



## INSTALLATION AND USER GUIDE

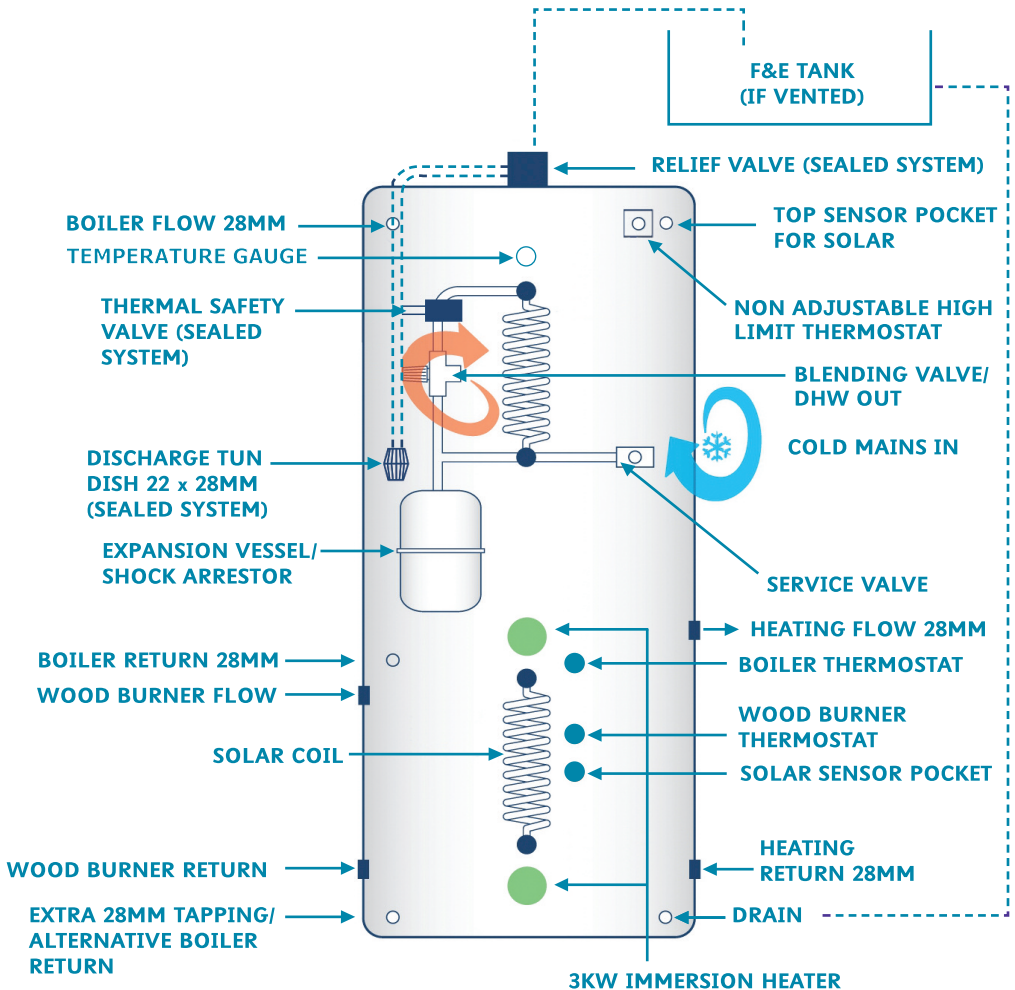
# ADVANCE UNIVERSAL MULTI-FUEL THERMAL STORE



**ADVANCE APPLIANCES LTD**

**PLEASE RETAIN AND ENSURE SERVICE RECORDS  
ARE KEPT UP TO DATE.**

# SCHEMATIC DIAGRAM OF UNIVERSAL THERMAL STORE



**IMPORTANT:** Gravity circulation must be achievable through the store from the woodburner. The store must be on the same level or higher - see diagram on page 6

**Note:** The immersion heater supplied is fitted with a thermal cut out. This is an essential safety equipment, and immersion heaters without thermal cut outs must not be used.

**Note:** Woodburners up to a maximum of 30KW output can be safely fitted

## INTRODUCTION

The Advance Universal Thermal Store linking system is a major step forward in the design and operation of thermal store systems, allowing for a number of heat inputs to work together for a fully flexible vented or sealed central heating and mains pressure hot water system.

## OPERATION

Traditional boilers can be used to heat the thermal store (or heat bank as it is sometimes called). Any boilers used in conjunction with this product should be provided with a boiler thermostat and energy cut out set such that under no circumstances can the primary flow temperature exceed 100°C. The boiler must be capable of delivering a temperature of 75°C.

If there is any possibility of gravity circulation or pump over-run from the boiler then consideration should be given to fitting a zone valve and by-pass on the boiler flow circuit wired to close once the store temperature thermostat is satisfied. This also prevents boiler over-run reducing the temperature of the store. (Please see Page 7 for installation recommendation). Boilers can be left live 24hrs as heat loss is minimal. A timer is fitted and pre-wired.

Other appliances can be used by feeding the flow and return into the store. These tappings are used for low input devices such as solid fuel stoves, heat pumps, biomass, cookers and so on. A special pipe set is provided for this purpose. The bottom coil is for a solar input, but can also be used for other suitable inputs. Two 3kw immersion heaters are fitted, a low position 3kw immersion heater which can assist on extremely low temperature days and a mid position one for hot water boost if needed.

Central heating is drawn from side tappings.

Insulation on this store is excellent, 60mm thick, foam injected with a smart outer case.

The store is capable of working up to 3 bar pressure, making it suitable for all heating circuits, including underfloor, either sealed or open systems.

Hot water is supplied through an efficient internal heat exchanger at mains pressure for fast, safe hot water delivery and is controlled by a pre-plumbed fitted manifold with blending valve and shock arrestor fitted for easy installation.

*Note: Units operate at 75°C and heat pumps cannot be the prime heating source.*

## Solar and Ancillary inputs

We can only offer general advice regarding external appliances and fittings. The first rule is to follow manufacturer's instructions. Use the solar sensor pockets to control the inputs on the store, and use the spare top pocket as overheat protection for solar installations.

In summer - the solar season can run from April to September - wood burners, boilers and other inputs other than solar should not be necessary, as solar input should exceed the likely hot water requirements during this season. You can set the solar control to 80°C in the tank, giving ample hot water for domestic needs. An extra pocket is fitted into the store for solar over heat protection.

In installations where the thermal store is sited above the solar collector panels then if gravity circulation is possible through the solar pump an additional zone valve may be required.

Unless connected to photovoltaic solar systems the immersion heaters should not be required during the solar season, although the top one can be wired to a switched spur for any essential top up.

The immersion heaters should be set at 75°C.

**Note: The immersion heater supplied is fitted with a thermal cut out. This is an essential safety requirement, and immersion heaters without thermal cut outs must not be used.**

As it is a thermal store, thermal disinfection is not needed.

Some degree of experimentation in operation is likely as different systems will have different loads placed upon them.

Solid fuel systems are ideal – biomass, wood burning stoves or cookers can all be connected. It is possible to meet sealed system G3 requirements of Building Regulations by using the fully assembled SFUTS where the wiring and plumbing is provided.

Ancillary input is generally of an intermittent nature – for example a wood burner is usually only lit during certain periods of the day and should not be used at all in warmer weather where solar may be more appropriate. It is recommended that a gas/oil boiler is used with any intermittent heat source. Whilst it is possible to use electricity it can be expensive and off peak tariffs are preferred. Solar PV can be used.

Heat pumps are an option but it must be understood that the store operates at 75°C. It is essential that a heat source such as a gas or oil boiler is used for top up and that they achieve at least 75°C output. Each input has a dedicated thermostat so 75°C is easy to achieve with a wood burner for example and will result in substantial savings on gas or oil bills.

## VENTED OR SEALED SYSTEMS

The Universal can be vented or sealed.

A vented version will not have the thermal safety valve, pressure relief valve or tun-dish. It must be vented at the top of the tank and fed at a neutral point in the system.

The standard unit is for use with sealed heating systems. We recommend fitting this unit as it eliminates the need for a remote feed and expansion tank, suits underfloor systems and is easier to fit. There are appropriate levels of control and safety approved to meet part G of the building regulations fitted to the store, even with solid fuel inputs.

For over-temperature control a high limit thermostat turns on the heating pump which acts as a large heat dump. If the temperature in the store still continues to rise a non electrical thermal safety valves opens to allow cold water through the hot water coil to cool the store.

For over pressure, a relief valve is fitted to the top of the tank. The pressure relief and thermal safety valves are pre plumbed into a 28mm tun-dish for safe discharge.

We suggest an extra 3 bar relief valve is fitted in open circuit for additional safety and a filling loop with appropriate isolation.

The unit should be filled to 1 bar pressure cold. It has a maximum working pressure of 3 bar.

Remember when calculating heating expansion vessel size to include the capacity of all the pipe work, thermal store and heat emitters.

## SFUTS FULLY WIRED AND PLUMBED FOR SOLID FUEL WITH GAS/OIL BOILER ETC

The SFUTS (Solid Fuel Universal Thermal Store) takes the worry out of installation. It offers a fully integrated store with all relevant controls and safety features. It has three pumps fitted - a boiler pump, a heating pump and a re-circulator for the solid fuel device to aid heat up and stratification when the appliance is first lit. The sensor head can be adjusted, we recommend 50°C to 60°C. The sensing probe must be left as supplied, strapped to the pipework.

A heat sink (towel radiator or similar) needs to fitted as shown in the schematic. Two dual thermostats with over-heat protection are fitted (the third is for solar and is left to the installer) and a thermal safety valve is fitted in sealed heating circuits, plumbed in with the pressure relief valve to tun-dish discharge. This valve is thermo-mechanical and will work in the case of an interruption to electrical supply.

A 3amp supply from a fused spur is recommended, and you will need to wire a programmer/ room thermostat to the fitted junction box. Means for disconnection of the supply must be incorporated in the fixed wiring in accordance with the wiring rules. The mains supply wiring must be fixed in a way that prevents it coming into contact with hot parts (those that can experience a temperature rise of  $>50^{\circ}\text{C}$ ), or, that the insulation of the mains supply wiring must be protected, for example, by insulating sleeving having an appropriate temperature rating.

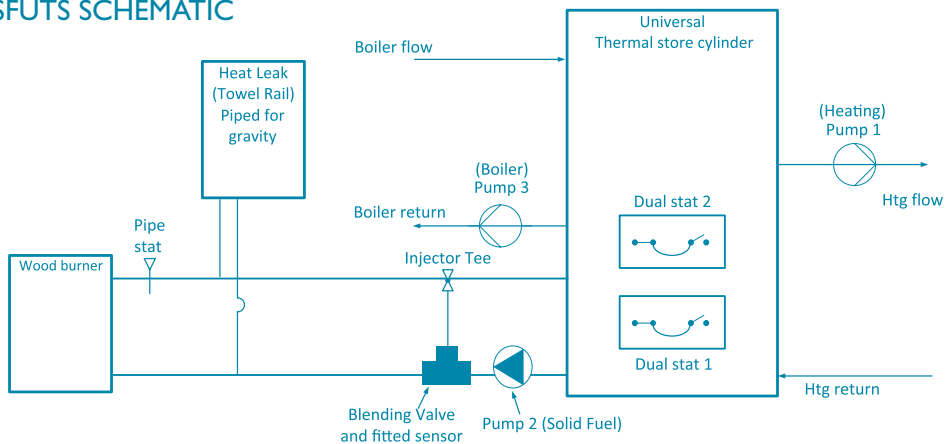
A pipe thermostat is supplied loose (but electrically connected) to mount about a metre away from the solid fuel appliance on the flow pipe. This thermostat senses when the appliance is lit/turned on. Wiring instructions come with the unit. The wiring centre is labelled for 3amp (50HZ) mains input, switched live boiler and programmer connections.

If the supply cord or any wiring on the store is damaged, it must be replaced by the manufacturer, its service agent or similarly qualified persons in order to avoid a hazard.

You will need to connect the boiler flow and return pipes, the solid fuel flow and return and the heating flow and return. Pumps are fitted and pre wired. The solid fuel circuit contains an injector tee, pump and blending valve to prevent cold water being returned to the wood burner.

The unit meets the requirements of G3.

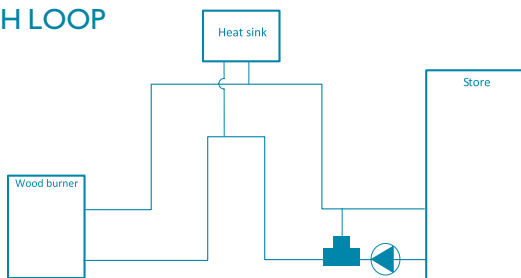
## SFUTS SCHEMATIC



This schematic is for solid fuel pumped circulation.

Note: A heat sink must be fitted

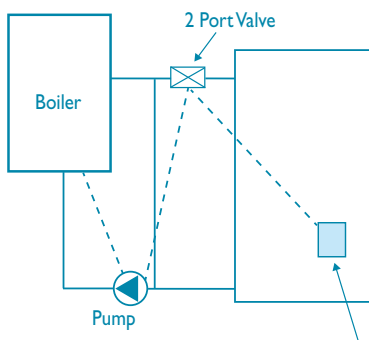
## SCHEMATIC WITH LOOP



**Note:** If the pipe rises above the thermal store, the wood burner must have a quench pipe system to protect against overheating

## WIRING

### BY-PASS



Wired in series so cylinder thermostat on demand will activate the boiler and OPEN the motorised valve (normally closed version)

## TIMERS FOR BOILER AND SOLID FUEL

In order to offer more control Advance are now fitting two timers to the store.

### Boiler Timer

The boiler should be timed to be on for at least twelve hours to maintain the store temperature. However, it can be a nuisance if it comes on overnight. For your convenience we now fit a pre-wired timer you can set to time the boiler.

### Solid Fuel Timer

If the woodburner, for example, is left burning after you go to bed, it will eventually cool but may still activate the pump on the woodburner circuit. To alleviate this we suggest that you set this to off from around midnight and back on in the morning. If the woodburner isn't lit nothing will happen if the timer is on because other controls like the pipe thermostat are in the same circuit.

If you light the fire in the morning you will need to be sure that the timer is on.

## Note

You don't have to use these timers - the thermal store works well without them, However they may well aid the efficiency of the operation and prevent nuisance overnight boiler firing and overnight store cooling.

## INSTALLATION

Ensure the unit is installed on a flat surface and that all tappings are accessible for future maintenance. Make sure the floor will support the full weight of the unit.

The system must be inhibited with a suitable proprietary brand taking account of the store volume. If vented the feed and expansion tank must be at the highest point in the system. A metal feed and expansion tank is preferred.

An expansion vessel of suitable capacity must be installed in sealed systems taking into account the total volume of the heating circuit and thermal store. On page 10 we list the expansion required for the cylinder only.

Install a propriety filling loop system with flexible hose, isolation valve, 3 bar relief valve, expansion vessel and pressure gauge. Fill to 1 bar cold. The filling loop should be installed to prevent back-siphonage.

The relief valve and discharge arrangement is fitted with the thermal safety valve in sealed heating systems. This is a mechanical device (non-electrical) which opens at 97°C and draws cold water through the hot water coil to dissipate heat in the store. It runs via a tun dish which should be connected via a 28mm pipe to a safe low level discharge point, follow G3 advice here. The pressure-relief device is to be operated regularly to remove lime deposits and to verify that it is not blocked.

A 28mm discharge pipe connected to the tun dish is to be installed in a continuously downward direction and in a frost-free environment.

The thermal safety valve gives the third level of protection necessary to meet G3.

An expansion (pressure relief) valve must be fitted into the heating circuit in addition to the relief valve on the tank.

For solid fuel appliances refer to manufacturer's instructions, especially with regard to heat sinks and so on. Always install a heat sink that will work on gravity between the store and the solid fuel appliance.

The SFUTS is pre-wired and pre-plumbed and is simple to install.

Follow the layouts carefully, the pumped solid fuel pipe-set is assembled and supplied packed with SFUTS. It should be attached to the store. If this is not possible it should be less than one metre from the store. Full fitting instructions are supplied with this pipe set.



Gravity flow is important in case of power cuts etc. Gravity flow is normally achieved by putting the thermal store on the same level or higher than the woodburner. If this can't be achieved a wood burner with a quench pipe must be installed in case of overheat.

Set the boiler thermostat to 75°C. Set the solid fuel thermostat to 80°C. This will help increase the energy stored in the unit and reduce reliance on fossil fuel. Solar thermal can also operate at 80°C. Boilers must have over-temperature protection and must be able to supply temperatures of at least 75°C. A zone valve and bypass may be necessary for boilers with pump over run if the store temperature is reduced by more than 3°C.

If your boiler has a pump fitted you can remove the boiler pump on the store and disconnect the wiring. It will not affect the operation of the system.

In high risk installations (care homes, nurseries etc.) care should be taken to reduce central heating temperatures with a blending valve. Underfloor heating should be routed through a control manifold. Nuisance gravity circulation should be minimised using either zone valves or anti-gravity valves.

In order to comply with Part L Building Regulations it is necessary to insulate any hot water (primary and secondary) pipework within one metre of the cylinder. Guidance is given in the Table 5 (Page 20) of the 2013 Domestic Heating Compliance guide. Insulation values for the most popular pipe sizes are reproduced below.

Pipe outside diameter	Maximum heat loss in W/m
15	7.89
22	9.12
28	10.07
35	11.08

**NOTE: ALL JOINTS MUST BE TESTED AS THEY CAN LOOSEN IN TRANSIT**

## HOT WATER

If hardness exceeds 200ppm, use a treatment to soften water.

Scale build-up can happen rapidly and reduce flow and efficiency.

Always flush after commissioning but **DO NOT USE** heavily chlorinated solutions unless you are prepared to thoroughly flush the whole heating system after heat up and cool down.

If flow is poor check incoming water supply and make sure all valves etc. are fully open.

If temperature is poor check that the store has reached 75°C and that the blending valve is set at the appropriate temperature.

Use inhibitor in heating systems. Remember to include the store volume when dosing.

## SERVICING

This should be done every year. Fill in the form at the back of this publication - you may need it in case of warranty issues.

Service the shock arrestor by inflating to 3 bar and ensure the store is inhibited with a proprietary brand of inhibitor to the recommended dose.

Check that the blending valve is controlling hot water temperature at (about) 50°C.

To drain the unit isolate all appliances and drain via the fitted drain cock. On sealed systems open the relief valve to allow air into the cylinder to prevent collapse.

Please see page 14 for full servicing requirements.

## WARRANTY

Warranty is for ten years on the tank against failure due to manufacturing fault, and two years on components supplied and fitted to the heating manifold and thermal store.

Conditions apply, the unit must be serviced annually and a record of service must be maintained. It must be in a frost free environment and must be used for public mains potable water only. It must be installed and used correctly in accordance with manufacturer's requirements and current best practice. Corrosion and scale are not covered. Chlorine/chloride levels must be below 200ppm. The store must be inhibited to correct dose.

Scale is not covered

Your statutory rights are not affected by the above.

## COLD SUPPLY

A minimum of 2 bar (200 MPa) pressure through a 22mm pipe is optimum. Below this the performance may be compromised. Test the household supply by turning on mains fed taps to ensure satisfactory flow rates can be achieved.

Above 18 litres per minute is the recommended flow. It is the installer's and householder's responsibility to check these before installation.

Fit a 3 bar (300MPa) control valve (not supplied) if pressures are likely to be in excess of this. This is the maximum recommended coil pressure.

NOTE: Mains pressures usually increase from late evening to early morning.

## SIZE & WEIGHT

MODEL	CAPACITY	WEIGHT FULL Kg	EXPANSION VESSEL SIZE (CYLINDER ONLY)*	HGT X DIA mm
SFUTS 210	210 ltrs	280	18 ltrs	1500 x 600
SFUTS 250	250 ltrs	325	24 ltrs	1750 x 600
SFUTS 300	300 ltrs	380	24 ltrs	2025 x 600

\* Please add the central heating pipework, radiators/underfloor and appliance volumes to arrive at expansion vessel size..

## DISPOSAL

At the end of the life of the product please dispose of in line with any regulations ruling at the time

## TECHNICAL SPECIFICATION

MAX COLD WATER PRESSURE		3 BAR		
MAX TANK OPERATING PRESSURE		3 BAR		
MIN OPERATING TEMPERATURE		75°C		
IMMERSION HEATERS		3KW / 230V AC 1 <sup>3</sup> / <sub>4</sub> " x 14"		
SHOCK ARRESTOR POTABLE		2 LITRE 3 BAR		
HEAT EXCHANGER HOT WATER		35KW		
HEAT EXCHANGER SOLAR		17KW		
HEAT LOSS 210 LITRE	CLASS C	1.67 / 24 HRS	69 WATTS	SOLAR VOLUME 80
HEAT LOSS 250 LITRE	CLASS C	1.77 / 24 HRS	74 WATTS	85
HEAT LOSS 300 LITRE	CLASS C	1.93 / 24 HRS	80 WATTS	90
FOAM GWP / ODP		1 / 0		
SOLAR COIL OUTPUT		20KW (0.75m <sup>2</sup> )		
HOT WATER COIL OUTPUT		35KW (1.5m <sup>2</sup> )		

## SPARE PARTS

2 LITRE EXPANSION VESSEL (SHOCK ARRESTOR)	AA0001
BLENDING VALVE	AA0002
3KW IMMERSION HEATER 1.75" HIGH TEMP	AA0005
SINGLE CONTROL THERMOSTAT	AA0010
NON ADJUSTABLE HI LIMIT THERMOSTAT	AA0030
DUAL CONTROL THERMOSTAT	AA0013
THERMAL SAFETY VALVE	AA0016
WIRING CENTRE	AA0027
PIPE THERMOSTAT	AA0028
28mm INJECTOR TEE	AA0029
A RATED PUMP	AA0031
3 BAR RELIEF VALVE	AA0015





# INSTALLER & COMMISSIONING ENGINEER DETAILS

## Customer Details

Name .....

Address .....

.....

Tel No. ....

## Installer Details

Name .....

Address .....

.....

Tel No. ....

DATE .....

## REGISTRATION DETAILS

(where applicable for unvented systems)

REG No. ....

ID SERIAL No. etc. ....

## Commissioning Engineer Details

Name .....

Address .....

.....

Tel No. ....

DATE .....

## REGISTRATION DETAILS

(where applicable for unvented systems)

REG No. ....

ID SERIAL No. etc. ....

## Servicing Requirements

1. Check pressure reducing valve (if fitted) is 3.0 bar static and adjust if necessary.
2. Check flow rates are correct at 18 litres per minute. Clean filter in pressure reducing valve only if required.
3. Check inhibitor levels in system.
4. Check expansion vessel change is 3.0 bar - inflate as required after decommissioning the cold supply.
5. Check blending valve temperature is 55°C or lower

Should further assistance or clarification be required contact Advance Advice on 01543 377723.

Failure to carry out annual service/maintenance requirements and log proof in service/maintenance records may invalidate warranty.

## Appliance Details

Model .....

Capacity ..... Litres

Serial No. ....

## General Installation

Has a check been done for joint tightness and leaks? Yes  No

Has a check been done for electrical safety? Yes  No

# SERVICE INTERVAL RECORD

Service regularly by an approved engineer and record details below

## SERVICE 1

Engineers Name .....  
Company Name .....  
Tel No. ....  
ID Serial No. ....  
Comments .....  
.....  
Signature .....

## SERVICE 2

Engineers Name .....  
Company Name .....  
Tel No. ....  
ID Serial No. ....  
Comments .....  
.....  
Signature .....

## SERVICE 3

Engineers Name .....  
Company Name .....  
Tel No. ....  
ID Serial No. ....  
Comments .....  
.....  
Signature .....

## SERVICE 4

Engineers Name .....  
Company Name .....  
Tel No. ....  
ID Serial No. ....  
Comments .....  
.....  
Signature .....

## SERVICE 5

Engineers Name .....  
Company Name .....  
Tel No. ....  
ID Serial No. ....  
Comments .....  
.....  
Signature .....

## SERVICE 6

Engineers Name .....  
Company Name .....  
Tel No. ....  
ID Serial No. ....  
Comments .....  
.....  
Signature .....

## SERVICE 7

Engineers Name .....  
Company Name .....  
Tel No. ....  
ID Serial No. ....  
Comments .....  
.....  
Signature .....

## SERVICE 8

Engineers Name .....  
Company Name .....  
Tel No. ....  
ID Serial No. ....  
Comments .....  
.....  
Signature .....

## HOT WATER ASSOCIATION CHARTER MEMBER

**Hot Water Association (HWA) Members undertake to offer their customers the following:**

- To supply fit for purpose products clearly and honestly described
- To supply products that meet or exceed appropriate standards and building and water regulations
- To provide pre and post sales technical support
- To provide clear and concise warranty details to customers



[www.hwacharter.org](http://www.hwacharter.org)



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