5600 Series

Precision Variable Temperature Fluid Baths

Easy to Use, High Stability Fluid Baths with Precision Temperature Control

Available in 75 L to 300 L!



5600 Fluid Bath with 56004 Storage Cart

FEATURES

- Unique Guildline Design with Metrology Based Features
- Full Automation Via a Windows Computer (USB, IEEE)
- Excellent Temperature Stability Low As:
  ±0.0015 K with Oil!
  ±0.001 K with Water!
- Fluid Temperature Range 0 °C to 55 °C
- Designed for use with Oil, Salt Water, Water, and other Fluids
- Customer Choice of 3 Tank Sizes: 75 L, 100 L and 300 L Models
- Fiberglass Tank with Proprietary EMI Shielding
- Convenient Access with Removable Tank Cover
- Excellent Control via a PRT Sensor
- 2nd Temperature Probe Included to Report Actual Temperature Anywhere in the Bath
- Automatic and Programmable Over and Under Temperature Protection

Guildline Instruments 5600 Baths are precision fluid/oil baths providing uniform temperature over a 0 °C to 55 °C range. These Fluid Baths are designed for both metrology and oceanography and are used with oil, water, salt water, or other liquids.

The 5600 Series of Fluid Baths Provide a Perfect Environment Under a Wide Range of Operating Temperatures for Precision Equipment Such as the Oil Based Resistance Standards and CTD's

For over 69 years Guildline has been making the best oil and fluid baths in the world. Customers include National Metrology Institutes, National Oceanography Institutes, and primary calibration laboratories.

Three convenient sizes are available in this Series. Customers have the option of a 75 L, 100 L or 300 L Fluid Bath. The 5600 Fluid Baths provide industry leading temperature accuracy and stability.

All 5600 Baths come with a second integrated temperature probe that can be used for temperature monitoring anywhere in the bath. Stability within 2 °C of ambient (e.g. 23 °C ± 2 °C) is ± 1 mK while temperature stability with oil is ± 1.5 mK – the best performance of any commercially available fluid or oil baths.

By installing the 5600 software on any available laptop, the user has complete control over programming the 5600 Bath, and on reporting temperature stability. There is no requirement to write special software to integrate a 3rd-party temperature probe necessary to report the actual temperature of the fluid in the bath.

Once a set temperature has been selected, the control circuitry defines the best heating (or cooling) curve to bring the bath to the set temperature with minimum overshoot, hysteresis, or oscillation, in the shortest possible time.

Over Temperature safety protection is provided by a passive power disconnect temperature limit switch. Programmable over and under temperature protection is also provided via software.



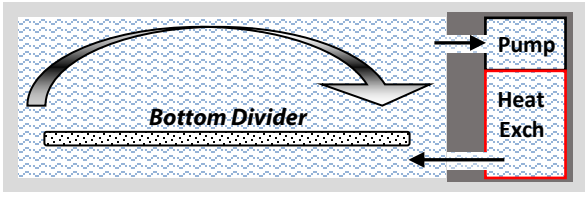
The 5600 Series has an EMI shielded fibreglass tank designed to be corrosion resistant and to last for decades. Many Guildline baths have been in operation for over 50 years and this same Guildline proven quality and dependability has been built into the 5600 Series.

Uses of the 5600 Fluid Bath include:

> *Holding primary or working resistance standards; automatic calibration of temperature probes, thermistors, or resistance standards; testing oceanography sensors including CTDs; and thermal stressing of precision materials.*

The 5600 Programmable Fluid Bath is a high precision bath for use with water, salt water, mineral oil, alcohol, ethylene glycol and fluorocarbons.

The 5600 Series Fluid Bath uses an insulated fibreglass tank with a proprietary design that provides complete EMI shielding. Unlike other Temperature Bath designs, the 5600 Series does NOT use Mechanical Stirrer's so the total bath interior is available for use. The circulation pump is a magnetically driven, propylene rotor pump that mixes the liquid. It removes fluid near the top of the tank, circulates it through the heat exchanger, and pumps it back into the bottom of the tank. The pump always runs when the power is on.



The discharge from the heater exchange is directed under the bottom divider of the tank. A much larger volume of liquid gets drawn down under the bottom divider through slots at one end. This flow mixes with the heat exchanger discharge. As it emerges from under the bottom divider, the liquid is close to the mean tank temperature so that gradients are less than 0.002 °C throughout the bath. The use of fibreglass also provides for rounded corners so that there are no eddy currents and the use of a special 'slippery' gelcoat paint ensures that the fluid flow is consistent throughout the bath.

The Bath Temperature Control PRT sensor is mounted in the outlet of the heat exchanger to compensate for heat loss. The measurement and control circuitry is calibrated at the factory so that the displayed temperature represents mean fluid temperature to within specified accuracy.

The liquid from the pump flows down through the heat exchanger which contains two heaters and the evaporator coils of the refrigerator. Only one heater is used while controlling at a set point. The 2nd heater is only used to quickly increase the bath temperature to a higher set point, when requested. The control heater has 500 W of power and the 2nd booster heater has 450 W of power.

The bath only uses the compressor when required and balances this to the heating/cooling level required by turning a heater on and off rapidly to provide the exact heating/cooling required. The Compressor has 500 W of power and uses C134A cooling fluid.

In addition to being designed for **best performance and ease of use**, the 5600 Fluid Bath is designed for easy maintenance. The circulation pump, cooling unit and electronic hardware are located in a separate compartment beside the tank with a convenient panel to provide full and unimpeded access. This compartment is EMI shielded from the bath tank, which in turn has its own EMI shield.

For the larger 300L size there are two separate units, each on wheels. The circulation pump, cooling unit, and electronic hardware are the same, but are placed in a physically separate Control/Mechanical cabinet. This separate cabinet is connected to the large 300L bath by insulated flexible hoses that can be of customer chosen length.

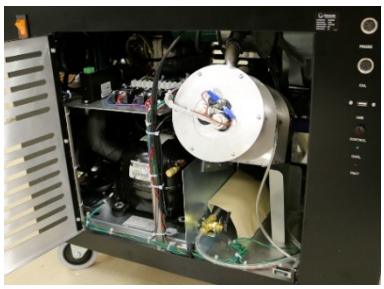
This unique design allows the **5600-300 litre bath to fit through a standard door and into a standard elevator** and provides flexibility in how the bath is placed in a laboratory. For example, the bath tank and the mechanical unit can be placed side-by-side, at right angles, with the mechanical unit behind the bath tank, or even in adjacent rooms.

All Baths come with a removable transparent tank cover allowing full access to the bath. The Bath interior is easily accessed through hinged panels. This entry access is shown to the left (door closed) and to the right (door open).



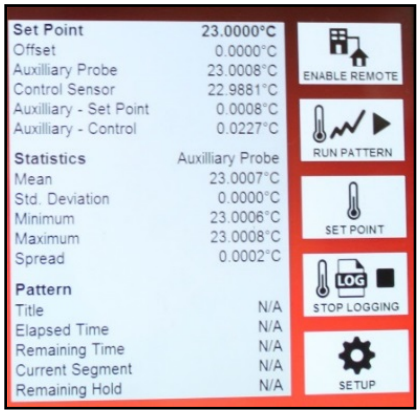
5600-300L Control/Mechanical Unit and Tank Unit





5600 Series Control Software - Providing Advanced Features!

5600 Series Fluid Baths come standard with USB, and optionally with RS232 and IEEE 488.2 via a connected computer. Programming is Standard Control Programmable Interchange (SCPI) based. The 5600 Series is fully compatible with the Guildline 6625T or 6645T (Temperature Measurement Systems). The Baths can also be used with a Guildline 6664C Scanner or Model 3210 Thermometry Auto-Switch.



Using a suitable laptop computer with the 5600 software installed, complete automation or manual operation and control is available

While other manufacturers may offer touch displays, they are integrated and part of the bath mainframe so if the display dies, then your bath is down until the display is repaired. For the 5600 Bath, simply connect any computer via the USB, load the 5600 Software and you up and running – no need to return the bath to the factory!

Advantages of the Windows Based Software include Bath control and data collection. The data is easily transferred to programs such as MS Excel, PowerPoint or even to a customer designed and written program. Backup of Data is easy and can be controlled manually as well as automatically. Additional functionality is only limited by the laptop being used. By having the 5600 control software installed on a laptop, customers can use additional functionality provided by any Windows based program including remote access and control.

5600 Specifications (All Models)			
Temperature Range	Water: 3 °C to 55 °C	Oil: 5 °C to 55 °C	
	Saltwater: 1 °C to 55 °C	alcohol and ethylene glycol: 0 °C to 55 °C	
Temperature Set Point Accuracy[1]		± 0.01 °C over 24 hours, ± 0.05 °C over 1 year	
Set Point Resolution	0.0001 °C	Display Resolution	0.0001 °C
Temperature Stability		Oil	Water
Set point 23 °C ± 2 °C		± 0.0015 K	± 0.001 K
12 °C to 21 °C ◄ Set point ► 25 °C to 35 °C		± 0.004 K	± 0.003 K
8 °C to 11 °C		± 0.02 K	± 0.01 K
Temperature Uniformity[2]		± 0.002 K relative to chamber center, 5 cm minimum from walls	
Temperature Attenuation		± 0.0015 °C/°C of ambient temperature	
Heating Rate (Typical)		Dependent on Bath size, fluid type and viscosity. Refer to Manual	
Cooling Rate (Typical)		Dependent on Bath size, fluid type and viscosity. Refer to Manual	
Cold Power On Stabilization		1 hour to within ± 2 mK of set point at ambient set point	
Temperature Monitor Accuracy		± 0.01 °C	
Temperature Monitor Resolution		0.0001 °C	
Over Temperature Protection		Programmable, Automatic shutdown if temperature > 60 °C ± 4 °C	
Maximum Power Dissipation of unit under test (set point above ambient)			10 W maximum
Temperature Operating		50 °F to 95 °F	10 °C to 35 °C
Temperature Storage		-4 °F to 140 °F	-20 °C to 60 °C
Storage Humidity	< 90 % RH	Operating Humidity	-10 % to 60 % RH 20 °C to 60 °C

	5600-75L (L x W x D)		**5600-100L** (L x W x D)	
Tank Capacity [5]	19.8 gal	75 L	26.4 gal	100 L
Tank Size	27.0 x 13.5 x 12.8 in	68.6 x 34.3 x 32.5 cm	27.0 x 13.5 x 16.6 in	68.6 x 34.3 x 42.2 cm
Exterior Size	54.2 x 24 x 21.2 in	137.7 x 61 x 53.8 cm	54.2 x 24 x 21.2 in	137.7 X 61 x 53.8 cm
Weight[3]	170 lbs	77.3 kg	180 lbs	81.8 kg
Power (VAC)	100, 115, 220, 230, 240 - ±10 % / 50 or 60 Hz ± 10 %			

	5600-300L Mechanical Unit [4] (L x W x D)		**5600-300L** Tank Unit [4] (L x W x D)	
Tank Capacity [5]			79.3 gal	300 L
Tank Size			39.4 x 25 x 20.5 in	100.1 x 63.5 x 52.1 cm
Exterior Size	30.3 x 21.3 x 25.7 inches	76.8 x 54.0 x 65.2 cm	55.2 x 30.3 x 28.6 in	140.3 x 76.8 x 72.7 cm
Weight[3]	250 lbs	114 kg	325 lbs	148 kg
Power (VAC)	100, 115, 220, 230, 240 - ±10 % / 50 or 60 Hz ± 10 %		-	

1 - Set Point Accuracy and Stability is defined as the deviation of the mean hourly value from the 24 hour mean for a single ambient temperature point at one point in the bath chamber (typically the center).

2 - Temperature Uniformity relative to the center of the bath chamber and 5 cm from the bottom or sides of the chamber. Specification applies to 5 °C to 40 °C.

3 - Model weight does not include any fluids.

4 - 300L Bath consists of a Tank Unit and a Control/Mechanical Unit for the pump, compressor and heat exchanger. Dimensions are for each unit.

5 - Tank Capacity is with the chamber filled, but no standards immersed. Actual capacity may be slightly more due to pump and tubes volume within the Bath.

The 5600 Series Baths and Software are true Metrology Based Standards providing the best performance and complete: fundamental control via a proportional-integral-derivative (PID) digital overlay; storing and accessing 17025 required Metrology Based data on temperature, stability and bath operation. ***A true Metrologist tool!***

ORDERING INFORMATION	
5600-XXL/Y	Precision Temperature Fluid Bath. Specify XXL as Bath Size (75 L,100 L or 300 L) Specify Y as 'O' or 'W' for use with OIL or WATER
	All 5600 Baths include: 5600 Software (Windows Based) Separate (2nd)) PRT) Specific Bath Monitoring Calibration Certificate Operation Manual downloadable from Guildline web site
Options Include:	
LPT	Laptop (delivered by local distributor)
SCW-18/30M	30 m Roll of Low Thermal Wire (18 AWG)
56001	Thermistor Probe Cable
56001-2	Temperature Probe Holder, 75/100 L
56001-3	Temperature Probe Holder, 300 L
56002-2	Resistor Tray, Adjustable Height, 75/100 L
56002-3	Resistor Tray, Adjustable Height, 300 L
56004	Storage Cart (Only for 75 L and 100 L Models)
56005	Drip Tray
56006-2	Cable Guide, 75/100 L
56006-3	Cable Guide, 300 L
56007	Drain Pump
56009	Patch Panel

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