer execution rate** | IPS | CE= |
| **computer speed** | FLOPS | CM= |
| **conductance** | S | CD= |
| **current** | A | CU= |
| **depth** | m | DP= |
| **distance** | m | DI= |
| **efficiency** | percent | EF= |
| **electrical conductivity** | S/m | EL= |
| **electron volt energy** | eV | EV= |
| **energy** | J | EN= |
| **frequency** | Hz | FR= |
| **gain** | dB | GA= |
| **galactic distance** | pc | GD= |
| **geocentric distance** | m | GE= |
| **heliocentric distance** | AU | HD= |
| **loss** | dB | LS= |
| **magnetic flux density** | T | MD= |
| **mass** | kg | MA= |
| **memory size** | Byte | MS= |
| **noise figure** | dB | NF= |
| **picture size** | pixel | PX= |
| **power** | W | PO= |

| Quantity | Unit | Dialog |
|---|---|---|
| **pressure** | Pa | PR= |
| **printer speed** | cps | PS= |
| **radiation absorbed dose** | Gy | RA= |
| **radiation dose equivalent** | Sv | RD= |
| **radiation exposure** | C/kg | RX= |
| **radioactivity** | Bq | RY= |
| **reactive power** | VAr | RP= |
| **resistance** | ohm | RE= |
| **resistivity** | ohmm | ER= |
| **size** | m | SI= |
| **stellar mass** | Msol | SM= |
| **storage capacity** | bit | SR= |
| **temperature** | K | TE= |
| **time** | s | TM= |
| **velocity** | m/s | VE= |
| **voltage** | V | VO= |
| **wavelength** | m | WA= |
| **word length** | bit | WL= |