



# R-404A

## TECHNICAL DATA SHEET

### Components

| Chemical Name                     | Chemical Formula                             | %By weight | CAS No   | EC No     |
|-----------------------------------|--|------------|----------|-----------|
| 1,1,1,2-Tetrafluoroethane (R134a) | C <sub>2</sub> H <sub>4</sub> F <sub>2</sub> | %4         | 811-97-2 | 212-377-0 |
| Pentafluoroethane (R125)          | CF <sub>3</sub> CHF <sub>2</sub>             | %44        | 354-33-6 | 206-557-8 |
| 1,1,1-Trifluoroethane (R143a)     | C <sub>2</sub> H <sub>3</sub> F <sub>3</sub> | %52        | 420-46-2 | 206-996-5 |

### Physical and Chemical Properties

At normal temperature and pressure, R404A is a colourless gas.

|   |                          |
|---|--------------------------|
| Physical state.....                                     | Gas                      |
| Form.....   | Compressed liquefied gas |
| Molecular Weight (g/mol).....                           | 97.61                    |
| Boiling Point at 1 atm, (°C) .....                      | -46.45                   |
| Sliding Boiling at 1atm, (K) .....                      | 0.7                      |
| Vapor pressure 25°C, (bar).....                         | 12.42                    |
| Liquid Density at 25°C, (kg/m <sup>3</sup> ) .....      | 1048                     |
| Critical Temperature, °C.....                           | 72.07                    |
| Critical Pressure, bar.....                             | 37.31                    |
| Critical Density, (kg/m <sup>3</sup> ) .....            | 484                      |
| Heat Capacity of Liquid at 25°C, (kJ/kg.K).....         | 1.44                     |
| Heat Capacity of Vapor at 1 atm at 25°C, (kJ/kg.K)..... | 0.85                     |
| Solubility in water 25°C (Ppm) .....                    | Depreciable              |
| Flammability (solid, gas) (%vol).....                   | None                     |
| ODP.....  | 0                        |
| GWP.....  | 3922*                    |

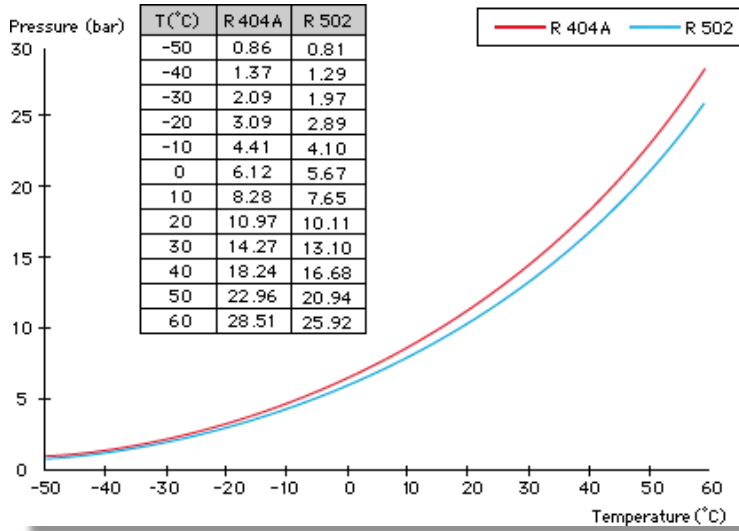
### Commercial Specifications (ISO9002)

|                                       |      |
|---------------------------------------|------|
| Purity, %, min.....                   | 99.5 |
| Moisture content, ppm by weight. .... | 10   |
| Acid Value, ppm by weight.....        | 0.1  |
| Residue, mg.kg.....                   | 100  |

\*The regulation on fluorinated greenhouse gases of EU 517-2014 has been taken considered.



## Comparison Chart Temperature/ Pressure R-502-R-404A



## Thermodynamic Properties

| TEMP.<br>(°C) | ABSOLUTE PRESSURE<br>(bar) |        | DENSITY<br>(Kg/m <sup>3</sup> ) |        | ENTHALPY<br>(kJ/Kg) |        | ENTROPY<br>(kJ/Kg.K) |        |
|---------------|----------------------------|--------|---------------------------------|--------|---------------------|--------|----------------------|--------|
|               | LIQUID                     | VAPOUR | LIQUID                          | VAPOUR | LIQUID              | VAPOUR | LIQUID               | VAPOUR |
| -50           | 0.85                       | 0.82   | 1319.99                         | 4.49   | 135.68              | 337.63 | 0.8120               | 1.7191 |
| -45           | 1.09                       | 1.05   | 1304.99                         | 5.64   | 141.64              | 340.80 | 0.8384               | 1.7131 |
| -40           | 1.36                       | 1.32   | 1289.70                         | 7.01   | 147.68              | 343.95 | 0.8644               | 1.7079 |
| -35           | 1.70                       | 1.65   | 1274.09                         | 8.62   | 153.79              | 347.07 | 0.8902               | 1.7034 |
| -30           | 2.09                       | 2.04   | 1258.12                         | 10.52  | 159.97              | 350.15 | 0.9158               | 1.6993 |
| -25           | 2.55                       | 2.49   | 1241.76                         | 12.73  | 166.24              | 353.18 | 0.9412               | 1.6958 |
| -20           | 3.08                       | 3.01   | 1224.97                         | 15.30  | 172.60              | 356.16 | 0.9664               | 1.6926 |
| -15           | 3.70                       | 3.62   | 1207.70                         | 18.25  | 179.04              | 359.07 | 0.9914               | 1.6898 |
| -10           | 4.40                       | 4.32   | 1189.90                         | 21.66  | 185.57              | 361.90 | 1.0162               | 1.6873 |
| -5            | 5.20                       | 5.11   | 1171.52                         | 25.55  | 192.20              | 364.65 | 1.0409               | 1.6849 |
| 0             | 6.11                       | 6.01   | 1152.51                         | 30.00  | 198.92              | 367.31 | 1.0655               | 1.6827 |
| 5             | 7.13                       | 7.03   | 1132.78                         | 35.07  | 205.76              | 369.86 | 1.0899               | 1.6806 |
| 10            | 8.28                       | 8.16   | 1112.27                         | 40.38  | 212.70              | 372.28 | 1.1143               | 1.6765 |
| 15            | 9.55                       | 9.43   | 1090.89                         | 47.38  | 219.77              | 374.57 | 1.1387               | 1.6743 |
| 20            | 10.97                      | 10.84  | 1068.53                         | 54.82  | 226.97              | 376.71 | 1.1630               | 1.6720 |
| 25            | 12.54                      | 12.40  | 1045.08                         | 63.28  | 234.32              | 378.68 | 1.1873               | 1.6695 |
| 30            | 14.25                      | 14.12  | 1020.38                         | 72.89  | 241.82              | 380.47 | 1.2117               | 1.6667 |
| 35            | 16.16                      | 16.01  | 994.26                          | 83.86  | 249.50              | 382.03 | 1.2362               | 1.6636 |
| 40            | 18.23                      | 18.08  | 966.50                          | 96.39  | 257.39              | 383.35 | 1.2609               | 1.6611 |
| 45            | 20.49                      | 20.34  | 936.81                          | 110.80 | 265.51              | 384.38 | 1.2859               | 1.6595 |
| 50            | 22.95                      | 22.80  | 904.81                          | 127.46 | 273.91              | 385.08 | 1.3113               | 1.6556 |



## Mollier Diagram

