

Shimadzu Thermal Analysis Instrument  
**60 Series**

**Pre Installation Requirements**  
(Installation Preparations / Confirmation)

## 1. Introduction

Thank you for purchasing the Shimadzu 60 Series Thermal Analysis Instrument. This document outlines the pre-installation preparations that must be completed beforehand by the customer to ensure smooth installation of the 60 Series thermal analysis instrument. To ensure accurate analysis, stable operation, and long service life, please follow the instructions below.

## 2. Applicable Models

This document is applicable to the following instruments.

DSC-60Plus/60APlus

DTG-60/60H

DTG-60A/60AH

TMA-60/60H

TA-60WS

TAC-60i

TAC-60L

## 3. Pre-Installation Requirements

Please be sure to read the following pre-installation precautions in order to use the instrument safely and correctly.

### 3.1 Installation Site Environmental Requirements and Layout

- (1) There are gas pipes and connection cables on the rear surface of the instrument. Ensure that more than 20 cm of clearance is left behind the wall surface. In addition, a minimum of 10 cm of clearance should be left on both sides of the instrument for the cooling fan.
- (2) Install the instrument in a location that satisfies the following conditions:
  - (a) Away from machinery and appliances that generate strong magnetic fields, electrical fields, or high frequency waves.
  - (b) Avoid poorly ventilated area.
  - (c) Frequency not exceeding 10 HZ, with low oscillation below 5  $\mu\text{m}$ .
  - (d) Free from dust, corrosive gas, and high humidity.
  - (e) Not exposed to direct sunlight.
  - (f) Operating temperature: 5-40 °C. But 15-30°C at automatic cooling system.  
Humidity: 60 % or less. (At automatic cooling system)
  - (g) Appropriate grounding must be provided in accordance with local electrical safety rules.

(3) Use a sturdy table that can support the weight of the instrument listed below.

Model	Weight	Remarks
DSC-60Plus	Approx. 28 kg	
DSC-60APlus	Approx. 31 kg	
DTG-60/60H	Approx. 35 kg	
DTG-60A/60AH	Approx. 40 kg	
TMA-60/60H	Approx. 45 kg	
TA-60WS	Approx. 2 kg	
TAC-60i	Approx. 2 kg	(Not including an electron cooling device.)
TAC-60L	Approx. 4 kg	(Not including an LN2 tank and Pump. Only attachment for DSC-60Plus.)

### 3.2 Power Supply

Power requirements are shown in the table below.

Item	DSC-60Plus/ 60APlus	DTG-60/60A	DTG-60H/60AH	TMA-60	TMA-60H	TA-60WS
Operating Voltage	100V to 230 V (In the case of 230V systems, decrease the supply voltage to 100V by a step-down transformer.)					
Allowable Voltage Fluctuation	±10 V					
Power Capacity*	800 VA	1300 VA	1500 VA	1000 VA	1500 VA	200 VA
Power Supply Frequency	50/60 Hz					
Grounding	Grounded outlet					

The DSC-60Plus/60APlus equipped with the TAC-60I(in case of EK-90SH) requires 200 V power supply. (See section 3.3.)

\*NOTE: We recommend the use of a power supply equipped with a ground (earth)-leakage circuit breaker for safety reasons. Use a voltage stabilizer if power supply variations constantly exceed  $\pm 2$  V or electrical waveform distortions are present.

Power Cable (100V)      Cable length: 1.8 m

### 3.3 Cooling Device

It is necessary to use cooling option when controlling temperatures at below ambient temperatures as in the case of the DSC-60(A) Plus equipped.

① In case of TAC-60i, it is necessary to use an electron cooler (intra-cooler) as a cooling device

(1) Polyscience IP-100 : power supply AC120V-60Hz or AC240V-50Hz.

(2) Prepare one single-phase AC power supply (200 V, 50/60 Hz, 1600 VA) as a power supply of the Thermo Haake(R) Intra-Cooler EK90/SH (AC code length: 2 m).

The AC plug of the EK-90/SH is designed Figure 1, therefore, it may be necessary to

change the plug. Provide an appropriate plug by the customer or consult with your service representative after checking the plug type.

For information on the power supply specifications of the EK90/SH, contact your local HAAKE distributor.



Figure 1 AC plug

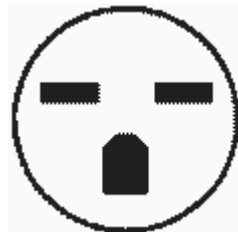


Figure 2 Outlet

- ② In case of TAC-60L, it is necessary to use LN<sub>2</sub>. (TAC-60L includes tank of 35L for accessory)

### 3.4 Gas

(1) Gas Specifications:

Air, oxygen, or inert gas can be used as atmosphere gas for the Thermal Analysis Instrument.

Required gas cylinder outlet pressure is 6-10 kg/cm<sup>2</sup>.

Helium, nitrogen or argon gas is generally used as inert gas.

Required minimum purity: 99.9 % (In case of cooling 99.9999%) / Maximum consumption: 100 mL/min (In case of cooling 350 mL/min)

Compressed oxygen and air to be used must be free from moisture, dust or oil.

(2) Installing a Gas Cylinder

For safety reasons, install gas cylinders in a place that satisfies the following conditions:

- (a) Keep the gas cylinders away from direct sunlight and heat sources such as a furnace or heating apparatus.
- (b) Do not allow any ignition sources (i.e. power distribution board, grounding wire or high-voltage power supply) in the vicinity.
- (c) Do not allow any flammable substances (i.e. oil, gasoline or organic solvent) in the vicinity.
- (d) Place the cylinders in a well-ventilated area.
- (e) Do not expose the cylinders to wind or rain if they are placed outside.

(3) Piping Components

- (a) **Gas Cylinders** must be provided by the customer in principle. As with household propane gas cylinders, the customer will need to rent a gas cylinder tank and purchase the content (gas) of a cylinder. When the cylinder is empty, the gas supplier will pick up the cylinder for refilling.
- (b) **Pressure Regulator** is attached to the head of the cylinder to supply gas at a regulated pressure (6-10 kg/cm<sup>2</sup>). Different types of pressure regulators are available according to the type of gas.
- (c) **Gas Conduit Pipe** is a stainless pipe with a joint used to connect the pressure

regulator and the thermal analyzer. Part Number (P/N) varies according to the type of gas and the length of the pipe.

- (d) **Branch Valve** is used to divide the flow of gas from one gas cylinder into two thermal analyzers. Equipped with a stop valve that turns ON/OFF the gas supply of two lines separately.
- (e) **Branch Pipe** is a simple branched pipe without ON/OFF function. (The valve opens at the main pressure regulator. Therefore, if the branch pipe turns off, the supply of gas to all the thermal analysis instruments connected will stop.)  
Two types of branch pipes are available - two-branched pipe, and two-and three-combined branch pipe.
- (f) **General Piping** uses a stainless pipe with a joint. This pipe is necessary when using the branch valve/branch pipe or the FC-40A. Part Number (P/N) varies according to the shape of joint ends or pipe length.

**3.5 Balance**

Please prepare a possible balance for weighting capacity of the quantity of sample to 0.01 mg.

**4. Pre-installation Checklist**

To:  
(Shimadzu Representative) \_\_\_\_\_  
\_\_\_\_\_

Contact Address: \_\_\_\_\_  
\_\_\_\_\_

Dear Customer,

The following page is a checklist summarizing the pre-installation conditions described in this manual.

Please complete the checklist and return it to our representative.

Customer Name: \_\_\_\_\_

Address: \_\_\_\_\_  
\_\_\_\_\_

Phone:

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## Pre-Checklist

Item		Requirements					Check
1. Installation environment	1-1 Temperature	5-40 °C But it is 15-30 °C at automatic cooling system					
	1-2 Humidity	60 % or less (At automatic cooling system)					
	1-3 Dimensions	Model	Wide	Depth	Height	Weight	
		DSC-60Plus	320	500	290	28	
		DSC-60APlus	320	500	290	31	
		DTG-60/60H	367	650	453	35	
		DTG-60A/60AH	367	650	453	40	
		TMA-60/60H	367	624	880	45	
		TA-60WS	90	230	190	2	
		TAC-60I with an electron cooler IP-100	381	511.2	566	75	
TAC-60I with an electron cooler EK90/SH		380	460	490	60		
TAC-60L	DSC+135, tank diameter 480		DSC+140, tank 750	DSC+4, Tank13(L N2 full 45)			
Unit: mm, kg In addition to the above dimensions, allow at least 100mm of clearance on both sides, and 200mm of clearance on the back side of the each unit. (Intra-Cooler cooling hose length: IP-100 1.9m ,EK90/SH 2m)							
1-4 Other	Free from noise sources						
	Low fluctuation of ambient temperature						
	Not exposed to vibration						
	Not exposed to direct sunlight or strong wind						
2. Power supply	2-1 Power Voltage	Allowable fluctuation for performance guarantee: 100 V±10 V Use a stabilizer in the case of power voltage fluctuations. When using the DSC-60Plus/60APlus equipped with the TAC-60I(in case of EK90/SH), 200 V power supply is required.					

	2-2 Power Capacity	800 VA (DSC-60Plus/60APlus) 1300 VA (DTG-60/60A) 1500 VA (DTG-60H/60AH) 1000 VA (TMA-60) 1500 VA (TMA-60H) 200 VA (TA-60WS) 1500 VA (For electron cooler IP-100) 1600 VA (For electron cooler EK90/SH AC200V) 400 VA (TAC-60L)	
	2-3 Power Supply Terminal	Consistent with the attached cable Grounded outlet is available	
3. Gas	3-1 Helium	Required minimum purity: 99.9%(In case of cooling 99.9999%)	
	Nitrogen		
	Argon		
4. Balance	4-1 Balance	Required reading possible to 0.01 mg.	
5. Other preparation	5-1 Liquid Nitrogen	Ensure the room is properly ventilated.	