



## Model 420 Dual Channel Flame Photometer

The Model 420 Clinical Flame Photometer was developed from the Single Channel Model 410 Flame Photometer, with the objective of improving productivity and analytical performance, when measuring Sodium and Potassium.

It is available in Clinical or Industrial format with appropriate NIST traceable calibration solution concentrates.

The biggest improvement is Dual Channel operation, allowing both Sodium and Potassium to be calibrated, measured and displayed simultaneously.

The Model 420 Flame Photometer retains many of the Model 410's attributes: ease of use, ease of maintenance and stable flame design but is enhanced with auto flame optimisation, internal standard referencing and on-board firmware to achieve significant improvement in sample throughput and precision.

The time taken to set up and calibrate the instrument is much reduced; achieved by automatic ignition and optimisation of the flame conditions.

The analytical performance is improved by the use of a Lithium Internal Standard signal which compensates for fluctuation in flame conditions.

The internal standard feature (Reference Mode) can be turned off if required.

Readings on both channels are linear over the working range of the Model 420 Flame Photometer. There are several monitoring and control functions included in the firmware; thus measurements can only be made after blanking and calibration.

The Model 420 Flame Photometer can operate in Continuous or Peak mode.

- In Continuous mode the instrument displays the current value on each channel and through the analogue ports. An instantaneous reading can be printed at any time.
- In Peak mode the Model 420 Flame Photometer automatically detects a stable reading, following sample introduction, for transfer to a printer or computer and the display is frozen until the next sample is introduced.



# Sherwood Scientific

## 47542000 Model 420 Clinical Flame Photometer

### Performance Specifications

*For optimum performance The Model 420 should be warmed up for 30 minutes, however the Lithium Internal Standard will reduce drift considerably for urgent samples.*

#### OPERATING CONDITIONS

**Temperature** +10°C to +35°C  
**Humidity** 85% Max @ +35°C NB. See Air Compressors

#### SODIUM MEASUREMENT

*Sodium is highly prone to self absorbance in the flame above a concentration of 16 ppm. Linearising software has been incorporated in the Model 420. At the normal clinical level of sodium 140mmol/l even diluted by 1:200 exceeds this concentration.  
 (NB. 140 mmol/l x 22.98 A.W(Na). =3217.2 ppm x 1/200 = <16 ppm).*

#### LITHIUM INTERNAL STANDARD

The Model 420 defaults to measurement with Lithium Internal Standard.  
 The Model 420 is supplied with Li solution 00156622. This should be diluted 1:10 with distilled water and the resulting solution used as the blank and to dilute the calibration standard and samples.  
 Sherwood Scientific can supply a 3 Molar solution of Li (00156603; 6 x 100ml), which when diluted 1:200 will give the optimum Lithium internal standard. This is cheaper than using the 00156622 and is designed to be used with the Model 805 Diluter where it is simultaneously diluted and mixed at the correct dilution to the standards and samples.

#### RANGE Displayed

**Na** 0.00 - 9.99; 10.0 - 199.9  
**K** 0.00 - 9.99; 10.0 - 199.9  
**Li** 0.00 - 9.99; 10.0 - 199.9

#### SAMPLE CONCENTRATION entering aspiration

Element	ppm	mg/l	meq/l
Na	0.5 - 40	0.5 - 40	0.022 - 1.74
K	0.5 - 20	0.5 - 20	0.013 - 0.5
Li	0.0 - 0.6	0.0 - 0.6	0.0 - 0.087

#### SPECIFICITY

**Na, K & Li Interference** is < 0.5% value of element under analysis.

#### LINEARITY

(To be tested without Li Internal Standard)  
**For Na,**  
 The 00156100 Standard diluted 1:200 set at 140 will read 69 - 71 at midpoint (Nominal 70).  
**For K,**  
 The 00156100 Standard diluted 1:200 set at 5.0 will read 2.45 - 2.55. (Nominal 2.50).

#### DIMENSIONS

730mm x 450mm x 450mm 16.5 Kg Packed  
 510mm x 390mm x 345mm 9.5 Kg Nett

#### SENSITIVITY

(i) **Minimum Detection level**=3 x noise

Element	ppm	mg/l	meq/l
Na	0.02	0.02	0.0009
K	0.02	0.02	0.0005
Li	0.05	0.05	0.007

(ii) **Minimum Concentration** to give 100 units on display

Element	ppm	mg/l	meq/l
Na	0.5	0.5	0.022
K	0.5	0.5	0.013
Li	0.5	0.5	0.072

#### REPRODUCIBILITY (K=10ppm 20 aliquots from single sample)

With Li Reference in operation < 1.0% CV  
 Without < 2.0% CV

#### SPEED OF ANALYSIS

Variable (sample every 15-60 seconds) at user option

#### ASPIRATION RATE

3-6 ml/min

#### MINIMUM SAMPLE REQUIREMENT

1.5ml (Diluted sample)