



AND ASSOCIATED COMPANIES

Sharp 5030 Report 8

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THERMO Scientific  5030 SHARP v1.21 SERIAL NUMBER 514 19-05-27
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PRINT FORMAT: COM2 8
PRINT CYCLE: 1 min
BAUDRATE: Bd 9600
DEVICE ADDRESS: 1

FILTER CHANGE
MASS > ug 1500
CYCLE h 8
HOUR: 24

AVERAGE STORAGE MODE 0

AIR FLOW: 1000

CALIBRATION
SENSITIVITY: 7016
CONCENTRATION FACTOR 100 %

HIGH VOLTAGE: 1330 V
ALPHA-THRESHOLD: 1000 mV
REF-THRESHOLD: 344 mV

T2-COMP-FACTOR: 0.00225
P2-COMP-FACTOR: 0.00015
Pabs-COMP-FACTOR: 0.00055

OPTIC CALIBRATION
T2-COMP-FACTOR NEPH. 0.25000
OPTIC SENSITIVITY 0.78162
OFFSET RANGE 1 353
OFFSET RANGE 2 50

| SENSOR CALIBRATION | | T1 | T2 | T3 | T4 | RH | P1 | P2 | P3 |
|--------------------|--|-----|----|----|----|-----|----|------|-----|
| | | -28 | 16 | -6 | 82 | 428 | 9 | -136 | 193 |

AIR FLOW 98.7

FLOW RATE REFERENCE VOLUMETRIC FLOW REF
STANDARD TEMPERATURE 25 _C

HEATER PARAMETERS
RH Nominal Value 65 %RH
Max. Heating Temp. 45 _C
Min. Heating Power 5 %

ANALOG OUTPUTS
OUTPUT ZERO: 4mA
CONC 0 999

GESYTEC PROTOCOL
STATUS VERSION STANDARD
NUMBER OF VARIABLES 1

CONC

Annotations:

- Firmware Version: v1.21
- Serial Number: 514
- Filter Change Settings: 1500 ug, 8 h, 24 h
- Flow Setting (LPH): 1000
- Mass Calibration Factor: 7016
- High Voltage Settings: 1330 V, 1000 mV, 344 mV
- Beta Temperature Correction Factor: 0.00225
- Nephelometer Settings: 0.25000, 0.78162, 353, 50
- Flow Reference: VOLUMETRIC FLOW REF
- Heater Settings: 65 %RH, 45 _C, 5 %



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Before any major change is made, such as a high voltage calibration or firmware update, it is recommended to print out and save a copy of Report 8. It contains all the parameters and settings that the instrument is currently using. It contains a lot of useful information.

FIRMWARE VERSION: Thermo recommends using Version 1.21 on all Sharp 5030 instruments. It is bug free and optimized for the best heater control to maintain the RH setpoint.

SERIAL NUMBER: Make sure any Report 8 contains the correct serial number that matches the number on the back plate. It can be changed with the command “dA[number]”. For future reference, store a copy of this Report 8, such as “Sharp 5030 Report 8 E514 12-Aug-2019”.

FILTER CHANGE SETTINGS: The first number, 1500 ug, is the maximum mass that will be collected on the filter tape before it automatically advances to a new spot. The second number, 8 h, is the cycle time of the regular tape advance. The third number, 24, is the starting hour. In this case the tape will advance every 8 hours starting at the 24th hour (midnight). A couple of oddities: 1) if the cycle time is set to 0, the tape will advance once a day just as it would if you entered 24, and 2) if the starting hour is set to 0, the tape will not advance at all, except when the mass is 1500.

FLOW SETTING: This setting should always be 1000 LPH (litres per hour). It is the same flow as the more commonly used 16.67 LPM (litres per minute).

MASS CALIBRATION FACTOR: This is the factor obtained when doing the mass foil calibration. It shows the relationship between the loss of beta count and a change in mass. This factor should always be 7000 +/- 2%. If a number is obtained outside of this range, the calibration should be repeated. If the number obtained is still outside the range, a new mass foil kit should be used.

HIGH VOLTAGE CALIBRATION: Originally the Sharp 5030 contained a built-in “Automated Detector Adjustment”, but this was dropped in later firmware versions. There is now a manual procedure that should be performed annually, or when indicated by a “plateau error”. This procedure uses a fixed high voltage – 1470 volts for older amplifiers and 1330 Volts for newer amplifiers. If the Beta signal is exceptionally noisy, try lowering the setting by 50 volts. As the detector ages it is normal for the alpha and reference thresholds to drop. Expect the new values determined by the calibration procedure to be lower or very close to the previous values.



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BETA TEMPERATURE CORRECTION FACTOR: This factor is determined at the factory and is usually close to 0.00250. If the Beta signal is found to be tracking significantly with changes to the temperature, there is a manual procedure to determine a new factor, but it should not be performed in the field.

NEPHELOMETER SETTINGS: The first number is the nephelometer temperature correction factor and from the factory is usually 0.25000. However, when performing the manual temperature correction procedure the new factor for the nephelometer is usually found to be closer to 0.00000. The second number is the Optical Sensitivity and is determined at the factory. This number can be changed if the calculated Sharp value is consistently, and significantly, higher or lower than the nephelometer value. The last two numbers are the Range 1 and Range 2 Offsets. Over time, as the nephelometer gets dirty, these offsets will increase in value. Range 1 should be between 100 and 700 and Range 2 should be between 10 and 70.

FLOW REFERENCE: The operating flow is maintained to a volumetric flow of 1000 LPH at the inlet, using the T1 ambient temperature. If the standard flow is being polled (JJ), then verify that the standard temperature is set to the desired reference, usually 25°C.

HEATER SETTINGS: When the Sharp 5030 is first turned on it will display one of two protocols: "EU-Version" or "US-Version". Pressing the second button from the left within the first 10 seconds allows the user to toggle between the two protocols. Make sure it is set to US-Version. Originally the US EPA RH threshold was 35%, but it was changed to 58%. Most Canadian agencies use the earlier 35% setting with a maximum temperature of 75°C and a power setting of 2%. During the winter, in colder climates, some agencies increase the power setting to prevent the detector from freezing, such as a setting of 10%. The heater settings in the example above are actually the EU settings of 65% RH, 45°C maximum and 5% power.