DIGIBLOCK
SAMPLE PREPARATION SYSTEM

USER MANUAL

Thank you for selecting our DigiBlock.

We are sure that you will be completely satisfied with the performance of this new unit entering your laboratory. We invite you to read carefully this user manual and to keep it close to the instrument for convenient and fast consulting. For any possible clarification or any request for assistance please contact either our local Representative or:

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1. INTRODUCTION

SPECIFICATION

Temperature

Setting   temp.   Temp.   curve

Model		Heating Block	Max Power.	Max. Temp.	Temp. Accuracy	Power Supply
ED-S series	ED16S	Alluminium alloy PTFE coated	1000W	210°C	±0.2℃	230V±10% 50/60Hz±5%
	ED36S		1400W	210°C	±0.2℃	
	ED54S	Graphite PTFE Coated	3000W	240°C	±1.0℃	
EHD series	EHD36S	Graphite	3000W	450°C	±0.1℃	

Time
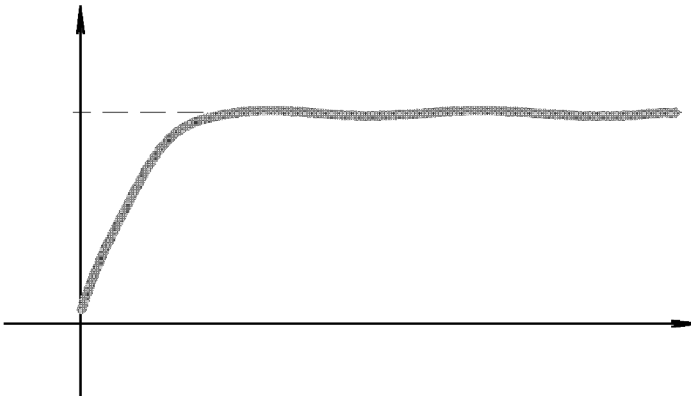
2. SAFETY RULES

General Information

Please read carefully this user manual before starting to use the instrument and follow its prescriptions with the utmost care. This user manual is part of the delivery, hence must be always kept together with the instrument on its working place.

It is imperative that every person operating with this system has read and fully understood this manual. The non-observance of the instructions contained herein or improper use may involve damages/injuries that are not covered by product liability.

Electrical safety

The instrument has to be used within the rated voltage. Prior to use, please check if the wire is aged. In case of aged wires, please contact the after-sales service for inspection. It is forbidden to disassemble the instrument and to connect internal circuit parts, in order to avoid a short circuit or open circuit.

Fire safety

Numerous reagents are flammable and explosive. When the solvent vapor concentration reaches a certain level, it would be flammable and could cause fire. The instrument should be kept away from the sources of ignition and high temperature places. If there is solvent pungent smell, carefully check whether there is gas or liquid leakage, and turn off the power.

Chemical safety

The instrument is an instrument for organic chemical sample pretreatment. The involved chemical solvents have harmful effects on the human health. Despite the instrument is fully closed and features full vent design, it is recommended to pay attention to the personal safety during the use. Regular check of liquid waste barrels as well as working conditions of the vent fan are required to avoid the risk of leakage caused by corrosion and to avoid the formation of organic solvent vapors affecting operators' health. If there is a fault, please contact the Labtech Service Team.

Please pay attention to the following notes when performing digestions.

(1) If your unit belongs to EHD series, you will see 5~10°C temperature pulse when the temperature is lower than 150°C, so please carefully setup and adjust the temperature.

(2) The working temperature of polypropylene tube cannot exceed 130°C.

(3) The working temperature of PTFE tube cannot exceed 210°C.

(4) The working temperature of 18 positions heating rack with Teflon coating cannot exceed 210°C.

(5) Please carefully control temperature when using acid HClO4. The temperature should not exceed 130°C if sample includes quite big organic components. It is appropriate to increase the temperature above 180°C when the sample decomposition is basically finished.

(6) The digestion reaction will be very strong if the sample includes quite big organic components. We recommend not to cover the tube.

(7) Glass vessels are not easy to uncap after heating. Let the tube cup cool down to ambient temperature.

(8) For applications where an EHD unit has to work constantly over 12 hours, it is recommended to set temperature not higher than 380°C.

3. INSTALLATION

Step 1: open the package and take out the unit. Place it on a stable laboratory bench. Handle the unit carefully to avoid bumping it. The laboratory bench should be stable, reliable and with no vibrations.

Step 2: connect the power supply cord. Take care the power switch is on the "O" position

before connecting the power supply cord.

Step 3: after the power supply cord is properly connected, switch ON the unit.

Optimized design has significantly improved the performance depending on installation conditions of the unit. Adequately selected installation environment will certainly be helpful to ensure longer service life and more efficient performance.

Avoid high temperature and high humidity

Never place the unit in a location where excessive heat, moisture or corrosive materials are present. The unit should be located in a clean environment where ambient temperature is between 15°C and 35°C and the humidity is between 45% and 80% respectively.

Avoid interference of strong electro-magnetic fields
Please keep the unit away from installations which release strong electro-magnetic field or high-frequency waves.

Keep it away from corrosive gas
The unit should not be placed in a place with excessive corrosive gases such as chlorine, hydrochloric acid, hydrogen sulfide, sulfurous acid gas, etc.

Place the unit on a stable platform

The installation platform must be horizontal and stable without vibration, capable of supporting the total weight of the main unit and accessories. A distance at least 15 cm must be kept between the left side of the instrument and the wall for undisturbed ventilation. Enough space around the unit fan should be left for smooth ventilation.

Avoid sharing power socket with other electric appliances
An independent power socket should be prepared for the unit. The power socket should not be shared with other electric appliances and the power supply should be grounded.

Do not place the unit in a place exposed to direct sunlight.

## Do not place the unit in a dusty environment.

Attention Please: improper working environment may significantly affect the measurement performance and reduce the life-span of the unit.

POWER SUPPLY
DigiBlock is available for power supply of 110V or 230V. The power supply of the unit should correspond with the factory-set value before switching on, otherwise the unit will be damaged. If the operator wants to change this value, please contact the Labtech Service Team.

The unit provides extra protection against the risk of electrical shock by grounding the appropriate metal parts. The extra protection may not function unless the power cord is connected to a properly grounded socket. It is the end user's responsibility to guarantee a proper ground connection is provided.
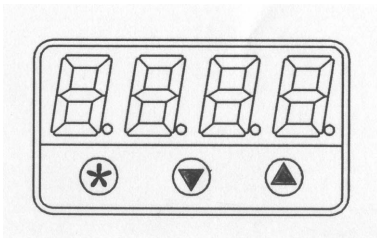
Main Components
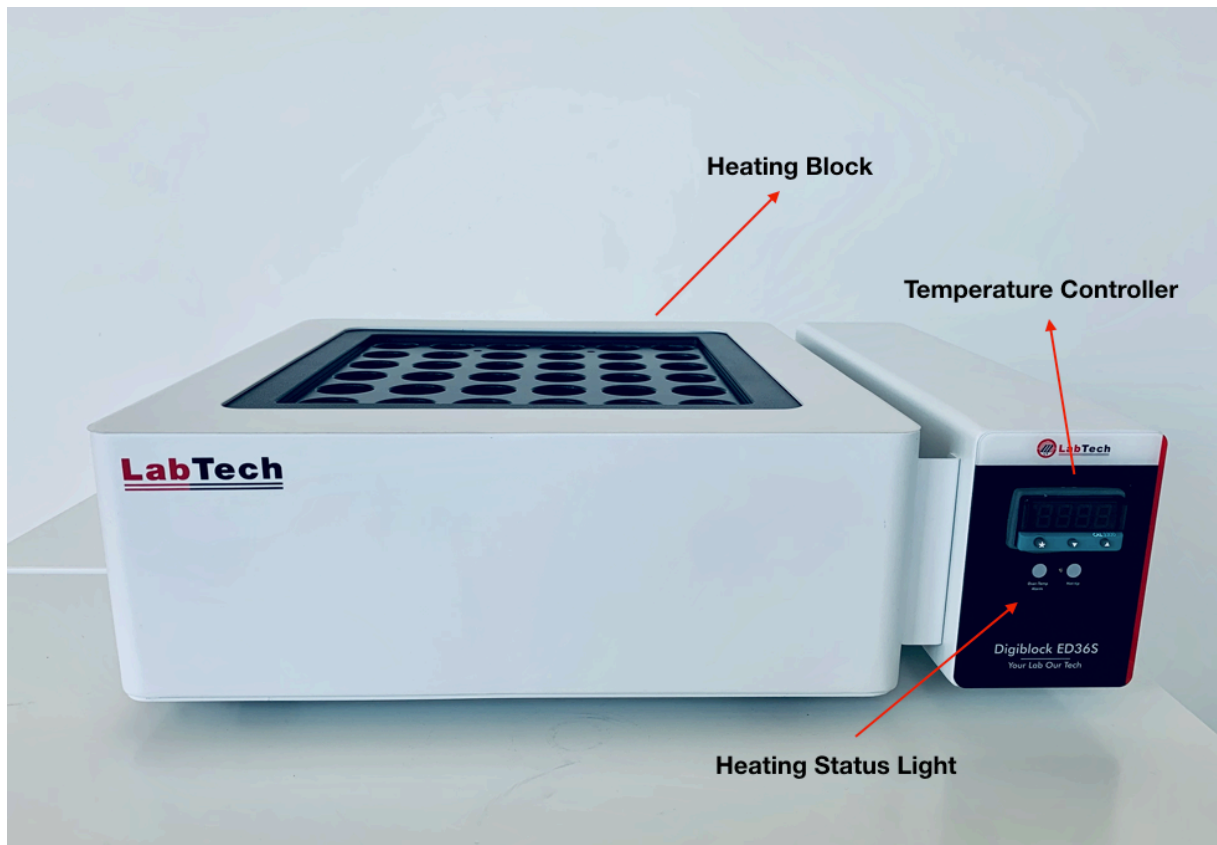
Please pay attention to the maximum working temperature of different vessels:
- **Polypropylene: 130°C**
- **PTFE: 210°C**
- **Borosilicate glass: 450°C**
- Please make sure not to exceed respectively maximum temperatures

4. OPERATION PROCEDURE

CAL3300 built-in CONTROLLER

Change the Setpoint

Press and hold ✳, the temperature of setpoint is displaying on LCD.

Press and hold ✳, use ▼ or ▲ buttons to decrease or increase the temperature of setpoint.

How to Select Display resolution

The selected temperature display is 1°C or 0.1°C, and the operation as follows.

Press ▼ and ▲ together for 3 seconds to enter program mode.

Press ▼ one time and LCD will alternatively display LEUL and 1.

Press and hold ✳ and press ▲ one time to enter 2 and LEUL 2.

Press ▲ continually until ɗiSP indicated on the LCD. The LCD alternatively display ɗiSP and 0.1.

Press and hold ✳ and press ▼ or ▲ to display resolution 0.1 or 1 degree. Once the setpoint is adjusted, release the ✳ button.

Press ▼ and ▲ together for 3 seconds again to exit program mode.

How to Setup Program Ramping

Press ▼ and ▲ together for 3 seconds to enter program mode.

Press ▲ continually until ⵙ𝖯⌐⌐ indicated on the LCD. Press and hold ✳ and press ▼ or ▲ to adjust the slope of temperature ramping 0~150℃/Hour (Temperature is ramping).

Press ▲ continually until ⵙ𝖯⌐∩ indicated on the LCD. Press and hold ✳ and press ▼ or ▲ to ⊓∩.

Press ▲ continually until ⵙₒ𝖠𝖴 indicated on the LCD. Press and hold ✳ and press ▼ or ▲ to adjust the keeping time (0~1440min) after reaching the setpoint.

Press ▼ and ▲ together for 3 seconds again to exit program mode.

When ⵙ𝖯⌐ and real temperature display alternatively the setup is finished. When ⵙₒ𝖠𝖴 and real temperature display alternatively the unit is running the set procedure. When STOP and real temperature display alternatively means the temperature program ramp is finished.

How to Unlock Parameters

Press ▼ and ▲ together for 3 seconds to enter program mode.

Press ▼ one time and LCD will alternatively display LEUL and 1.

Press and hold ✳ and press ▲ one time to enter 3 and LEUL 3.

Press ▲ continually until ∪𝖤⌐ indicated on the LCD. The LCD alternatively display ∪𝖤⌐ and corresponding number.

Press ▼ and ▲ together for 10 seconds to enter LEUL 4.

When Lₒ𝖢𝖴 display on the LCD, press and hold ✳ and press ▼ or ▲ to ∩ₒ∩𝖤.

Press ⬇ and ⬆ together for 3 seconds again to exit program mode.

The unlock procedure is finished.

⚠ **Attention Please:** It is prohibited to change any other parameters that are not indicated in user manual.

iTouch Separate CONTROLLER
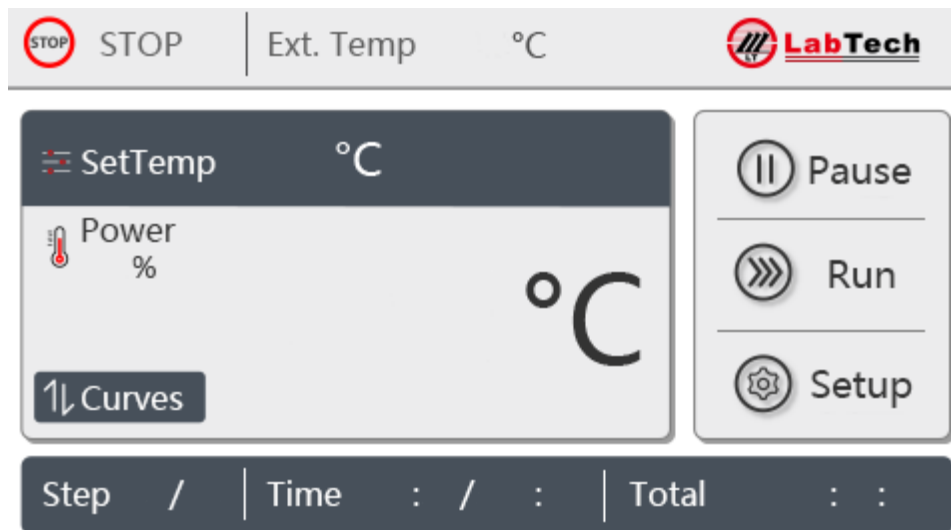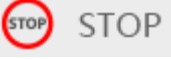
LabTech iTouch controller operates by simply touching the keys on the screen.
Connect the iTouch controller to the back of DigiBlock main unit, switch ON the DigiBlock and the iTouch screen is automatically ready for operations.

1. Temperature control range: room temperature to 210°/415°C (based on different DigiBlock model).

2. Working time: from 1 to 15 heating steps. Each step can be set from **-2** to **9999**min.

   "**-2**" Maximum heating speed to reach temperature setpoint

   "**-1**" End the program

   "**0**" Maintain previous step time setting

3. Temperature sensor mode: built-in K type sensor or optional PT100 external sensor.

Control Panel

1. Real-time status interface
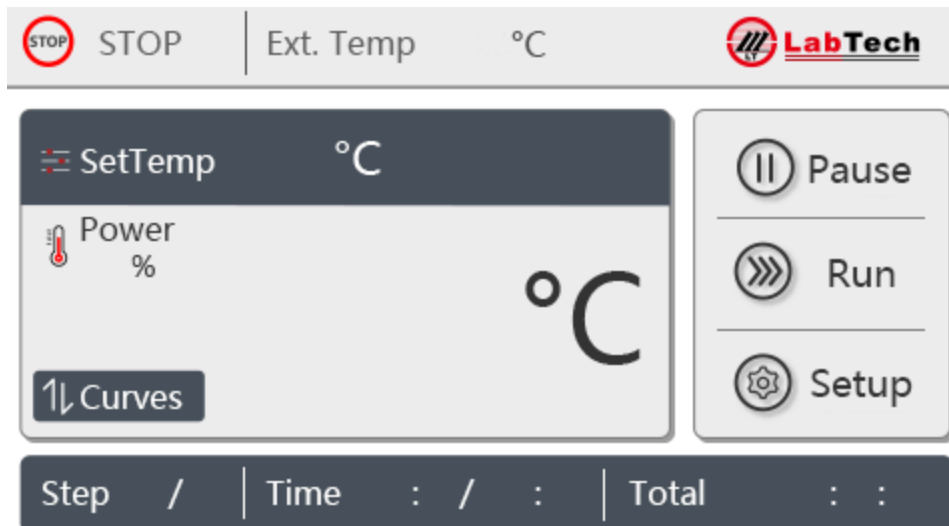
1) Real-T °C: actual temperature
2) SetTemp °C： temperature setpoint of running heating step
3) Power %: Output power percentage
4) Curves: Switch to heating graph page
5) Setup: Switch to method setup page
6) Step A/B: A means the running step no. B means the total step no. in a method
7) Time A/B: A means actual running time of current heating step. B means set time of current heating step
8) Total: Total running time of the method
9) ⬡ STOP : Method running status display
10) Ext. Temp: Display the external temperature (external sensor will be needed)
11) Run: Start selected method
12) Pause: Pause running method

13) Stop: Stop running method

2. Program heating graph

1) Purple curve: theoretical heating curve

2) Red curve: running heating curve

Operation

1. Method View Interface
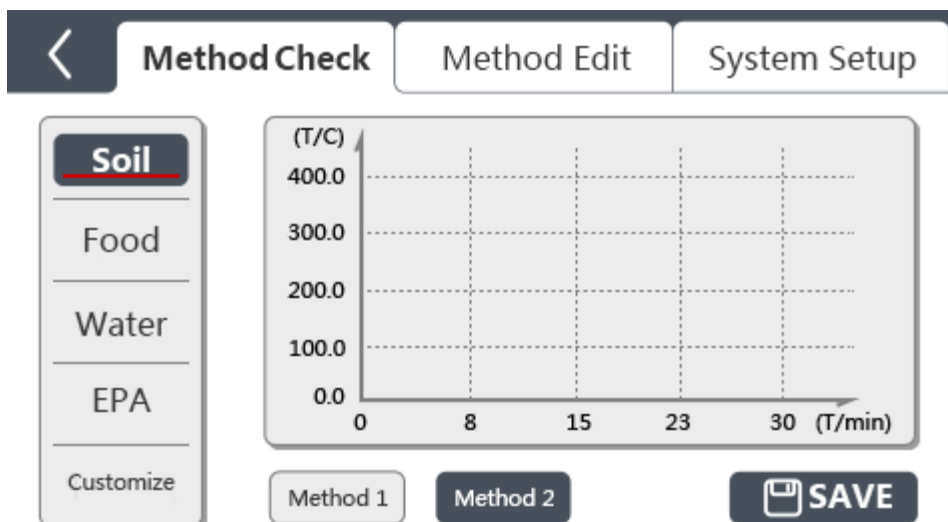
1) Category selection: touch **SETUP** button and select desired category name located in the left column (**Soil, Food, Water, EPA and Customize).**

2) Method selection: touch **Method1** or **Method2** buttons to select method 1 or 2.

3) Save: select a desired method to run

4) Exit: back to the main page without selecting any method

2. Method Setup Interface

1) Category selection: select desired method category located in the left column

2) Method selection: touch **Method1** or **Method2** buttons to select method 1 or 2

3) Step no.: Square min means temperature heating time (usually set to -2, that means heat in max. heating speed); even number means temperature holding time. Square °C means set temperature.

   For last step of the program, please set to -1 to stop heating after time end. Max N°30 Steps.

4) Next: next page

5) Save: save modified parameters

Application

Edit a soil digestion method in Soil category, heat from room temperature to 100℃ and hold in 100 ℃ untill switch off the unit.

   a) In home page, touch Setup to enter into method set interface.
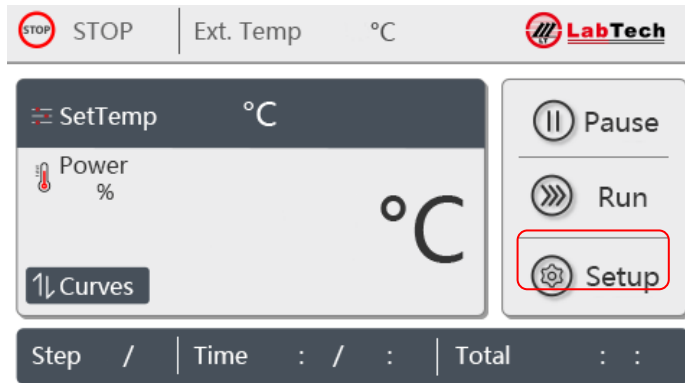
b) Enter in to Method Edit interface, touch Soil and Method1
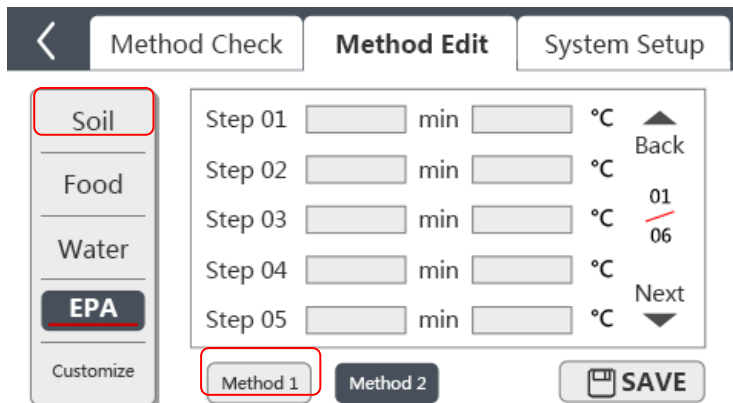
c) Step 01 : Touch the Temp. Text box, input 100 via the digital key. Then touch Time text box to input -2 which means heat in max. heating speed (Normally, the average heating speed is around 5℃/min).

   Step 02 : Touch the Temp. text box and input 100 via the digital key. Then touch Time text box to input 0 which means hold the temperature at previous step setpoint.

   Touch SAVE to save the method.

d) Touch Method Check to review the method.

e) Touch Soil then Method1 to check if the program heating curve you just set is correct. Touch Save to quit the interface and select this program.

f) In home page, touch RUN to start the selected program.

Edit another soil digestion method in Soil category, heat from room temperature to 100℃ within 15min, hold 100℃ for 60min, then increase the temperature to 150℃ within 8min, hold 150℃ for 60min. End the program.

a) In home page, touch Setup to enter into Method Edit interface.

b) Touch Soil and Method2

Step 01 : Touch the Temp. Text box, input 100 via the digital key. Then touch Time text box to input 15.

NOTE : Recommended temperature increasing Time is '-2' (the average heating speed is around 5℃/min), thus the unit can heat in the max. heating speed.

Step 02 : Touch the Temp. text box and input 100 via the digital key. Then touch Time text box to input 60 which means hold the temperature at previous step setpoint for 60min.

Step 03: Touch the Temp. Text box, input 150 via the digital key. Then touch Time text box to input 8 which means temperature increase from 100C to 150C within

8min.

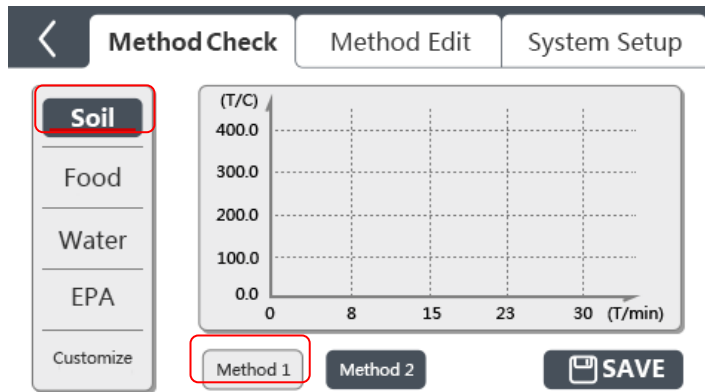Step 04: Touch the Temp. Text box, input 150 via the digital key. Then touch Time text box to input 60 which means holding temperature at 150C for 60min.

Step 05: Touch the Temp. Text box, input 150 via the digital key. Then touch Time text box to input -1 which means stop the program after step 04.

Touch SAVE to save the method.

c) Touch Method Check to view and check the heating graph.

d) Touch Soil then Method2 to check if the programm heating curve you just set is correct. Touch Save to quit the interface and select this programm.

e) In home page, touch RUN to start the selected programm.

f) When finish all the steps, the unit stops and buzzer screaming. Touch any key to stop the buzzer.

5. SOLVENTS TABLE

Solvent	Formula	Molar mass in g/mol	Evaporation energy in J/g	Boiling point at 1013 mbar	Density in g/cm³	Vacuum in mbar for boiling point at 40 °C
Acetone	CH_3H_6O	58.1	553	56	0.790	556
n-amylalcohol, n-pentanol	C_5H1_2O	88.1	595	37	0.814	11
Benzene	C_6H_6	78.1	548	80	0.877	236
n-butanol	$C_4H_{10}O$	74.1	620	118	0.810	25
tert. butanol (2-methyl-2-propanol)	$C_4H_{10}O$	74.1	590	82	0.789	130
Chlorobenzene	C_6H_5Cl	112.6	377	132	1.106	36
Chloroform	$CHCl_3$	119.4	264	62	1.483	474
Cyclohexane	C_6H_{12}	84.0	389	81	0.779	235
Diethylether	$C_4H_{10}O$	74.0	389	35	0.714	850
1,2-dichloroethane	$C_2H_4Cl_2$	99.0	335	84	1.235	210
1,2-dichloroethylene (cis)	$C_2H_2Cl_2$	97.0	322	60	1.284	479
1,2-dichloroethylene (trans)	$C_2H_2Cl_2$	97.0	314	48	1.257	751
Diisopropyl ether	$C_6H_{14}O$	102.0	318	68	0.724	375
Dioxane	$C_4H_8O_2$	88.1	406	101	1.034	107
DMF (dimethyl-formamide)	C_3H_7NO	73.1		153	0.949	11
Acetic acid	$C_2H_4O_2$	60.0	695	118	1.049	44
Ethanol	C_2H_6O	46.0	879	79	0.789	175
Ethylacetate	$C_4H_8O_2$	88.1	394	77	0.900	240
Heptane	C_7H_{16}	100.2	373	98	0.684	120
Hexane	C_6H_{14}	86.2	368	69	0.660	360
Isopropylalcohol	C_3H_8O	60.1	699	82	0.786	137
Isoamylalcohol (3-methyl-1-butanol)	$C_5H_{12}O$	88.1	595	129	0.809	14
Methylethylketone	C_4H_8O	72.1	473	80	0.805	243
Methanol	CH_4O	32.0	1227	65	0.791	337
Methylene chloride, dichloromethane	CH_2Cl_2	84.9	373	40	1.327	850
Pentane	C_5H_{12}	72.1	381	36	06.26	850
n-propylalcohol	C_3H_8O	60.1	787	97	0.804	67
Pentachloroethane	C_2HCl_5	202.3	201	162	1.680	13
1,1,2,2-tetra-chloroethane	$C_2H_2Cl_4$	167.9	247	146	1.595	20
Tetrachlorocarbon	CCl_4	153.8	226	77	1.594	271
1,1,1-trichloroethane	$C_2H_3Cl_3$	133.4	251	74	1.339	300
Tetra-chloro-ethylene	C_2Cl_4	165.8	234	121	1.623	53
THF (tetrahydrofurane)	C_4H_8O	72.1		67	0.889	374
Toluene	C_7H_8	92.2	427	111	0.867	77
Trichloroethylene	C_2HCl_3	131.3	264	87	1.464	183
Water	H_2O	18.0	2261	100	1.000	72
Xylene (mixture)	C_8H_{10}	106.2	389			25
o-xylene	C_8H_{10}	106.2		144	0.880	
m-xylene	C_8H_{10}	106.2		139	0.864	
p-xylene	C_8H_{10}	106.2		138	0.861	

6. SERVICE

The LABTECH worldwide technical support network consists of highly trained Field Service Engineers, Technical Support Specialists and Service Coordinators who are ready to quickly assist customers with answers and solutions to service needs and application questions.

For any possible clarification or any request for assistance please contact either our local Representative or:

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