

- The second configuration has an 18-pin User Configuration jumper block and a 4-pin power connector only.

AT jumpers (with 3-pin power connector)

=====

User Configuration jumper block (12-pin)

```

+12-10-8--6--4--2+
|0 0 0 0 0 0|
|0 0 0 0 0 0|
+11-9--7--5--3--1+

```

```

+-----+ +-----+
Drive is |0 0 0 0 0 X| |0 0 0 0 X X| Slave drive
master   |0 0 0 0 0 X| |0 0 0 0 X X| present
+-----+ +-----+

```

```

+-----+ +-----+
Drive is |0 0 0 0 0 0| |xxxx 0 0 0 0| Bus Reset HIGH
slave    |0 0 xxxx 0 0| |0 0 0 0 0 0|
+-----+ +-----+

```

```

+-----+
Bus Reset |X 0 0 0 0 0|
LOW       |X 0 0 0 0 0|
+-----+

```

The bus reset active level is systemdependent. You must install a jumper in one of these positions for the drive to operate.

```

+-----+ +-----+
Drive    |0 0 0 X 0 0| |0 0 0 0 0 0| Factory test
activity LED|0 0 0 X 0 0| |0 xxxx 0 0 0| only (Do Not
(Optional, +-----+ +-----+ Use)
master only)

```

Drive activity LED

To cause the drive to use the DASP signal to indicate bus activity through a remote LED, install a jumper on pins 5 and 6. This jumper can only be installed on the master drive. (On the slave drive, the DASP- signal indicates that a slave is present.

Factory Test

Not recommended for field use. When a jumper is installed on pins 7 and 9, the actuator continuously seeks between track 0 and the maximum data track and ignores any signals sent through the interface.

Master/Slave

You can install up to two drives on a single AT bus if you use a daisy-chain cable. Table below describes how to install the jumpers.

System Configuration	Pins 1 and 2	Pins 3 and 4	Pins 5 and 7
Only drive in system	CLOSED	OPEN	OPEN
Master in a two-drive system	CLOSED	CLOSED	OPEN
Slave in a two-drive system	OPEN	OPEN	CLOSED

AT jumpers (without 3-pin power connector)

=====

User Configuration jumper block (18-pin)

+18-16-14-12-10-8--6--4--2+
0 0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0 0
+17-15-13-11-9--7--5--3--1+

Drive is master	Slave drive present
+-----+	+-----+
0 0 0 0 0 0 X 0	0 0 0 0 0 X X 0
0 0 0 0 0 0 X 0	0 0 0 0 0 X X 0
+-----+	+-----+

Drive is slave	Bus Reset HIGH
+-----+	+-----+
0 0 0 0 X 0 0 0	0 X 0 0 0 0 0 0
0 0 0 0 X 0 0 0	0 X 0 0 0 0 0 0
+-----+	+-----+

Bus Reset LOW	Drive activity LED (optional)
+-----+	+-----+
X 0 0 0 0 0 0 0	0 0 X 0 0 0 0 0
X 0 0 0 0 0 0 0	0 0 X 0 0 0 0 0
+-----+	+-----+

The bus reset active level is system-dependent. You must install a jumper in one of these positions for the drive to operate.

Factory test (Do Not Use)	Factory reserved (Do Not Remove)
+-----+	+-----+
0 0 0 0 0 0 0 X	0 0 0 X 0 0 0 0
0 0 0 0 0 0 0 X	0 0 0 X 0 0 0 0
+-----+	+-----+

Drive activity LED

To cause the drive to use the DASP signal to indicate bus activity through a remote LED, install a jumper on pins 13 and 14. This jumper can only be installed on the master drive. (On the slave drive, the DASP- signal is used to indicate that a slave is present.)

Factory Test

Not recommended for field use. When a jumper is installed on pins 1 and 2, the actuator continuously seeks between track 0 and the maximum data track and ignores any signals sent through the interface.

Factory reserved

Do not remove. At the factory, a jumper was installed on pins 11 and 12 of the User Configuration jumper block. The drive cannot function properly without it.

Master/Slave

You can install up to two drives on a single AT bus if you use a daisy-chain cable. Table below describes how to install the jumpers.

System Configuration	Pins 3 and 4	5 and 6	7 and 8
Only drive in	CLOSED	OPEN	OPEN
Master in a two-drive system	CLOSED	CLOSED	OPEN
Slave in a two-drive system	OPEN	OPEN	CLOSED

XT jumpers (with 3-pin power connector)

User Configuration jumper block (12-pin)

+12-10-8--6--4--2+
|0 0 0 0 0 0|
|0 0 0 0 0 0|
+11-9--7--5--3--1+

XT mode (Always installed)	ST325A/X only Full capacity (20 MBytes)
+-----+	+-----+
0 0 X 0 0 0	0 0 0 0 0 0
0 0 X 0 0 0	0 0 0 0 0 0
+-----+	+-----+

ST351A/X only Full capacity (40 MB)	ST351A/X only 30-MB capacity
+-----+	+-----+
0 0 0 0 0 X	0 0 0 0 X 0
0 0 0 0 0 X	0 0 0 0 X 0
+-----+	+-----+

ST351A/X only 20-MB capacity	Bus Reset HIGH
+-----+	+-----+
0 0 0 0 X X	xxxx 0 0 0 0
0 0 0 0 X X	0 0 0 0 0 0
+-----+	+-----+

Bus Reset LOW
+-----+
X 0 0 0 0 0
X 0 0 0 0 0
+-----+

The bus reset active level is system-dependent. You must install a jumper in one of these positions for the drive to operate.

Drive activity LED (Optional, master only)	Factory test only (Do Not Use)
+-----+	+-----+
0 0 0 X 0 0	0 0 0 0 0 0
0 0 0 X 0 0	0 xxxx 0 0 0
+-----+	+-----+

Drive capacity options

To specify different capacities for the ST351A/X drive install the jumpers.

You cannot change the capacity of the ST325A/X. Do not install jumpers on pins 1 and 2 or pins 3 and 4.

Bus Reset (HIGH and LOW)

The setting of this jumper depends on the system. A jumper must be

installed in either the HIGH or LOW position for the drive function.

Drive activity LED

When a jumper is installed on pins 5 and 6, the drive uses the DASP-signal to indicate bus activity through a remote LED.

Factory Test

Not recommended for field use. When a jumper is installed on pins 7 and 9, the actuator continuously seeks between track 0 and the maximum data track and ignores any signals sent through the interface.

XT jumpers (without 3-pin power connector)

=====

User Configuration jumper block (18-pin)

```

+18-16-14-12-10-8--6--4--2+
|0 0 0 0 0 0 0 0 0 0|
|0 0 0 0 0 0 0 0 0 0|
+17-15-13-11-9--7--5--3--1+

```

XT mode (Always installed)

```

+-----+
|0 0 0 0 X 0 0 0 0|
|0 0 0 0 X 0 0 0 0|
+-----+

```

ST325A/X only

Full capacity (20 MBytes)

```

+-----+
|0 0 0 0 0 0 0 0 X 0|
|0 0 0 0 0 0 0 0 X 0|
+-----+

```

ST351A/X only

Full capacity (40 MB)

```

+-----+
|0 0 0 0 0 0 0 0 X 0|
|0 0 0 0 0 0 0 0 X 0|
+-----+

```

ST351A/X only

30-MB capacity

```

+-----+
|0 0 0 0 0 0 0 X 0 0|
|0 0 0 0 0 0 0 X 0 0|
+-----+

```

ST351A/X only
20-MB capacity


```

+-----+
|0 0 0 0 0 0 X X 0|
|0 0 0 0 0 0 X X 0|
+-----+

```

<pre> Bus Reset HIGH +-----+ 0 X 0 0 0 0 0 0 0 0 X 0 0 0 0 0 0 0 +-----+ </pre>	<pre> Bus Reset LOW +-----+ X 0 0 0 0 0 0 0 0 X 0 0 0 0 0 0 0 0 +-----+ </pre>
---	--

The bus reset active level is system-dependent. A must jumper must be installed in one of these positions for the drive to operate.

<pre> Drive activity LED (Optional, master only) +-----+ 0 0 X 0 0 0 0 0 0 0 0 X 0 0 0 0 0 0 +-----+ </pre>	<pre> Factory test (Do not use) +-----+ 0 0 0 0 0 0 0 0 X 0 0 0 0 0 0 0 0 X +-----+ </pre>
---	--

```

Factory reserved
(Do Not Remove)
+-----+
|0 0 0 X 0 0 0 0 0|
|0 0 0 X 0 0 0 0 0|
+-----+

```

Bus Reset (HIGH and LOW)

The setting of this jumper depends on the system. A jumper must be installed in either the HIGH or LOW position for the drive function.

Drive activity LED

When a jumper is installed on pins 13 and 14, the drive uses the DASP- signal to indicate bus activity through a remote LED.

Factory Test

Not recommended for field use. When a jumper is installed on pins 1 and 2, the actuator continuously seeks between track 0 and the

maximum data track and ignores any signals sent through the interface.

Drive capacity options

To specify different capacities for the ST351A/X drive install the jumpers.

The ST325A/X drive does not offer the option of changing capacity. Install a jumper on pins 3 and 4 only. Leave pins 5 and 6 open.

3-pin DC power

```
---+-----+---
 | 3  2  1 | <--- key
+---+---+---+
 |  | +----- + 5 VDC
 | +----- +12 VDC
+----- Ground
```

4-pin DC power

```
---+-----+---
 | 4  3  2  1 |
+---+---+---+
 |  | | +----- +12 VDC
 |  | +----- +12 VDC return
 | +----- + 5 VDC return
+----- + 5 VDC
```

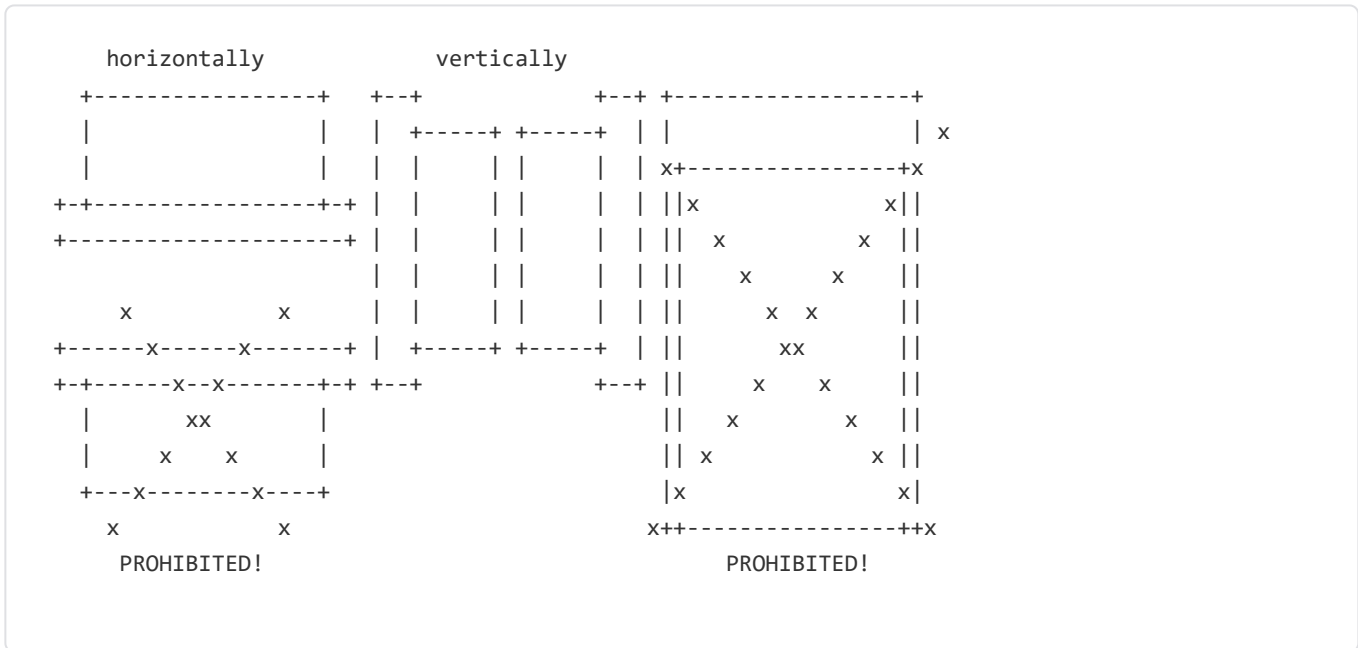
Install

SEAGATE ST325/351-A/X DRIVE PRODUCT MANUAL 36145-005, REV. E

Notes on installation

=====

Drive mounting



You must mount the drive within 5* of a vertical or horizontal axis.

Mounting the drive

For optimum performance, format the drive in the same orientation as you intend to mount it in the host system. Allow a minimum clearance of 0.050-inch around the entire drive envelope for cooling airflow and movement during shock or vibration. Shock mounts placed between the drive and the host frame should be designed so that the system has a vertical resonant frequency of 25 Hz or less.

Bottom mounting

Insert four mounting screws not more than 0.200 inches (6 full turns) into the drive frame. If you use a screw that is too long, you could damage the drive.

Standard side mounting

Insert four mounting screws not more than 0.125 inches (4 full turns) into the drive frame. If you use a screw that is too long, you could damage the drive.

Three-hole side mounting

If your system does not allow you to use all four mounting points, you can mount the drive satisfactorily using only three screws.

Use 6-32 UNC-2A screws on drives with standard-size mounting holes. These drives have an "S" stamped on the frame runner. Use M4 screws on drives with metric mounting holes. These drives have an "M" stamped on the frame runner.

Caution: Be careful not to over-tighten the screws - you could damage the drive. (Max torque: 6 inch-lbs).

Acoustics

At a distance of 1 meter, the drive creates a sound pressure of 35 dBA at idle.

Auto-park

Upon power-down, the read/write heads automatically move to the shipping zone. The heads park inside the maximum data cylinder. When power is applied, the heads recalibrate to track 0.

AT/XT interface connector

The interface cable connector is a 40-pin connector with two rows of 20 pins on 100 mil centers. The maximum cable length is 18 inches (0.457 meters). Strain relief is recommended. Recommended cables are shown below.

AMP P/N 1-499496-0

DuPont P/N 66900-040

A dual-drive AT system requires an AT interface daisy-chani cable. A dual-drive XT system requires two separate XT interface cables. The ST351A/X family drives do not use terminating resistors.

Features

SEAGATE ST325/351-A/X DRIVE PRODUCT MANUAL 36145-005, REV. E

AT and XT power-on diagnostics

If an error condition is detected during the power-on diagnostics, the LED flashes to indicate the cause of the failure.

LED flash codes

Number of LED flashes	Description of problem
1	Microprocessor memory failure
2	Program ROM memory checksum error
5	Program RAM access error
6	Buffer memory access error
7	Drive not ready
8	Error uploading RAM
9	Program RAM not compatible with ROM
10	Read/Write sequencer chip diagnostics error
11	Program RAM checksum error
12	Error uploading defect data
13	Defect data checksum error
17	Spindle failure
18 or 19	Invalid defect tables

Default logical configuration

	ST325A/X	ST351A/X
Cylinders	615	980
R/W Heads	4	5
Sec./track	17	17

Recommended logical configuration

A wide variety of configurations are available. The configurations shown below are recommendations. They provide the maximum possible formatted capacity.

	ST325A/X	ST351A/X
Cylinders	615	820
R/W Heads	4	6

Sec./track 17 17

Maximum logical parameters

All cylinder, head, and sector geometries are limited to:

- The maximum specified below, and
- The constraints of the following two relations:

(heads) x (sectors per track) 255

(cylinders) x (heads) x (sectors per track) guaranteed sectors

Cylinders 1,024

Logical heads 16

Sectors per track 128

Reliability

MTBF power on-hours 150,000

MTTR (minutes) 30

Service life (years) 5

The specification for MTBF, above, assumes nominal power at sea level and an ambient temperature of 25°C.

Seek Time

		Read	Write	
Track-to-Track	msec. typ.	7	13	
	msec. max.	12	16	
Average	msec. typ.	28	35	
Average	msec. max.	36	40	
Full-stroke	msec. typ.	65	75	
	msec. max.	80	85	
Latency	msec. avg.	9.84	9.84	

Average seek time is a true statistical average seek time, less overhead. It is measured by executing at least 5,000 logical read/write

commands between random sector addresses. Track-to-track seek time is an average of all possible single-track seeks in both directories. Full stroke seek time is one-half the time needed to seek from the first data block to the maximum data block and back to the first block.

All typical measurements assume a block size of 512 bytes, nominal power at sea level, and an ambient temperature of 25°C. Maximum seek times are measured over the full range of environmental conditions and voltage conditions.

Environment

The ST351A/X family drives are listed in accordance with UL 478 and CSA (0-M1982) and meet all applicable sections of VDE 0806/08.81 and IEC 380, as tested by TUV-Rheinland, North America.

Input noise

The input noise was measured at the host system power supply across an equivalent 20-ohm resistance on the +12 VDC line and an equivalent 8-ohm resistance on the +5 VDC line.

Permitted input noise ripple (max) 100mV (peak-to-peak)

Permitted input noise frequency (max) 20 MHz