

# SP600 Spectrophotometer



## SP600 Specifications

- Wavelength range from 330 to 900 nm
- RS232 interface for computer downloads
- Large illuminated graphic display
- Touch-sensitive film keypad with logical layout
- Innovative sample chamber allows use of round vials and rectangular cells of different sizes without adapter
- Ability to program 16 user-entered methods
- Fast, easy lamp change – no tools required
- Software updates free of charge

## Functions

- Pre-programmed Orbeco-Hellige® methods
- Absorption
- Transmission
- Spectral data recording
- User calibration (polynomials)
- Concentration (linear)
- Multiple wavelength function

## Specifications

<b>Wavelength:</b>	330 to 900 nm
<b>Photometric Range:</b>	-0.3 to 2.5 Abs
<b>Spectral Bandwidth:</b>	10 nm
<b>Wavelength Accuracy:</b>	+/- 2 nm
<b>Wavelength Reproducibility:</b>	+/- 1 nm
<b>Light Source:</b>	Pre-adjusted tungsten halogen lamp
<b>Monochromator:</b>	Holographic Grating
<b>Detector:</b>	Silicon Photodiode
<b>Multifunctional sample chamber for:</b>	Round vials, 24 and 16 mm, Rectangular cells 10-50 mm
<b>Display:</b>	LCD graphic display
<b>Data Storage Capacity:</b>	1000 test data sets
<b>Dimensions:</b>	10.6" x 10.8" x 5.9"
<b>Weight:</b>	7.0 pounds



### Ordering Information

P/N	Description
L712000	SP 600 Spectrophotometer with AC adapter
L711050	SP600 External Battery Pack 12V Ni-Cad
L711160	SP600 Secondary Standard Kit
L711080	SP600 Serial Cable
L197620	Sample Cell, Round 24 mm with Lid, 12 pk
L197665	Sample Cell, Round 16 mm with Lid, 10 pk
L601040	Rectangular Cell, 10 mm
L601070	Rectangular Cell, 50 mm
L661130	Rectangular Cell, UV Quartz 10 mm

# SP600 Optics and Operations

The SP600 is a single-beam spectrophotometer. The instrument performs a self-test as soon as it is switched on, confirming proper operation of all key components. Using an innovative tungsten halogen lamp with flash function, the lamp is switched on only momentarily during the measurement process, eliminating a warm-up period. An integrated Didymium-filter confirms instrument operation, assuring data integrity. Using a unique holographically-produced monochromator, the light is split into spectral ranges, where a movable mirror ensures that light of the desired proper wavelength is focused automatically as it passes through the water sample. The light not absorbed by the sample travels to the silicon photodiode detector. This signal is then evaluated by a microprocessor and shown as a direct read result in the display.

Features of the SP600 include:

- **Innovative multifunctional sample chamber eliminates the need for most cell adapters**  
Round vials measuring 16 mm and 24 mm in diameter and rectangular cells with pathlengths from 10 to 50 mm may be used without an adapter. Only round 10 mm cells require any adapter.
- **AC or Battery Power**  
The instrument can be run on battery power with an available battery pack.

## • Wavelength Scanning / User Calibrations

A wavelength scan can be performed over a user-defined interval between 330 and 900 nm. Using this function, an operator can carry out measurements of standards of different concentrations to generate user calibrations of up to 10 order polynomials. An external mathematical program is available to assist.

## • New methods

New Test methods are continuously being added to meet market testing needs and reagent choices. These new methods can be added easily and quickly using free software available on our website.

## • Data Handling

A RS-232 connection allows for the instrument to be connected with a PC or printer. Each data point is logged with the date, time, operator number, measuring range and method number. Up to 1000 data points can be recorded in the instrument's memory.

## • Low Maintenance

Due to the original and thoughtful design of the SP600, the only maintenance that is required is eventual replacement of the halogen bulb--which is fast and simple - The bulb is conveniently located at the back of the spectrophotometer - no tools required!

## • SP600 and Reagents

A Complete System for Accurate Water Testing - Orbeco-Hellige manufactures and markets a full line of water testing reagents which work as a system with the SP 600. Many tests use Orbeco's new popular line of economical Powder Pack™ unit -dose reagents. See Below for a complete listing.

## Orbeco-Hellige Reagents for the SP600 Spectrophotometer

Parameter	Method	Range	Reagent	Part Number
Acid demand to pH 4.3 T	Acid/Indicator	0.1-4 mmol/l	ALKA-M Tablets, 100 ct.	RT321-0
Alkalinity-m	Acid/Indicator	5-200 mg/l	ALKA-M Tablets, 100 ct.	RT321-0
Alkalinity-p	Acid/Indicator	5-300 mg/l	ALKA-P Tablets, 100 ct.	RT323-0
Aluminum T	Eriochrome Cyanine R	0.01-0.3 mg/l	Aluminum #. 1 Tablets, 100 ct.	RT-546-0
			Aluminum #. 2 Tablets, 100 ct.	RT-547-0
Aluminum	Eriochrome Cyanine R	0.01-0.25 mg/l	Aluminum PP Rgt Set, 10 mL, 100 Tests	RS5000
Ammonia	Indophenol Blue	0.02-1 mg/l	Ammonia #1 Tablets, 100 ct.	RT258-0
			Ammonia #2 Tablets, 100 ct.	RT259-0
Ammonia	Salicylate	0.01-0.8 mg/l	Ammonia Cyanurate PP,	RS5500
			Ammonia Salicylate PP, SET	
Ammonia	Salicylate	0-2.5 mg/l	Ammonia LR Rgt Set, 50 Tests	RS5600
Ammonia	Salicylate	0 - 50 mg/L	Ammonia HR Rgt Set, 50 Tests	RS5650
Arsenic	Silverdiethyldithiocarbamate	0.02-0.6 mg/l	See test instruction for reagents	
Boron	Azomethine	0.1-2.0 mg/l	Boron #. 1 Tablets, 100 ct.	RT579-0
			Boron #. 2 Tablets, 100 ct.	RT560-0
Bromine	DPD	0.05-1, 0.1-3, 0.1-6.5 mg/l	DPD #1 Tablets, 100 ct.	RT106-0
Cadmium (Cd <sup>2+</sup> )	Cadion	0.025-0.75 mg/l	Cadmium Tube Test, 25 Tests	L420750
Chlorine	DPD	0.02-0.5, 0.05-1.5, 0.05-3 mg/l	DPD #1 Tablets, 100 ct.	RT106-0
			DPD #3 Tablets, 100 ct.	
			DPD #1, High Calcium Tablets, 100 ct.	RT108-0, RT574-0
Chlorine	DPD	0.05-2 mg/l	DPD 1 Buffer Soln, 15 ml	L471010
			DPD 1 Rgnt Soln, 15 ml	
			DPD 3 Soln, 15 ml	L471020, L471030
Chlorine	DPD	0.01-2.00 mg/l	DPD Free Cl Rgt PP, 10 mL, 100/pkg	RP010-0
			DPD Total Cl Rgt PP, 10 mL, 100/pkg	RP012-0
Chlorine	KI	5-200 mg/l	Chlorine HR (KI) Tablets, 100 ct.	RT300-0
			Acidifying GP Tablets, 100 ct.	RT548-0
Chlorine Dioxide	DPD/Glycine	0.05-1 mg/l	DPD #1 Tablets, 100 ct.	RT106-0
		0.05-2.5 mg/l	DPD #3 Tablets, 100 ct.	RT108-0
			Glycine Tablets, 100 ct.	RT-217-0
Chlorine Dioxide	DPD	0.5-2.5 mg/l	DPD 1 Buffer Soln, 15 ml	L471010
			DPD 1 Rgnt Soln, 15 ml	L471020
Chloride T	Silver nitrate/turbidity	0.5-25 mg/l	Chloride T1 Tablets, 100 ct.	RT591-0
			Chloride T2 Tablets, 100 ct.	RT592-0
Chloride	Iron (III)-thiocyanate	5-60 mg/l	Chloride Reagent Test, 100 Tests	L2419031
Chromium	1.5-Diphenylcarbohydrazide	0.005-0.5 mg/l, 0.02-2 mg/L	Persulfate Rgt. For CR, pp 100 pkg.	RP730-0
			Chromium Hexavalent, pp 100 pkg	RP731-0

Parameter	Method	Range	Reagent	Part Number
COD	Dichromate	0-150 mg/l	COD Tube Test, 0-150 mg/L, 25 Tests	TT20720
COD	Dichromate	0-1,500 mg/l	COD Tube Test, 0-1,500 mg/L, 25 Tests	TT20721
COD	Dichromate	0-15,000 mg/l	COD Tube Test, 0-15,000 mg/L, 25 Tests	TT20722
Color	Direct Reading EN ISO 778:1994			--
Copper	Biquinoline	0.05-1, 0.5-5 mg/l	Copper #1 Tablets, 100 ct. Copper #2 Tablets, 100 ct.	RT355-0 RT356-0
Copper, Free	Bicinchoninate	0.05-5 mg/l	Copper Free, pp, 100 ct.	RP030-0
Cyanide	Pyridine Barbituric Acid	0.005-0.2, 0.01-0.5 mg/l	Cyanide Reagent Set, 260 Tests	L2418875
DEHA	PPST	0.02-0.5 mg/l	DEHA Soln., 100ml DEHA Tablets, 100 ct.	L461181 RT322-0
DEHA	PSST	0.02-0.5 MG/L	OXYSCAV 1 Rgt., DEHA 2 Rgt. Solution , set	RS6000
Fluoride	SPADNS	0.02-1.5 mg/l	SPADNS Reagent, 16oz Fluoride Standard 1 mg/l, 16 oz	R3903-16 R3902-16
Formaldehyde	H2SO4/Chromotropic Acid	1-5 mg/l, 0.02-1 mg/l	Spectroquant, powder & liquid	L420751
Formaldehyde	H2SO4/Chromotropic Acid	0.1-5 mg/l	Spectroquant, tube test/25	L420752
Hardness – Total	Metallphthalein	2-50 mg/l	Hardcheck P/Total Hardness Tablets, 100 ct.	RT566-0
Hardness, Total HR	Metallphthalein	20-500 mg/l	Hardcheck P/Total Hardness Tablets, 100 ct.	RT566-0
Hazen (Pt-Co-Scale: APHA)	Direct Reading	0-500 mg/l	Not required	--
Hydrazine	4-(Dimethylamino)-Benzaldehyde	0.05-0.5 mg/l	Hydrazine Test Powder	L462910
Hydrazine	4-(Dimethylamino)-Benzaldehyde	0.005-0.6 mg/l	Hydra 2, 100 ml	L531200
Hydrogen Peroxide T	DPD/Catalyst <sup>5</sup>	0.01-0.5 mg/l, 0.03-1.5mg/l	Hydrogen Peroxide LR, tablet / 100 ct	RT-238-0
Iodine	DPD	0.05-3.6 mg/l	DPD No. 1, tablet / 100 ct	RT106-0
Iron	PPST	0.01-0.5, 0.1-1 mg/l	Iron LR Tablets, 100 ct. IRON II LR Tablets, 100 ct.	RT537-0 RT542-0
Iron	1, 10-Phenantroline	0.1-3 mg/l	Iron Ferro Rgt PP, 10 mL, 100/pkg	RP056-0
Iron, Total	TPTZ	0.1-1.8 mg/l	Iron TPTZ, pp 100 ct.	RP055-0
Lead	4-(2-Pyridylazo)-resorcin <sup>6</sup>	0.1-5 mg/l	Spectroquant, 50 test	L420753
Lead	4-(2-Pyridylazo)-resorcin <sup>6</sup>	0.1-5 mg/l	Spectroquant, tube test/ 25	L420754
Manganese	Formaloxime	0.2-4 mg/l	Manganese LR 1 Tablets, 100 ct. Manganese LR 2 Tablets, 100 ct.	RT608-0 RT609-0
Manganese LR	PAN	0.01-0.7 mg/l	Ascorbic Acid,pp100 ct., Alkaline Cyanide, PAN indicator	RS5090
Manganese HR	Periodate oxidation	0.1-18 mg/l	Manganese Citrate Puffer, Sodium Periodate Set	RS5100
Molybdate T	Thioglycolate	1-30 mg/l	Molybdate, No.1 Tablets 100 ct Molybdate No.2 Tablets, 100 ct	RT306-0 RT307-0
Molybdate	Mercaptoacetic acid	0.5-66 mg/l	Reagent Set, Molybdenum HR 1, HR2, HR3	RS5300
Nickel	Dimethylglyoxime <sup>2</sup>	0.02-1 mg/l 0.2-7 mg/l	RT (Nickel-51, Nickel-52)	L2419033
Nitrate	Chromotropic Acid	1-30 mg/l	Nitrate Chromotropic, Nitra X Rgt Set	RS5580
Nitrate	2,6-Dimethylphenole	0.5-14 mg/l	Nitrate/Nitrate-N, Tube Test, 24 Tests	L2420702
Nitrite	NED	0.01-0.5 mg/l	Nitrite LR Tablets, 100 ct.	RT231-0
Nitrite	Sulfamic acid,Naphthyl-amine	0.03-0.6, 0.3-3 mg/l	Nitrite/Nitrite-N Tube Test, 24 Tests	L2419018
Nitrite	Diazotization	0.01-0.3 mg/l	Nitrite 3, pp 100 ct.	RP098-0
Nitrogen – Total, LR	Persulfate Digestion Method	0.5-25 mg/l	Reagent Set	RS5550
Nitrogen – Total, HR	Persulfate Digestion Method	5-150 mg/L	Reagent Set	RS5560
Nitrogen – Total	2,6-Dimethylphenole	0.5-14, 14-140 mg/l	Nitrogen (Total), Tube Test, 24 Tests	L2420703
Ozone	DPD/Glycine	0.02-0.5 mg/l 0.02-1 mg/l	DPD No. 1 Tablet, 100 ct. DPD No. 3 Tablet, 100 ct. Glycine Tablet, 100 ct.	RT106-0 RT108-0 RT217-0
pH-Value T	Phenol red <sup>5</sup>	6.5-8.4	Phenol Red/Photometer, tablet, 100 ct	RT117-0
pH-Value T	Phenol red <sup>5</sup>	6.5-8.4	Phenol Red- Solution	L471040
Phenol	4-Aminoantipyrine	0.1-5 mg/l	Phenol No. 1 Tablets, 100 ct Phenol No. 2 Tablets, 100 ct	RT595-0 RT596-0
Phosphate Acid, Hydrolysis	Acid Digestion/Ascorbic Acid	0.02-1.6 mg/l	Reagent Set	RS5250
Phosphate, Total	Acid Persulfate Digestion	0.02-1.1 mg/l	Reagent Set	RS5210
Phosphate – Total	Phosphomolybdic Acid	0.07-3, 0.2-10 mg/l	Phosphate (Total) Tube Test, 0.07-3, 0.2-10 mg/l	L2419019
Phosphate – Total	Phosphomolybdic Acid	1.5-20, 5-60 mg/l	Phosphate (Total) Tube Test, 1.5-20, 5-60 mg/l	L2420700
Phosphate – Ortho	Phosphomolybdic acid/Ascorbic acid	0.05-4 mg/l	Phosphate #1 LR Tablets, 100 ct. Phosphate #2 LR Tablets, 100 ct.	RT304-0 RT305-0
Phosphate - Ortho	Vanadomolybdate	1-80 mg/l	Phosphate #1 HR Tablets, 100 ct. Phosphate #2 HR Tablets, 100 ct.	RT581-0 RT582-0
Phosphate – Ortho	Vanadomolybdate	3-60 mg/l	Ortho-Phosphate VM, Tube Test, 24 Tests	L2420701
Phosphate, Ortho	Ascorbic Acid	0.06-2.5 mg/l	Phos 3 F10, pp, 100 ct.	RP155-0
Phosphate, Ortho	Ascorbic Acid	0.06-5mg/l	Reagent Set	RS5200
Potassium	Tetraphenylborate-Turbidity	1-10 mg/l	Potassium-T Tablets, 100 ct	RT567-0
Silica	Silicomolybdate	0.05-3 mg/l	Silica #1 Tablets, 100 ct. Silica #2 Tablets, 100 ct. Silica PR Tablets, 100 ct.	RT313-0 RT314-0 RT315-0
Silica LR	Heteropolyblue	0.1-1.6 mg/l	Amino Acid F F10, pp, 100 ct., Citric Acid, Molybdate 3	RS5690
Silica HR	Silicomolybdate	1-100 mg/l	Silica HR Acid Rgt. Citric Acid, MolybdateF10, pp,100 ct.	RS5700
Sulfate	Bariumsulfate-Turbidity	2-100 mg/l	Sulpha 4, pp, 100 ct.	RP-215-0
Sulfide	DPD/Catalyst	0.04-0.5 mg/l	Sulfide # 1, Sulfide #2 Tablets, 100 ct	L502940, L502940
Sulfite LR	DTNB	0-0.5, 0.1-10 mg/l	Sulfite LR Tablets, 100 ct.	RT802-0
Surfactants (anionic)	Methylene Blue	0.05-2 mg/l	Spectroquant, tube test, 25	L420755
TOC	H <sub>2</sub> SO <sub>4</sub> /Persulfate/Indicator	50-800 mg/l	Spectroquant, tube test, 25, Caps (6)	L420756, L420757
Turbidity	Attenuated Radiation Method	5-500		--
Urea	Indophenol/Urease	0.1-2 mg/l	UREA-Reagent #1, 15 ml UREA-Reagent #2, 10 ml Ammonia #1 Tablet, Ammonia #2 Tablet, 100 ct.	RT258, RT259
Zinc	Zincon	0.02-0.5 mg/l	Copper/Zinc LR Tablet, 100 ct EDTA Tablet, 100 ct. Dechlor Tablet, 100 ct	RT262-0 RT239-0 RT235-0