



TS-1800 Site Preparation Guide

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1 About This Guide

The information and requirements provided in this document ensure proper installation and operation of the Twine TS-1800 Digital Thread & Yarn Dyeing system. The customer is responsible for:

- Preparing the site as described in this document.
- Complying with all applicable local regulations.
- Filling out and signing the Site Preparation Checklist.
- Sending the Site Preparation Checklist to your Twine representative.

If you have any questions about the information in this document, contact your Twine representative.

All site preparation requirements must be met before the installation date.



2 Terms and Abbreviations

The table below lists terms and abbreviations used throughout this document.

Term/Abbreviation	Definition
A	Ampere
AC	Alternating Current
ASL	Above Sea Level
°C	degrees Celsius or Centigrade
°F	degrees Fahrenheit
ft	feet
kg	kilograms
lb	pounds
TS-1800	Digital Thread Dyeing system
VAC	Volts Alternating Current



3 Physical Description

3.1 Overview

The TS-1800 comprises a single stand-alone unit, as shown in the figure below.



Figure 1: TS-1800 Digital Thread & Yarn Dying System



3.2 Size and Weight

The TS-1800 has the following main dimensions and weight:

- Length (L) 2.0 meters (79 inches)
- Width (W) 0.75 meters (30 inches)
- Height (H) 1.45 meters (57 inches)
- Weight 480 kg (1058 lb)

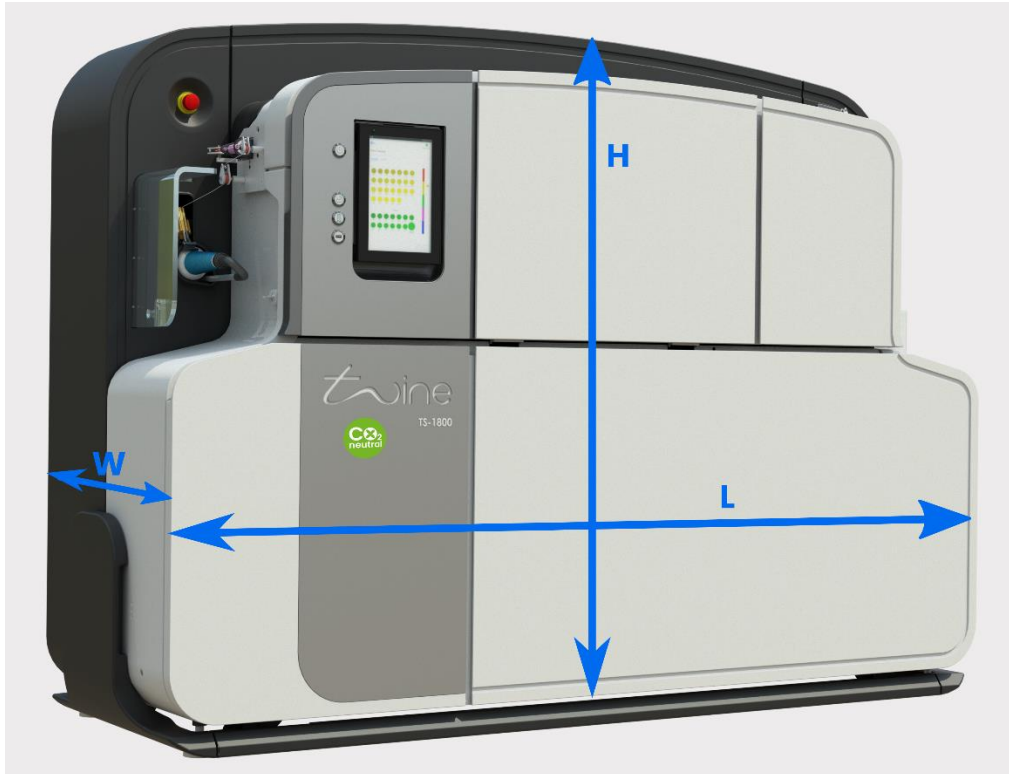


Figure 2: TS-1800 Dimensions



4 Shipping and Delivery

4.1 Shipping Pallet

The approximate size and weight of the TS-1800 system when mounted on a pallet is as follows:

- Length (L) 2.25 meters (89 inches)
- Width (W) 0.89 meters (35 inches)
- Height (H) 1.74 meters (69 inches)
- Weight 600kg (1323lb)

4.2 Pallet Lifting Equipment

A forklift must be available for pallet lifting. It must be able to lift at least 600kg (1323 lb).

4.3 Unpacking Area

An unpacking area must be available. The area must enable sufficient clearance to lift the machine pallet and to unload the machine from the pallet.

4.4 Transporting the System in a Building

Before entering the building with the system, identify the route you want to use to get the system to the installation site.

The site manager is responsible for ensuring that:

- All floors enroute to the site installation area can handle the total weight of the system together with the transportation mechanism.
- The building infrastructure (such as the elevators) can handle the total weight of the system together with the transportation mechanism.



5 Installation Area

5.1 General

IMPORTANT!

If the TS-1800 is going to be located in an area that is not on ground floor level, you must ensure that the area has sufficient capacity for the weight and physical dimensions of the machine.

- The installation area should be free of sources of vibration and electromagnetic interference that might affect the proper functioning of the TS-1800.
- Locate the TS-1800 in an area with a level floor, with a gradient of no more than 0.5% (5mm per meter).
- The floor should be stable and must be capable of bearing the weight of the TS-1800. The minimum floor load specification is 235Kg/m² (48lb/ft²).
- Clearance around and above the TS-1800 should ensure convenient access and servicing.
- The area around the TS-1800 must always remain dry.



5.2 Floor Plan

A sample floor plan is shown below, with the TS-1800 placed in a likely operating area. The dimensions shown in the figure are minimum clearance requirements.

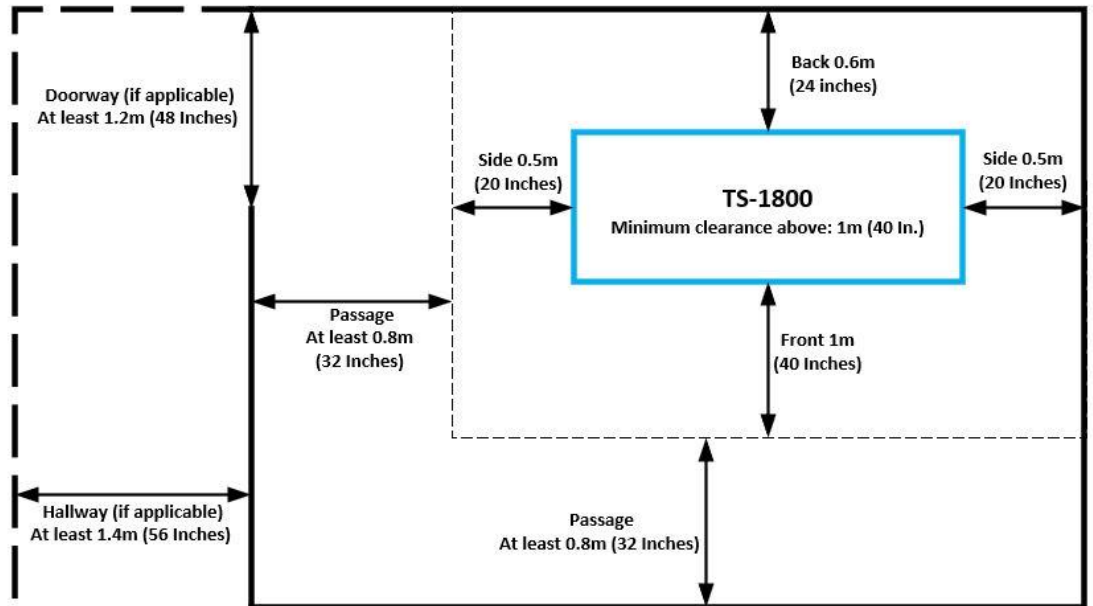


Figure 3: Floor Plan Sample (not to scale)



6 Electrical Requirements

The customer is responsible for ensuring that all tasks described in this section are performed by qualified personnel.

6.1 Power

A stable, reliable source of power is necessary. Power to the TS-1800 is supplied via a standard wall socket.

TS-1800 Power Rating

Total power consumption is 3KW. Power Supply:

220 to 240 VAC 50 to 60Hz, 15A, single phase. The wall outlet socket should be your in-country standard.

Or:

220 to 240 VAC 50 to 60Hz, 15A, dual-phase, NEMA6-15 outlet for the USA or any 110V power Grid.

If the power Grid cannot supply a minimum of 220V, the machine must be connected using a Transformer.

Transformer Input 208V, 20Am, Transformer Output 220V-240V, 20Am

If the power at your facility does not support the above specifications, contact your Twine representative.

6.2 Grounding

The TS-1800 is grounded through a single-phase, AC plug. Make sure that the AC socket used is correctly grounded in accordance with local electrical codes.

6.3 Circuit Breaker

A circuit breaker must be installed according to local regulation requirements.

We recommend using a circuit breaker that is dedicated to the applicable power socket.

An adjustable trip circuit breaker rated at 16A FLA (20A Trip) 240VAC, or 20A fixed trip type may be used.



6.4 Residual Current or Earth Leakage Device

We recommend using a wall socket that is connected through a residual current or earth leakage device.

6.5 Power cable

The Power cable cord supplied with the machine, is without a power plug, in order to be worldwide compatible. The local plug assembly should be performed by a local electrician according to the safety regulations of your country.

6.6 UPS – Recommendations

1. Output power capacity 5000VA
2. Nominal Output Voltage 240V
3. Nominal Input Voltage 240V
4. Output frequency 50/60 Hz.



7 Network

7.1 Network Connections

The TS-1800 should be placed in an area with access to a strong Wi-Fi signal and connected to the network via a LAN communication connection.

- Min. Internet Speed 40mb
- Wi-Fi frequency should be 2.4GHz
- Port 80, 1080, 443 and Port 1433 must be open(outside) to enable SW upgrades and online support.
- RSM Connectivity –

The PPC and the RSM (Remote Service Manager) should be connected to the same network. The TS-1800 transmits his identity to the network using UDP on Port 8888. Enable the machine to be discoverable by the RSM. The actual connection from the RSM to the discovered machine using TCP on Port 1984.

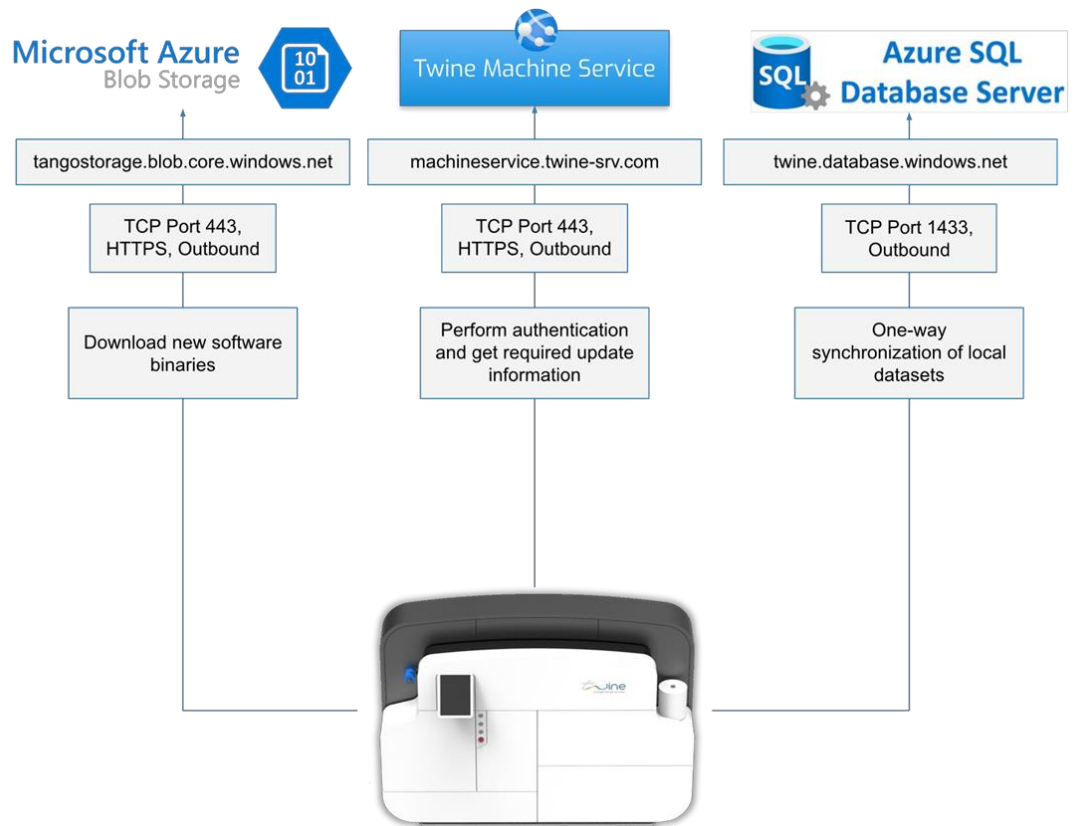


7.2 Software Update Network Requirements

A Machine update is the process of updating the software version and database definitions. In order to perform an update, the machine will first log-in to the “machine service” web service and retrieve the required information for the update.

Next, it will download the new software binaries from an Azure blob storage. Once the binaries are downloaded, the machine will start to update the local database definitions by connecting to a remote Azure SQL Server database.

All means of communication for an update are encrypted and secure.



8 Environmental Conditions

8.1 Temperature, Humidity and Altitude

The environmental conditions for the TS-1800 must be maintained within the limits detailed in the table below.

Parameter	Specification
Operating temperature	10°C to 30°C (50°F to 86°F)
Non-operating temperature	5°C and 50°C (41°F and 122°F)
Relative humidity	20% to 60%
Operating altitude	Must be less than 3000m above sea level

8.2 Air Quality

The TS-1800 should be located in a room with adequate ventilation. Typically, this means locating the TS-1800 in an airconditioned area where the air is replaced at least four (4) times per hour.

8.3 System Environmental Specifications

- Indoor use
- Overvoltage Category II
- Pollution degree 2
- Maximum sound level: ° 65 dB



9 Accessories and Utilities

9.1 Start-Up Kit

The TS-1800 comes supplied with a start-up kit which includes tools and accessories. Make sure that your start-up kit is available during installation and operation.

9.2 Fire Safety Equipment

Use only gas-based fire extinguishers in case of fire.

9.3 Cleaning the System

All parts of the system can be cleaned using one the following materials:

- Isopropyl alcohol, technical grade
- Ethanol, 99.9% technical grade

We recommend always keeping a gallon of one of these materials on site.

IMPORTANT!

Safety gloves **must** be worn when cleaning the system. Safety gloves are supplied with the system.

9.4 Inputs and Outputs

The following input/output connections are required:

- One electrical power socket as described in sections 6.1
- One network LAN connection
- Wi-Fi connection

9.5 Color Selection tools

To dye a new color, the TS-1800 must receive a color input in the L*a*b* format This color format can be extracted from a fabric/yarn sample using a spectrophotometer.

Examples for recommended spectrophotometers:



- High-end: Datacolor 800
- Mid-range: X-Rite i1 Pro 3
- Basic: Spectro 1 Pro by Variable

Spectrophotometer settings for color matching:

- ΔE Formula: ΔE CMC 2:1
- Color format: CIE Lab
- Standard Illuminant: D65
- Standard Observer: CIE 1964 10°

IMPORTANT!

It is mandatory to have a spectrophotometer in hand for the installation. Please notify Twine in advance if you do not have one for the training.



10 Materials Handling & Storage

10.1 Ink Cartridges

The following storage requirements are important for ink cartridges:

- Store ink cartridges in a dedicated cabinet.
- Ink cartridges should be stored upright on trays.
- Keep the temperature of the storage area between 5°C and 50°C (41°F and 122°F).
- Ensure that the humidity range of the storage area falls between 10% and 70%.
- Ink cartridges can be used only until the expiration date specified on the cartridge.

10.2 Handling Waste

All waste created by the TS-1800 is considered hazardous chemical waste and must be disposed of responsibly.

There are 3 types of waste:

1. Empty TDI™ ink cartridges
2. Full Waste cartridges (reused ink cartridges)
3. TS-1800 used Carbon Filter

Handling TS-1800 Waste:

1. Store empty Ink cartridges and full waste cartridges separately from new TDI™ ink cartridges.
2. The three (3) waste items types are composed of chemicals, plastic, fiber and other materials. Please dispose of them responsibly by sending them to a local chemical handling company, in accordance with local laws and regulations.



11 Customer Information

Please fill in the information requested below and send it to your Twine representative.

When your Twine representative approves your checklist, he will schedule the system installation.

If you have any additional questions, please contact your Twine representative.

11.1 Customer Details

Company name: _____

Company address: _____

Company telephone no.: _____

Company email address: _____



11.2 Site Preparation Checklist

#	Item	Meets Requirements		Notes
		Yes	No	
	Personnel available for training			
	Forklift and unloading area			
	Floor requirements			
	Access to installation location			
	Power requirements			
	Circuit breaker			
	Grounding			
	Power plug			
	Communication line			
	Wi-Fi (recommended)			
	Environmental conditions			
	Ventilation			
	Fire extinguisher			



11.3 Customer Acknowledgement

The undersigned acknowledges and agrees that any non-compliance with the requirements specified in this document may result in additional charges which will be incurred by the undersigned, and in the event that such charges are incurred by Twine, the undersigned will reimburse Twine for any such costs actually incurred by Twine.

Full name:

Company signature:

Date:

