

REFRACTOMETERS

Atago Digital HandHeld PAL

Applications

- **Control of dissolution ratio (multiple in %):** When water soluble cutting oils, aqueous cleaning agents, surfactants, liquid chemicals, etc. are diluted for use, their dilution ratio (multiple in %) can be managed by the Palette α series.
- **Control of water content (%):** The water content in certain kinds of metal working oils. Liquid cleansers, and liquid medicine, can evaporate while being used. To maintain the level of highest efficiency for the liquid, water needs to be replenished for optimal efficiency. In such cases, change in the water content can be managed by the Palette α series.
- **Control the blend ratio of two liquids (%):** When a liquid additive is mixed a primary liquid (for example when flux or working oil is dissolved into a liquid cleanser), the blend ratio (%) of the foreign liquid can be managed by the Palette α series.

Example of measurements:

- **Metalworking oils:** Water soluble cutting oils, lubricating oils, working oils, rolling oils, quenching oils, stretching oils, mold lubricant (except insoluble agents), etc.
- **Detergents:** Aqueous cleaning agents, quasi-aqueous detergents, hydrocarbon detergents, petrochemical detergents, alkaline detergents, isopropyl alcohol (IPA), etc.
- **Other liquids:** Alkaline solutions, ammonia solutions, surfactants, caustic sodas, hydrogen peroxide water, glycerin, caulking agents, sealants, sealing agents, liquid resin, fire extinguishing solutions, salt water, adhesive agents, gelatin, protein water, DMF, freeze protective agents, thermal catalytic solutions (for freezer, solar apparatus), adhesive (all kinds), etching agents, anti-freezing agents, flux, corrosion protective agents, formalin, water glass, plating agents, lining agents, etc.

MODEL	CONCENTRATION RANGE	BEST ACCURACY	RESOLUTION	MEASUREMENT TEMPERATURE	INTERNATIONAL PROTECTION
PR-32 α (3405)	Brix 0.0 to 32.0%	Brix $\pm 0.1\%$	Brix 0.1%	5 to 40°C	IP64 Dust-tight and Protected against splashing water.
PR-101 α (3442)	Brix 0.0 to 45.0%	Brix $\pm 0.1\%$	Brix 0.1%	(aut. temp. compensation)	
PR-201 α (3452)	Brix 0.0 to 60.0%	Brix $\pm 0.1\%$	Brix 0.1%	10 to 40°C	
PR-301 α (3462)	Brix 45.0 to 90.0%	Brix $\pm 0.1\%$ (10 to 30°C)	Brix 0.1%	(aut. temp. compensation)	
PR-60PA (3477)	Isopropyl alcohol 0.0 to 60.0% (W/W)	$\pm 0.5\%$ (0 to 30%) $\pm 0.8\%$ (40%), $\pm 1.6\%$ (60%)	0.1%	10 to 35°C (aut. temp. compensation)	
PET-109 (3486)	Ethyl alcohol 0.0 to 45.0% (W/W)	$\pm 0.5\%$ (0 to 30%) $\pm 0.8\%$ (40%) $\pm 1.2\%$ (45%)	0.1%	10 to 35°C (aut. temp. compensation)	
PR-100SA (3488)	Salinity 0 to 100%	$\pm 2\%$	1%	5 to 40°C (aut. temp. compensation)	
PR-40DMF (3489)	Dimethylformamide 0.0 to 40.0% (W/W)	$\pm 0.3\%$	0.1%	5 to 40°C (aut. temp. compensation)	
PR-RI (3480)	Refractive index 1.3306 to 1.4436	Refractive index ± 0.0002 (water at 20°C)	Refractive index ± 0.0002 (water at 20°C)	5 to 45°C (resolution 1°C)	



Atago Coolant & Antifreeze Refractometers



These refractometers can be used for measuring the concentration and freezing temperature of ethylene glycol and propylene glycol which are used as antifreeze mixture for automobiles, thermal catalyst for solar power systems, and other industrial applications.

FUNCTIONS	BR-1E (2821)	BC-2E (2832)	BC-3E (2842)
Freezing point of coolant Ethylene glycol	0 \Rightarrow 70%, 0 \Rightarrow -50°C	0 \Rightarrow -50°C	32 \Rightarrow -60°F
Freezing point of coolant Propylene glycol	0 \Rightarrow 70%, 0 to -50°C	0 \Rightarrow -50°C	32 \Rightarrow -50°F
Battery fluid (20/20)	-	1.150 \Rightarrow 1.300	1.150 \Rightarrow 1.300
Minimum scale	5°C / 5%vol	-	-

Digital Hydrometer

SBS BATTERY SBS-2002

Battery testing has never been this easy. Simply insert the nozzle into the battery, depress the finder pump, and extract a few drops of sulphuric acid (H₂SO₄) electrolyte. Touch one button and the processor does the rest. Within three seconds you have a temperature compensated accurate reading of specific gravity and temperature.

- Time savings 5 times faster than conventional methods
- 99.998% accurate
- Measures specific gravity and temperature
- Automatically temperature-compensated to 25°C (77°F)
- Waterproof membrane keypad
- Adjustable hand strap
- 7.8" suction tube (1/8" dia)
- Rugged/durable
- Compact and only 8 oz.
- Long-life pump
- Large LED display



Included accessories: Carrying case, sampling tube (3), 9V batteries

FUNCTIONS	BS-2002
Method of Detection	Specific gravity; light refraction system
Temperature	Platinum membrane thermal sensor
Range	1.000-1.300
Measuring time	Within 3 seconds after pushing "START" button
Indicator	LCD display; specific gravity, temperature