

# Conversion Table of commonly used pressure units

WIKA Data Sheet IN 00.08

## SI Units - Engineering units (based on the metre)

		SI units						Engineering units						
		to	bar	mbar	µbar	Pa	kPa	MPa	mmHg	mmWS	mWS	kp/mm <sup>2</sup>	kp/cm <sup>2</sup>	atm
		from												
SI units	1 bar	1	10 <sup>3</sup>	10 <sup>6</sup>	10 <sup>5</sup>	100	0.1	750.064	10.1972 · 10 <sup>3</sup>	10.1972	10.1972 · 10 <sup>-3</sup>	1.01972	0.986923	
	1 mbar	10 <sup>-3</sup>	1	10 <sup>3</sup>	100	0.1	0.1 · 10 <sup>-3</sup>	750.064 · 10 <sup>-3</sup>	10.1972	10.1972 · 10 <sup>-3</sup>	10.1972 · 10 <sup>-6</sup>	1.01972 · 10 <sup>-3</sup>	0.986923 · 10 <sup>-3</sup>	
	1 µbar	10 <sup>-6</sup>	10 <sup>-3</sup>	1	0.1	0.1 · 10 <sup>-3</sup>	0.1 · 10 <sup>-6</sup>	750.064 · 10 <sup>-6</sup>	10.1972 · 10 <sup>-3</sup>	10.1972 · 10 <sup>-6</sup>	10.1972 · 10 <sup>-9</sup>	1.01972 · 10 <sup>-6</sup>	0.986923 · 10 <sup>-6</sup>	
	1 Pa	10 <sup>-5</sup>	0.01	10	1	10 <sup>-3</sup>	10 <sup>-6</sup>	7.50064 · 10 <sup>-3</sup>	101.972 · 10 <sup>-3</sup>	101.972 · 10 <sup>-6</sup>	101.972 · 10 <sup>-9</sup>	10.1972 · 10 <sup>-6</sup>	9.86923 · 10 <sup>-6</sup>	
	1 kPa	0.01	10	10 · 10 <sup>3</sup>	10 <sup>3</sup>	1	10 <sup>-3</sup>	7.50064	101.972	101.972 · 10 <sup>-3</sup>	101.972 · 10 <sup>-6</sup>	10.1972 · 10 <sup>-3</sup>	0.986923 · 10 <sup>-3</sup>	
	1 MPa	10	10 · 10 <sup>3</sup>	10 · 10 <sup>6</sup>	10 <sup>6</sup>	10 <sup>3</sup>	1	7.50064 · 10 <sup>3</sup>	101.972 · 10 <sup>3</sup>	101.972	101.972 · 10 <sup>-3</sup>	10.1972 · 10 <sup>-3</sup>	9.86923	
Engineering units	1 mmHg	1.33322 · 10 <sup>-3</sup>	1.33322	1.33322 · 10 <sup>3</sup>	133.322	133.322 · 10 <sup>-3</sup>	133.322 · 10 <sup>-6</sup>	1	13.5951	13.5951 · 10 <sup>-3</sup>	13.5951 · 10 <sup>-6</sup>	1.35951 · 10 <sup>-3</sup>	1.31579 · 10 <sup>-3</sup>	
	1 mmWS	98.0665 · 10 <sup>-6</sup>	98.0665 · 10 <sup>-3</sup>	98.0665	9.80665	9.80665 · 10 <sup>-3</sup>	9.80665 · 10 <sup>-6</sup>	73.5561 · 10 <sup>-3</sup>	1	10 <sup>-3</sup>	10 <sup>-6</sup>	0.1 · 10 <sup>-3</sup>	96.7841 · 10 <sup>-6</sup>	
	1 mWS	98.0665 · 10 <sup>-3</sup>	98.0665	98.0665 · 10 <sup>3</sup>	9.80665 · 10 <sup>3</sup>	9.80665	9.80665 · 10 <sup>-3</sup>	73.5561	10 <sup>3</sup>	1	10 <sup>-3</sup>	0.1	96.7841 · 10 <sup>-3</sup>	
	1 kp/mm <sup>2</sup>	98.0665	98.0665 · 10 <sup>3</sup>	98.0665 · 10 <sup>6</sup>	9.80665 · 10 <sup>6</sup>	9.80665 · 10 <sup>3</sup>	9.80665	73.5561 · 10 <sup>3</sup>	10 <sup>6</sup>	10 <sup>3</sup>	1	100	96.7841	
	1 kp/cm <sup>2</sup>	0.980665	0.980665 · 10 <sup>3</sup>	0.980665 · 10 <sup>6</sup>	98.0665 · 10 <sup>3</sup>	98.0665	98.0665 · 10 <sup>-3</sup>	735.561	10 · 10 <sup>3</sup>	10	0.01	1	0.967841	
	1 atm	1.01325	1.01325 · 10 <sup>3</sup>	1.01325 · 10 <sup>6</sup>	101.325 · 10 <sup>3</sup>	101.325	101.325 · 10 <sup>-3</sup>	760	10.3323 · 10 <sup>3</sup>	10.3323	10.3323 · 10 <sup>-3</sup>	1.03323	1	

Corresponding pressure units: ■ 1 Pa = 1 N/m<sup>2</sup>  
 ■ 1 hPa = 1 mbar  
 ■ 1 mmHg = 1 Torr  
 ■ 1 kp/cm<sup>2</sup> = 1 at (atü)

### Notes

The table refers to DIN 1301 Part 1 (2002) and Part 3 (1979).  
 In accordance with the Execution Ordinance to the law on units in metrology (Federal German Units Ordinance) from 13th December 1985 only the following units are admissible for pressures:

- pascal (Pa)
- bar (bar)
- millimetre of mercury (mmHg), but only for blood pressure and the pressure of other physical liquids in medicine

Valid for these units in accordance with Federal German Unit Ordinance are the definitions and conversion factors per DIN 1301.

Listed in Part 1 of this standard

- pascal as derived SI unit with special name and with special unit symbol
  - bar as generally applicable unit outside the SI
  - millimetre of mercury as unit outside the SI with limited area of application
- Part 3 of this standard defines amongst other things conversion factors for the following units
- conventional millimetre of mercury (mmHg)
  - conventional metre of water (mWS)
  - torr (Torr)
  - technical atmosphere (at)
  - standard atmosphere (atm)

## SI units - Engineering units (based on the foot)

		SI units						Engineering units			
		bar	mbar	µbar	Pa	kPa	MPa	psi	ft H <sub>2</sub> O	in. H <sub>2</sub> O	in. Hg
from	to										
SI units	1 bar	1	10 <sup>3</sup>	10 <sup>6</sup>	10 <sup>5</sup>	100	0.1	14.50377	33.4553	401.463	29.52998
	1 mbar	10 <sup>-3</sup>	1	10 <sup>3</sup>	100	0.1	0.1	14.50377	33.4553	401.463	29.52998
	1 µbar	10 <sup>-6</sup>	10 <sup>-3</sup>	1	0.1	0.1	0.1	14.50377	33.4553	401.463	29.52998
	1 Pa	10 <sup>-5</sup>	0.01	10	1	10 <sup>-3</sup>	10 <sup>-6</sup>	0.1450377	0.334553	4.01463	0.2952998
	1 kPa	0.01	10	10	10 <sup>3</sup>	1	10 <sup>-3</sup>	0.1450377	0.334553	4.01463	0.2952998
	1 MPa	10	10	10	10 <sup>6</sup>	10 <sup>3</sup>	1	0.1450377	0.334553	4.01463	0.2952998
Engineering units	1 psi	68.94757	68.94757	68.94757	6.894757	6.894757	6.894757	1	2.30666	27.6799	2.036020
	1 ft H <sub>2</sub> O	29.8907	29.8907	29.8907	2.98907	2.98907	2.98907	433.5275	1	12	0.8826709
	1 in. H <sub>2</sub> O	2.49089	2.49089	2.49089	0.249089	0.249089	0.249089	36.12729	83.3333	1	73.55591
	1 in. Hg	33.86389	33.86389	33.86389	3.386389	3.386389	3.386389	0.4911542	1.132925	13.59510	1

Corresponding pressure units:

- 1 Pa = 1 N/m<sup>2</sup>
- 1 psi = 1 lbf/in.<sup>2</sup>
- 1 mmHg = 1 Torr
- 1 kgf/cm<sup>2</sup> = 1 at

### Notes

The table refers to ISO 31-1:1992 and ISO 31-3:1992  
 For lengths ISO 31-1 defines conversion factors for units no longer to be used:

- inch (in)
- foot (ft)

For pressures ISO 31-3 defines conversion factors for units no longer to be used:

- pound-force per square inch (lbf/in.<sup>2</sup>)
- conventional millimetre of water (mmH<sub>2</sub>O)
- conventional millimetre of mercury (mmHg)
- Torr (Torr)
- technical atmosphere (at)
- standard atmosphere (atm)