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Engineering Unit Conversion Chart Pack

Engineering factors, pressure, power and length charts in one printable PDF

For: Engineers, technicians, students and workshops

allunitconversions.com/charts/engineering-pack
By Miguel Coelho · Edition 2.0
9 November 2026

Four reference sheets for the desk, workshop or classroom: everyday engineering multiply-by factors with SI prefixes, a pressure chart (psi, kPa, bar, atm, MPa, Torr), a power chart (W, kW, hp, BTU/h, tons of refrigeration) and a length chart (metric, imperial and nautical). Each sheet is also available on its own.

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allunitconversions.com/engineering-conversion-chart

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allunitconversions.com/pressure-conversion-chart

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allunitconversions.com/power-conversion-chart

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allunitconversions.com/length-conversion-chart

Conversion values in this pack are generated by the AllUnitConversions conversion library and automatically checked against exact definitions (NIST SP 811, BIPM SI Brochure, 1959 International Yard and Pound Agreement) before the PDF is produced. Reference data taken from standards and regulations is cited to its source on each sheet. Free to print, copy and share with attribution (CC BY 4.0).

Printing tip: print double-sided and staple at the top left, or print single sheets from each chart's own page.

Engineering Conversion Chart

Multiply-by factors for the units engineers convert every day, with SI prefixes

For: Mechanical, civil, HVAC and process engineers; technicians and students

allunitconversions.com/engineering-conversion-chart
By Miguel Coelho · Edition 2.0
9 November 2026

EXACT DEFINITION	FORMULA	REVERSE	WORKED EXAMPLE
All factors derive from 1 in = 25.4 mm, 1 lb = 0.453 592 37 kg and g_0 = 9.806 65 m/s²	value in "To" units = value × factor	value in "From" units = value ÷ factor	250 psi × 6.894 757 = 1,723.7 kPa

Factors are given to 7 significant figures.

Conversion factors

From	To	Multiply by	Typical use
Inches (in)	Millimetres (mm)	25.4	Drawings, fasteners
Feet (ft)	Metres (m)	0.3048	Site dimensions
Miles (mi)	Kilometres (km)	1.609344	Distances
Nautical miles (nmi)	Kilometres (km)	1.852	Marine, aviation
Square inches (in²)	Square centimetres (cm²)	6.4516	Cross-sections
Square feet (ft²)	Square metres (m²)	0.09290304	Floor areas
Acres (ac)	Hectares (ha)	0.4046856	Land
Cubic inches (in³)	Cubic centimetres (cm³)	16.38706	Engine displacement
Cubic feet (ft³)	Litres (L)	28.31685	Tanks, rooms
US gallons (US gal)	Litres (L)	3.785412	US liquids
UK gallons (UK gal)	Litres (L)	4.54609	UK liquids
Pounds (lb)	Kilograms (kg)	0.4535924	Mass
Pound-force (lbf)	Newtons (N)	4.448222	Loads
Kips (kip)	Kilonewtons (kN)	4.448222	Structural loads
Kilogram-force (kgf)	Newtons (N)	9.80665	Legacy metric loads
psi (psi)	Kilopascals (kPa)	6.894757	Hydraulics, tyres
psi (psi)	Bar (bar)	0.06894757	Gauges
Bar (bar)	Kilopascals (kPa)	100	Gauges
Atmospheres (atm)	Kilopascals (kPa)	101.325	Standard atmosphere
Pound-force feet (lbf·ft)	Newton-metres (N·m)	1.355818	Bolt torque
Foot-pounds (ft·lbf)	Joules (J)	1.355818	Work, impact
British thermal units (BTU)	Kilojoules (kJ)	1.055056	Heat
Kilowatt-hours (kWh)	Megajoules (MJ)	3.6	Electricity
Therms (thm)	Kilowatt-hours (kWh)	29.30711	Gas billing
Horsepower (mech.) (hp)	Kilowatts (kW)	0.7456999	Motors, engines
BTU per hour (BTU/h)	Watts (W)	0.2930711	HVAC capacity
Tons of refrigeration (RT)	Kilowatts (kW)	3.516853	Chillers
Miles per hour (mph)	Kilometres per hour (km/h)	1.609344	Vehicles
Knots (kn)	Kilometres per hour (km/h)	1.852	Marine, aviation
Feet per second (ft/s)	Metres per second (m/s)	0.3048	Fluid velocity
US gallons per minute (US gpm)	Litres per minute (L/min)	3.785412	Pumps
Cubic feet per minute (CFM)	Cubic metres per hour (m³/h)	1.699011	Air flow

Temperature

Conversion	Formula
°C to °F	°F = °C × 1.8 + 32
°F to °C	°C = (°F − 32) ÷ 1.8
°C to K	K = °C + 273.15
°F to °R	°R = °F + 459.67
Temperature difference	1 K = 1 °C = 1.8 °F = 1.8 °R

SI prefixes

Prefix	Symbol	Factor	Prefix	Symbol	Factor
quetta	Q	10^{30}	deci	d	10^{-1}
ronna	R	10^{27}	centi	c	10^{-2}
yotta	Y	10^{24}	milli	m	10^{-3}
zetta	Z	10^{21}	micro	µ	10^{-6}
exa	E	10^{18}	nano	n	10^{-9}
peta	P	10^{15}	pico	p	10^{-12}
tera	T	10^{12}	femto	f	10^{-15}
giga	G	10^{9}	atto	a	10^{-18}
mega	M	10^{6}	zepto	z	10^{-21}
kilo	k	10^{3}	yocto	y	10^{-24}
hecto	h	10^{2}	ronto	r	10^{-27}
deca	da	10^{1}	quecto	q	10^{-30}

Sources and method

- **International Yard and Pound Agreement (1959)** — 1 in = 25.4 mm, 1 ft = 0.3048 m, 1 lb = 0.453 592 37 kg exactly
- **NIST Special Publication 811** — Guide for the Use of the International System of Units (www.nist.gov/pml/special-publication-811)
- **BIPM SI Brochure, 9th edition** — Definitions of the SI units, including the kelvin (www.bipm.org/en/publications/si-brochure)

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Pressure Conversion Chart

psi, kPa, bar, atm, Pa, MPa, mbar and Torr

For: Engineers, HVAC technicians, mechanics and cyclists

allunitconversions.com/pressure-conversion-chart
By Miguel Coelho · Edition 2.0
9 November 2026

EXACT DEFINITION	FORMULA	REVERSE	WORKED EXAMPLE
1 bar = 100 kPa; 1 atm = 101.325 kPa; 1 psi = 6.894 757 kPa	kPa = psi × 6.894 757	psi = kPa ÷ 6.894 757; psi = bar × 14.503 77	32 psi × 6.894757 = 220.6 kPa = 2.206 bar

Matrix values use 6 significant figures; tables are rounded as shown.

Factor matrix — 1 unit in every other unit

1 unit =	Pa	kPa	MPa	bar	mbar	atm	psi	Torr
1 Pa	1	0.001	1×10^{-6}	1×10^{-5}	0.01	9.86923×10^{-6}	1.45038×10^{-4}	0.00750062
1 kPa	1,000	1	0.001	0.01	10	0.00986923	0.145038	7.50062
1 MPa	1×10^{6}	1,000	1	10	10,000	9.86923	145.038	7,500.62
1 bar	100,000	100	0.1	1	1,000	0.986923	14.5038	750.062
1 mbar	100	0.1	1×10^{-4}	0.001	1	9.86923×10^{-4}	0.0145038	0.750062
1 atm	101,325	101.325	0.101325	1.01325	1,013.25	1	14.6959	760
1 psi	6,894.76	6.89476	0.00689476	0.0689476	68.9476	0.068046	1	51.7149
1 Torr	133.322	0.133322	1.33322×10^{-4}	0.00133322	1.33322	0.00131579	0.0193368	1

psi to kPa and bar (tyres, HVAC, hydraulics)

psi (psi)	Kilopascals (kPa)	Bar (bar)	psi (psi)	Kilopascals (kPa)	Bar (bar)	psi (psi)	Kilopascals (kPa)	Bar (bar)
1	6.9	0.069	**19**	131.0	1.310	**65**	448.2	4.482
2	13.8	0.138	**20**	137.9	1.379	**70**	482.6	4.826
3	20.7	0.207	**21**	144.8	1.448	**75**	517.1	5.171
4	27.6	0.276	**22**	151.7	1.517	**80**	551.6	5.516
5	34.5	0.345	**23**	158.6	1.586	**85**	586.1	5.861
6	41.4	0.414	**24**	165.5	1.655	**90**	620.5	6.205
7	48.3	0.483	**25**	172.4	1.724	**95**	655.0	6.550
8	55.2	0.552	**26**	179.3	1.793	**100**	689.5	6.895
9	62.1	0.621	**27**	186.2	1.862	**105**	723.9	7.239
10	68.9	0.689	**28**	193.1	1.931	**110**	758.4	7.584
11	75.8	0.758	**29**	199.9	1.999	**115**	792.9	7.929
12	82.7	0.827	**30**	206.8	2.068	**120**	827.4	8.274
13	89.6	0.896	**35**	241.3	2.413	**125**	861.8	8.618
14	96.5	0.965	**40**	275.8	2.758	**130**	896.3	8.963
15	103.4	1.034	**45**	310.3	3.103	**135**	930.8	9.308
16	110.3	1.103	**50**	344.7	3.447	**140**	965.3	9.653
17	117.2	1.172	**55**	379.2	3.792	**145**	999.7	9.997
18	124.1	1.241	**60**	413.7	4.137	**150**	1,034.2	10.342

bar to psi and kPa

Bar (bar)	psi (psi)	Kilopascals (kPa)	Bar (bar)	psi (psi)	Kilopascals (kPa)
0.5	7.25	50	**10.5**	152.29	1,050
1.0	14.50	100	**11.0**	159.54	1,100

Bar (bar)	psi (psi)	Kilopascals (kPa)
1.5	21.76	150
2.0	29.01	200
2.5	36.26	250
3.0	43.51	300
3.5	50.76	350
4.0	58.02	400
4.5	65.27	450
5.0	72.52	500
5.5	79.77	550
6.0	87.02	600
6.5	94.27	650
7.0	101.53	700
7.5	108.78	750
8.0	116.03	800
8.5	123.28	850
9.0	130.53	900
9.5	137.79	950
10.0	145.04	1,000

Bar (bar)	psi (psi)	Kilopascals (kPa)
11.5	166.79	1,150
12.0	174.05	1,200
12.5	181.30	1,250
13.0	188.55	1,300
13.5	195.80	1,350
14.0	203.05	1,400
14.5	210.30	1,450
15.0	217.56	1,500
15.5	224.81	1,550
16.0	232.06	1,600
16.5	239.31	1,650
17.0	246.56	1,700
17.5	253.82	1,750
18.0	261.07	1,800
18.5	268.32	1,850
19.0	275.57	1,900
19.5	282.82	1,950
20.0	290.08	2,000

Sources and method

- **BIPM SI Brochure, 9th edition** — Definitions of the SI units, including the kelvin (www.bipm.org/en/publications/si-brochure)
- **NIST Special Publication 811** — Guide for the Use of the International System of Units (www.nist.gov/pml/special-publication-811)

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Power Conversion Chart

Watts, kilowatts, horsepower, BTU/h and tons of refrigeration

For: Engineers, HVAC technicians, electricians and mechanics

allunitconversions.com/power-conversion-chart
By Miguel Coelho · Edition 2.0
9 November 2026

EXACT DEFINITION	FORMULA	REVERSE	WORKED EXAMPLE
1 hp = 745.699 872 W; 1 BTU/h = 0.293 071 W; 1 RT = 12,000 BTU/h	kW = hp × 0.7457; W = BTU/h × 0.293 071	hp = kW ÷ 0.7457; BTU/h = W × 3.412 14	A 12,000 BTU/h air conditioner = 3.517 kW = 1 RT

Matrix values use 6 significant figures; tables are rounded as shown.

Factor matrix — 1 unit in every other unit

1 unit =	W	kW	MW	hp	PS	BTU/h	RT
1 W	1	0.001	1×10^{-6}	0.00134102	0.00135962	3.41214	2.84345×10^{-4}
1 kW	1,000	1	0.001	1.34102	1.35962	3,412.14	0.284345
1 MW	1×10^{6}	1,000	1	1,341.02	1,359.62	3.41214×10^{6}	284.345
1 hp	745.7	0.7457	7.457×10^{-4}	1	1.01387	2,544.43	0.212036
1 PS	735.499	0.735499	7.35499×10^{-4}	0.98632	1	2,509.63	0.209135
1 BTU/h	0.293071	2.93071×10^{-4}	2.93071×10^{-7}	3.93015×10^{-4}	3.98466×10^{-4}	1	8.33333×10^{-5}
1 RT	3,516.85	3.51685	0.00351685	4.71618	4.78159	12,000	1

Horsepower to kilowatts

Horsepower (mech.) (hp)	Kilowatts (kW)	Horsepower (mech.) (hp)	Kilowatts (kW)	Horsepower (mech.) (hp)	Kilowatts (kW)	Horsepower (mech.) (hp)	Kilowatts (kW)
1	0.75	**12**	8.95	**35**	26.10	**90**	67.11
2	1.49	**13**	9.69	**40**	29.83	**95**	70.84
3	2.24	**14**	10.44	**45**	33.56	**100**	74.57
4	2.98	**15**	11.19	**50**	37.28	**150**	111.85
5	3.73	**16**	11.93	**55**	41.01	**200**	149.14
6	4.47	**17**	12.68	**60**	44.74	**250**	186.42
7	5.22	**18**	13.42	**65**	48.47	**300**	223.71
8	5.97	**19**	14.17	**70**	52.20	**350**	260.99
9	6.71	**20**	14.91	**75**	55.93	**400**	298.28
10	7.46	**25**	18.64	**80**	59.66	**450**	335.56
11	8.20	**30**	22.37	**85**	63.38	**500**	372.85

BTU per hour to watts and tons of refrigeration

BTU per hour (BTU/h)	Watts (W)	Tons of refrigeration (RT)	BTU per hour (BTU/h)	Watts (W)	Tons of refrigeration (RT)
1,000	293	0.08	**18,000**	5,275	1.50
2,000	586	0.17	**24,000**	7,034	2.00
5,000	1,465	0.42	**30,000**	8,792	2.50
6,000	1,758	0.50	**36,000**	10,551	3.00
8,000	2,345	0.67	**42,000**	12,309	3.50
9,000	2,638	0.75	**48,000**	14,067	4.00
10,000	2,931	0.83	**60,000**	17,584	5.00
12,000	3,517	1.00	**100,000**	29,307	8.33
15,000	4,396	1.25			

Sources and method

- **NIST Special Publication 811** — Guide for the Use of the International System of Units (www.nist.gov/pml/special-publication-811)

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Length Conversion Chart

Metric, imperial and nautical lengths with a full factor matrix

For: Students, engineers, builders and travellers

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By Miguel Coelho · Edition 2.0
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EXACT DEFINITION	FORMULA	REVERSE	WORKED EXAMPLE
1 in = 25.4 mm; 1 ft = 0.3048 m; 1 mi = 1.609 344 km; 1 nmi = 1852 m	m = ft × 0.3048; km = mi × 1.609 344	ft = m ÷ 0.3048; mi = km ÷ 1.609 344	6 ft = 72 in = 1.8288 m

Matrix values use 6 significant figures; tables are rounded as shown.

Factor matrix — 1 unit in every other unit

1 unit =	mm	cm	m	km	in	ft	yd	mi	nmi
1 mm	1	0.1	0.001	1×10^{-6}	0.0393701	0.00328084	0.00109361	6.21371×10^{-7}	5.39957×10^{-7}
1 cm	10	1	0.01	1×10^{-5}	0.393701	0.0328084	0.0109361	6.21371×10^{-6}	5.39957×10^{-6}
1 m	1,000	100	1	0.001	39.3701	3.28084	1.09361	6.21371×10^{-4}	5.39957×10^{-4}
1 km	1×10^{6}	100,000	1,000	1	39,370.1	3,280.84	1,093.61	0.621371	0.539957
1 in	25.4	2.54	0.0254	2.54×10^{-5}	1	0.0833333	0.0277778	1.57828×10^{-5}	1.37149×10^{-5}
1 ft	304.8	30.48	0.3048	3.048×10^{-4}	12	1	0.333333	1.89394×10^{-4}	1.64579×10^{-4}
1 yd	914.4	91.44	0.9144	9.144×10^{-4}	36	3	1	5.68182×10^{-4}	4.93737×10^{-4}
1 mi	1.60934×10^{6}	160,934	1,609.34	1.60934	63,360	5,280	1,760	1	0.868976
1 nmi	1.852×10^{6}	185,200	1,852	1.852	72,913.4	6,076.12	2,025.37	1.15078	1

Inches to centimetres and millimetres

Inches (in)	Centimetres (cm)	Millimetres (mm)	Inches (in)	Centimetres (cm)	Millimetres (mm)	Inches (in)	Centimetres (cm)	Millimetres (mm)
1	2.54	25.4	**17**	43.18	431.8	**33**	83.82	838.2
2	5.08	50.8	**18**	45.72	457.2	**34**	86.36	863.6
3	7.62	76.2	**19**	48.26	482.6	**35**	88.90	889.0
4	10.16	101.6	**20**	50.80	508.0	**36**	91.44	914.4
5	12.70	127.0	**21**	53.34	533.4	**37**	93.98	939.8
6	15.24	152.4	**22**	55.88	558.8	**38**	96.52	965.2
7	17.78	177.8	**23**	58.42	584.2	**39**	99.06	990.6
8	20.32	203.2	**24**	60.96	609.6	**40**	101.60	1,016.0
9	22.86	228.6	**25**	63.50	635.0	**41**	104.14	1,041.4
10	25.40	254.0	**26**	66.04	660.4	**42**	106.68	1,066.8
11	27.94	279.4	**27**	68.58	685.8	**43**	109.22	1,092.2
12	30.48	304.8	**28**	71.12	711.2	**44**	111.76	1,117.6
13	33.02	330.2	**29**	73.66	736.6	**45**	114.30	1,143.0
14	35.56	355.6	**30**	76.20	762.0	**46**	116.84	1,168.4
15	38.10	381.0	**31**	78.74	787.4	**47**	119.38	1,193.8
16	40.64	406.4	**32**	81.28	812.8	**48**	121.92	1,219.2

Feet to metres

Feet (ft)	Metres (m)	Feet (ft)	Metres (m)	Feet (ft)	Metres (m)	Feet (ft)	Metres (m)
1	0.305	**16**	4.877	**31**	9.449	**46**	14.021
2	0.610	**17**	5.182	**32**	9.754	**47**	14.326
3	0.914	**18**	5.486	**33**	10.058	**48**	14.630

Feet (ft)	Metres (m)	Feet (ft)	Metres (m)	Feet (ft)	Metres (m)	Feet (ft)	Metres (m)
4	1.219	**19**	5.791	**34**	10.363	**49**	14.935
5	1.524	**20**	6.096	**35**	10.668	**50**	15.240
6	1.829	**21**	6.401	**36**	10.973	**51**	15.545
7	2.134	**22**	6.706	**37**	11.278	**52**	15.850
8	2.438	**23**	7.010	**38**	11.582	**53**	16.154
9	2.743	**24**	7.315	**39**	11.887	**54**	16.459
10	3.048	**25**	7.620	**40**	12.192	**55**	16.764
11	3.353	**26**	7.925	**41**	12.497	**56**	17.069
12	3.658	**27**	8.230	**42**	12.802	**57**	17.374
13	3.962	**28**	8.534	**43**	13.106	**58**	17.678
14	4.267	**29**	8.839	**44**	13.411	**59**	17.983
15	4.572	**30**	9.144	**45**	13.716	**60**	18.288

Miles to kilometres and nautical miles

Miles (mi)	Kilometres (km)	Nautical miles (nmi)	Miles (mi)	Kilometres (km)	Nautical miles (nmi)
1	1.61	0.87	**30**	48.28	26.07
2	3.22	1.74	**35**	56.33	30.41
3	4.83	2.61	**40**	64.37	34.76
4	6.44	3.48	**45**	72.42	39.10
5	8.05	4.34	**50**	80.47	43.45
6	9.66	5.21	**55**	88.51	47.79
7	11.27	6.08	**60**	96.56	52.14
8	12.87	6.95	**65**	104.61	56.48
9	14.48	7.82	**70**	112.65	60.83
10	16.09	8.69	**75**	120.70	65.17
11	17.70	9.56	**80**	128.75	69.52
12	19.31	10.43	**85**	136.79	73.86
13	20.92	11.30	**90**	144.84	78.21
14	22.53	12.17	**95**	152.89	82.55
15	24.14	13.03	**100**	160.93	86.90
16	25.75	13.90	**150**	241.40	130.35
17	27.36	14.77	**200**	321.87	173.80
18	28.97	15.64	**250**	402.34	217.24
19	30.58	16.51	**500**	804.67	434.49
20	32.19	17.38	**1,000**	1,609.34	868.98
25	40.23	21.72			

Sources and method

- **International Yard and Pound Agreement (1959)** — 1 in = 25.4 mm, 1 ft = 0.3048 m, 1 lb = 0.453 592 37 kg exactly
- **NIST Special Publication 811** — Guide for the Use of the International System of Units (www.nist.gov/pml/special-publication-811)
- **BIPM SI Brochure, 9th edition** — Definitions of the SI units, including the kelvin (www.bipm.org/en/publications/si-brochure)

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