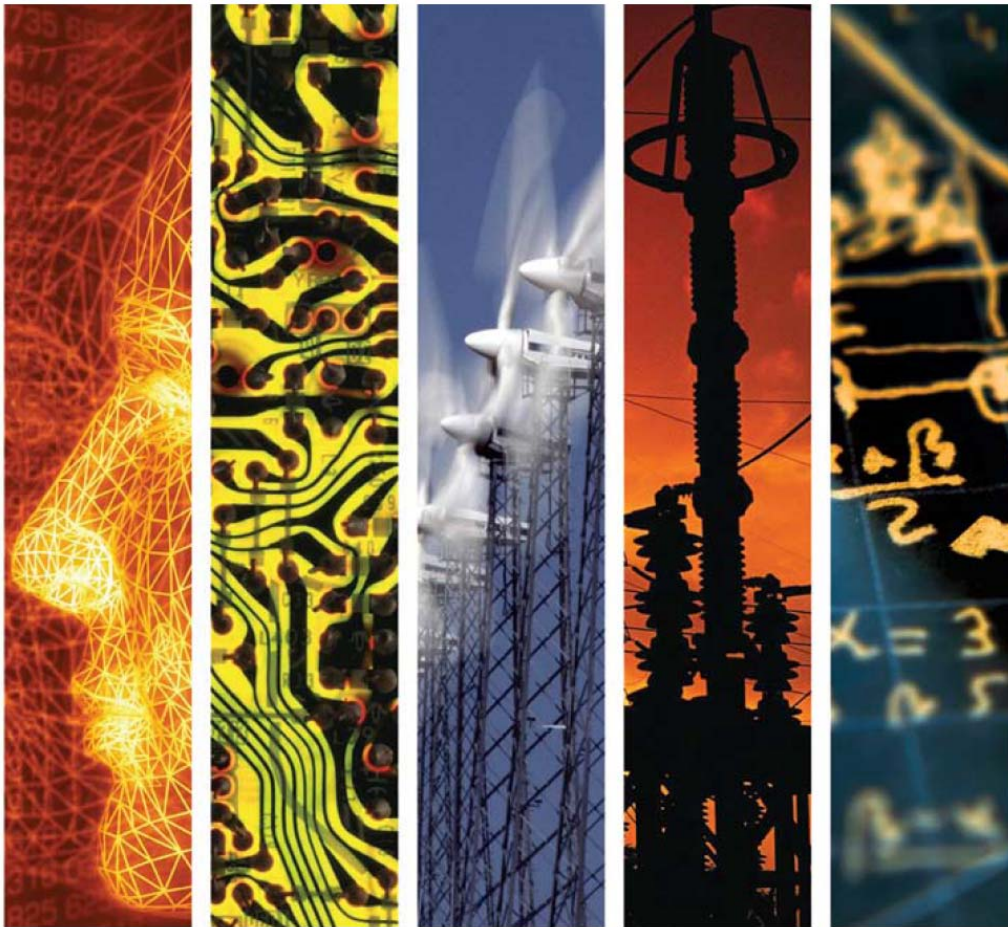


Numerical Indexing



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Numerical Data Indexing on STN

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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-amperes)

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 [$m = \text{feet} \times 0.3048$]

yard use m [$m = \text{yard} \times 0.9144$]

fathom use m [$m = \text{fathom} \times 1.8288$]

mile use m [$m = \text{mile} \times 1609.344$]

diameter see size

distance : m (metre)

feet use m [$m = \text{feet} \times 0.3048$]

yard use m [$m = \text{yard} \times 0.9144$]

fathom use m [$m = \text{fathom} \times 1.8288$]

mile use m [$m = \text{mile} \times 1609.344$]

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 [$J = \text{cal} \times 4.1868$]

kWh use J [$J = \text{kWh} \times 3600000$]

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 [$\text{pc} = \text{ly} * 0.3066$]

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 [$\text{m} = \text{AU} * 149597870000$]

Earth radii use m [$\text{m} = \text{Earth radii} * 6378140$]

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 [$\text{AU} = \text{solar radii} * 0.00465424$]

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 [$\text{T} = \text{gauss} * 0.0001$]

Wb/m² use T

mass : kg (kilogram)

1989-

oz use kg [$\text{kg} = \text{oz} * 0.028349$]

lb use kg [$\text{kg} = \text{lb} * 0.45359237$]

ton use kg [$\text{kg} = \text{ton} * 1016.05$]

tonne use kg [$\text{kg} = \text{tonne} * 1000$]

memory size : byte

K use byte [$\text{byte} = \text{K} * 1024$]

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 [$W = \text{hp} \times 745.7$]

power, apparent *use* apparent power

power, reactive *use* reactive power

pressure : Pa (pascal)

Not used for partial pressure.

atm *use* Pa [$\text{Pa} = \text{atm} \times 101325$]

bar *use* Pa [$\text{Pa} = \text{bar} \times 100000$]

cm Hg *use* Pa [$\text{Pa} = \text{cm Hg} \times 1333.22$]

kgf/m² *use* Pa [$\text{Pa} = \text{kgf/m}^2 \times 9.80665$]

lbf/in² *use* Pa [$\text{Pa} = \text{lbf/in}^2 \times 6894.76$]

mm Hg *use* Pa [$\text{Pa} = \text{mm Hg} \times 133.322$]

N/m² *use* Pa

psi *use* Pa [$\text{Pa} = \text{psi} \times 6894.76$]

torr *use* Pa [$\text{Pa} = \text{torr} \times 133.322$]

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 [$\text{Gy} = \text{rad} \times 0.01$]

radiation dose equivalent : Sv (sievert)

rem *use* Sv [$\text{Sv} = \text{rem} \times 0.01$]

radiation exposure : C/kg (coulomb per kilogramme)

roentgen *use* C/kg [$\text{C/kg} = \text{roentgen} \times 0.000258$]

radioactivity : Bq (becquerel)

curie *use* Bq [$\text{Bq} = \text{curie} \times 37000000000$]

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 [$m = \text{inch} \times 0.0254$]

feet *use* m [$m = \text{feet} \times 0.3048$]

yard *use* m [$m = \text{yard} \times 0.9144$]

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 [$K = \text{degC} + 273.15$]

C *use* K [$K = C + 273.15$]

degF *use* K [$K = (\text{degF} + 459.67) \times 0.5555556$]

F *use* K [$K = (F + 459.67) \times 0.5555556$]

degK *use* K

tesla *see* magnetic flux density

thickness *use* size

time : s (second)

minute *use* s [$s = \text{minute} \times 60$]

hour *use* s [$s = \text{hour} \times 3600$]

day *use* s [$s = \text{day} \times 86400$]

week *use* s [$s = \text{week} \times 604800$]

year *use* s [$s = \text{year} \times 31557600$]

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 STN Search Examples

Inspec Vendor	Inspec Database including Numerical Data Indexing	Numerical Data Indexing Search Field	Numerical Data Indexing Search Examples
STN	Inspec	<i>Property or Unit use /PHP</i> <i>Values/Ranges use individual fields*</i>	S WAVELENGTH/PHP <i>N.B: Online thesaurus available for /PHP</i> <i>e.g. E FREQUENCY/PHP.</i> <i>Unit can be reset using SET UNIT. (eg. Enter temperature in Degrees C instead of K)</i> S 3.73E02/TEMP S 3.73E2-5.33E2/TEMP S TEMP>3.73E+02 (also >=, <=, <) S TEMP<3.73E-02

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

3.2 Table of STN-Specific Numerical Data Indexing Search Fields

Quantity	Unit	STN
age	yr	/AGE
altitude	m	/ALT
apparent power	VA	/POA
bandwidth	Hz	/BAW
bit rate	bit/s	/BIR
byte rate	Byte/s	/BYR
capacitance	F	/CAP
computer execution rate	IPS	/COE
computer speed	FLOPS	/COS
conductance	S	/CON
current	A	/CUR
depth	m	/DEP
distance	m	/DIS
efficiency	percent	/EFF
electrical conductivity	S/m	/ECND
electron volt energy	eV	/EEV
energy	J	/ENE
frequency	Hz	/FRE
gain	dB	/GAI
galactic distance	pc	/GAD
geocentric distance	m	/GED
heliocentric distance	AU	/HED
loss	dB	/LOS

magnetic flux density	T	/MFD
mass	kg	/M
memory size	Byte	/MES
noise figure	dB	/NOF
picture size	pixel	/PIS
power	W	/POW
pressure	Pa	/PRES
printer speed	cps	/PRSP
radiation absorbed dose	Gy	/RADA
radiation dose equivalent	Sv	/RADE
radiation exposure	C/kg	/RAE
radioactivity	Bq	/RAD
reactive power	VAr	/POR
resistance	ohm	/RES
resistivity	ohmm	/EREST
size	m	/SIZ
stellar mass	Msol	/STM
storage capacity	bit	/SCA
temperature	K	/TEMP
time	s	/TIM
velocity	m/s	/VEL
voltage	V	/VOLT
wavelength	m	/WVL
word length	bit	/WOL