CATALOGUE

Tamson Instruments

Contact:
G-Labo Germany
Bgm.-Horneffstr.26
69509 Mörlenbach
Tel.: + 49 6209 797100
Fax: + 49 6209 797101
Mail: info@g-labo.de
Web: www.g-labo.de

PMT
est. 1878

TV4000

with TVS and manifold for ASTM D2171


500

Content

Content

Tamson sets the standard

Introducing Tamson

Founded in 1878, Tamson began as a wholesaler in laboratory equipment in the field of chemistry and physics. By the 1950s the product range had diversified into a field of manufacturing thermostic baths and circulators for industry. This business generated 65 years of dedicated experience within this specialized field, reflecting upon the success, quality and high performance of Tamson products. We are proud of using the Tamson name which stands for quality, precision and reliability.

In January 1998, the company name changed to Tamson Instruments BV, when the production and wholesaler departments were separated. In 2008, Tamson Instruments BV moved to a new office in Bleiswijk near Rotterdam, The Netherlands. All Tamson products are manufactured in The Netherlands.

Product range

We offer a quality range of cooling and heating circulators. Our robust products provide reliable and very accurate temperature regulation of fluids. An accuracy beyond 0.005 Kelvin can be achieved. The product range provides exact temperature controlling from -100°C to +250°C. Our equipment can be found in many diverse areas of research across industrial fields such as petroleum industry, universities, research institutes and quality control laboratories. Our main markets are being found in chemical, quality control and product processing, along with research and development industries.

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Email sales@tamson.com
Website www.tamson.com

In this catalogue, the Tamson product range is divided into five groups:

1) Petroleum Testing Equipment
2) High Temperature Baths
3) Low Temperature Baths
4) Accessories
5) Calibration Baths & Digital Contact Thermometers

Tamson sets the standard

Tamson Instruments BV is an innovative manufacturer and is ahead in the newest developments and technologies. We develop, design, and produce state-of-the-art thermostatic baths, coolers, circulators and instruments for tempertature calibration. Tamson continuously invests into new technology. Our products operate with amazing high accuracy, long life quality, and reliability. As a manufacturer, we continually strive to enhance our products and we are extending our product range in order to better serve our customers needs. In the markets for manual kinematic viscosity and calibration baths we set the standard.

Since October 2017, Tamson Instruments is ISO 9001:2015 certified by SGS for the manufacturing and supply of petroleum testing equipment. The Tamson team is very proud to be ISO 9001:2015 certified. We believe that ISO 9001:2015 is a recognition of our hard work to always keep improving our products, as well as our service.

More in-depth technical information regarding the products can be found in the specification sheets and manuals which can be downloaded from our website.

We look forward to receiving your questions, feedback and further requests.

Thank you for reading our catalogue.

Kind regards,

Tamson Instruments B.V.

ASTM EQUIPMENT

1.1 ASTM D70 Density of Semi-Solid Bituminous Materials

ASTM D70 - IP 189 - IP 190 - ISO 3838 - J15 K2265

This test method covers the determination of the relative density and density of semi-solid bituminous materials, asphalt cements, and soft tar pitches by use of a pycnometer. The sample is placed in a calibrated pycnometer. The pycnometer and sample are weighed, then the remaining volume is filled with water. The filled pycnometer is brought to the test temperature, and weighed. The density of the sample is calculated from its mass and the mass of water displaced by the sample in the filled pycnometer.

TC16 for ASTM D70

Main characteristics

The insulation of the bath and electronic design result in a very stable working temperature of ± 0.02°C. The set point can be set in steps of 0.1°C in the range of 0°C up to 250°C (-148..482°F). The accuracy on the display is displayed in 0.1°C. However the controller has an internal accuracy of 0.01°C.

Range	..250°C/...482°F
Reading	Standard °C, °F on request
Used materials inside bath	Stainless steel 304
Setting	0.1°C
Stability ±	0.02 °C
Heating	1400 W
Bath volume	16 L
Opening bath	180 x 210 mm
Depth bath	220 mm
Pump (mBar)	Max pressure 300 (optional 1 Bar)
Pump (L/min)	Max flow 7.5 (optional 16)
Dimension (LxWxH)	480 x 295 x 480 mm
Weight	21 kg

▶ TC16 **P/N** 00T0671 (230V/50-60Hz) • **P/N** 00T0861 (115V/60Hz)

Neccessary accessories		ASTM D70	IP 189/IP 190
P/N 13T8049	TC16 cover for ASTM D70/IP 189/IP 190	•	•
P/N 13T8050	Ridge for pycnometer brackets	•	•
P/N 13T8051	Bracket for three Hubbard pycnometers (one piece)	•	
P/N 13T8052	Bracket for three Gay-Lussac pycnometers (one piece)		•

Accessories		ASTM D70	IP 189/IP 190
P/N 00T0565 P/N 00T0567 P/N 00T0570	TLC15-5 external circulator to cool down the TC16 bath fluid to measure the density @25°C, 20°C or 15°C (below or near ambient temperature)	•	
P/N 12T1075	Set of tubing, connectors, and clamps between TC and TLC baths	•	
P/N 31T0030	Pycnometer Gay-Lussac		•
P/N 31T0031	Pycnometer Hubbard	•	

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1.2 ASTM D91 Centrifuge for Petrol and Mineral Oils

ASTM D91 - ASTM D96 - ASTM D893 - ASTM D1796 - ASTM D2273 - ASTM D2709 - ASTM D2711 - ASTM D4007 -ASTM D5546 - API 2542 - API 2548 - BS 4385 - ISO 3734 - ISO 9030 - IP 75 - IP 359

The centrifuge is specially designed for water and sediment determination, as well as characterization of used oils and petroleum features as demulsibility and precipitation.

Main Characteristics
A choice of accessories is available for 6" and 8" 100 mL cone-shaped centrifuge tubes, 6" pear-shaped centrifuge tubes, as well as finger-shaped centrifuge tubes of 12.5 mL.

- Maintenance free induction motor
- Controller by microprocessor circuit board
- Noise level <60 dB
- Automatic rotor recognition, it shows on screen max. RPM, max. RCF and max. capacity avoiding over speed
- Temperature regulation from ambient +5°C to +80°C
- Opening of the lid is selectable: automatic at the end of the cycle or manual by pressing the button on the keypad
- Temperature selectable on °C/°F
- RPM / RCF adjustable along run

Centrifuge

▶ Centrifuge **P/N** 31T0200 (230V/50-60Hz) • **P/N** 31T0220 (115V/60Hz)

Necessary accessories	
P/N 31T0201	Swing out rotor for four 8" cone-shaped centrifuge tubes
P/N 31T0204	Swing out rotor for four 6" and 8" cone-shaped centrifuge tubes
P/N 31T0208	Four adapters for four 6" cone-shaped centrifuge tubes
P/N 31T0203	Four adapters for four 8" cone-shaped centrifuge tubes
P/N 31T0205	Four adapters for pear-shaped centrifuge tubes
P/N 31T0212	Adapter for 28 finger-shaped centrifuge tubes (for P/N 31T0204)
P/N 31T0210	Adapter for four finger-shaped centrifuge tubes (for P/N 31T0201)
P/N 31T0211	Adapter for 16 finger-shaped centrifuge tubes (for P/N 31T0201)
P/N 09T0015	Tube glassware 100 mL, 8" cone-shaped centrifuge tube, graduated
P/N 31T0206	Tube glassware 100 mL, pear-shaped centrifuge tube, graduated
P/N 31T0209	Tube glassware 100 mL, 6" cone-shaped centrifuge tube, graduated
P/N 31T0207	Tube glassware 12.5 mL, cone-shaped centrifuge tube, graduated
P/N 31T0202	Stopper for 6" and 8" cone-shaped centrifuge tubes, 100 pcs
P/N 31T0227	Tube glassware 100 mL, pear-shaped centrifuge tube, graduated. Non certified, verified.
P/N 31T0226	Tube glassware 100 mL, 8" cone-shaped trace sediment centrifuge tube, graduated

Optional	
P/N 31T0216	Preventing toxic fumes and explosion hazard due to gas building up during tempering and centrifuge process (220-230V/50-60Hz).
P/N 00T0671	Water bath to preheat cone-shaped centrifuge tubes, please see section 1.18

1.3 ASTM D97 Adjustable Cloud and Pour Point Bath

ASTM D97 - ASTM D2500 - ISO 3015 - ISO 3016 - IP 15 - IP 219

The pour point describes a procedure for testing the fluidity of a petroleum product at a temperature. The cloud point is defined as the temperature of a liquid specimen when the smallest observable cluster of wax crystals first appears upon cooling.

Main characteristics
Apparatus to determine the cloud and pour point manually. The TLC40-14 and TLC80-14 are single and adjustable low-temperature circulator baths with position for six jackets. All accessories are supplied by Tamson.

The used cooling system is ozone friendly and doesn't contain any CFK/HCFK gas. For more information about the TLC40-14 and TLC80-14, please see section 3.4.

TLC80-14 for ASTM D97 or D2500

	TLC40-14	TLC80-14
Range	-40*..+20°C/-40..+68 °F	-80..+20°C/-112..+68°F
Reading	Standard °C, °F on request	
Used materials inside bath	Stainless steel 304	
Setting	0.1°C	
Stability ±	Better than 0.05 °C	
Heating	1550 W	
Bath volume	14 .. 15 L	
Opening bath	240 x 170 mm	
Depth bath	150 mm	
Pump (mBar)	Max pressure 300 (optional 1 Bar)	
Pump (L/min)	Max flow 7 (optional 16)	Max flow 10 (optional 16)
Dimension LxWxH	810 x 460 x 770 mm	
Weight	65 kg	80 kg
Heat removal	See section 3.1	

* On request the TLC40-14 can have an optional working range from -45..+20°C.

▶ TLC40-14 **P/N** 00T0520 (230V/50Hz) • **P/N** 00T0522 (230V/60Hz) • **P/N** 00T0525 (115V/60Hz)
▶ TLC80-14 **P/N** 00T0530 (230V/50Hz) • **P/N** 00T0532 (230V/60Hz) • **P/N** on request (115V/60Hz)

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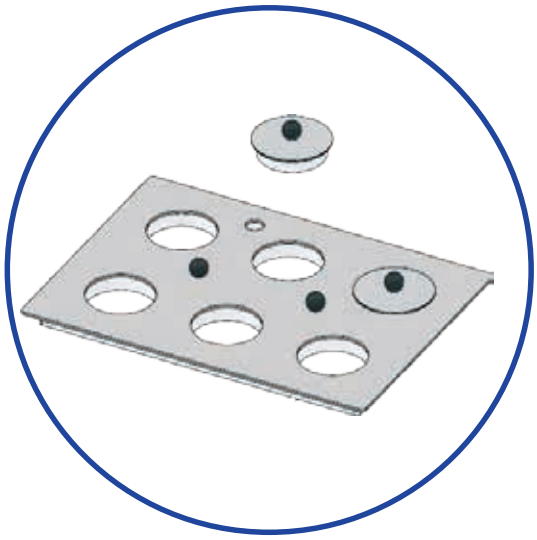
Necessary accessories	
P/N 03T2171	Insulated cover for six positions with insulated lids (one needed)
P/N 14T0235	Jacket (six needed)
P/N 09T0142	Test jar for manual pour or cloud point (case of 24 pieces)
P/N 31T0421	Felt gasket (pack of ten pieces)
P/N 31T0422	Felt disk (pack of ten pieces)
P/N 31T0013	Cork for test jar P/N 31T0012 or P/N 09T0142 (pack of ten pieces)
P/N 31T0423	Cork for bath thermometer (pack of ten pieces)
P/N 25T0904BW	ASTM thermometer S5C with works certificate
P/N 25T0905TW	Thermometer with blue filling similar to ASTM 6C with works certificate
P/N 25T0946BW	Thermometer with blue filling similar to ASTM 61C with works certificate



P/N 03T2171

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1.4 ASTM D130 Copper Corrosion from Petroleum Products

ASTM D130 - EN/ISO 2160 - IP 154 - DIN 51811 - ASTM D4048 - IP 112 - ASTM D7095

This test method covers the detection of the corrosiveness to copper of aviation gasoline, aviation turbine fuel, automotive gasoline, natural gasoline or other hydrocarbons having a Reid vapour pressure no greater than 18 psi.

Main Characteristics

The cover of the corrosion bath has six openings, each supplied with a lid with a hook for suspending a copper corrosion test vessel (P/N 14T0100) or the openings can accommodate test tubes in holders (P/N 14T0102). The temperature range is from ambient +5°C to 250°C. Optional is a cover with nine openings to test nine samples (P/N 03T2311). When not used for copper corrosion tests, the pump can be used to circulate the bath content to an external application. Alternatively, a TC40 can be used as an 18 position bath.

Range	..250°C/...482°F
Reading	Standard °C, °F on request
Used materials inside bath	Stainless steel 304
Setting	0.1°C
Stability ±	0.02 °C
Heating	1400 W
Bath volume	16 L
Opening bath	Cover with 6 x 51 Ø mm openings (9 optional)
Depth bath	220 mm
Pump (mBar)	Max pressure 300 (optional 1 Bar)
Pump (L/min)	Max flow 7.5 (optional 16)
Dimension (LxWxH)	480 x 295 x 480 mm
Weight	21 kg

▶ TC16 (for ASTM D130) **P/N** 31T0671 (230V/50-60Hz) • **P/N** 31T0861 (115V/60Hz)

Copper Corrosion Bath

Test Cylinder

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Email sales@tamson.com
Website www.tamson.com

ASTM Equipment

Necessary Accessories		ASTM D130, IP 154	ASTM D4048 IP 112	ASTM D7095
P/N 14T0100	Test cylinder with o-ring	•		•
P/N 31T0003	ASTM copper strip corrosion test standard	•	•	•
P/N 31T0002	Copper strip (one piece)	•	•	
P/N 31T0001	Sanding paper silicon carbide P220 (one piece)	•		
P/N 09T0010	Test tube 25 x 150 mm	•		•
P/N 14T0102	Test tube holder for P/N 09T0010	•		•
P/N 31T0000	Multistrip vise, holds up to four strips while polishing	•	•	•
P/N 31T0005	Silicon carbide powder 105-µm (1 kg)	•	•	
P/N 09T0011	Flat viewing test tube	•	•	•
P/N 25T0928BW	Themometer with blue filling similar to ASTM 34C with works certificate	•	•	•
P/N 08T0001	Silicon oil 200-10 mm²/s 20 ltrs transparent (20..150°C)		•	
P/N 25T2154	Thermometer holder	•	•	•
P/N 31T0009	Sanding paper P240 (one piece)		•	
P/N 31T0008	Vented cork for test tube P/N 09T0010 (25 pieces)	•	•	•
P/N 24T0385	O-ring for test cylinder (P/N 14T0100)	•		•
P/N 31T0011	Sourcing pad 400 grit (box of 20 pieces)			•
P/N 31T0010	Disposable copper foil strip (one piece)			•
P/N 14T0109	Test jar holder ASTM D4048 P/N 31T0012		•	
P/N 31T0012	Test jar ASTM D4048		•	
P/N 31T0013	Vented cork for test jar D4048 (one piece)		•	

For TC16 spare parts, please see section 2.6

Alternative set-up for 18 positions	
P/N 00T0681 or P/N 00T0851	TC40 230V/50-60Hz or TC40 115V/60Hz
P/N 03T2313	Cover with 18 x 51 mm openings
P/N 14T0101	Lid + mounting hook (number of pieces to be ordered separately depending on number of test cylinders)

Test Tube in Holder

1.5 ASTM D445 How to Select the Appropriate Viscosity Bath?

	TV2000 (1)** TV4000 (2)** TV4000DC (3)** TV7000DC (4)**	TV12**	TV2500**	TV2000AKV**	TV12LT*	TV4000LT (1) TV7000LT (2)	TLV25	TV15000	TV16000
Temperature range	Ambient..230°C	Ambient..120°C	Ambient..120°C	Ambient..130°C	-42°C..+20°C	-40°C..+100°C	-80°C..+60°C	+5°C..+60°C	+10°C..+60°C
Setting (°C)	0.01	0.01	0.01	0.1	0.01	0.01	0.1	0.005	0.005
Offset	0.005	0.005	0.01	0.01	0.005	0.005	0.01	0.005	0.005
Stability	(1,2,4) ±0.01°C (3) ±0.002°C@40°C	±0.005°C	±0.02°C	±0.01°C	±0.01°C	±0.02°C	±0.04°C	±0.007°C	±0.005°C
Heating (W)	2800	1280	1400	2800	1200	2000	1500	2500	2500
Heaters	2	2	1	3	2	2	1	2	2
Built-in light	No	Yes	No	No	Yes	No	Yes	No	No
Removable outside window	Yes	Yes	No	No	Yes	No	Yes	No	No
Bath Volume (L)	(1) - 20 (2,3) – 40 (4) - 70	12..15	25	20	15..18	(1) – 40 (2) - 70	25	155	160
Number of lids	(1) – 3 (2,3,4)– 7 or 8	4	4	1	4	7 or 8	3	On request	9
Opening bath (mm)	(1) – 130 * 165 (2,3) – 260 * 240 (4) – 260 * 240	248 * 73	185 * 155	130 * 165	248 * 112	260 * 240	1620	230 * 820	250 * 365
Depth bath (mm)	(1) – 300 (2,3) – 300 (4) - 600	300	300	300	300	300	400	650	965
Dimensions (LxWxH)	(1) – 285*465*585 (2,3) – 350*590*585 (4) – 350*630*885	318*365*640	340*204*600	285*465*585	670*425*720	(1) - 560*492*1150 (2) - 560*492*1450	570*410*540	1170*420*1400	575*575*1700
Weight (kg)	(1) – 40 (2,3) – 41 (4) – 61	20	15	40	65	(1)– 100 (2) – 120	38.5	130	135
Stirring included	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cooling coil	Yes	Yes	Yes	Yes	No	No	No	No	No
Cataloque section	1.6	1.8	1.7	1.9	1.10	1.11	1.12	1.21	1.20
ASTM Method	D 4 4 5 + D 2 1 7 0 (1,2,3,4) + D2162 (4)	D445	D445	D445	D445	D445+D2162 (for 2)	D445	D445+D2162	D2162 + D445
Drain	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes
Overflow outlet	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes
Integrated cooling	No	No	No	No	Yes	Yes	No	Yes	Yes

* Optional -50..+20°C and -42..+80°C

** With external cooler from +10°C possible

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Email sales@tamson.com
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1.6 ASTM D445 High Temperature Viscosity Baths - TV Series

ASTM D445 - ASTM D2162 - ASTM D2170 - ISO/EN 3104 - IP 71 - DIN 51366

This test method specifies a procedure for the determination of the kinematic viscosity of liquid petroleum products, both transparent and opaque, by measuring the time for a volume of liquid to flow under gravity through a calibrated glass capillary viscometer.

Main characteristics

Bath can be operated from ambient +5°C up to +230°C (41..446°F). With the use of the built-in cooling coil and an external Tamson cooling circulator, span lies 5°C above the temperature of the cold flow of the external cooling circulator. The TV2000, TV4000(DC), and TV7000DC have a bath volume of 20, 40, and 70 litres respectively. The TV2000 has a cover with three openings and lids. The TV4000(DC) and TV7000DC have a cover with seven openings and lids. These openings accommodate glass capillary viscometers in viscometer holders. The TV4000DC has the same specifications as the TV4000, but with a unique stability of 0.002°C at 40°C. The TV7000DC is used to calibrate long thermometers, to calibrate master viscometers or for oxidation stability tests. A bath overflow outlet protects from expanding bath oil when the bath filling is expanding at higher temperatures. A bath drain is standard included. The bath is fitted with a double window of which the front pane is detachable for cleaning purposes.

TV4000

	TV2000	TV4000	TV4000DC	TV7000DC
				
Range	…230°C/…446°F			
Reading	Standard °C, °F on request			
Used materials inside bath	Stainless steel 304, brass bearings			
Setting	0.01°C			
Offset ±	0.01°C (optional 0.005°C)			
Stability ±	0.01°C	0.01°C	0.002°C @40°C 0.005°C @100°C 0.010°C @150°C	0.01°C
Heating	2800 W			
Heaters	2			
Bath volume	20 L	40 L	40 L	70 L
Number of Ø 51 mm lids	3 (4 optional)	4 + 3 (4 + 4 optional)		
Window	140 x 285 mm	270 x 285 mm		270 x 585 mm
Opening bath (without cover)	130 x 165 mm	260 x 240 mm		260 x 240 mm
Depth bath	300 mm	300 mm		630 mm

- TV2000 **P/N** 00T0782 (230V/50-60Hz) • **P/N** 00T0784 (115V/60Hz)
- TV4000 **P/N** 00T0772 (230V/50-60Hz) • **P/N** 00T0774 (115V/60Hz)
- TV4000DC **P/N** 00T0802 (230V/50-60Hz) • **P/N** 00T0804 (115V/60Hz)
- TV7000DC **P/N** 00T0796 (230V/50-60Hz) • **P/N** 00T0798 (115V/60Hz)

ASTM Equipment

Options		TV2000	TV4000	TV4000DC	TV7000DC
P/N 23T2405	Cover with four openings (Ø51 mm) + lids and two openings for ASTM thermometers (Ø12.5 mm)	•			
P/N 23T2406	Cover with three openings (Ø60 mm) + lids and two openings for ASTM thermometers (Ø12.5 mm)	•			
P/N 23T2401	Cover with eight openings (Ø51 mm) + lids and two openings for ASTM thermometers (Ø12.5 mm)		•	•	•
P/N 23T2402	Cover with eight openings (Ø60 mm) + lids and two openings for ASTM thermometers (Ø12.5 mm)		•	•	•
P/N 23T2403	Cover with four openings (Ø51 mm) + lids and three openings (Ø60 mm) + lids and two openings for ASTM thermometers (Ø12.5 mm)		•	•	•

Accessories		TV2000	TV4000	TV4000DC	TV7000DC
P/N 00T0908	Illuminator Z41 80..230V/50-60Hz (back panel)	•	•	•	
P/N 00T0907	Illuminator Z71 80..230V/50-60Hz (back panel)				•
P/N 10T6066	Viscohanger	•	•	•	•
P/N 10T6090	8 Channel stop-watch	•	•	•	•
P/N 00T0239	ASTM thermometer holder	•	•	•	•
P/N 00T0220	Can with 20L of mineral oil (suitable for 80..150°C)	•	•	•	•
P/N 08T0001	Can with 20L of silicon oil 200-10 mm²/s (suitable for 20..150°C)	•	•	•	•
P/N 00T0238	Can with 20L of silicon oil 550 (suitable for 80..250°C)	•	•	•	•
P/N 00T0050	TLC10-3 to work below ambient temperature	•			
P/N 00T0565	TLC15-5 to work below ambient temperature		•	•	
P/N 00T0520	TLC40-14 to work below ambient temperature				•
P/N 12T1075	Set of tubing, connectors, and clamps between TV and TLC baths	•	•	•	•
P/N 02T0203	Spill tray	•			
P/N 02T0201	Spill tray		•	•	•
P/N 07T0086	Float / Level detector	•			
P/N 07T0087	Float / Level detector		•	•	
P/N 07T0088	Float / Level detector				•
P/N 14T0303	Adapter to insert an E20 thermometer in the bath cover	•	•	•	•

Main spare parts 230V/50-60Hz (115V-60Hz on request)		TV2000	TV4000	TV4000DC	TV7000DC
P/N 06T0500	Microprocessor board TMC70	•	•	•	•
P/N 06T0512	PCB power TMC70	•	•	•	•
P/N 28T4026	PT-100 sensor	•	•	•	•
P/N 04T0068	Stirrer complete				•
P/N 04T0081	Stirrer complete		•	•	
P/N 04T0082	Stirrer complete	•			
P/N 25T0202	Heater 1400 W	•	•	•	
P/N 25T0352	Heater 500 W 48V DC				•
P/N 06T0502	PCB display TMC70				•
P/N 24T8541	Mains switch	•	•	•	•

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Tel. +31 10 522 43 73
Email sales@tamson.com
Website www.tamson.com

1.7 ASTM D445 High Temperature Viscosity Baths - TV2500 and TV3500

ASTM D445 - ASTM D2162 - ISO/EN 3104 - IP 71 - DIN 51366 - ASTM D1298

Main Characteristics

The TV2500 or TV3500 bath can be operated from ambient +5°C up to +120°C (41..248°F). With the use of the built-in cooling coil and an external Tamson cooling circulator, span lies 5°C above the temperature of the cold flow of the external cooling circulator. The TV2500 has a bath volume of 25 liters. The TV3500 has a bath volume of 35 liters. The TV2500 offers two rows of two openings with lids. The TV3500 can be equipped with a cover with nine openings and lids. These openings will accommodate glass capillary viscometers in viscometer holders. A bath overflow outlet protects from expanding bath fluid when the bath filling is too high. A bath drain is standard included.

	TV2500	TV3500
Range	...120°C/...248°F	
Reading	Standard °C, °F on request	
Used materials inside bath	Stainless steel 304	
Setting	0.01°C	
Stability ±	0.02°C	
Heating	1400 W	
Heaters	1	
Bath volume	25 L	35 L
Number of lids	4	9
Opening lid	Ø51 mm	
Window	230 x 300 mm	
Opening bath (without cover)	185 x 155 mm	400 x 120 mm
Depth bath	300 mm	320 mm

TV3500

▶ TV2500 **P/N** 19T1003 (230V/50-60Hz) • **P/N** 19T1004 (115V/60Hz)
▶ TV3500 **P/N** 19T1005 (230V/50-60Hz) • **P/N** 19T1006 (115V/60Hz)

▶ For ASTM D1298 (density by hydrometer) you can use the TV2500 in combination with a special cover with three holes (P/N 03T2119) and a TLC10-3 cooling circulator. Please also see section 'ASTM D1298 – Density by Hydrometer'.

TV2500 for ASTM D1298

ASTM Equipment

Options		TV2500	TV3500
P/N 07T0085	Float / Level detector	•	•
P/N 02T0210	Safety window for use when set point >50°C	•	
P/N 02T0200	Spill tray	•	
P/N 23T2408	Cover with three openings and lids Ø 60 mm	•	
P/N 02T0211	Safety window for use when set point >50°C		•
P/N 13T3013	Spill tray		•
P/N 03T2143	Cover with three openings and lids Ø 60 mm		•

Accessories		ASTM D445	ASTM D1298
P/N 00T0909	Illuminator Z41 (85...230V/50-60 Hz)	•	•
P/N 10T6066	Viscohanger	•	
P/N 10T6090	8 channel stop-watch	•	
P/N 00T0239	ASTM thermometer holder	•	•
P/N 14T0303	Adapter to insert an E20 thermometer in the bath cover	•	•
P/N 00T0220	Can with 20L of mineral oil (suitable for 80..150°C)	•	
P/N 08T0001	Can with 20L of silicon oil 200-10 mm²/s (suitable for 20..150°C)	•	
P/N 00T0050	TLC10-3 external cooler to work below ambient temperature	•	•
P/N 03T2119	Cover with three openings for hydrometer cylinder		•
P/N 03T2128	Cover with five openings for hydrometer cylinder		•
P/N 09T0400	Hydrometer cylinder		•

Main spare parts 230V/50-60Hz (115V-60Hz on request)		TV2500	TV3500
P/N 25T1295	Motor 30 W	•	•
P/N 25T0360	Heater 1400 W	•	•
P/N 06T0514	PCB power TMC70	•	•
P/N 24T8581	Safety cut-out thermostat	•	•
P/N 25T2311	PT-100 sensor	•	•
P/N 25T1343	Capacitor 2uF	•	•
P/N 06T0513	PCB display	•	•

▶ **For Viscosity Accessories, see section 'Viscosity Accessories'.**

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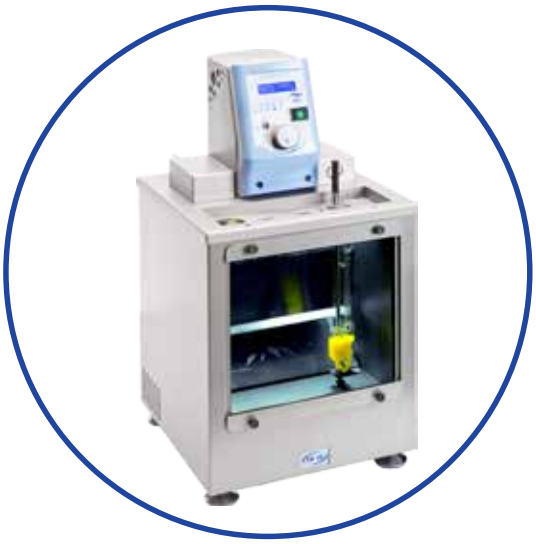
Email sales@tamson.com
Website www.tamson.com

1.8 ASTM D445 High Temperature Viscosity Baths - TV12

ASTM D445 - ISO/EN 3104 - IP 71 - DIN 51366

Main Characteristics

The TV12 is a unique viscosity bath with a small footprint. The TV12 can be operated from ambient +5°C up to +120°C (41..248°F). With the use of the built-in cooling coil and an external Tamson cooling circulator, span lies 5°C above the temperature of the cold flow of external cooling circulator. The TV12 has a bath volume of only 12 liters and a unique stability of 0.005°C. The TV12 offers one row of four openings with lids. These openings will accommodate glass capillary viscometers in viscometer holders. A permanent LED light is located in the top plate to supply clear light and guarantees optimal visibility inside the bath. A bath overflow outlet protects from expanding bath fluid when the bath filling is too high. A bath drain is standard included. The bath is fitted with a double window of which the front pane is detachable for cleaning purposes.



TV12

Range	...120°C/...248°F
Reading	Standard °C, °F on request
Used materials inside bath	Stainless steel 304
Setting	0.01°C
Offset ±	0.01°C
Stability ±	0.005°C
Heating	1280 W
Heaters	2
Bath volume	12..15 L
Number of lids	4
Opening lid	Ø 51 mm
Window	140 x 285 mm
Opening bath	248 x 73 mm
Depth bath	300 mm

▶ TV12 **P/N** 00T0400 (230V/50-60Hz) • **P/N** 00T0405 (115V/60Hz)

▶ **For spare parts, options and accessories, please see our TV12LT.**

PowerPoint with more details at www.tamson.com

1.9 ASTM D445 Automated Viscosity Measuring: TV2000AKV

ASTM D445 - ISO/EN 3104 - IP 71 - DIN 51366

Main Characteristics

The TV2000AKV system offers a possibility to determine automated kinematic viscosity in a way which complies to the ASTM methods D445 and D446. The measuring head is able to measure both transparent and coloured / darker liquids. The sensitivity of the electronic detection system can be adapted for coloured liquids. The measuring head can store up to 25 viscometer glass capillary viscometer constants. It is further possible to set the amount of runs (tests) per sample. The system determines the best repeatability from the measuring results. The TV2000AKV can be operated from ambient +5°C up to +130°C. With the use of the built-in cooling coil and an external Tamson cooling circulator, span lies 5°C above the temperature of the cold flow of the external cooling circulator. The TV2000AKV has a bath volume of 20 liters. The viscosity measurement range is defined by the used glass capillary viscometers and may vary from 0.3 up to 10,000 mm²/s.

TV2000AKV

Range	…130°C/…266°F
Reading	Standard °C, °F on request
Used materials inside bath	Stainless steel 304
Setting	0.1°C
Offset ±	0.01°C
Stability ±	0.01°C
Heating	2800 W
Heaters	3
Bath volume	20 L
Number of lids	1
Window	140 x 285 mm
Opening bath	130 x 165 mm

▶ TV2000AKV **P/N** 00T0820 (230V/50-60Hz) • **P/N** 00T0830 (115V/60Hz)

Check for more technical details www.tamson.com

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ASTM Equipment

TV2000AKV VISCOMETERS for transparent and opaque liquids.
The glass capillary viscometers supplied for the TV2000AKV are completely manufactured according to ASTM D446 and IP 71, however the timing marks have been omitted for the infra-red sensors of the electronic detection system. The AKV viscometers are further more precisely manufactured than the standard method requires. This guarantees optimal measuring results. The AKV viscometers are supplied with a factory calibration certificate, stating the viscometer serial number and calibration constant of the viscometer. In order to use the TV2000AKV you will need the viscometers which are solely supplied by Tamson. The following glass capillary viscometers are available as shown in the tables below.

UBBELOHDE AKV VISCOMETER for transparent liquids				
P/N 25T0766	Size number 0	Nom. Constant 0.001	Range from 0.3 to 1 mm²/s	
P/N 25T0767	Size number 0C	Nom. Constant 0.003	Range from 0.6 to 3 mm²/s	
P/N 25T0768	Size number 0B	Nom. Constant 0.005	Range from 1 to 5 mm²/s	
P/N 25T0769	Size number 1	Nom. Constant 0.01	Range from 2 to 10 mm²/s	
P/N 25T0770	Size number 1C	Nom. Constant 0.03	Range from 6 to 30 mm²/s	
P/N 25T0771	Size number 1B	Nom. Constant 0.05	Range from 10 to 50 mm²/s	
P/N 25T0772	Size number 2	Nom. Constant 0.1	Range from 20 to 100 mm²/s	
P/N 25T0773	Size number 2C	Nom. Constant 0.3	Range from 60 to 300 mm²/s	
P/N 25T0774	Size number 2B	Nom. Constant 0.5	Range from 100 to 500 mm²/s	
P/N 25T0775	Size number 3	Nom. Constant 1.0	Range from 200 to 1000 mm²/s	
P/N 25T0776	Size number 3C	Nom. Constant 3.0	Range from 600 to 3000 mm²/s	
P/N 25T0777	Size number 3B	Nom. Constant 5.0	Range from 1000 to 5000 mm²/s	
P/N 25T0778	Size number 4	Nom. Constant 10.0	Range from 2000 to 10000 mm²/s	

CANNON FENSKE ROUTINE AKV VISCOMETER for transparent liquids				
P/N 25T0779	Size number 25	Nom. Constant 0.002	Range from 0.4 to 2 mm²/s	
P/N 25T0780	Size number 50	Nom. Constant 0.004	Range from 0.8 to 4 mm²/s	
P/N 25T0781	Size number 75	Nom. Constant 0.008	Range from 1.6 to 8 mm²/s	
P/N 25T0782	Size number 100	Nom. Constant 0.015	Range from 3 to 15 mm²/s	
P/N 25T0783	Size number 150	Nom. Constant 0.035	Range from 7 to 35 mm²/s	
P/N 25T0784	Size number 200	Nom. Constant 0.1	Range from 20 to 100 mm²/s	
P/N 25T0785	Size number 300	Nom. Constant 0.25	Range from 50 to 200 mm²/s	
P/N 25T0786	Size number 350	Nom. Constant 0.5	Range from 100 to 500 mm²/s	
P/N 25T0787	Size number 400	Nom. Constant 1.2	Range from 100 to 500 mm²/s	
P/N 25T0788	Size number 450	Nom. Constant 2.5	Range from 200 to 1000 mm²/s	
P/N 25T0789	Size number 500	Nom. Constant 8	Range from 600 to 3000 mm²/s	
On request	Size number 600	Nom. Constant 20	Range from 2000 to 10000 mm²/s	

ASTM Equipment

Necessary accessories		TV2000AKV
P/N 00T0890	Measuring head for Cannon Fenske Routine AKV viscometers	•
P/N 00T0840	Measuring head for Ubbelohde AKV viscometers	•
P/N 00T0233	Vacuum pump with teflon valves	•

Accessories		TV2000AKV
P/N 00T0239	ASTM thermometer holder	•
P/N 14T0303	Adapter to insert an E20 thermometer in the bath cover	•
P/N 08T0001	Can with 20L of silicon oil 200-10 mm²/s (suitable for 20..150°C)	•
P/N 00T0565	TLC15-5 external cooler to work below ambient temperature	•

Main consumables		TV2000AKV
P/N 28T7030	Printer ribbon	•
P/N 28T7036	Printer paper	•
P/N 06T1723	Stopper for viscometer	•
P/N 24T0043	Silicon tubing	•

▶ **For Viscosity Accessories, see section 'Viscosity Accessories'.**

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Email sales@tamson.com
Website www.tamson.com

1.10 ASTM D445 Low Temperature Viscosity Bath: TV12LT

ASTM D445 - ISO/EN 3104 - IP 71 - DIN 51366 - IP EM PJ - IEC 61868

This test method specifies a procedure for the determination of the kinematic viscosity of liquid petroleum products, both transparent and opaque, by measuring the time for a volume of liquid to flow under gravity through a calibrated glass capillary viscometer.

TV12LT

Main Characteristics

The TV12LT with integrated cooling is a unique viscosity bath with a small footprint. It can be operated from -42°C up to +20°C (-40..68°F). Ranges from -42°C up to +80°C and -50°C up to +20°C are available. The TV12LT has a small bath volume of 15 liters and a unique temperature stability. The TV12LT offers one row of four openings with lids. These openings will accommodate glass capillary viscometers in viscometer holders. A permanent LED light is located in the top plate to supply clear light and guarantees optimal visibility inside the bath. A bath overflow outlet protects from expanding bath fluid when the bath filling is too high. A bath drain is standard included. The bath is fitted with two windows of which the front panel is detachable for cleaning purposes. TV12LT is specially designed for kinematic viscosity testing of aviation fuels at sub zero temperatures. The TV12LT also is suitable to calibrate thermometers or other sensors.

Range	-42..+20°C*/-43.6..+68°F
Reading	Standard °C, °F on request
Used materials inside bath	Stainless steel 304
Setting	0.01°C
Offset ±	0.01°C (optional 0.005°C)
Stability ±	0.01°C
Heating	1200 W
Heaters	2
Bath volume	15....18 L
Number of lids	4
Window	255 x 230 mm
Opening lid	Ø 51 mm
Opening bath	248 x 112 mm

▶ TV12LT **P/N** 00T0410 (230V/50Hz) • **P/N** 00T0420 (230V/60Hz) • **P/N** 00T0415 (115V/60Hz)

* **Range from -42°C up to +80°C**

▶ TV12LT **P/N** 00T0425 (230V/50Hz) • **P/N** 00T0435 (230V/60Hz) • **P/N** 00T0430 (115V/60Hz)

* **Range from -50°C up to +20°C**

▶ TV12LT **P/N** 00T0470 (230V/50Hz) • **P/N** 00T0480 (230V/60Hz) • **P/N** 00T0475 (115V/60Hz)

Options		TV12	TV12LT
P/N 07T0085	Float / Level detector	•	•
P/N 13T6200	Leveling platform	•	•
P/N 13T6210	Calibration / metal block	•	•
P/N 13T3022	High contrast white back plate	•	
P/N 13T3021	High contrast white back plate		•
P/N 23T2412	Cover with four Ø51 mm openings and lids for Cannon-Fenske Routine viscometers		•
P/N 23T2413	Cover with four holes and lids (Ø60 mm)		•

Accessories		TV12	TV12LT
P/N 10T6066	Viscohanger	•	•
P/N 10T6090	8 Channel Stop-watch	•	•
P/N 00T0239	ASTM thermometer holder	•	•
P/N 14T0303	Adapter to insert an E20 thermometer in the bath cover	•	•
P/N 00T0220	Can with 20L of mineral oil (suitable for 80..150°C)	•	
P/N 08T0001	Can with 20L of silicon oil 200-10 mm²/s (suitable for 20..150°C)	•	
P/N 00T0050	TLC10-3 external cooler to work below ambient temperature	•	
P/N 02T0202	Spill tray	•	
P/N 02T0204	Spill tray		•
P/N 12T1075	Set of tubing, connectors, and clamps between TV and TLC baths	•	•

▶ For Viscosity Accessories, see section 'Viscosity Accessories'.

Main spare parts 230V/50-60Hz (115V-60Hz on request)		TV12	TV12LT
P/N 25T1295	Motor 30 W	•	•
P/N 25T1343	Capacitor 2uF	•	•
P/N 25T0340	Heater 700 W	•	•
P/N 25T0351	Heater 500 W	•	•
P/N 24T0028	Power supply 600 W	•	•
P/N 24T8081	Motor fuse 0.3 Amp	•	•
P/N 25T1123	Compressor		•
P/N 24T8581	Safety cut-out thermostat	•	•
P/N 24T8545	Mains switch	•	•
P/N 25T2311	PT-100 sensor	•	•
P/N 06T0512	PCB power supply TMC70	•	•
P/N 06T0500	PCB microprocessor TMC70	•	•
P/N 06T0503	PCB – IO DC PWM heating	•	•
P/N 06T0517	PCB TMC70 IO/cooler LT-version		•
P/N 06T0507	PCB display	•	•

Recommended set-up for kinematic viscosity of aviation fuels:
1 x TV12LT, 1 x 8-channel stopwatch (P/N 10T6090), 1 x N2B reference fuel (P/N N2B), 4 x Ubbelohde viscometer holder (P/N 10T6001), Ubbelohde viscometers sizes 0C (P/N 25T0814), 0B (P/N 25T0816), 1 (P/N 25T0817), and 1C (P/N 25T0818), 1 x high contrast white back plate (P/N 13T3021), 1 x spill tray (P/N 02T0204), 1 x thermometerholder (P/N 14T0303) and 1 x E20 thermometer (P/N 19T4021).

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Email sales@tamson.com
Website www.tamson.com

1.11 ASTM D445 Low Temperature Viscosity Baths 40&70 litres

ASTM D445 - ASTM D2162 - ISO/EN 3104 - IP 71 - DIN 51366

Main Characteristics

The TV4000LT and TV7000LT are unique visibility baths with wide dimensions. Working temperature ranges from -40°C up to +100°C. The integrated cooling system is able to lower the temperature of the bath content down to -40°C within approximately two hours. The cooling power can be controlled over several stages, so that the heat removal capacity is trimmed to the desired set point temperature, saving up to 50% of energy. Due to its wide temperature range, the bath can be used for multiple purposes varying from low temperature viscosity measurement to calibration of sensors and thermometers. The large windows show the bath contents clearly. The windows are heated preventing built up of condensate. The maximum temperature lies around +100°C. Overall accuracy is better than ± 0.02°C over the whole temperature range. Ambient temperature drifts <0.003°C/°C. The homogeneity is better than 0.02°C. Drift, accuracy and homogeneousness were measured with methanol as bath medium and are true min-max values found over eight hours. The TV7000LT can be used to calibrate long thermometers or to calibrate hydrometers.

TV4000LT

	TV4000LT 	**TV7000LT** 
Range	-40..100°C/-40..212°F	
Reading	Standard °C, °F on request	
Used materials inside bath	Stainless steel 304	
Setting	0.01°C	
Offset ±	0.01°C	
Stability ±	0.02°C	
Heating	2000 W	
Heaters	2	
Bath volume	40 L	70 L
Number of lids	4 + 3 (4 + 4 optional)	
Window	270 * 285 mm	270 * 585 mm
Opening lid	Ø 51 mm	
Opening bath	260 x 240 mm	
Depth bath	300 mm	600 mm

- TV4000LT **P/N** 00T0460 (230V/50Hz)
- TV7000LT **P/N** 00T0450 (230V/50Hz)

Options		TV4000LT	TV7000LT
P/N 23T2401	Cover with eight openings (Ø51 mm) + lids and two openings for ASTM thermometers (Ø12.5 mm)	•	•
P/N 23T2402	Cover with eight openings (Ø60 mm) + lids and two openings for ASTM thermometers (Ø12.5 mm)	•	•
P/N 00T0909	Illuminator Z41 85~240V/50-60Hz	•	
P/N 00T0907	Illuminator Z71 85~240V/50-60Hz		•
P/N 07T0085	Float / Level detector	•	•

Accessories		TV4000LT	TV7000LT
P/N 10T6066	Viscohanger	•	•
P/N 10T6090	8 Channel stop-watch	•	•
P/N 00T0239	ASTM thermometer holder	•	•
P/N 14T0303	Adapter to insert an E20 thermometer in the bath cover	•	•

▶ **For Viscosity Accessories, see section 'Viscosity Accessories'**

Main spare parts 230V/50-60Hz (115V-60Hz on request)		TV4000LT	TV7000LT
P/N 04T0081	Stirrer complete	•	
P/N 04T0063	Stirrer complete		•
P/N 25T0216	Heater 500/1500 W	•	•
P/N 24T8545	Mains switch	•	•
P/N 24T8581	Safety cut-out thermostat	•	•
P/N 25T2311	PT-100 sensor	•	•
P/N 06T0500	PCB microprocessor TMC70	•	•
P/N 06T0517	PCB TMC70 IO/Cooler LT-version	•	•
P/N 06T0512	PCB power supply TMC70	•	•

Specification sheets at www.tamson.com

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Email sales@tamson.com
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1.12 ASTM D445 Ultra Low Temperature Viscosity Bath

ASTM D445 - ISO/EN 3104 - IP 71 - DIN 51366 - ASTM D2532

Main Characteristics

The TLV25 system contains a 25 litres Dewar flask. The fluid in this flask must permanently be cooled by a separate immersion cooler when using at temperatures below ambient. The temperature set point is maintained via a microprocessor controlled heating element. When using the TCC-IC, a minimum working temperatures of -80°C can be reached. All presented data is measured by using a TLV25 filled with methanol and a TCC-IC immersion cooler. At the minimum temperature, the provided heat removal is still enough to maintain stable temperature control, even when glass capillary viscometers are placed in the bath. The systems accuracy is better than the requirements of ASTM D445 and ISO 3104. The bath is illuminated by a fluorescent light built-in behind the Dewar flask. The top lid has a turn table construction with three openings and three lids. By turning the lid, the immersed viscometer can be positioned in front of the window. This window is heated to keep clear sight at sub zero temperatures. The set point can be set in steps of 0.1°C from -90°C up to +60°C (-130..140°F). Overall accuracy is better than ± 0.04K. Set-up of TLV25 and TCC-IC can also be used for ASTM D2532.

TLV25

Range	-80..60°C/-130...140°F
Reading	Standard °C, °F on request
Used materials inside bath	Stainless steel 304
Setting	0.1°C
Offset ±	0.1°C
Stability ±	0.04°C
Heating	1500 W
Heaters	1
Bath volume	25 L
Number of lids	3
Opening lid	Ø 51 mm
Opening bath	Ø 161 mm
Depth bath	400 mm

▶ TLV25 **P/N** 00T0650 (230V/50-60Hz) • **P/N** 00T0780 (115V/60Hz)

▶ **Please also see our 'TCC-IC' where you will find the necessary TCC-IC immersion cooler for the TLV25.**

Necessary options		TLV25
P/N 00T0300	TCC-IC to reach -80°C (230V/50HZ)	•
P/N 00T0301	TCC-IC to reach -80°C (230V/60HZ)	•

Accessories		TLV25
P/N 10T6066	Viscohanger	•
P/N 10T6090	8 Channel stop-watch	•
P/N 00T0239	ASTM thermometer holder	•
P/N 14T0303	Adapter to insert an E20 thermometer in the bath cover	•

▶ **For Viscosity Accessories, see section 'Viscosity Accessories'.**

1.13 ASTM D565 Carbonizable Substances in White Mineral Oil or Paraffin Wax

ASTM D565 - ASTM D612

Main characteristics

The ASTM D565 (mineral oil) and ASTM D612 (paraffin wax) test methods cover the determination whether the sample conforms to the standard quality required for pharmaceutical use as defined by the United States Pharmacopeia, the National Formulary, or the Food and Drug Administration.

For the test, either mineral oil or melted wax is treated with concentrated sulfuric acid (H_2SO_4) and heated under prescribed conditions. The resulting colour is compared with a reference standard to determine whether it passes or fails the test.

A TC16 with temperature range from ambient +5°C to 250° is suitable for immersing test tubes. The levelling platform (P/N 07T0210) will keep the test tubes above the 10 mL line and is needed as an accessory. A special stainless steel cover (P/N 03T2314) with eight Ø16 mm openings is needed to suspend the test tubes in the bath.

TC16 can be emptied via the standard installed drain on the backside of the apparatus.

TC16 for ASTM D565

Range	..250°C/...482°F
Reading	Standard °C, °F on request
Used materials inside bath	Stainless steel 304
Setting	0.1°C
Stability ±	0.02°C
Heating	1400 W
Bath volume	16 L
Opening bath	180 x 210 mm
Depth bath	220 mm
Pump (mBar)	Max pressure 300 (optional 1 Bar)
Pump (L/min)	Max flow 7.5 (optional 16)
Dimension (LxWxH)	480 x 295 x 480 mm
Weight	21 kg

▶ TC16 **P/N** 00T0671 (230V/50-60Hz) • **P/N**00T0861 (115V/60Hz)

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ASTM Equipment

Necessary options for TC16	
P/N 07T0210	Levelling platform for TC16
P/N 03T2314	Cover with eight 16 mm openings for ASTM D565/D612 test tubes

Accessories for ASTM D565/D612	
P/N 09T0230	Test tube for ASTM D565/D612. Stopper is included. Test tube is delivered with rolled edge.
P/N 31T0040	Colour comparator for ASTM D565/D612.
P/N 08T0001	Can with 20L of silicon oil 200-10 mm²/s (suitable for 20..150°C)

Test tube for ASTM D565/D612

New Product
www.tamson.com

1.14 ASTM D789 Kinematic Viscosity of Polymer Solutions

ASTM D789 - D1243 - D1601 - D2857 - D3591 - D4603 - TAPPI T230

Main characteristics

The Tamson viscometer baths are developed for use in laboratories where temperature stability and precision of equipment are essential. With the TV2000AKV system it is possible to determine viscosity of polymers. The measuring head is suited to measure both transparent and coloured / darker liquids. Via the menu the sensitivity of the electronic detection system can be adapted. The measuring head can store up to 25 viscometer tube constants. It is further possible to set the amount of runs (test) per sample. The system determines the best repeatability from the measuring results. The TV2000AKV is ideal for testing the viscosity of polymers. Our systems can only be used for viscosity determination and not for sample preparations. Please see section 1.9 for all details of the TV2000AKV.

TV2000AKV

Range	…130°C/…266°F
Reading	Standard °C, °F on request
Used materials inside bath	Stainless steel 304
Setting	0.1°C
Offset ±	0.01°C
Stability ±	0.01°C
Heating	2800 W
Heaters	3
Bath volume	20 L
Number of lids	1
Window	140 x 285 mm
Opening bath	130 x 165 mm

▶ TV2000AKV **P/N** 00T0820 (230V/50-60Hz) • **P/N** 00T0830 (115V/60Hz)

For detailed overview please see www.tamson.com

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ASTM Equipment

Accessories for TV2000AKV							
Item	**Description**	**ASTM D789**	**ASTM D1243**	**ASTM D2857**	**ASTM D3591**	**ASTM D4603**	**TAPPI T230**
P/N 00T0820	TV2000AKV	•	•	•	•	•	•
P/N 00T0565 P/N 00T0567 P/N 00T0570	TLC15 230V/50Hz TLC15 230V/60Hz TLC15 115V/60Hz	•	•	•	•	•	•
P/N 00T0840	Measuring head Ubbelohde viscometer	•	•		•	•	
P/N 00T0890	Measuring head Cannon Fenske (CFR) viscometer	•		•	•		•
P/N 25T0769	AKV Ubbelohde size 1	•			•		
P/N 25T0770	AKV Ubbelohde size 1C		•			•	
P/N 25T0775	AKV Ubbelohde size 3	•					•
P/N 25T0780	AKV CFR size 50			•			
P/N 25T0781	AKV CFR size 75	•		•	•		•
P/N 25T0782	AKV CFR size 100			•			•
P/N 25T0783	AKV CFR size 150			•			•
P/N 25T0784	AKV CFR size 200			•			•
P/N 00T0239	Thermometer holder	•	•	•	•	•	
P/N 25T0915BW	Thermometer with blue filling similar to ASTM 16C	•					
P/N 25T0981GW	Thermometer with gallium filling, similar to ASTM 110C			•			
P/N 25T0988BW	Thermometer with blue filling similar to ASTM 118C		•	•	•	•	
P/N 25T0938BW	Thermometer with blue filling similar to ASTM 45C						•
P/N 08T0001	Can with 20L of silicon oil 200-10 mm²/s (suitable for 20..150°C)			•			

▶ **Alternative set-up with TV2000 for manual measurements, see specification sheet on our website.**

1.15 ASTM D849 Copper Corrosion by Aromatic Hydrocarbons

ASTM D849

This test method covers the corrosiveness of industrial aromatic hydrocarbons to a copper strip. A polished copper strip is immersed in 200 mL of specimen in a flask with a condenser and placed in boiling water for 30 minutes. At the end of this period, the copper strip is removed and compared with the ASTM copper strip corrosion standard.

Main Characteristics

This apparatus consists of a six position TC40 circulator bath and it is delivered with six sets of glassware (250 mL flask and condenser) as standard. The standard included cover of the TC40 has six openings, each with a lid. The TC40 is equipped with a levelling platform and two stand rods with six clamps to hold the glassware in a vertical position. The temperature range is from ambient +5°C to 250°C. All accessories for this test method are supplied by Tamson.

ASTM D849 Apparatus

Range	..250°C/...482°F
Reading	Standard °C, °F on request
Used materials inside bath	Stainless steel 304
Setting	0.1°C
Stability ±	0.02°C
Heating	2800 W
Bath volume	40 L
Opening bath	Six openings
Depth bath	200 mm
Pump (mBar)	Max pressure 300 (optional 1 Bar)
Pump (L/min)	Max flow 7.5 (optional 16)
Dimension (LxWxH)	705 x 375 x 440 mm
Weight	30 kg

▶ Complete apparatus for ASTM D849 **P/N** 00T2015 (230V/50-60Hz) • **P/N** 00T2016 (115V/60Hz)

Necessary Accessories		ASTM D849 accessories
P/N 31T0003	ASTM copper strip corrosion test standard	•
P/N 31T0007	Copper strip with hole (per one strip)	•
P/N 31T0320	Soft copper (roll of 30m)	•
P/N 31T0000	Multistrip vise, holds up to four strips while polishing	•
P/N 31T0005	Silicon carbide powder 105-µm (1 kg)	•
P/N 09T0011	Flat viewing glass tube	•
P/N 25T0928BW	Thermometer with blue filling similar to ASTM 34C	•
P/N 08T0001	Can with 20L of silicon oil 200-10 mm²/s (suitable for 20..150°C)	•
P/N 25T2154	Thermometer holder	•
P/N 31T0009	Sanding paper P240 (one piece)	•

▶ **For spare parts, please see section 2.6**

PMT est. 1878 Tamson Instruments
Tel. +31 10 522 43 73
Email sales@tamson.com
Website www.tamson.com

1.16 ASTM D1298 Density by Hydrometer

ASTM D287 - ASTM D1298 - ASTM D6822 - IP 160 - ASTM E126 - API 2547 - ISO 3675

This specific method covers following laboratory determinations by hydrometer method:

-Density,
-Relative density (specific gravity),
-American Petroleum Institute (gravity of crude petroleum and liquid petroleum products).

Main Characteristics

A Tamson TLC15-5 refrigerator circulates a (cold) flow through the double walls of the cylinders. The TLC15-5 maintains the bath temperature within ± 0.25°C of the test temperature required by the method. The PTFE valves ensure fast drainage and cleaning of the cylinders. The easy detachable spill tray prevents that portions of the sample are spilled on the workbench. The rack offers full view on the hydrometer. Our special ASTM D1298 support eliminates the problem of mounting brackets or portions of a thermostatic bath blocking the view. The Tamson D1298 apparatus is a complete set-up existing of three Jacketed glass cylinders, rack and TLC15-5 circulator. Our system offers an interesting price advantage compared to other solutions based on a combination of a thermostatic bath with an external chiller. The ASTM D1298 set-up can also be used for ASTM D287 or ASTM D6822 test methods.

ASTM D1298 Apparatus

Range	5°C....120°C	
Setting	0.01°C	
Stability ±	Better than 0.1°C	
	TLC15-5	**Rack**
Bath volume	5 L	
Opening bath	85 x 150 mm (effective use)	
Depth bath	150 mm	
Length	420 mm (460 mm incl drain)	360 mm (front to back)
Width	265	320 (left to right)
Height	565	800 mm
Weight	30 kg	9 kg (glass parts included)
Power	1100 W (1 heater)	
Ambient temperature	15..28°C	
CE	Products conform to CE regulation	

- Set-up ASTM D1298 **P/N** 00T2000 (230V/50Hz) • **P/N** 00T2001 (230V/60Hz) • **P/N** 00T2002 (115V/60Hz)
- An additional rack is available to get an apparatus for six positions with one circulator • **P/N** 00T1260
- Alternative for this setup is a TV2500 in combination with the TLC10-3. For further information, please see section 1.7.

Accessories		ASTM D1298
P/N 25T0928BW	Thermometer with blue filling similar to ASTM 34C	•
P/N 25T2153	Thermometer holder D1298	•

Hydrometers			
Reference	**Description** **L 50 series acc. to BS 718** **Ref. temperature (Tp.): 15 °C** **Measuring span: 0.050 g/cm³** **Scale units: 0.0005 g/cm³** **Total length (L): 335 mm** **Hydrometer is supplied without certificate**	**Reference**	**Description** **M 50 series acc. to BS 718** **Ref. temperature (Tp.): 15 °C** **Measuring span: 0.050 g/cm³** **Scale units: 0.001 g/cm³** **Total length (L): 270 mm** **Hydrometer is supplied without certificate**
P/N 25T2401	Hydrometer L50 @ 15°C 0.600-0.650	P/N 25T2450	Hydrometer M50 @ 15°C 0.600-0.650
P/N 25T2402	Hydrometer L50 @ 15°C 0.650-0.700	P/N 25T2451	Hydrometer M50 @ 15°C 0.650-0.700
P/N 25T2403	Hydrometer L50 @ 15°C 0.700-0.750	P/N 25T2452	Hydrometer M50 @ 15°C 0.700-0.750
P/N 25T2404	Hydrometer L50 @ 15°C 0.750-0.800	P/N 25T2453	Hydrometer M50 @ 15°C 0.750-0.800
P/N 25T2405	Hydrometer L50 @ 15°C 0.800-0.850	P/N 25T2454	Hydrometer M50 @ 15°C 0.800-0.850
P/N 25T2406	Hydrometer L50 @ 15°C 0.850-0.900	P/N 25T2455	Hydrometer M50 @ 15°C 0.850-0.900
P/N 25T2407	Hydrometer L50 @ 15°C 0.900-0.950	P/N 25T2456	Hydrometer M50 @ 15°C 0.900-0.950
P/N 25T2408	Hydrometer L50 @ 15°C 0.950-1.000	P/N 25T2457	Hydrometer M50 @ 15°C 0.950-1.000
P/N 25T2409	Hydrometer L50 @ 15°C 1.000-1.050	P/N 25T2458	Hydrometer M50 @ 15°C 1.000-1.050
P/N 25T2410	Hydrometer L50 @ 15°C 1.050-1.100	P/N 25T2459	Hydrometer M50 @ 15°C 1.050-1.100

Reference	**Description** **L 50 series acc. to DIN 12791** **Ref. temperature (Tp.): 20 °C** **Measuring span: 0.050 g/cm³** **Scale units: 0.0005 g/cm³** **Total length (L): 335 mm** **Hydrometer is supplied without certificate**	**Reference**	**Description** **L 50 series acc. to DIN 12791** **Ref. temperature (Tp.): 20 °C** **Measuring span: 0.050 g/cm³** **Scale units: 0.0005 g/cm³** **Total length (L): 335 mm** **Hydrometer is supplied without certificate**
P/N 25T2500	Hydrometer L50 @ 20°C 0.600-0.650	P/N 25T2509	Hydrometer L50 @ 20°C 1.050-1.100
P/N 25T2501	Hydrometer L50 @ 20°C 0.650-0.700	P/N 25T2510	Hydrometer L50 @ 20°C 1.100-1.150
P/N 25T2502	Hydrometer L50 @ 20°C 0.700-0.750	P/N 25T2511	Hydrometer L50 @ 20°C 1.150-1.200
P/N 25T2503	Hydrometer L50 @ 20°C 0.750-0.800	P/N 25T2512	Hydrometer L50 @ 20°C 1.200-1.250
P/N 25T2504	Hydrometer L50 @ 20°C 0.800-0.850	P/N 25T2513	Hydrometer L50 @ 20°C 1.250-1.300
P/N 25T2505	Hydrometer L50 @ 20°C 0.850-0.900	P/N 25T2514	Hydrometer L50 @ 20°C 1.300-1.350
P/N 25T2506	Hydrometer L50 @ 20°C 0.900-0.950	P/N 25T2515	Hydrometer L50 @ 20°C 1.350-1.400
P/N 25T2507	Hydrometer L50 @ 20°C 0.950-1.000	P/N 25T2516	Hydrometer L50 @ 20°C 1.400-1.450
P/N 25T2508	Hydrometer L50 @ 20°C 1.000-1.050	P/N 25T2517	Hydrometer L50 @ 20°C 1.450-1.500

Reference	**Description** **M 50 series acc. to DIN 12791** **Ref. temperature (Tp.): 20 °C** **Measuring span: 0.050 g/cm³** **Scale units: 0.001 g/cm³** **Total length (L): 270 mm** **Hydrometer is supplied without certificate**	**Reference**	**Description** **M 50 series acc. to DIN 12791** **Ref. temperature (Tp.): 20 °C** **Measuring span: 0.050 g/cm³** **Scale units: 0.001 g/cm³** **Total length (L): 270 mm** **Hydrometer is supplied without certificate**
P/N 25T2550	Hydrometer M50 @ 20°C 0.600-0.650	P/N 25T2555	Hydrometer M50 @ 20°C 0.850-0.900
P/N 25T2551	Hydrometer M50 @ 20°C 0.650-0.700	P/N 25T2556	Hydrometer M50 @ 20°C 0.900-0.950
P/N 25T2552	Hydrometer M50 @ 20°C 0.700-0.750	P/N 25T2557	Hydrometer M50 @ 20°C 0.950-1.000
P/N 25T2553	Hydrometer M50 @ 20°C 0.750-0.800	P/N 25T2558	Hydrometer M50 @ 20°C 1.000-1.050
P/N 25T2554	Hydrometer M50 @ 20°C 0.800-0.850	P/N 25T2559	Hydrometer M50 @ 20°C 1.050-1.100

PMT est. 1878 Tamson Instruments
Tel. +31 10 522 43 73
Email sales@tamson.com
Website www.tamson.com

ASTM Equipment

Reference	Description API hydrometer at 60°F, length 163mm, API Gravity hydrometer ASTM D287, REF. temperature (Tp.): 60°F, Measuring span: API, Scale units: 0.1 degrees API, Total length (L): 163 mm, Hydrometer is supplied without certificate.	Reference	Description API hydrometer at 60°F, length 163mm, API Gravity hydrometer ASTM D287, REF. temperature (Tp.): 60°F, Measuring span: API, Scale units: 0.1 degrees API, Total length (L): 163 mm, Hydrometer is supplied without certificate.
P/N 25T3810	API Gravity hydrometer ASTM, 21H-62	P/N 25T3820	API Gravity hydrometer ASTM, 31H-62
P/N 25T3811	API Gravity hydrometer ASTM, 22H-62	P/N 25T3821	API Gravity hydrometer ASTM, 32H-62
P/N 25T3812	API Gravity hydrometer ASTM, 23H-62	P/N 25T3822	API Gravity hydrometer ASTM, 33H-62
P/N 25T3813	API Gravity hydrometer ASTM, 24H-62	P/N 25T3823	API Gravity hydrometer ASTM, 34H-62
P/N 25T3814	API Gravity hydrometer ASTM, 25H-62	P/N 25T3824	API Gravity hydrometer ASTM, 35H-62
P/N 25T3815	API Gravity hydrometer ASTM, 26H-62	P/N 25T3825	API Gravity hydrometer ASTM, 36H-62
P/N 25T3816	API Gravity hydrometer ASTM, 27H-62	P/N 25T3826	API Gravity hydrometer ASTM, 37H-62
P/N 25T3817	API Gravity hydrometer ASTM, 28H-62	P/N 25T3827	API Gravity hydrometer ASTM, 38H-62
P/N 25T3818	API Gravity hydrometer ASTM, 29H-62	P/N 25T3828	API Gravity hydrometer ASTM, 39H-62
P/N 25T3819	API Gravity hydrometer ASTM, 30H-62	P/N 25T3829	API Gravity hydrometer ASTM, 40H-62

Reference	Description API hydrometer at 60°F, length 380mm, API Gravity hydrometer ASTM D287, REF. temperature (Tp.): 60°F, Measuring span: API, Scale units: 0.1 degrees API, Total length (L): 380 mm Hydrometer is supplied Without certificate.	Reference	Description API hydrometer at 60°F, length 380mm, API Gravity hydrometer ASTM D287, REF. temperature (Tp.): 60°F, Measuring span: API, Scale units: 0.1 degrees API, Total length (L): 380 mm Hydrometer is supplied Without certificate.
P/N 25T3830	API Gravity hydrometer ASTM, 51H-62, -1+11:0.1°API	P/N 25T3835	API Gravity hydrometer ASTM, 56H-62 49+61:0.1°API
P/N 25T3831	API Gravity hydrometer ASTM, 52H-62, 9+21:0.1°API	P/N 25T3836	API Gravity hydrometer ASTM, 57H-62 59+71:0.1°API
P/N 25T3832	API Gravity hydrometer ASTM, 53H-62 19+31:0.1°API	P/N 25T3837	API Gravity hydrometer ASTM, 58H-62 69+81:0.1°API
P/N 25T3833	API Gravity hydrometer ASTM, 54H-62 29+41:0.1°API	P/N 25T3838	API Gravity hydrometer ASTM, 59H-62 79+91:0.1°API
P/N 25T3834	API Gravity hydrometer ASTM, 55H-62 39+51:0.1°API	P/N 25T3839	API Gravity hydrometer ASTM, 60H-62 89+101:0.1°API

***The hydrometers can also be supplied with a government verified certificate with three test points. Then a "C" should be added to the reference number. A works certificate is also available. Prices are on request. Other hydrometer types on request.**

Spare parts set-up, standard included when delivered for the first time		Set-up
P/N 09T0000	Jacketed hydrometer cylinder with stopper valve (three per setup needed)	•
P/N 08T0100	Tubing 8 x 12 mm 1 meter (3 meter per set-up needed)	•
P/N 08T0120	Plastic screw cap red with opening GL14 (six per set-up needed)	•
P/N 08T0122	Plastic hose connection angled GL14 (three per set-up needed)	•
P/N 08T0121	Plastic hose connection straight GL14 (three per set-up needed)	•
P/N 08T0125	Y split Polypro Pylene (two per set-up needed)	•
P/N 08T0126	T split Polypro Pylene (four per set-up needed)	•

▶ **For main spare parts for the TLC15-5, please see our section `TLC Line'.**

1.17 ASTM D1319 Fluorescent Indicator Adsorption System

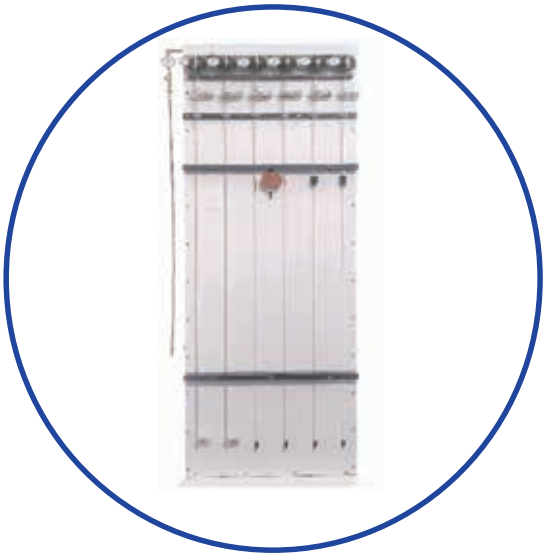
ASTM D1319

This test method covers the determination of hydrocarbon types over the concentration ranges from 5 to 99 volume % aromatics, 0.3 to 55 volume % olefins, and 1 to 95 volume % saturates in petroleum fractions that distill below 315°C. This test method may apply to concentrations outside these ranges, but the precision has not been determined. Samples containing dark-colored components that interfere in reading the chromatographic bands cannot be analyzed.

Main characteristics

Tamson offers systems and accessories for use in accordance with ASTM D1319. Available in two, four, and six test positions. System includes easy-to-read gauges, electromagnetic vibration system, and handheld or floor standing UV blacklight.

- **P/N** 09T0172 FIA system complete, two station
- **P/N** 09T0173 FIA system complete, four station
- **P/N** 09T0174 FIA system complete, six station



FIA System

Accessories	
P/N 09T0170	FIA socket tip clamp
P/N 09T0171	FIA #28 pinch clamp for column ball/socket connection
P/N 09T0175	FIA analyzer tube, case of 500
P/N 09T0176	FIA analyzer tube, tapered tip, each
P/N 09T0177	FIA 28/12 ball joint connector
P/N 09T0178	FIA dyed gel, 40 gram bottle
P/N 09T0179	FIA colomn W/ flat end for compressor fitting
P/N 09T0180	FIA fitting connector, column to analyzer tube
P/N 09T0181	O-ring for FIA connector, analyzer tube section
P/N 09T0182	O-ring for FIA connector, column section
P/N 09T0183	FIA precicion bore column
P/N 09T0184	12/2 socket tip for FIA precision bore column
P/N 09T0185	FIA regulator
P/N 09T0186	FIA standard column
P/N 09T0187	FIA silica gel, 1LB container
P/N 09T0188	FIA silica gel, 10 gram packet
P/N 09T0189	FIA silica gel, 100 gram container
P/N 09T0190	FIA silica gel 5 LB container
P/N 09T0191	FIA sample application syringe
P/N 09T0192	FIA syringe needle, 22 gauge 4”
P/N 09T0193	FIA fitting connector, analyzer tube
P/N 09T0194	FIA electromagnetic vibration unit

PMT est. 1878 Tamson Instruments
Tel. +31 10 522 43 73
Email sales@tamson.com
Website www.tamson.com

1.18 ASTM D1480 Density by Bingham Pycnometer

ASTM D1480

This test method covers two procedures for the measurement of the density of materials which are fluid at the desired test temperature. Its application is restricted to liquids of vapor pressures below 80 kPa (600 mm Hg) and viscosities below 40 000 mm²/s (cSt) at the test temperature. The method is designed for use at any temperature between 20 °C and 100 °C. It can be used at higher temperatures.

TV12 for ASTM D1480

Main Characteristics

For this test method, the liquid sample is introduced into the pycnometer, equilibrated to the desired temperature, and weighed. The density or specific gravity is then calculated from this weight and the previously determined calibration factor, and a correction is applied for the buoyancy of air. The TV12 is a unique visibility bath with a small footprint. The TV12 can be operated from ambient +5°C up to +120°C (41..248°F). With the use of the built-in cooling coil and an external Tamson TLC10-3 cooling circulator, span lies 5°C above the temperature of the cold flow. The TV12 has a bath volume of only 12 liters and a unique stability of 0.005°C. The TV12 offers one row of four openings with lids. These openings will accommodate Bingham pycnometers in Bingham pycnometer holders. A permanent LED light is located in the top plate to supply clear light and guarantees optimal visibility inside the bath. A bath overflow outlet protects from expanding bath fluid when the bath filling is too high. A bath drain is standard included. The bath is fitted with a double window of which the front pane is detachable for cleaning purposes.

Range	…120°C/…248°F
Reading	Standard °C, °F on request
Used materials inside bath	Stainless steel 304
Setting	0.01°C
Offset ±	0.01°C
Stability ±	0.005°C
Heating	1280 W
Heaters	2
Bath volume	12..15 L
Number of lids	4
Opening lid	Ø 51 mm
Window	140 x 285 mm
Opening bath	248 x 73 mm
Depth bath	300 mm

▶ TV12 **P/N** 00T0400 (230V/50-60Hz) • **P/N** 00T0405 (115V/60Hz)

▶ **For spare parts, options and accessories, please see our TV12LT.**

Necessary accessories	
P/N 00T0565 P/N 00T0567 P/N 00T0570	TLC10-3 external cooler to work below ambient temperature 230V/50Hz TLC10-3 external cooler to work below ambient temperature 230V/60Hz TLC10-3 external cooler to work below ambient temperature 115V/60Hz
P/N 10T6342	Bingham Pycnometer Holder
P/N 31T0033	Pycnometer Bingham 10 mL
P/N 12T1075	Tubing/Connector/Clamp between TV bath and TLC cooling circulator

Accessories and options	
P/N 19T4024	E20 thermometer range -40°C to +140°C, resolution 0.01 (two decimals), accuracy ± 0.02°C
P/N 14T0303	Adapter to insert an E20 thermometer in TV12

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Tel. +31 10 522 43 73
Email sales@tamson.com
Website www.tamson.com

1.19 ASTM D1796 Liquid Bath to Pre-Heat Centrifuge Tubes

ASTM D1796 - API 2548 - DIN 51 793, IP 75 - ASTM D4007 - IP 359 - ASTM D91 - ASTM D96 - ASTM D2273

Main Characteristics

This test method covers the determination of water and sediment in fuel oils (ASTM D1796) or crude oils (ASTM D4007) by the centrifuge method. The TC16 is according to the requirements of preheating the cone-shaped centrifuge tubes in a waterbath for the above mentioned ASTM standards. The bath has place for nine cone-shaped centifuge tubes. The temperature range is from ambient +5°C to 250°C. With the leveling platform (P/N 13T8010) the cone-shaped centrifuge tubes can be immersed in vertical position to the 100-mL mark as strictly indicated in the ASTM methods. When not used for preheating purposes, the pump can be used to circulate the bath content to an external application. For more information about the centrifuge, please see section 1.2.

TC16
for ASTM D1796

Range	..250°C/...482°F
Reading	Standard °C, °F on request
Used materials inside bath	Stainless steel 304
Setting	0.1°C
Stability ±	0.02°C
Heating	1400 W
Bath volume	16 L
Opening bath	9 x Ø 51 mm
Depth bath	220 mm
Pump (mBar)	Max pressure 300 (optional 1 Bar)
Pump (L/min)	Max flow 7.5 (optional 16)
Dimension LxWxH	480 x 295 x 480 mm
Weight	21 kg

▶ TC16 for cone-shaped cenfrifuge tubes **P/N** 00T0671 (230V/50-60Hz) • **P/N** 00T0861 (115V/60Hz)

Necessary accessory		TC16
P/N 13T8010	Leveling platform + holder for nine cone-shaped centrifuge tubes + nine lids	•

TC16 for ASTM D1796
Side view

1.20 ASTM D1838 Corrosiveness to Copper of LPG

ASTM D1838 - EN/ISO 6251 - IP 411 - BS 2000 part 411 - BS 6924 - NFM 41007

The test involves the immersion of a polished copper strip in approximately 100 mL of sample. The sample is exposed at a temperature of 37.8°C (100°F) for one hour in a cylinder of suitable working pressure. At the end of this period, the copper strip is removed and rated as one of the four classifications of the ASTM copper corrosion standard.

Main characteristics

The TB30 bath is designed to cover the detection of the corrosiveness to copper of liquefied petroleum gases conforming to ASTM D1838, IP 411, and ISO 6251. The TB30 is specially designed to hold a temperature stable at 37.8°C without the use of an external circulator. The bath is deep enough to accommodate four corrosion test cylinders for LPG in an upright position. The overflow outlet, drain and cooling coil are standard included.

TB30 D1838

Range	..80°C/...167°F
Reading	°C or °F
Materials used inside bath	Stainless steel 304
Setting	0.01°C
Stability ±	0.02°C
Heating	2 x 1400 W
Bath volume	30 L
Bath opening	163 x 192 mm
Bath depth	460 mm
Dimensions (LxWxH)	258 x 490 x 680

▶ TB30 **P/N** 00T0065 (230V/50-60Hz) • **P/N** 00T0066 (115V/60Hz)

Necessary accessories for TB30	
P/N 03T2322	Lid and immersion holder (support) for two corrosion test cylinder (two pieces needed).

Necessary accessories	
P/N 14T0115	Corrosion test cylinder for LPG
P/N 31T0003	ASTM copper strip corrosion test standard
P/N 31T0007	Copper strip with a 3.2 mm hole (one piece)
P/N 31T0001	Sanding paper silicon carbide P220 (one Piece)
P/N 12T1070	Flexible inert hose
P/N 31T0000	Multistrip vise, holds up to four strips while polishing
P/N 31T0005	Silicon carbide powder 105 um (1 kg)
P/N 09T0011	Flat viewing test tube
P/N 25T0928BW	Thermometer with blue filling similar to ASTM 34C with works certificate
P/N 25T2154	Thermometer holder 425 x 10 mm

PMT est. 1878 Tamson Instruments
Tel. +31 10 522 43 73
Email sales@tamson.com
Website www.tamson.com

1.21 ASTM D2068 Filter Blocking Tendency

ASTM D2068 - IP 387 - CEN N403 - BS EN 590 - IP PM EA

This test method covers three procedures for the determination of the filter blocking tendency (FBT) and filterability of middle distillate fuel oils and liquid fuels such as biodiesel and biodiesel blends. The three procedures and associated filter types, are applicable to fuels within the viscosity range of 1.3 to 6.0 mm²/s at 40°C.

Filter Blocking Tendency

Main Characteristics

The Tamson Filter Blocking Tendency (TFBT) tester is a unique instrument designed to test distillate fuels including gas oil, gas turbine fuel, kerosine, diesel, biodiesel and biodiesel blends. It performs conform to procedures "A" and "B" of the ASTM D2068 / IP 387 methods. The TFBT is microprocessor controlled and provides a simple user interface using a touch screen.

This interface is exceptionally easy to use for selecting different tests, setting parameters and for calibration of the temperature and pressure sensors. The touch screen display provides the operator with test procedure information as well as indicating the selected test method, sample temperature, pressure, volume, and test result.

A printer is integrated to provide a permanent record of the test parameters or to print the test results with a filterability graph.

The software permits the operator to exactly set the test volume of 20 mL/min even at the maximum pressure of 150 kPa. This allows both specification testing and gravimetric tests to be carried out in conjunction with the appropriate filters and holders.

The fuel sample is drawn from the fuel reservoir by the pump. The pressure and temperature of the fuel are continuously monitored while it is pumped through the specified filter into the waste container. The recorded pressure rise, or the volume of pumped sample that causes a specified pressure to be exceeded, are used by the microprocessor to calculate the test result. Standard tests use 300 mL of fuel pumped at 20 mL/min. Verification and re-calibration is simple and secure. It can all be done electronically and this is very accurate compared to using knobs and screwdrivers.

Filter Blocking Tendency Range	1.0 to 30 (low number is best)
Maximum pressure	1500 mBar
Power	40 W
Voltage	85~264V
Weight	10 kg
Dimensions	280 x 350 x 620
Frequency	47..63 Hz
Timers	± 0.001 sec
Temperature	± 0.05°C
Output	Printer

▶ TFBT **P/N** 00T0942 (85~264V/47-63Hz)

Please see presentation at www.tamson.com

ASTM Equipment

Necessary accessories for procedure A	
P/N 15T0002	Adapter block for procedure "A" with stainless steel housing
P/N 24T0064	Pack (98) of filter discs for adapter "A" Whatman GF/A (FBT)
P/N 24T0052	Hose tygon 15 mtrs 3.2 x 6.4 mm
P/N 24T0049	Blue tubing 4 x 2.5 mm

Necessary accessories for procedure B	
P/N 15T0003	Adapter block for procedure"B" Whatman
P/N 24T0067	Pack (98) of filter for adapter "B" Whatman syringe GF/A
P/N 24T0052	Hose tygon 15 mtrs 3.2 x 6.4 mm
P/N 24T0043	Silicon anti-splash tubing for procedure "B"

Necessary accessories for one adapter to test procedures A + B	
P/N 15T0005	Adapter block for procedure A + B
P/N 24T0064	Pack (98) of filter discs for adapter "A" Whatman GF/A (FBT)
P/N 24T0052	Hose tygon 15 mtrs 3.2 x 6.4 mm
P/N 24T0067	Pack (98) of filter for adapter "B" Whatman syringe GF/A
P/N 24T0043	Silicon anti-splash tubing for procedure "B"

Optional accessories	
P/N 31T2002	Beaker 400 mL
P/N 31T2004	Beaker 150 mL
P/N 19T9030	Level and pressure calibration kit Volume Scale 10 mL Pressure resolution 1 mBar Works certificate (pressure readout) (Timer is crystal based and does not need calibration)
P/N 28T7035	Printer paper, thermally, set of 5.
P/N 25T2230	FBT verification fluid for procedure "B"

Consumables	
P/N 24T0052	Hose tygon 15 mtrs 3.2 x 6.4 mm
P/N 28T7035	Printer paper, thermally, set of 5

Spareparts	
P/N 24T0060	Sparepart filter housing "A" Millipore M5
P/N 24T0061	Sparepart kit adapter "A" Millipore 4 x set of : O - ring (thick) O - ring (thin) Stainless disc
P/N 24T0074	Sparepart adapter A + B
P/N 24T0060	Sparepart adapter B

PMT est. 1878 Tamson Instruments
Tel. +31 10 522 43 73
Email sales@tamson.com
Website www.tamson.com

1.22 ASTM D2162 Master Viscometer Bath: TV16000

IUPAC 2002 - ASTM D445 - ASTM D2162 - ISO/EN 3104 - IP 71 - DIN 51366

This thermostatic bath is specially designed for tests that require ultra precise temperature control, or processes that need to be followed visually.

Main Characteristics

The TV16000 conforms to ASTM D445: Standard Test Method for Kinematic Viscosity of Transparent and Opaque Liquids and ASTM D2162: Primary Basic Calibration of Master Viscometers and Viscosity Oil Standards. Other applications are thermometer and sensor calibration or density measurement.

When using a metal block (thermo well) inside the bath, stabilities of ± 0.005°C can be achieved. A stirrer moves the bath fluid alongside a special heater ensuring optimal temperature control and ensuring excellent uniformity. The bath conforms to CE-regulation. Further the bath is equipped with a mechanical over-temperature device which trips when in case of malfunction the bath exceeds the preset maximum temperature. This feature guarantees safe-around-the-clock operation.

TV16000

Range	10..60°C/50..140°F
Reading	Standard °C, °F on request
Used materials inside bath	Stainless steel 304
Setting	0.005°C
Stability ±	0.005°C
Uniformity	<0.005°C
Heating	2500 W
Heaters	2
Bath volume	160 L
Opening bath	250 x 365 mm
Depth bath	965 mm
Dimension (LxWxH)	575 x 575 x 1700 mm
Weight	135 kg

▶ TV16000 **P/N** 00T0490 (230V/50Hz) • **P/N** 00T0492 (230V/60Hz) • **P/N** 00T0495 (115V/60Hz)

▶ **For options and spare parts, please see our 'TV15000'.**

1.23 ASTM D2162 Extremely Stable Thermostatic Bath

ASTM D2162 - D445 - ISO/EN 3104 - IP 71 - DIN 51366

The thermostatic bath has been developed to measure pH according to IUPAC recommendations 2002 "Measurement of pH. Definition, standards, and procedures". IUPAC recommends definitions, procedures, and terminology relating to pH measurements in dilute aqueous solutions in the temperature range from 5°C to 50°C.

Main Characteristics

This unique TV15000 can be used to measure the pH at 5°C, 15°C, 25°C, 37°C, and 50°C, where the temperature has to be maintained within ± 0.01°C of the set point. For this purpose the bath is used by national metrological institutions (NMIs).

Also, this bath can be used for tests that require ultra precise temperature control, or processes that need to be followed visually. Examples are thermometer and sensor calibration, and density measurements. When using a metal block (thermo well) inside the bath, stabilities of ± 0.005°C can be achieved.

TV15000

Range	5..60°C / 41..140°F
Reading	Standard °C, °F on request
Used materials inside bath	Stainless steel 304
Setting	0.005°C
Stability ±	0.007°C
Uniformity	< 0.007°C
Heating	2500 W
Heaters	2
Bath volume	155 L
Opening bath	230 x 820 mm
Depth bath	650 mm
Dimension (LxWxH)	1170 x 420 x 1400 mm
Weight	130 kg

▶ TV15000 **P/N** 00T0500 (230V/50Hz) • **P/N** 00T0505 (230V/60Hz) • **P/N** 00T0502 (115V/60Hz)

Options		TV15000	TV16000
On request	Top lid closed	•	•
On request	Cover with nine Ø51 mm openings and lids	•	•
On request	Cover with six Ø60 mm openings and lids	•	•
On request	Leveling platform with calibration block	•	•

PMT est. 1878 Tamson Instruments
Tel. +31 10 522 43 73
Email sales@tamson.com
Website www.tamson.com

ASTM Equipment

Main spare parts 230V/50-60Hz (115V-60Hz on request)		TV15000	TV16000
P/N 06T0512	PCB power TMC70	•	•
P/N 25T1104	Compressor	•	•
P/N 24T8081	Motor fuse 0.3 Amp	•	•
P/N 28T4022	Heater 1500 W	•	•
P/N 25T1295	Motor 30 W	•	•
P/N 25T1244	Fan	•	•
P/N 06T0517	PCB TMC70 IO/cooler LT-version	•	•
P/N 06T0503	PCB – IO DC PWM heating	•	•
P/N 06T0525	PCB window heating	•	•
P/N 24T0028	Power supply 500 W	•	•
P/N 24T8581	Safety cut-out thermostat	•	•
P/N 25T0351	Heater 500 W	•	•
P/N 06T0502	PCB - display	•	•
P/N 28T4026	PT-100 sensor	•	•
P/N 24T8545	Mains switch	•	•
P/N 06T0500	PCB microprocessor TMC70	•	•

Accessoires			
P/N 25T0581P	Master Ubbelohde viscometer ISO 17025 calibrated under UKAS size 0	ASTM D2162	
P/N 25T0582P	Master Ubbelohde viscometer ISO 17025 calibrated under UKAS size 0B	ASTM D2162	
P/N 25T0583P	Master ubbelohde viscometer ISO 17025 calibrated under UKAS size 0C	ASTM D2162	
P/N 25T0584P	Master Ubbelohde viscometer ISO 17025 calibrated under UKAS size 1	ASTM D2162	
P/N 25T0585P	Master Ubbelohde viscometer ISO 17025 calibrated under UKAS size 1B	ASTM D2162	
P/N 25T0586P	Master Ubbelohde viscometer ISO 17025 calibrated under UKAS size 1C	ASTM D2162	
P/N 25T0587P	Master Ubbelohde viscometer ISO 17025 calibrated under UKAS size 2	ASTM D2162	
P/N 25T0588P	Master Ubbelohde viscometer ISO 17025 calibrated under UKAS size 2B	ASTM D2162	
P/N 25T0589P	Master Ubbelohde viscometer ISO 17025 calibrated under UKAS size 2C	ASTM D2162	
P/N 25T0590P	Master Ubbelohde viscometer ISO 17025 calibrated under UKAS size 3	ASTM D2162	
P/N 25T0591P	Master Ubbelohde viscometer ISO 17025 calibrated under UKAS size 3B	ASTM D2162	
P/N 25T0592P	Master Ubbelohde viscometer ISO 17025 calibrated under UKAS size 3C	ASTM D2162	
P/N 25T0593P	Master Ubbelohde viscometer ISO 17025 calibrated under UKAS size 4	ASTM D2162	
P/N 25T0594P	Master Ubbelohde viscometer ISO 17025 calibrated under UKAS size 4B	ASTM D2162	
P/N 25T0595P	Master Ubbelohde viscometer ISO 17025 calibrated under UKAS size 4C	ASTM D2162	
P/N 25T0596P	Master Ubbelohde viscometer ISO 17025 calibrated under UKAS size 5	ASTM D2162	
P/N 10T6035	Viscometer holder Master Ubbelohde	ASTM D2162	
P/N 10T6030	Viscometer holder Master Cannon Fenske	ASTM D2162	
On request	Uncalibrated master viscometers either Cannon Fenske or Ubbelohde	ASTM D2162	

1.24 ASTM D2170 Kinematic Viscosity of Asphalts (Bitumen)

ASTM D2170 - IP 319 - EN/ISO 12595

This test methods covers procedures for the determination of kinematic viscosity of liquid asphalts (bitumens), road oils and distillation residues of liquid asphalts (bitumens) all at 60°C (140°F) and of asphalt cements at 135°C (275°F).

Main characteristics

The Tamson TV2000 and TV4000 viscometer baths are specially designed for tests that require ultra-precise temperature control, or tests that need to be followed visually. Both 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. Visibility through the bath is excellent. The well insulated and reliable Tamson baths are ideal to use at high temperatures. For more information about the baths, please see section 1.6.

- TV2000 **P/N** 00T0782 (230V/50-60Hz) • **P/N** 00T0784 (115V/60Hz)
- TV4000 **P/N** 00T0772 (230V/50-60Hz) • **P/N** 00T0774 (115V/60Hz)

TV2000 for ASTM D2170

Accessories		TV2000	TV4000
P/N 00T0908	Illuminator Z41 80~230V/50-60Hz (backpanel)	•	•
P/N 10T6090	8 channel stop-watch	•	•
P/N 08T0001	Can with 20L of silicon oil 200-10 mm²/s (suitable for 20..150°C)	1 can	2 cans
P/N 00T0239	ASTM thermometer holder	•	•
P/N 25T0940BW	Thermometer with blue filling similar to ASTM 47C	•	•
P/N 25T0981GW	Thermometer with gallium filling similar to ASTM 34C	•	•
P/Ns 25T0802 to 25T0813	CFO viscometers, please see section 4.1	•	•
P/Ns 25T0890 to 25T0899	Zeitfuchs Cross Arm, please see section 4.1	•	•
P/Ns 25T1030 to 25T1040	BS/IP/RF viscometers, please see section 4.1	•	•
P/N 06T1724	Stopper CFO/ZRA (pack of 12 pieces)	•	•
P/N 25T1069	Pipet for BS/IP/RF viscometer	•	•
P/N 10T6071	Cannon Fenske Opaque viscometer holder	•	•
P/N 10T6327	Zeitfuchs Cross Arm viscometer holder	•	•
P/N 10T6051	BS/IP/RF viscometer holder	•	•
P/N 02T0203	Spill tray	•	
P/N 02T0201	Spill tray		•
P/N 07T0086	Float / Level detector	•	
P/N 07T0087	Float / Level detector		•

1.25 ASTM D2171 Set-Up for Viscosity of Bitumen

ASTM D2171 - IP 122 - EN 12596 - AASHTOT202

This test method covers procedures for the determination of viscosity of asphalt (bitumen) by vacuum capillary viscometers at 60°C. It is applicable to materials having viscosities in the range from 0.0036 to over 20,000 Pa.

Main Characteristics

The Tamson Vacuum System (TVS) is designed for precise measurement and control of vacuum at 300 mm Hg below atmospheric pressure. The TVS is equipped with an internal vacuum pump. The internal set points for the instrument gauge are preset at Tamson to regulate vacuum at 300 ± 0.5 mm Hg below atmospheric pressure (the vacuum required in ASTM D2171). These set points may be altered to fit the user's specific needs within the TVS operating range of 0 to 320 mm Hg below atmospheric pressure.

In asphalt laboratories the TVS may be used in conjunction with Cannon-Manning, Asphalt Institute, and Modified Koppers vacuum viscometers for measurement of highly viscous materials such as asphalt cement at 60°C (140°F) according to ASTM D2171. The TVS is also useful in other laboratory systems where accurate measurements and control of vacuum is required.

TV4000 with TVS and Manifold

For ASTM D2171 Tamson supplies a TV4000, a TVS and a four position Tamson Vacuum Manifold (TVM). With this setup, four vacuum viscometers can be used. For more information about the TV4000, please see section 1.6.

- TVS **P/N** 00T0940 (85~230V)
- TVM **P/N** 00T0941
- TV4000 **P/N** 00T0772 (230V/50-60Hz) • **P/N** 00T0774 (115V/60HZ)

(Necessary) options		ASTM D2171
P/N 00T0772	TV4000 viscosity bath (230V/50-60Hz)	•
P/N 00T0940	Tamson vacuum system (85~240V/50-60Hz)	•
P/N 00T0941	Tamson vacuum manifold for four positions with tubing	•
P/N 13T8030	Bracket	•
P/N 02T0230	Fluid trap complete	•
P/N 24T0046	Silicone tubing	•

Accessories		ASTM D2171
P/N 00T0908	Illuminator Z41 (85~230V/50-60Hz)	•
P/N 10T6066	Viscohanger	•
P/N 10T6090	8 Channel stop-watch	•
P/N 00T0239	ASTM thermometer holder	•
P/N 08T0001	Can with 20L of silicon oil 200-10 mm²/s (suitable for 20..150°C)	•
P/N 10T6052	Viscometer holder CMVV/AIVV	•
P/N 10T6053	Viscometer holder Modified Koppers Vacuum	•
P/N 02T0201	Spill tray	•
P/N 07T0087	Float / Level detector	•

Cannon Manning Vacuum Viscometers				
P/N 25T1045	Size number 4	Range from 0.0036 - 0.08	Viscosity range, Pa•s	
P/N 25T1046	Size number 5	Range from 0.012 - 0.24	Viscosity range, Pa•s	
P/N 25T1047	Size number 6	Range from 0.036 - 0.8	Viscosity range, Pa•s	
P/N 25T1048	Size number 7	Range from 0.12 - 2.4	Viscosity range, Pa•s	
P/N 25T1049	Size number 8	Range from 0.36 - 8	Viscosity range, Pa•s	
P/N 25T1050	Size number 9	Range from 1.2 - 24	Viscosity range, Pa•s	
P/N 25T1051	Size number 10	Range from 3.6 - 80	Viscosity range, Pa•s	
P/N 25T1052	Size number 11	Range from 12 – 240	Viscosity range, Pa•s	
P/N 25T1053	Size number 12	Range from 36 – 800	Viscosity range, Pa•s	
P/N 25T1054	Size number 13	Range from 120 – 2400	Viscosity range, Pa•s	
P/N 25T1055	Size number 14	Range from 360 - 8000	Viscosity range, Pa•s	

Asphalt Institute Vacuum Viscometers				
P/N 25T3001	Size number 25	Range from 4.2 - 80	Viscosity range, Pa•s	
P/N 25T3002	Size number 50	Range from 18 – 320	Viscosity range, Pa•s	
P/N 25T3003	Size number 100	Range from 60 – 1280	Viscosity range, Pa•s	
P/N 25T3004	Size number 200	Range from 240 – 5200	Viscosity range, Pa•s	
P/N 25T3005	Size number 400R	Range from 960 – 140000	Viscosity range, Pa•s	
P/N 25T3006	Size number 800R	Range from 3800 - 580000	Viscosity range, Pa•s	

Modified Koppers Vacuum Viscometers				
P/N 25T3010	Size number 25	Range from 4.2 – 80	Viscosity range, Pa•s	
P/N 25T3011	Size number 50	Range from 18 – 320	Viscosity range, Pa•s	
P/N 25T3012	Size number 100	Range from 60 – 1280	Viscosity range, Pa•s	
P/N 25T3013	Size number 200	Range from 240 – 5200	Viscosity range, Pa•s	
P/N 25T3014	Size number 400	Range from 960 - 20000	Viscosity range, Pa•s	

Please see Bitumen presentation at www.tamson.com

1.26 ASTM D4807 Sediment in Crude Oil Membrane Filtration

ASTM D4807 - MPMS, Chapter 10.8

This test method covers the determination of sediment in crude oils by membrane filtration. This test method has been validated for crude oils with sediments up to approximately 0.15 mass %.

Main characteristics

The Tamson TC16 circulator pumps the bath content filled with silicon oil through the jacketed (double wall) funnel to maintain the crude oil sample at 90°C. Necessary filter support, clamp, rubber stopper, 1000 mL vacuum filtering flask, glass T-piece with ground wire, insulated tubing with connectors, rod stand with clamps, membrane filters, and a vacuum pump are included in P/N 00T2010 or P/N 00T2011.

ASTM D4807 Apparatus

Range	...250°C/...482°F
Reading	Standard °C, °F on request
Used materials inside bath	Stainless steel 304, brass bearings
Setting	0.1°C
Stability ±	0.02°C
Heating	1400 W
Bath volume	16 L
Opening bath	180 x 210 mm
Depth bath	220 mm
Pump (mBar)	Max pressure 300 (optional 1 Bar)
Pump (L/min)	Max flow 7.5 (optional 16)
Dimension LxWxH	480 x 294 x 480 mm
Weight	21 kg

▶ ASTM D4807 apparatus complete **P/N** 00T2010 (230V/50-60Hz) • **P/N** 00T2011 (115V/60Hz)

Optional for TC16	
P/N 07T0210	Leveling platform TC16
P/N 00T0254	Top lid cover with one set of rings for TC16
P/N 08T0001	Silicon oil 200-10 mm²/s 20 ltrs transparent

Accessories for ASTM D4807	
P/N 21T0230	Oven 230V/50-60Hz
P/N 21T0240	Analytical balance (230V/50Hz)
P/N 21T0250	Desiccator with lid and knob, DN100
P/N 21T0251	Desiccator plate DN100, 90 mm, porcelain
P/N 25T0928BW	Thermometer with blue filling similar to ASTM 34C
P/N 25T2154	Thermometer holder 425x10 mm
P/N 08T0001	Can with 20L of silicon oil 200-10 mm²/s (suitable for 20..150°C)

1.27 ASTM D4870 Total Sediment in Residual Fuels

ISO 10307 - IP 375 - IP 390 (proc. A) - ASTM D4870

Tamson supplies oil baths with accessories for this total sediment test in residual fuels. The oil bath is needed for thermal ageing of the samples.

Main characteristics

A selection can be made between two baths. The cover (P/N 03T2310) of the TC16 offers six openings for air wells. The cover (P/N 03T2312) of the TC40 offers fifteen openings for air wells. Cover needs to be bought separately as an accessory. Air wells, conical flasks, condensers and stoppers can be bought from Tamson as well. The temperature range of the ageing baths is from ambient +5°C to 250°C. Please see §2.6 for more information about the TC16 and TC40.

TC16
Ageing Bath

	TC16	TC40
Range	...250°C/...482°F	
Reading	Standard °C, °F on request	
Used materials inside bath	Stainless steel 304	
Setting	0.1°C	
Stability ±	0.02°C	
Heating	1400 W	2800 W
Bath volume	16 L	40 L
Opening bath	180 x 210 mm	420 x 275 mm
Depth bath	220 mm	200 mm
Pump (mBar)	Max pressure 300 (optional 1 Bar)	
Pump (L/min)	Max flow 7.5 (optional 16)	
Dimension LxWxH	480 x 295 x 480 mm	705 x 375 x 480 mm
Weight	21 kg	30 kg

▶ TC16 **P/N** 00T0671 (230V/50-60Hz) • **P/N** 00T0861 (115V/60Hz)
▶ TC40 **P/N** 00T0681 (230V/50-60Hz) • **P/N** 00T0851 (115V/60Hz)

Necessary accessories		TC16	TC40
P/N 03T2310	Top cover for TC16. Six openings Ø62 mm with lids and one thermometer openings	•	
P/N 03T2312	Top cover for TC40. Fifteen openings Ø62 mm with lids and one thermometer openings		•
P/N 14T0230	Air well, cylinder Ø55 mm inside and 120 mm in length	•	•
P/N 14T0232	Top lid for air well with 10 mm opening	•	•
P/N 08T0001	Can with 20L of silicon oil 200-10 mm²/s (suitable for 20..150°C)	•	•
P/N 25T0921BW	ASTM thermometer S22C (lowhazardous to ship)	•	•
P/N 31T0423	Cork stopper for thermometer	•	•
P/N 31T0014	Conical flask, 50 mL narrow mouth, pack of 10	•	•
P/N 31T0015	Condenser air, made of borosilicate glass, pack of 10	•	•
P/N 31T0016	Rubber stopper, unbored for conical flask, pack of 10	•	•
P/N 31T0017	Cork stopper, bored centrally for the air condenser, pack of 10	•	•

1.28 ASTM D6468 Stabillity of Middle Distilled Fuels

ASTM D6468 - Dupont F21- Octel F31 - IP 467

This test method covers relative stability of middle distillate fuels under high temperature aging conditions with limited air exposure. Tamson supplies baths for this thermal ageing of the samples.

TC16 for ASTM D6468

Main characteristics

The separately to order cover of the bath has six openings with lids. The openings can accommodate test tubes (P/N 09T0012) in holders (P/N 14T0103). Optional is a cover with nine openings and lids. The temperature range is from ambient +5°C to 250°C. Alternatively a TC40 for 18 positions can be supplied.

	TC16	TC40
Range	...250°C/...482°F	
Reading	Standard °C, °F on request	
Used materials inside bath	Stainless steel 304	
Setting	0.1°C	
Stability ±	0.02°C	
Heating	1400 W	2800 W
Bath volume	16 L	40 L
Opening bath	180 x 210 mm	420 x 275 mm
Depth bath	220 mm	200 mm
Pump (mBar)	Max pressure 300 (optional 1 Bar)	
Pump (L/min)	Max flow 7.5 (optional 16)	
Dimension LxWxH	480 x 295x 480 mm	705 x 375 x 480 mm
Weight	21 kg	30 kg

▶ TC16 **P/N** 00T0671 (230V/50-60Hz) • **P/N** 00T0861 (115V/60Hz)
▶ TC40 **P/N** 00T0681 (230V/50-60Hz) • **P/N** 00T0851 (115V/60Hz)

Necessary accessories		TC16	TC40
P/N 09T0012	Test tube 25 x 200 mm	•	•
P/N 14T0103	Test tube holder for test tube 25 x 200 mm (P/N 09T0012)	•	•
P/N 08T0001	Can with 20L of silicon oil 200-10 mm²/s (suitable for 20..150°C)	•	•
P/N 25T0975BW	Thermometer with blue filling similar to ASTM 102C with works certificate	•	•
P/N 25T2154	Thermometer holder, 425 x 10 mm	•	•
P/N 13T8000	Cover TC16 with six openings	•	
P/N 03T2311	Cover TC16 with nine openings	•	
P/N 03T2313	Cover TC40 with eighteen openings		•

Accessories	
P/N 31T0410	Membrane filter holder
P/N 31T0405	1000 mL heavy walled vacuum flask
P/N 11T0031	Vacuum pump with gauge (230V/50Hz)
P/N 31T0412	Filter paper, pack of 100
P/N 31T1000	Reflection meter

1.29 ASTM D7501 Cold Soak Filtration Test of Biodiesel

ASTM D7501 - IP PM EA - CEN N403 - CGSB 3.0 No. 142

For this test 300 mL of biodiesel (B100) is stored at 4.5 ±0.5°C (40 ± 1°F) for 16 hours, allowed to warm to 25 ±1°C (77 ±2°F), and vacuum filtered through a single 0.7 µm glass fiber filter at controlled vacuum levels of 70–85 kPa.

Main characteristics

TLB50 bath (see also section 3.7 TLB50) is specially designed to condition the biodiesel samples in 500 mL jars at 4.5°C for sixteen hours. The TLB50 bath can be used to maintain the samples at +25°C after the cold soak test.

Filtration kit (P/N 31T2000) is delivered completely with 0.7 micron filters (100 pieces), glass filter funnel and clamp, filter forceps, one litre safety flask, one litre receiving flask, 500 mL graduated cylinder, ten petri dishes, ten watch glasses, glass piece with earth lead, two stoppers with hole (two pieces), stopwatch, and tubing.

TLB50

▶ TLB50 **P/N** 00T0072 (230V/50Hz) • **P/N** 00T0071 (115V/60Hz) • **P/N** 00T0073 (230V/60Hz)

Necessary acessories	
P/N 31T2000	Filtration kit: 0.7 micron filters, glass filter funnel and clamp, filter forceps, one litre safety flask, one litre receiving flask, 500 mL graduated cylinder, ten petri dishes, ten watch glasses, earth leads, two stoppers with hole, stopwatch and tubing.
P/N 11T0031	Vacuum pump 230V (P/N 11T0032 is for 115V/60Hz)
P/N 25T0944BW	Thermometer with blue filling similar to ASTM 57C with works certificate
P/N 00T0239	Thermometer holder
P/N 31T0018	500 mL bottle (set of 10 bottles)
P/N 13T8044	Tripod complete with clamps (two needed)

Necessary options for TLB50	
P/N 03T0080	Top lid for single levelling platform (P/N 03T0071). Complete with handle
P/N 03T0071	Single levelling platform
P/N 03T1049	Rack to hold bottles or glassware (two needed)
P/N 03T1040	Rail to hold bottle brackets preventing bottles from floating (four needed)
P/N 03T1041	Bottle bracket for three bottles (four needed)

Optional for TLB50	
P/N 11T0040	Optional alarm to operate within temperature band. Three temperatures are pre set for operation: - Set point temperature - Minimum allowed bath temperature - Maximum allowed temperature

1.30 ASTM D7667 Silver Corosion Test of Fuels

IP 227 - ASTM D4818 - ASTM D7667 - ASTM D7671 - IP 611

This test method specifies a method for the determination of the corrosive tendencies towards silver of aviation turbine fuel, automotive spark ignition engine oils, and automotive gasoline. The result is classified as an integer in the range 0 to 4.

Main Characteristics

The corrosion bath offers place for six test positions. The standard included cover of the bath has six openings, each supplied with a lid with a hook for suspending a copper corrosion test vessel (P/N 14T0100) or the openings can accommodate test tubes in holders (P/N 14T0102). The temperature range is from ambient +5°C to 250°C. Optional is a cover with nine openings to test nine samples (P/N 03T2311). When not used for silver corrosion tests, the pump can be used to circulate the bath content to an external application. Alternatively, a TC40 can be used as an 18 position bath.

Silver Corrosion bath

Range	..250°C/..482°F
Reading	Standard °C, °F on request
Used materials inside bath	Stainless steel 304, brass bearings
Setting	0.1°C
Stability ±	0.02°C
Heating	1400 W
Bath volume	16 L
Opening bath	6 x Ø51 mm (9 optional)
Depth bath	220 mm
Pump (mBar)	Max pressure 300 (optional 1 Bar)
Pump (L/min)	Max flow 7.5 (optional 16)
Dimension (LxWxH)	480 x 295 x 480 mm
Weight	21 kg

▶ TC16 (for silver corrosion) • **P/N** 31T0671 (230V/50-60Hz) • **P/N** 31T0861 (115V/60Hz)

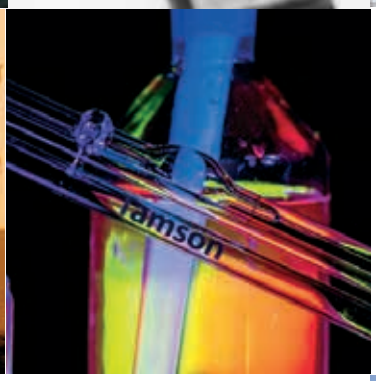
Alternative set-up for 18 positions	
P/N 00T0681 P/N 00T0851	TC40 230V/50-60Hz TC40 115V/60Hz
P/N 03T2313	Cover with 18 x Ø51 mm openings
P/N 14T0101	Lid + mounting hook (number of pieces to be ordered separately depending on number of test cylinders)

ASTM Equipment

Necessary accessories		IP 227	ASTM D4814	ASTM D7667		ASTM D7671		IP 611
				Procedure A	Procedure B	Procedure A	Procedure B	
P/N 31T0300	Test tube (amber glass)	•						
P/N 31T0301	Cold-finger condenser (amber + transparent glass)	•						
P/N 31T0302	Glass cradle	•						
P/N 31T0303	Silver strip (one piece)	•	•			•	•	•
P/N 31T0304	Silver strip standard	•	•	•	•	•	•	•
P/N 31T0001	Sanding paper P220	•						•
P/N 31T0000	Multistrip vise	•	•			•	•	•
P/N 31T0005	Silicon carbide powder 105-µm (1kg)	•	•			•	•	•
P/N 25T0928BW	ASTM thermometer S34C (non hazardous)	•	•	•	•	•	•	•
P/N 25T2154	Thermometer holder	•	•	•	•	•	•	•
P/N 31T0009	Sanding paper P240	•	•			•	•	•
P/N 14T0100	Test cylinder		•	•		•		•
P/N 09T0010	Test tube 25 x 150 mm		•	•	•	•	•	•
P/N 09T0011	Flat glass viewing test tube		•			•	•	
P/N 14T0102	Test tube holder				•		•	
P/N 31T0305	SSCD			•	•			
P/N 31T0011	Sourcing pad 400 grit			•	•			
P/N 31T0307	Thin silver strip			•	•			
P/N 31T0306	Waterproof oxide sanding sheets			•	•			
P/N 31T0008	Vented cork for test tube						•	
P/N 24T0385	O-ring for test cylinder (P/N 14T0100)		•	•		•		•
P/N 31T0308	PTFE cradle holder					•		•
P/N 31T0309	Cable tie						•	

Please see Corrosion presentation at www.tamson.com

ASTM Equipment



HIGH TEMPERATURE BATHS

2.1 How to select the appropriate circulator?

	Tamson Bracket	TTU-A	TC6B	TC10B	TC20B	TB30	TC16	TC40	TC58
Temperature range	Ambient..200°C	Ambient..200°C	Ambient..200°C	Ambient..200°C	Ambient..200°C	ambient..+120°C	Ambient..250°C	Ambient..250°C	Ambient..250°C
Setting (°C)	0.1	0.01	0.1	0.1	0.1	0.01	0.1	0.1	0.1
Stability ± (°C)	Better then 0.03	0.02	Better then 0.03	Better then 0.02	Better then 0.02	0.02	0.02	0.02	0.02
Heating (W)	1100	1400	1100	1100	1550	2800	1400	2800	2800
Heaters	1	1	1	1	1	2	1	2	2
Bath Volume (L)	max 50	max 60	6	10	20	30	16	40	58
Opening bath (mm)	>185*(<186*422)*190	140*180	148*120	185*200	300*320	163*192	180*210	420*275	420*275
Depth bath (mm)	>160	>160	150	150	150	460	220	200	300
Pump pressure (mBar)	300 max	300 max	300 max	300 max	300 max	-	300 max	300 max	300 max
Pump capacity	7.5 max	7.5 max	7.5 max	7.5 max	7.5 max	-	7.5 max	7.5 max	7.5 max
Dimensions (LxWxH)	-	-	350*213*440	440*250*440	555*375*425	285 x 490 x 680	455*295*440	705*375*440	705*375*590

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Email sales@tamson.com
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2.2 Tamson Bracket - TB

A heating immersion circulator is available for various bath tanks up to a capacity of 50 liters and come equipped with a mounting bridge that fits onto all tanks with a maximum opening of 442 mm. The Tamson Bracket is based on the Tamson Thermostatic Unit (TTU) and can be used for heating and/or circulating purposes. The bath fluid is heated via a micro-processor controlled heating element. The bracket can be placed on a tank. The width of the bracket can be adjusted between 186 and 422 mm.

Tamson Bracket

Main Characteristics

The set point of the TB can be set in steps of 0.1°C in the range of 0°C up to 200°C (32..392°F). The accuracy of the display is displayed in 0.1°C. However, the controller has an internal accuracy of 0.01°C. Two decimal readout is also available via the RS232 and the free Tamcom software. Due to the friction-heat of the stirring mechanism, the minimum temperature lies approximately 5°C above the ambient temperature.

Range	...200°C/...392°F
Reading	Standard °C, °F on request
Used materials inside bath	Stainless steel 304
Setting	0.1°C
Stability ±	0.03°C
Heating	1100 W
Bath volume	Max 50 L
Width bath	> 186 mm < 422 mm
Depth bath	> 160 mm
Length bath	> 185 mm
Height head	190 mm
Pump (mBar)	Max pressure 250
Pump (L/min)	Max flow 7.5
Weight	4 kg

▶ **P/N** 00T0380 (230V/50-60Hz) • **P/N** 00T0385 (115V/60Hz)

▶ **For options and spare parts, please see our section `TCB line'**

2.3 Tamson Circulator - TCB Line

Circulators offer many application possibilities, e.g. routine laboratory applications, temperature control of samples, incubations, dental applications, material testing, corrosion tests, tempering of cultures as well as temperature testing of food and luxury articles. The 'TCB" baths can be used as circulator or as a water/oil bath.

Main Characteristics
The set point can be set in steps of 0.1° in the range from 0°C up to 200°C (32...392°F). The accuracy on the display is displayed in 0.1°C. However, the controller has an internal accuracy of 0.01°C. Two decimal readout is also available via the RS232 and the free Tamcom software. Due to the friction-heat of the stirring mechanism and when using a top lid, the minimum temperature lies approximately 5°C above the ambient temperature. When using the standard built-in cooling coil the minimum operating temperature lies approximately 5°C above the temperature of the cooling liquid. In general the minimum temperature lies around 10°C.

TCB Line

	TC6B 	TC10B 	TC20B 
Range	...200°C/...392°F		
Reading	Standard °C, °F on request		
Used materials inside bath	Stainless steel 304		
Setting	0.1°C		
Stability ±	Better then 0.02°C		
Heating	1100 W	1100 W	1550 W
Bath volume	6 L	10 L	20 L
Opening bath (round edge)	148 x 120 mm	185 x 200 mm	300 x 320mm
Depth bath	150 mm	150 mm	150 mm
Pump (mBar)	Max pressure 300		
Pump (L/min)	Max flow 7		
Dimension LxWxH	350 x 213 x 440 mm	440 x 250 x 440 mm	555 x 375 x 425 mm
Weight	8 kg	11 kg	13 kg

- TC6B **P/N** 00T0030 (230V/50-60Hz) • **P/N** 00T0035 (115V/60Hz)
- TC10B **P/N** 00T0150 (230V/50-60Hz) • **P/N** 00T0155 (115V/60Hz)
- TC20B **P/N** 00T0160 (230V/50-60Hz) • **P/N** 00T0165 (115V/60Hz)

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Options		TB	TC6B	TC10B	TC20B
P/N 02T3025	RS232 serial communication port	•	•	•	•
P/N 25T0253	Heater 1550 W (boost heater)	•			
P/N 03T0016	Leveling platform TC6B		•		
P/N 03T0017	Leveling platform TC10B			•	
P/N 03T0031	Leveling platform TC20B				•
P/N 00T0050 P/N 00T0051 P/N 00T0052	TLC10-3 external cooler 230V/50Hz TLC10-3 external cooler 230V/60Hz TLC10-3 external cooler 115V/60Hz		•	•	•

Spare parts 230V/50-60Hz (115V-60Hz on request)		TB	TC6B	TC10B	TC20B
P/N 25T1343	Capacitor 2uF	•	•	•	•
P/N 25T1295	Motor 30 W	•	•	•	•
P/N 25T0251	Heater 1100 W	•	•	•	
P/N 25T0253	Heater 1550 W				•
P/N 25T2311	PT-100 sensor	•	•	•	•
P/N 06T0496	PCB TC bath	•	•	•	•
P/N 24T8545	Mains switch	•	•	•	•
P/N 28T3902	Front foil TTU-B	•	•	•	•
P/N 24T8581	Safety cut-out thermostat	•	•	•	•
P/N 28T3022	K1S controller	•	•	•	•
P/N 24T8081	Motor fuse 0.3 Amp	•	•	•	•

For detailed overview please see www.tamson.com

2.4 Tamson Thermostatic Unit - TTU-A

The Tamson Thermostatic Unit (TTU) can be used for heating and/or circulating purposes. The bath fluid is heated via a micro-processor controlled heating element. Tamson offers thermostatic controllers as a replacement unit or as a "plug and play" unit to heat a bath or application.

Main characteristics
A choice for different applications is offered:
- Stirring with short or long shaft
- Heating with or without boost heater
- Circulating and pumping
- Below ambient temperature regulation using a cooling coil

Set point is adjustable in steps of 0.01°C. The overall system accuracy is better than ± 0.02°C but depends on the application. Readout can be switched between °C or °F. When equipped with a pump, the pump pressure is 300 mBar and seven liters per minute (no counter pressure).

TTU-A

P/N 19T1010 & P/N 19T3110

Range	.... 200°C
Reading	°C or °F
Used materials inside bath	Stainless steel, brass bearings
Setting	0.01°C
Stability ±	0.01°C
Heating	1400 W or 2800 W
Weight	4 kg

- Long shaft, stirrer, cooling coil — **P/N** 19T1010 (230V/50-60Hz) • **P/N** 19T1011 (115V/60Hz)
- Long shaft, stirrer, boost heater — **P/N** 19T1020 (230V/50-60Hz) • **P/N** 19T1021 (115V/60Hz)
- Short shaft, stirrer and pump — **P/N** 19T3110 (230V/50-60Hz) • **P/N** 19T3111 (115V/60Hz)
- Short shaft, stirrer and boost heater — **P/N** 19T3120 (230V/50-60Hz) • **P/N** 19T3121 (115V/60Hz)

TTU-A

P/N 19T1020 & P/N 19T3120

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Email sales@tamson.com
Website www.tamson.com

2.5 Tamson Bath TB30

The TB30 can be used from ambient to +120°C. It is perfect designed to calibrate temperature sensors or thermometers. The construction of the bath results in a stable working temperature of ± 0.02°C. The set point can be set in steps of 0.01° in the range of 0°C up to 120°C (33.8 to 248°F). The accuracy on the display is displayed in 0.01°C.

TB30

Range	..120°C/...248°F
Reading	°C or °F
Materials used inside bath	Stainless steel 304, brass bearings
Setting	0.01°C
Stability ±	0.02°C
Heating	2800 W
Bath volume	30 L
Bath opening	163 x 192 mm
Bath depth	460 mm
Dimensions LxWxH	258 x 490 x 680 mm

- TB30 **P/N** 00T0069 (230V/50-60Hz) • **P/N** 00T0070 (115V/60Hz)
- TB30 with leveling platform **P/N** 00T0067 (230V/50-60Hz) • **P/N** 00T0068 (115V/60Hz)

Necessary accessories	
P/N 03T2319	Lid TB30 for P/N 00T0069 and P/N 00T0070
P/N 03T2323	Lid TB30 for P/N 00T0067 and P/N 00T0068
P/N 25T2154	Thermometer holder 425 x 10 mm
P/N 00T2320	Half lid, two needed for P/N 00T0069 and P/N 00T0070
P/N 00T2323	Full lid, one needed for P/N 00T0067 and P/N 00T0068

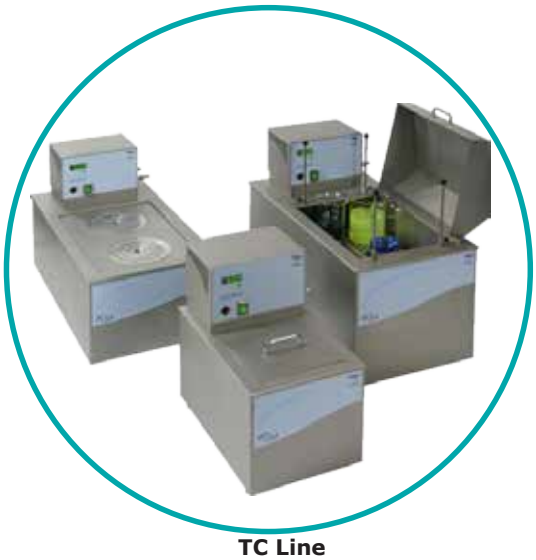
TB30
with leveling platform

2.6 Tamson Circulator – TC Line

The working temperature range offers many possibilities, e.g. routine applications, temperature control of samples, incubations, dental applications, material testing, corrosion tests, tempering of cultures as well as temperature testing of food and luxury articles. The "TC" baths are used for precise temperature control. They can be used as circulator and/or water/oil bath.

Main Characteristics

The insulation of the bath and electronic design result in a very stable working temperature of ± 0.02°C for the TC baths. The set point can be set in steps of 0.1° in the range form 0°C up to 250°C (32…482°F). The accuracy on the display is displayed in 0.1°C. However, the controller has an internal accuracy of 0.01°C. Two decimal readout is also available via the RS232 and the free Tamcom software. Due to the friction-heat of the stirring mechanism and when using a top lid, the minimum temperature lies approximately 5°C above the ambient temperature. When using the standard built-in cooling coil the minimum temperature lies approximately 5°C above the temperature of the cooling liquid. In general the minimum temperature lies around 10°C.



TC Line

	TC16 	TC40 	TC58 
Range	…250°C/…482°F		
Reading	Standard °C, °F on request		
Used materials inside bath	Stainless steel 304, brass bearings		
Setting	0.1°C		
Stability ±	0.02°C		
Heating	1400 W	2800 W	2800 W
Bath volume	16 L	40 L	58 L
Opening bath	180 x 210 MM	420 x 275 mm	420 x 275 mm
Depth bath	220 mm	200 mm	300 mm
Pump (mBar)	Max pressure 300 (optional 1 Bar)		
Pump (L/min)	Max flow 7.5 (optional 16)		
Dimension LxWxH	480 x 295 x 480 mm	705 x 375 x 440 mm	705 x 375 x 590 mm
Weight	21 kg	30 kg	35 kg

- TC16 **P/N** 00T0671 (230V/50-60Hz) • **P/N** 00T0861 (115V/60Hz)
- TC40 **P/N** 00T0681 (230V/50-60Hz) • **P/N** 00T0851 (115V/60Hz)
- TC58 **P/N** 00T0691 (230V/50-60Hz) • **P/N** 00T0881 (115V/60Hz)

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Email sales@tamson.com
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High Temperature Baths

Options		TC16	TC40	TC58
P/N 02T3025	RS232 serial communication port	•	•	•
P/N 00T0253	Suction/pressure pump	•	•	•
P/N 24T0399	Performance pump (16L/min)	•	•	•
P/N 25T0194	Additional boost heater (1400W)	•		
P/N 07T0210	Leveling platform TC16	•		
P/N 07T0211	Leveling platform TC40		•	
P/N 07T0212	Leveling platform TC58			•
P/N 03T2270	Lid leveling platform		•	•
P/N 03T3200	Gabled lid		•	•
P/N 03T2210	Gabled lid + leveling platform		•	•
P/N 00T0254	Top lid cover with one set of rings	•		
P/N 00T0255	Top lid cover with two sets of six rings		•	•
P/N 00T0256	Top lid cover with six sets of three rings		•	•
P/N 00T0050 P/N 00T0051 P/N 00T0052	TLC10-3 external cooler 230V/50Hz TLC10-3 external cooler 230V/60Hz TLC10-3 external cooler 115V/60Hz	•		
P/N 00T0565 P/N 00T0567 P/N 00T0570	TLC15-5 external cooler 230V/50Hz TLC15-5 external cooler 230V/60Hz TLC15-5 external cooler 115V/60Hz		•	•
P/N 06T1660	Remote PT-100	•	•	•

Spare parts 230V/50-60Hz (115V-60Hz on request)		TC16	TC40	TC58
P/N 25T1242	Fan	•	•	•
P/N 04T0035	Pump complete	•	•	•
P/N 24T8080	Motor fuse	•	•	•
P/N 24T3300	Motor capacitor	•	•	•
P/N 06T0496	PCB TC bath	•	•	•
P/N 25T0194	Heater 1400 W	•	•	•
P/N 24T8541	Mains switch	•	•	•
P/N 24T8581	Safety cut-out thermostat	•	•	•
P/N 28T3022	K1S controller	•	•	•
P/N 25T2311	PT-100 sensor	•	•	•

Detailed information www.tamson.com

LOW TEMPERATURE BATHS

3.1 How to select the appropriate cooler?

	TLC10-3	TLC15-5	TLC30-5	TLC40-14	TLC80-14	TLC80-14DP	TLC90-14	TLB50
Temperature range	-10..+60°C (Optional -10..+120°C)	-15..+60°C (Optional -15..+120°C)	-30..+60°C (Optional -30..+120°C)	-40..+20°C + (Optional -45..+20°C)	-80°C..ambient	-82°C..ambient	-90°C..ambient	-5°C..+80°C
Setting (°C)	0.01	0.01	0.01	0.1	0.1	0.1	0.1	0.01
Stability ±	Better than 0.05°C	Better than 0.05°C	Better than 0.05°C	Better than 0.05K°C	Better than 0.05°C	Better than 0.05°C	Better than 0.05°C	0.02°C
Heating (W)	1100	1100	1100	1550	1550	1550	1550	2800
Heaters	1	1	1	1	1	1	1	2
Bath Volume (L)	3.5	5	5	14..15	14..15	14..15	14..15	50
Opening bath (mm)	40*115	85*150	85*150	240*170	240*170	240*170	240*170	310*400
Depth bath (mm)	150	150	150	150	150	150	150	290
Pump pressure (mBar)	270 max	300 max	300 max	300 max	300 max	300 max	300 max	Optional 300 max
Pump capacity (L/min)	7 max (optional 10)	7 max (optional 10)	7 max (optional 10)	7 max (optional 16)	7 max (optional 16)	7 max (optional 16)	7 max (optional 16)	Optional 7 max
Heat removal °C (WATT)	@50° - 320 @0° - 100 @-10° - 50	@2° - 250 @-7° - 200 @-10° - 150 @-12° - 75 @-14° - 50	@15° - 200 @0° - 170 @-3° - 150 @-25° - 100 @-30° - 50	@-10° - 1220 @-20° - 880 @-30° - 520 @-40° - 250	@-80° - 300	@-80° - 600	@-80°- 300 @-90°- 75	@-5° - 180 @10° - 250 @30° - 330
Dimensions(LxWxH)	355*195*410	420*26*565	420*265*565	810*460*770	810*460*770	781*496*1175	810*460*770	720*440*720

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Email sales@tamson.com
Website www.tamson.com

3.2 Tamson Cooling Circulators - TLC Line TLC10-3

The TLC10-3 has been developed to be used as general purpose circulator and it can be used in various applications where cooling is needed. Experiments, refractometers, rotary-evaporators, distillation units, water baths, viscosity baths, flash point testers are applications for which the TLC10-3 can be used.

TLC10-3

Main Characteristics

The apparatus holds a small bath containing 3.5 litres and the filling opening measures 40 x 120 mm. Due to its special design the system is extremely quiet, compact and saves costly laboratory space. Readout is in degrees °C or in °F. The bath comes standard with RS232 communication and when using the free software tool Tamcom, it provides temperature logging or a predefined temperature set point curve. A pump provides circulation in the bath or via an external circuit. The pump offers seven litres per minute with a maximum counter pressure of 300 mBar.

Range	-10..60°C* / 14..140°F
Reading	Standard °C, °F on request
Used materials inside bath	Stainless steel 304, brass bearings
Setting	0.01°C
Stability ±	Better than 0.05°C
Heating	1100 W
Bath volume	3.5 L
Opening bath	40 x 120 mm
Depth bath	150 mm
Pump (mBar)	Max pressure 300
Pump (L/min)	Max flow 7
Dimension LxWxH	360 x 228 x 552 mm
Weight	18 kg
Heat removal	See section 3.1

* On request the TLC10-3 can have a working range from -10..120°C

▶ TLC10-3 **P/N** 00T0050 (230V/50Hz) • **P/N** 00T0051 (230V/60Hz) • **P/N** 00T0052 (115V/60Hz)

▶ **For options and spare parts, please see section `TC15-5 • TC30-5'**

Manuals see
www.tamson.com

3.3 Tamson Cooling Circulators – TLC Line TLC15-5, TLC30-5

The TLC15-5 and TLC30-5 have been developed to be used as general purpose circulator and they can be used in various applications where cooling is needed. Examples are experiments, refractometers, rotary-evaporators, distillation units, water baths, viscosity baths, flash point testers, foaming tests and ductility tests.

Main Characteristics
The apparatus holds a small bath containing five litres and the filling opening measures 85 x 150 mm. Due to its special design the system is extremely quiet, compact and saves costly laboratory space. Readout is in degrees °C or in °F. A pump provides circulation in the bath or to an external circuit. The pump offers seven litres per minute with a maximum counter pressure of 300 mBar.

TLC15-5

	TLC15-5 	**TLC30-5** 
Range	-15..60°C*/-5..140°F	-30..60°C**/-5..140°F
Reading	Standard °C, °F on request	
Used materials inside bath	Stainless steel 304, brass bearings	
Setting	0.01°C	
Stability ±	Better than 0.02°C	
Heating	1100 W	
Bath volume	5 L	
Opening bath	85 x 150 mm	
Depth bath	150 mm	
Pump (mBar)	Max pressure 300	
Pump (L/min)	Max flow 7	
Dimension LxWxH	420 X 265 X 565 mm	
Weight	30 kg	
Heat removal	See section 3.1	

* On request the TLC15-5 can have a working range from -15..120°C
** On request the TLC30-5 can have a working range from -30..120°C

▶ TLC15-5 **P/N** 00T0565 (230V/50Hz) • **P/N** 00T0567 (230V/60Hz) • **P/N** 00T0570 (115V/60Hz)
▶ TLC30-5 **P/N** 00T0555 (230V/50Hz) • **P/N** 00T0562 (230V/60Hz) • **P/N** 00T0560 (115V/60Hz)

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Options		TLC10-3	TLC15-5	TLC30-5
P/N 06T1660	Remote PT-100	•	•	•
P/N 04T0225	Performance pump		•	•
P/N 04T0228	Performance pump	•		

Spare parts 230V/50Hz (115V-60Hz/230V-60HZ on request)		TLC10-3	TLC15-5	TLC30-5
P/N 25T1295	Motor 30 W	•	•	•
P/N 25T1343	Capacitor 2uF	•	•	•
P/N 25T0251	Heater 1100 W	•	•	•
P/N 24T8081	Motor fuse 0.3 Amp.	•	•	•
P/N 24T8581	Safety cut-out thermostat	•	•	•
P/N 24T8545	Mains switch	•	•	•
P/N 25T2310	PT-100 sensor	•	•	•
P/N 06T0514	Circuit board TLC-TMC70 (power board)	•	•	•
P/N 06T0513	Circuit board TLC-TMC70 uP-display	•	•	•
P/N 04T0220	Standard pump complete		•	•
P/N 04T0226	Standard pump complete	•		

3.4 Tamson Cooling Circulators – TLC Line TLC40, TLC80, TLC90

The TLC40-14 cooling circulator can be used for multiple heat removal purposes such as replacement of tap water, fast cool down, flash point, distillation, density or cloud and pour point testing. Also, this unit can be used to cool down water baths and viscosity baths which have a large bath volume. TLC80-14 and TLC90-14 cooling circulators can be used for general low temperature use and shows excellent heat removal performance in combination with cloud and pour point tests or cold filter plugging point tests.

TLC40-14

Main Characteristics

The apparatus holds a bath containing 14 litres and the filling opening measures 240 x 170 mm. Due to its special design the system is extremely quiet, compact and saves costly laboratory space. The minimum temperature which can be reached with the TLC40-14 is -40°C. The minimum temperature which can be reached with the TLC80-14 is -80°C. At -80°C the heat removal capacity is still 300 Watts! The minimum temperature which can be reached with the TLC90-14 is -90°C. Readout is in degrees °C or in °F. A pump provides circulation in the bath or pumps the flow to an external circuit. The pump offers seven litres per minute with a maximum counter pressure of 300 mBar. Optional is a performance pump which offers 16 litres per minute.

	TLC40-14 	TLC80-14 	TLC90-14 
Range	-40..+20°C*/-40..+68 °F	-80..+20°C/-112..+68°F	-90..+20°C/-130..+68°F
Reading	Standard °C, °F on request		
Used materials inside bath	Stainless steel 304, brass bearings		
Setting	0.1°C		
Stability ±	Better than 0.05°C		
Heating	1550 W		
Bath volume	14 .. 15 L		
Opening bath	240 x 170 mm		
Depth bath	150 mm		
Pump (mBar)	Max pressure 300 (optional 1 Bar)		
Pump (L/min)	Max flow 7 (optional 16)	Max flow 10 (optional 16)	Max flow 10 (optional 16)
Dimension LxWxH	810 x 460 x 770 mm		
Weight	65 kg	80 kg	80 kg
Heat removal	See section 3.1		

* On request the TLC40-14 can have an optional working range from -45..+20°C.

- TLC40-14 **P/N** 00T0520 (230V/50Hz) • **P/N** 00T0522 (230V/60Hz) • **P/N** 00T0525 (115V/60Hz)
- TLC80-14 **P/N** 00T0530 (230V/50Hz) • **P/N** 00T0532 (230V/60Hz) • **P/N** on request (115V/60Hz)
- TLC90-14 **P/N** 00T0580 (230V/50Hz) • **P/N** 00T0585 (230V/60Hz) • **P/N** on request (115V/60Hz)

- **For options and spare parts, please see section TLC80-14DP**

PMT est. 1878 Tamson Instruments
Tel. +31 10 522 43 73
Email sales@tamson.com
Website www.tamson.com

3.5 Tamson Cooling Circulators – TLC Line TLC80-DP

The TLC80-14DP can be used for general low temperature use but shows excellent heat removal performance in combination with cloud and pour point tests, and cold filter plugging point tests.

Main Characteristics

The apparatus holds a bath containing 14 litres and the filling opening measures 240 x 170 mm. Due to its special design the system is extremely quiet. The minimum temperature which can be reached is -82°C. At this low temperature the heat removal capacity lies around 150 watts. The TLC80-14DP is developed to cool down several instruments in a row. The Tamson manifold can be used for this purpose. Readout is in degrees °C or in °F. A pump provides circulation in the bath or via an external circuit. The pump offers 7 litres per minute with a maximum counter pressure of 300 mBar. A single switch can turn the apparatus into economy mode when the full cooling capacity is not needed (e.g. overnight). Optional is a performance pump which offers 16 litres per minute.

TLC80-14DP

Range	-82..20°C / -112..68°F
Reading	Standard °C, °F on request
Used materials inside bath	Stainless steel 304, brass bearings
Setting	0.1°C
Stability ±	Better than 0.05°C
Heating	1550 W
Bath volume	14..15 L
Opening bath	240 x 170 mm
Depth bath	150 mm
Pump (Bar)	Max pressure 0.3 (optional 1 Bar)
Pump (L/min)	Max flow 10 (optional 16)
Dimension LxWxH	810 x 490 x 1150 mm
Weight	140 kg
Heat removal	See section 3.1

▶ TLC80-14DP **P/N** 00T0540 (230V/50Hz)

More product information at www.tamson.com

Options		TLC40-14	TLC80-14	TLC90-14	TLC80-14DP
P/N 02T3025	RS232 serial communication	•	•	•	•
P/N 24T0399	Performance pump (16 L/min)	•	•	•	•
P/N 00T0635	Manifold	•	•	•	•
P/N 06T1660	Remote PT-100	•	•	•	•

Spare parts 230V/50Hz (115V-60Hz/230V-60HZ on request)		TLC40-14	TLC80-14	TLC90-14	TLC80-14DP
P/N 25T1290	Motor for pump	•	•	•	•
P/N 24T3300	Capacitor 7uF	•	•	•	•
P/N 25T0253	Heater 1550 W	•	•	•	•
P/N 24T8080	Motor fuse 0.6 Amp.	•	•	•	•
P/N 06T0475	Mains board (PCB TTU)	•	•	•	•
P/N 24T8581	Safety cut-out thermostat	•	•	•	•
P/N 24T8541	Mains switch	•	•	•	•
P/N 25T2312	PT-100 sensor	•	•	•	•
P/N 28T3022	K1S controller	•	•	•	•
P/N 04T0025	Pump complete	•	•	•	•

Precision
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Tel. +31 10 522 43 73
Email sales@tamson.com
Website www.tamson.com

3.6 Tamson Cool Cube - Immersion Cooler and Bath

The Tamson Cool Cube (TCC) is a compact cooler which is used as a heat removal platform enabling low temperatures of -80°C and below. The TCC functions as basis for three different models. Available are a thermostatic bath (TCC - B), an Immersion cooler (TCC - IC), and a circulator system (TCC - C).

TCC - IC

Main Characteristics

The TCC comprises of a two stage compressor system which is switched in cascade. The unit is low noise and once it reaches temperatures below -70°C it is relatively energy efficient.

The cooling probe of the TCC-IC is formed by a stainless steel corrugated hose attached to an insulated flexible hose. The probe can be immersed in a fluid which has to be cooled down.

The TCC-B model has an internal bath and can be closed with a lid. The lid can be removed to insert a product inside the bath fluid. Alternatively, the standard integrated pump can be used to circulate the bath fluid to an external application.

The TCC - C is under development at the moment. The TCC – C will be a closed system (no bath lid). The standard pump will circulate the bath fluid to an external application for heat removal purposes.

	TCC - IC	TCC-B
Minimum Probe temp	-100°C/-112°F	N/A
Practical working temperature	-80°C/-112°F	-80°C/-112°F
Body	Top lid stainless steel, body powder coat Zincor	
Hose length	2000 mm	N/A
Probe length	200 mm	N/A
Probe diameter	47 mm	N/A
Height + Display	660 mm	
Height casing without display	610 mm	
Width	380 mm	
Depth	830 mm	
Depth with distance spacers	920 mm	
Power	1200 Watt	

TCC - B

- TCC - IC **P/N** 00T0300 (230V/50Hz) • **P/N** 00T0301 (230V/60Hz)
- TCC - B **P/N** 00T0310 (230V/50Hz) • **P/N** 00T0311 (230V/60Hz)

3.7 Tamson Low Temperature Bath TLB50

TLB50 is a thawing bath for sample preparation. The bath has an operating range of -5°C up to 80°C. The bench top bath with integrated cooling can replace the combination of a water bath with an external cooling circulator. This not only saves bench space, but also save costs because of its high cooling efficiency.

TLB50

Main characteristics
The TLB50 has a wide bath opening and several options like a fixed or split levelling platform and an adjustable rack for placing different sized sample bottles. The primary use of the TLB50 is sample pre-conditioning. Before most samples are analysed, they require to be conditioned to a specified temperature as described in specific test methods i.e.:
- ASTM D323 Reid vapor pressure test between 0 to 1°C (32 to 34°F),
- ASTM D5 penetration tests for bitumen,
- ASTM D86 sample preperation,
- Long-term storage of gasoline <10°C or <20°C (<50°F or 68°F).

The set point is adjustable in steps of 0.01°. The overall system accuracy is better than ± 0.02°C. Readout can be switched between °C or °F. Due to a specific cooling construction, the unit switches to an energy friendly operating mode when reaching the desired bath set point temperature. In comparison to standard equipment this can save up to 600 Watt. When cooling down to the desired bath temperature the bath switches to maximum cooling power.

Range	-5..+80°C/23..+176°F
Reading	°C or °F menu selectable
Setting	0.01°C
Stability ±	0.02°C
Uniformity ±	0.02°C
Heating	2800 W
Heaters	2
Bath volume	50 L
Opening bath L x W	310 x 400 mm
Depth	290 mm
Dimensions LxWxH	720 x 440 x 720 mm
Weight	65 kg
Power	Nominal 800 W Maximum 3000 W
Ambient condition	18 .. 23°C

▶ TLB50 **P/N** 00T0072 (230V/50Hz) • **P/N** 00T0071 (115V/60Hz) • **P/N** 00T0073 (230V/60Hz)

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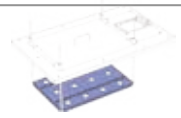
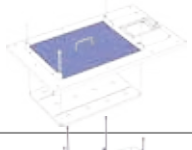
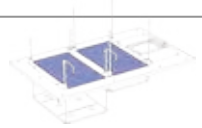
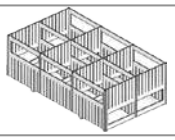
Tel. +31 10 522 43 73
Email sales@tamson.com
Website www.tamson.com

Options for TLB50 (not standard included)		
P/N 03T2146	Top lid for bath, use without leveling platform. Complete with handle.	
P/N 03T0071	Single leveling platform: - adjustable - one platform - without lid (P/N 03T0080)	
P/N 03T0080	Top lid for single leveling platform (P/N 03T0071). Complete with handle.	
P/N 03T0072	Double leveling platform: - independently adjustable - two platforms - without two lids (P/N 03T0081)	
P/N 03T0081	One lid for double leveling platform complete with handle. Two P/N 03T0081 are needed in combination with P/N 03T0072.	
P/N 11T0040	Optional alarm to operate within temperature band.	
P/N 03T1049	Rack to hold bottles or glassware.	
P/N 03T1040	Rail to hold bottle bracket(s) to prevent bottles from floating. With one rack (P/N 03T1049): two are needed With two racks (P/N 03T1049): Four are needed	
P/N 03T1041	Bottle bracket. Prevents bottles from floating. To be placed in rail (P/N 03T1040), four needed.	

Spare parts 230V/50Hz (115V-60Hz/230V-60HZ on request)		TTU-A	TB30	TLB50
P/N 25T1295	Motor 30 W	•	•	•
P/N 25T1343	Capacitor 24F	•	•	•
P/N 24T8081	Motor fuse 0.3 Amp	•	•	•
P/N 24T8581	Safety cut-out thermostat	•	•	•
P/N 25T2310	PT-100 sensor	•	•	•

ACCESORIES

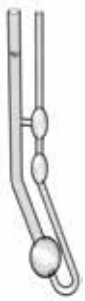
4.1 Viscometers

For the determination of kinematic viscosity of transparent and opaque Newtonian liquids according to ASTM D446 - ISO 3105 - IP 71, and BS 188.

Glass capillary viscometers with ISO 17025 certificate

UBBELOHDE VISCOMETER for transparent and opaque liquids				
P/N 25T0814	Size number 0	Nom. Constant 0.001	Range from 0.3 to 1 mm²/s	
P/N 25T0815	Size number 0C	Nom. Constant 0.003	Range from 0.6 to 3 mm²/s	
P/N 25T0816	Size number 0B	Nom. Constant 0.005	Range from 1 to 5 mm²/s	
P/N 25T0817	Size number 1	Nom. Constant 0.01	Range from 2 to 10 mm²/s	
P/N 25T0818	Size number 1C	Nom. Constant 0.03	Range from 6 to 30 mm²/s	
P/N 25T0819	Size number 1B	Nom. Constant 0.05	Range from 10 to 50 mm²/s	
P/N 25T0820	Size number 2	Nom. Constant 0.1	Range from 20 to 100 mm²/s	
P/N 25T0821	Size number 2C	Nom. Constant 0.3	Range from 60 to 300 mm²/s	
P/N 25T0822	Size number 2B	Nom. Constant 0.5	Range from 100 to 500 mm²/s	
P/N 25T0823	Size number 3	Nom. Constant 1.0	Range from 200 to 1000 mm²/s	
P/N 25T0824	Size number 3C	Nom. Constant 3.0	Range from 600 to 3000 mm²/s	
P/N 25T0825	Size number 3B	Nom. Constant 5.0	Range from 1000 to 5000 mm²/s	
P/N 25T0826	Size number 4	Nom. Constant 10	Range from 2000 to 10000 mm²/s	
P/N 25T0827	Size number 4C	Nom. Constant 30	Range from 6000 to 30000 mm²/s	
P/N 25T0828	Size number 4B	Nom. Constant 50	Range from 10000 to 50000 mm²/s	
P/N 25T0829	Size number 5	Nom. Constant 100	Range from 20000 to 100000 mm²/s	

Glass capillary viscometers with ISO 17025 certificate

CANNON-FENSKE ROUTINE VISCOMETER for transparent liquids				
P/N 25T0790	Size number 25	Nom. Constant 0.002	Range from 0.5 to 2 mm²/s	
P/N 25T0791	Size number 50	Nom. Constant 0.004	Range from 0.8 to 4 mm²/s	
P/N 25T0792	Size number 75	Nom. Constant 0.008	Range from 1.6 to 8 mm²/s	
P/N 25T0793	Size number 100	Nom. Constant 0.015	Range from 3 to 15 mm²/s	
P/N 25T0794	Size number 150	Nom. Constant 0.035	Range from 7 to 35 mm²/s	
P/N 25T0795	Size number 200	Nom. Constant 0.1	Range from 20 to 100 mm²/s	
P/N 25T0796	Size number 300	Nom. Constant 0.25	Range from 50 to 250 mm²/s	
P/N 25T0797	Size number 350	Nom. Constant 0.5	Range from 100 to 500 mm²/s	
P/N 25T0798	Size number 400	Nom. Constant 1.2	Range from 240 to 1200 mm²/s	
P/N 25T0799	Size number 450	Nom. Constant 2.5	Range from 500 to 2500 mm²/s	
P/N 25T0800	Size number 500	Nom. Constant 8	Range from 1600 to 8000 mm²/s	
P/N 25T0801	Size number 600	Nom. Constant 20	Range from 4000 to 20000 mm²/s	
P/N 25T0842	Size number 650	Nom. Constant 50	Range from 10000 to 40000 mm²/s	
P/N 25T0843	Size number 700	Nom. Constant 100	Range from 20000 to 100000 mm²/s	

▶ **For Viscometer holders, please see section 'Viscosity accessories'**

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Tel. +31 10 522 43 73
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CANNON-FENSKE REVERSE FLOW VISCOMETER for opaque and transparent liquids				
P/N 25T0802	Size number 25	Nom. Constant 0.002	Range from 0.5 to 2 mm²/s	
P/N 25T0803	Size number 50	Nom. Constant 0.004	Range from 0.8 to 4 mm²/s	
P/N 25T0804	Size number 75	Nom. Constant 0.008	Range from 1.6 to 8 mm²/s	
P/N 25T0805	Size number 100	Nom. Constant 0.015	Range from 3 to 15 mm²/s	
P/N 25T0806	Size number 150	Nom. Constant 0.035	Range from 7 to 35 mm²/s	
P/N 25T0807	Size number 200	Nom. Constant 0.1	Range from 20 to 100 mm²/s	
P/N 25T0808	Size number 300	Nom. Constant 0.25	Range from 50 to 200 mm²/s	
P/N 25T0809	Size number 350	Nom. Constant 0.5	Range from 100 to 500 mm²/s	
P/N 25T0810	Size number 400	Nom. Constant 1.2	Range from 240 to 1200 mm²/s	
P/N 25T0811	Size number 450	Nom. Constant 2.5	Range from 500 to 2500 mm²/s	
P/N 25T0812	Size number 500	Nom. Constant 8	Range from 1600 to 8000 mm²/s	
P/N 25T0813	Size number 600	Nom. Constant 20	Range from 4000 to 20000 mm²/s	
P/N 25T0850	Size number 650	Nom. Constant 50	Range from 10000 to 40000 mm²/s	
P/N 25T0851	Size number 700	Nom. Constant 100	Range from 20000 to 100000 mm²/s	

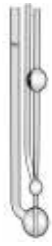
▶ Stopper CFO (pack of 12) **P/N** 06T1724

Glass capillary viscometers with ISO 17025 certificate

BS/IP/RF U-tube VISCOMETER for opaque and transparent liquids				
P/N 25T1030	Size number 1	Nom. Constant 0.003	Range from 0.6 to 3 mm²/s	
P/N 25T1031	Size number 2	Nom. Constant 0.01	Range from 2 to 10 mm²/s	
P/N 25T1032	Size number 3	Nom. Constant 0.03	Range from 6 to 30 mm²/s	
P/N 25T1033	Size number 4	Nom. Constant 0.1	Range from 20 to 100 mm²/s	
P/N 25T1034	Size number 5	Nom. Constant 0.3	Range from 60 to 300 mm²/s	
P/N 25T1035	Size number 6	Nom. Constant 1.0	Range from 200 to 1000 mm²/s	
P/N 25T1036	Size number 7	Nom. Constant 3.0	Range from 600 to 3000 mm²/s	
P/N 25T1037	Size number 8	Nom. Constant 10	Range from 2000 to 10000 mm²/s	
P/N 25T1038	Size number 9	Nom. Constant 30	Range from 6000 to 30000 mm²/s	
P/N 25T1039	Size number 10	Nom. Constant 100	Range from 20000 to 10000 mm²/s	
P/N 25T1040	Size number 11	Nom. Constant 300	Range from 60000 to 300000 mm²/s	

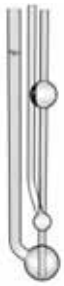
▶ Special pipette for charging BS/IP/RF viscometers according to ASTM D2170 (section A 2.3.3.4) includes stopper **P/N** 25T1069

Glass capillary viscometers with ISO 17025 certificate

BS/IP/SL U-tube VISCOMETER for transparent liquids				
P/N 25T0831	Size number 1A	Nom. Constant 0.03	Range from 6 to 30 mm²/s	
P/N 25T0830	Size number 1	Nom. Constant 0.01	Range from 3.5 to 10 mm²/s	
P/N 25T0833	Size number 2A	Nom. Constant 0.3	Range from 60 to 300 mm²/s	
P/N 25T0832	Size number 2	Nom. Constant 0.1	Range from 20 to 100 mm²/s	
P/N 25T0835	Size number 3A	Nom. Constant 3.0	Range from 600 to 3000 mm²/s	
P/N 25T0834	Size number 3	Nom. Constant 1.0	Range from 200 to 1000 mm²/s	
P/N 25T0837	Size number 4A	Nom. Constant 30	Range from 6000 to 30000 mm²/s	
P/N 25T0836	Size number 4	Nom. Constant 10	Range from 2000 to 10000 mm²/s	
P/N 25T0838	Size number 5	Nom. Constant 100	Range from 20000 to 100000 mm²/s	

▶ **For Viscometer holders, please see section 'Viscosity accessories'**

Glass capillary viscometers with ISO 17025 certificate

BS/IP/SL(S) VISCOMETER for transparent liquids				
P/N 25T1013	Size number 1	Nom. Constant 0.008	Range from 1.05 mm²/s	
P/N 25T1014	Size number 2	Nom. Constant 0.003	Range from 2.1 to 3 mm²/s	
P/N 25T1015	Size number 3	Nom. Constant 0.01	Range from 3.8 to 10 mm²/s	
P/N 25T1016	Size number 4	Nom. Constant 0.03	Range from 6 to 30 mm²/s	
P/N 25T1017	Size number 5	Nom. Constant 0.1	Range from 20 to 100 mm²/s	
P/N 25T1018	Size number 6	Nom. Constant 0.3	Range from 60 to 300 mm²/s	
P/N 25T1019	Size number 7	Nom. Constant 1.0	Range from 200 to 1000 mm²/s	
P/N 25T1020	Size number 8	Nom. Constant 3.0	Range from 600 to 2000 mm²/s	
P/N 25T1021	Size number 9	Nom. Constant 10.0	Range from 2000 to 10000 mm²/s	

Glass capillary viscometers with ISO 17025 certificate

BS/U-tube VISCOMETER for transparent liquids				
P/N 25T1001	Size number A	Nom. Constant 0.003	Range from 0.9 to 3 mm²/s	
P/N 25T1002	Size number B	Nom. Constant 0.01	Range from 2.0 to 10 mm²/s	
P/N 25T1003	Size number C	Nom. Constant 0.03	Range from 6 to 30 mm²/s	
P/N 25T1004	Size number D	Nom. Constant 0.1	Range from 20 to 100 mm²/s	
P/N 25T1005	Size number E	Nom. Constant 0.3	Range from 60 to 300 mm²/s	
P/N 25T1006	Size number F	Nom. Constant 1.0	Range from 200 to 1000 mm²/s	
P/N 25T1007	Size number G	Nom. Constant 3.0	Range from 600 to 3000 mm²/s	
P/N 25T1008	Size number H	Nom. Constant 10.0	Range from 2000 to 10000 mm²/s	

Glass capillary viscometers with ISO 17025 certificate

BS/U/M-Miniature VISCOMETER for transparent liquids				
P/N 25T1022	Size number M1	Nom. Constant 0.001	Range from 0.2 to 1 mm²/s	
P/N 25T1023	Size number M2	Nom. Constant 0.005	Range from 1 to 5 mm²/s	
P/N 25T1024	Size number M3	Nom. Constant 0.015	Range from 3 to 15 mm²/s	
P/N 25T1025	Size number M4	Nom. Constant 0.04	Range from 8 to 40 mm²/s	
P/N 25T1026	Size number M5	Nom. Constant 0.1	Range from 20 to 100 mm²/s	

Glass capillary viscometers with ISO 17025 certificate

BS/IP/MSL VISCOMETER for transparent liquids				
P/N 25T0750	Size number 1	Nom. Constant 0.003	Range from 0.6 to 3 mm²/s	
P/N 25T0751	Size number 2	Nom. Constant 0.01	Range from 2.0 to 10 mm²/s	
P/N 25T0752	Size number 3	Nom. Constant 0.03	Range from 6 to 30 mm²/s	
P/N 25T0753	Size number 4	Nom. Constant 0.1	Range from 20 to 100 mm²/s	
P/N 25T0754	Size number 5	Nom. Constant 0.3	Range from 60 to 300 mm²/s	
P/N 25T0755	Size number 6	Nom. Constant 1.0	Range from 200 to 1000 mm²/s	
P/N 25T0756	Size number 7	Nom. Constant 3.0	Range from 600 to 3000 mm²/s	

▶ **For Viscometer holders, please see section 'Viscosity accessories'**

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Tel. +31 10 522 43 73
Email sales@tamson.com
Website www.tamson.com

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SIL VISCOMETER for transparent liquids				
P/N 25T0882	Size number 0C	Nom. Constant 0.003	Range from 0.9 to 3 mm²/s	
P/N 25T0883	Size number 1	Nom. Constant 0.01	Range from 2.0 to 10 mm²/s	
P/N 25T0884	Size number 1C	Nom. Constant 0.03	Range from 6 to 30 mm²/s	
P/N 25T0885	Size number 2	Nom. Constant 0.1	Range from 20 to 100 mm²/s	
P/N 25T0886	Size number 2C	Nom. Constant 0.3	Range from 60 to 300 mm²/s	
P/N 25T0887	Size number 3	Nom. Constant 1.0	Range from 200 to 1000 mm²/s	
P/N 25T0888	Size number 3C	Nom. Constant 3.0	Range from 600 to 3000 mm²/s	
P/N 25T0889	Size number 4	Nom. Constant 10.0	Range from 2000 to 10000 mm²/s	

Glass capillary viscometers with ISO 17025 certificate

Zeitfuchs Cross-Arm VISCOMETER for opaque and transparent liquids				
P/N 25T1041	Size number 1	Nom. Constant 0.003	Range from 0.6 to 3 mm²/s	
P/N 25T0890	Size number 2	Nom. Constant 0.01	Range from 2 to 10 mm²/s	
P/N 25T0891	Size number 3	Nom. Constant 0.03	Range from 6 to 30 mm²/s	
P/N 25T0893	Size number 4	Nom. Constant 0.10	Range from 20 to 100 mm²/s	
P/N 25T0894	Size number 5	Nom. Constant 0.3	Range from 60 to 300 mm²/s	
P/N 25T0895	Size number 6	Nom. Constant 1.0	Range from 200 to 1000 mm²/s	
P/N 25T0896	Size number 7	Nom. Constant 3.0	Range from 600 to 3000 mm²/s	
P/N 25T0897	Size number 8	Nom. Constant 10.0	Range from 2000 to 10000 mm²/s	
P/N 25T0898	Size number 9	Nom. Constant 30.0	Range from 6000 to 30000 mm²/s	
P/N 25T0899	Size number 10	Nom. Constant 100.0	Range from 20000 to 100000 mm²/s	

▶ **For Viscometer holders, please see section 'Viscosity accessories'**

Glass capillary viscometers are delivered with an ISO 17025 certificate, except SIL Glass capillary viscometers, they are deliverd with a works certificate.

Other ASTM D446 viscometers on request.

4.2 Viscosity Accessories

VISCOMETER HOLDERS

A high quality holder/support for use with manual glass capillary viscometers.

Main Characteristics

- Insulated handle, easy to grab at high working temperatures
- Stainless steel
- Ring to hang out ± 265 mm
- Smart design prevents viscometer from falling out of holder
- Viscometer will not move when applying vacuum to the viscometer

Viscometer Holders

Viscometers ASTM D446, IP71, BS88, ASTM 2170	
P/N 10T6001	Viscometer holder "Ubbelhode"
P/N 10T6040	Viscometer holder "Pinkevitch transparent D446, 269 mm" / VPZH-4
P/N 10T6061	Viscometer holder "Cannon-Fenske Routine"
P/N 10T6071	Viscometer holder "Cannon-Fenske Opaque/Reverse Flow"
P/N 10T6321	Viscometer holder "BS/U-tube Transparent/Routine"
P/N 10T6051	Viscometer holder "BS/IP/RF U-Tube Opaque"
P/N 10T6323	Viscometer Holder "BS/IP/SL"
P/N 10T6324	Viscometer Holder "BS/IP/SL(S)"
P/N 10T6325	Viscometer Holder "BS/U/M"
P/N 10T6326	Viscometer Holder "BS/IP/MSL"
P/N 10T6327	Viscometer Holder "Zeitfuchs Cross Arm"

Russian viscometers	
P/N 10T6050	Viscometer holder "Russian Viscometers (ВПЖ-2) like Pinkevitch" (VPZH-2)
P/N 10T6054	Viscometer holder for Russian Viscometer (ВНЖ) VNZH.

Viscometers ASTM D2171	
P/N 10T6052	Viscometer holder "CMVV/AIVV" (adjustable in length)
P/N 10T6053	Viscometer holder "MKVV"

Viscometers ASTM D2162	
P/N 10T6035	Viscometer holder "Master Ubbelhode"
P/N 10T6030	Viscometer holder "Master Cannon Fenske"

PMT est. 1878 Tamson Instruments
Tel. +31 10 522 43 73
Email sales@tamson.com
Website www.tamson.com

Accessories

VISCOMETER WASHER

Designed in order to eliminate hand cleaning of glass capillary viscometers.

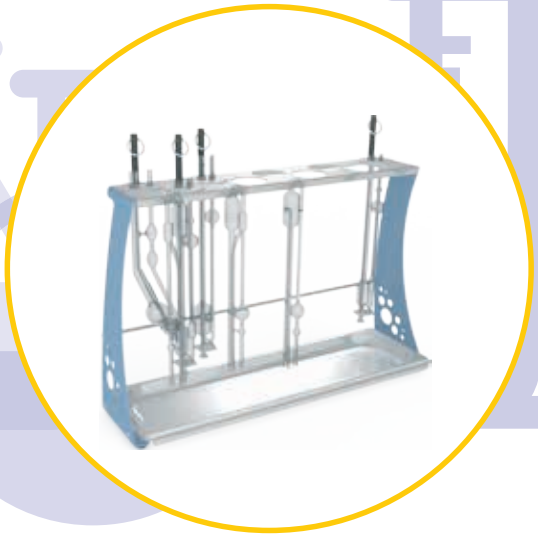
Main Characteristics

Viscometer washer supplied with six nozzle stoppers. It allows external and internal washing of all types of glass capillary viscometer as mentioned in ASTM D446. We recommend to prewash glass capillary viscometers with BIO2000E solvent. Eliminate further hand cleaning with the use of T218TB. Glass capillary viscometers are suspended in Biosane solvent vapours at 80°C. Very fast cleaning (5 to 15 min) for six glass capillary viscometers and negligible solvent consumption.

- **P/N** 18450 Model VTW-classic (230V/50-60Hz) (115V/60Hz on request)
- **P/N** T218TB Biosane T 218 solvent (per can of 26 L)
- **P/N** T218TB5 Biosane T 218 solvent (per can of 5 L)
- **P/N** BIO2000E Biosane pre-wash
- **P/N** TLC10-3 00T0050 (230V/50Hz) **P/N** 00T0051 (230V/60Hz) **P/N** 00T0052 (115V/60Hz) to condensate vapour.

For use on	AC 230V/50-60 Hz – 16A
Width	400 mm
Depth	400 mm
Height	1000 mm
Weight	± 30 kg

VTW-classic



Viscohanger

VISCOHANGER

A nine position hanger for use with manual glass capillary viscometers and holders. The unit facilitates safe, easy storage of glass capillary viscometers once taken from a viscometer bath prior to cleaning. The detachable drip tray collects residual bath fluid and allows easy disposal to waste. It also has five hooks to hang the glass capillary viscometer upside-down.

Main Characteristics

- Made from stainless steel to aid chemical resistance
- Space saving footprint
- Easy to clean
- Nine openings (Ø 51 mm) to hang viscometers in their holder
- Five hooks to hang glass capillary viscometers upside-down

- **P/N** 10T6066

Accessories

8 Channel stop-watch

8 CHANNEL STOP-WATCH

Timer to measure the time for a volume of liquid to flow under gravity through a calibrated glass capillary viscometer. The apparatus contains eight individual stopwatches. Each stopwatch operates by pressing a single button to run, stop or reset. Auto power-off when no stopwatches are running. After power-off individual values are kept in memory. All values can be reset together at the same timer or per individual channel.

Main Characteristics

- Eight individual channels
- Easy to use
- Long battery life
- Uses simple 9V block (battery included)
- 0.01 sec. resolution
- Outer dimension 195 x 112 x 46 mm (L x W x H)

- **P/N** 10T6090

ILLUMINATOR

Backlight illuminator for visibility baths.

References

- **P/N** 00T0909 Stand alone Z41 illuminator (85~230V/50-60Hz)
- **P/N** 00T0908 Back panel with LED light for TV2000MKII and TV4000MKII (85~230V/50-60Hz)
- **P/N** 00T0907 Back panel with LED light for TV7000DC and TV7000LT (85~230V/50-60Hz)

Z41 Standalone & Z41 Backpanel

Pricing at www.tamson.com

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Tel. +31 10 522 43 73
Email sales@tamson.com
Website www.tamson.com

GENERAL PURPOSE VISCOSITY REFERENCE STANDARDS

ISO 17025 and ISO Guide 34 certified viscosity standards are for the calibration and verification of glass capillary viscometers and other viscosity measuring equipment where operating temperature is controlled precisely.

Main Characteristics

- Certified to ISO 17025 Quality System.
- Manufactured in accordance with ASTM D2162.
- Density g/mL in accordance with ASTM D1480.
- Kinematic (mm^2/s) & dynamic viscosity (mPa.s) given at all temperatures.
- Standard pack size 500 mL.
- Fully traceable to national standards.
- Ensures full compliance to ASTM & IP test method protocol.
- Tamper evident security packaging.
- Two year shelf life.

Reference standard

REFERENCE number	Viscosity standard	VISCOSITY STANDARDS (Flask of 500 mL) - with ISO 17025 certificate						
		Approximate Kinematic Viscosity in mm^2/s (Centistokes)						
		20°C	25°C	40°C	50°C	60°C	80°C	100°C
25T0726*	N0.4	0.4693	0.4497	0.3982	-	-	-	-
25T0727*	N0.8	0.7412	0.7024	0.6045	-	-	-	-
25T0728*	N1.0	1.292	1.203	0.9908	0.8826	-	-	-
25T0729	N2	2.886	2.604	1.981	1.688	1.461	-	-
25T0700	S3	4.527	3.999	2.885	2.392	2.022	1.511	1.184
25T0708	D5	6.553	5.677	3.893	3.142	2.598	1.876	1.433
25T0701	S6	10.46	8.872	5.781	4.538	3.663	2.548	1.891
25T0710	N7.5	12.38	10.49	6.787	5.300	4.253	2.924	2.149
25T0709	D10	14.57	12.15	7.579	5.810	4.597	3.100	2.249
25T0730	N10	20.72	16.92	10.01	7.473	5.780	3.758	2.656
25T0738	N14	30.30	24.46	14.03	10.28	7.812	4.939	3.413
25T0702	S20	42.78	33.72	18.19	12.90	9.545	5.785	3.882
25T0715	N26	60.96	48.99	27.45	19.75	14.74	8.992	6.018
25T0731	N35	85.45	65.30	32.42	21.93	15.75	8.833	5.633
25T0716	N44	111.2	86.38	44.20	30.15	21.46	12.10	7.613
25T0703	S60	158.8	117.9	54.29	35.16	24.04	12.81	7.786
25T0717	N75	196.6	150.4	73.73	49.01	34.08	18.41	11.18
25T0732	N100	330.2	238.4	101.6	62.90	41.31	20.59	11.89
25T0741	N140	408.7	304.8	140.1	89.71	60.31	30.82	17.91
25T0704	S200	649.1	457.5	183.0	109.1	69.24	32.58	17.99
25T0742	N250	794.9	581.3	253.5	157.5	103.0	50.11	27.95
25T0711	D500	817.8	573.3	224.7	132.2	82.92	38.19	20.71
25T0733	N350	1179	818.4	312.1	180.5	111.3	49.79	26.33
25T0740	N415	1369	988.1	415.7	253.1	162.5	76.56	41.52
25T0713	D1000	1640	1132	421.8	240.3	146.2	63.64	32.88
25T0705	S600	2219	1498	528.5	292.2	173.2	72.37	36.34
25T0743	N750	2807	1961	757.1	438.2	269.0	117.4	60.00
25T0734	N1000	4427	2952	1003	540.3	311.9	124.0	59.52
25T0744	N1400	5806	3941	1401	772.5	454.2	184.1	88.60
25T0706	S2000	8089	5303	1706	886.9	494.9	184.9	84.26
25T0714	D5000	10380	6729	2100	1073	589.4	214.4	95.45
25T0712	N2500	11431	7576	2507	1317	739.7	276.3	124.5
25T0736	D7500	12521	8282	2725	1424	794.8	293.0	130.7
25T0735	N4000	16881	10950	3420	1735	945.8	336.0	145.9
25T0718	N5100	27783	17622	5172	2528	1330	444.1	183.2
25T0707	S8000	37546	23680	6846	3310	1722	561.8	226.6
25T0719	N10200	58149	36421	10268	4896	2507	791.5	308.8
25T0737	N15000	74610	46603	13014	6162	3123	972.3	373.1
25T0721	N18000	106285	65942	18077	8447	4235	1280	477.3
25T0722	S30000	137816	85532	23398	10902	5452	1638	604.2
25T0746	N62000	-	-	55000	25000	-	4000	1500
25T0745	N130000	-	-	150000	75000	-	15000	4000
Nominal Values								

* Hazardous to ship

▶ FOR ALL OTHER VISCOSITY STANDARDS, TBN/TAN STANDARDS, CERTIFIED REFERENCE MATERIALS AND OTHER REFERENCE STANDARDS, PLEASE VISIT OUR WEBSITE WWW.TAMSON.COM

4.3 ASTM Thermometers

As of the 10th October 2017, Tamson Instruments B.V. is not supplying mercury in glass thermometers anymore. This is in accordance with EU Regulation 847/2012 restricting the sales of measuring devices that contain mercury. As an alternative, Tamson is supplying alternative precision thermometers, manufactured as per latest specifications of ASTM E2251 (standard specification for liquid-in-glass ASTM thermometers with low-hazard precision liquids); for the temperature range from -50°C up to 250°C; fine subdivision up to 0.01°C; all instruments are for government calibration. The thermometers with a 'B' in the part number have the following characteristics: white backed, round or prismatic, with blue special filling, non-wetting because of capillary tube specially coated inside, durable pigment, round top finish, in transparent square plastic case. When a 'G' or 'T' is used in the part number, the thermometer is filled with gallium or toluene. All thermometers mentioned in the table below are low hazardous to ship. Thermometers are supplied with a conformity certificate. A works certificate or ISO 17025 verification certificate are on request.

ASTM No.	P/N Cat.	Range	Subdivision in °C	Immersion In mm
1 C	25T0901B	-20 à +150	1	76
2 C	25T0902G	-5 à +300	1	76
3 C	25T0903G	-5 à +400	1	76
S5 C	25T0904B	-38 à +50	1	108
6 C	25T0905T	-80 à +20	1	76
7 C	25T0906G	-2 à +300	1	Total
8 C	25T0907G	-2 à +400	1	Total
9 C	25T0908B	-5 à +110	0.5	57
10 C	25T0909G	+90 à +370	2	57
11 C	25T0910G	-6 à +400	2	25
S12 C	25T0911B	-10 à +102	0.2	Total
13 C	25T0912G	+155 à +170	.5	Total
14 C	25T0913B	+38 à +82	0.1	79
S15 C	25T0914B	-2 à +80	0.2	Total
16 C	25T0915B	+30 à +200	0.5	Total
17 C	25T0916B	+19 à +27	0.1	Total
18 C	25T0917B	+34 à +42	0.1	Total
19 C	25T0918B	+49 à +57	0.1	Total
20 C	25T0919B	+57 à +65	0.1	Total
21 C	25T0920B	+79 à +87	0.1	Total
S22 C	25T0921B	+95 à +103	0.1	Total
23 C	25T0922B	+18 à +28	0.2	90
24 C	25T0923B	+39 à +54	0.2	90
25 C	25T0924B	+95 à +105	0.2	90
26 C	25T0925B	+130 à +140	0.1	Total
33 C	25T0927B	-38 à +42	0.2	50
34 C	25T0928B	+25 à +105	0.5	50
35 C	25T0929B	+90 à+170	0.2	51
36 C	25T0930B	-2 à +68	0.2	45
38 C	25T0931B	+24 à +78	0.2	100
39 C	25T0933B	+48 à +102	0.2	100
40 C	25T0932B	+72 à +126	0.2	100
41 C	25T0934B	+98 à +152	0.2	100
42 C	25T0935G	+95 à 255	0.5	100
44 C	25T0937B	+18.5 à +21.5	0.05	Total
45 C	25T0938B	+23.6 à +26.4	0.05	Total
46 C	25T0939B	+48.6 à +51.4	0.05	Total
47 C	25T0940B	+58.6 à +61.5	0.05	Total
49 C	25T0941B	+20 à +70	0.2	65
52 C	25T0942B	-10 à +5	0.1	Total
54 C	25T0943B	+20 à +100.6	0.2	Total
S56 C	25T0956B	+19 à +35	0.02	Total
57 C	25T0944B	-20 à +50	0.5	57
61 C	25T0946B	+32 à +127	0.2	79
S62 C	25T0947B	-38 à +2	0.1	Total

ASTM No.	P/N Cat.	Range	Subdivision in °C	Immersion In mm
S63 C	25T0948B	+8 à +32	0.1	Total
S64 C	25T0949B	+25 à +55	0.1	Total
S65 C	25T0950B	+50 à +80	0.1	Total
S67C	25T0952B	+95 à +155	0.2	Total
68 C	25T0953G	+145 à +205	0.2	Total
71 C	25T0955B	-37 à +21	0.5	76
73 C	25T0957B	-41.4 à +38.6	0.05	Total
82 C	25T0958B	-15 à +105	1	30
83 C	25T0959B	+15 à +70	1	40
84 C	25T0960B	+25 à +80	1	249
85 C	25T0961B	+40 à +150	1	181
86 C	25T0962B	+95 à +175	1	35
87 C	25T0963G	+150 à +205	1	40
88 C	25T0964G	+10 à +200	1	57
89 C	25T0965B	-20 à +10	0.1	76
90 C	25T0966B	0 à +30	0.1	76
S91 C	25T0967B	+20 à +50	0.1	76
92 C	25T0968B	+40 à +70	0.1	76
93 C	25T0969B	+60 à 90	0.1	76
94 C	25T0970B	+80 à +110	0.1	76
95 C	25T0971B	+100 à +130	0.1	76
96 C	25T0972B	+120 à +150	0.1	76
98 C	25T0973B	+16 à +82	0.5	Total
99 C	25T0974B	-48 à +4	0.2	35
102 C	25T0975B	+123 à +177	0.2	100
103 C	25T0976G	+148 à +202	0.2	100
104 C	25T0977G	+173 à +227	0.2	100
105 C	25T0978G	+198 à+252	0.2	100
106 C	25T0979G	+223 à +277	0.2	100
107 C	25T0980G	+248 à +302	0.2	100
110 C	25T0981G	+133.6à+136.4	0.05	Total
111 C	25T0982G	+170 à +250	0.2	100
112 C	25T0983B	+4 à +6	0.02	Total
113 C	25T0984B	-1 à +175	0.5	Total
114 C	25T0985T	-80 à +20	0.5	Total
S116 C	25T0986B	+18.9 à +25.1	0.01	Total
S117 C	25T0987B	+23.9 à +30.1	0.01	Total
118 C	25T0988B	+28.6 à +31.4	0.05	Total
119 C	25T0989B	-38 à +30	0.1	100
S120 C	25T0990B	+38.5 à +41.5	0.05	Total
121 C	25T0991B	+98.5 à +101.5	0.05	Total
122 C	25T0992B	-45 à -35	0.1	Total
126 C	25T0993B	-27.4 à -24.6	0.05	Total
127 C	25T0995B	-21.4 à -18.6	0.05	Total
128 C	25T0994B	-1.4 à +1.4	0.05	Total

- **P/N 00T0239** Thermometer holder 325 x 10 mm
- **P/N 00T2154** Thermometer holder 425 x 10 mm

- **For our digital contact thermometer, conforming to ASTM E20, please see section 5.2**

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Tel. +31 10 522 43 73
Email sales@tamson.com
Website www.tamson.com

4.4 Tubing to be used with circulators

To replace unsafe tubing to circulate fluids at high or low temperatures.

Main Characteristics

- Temperature range ambient.. +250°C/+482°C.
- Complete stainless steel 316 quality.
- Flexible.
- Chemical resistant.
- Standard threads (1/4" and 3/8" straight internal, flat seal).

Flex hose insulated + non insulated

Corrugated (NON braided)					
P/N	**Length (mtr)***	**Fitting (inch)****	**Pressure (Bar)**	**Bending (inner) radius**	**Description**
12T1002	1	¼"	10	16 (mm)	Not insulated
12T1003	2	¼"	10	16 (mm)	Not insulated
12T1004	1	3/8"	5.5	22 (mm)	Not insulated
12T1005	2	3/8"	5.5	22 (mm)	Not insulated
12T1050	1	¼"	10	40 (mm)	Insulated
12T1051	2	¼"	10	40 (mm)	Insulated
12T1052	1	3/8"	5.5	50 (mm)	Insulated
12T1053	2	3/8"	5.5	50 (mm)	Insulated

* Other lengths on request.
** Both sides, internal straight, flat seal.

Options P/N	Description (all stainless steel)	Dimensions
23T0078	Male male nipple	g1/4o x g1/4o
23T0077	Male male nipple	g3/8o x g3/8o
23T0075	T-connector	3x g1/4i
23T0079	Male male nipple	R1/4o x R1/4o
23T0080	Male male nipple	R3/8o x R3/8o
23T0071	T-connector	3x g3/8i
23T0023	T-valve	3x g3/8i
23T0073	Female female socket	g1/4ix g1/4i
23T0081	Female female socket	g3/8ix g3/8i
23T0082	Reducing bush	g1/4ix g3/8o
23T0084	Washer fiber for g1/4 (diameter hole=1/4")	
23T0085	Washer fiber for g3/8 (diameter hole=3/8")	
23T0086	Washer fiber outer dimension 1/4"	
23T0087	Washer fiber outer dimension 3/8"	
	Foam insulation, adhesive tape on request	

I = Inner thread.
o = Outer thread.
g = British Standard Pipe straight (not conical).
R = BSP conical.

4.5 Bath fluids

To replace water as a bath fluid. Viscosity, volatility and other properties that change with temperature affect the performance of fluids in controlled baths and circulators. Tamson has tested and used each of the fluids we sell, over the ranges recommended in the following table, each fluid remains at a low enough viscosity to be adequately pumped or stirred. Whether your application is industrial or critical lab calibration work, Tamson fluids give you top performance and stability.

Can with 20L of mineral oil

Main Characteristics

Type	Remarks	Life			Viscosity [mm²/s] x				Temp. Range	Package
		150°C	200°C	250°C	80°C	100°C	150°C	200°C		
Mineral	T150 Yellow Mineral oil	1/2 yr	X	X	3	2.2	1.8		80..150°C	20 ltrs
Silicon	200-10 Transparent Dimethyl siloxane polymer	No limit	200hrs	<10hrs	4	3.5	2.5		20..150°C	20 ltrs
Silicon	200-50 Transparent Dimethyl siloxane polymer	No limit	200hrs	<10hrs	20	15	9		80..150°C	20 ltrs
Silicon	Silicon 210 Dark Dimethyl poly siloxane	No limit	<2yrs	<1yr	(35)	30	22	12	80..250°C	20 ltrs
Silicon	Silicon 550 Colourless Polyphenyl methyl dimethyl siloxane	No limit	<1yr	<1200 hrs	(50)	20	12	5	80..250°C	20 ltrs

- **P/N 00T0220** Tamson mineral oil T150 20 L (80..150°C/176..302°F)
- **P/N 08T0001** Silicon 200-10 mm²/s 20 L Transparent (20..150°C/ 68..302°F)
- **P/N 00T0226** Silicon 200-50 mm²/s -20 L Transparent (80..150°C/176..302°F)
- **P/N 00T0229** Silicon 200-100 mm²/s - 20 L Transparent (80..150°C/176..302°F)
- **P/N 00T0231** Silicon 210-20 ltrs Darkish (80..250°C/176..482°F)
- **P/N 00T0238** Silicon 550-20 ltrs Transparent (80..250°C/176..482°F)

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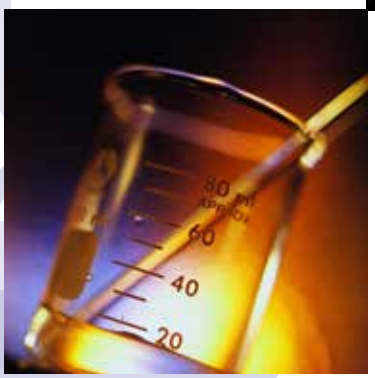
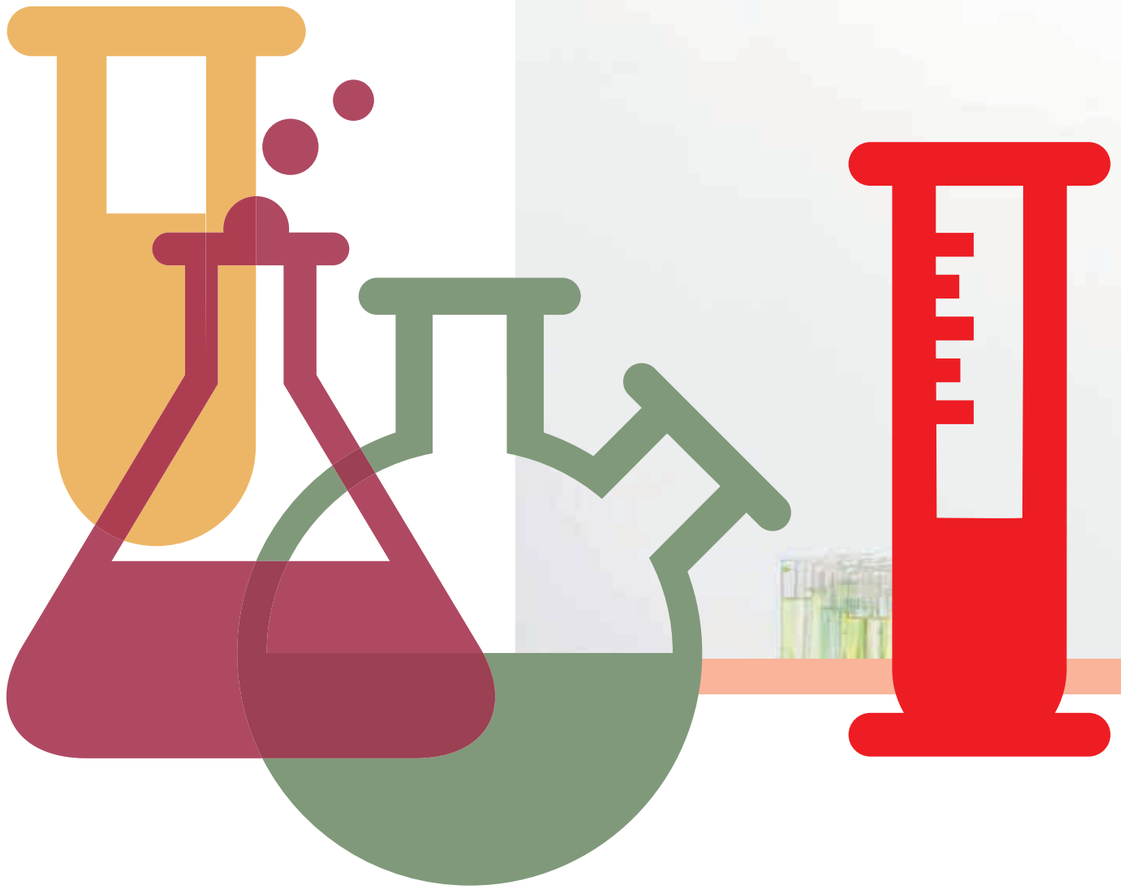


TEMPERATURE CALIBRATION & MEASUREMENT



5.1 Calibration Baths

Calibration of temperature measuring instruments with thermostats.

The most important prerequisite for calibration is very precise temperature stability. Thermostats with bath liquids are the most precise devices for this application as they allow especially good temperature stability and homogeneity. Liquid bath thermostats are superior to incubators and metal block thermostats, since liquids transfer heat between 40 and 60 times better than air.

As the world's leading manufacturer of precise thermostats, we offer a line of calibration thermostats with various performance levels. Depending on your specified bath size, temperature range, temperature stability, and other technical features, you are sure to find the ideal device for your application.

TV12
Calibration

Calibration Baths	TV12	TV12LT	TB30	TV4000DC	TV15000	TV16000
Temperature Range °C	Ambient..120	(1) -42..+20 (2) -42..+80	Ambient..+120	Ambient..230	5..60	10..60
Temperature Stability °C	Stdev ± 0.002	±0.01	± 0.02	± 0.002 @40°C	± 0.007	± 0.005
Setting °C	0.01	0.01	0.01	0.01	0.005	0.005
Bath volume L	12..15	15	30	40	155	160
Bath opening mm	248 x 73	248 x 112	163 x 192	260 x 240	230 x 820	250 x 365
REF 230V/50Hz	00T0400	(1) 00T0410 (2) 00T0425	00T0065	00T0802	00T0500	00T0490
REF 230V/60Hz	00T0400	(1) 00T0420 (2) 00T0435	00T0065	00T0802	00T0505	00T0495
REF 115V/60Hz	00T0405	(1) 00T0415 (2) 00T0430	00T0066	00T0804	00T0502	00T0492

▶ **We offer many other calibration baths. To offer you the right bath for your calibrations, please contact Tamson.**

▶ For the **TV12**, see section 1.8
▶ For the **TV12LT**, see section 1.10
▶ For the **TV4000DC**, see section 1.6
▶ For the **TV15000,** see section 1.23
▶ For the **TV16000**, see section 1.22
▶ For the **TB30**, see section 2.5

PMT est. 1878 Tamson Instruments
Tel. +31 10 522 43 73
Email sales@tamson.com
Website www.tamson.com

5.2 Digital E20 Contact Thermometer

This thermometer is referred to as a Resistive Contact Thermometer (RCT) or Resistive Thermometer Device (RTD). It uses a six points ITS 90 calibration to guarantee the precision of ± 0.01°C over its full range. The maximal available range is -40..140°C with 0.001° reading and ± 0.01°C precision. The probe is very fast and ensures T63 < 3 sec. That means that at least 63 percent of the temperature change is displayed within three seconds. This reading is so fast because the measuring probe is a PT-100 encapsulated in a thin walled stainless steel tube. As a result there is very few thermal mass filtering thermal fluctuations, resulting in a fast and precise displayed temperature.

E20 Thermometer

Construction
The thermometer consists of a stainless steel PT100 probe, a small electronic circuit board which is placed in a plastic (ABS) housing. The PT100 probe is thermally insulated from this housing using a PTFE ring. The electronics are powered via USB cable. The probe is designed to accommodate a wide range of voltages and frequencies (85~260V/ 50-60Hz).

Calibration
The probe is factory calibrated for the specific range which is specified in the table on the next page. Outside this range the thermometer will display "Low" or "High". Each thermometer is individually calibrated and will meet the specified accuracy. Each thermometer also is tested at a minimum of five other temperatures. Additional test points at specific temperatures can be requested. Each thermometer comes with a works calibration certificate.

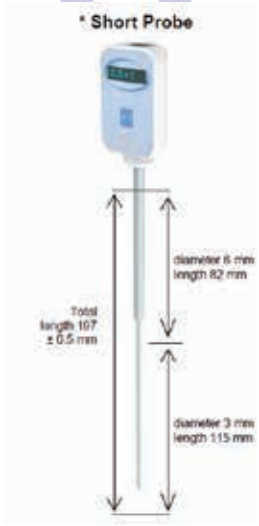
USB
The thermometer can be connected to a USB device to power it. Special software enables upload of calibration parameters over the USB. The thermometer meets the following standards and regulations: CE, IEC 751, ITS 90, ASTM E644, ASTM E1137, and ASTM E2877.

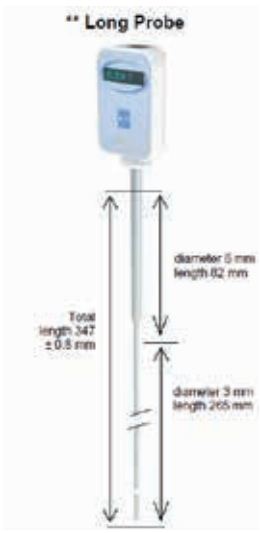
Item	Unit	
Part number		For range, please see table on the next page.
Range		-40 .. + 140°C/-40..302.°F, please see table on the next page
Reading		*C or *F menu selectable
Interface		USB
Resolution	[°C/°F]	0.001, please see table on the next page
Accuracy	[°C]	± 0.01, please see table on the next page
Linearity	[°C]	± 0.01
Drift annual	[°C]	± 0.001
Response T_{63}	[Sec]	< 3
Power	[V]	5 - mains adapter RJ11
Dimensions	[mm]	62 x 39 x 22 (excluding probe)
Probe	[mm]	65 x 6 mm - 115 x 3
Probe material		304 stainless steel
Weight	[gr]	42
CE		Conforms to CE regulation

Calibration Baths & Measurement

Range	-40 .. + 20°C	0 .. +80°C	20 .. + 120°C	-40 .. + 140°C
0.01 (Two decimal), accuracy ± 0.02°C short* PT-100 probe	P/N 19T4021	P/N 19T4022	P/N 19T4023	P/N 19T4024
0.001 (Three decimal), accuracy ± 0.01°C short* PT-100 probe	P/N 19T4031	P/N 19T4032	P/N 19T4033	P/N 19T4034
0.01 (Two decimal), accuracy ± 0.02°C long** PT-100 probe	P/N 19T4041	P/N 19T4042	P/N 19T4043	P/N 19T4044
0.001 (Three decimal), accuracy ± 0.01°C long** PT-100 probe	P/N 19T4051	P/N 19T4052	P/N 19T4053	P/N 19T4054
Additional verification temperature point to be mentioned on works certificate	P/N 10T6098	P/N 10T6098	P/N 10T6098	P/N 10T6098

- E20 thermometer is delivered with PT100 probe, works calibration certificate and a protective suitcase.





PMT est. 1878 Tamson Instruments
Tel. +31 10 522 43 73
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All popular viscometers:

- D446 – IP 71

- BS188

– ISO 3104

- Calibrated (ISO 17025) viscometers

Viscometer tube
Zeitfuchs Cross-arm

see page **85**

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Manufacturer and supplier of:

- Viscosity measurement equipment
- Calibration baths
- Heating baths and circulators
- Cooling baths and circulators
- Reference standards
- Digital contact thermometers (DCT)
- ASTM test equipment

- ASTM/IP equipment:
  - D70
  - D91
  - D97
  - D4870
  - D130
  - D445/D446
  - D789
  - D1298
  - D1319
  - D1480
  - D1796/D4007
  - D1838
  - D2068
  - D2162
  - D2170
  - D2171
  - D4807
  - D565/612
  - D6468
  - D7501
  - D7671
  - D7667
  - E20-09

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Tamson Instruments bv
Tel +31 (0)10 522 43 73
Email sales@tamson.com
Website www.tamson.com
The Netherlands

Contact:
G-Labo Germany
Bgm.-Horneffstr.26
69509 Mörlenbach
Tel.: + 49 6209 797100
Fax: + 49 6209 797101
Mail: info@g-labo.de
Web: www.g-labo.de