

### Specifications TV2000, TV4000, TV7000DC

ASTM D445 - ASTM D446 - IP 71 - ISO/EN 3104 - ASTM D2170 - ASTM D2162



- ⊕ Completely stainless steel
- ⊕ Conforms to ASTM D445
- ⊕ High precision stability
- ⊕ Large windows
- ⊕ Easy to operate
- ⊕ RS232 communication
- ⊕ Drain and overflow outlet

#### General

Tamson viscometer and Tamson calibration baths are specially designed for tests that require ultra-precise temperature control, or processes that need to be followed visually, e.g. viscometry, thermometer calibration, crystal growing, density and reaction rate measurement, etc. All models are fitted with double windows in front and rear walls. Visibility through the bath is excellent.

#### Construction

The stainless steel construction with 25 mm thick rock wool insulation ensures an exceptionally stable bath temperature which is further improved by an ingenious stirring mechanism with baffle plates. All wetted parts are made from stainless steel, providing resistance against all usual bath fluids. The bath is fitted with adjustable feet for levelling. The cover of the bath has a number of round ø51 mm openings with lids, for suspending glass capillary viscometers in holders. To work at temperatures below ambient, use of cooling must be made. A cold flow can be pumped through the cooling coil inside the apparatus.

Item	Unit	TV2000	TV4000	TV7000DC
P/N 230V/50~60Hz		00T0782	00T0772	00T0796
P/N 115V/60Hz		00T0784	00T0774	00T0798
Range	[°]	Ambient to 230C/446F	Ambient to 230C/446F	Ambient to 180C/356F
Reading	°C or °F menu selectable			
Readout	Two decimals (0.01). Three decimals optional			
Interface	RS232			
Setting ±	[°C]	0.01		
Stability* ±	[°C]	0.01		
Uniformity* ±	[°C]	0.01		
Heating 230V	[kW]	2.8	2.8	2.4
Heating 115V	[kW]	1.75	1.75	1.5
Heaters		2	2	3
Bath volume	[L]	20	40	70
Number of lids		3	4+3 or 4+4	4+3 or 4+4
Opening lid	[mm]	ø51	ø51	ø51
Window	[mm]	140 * 285	270 * 285	270 * 585
Opening bath	[mm]	130 * 165	260 * 240	260 * 240
Depth	[mm]	300	300	630
Length	[mm]	350	400	460
Width	[mm]	470	590	410
Height	[mm]	590	590	1010
Weight	[kg]	40	41	61
Power 230V	[kW]	2.9	2.9	2.6
Power 115V	[kW]	1.8	1.8	1.6
Frequency	[Hz]	Suited for both 50 & 60		
CE	All models conform CE regulation			
* Value measured in water @ +50°C/+122°F				

Tap water or a combination with the external Tamson TLC10-3 or TLC15-5 cooling circulators can be used for this purpose. All models are fitted with double windows in front and rear walls. The windows are formed with two panes of tempered safety glass separated by 20 mm air space. A power plug on the backside is mounted to provide power for an optional Z41 or Z71 LED illumination unit to provide a better view inside the bath.

#### Agitation

A vane type stirrer with brass bearings moves the bath fluid past the heaters and then from under the main baffle plate, thus directing the freshly heated bath fluid to the walls as well as window areas and is creating an optimal temperature uniformity inside the bath.

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#### Span

TV2000 & TV4000 can be operated from ambient +5°C up to +230°C/446°F and TV7000DC up to +180°C/356°F. With the use of the built-in cooling coil, span lies 5°C above the temperature of the cooling liquid.

#### Accuracy and set point

The set point can be set in steps of 0.01°. The system overall accuracy is within  $\pm 0.01^\circ\text{C}$ . Please see the graphs for more details. After the temperature control is stable, the offset can even be adjusted with  $\pm 0.005^\circ\text{C}$ .

#### Viscometer arrangement

The TV4000 and TV7000DC stainless steel bath cover has seven openings with lids, arranged in two rows of resp. four and three openings. An optional cover with eight openings is available. The TV2000 offers three openings (2 + 1 lids). These openings of  $\varnothing 51$  mm will accommodate glass capillary in holders (please see our specification sheet "viscosity accessories"). Additionally, separate thermometers can be placed through two  $\varnothing 12.5$  mm openings in the cover.

#### Safety

The bath conforms to CE regulations. It also is equipped with a mechanical adjustable and resettable safety thermostat. Advanced safety features are microprocessor control of:

- Electronic- and processor system,
- Control and feedback from each heating,
- System accuracy.

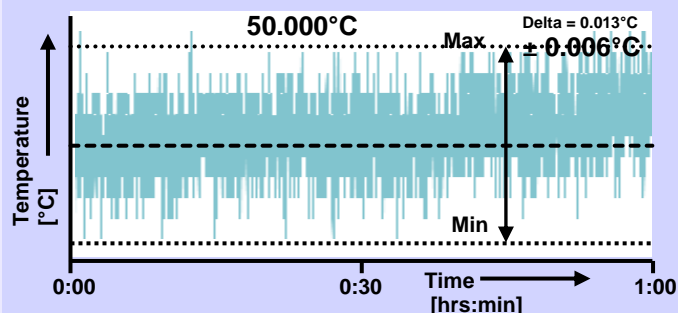
System error results in total cut-off from the power supply.

The viscosity baths are standard equipped with a float. In case the level of the bath fluid is too low, the float will switch-off the bath.

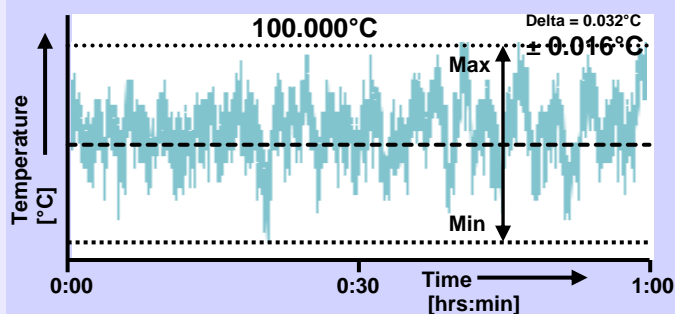
#### Optional equipment

See next page.

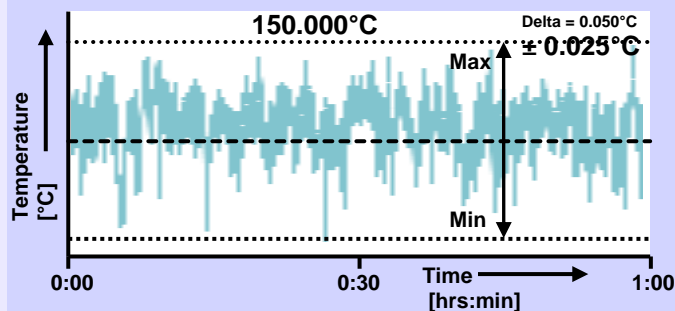
#### Temperature stability @ 50°C



#### Temperature stability @ 100°C



#### Temperature stability @ 150°C









# Tamson Instruments

## Specification sheet

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TV2000 is standard included with:		
P/N	Picture	Description
23T2404		Cover with 3 openings: - 3 x $\varnothing 51$ mm opening - 2 x $\varnothing 12.5$ mm opening for thermometer
		3 * lid for $\varnothing 51$ mm opening



Optional covers for TV2000:		
P/N	Picture	Description
23T2405		Cover with 4 openings: - 4 x $\varnothing 51$ mm opening - 2 x $\varnothing 12.5$ mm opening for thermometer
		4 * lid for $\varnothing 51$ mm opening
23T2406		Cover with 3 openings: - 3 x $\varnothing 60$ mm opening - 2 x $\varnothing 12.5$ mm opening for thermometer
		3 * lid for $\varnothing 60$ mm opening



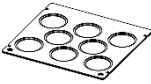




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TV4000 or TV7000DC is standard included with:		
P/N	Picture	Description
23T2400		Cover with 7 openings: - 7 x $\varnothing 51$ mm opening - 2 x $\varnothing 12.5$ mm opening for thermometer
		7 * lid for $\varnothing 51$ mm opening



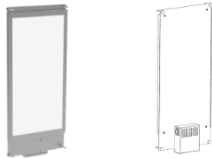

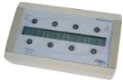



Optional covers for TV4000 or TV7000DC:		
P/N	Picture	Description
23T2401		Cover with 8 openings: - 8 x $\varnothing 51$ mm opening - 2 x $\varnothing 12.5$ mm opening for thermometer
		8 * lid for $\varnothing 51$ mm opening
23T2402		Cover with 8 openings: - 8 x $\varnothing 60$ mm opening - 2 x $\varnothing 12.5$ mm opening for thermometer
		8 * lid for $\varnothing 60$ mm opening
23T2403		Cover with 7 openings: - 4 x $\varnothing 51$ mm opening - 3 x $\varnothing 60$ mm opening - 2 x $\varnothing 12.5$ mm opening for thermometer
		4 * lid for $\varnothing 51$ mm opening
		3 * lid for $\varnothing 60$ mm opening

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Accessories				
P/N	Picture	TV2000	TV4000	TV7000DC
00T0909		Illuminator "Z41" stand alone (85 ~ 230V/50-60Hz)		
00T0908		Illuminator "Z41" backpanel (85 ~ 230V/50-60Hz)		
00T0907				Illuminator "Z71" backpanel (85 ~ 230V/50-60Hz)
00T0565		Cooling circulator TLC15-5 - 230V/50Hz		
00T0567		Cooling circulator TLC15-5 - 230V/60Hz		
00T0570		Cooling circulator TLC15-5 - 115V/60Hz		
10T6090		Timer, 8 positions		
10T6094		Tamson TT3B thermometer with external probe, three decimal reading, precision $\pm 0.01^{\circ}\text{C}$ , short PT-100 probe with range -40 .. +140°C including a works calibration certificate. (Please see specification sheet "TT3B thermometer")		
14T0303		Adapter to insert a TT3B thermometer in the opening of the cover		
02T3041		Three decimal readout (0.001)		
Viscosity accessories		Please see specification sheet "Viscosity accessories", e.g. viscometers, viscometer holders, bath fluids, general purpose reference standards, etc		



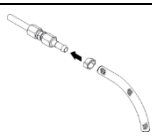



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P/N	Picture	Accessories		
		TV2000	TV4000	TV7000DC
00T0944			Tamson Manifold Kinematic Viscosity (TMKV)	
00T0233		Vacuum pump 230V/50-60Hz		
00T0261		Vacuum pump 115V/60Hz		
12T1075		Tubing with connectors and clamps to be used between a TLC and a TV		
02T0203		Spill tray		
02T0201			Spill tray	

TV4000 with TMKV (P/N 00T0944) and Vacuum pump to be used with the following viscometers:

- Ubbelohde
- BS/U-tube
- BS/U/M miniature
- SIL
- BS/IP/SL(S)
- BS/IP/MSL

