HP 35s code for psychrometric calculations

This program calculates the relative humidity in % and the vapour density r_{ν} in g kg⁻¹ from the (dry bulb) temperature and the wet bulb temperature in either degrees Celsius or Fahrenheit. It is an implementation of Eqs. 5.18 and 5.29 in the book.

USAGE

When the program is run (XEQ WOO1), the calculator prompts for the temperature (in Celcius) and the wet bulb temperature (in Celsius). When the program finishes, the *X*-register contains the vapour density in $g kg^{-1}$ and the *Y*-register contains the relative humidity in %. Both registers are simultaneously visible on the calculator display. After program completion, the *R*-register contains the vapour density in $kg kg^{-1}$.

There are two options that can be set with flags 1 and 2. If flag 1 is set the calculator prompts for the temperature and the wet bulb depression. If flag 2 is set, any input is assumed to be in Fahrenheit.

The pressure is fixed to 1000 hPa. If another pressure is required, change line W051 to contain the required pressure in hPa.

The program uses registers T, W, D, and R. The input registers are kept unchanged for repeated use of the program.

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| PROGRAM LISTING | | |
| WOO1 LBL W | W022 + | W043 \times |
| W002 SF 10 | WO23 STO R | W044 LASTx |
| WOO3 DRY BULB T | W024 RCL T | W045 243.5 |
| WOO4 INPUT T | W025 XEQ W039 | W046 + |
| W005 FS? 1 | W026 \div | WO47 \div |
| W006 GTD W010 | W027 100 | W048 e^x |
| WOO7 WET BULB TW | W028 \times | W049 6.112 |
| WOO8 INPUT W | WO29 IP | W050 \times |
| W009 GTO W015 | WO30 RCL R | W051 1000 |
| W010 RCL T | W031 10000 | W052 x<>y |
| WO11 WB DEPR T-TW | W032 \times | W053 ÷ |
| W012 INPUT D | WO33 IP | W054 1 |
| W013 - | W034 0.1 | W055 - |
| W014 STO W | W035 \times | W056 1.61 |
| W015 - | WO36 RH (%) AND RV | W057 \times |
| W016 FS? 2 | W037 CF 10 | W058 1/x |
| W017 XEQ W060 | WO38 RTN | W059 RTN |
| W018 -401.6e-6 | W039 FS? 2 | W060 1.8 |
| W019 $	imes$ | WO40 →°C | W061 ÷ |
| WO20 RCL W | W041 17.67 | W062 RTN |
| W021 XEQ W039 | W042 x<>y | LN=279 CK=07DE |
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Please refer to the HP 35s manual for instructions on using the programming capabilities of the calculator.

