

**TEAC DVW28U/EXT/KIT
EXTERNAL CD-RW/DVD-MULTI RECORDER**

HARDWARE SPECIFICATION

Rev. A

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1. SCOPE

This is hardware specification of the TEAC DVW28U/EXT/KIT external CD-RW/DVD-Multi recorder (hereinafter referred to as drive).

2. OUTLINE

The outline of this drive is given in Table 2-1.

(Table 2-1) Outline of the specification

Model Name		DVW28U/EXT/KIT
TEAC PN		0US3001117
Applicable safety and EMC standards		UL, FCC
Interface transfer rate		480Mbps at high speed, 12Mbps at full speed
Average access time		140msec (CD-ROM)/150msec (DVD-ROM)
Disc Speed (24x CAV speed mode)		5.160min ⁻¹ (Approx)
Host interface		USB 2.0
Power source		+5VDC
Starting time		CD-ROM: 14sec typ (excluding multi-session CD) DVD-ROM: 13sec typ (excluding dual layers and multi-border)
Readable discs	CD	CD-DA, CD-ROM, CD-R, CD-RW
	DVD	DVD-ROM, DVD-R, DVD-R DL, DVD-RW, DVD+R, DVD+R DL, DVD+RW, DVD-RAM
Recordable discs		CD-R, CD-RW, DVD-R, DVD-R DL, DVD-RW, DVD+R, DVD+R DL, DVD+RW, DVD-RAM, (Refer to item 4.6)
Applicable format	CD	CD-DA, CD-ROM (Mode1, Mode2) CD-ROM XA Mode2 (Form1, Form2) Photo CD (Single/Multi-session), CD-i, Video-CD CD-Extra (CD-Plus), CD-Text
	DVD	DVD-ROM, DVD-Video, DVD-R (Single/Multi-border) DVD-R DL (Single/Multi-border) DVD-RW (Single/Multi-border), DVD+R (Single/Multi-session) DVD+R DL (Single/Multi-session) DVD+RW (Single/Multi-session), DVD-RAM (4.7GB)
Write methods	CD	Disc at once, Session at once, Track at once, Packet write
	DVD	Disc at once, Incremental, Over write, Sequential
Front Bezel		Black
Eject Button Color		Black

Access indicator	Green
Laser class	Class 1 laser product
RoHS directive	Complies with

3. CONSTRUCTION

3.1 External Construction

(1) Dimension

- (a) Height : 22mm
- (b) Width : 134.9mm
- (c) Depth : 136.5mm

(2) Mass : 278g

(3) Disc clamp system : Ball clamp

(4) Loading : Manual loading using the tray

(5) Ejection

- (a) Manual eject using the eject button
- (b) Automatically eject using the command
- (c) Eject distance : 10mm or more

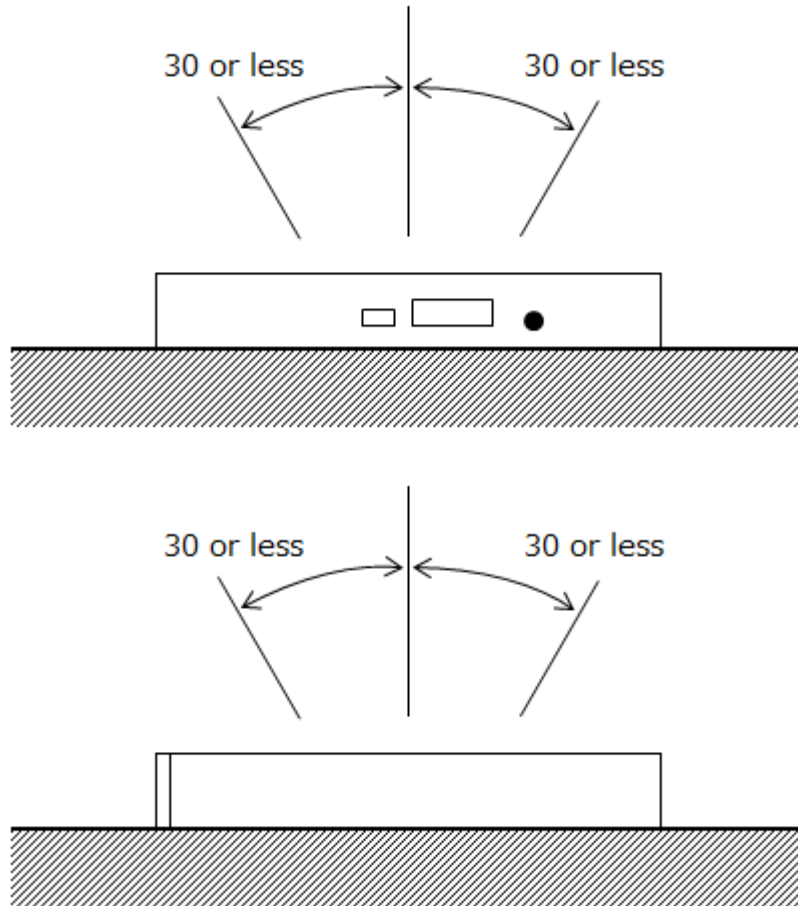
(6) External view : Refer to Fig. 3.1-1



(Fig. 3.1-1) External view of the drive

3.2 Installation

- (1) Installation direction : Refer to Fig. 3.2-1
- (2) Tilt : Refer to Fig. 3.2-1



(Fig. 3.2-1) Tilt of the drive

4. DISC SPECIFICATION

4.1 Applicable Disc Format Rotational Speed

(Table 4.1-1) Applicable Disc Format

CD	CD-DA CD-ROM (Mode1, Mode2) CD-ROM XA Mode2 (Form1, Form2) Photo CD (Single/Multi-session) CD-i Video-CD CD-Extra (CD-Plus) CD-Text
DVD	DVD-ROM DVD-Video DVD-R (Single/Multi-border), DVD-DL (Single/Multi-border) DVD-RW (Single/Multi-border) DVD+R (Single/Multi-session), DVD+DL (Single/Multi-session) DVD+RW (Single/Multi-session) DVD-RAM (4.7GB)

4.2 Rotational Speed

(Table 4.2-1) Rotational speed

Operation/Disc format	Read speed/Disc speed
Idle mode (DVD)	2x CLV 2774 - 1150rpm
Idle mode (DVD-RAM)	2x CLV 3246 1375rpm
Idle mode (CD)	4x CLV 1833 - 790rpm
Read (DVD-ROM)	8x CAV 4680rpm
Read (DVD-ROM DL)	8x CAV 4680rpm
Read (DVD-RAM)	3 - 5x ZCLV 489 - 3438rpm
Read (CD-ROM)	24x CAV 5160rpm
Read (CD-RW)	24x CAV 5160rpm
Read (DVD-R, DVD+R)	8x CAV 4680rpm
Read (DVD-R DL)	8x CAV 4680rpm
Read (DVD+R DL)	8x CAV 4680rpm
Read (DVD-RW, DVD+RW)	8x CAV 4680rpm

4.3 Data Capacity

650MB/700MB	: CD-ROM Mode1
	: CD-ROM XA Mode2 Form1
738MB/795MB	: CD-ROM XA Mode2 Form1
74min/79min	: CD-DA
4.7GB/side	: DVD-ROM, DVD-Video, DVD-R, DVD-RW, DVD-RAM, DVD+R, DVD+RW
8.5GB/side	: DVD-ROM, DVD-Video, DVD-R, DVD+R

4.4 Write Methods

CD	: Disc at once, Track at once, Session at once, and Packet write
DVD-R	: Disc at once, Incremental
DVD-RW	: Disc at once, Incremental, Over write
DVD+R	: Sequential (Multi-session)
DVD+RW	: Random write
DVD-RAM	: Random write

4.5 Readable Disc

CD-DA, CD-ROM, CD-R, CD-RW,
DVD-ROM, DVD-R, DVD-R DL, DVD-RW, DVD+R, DVD+R DL, DVD+RW, DVD-RAM

4.6 Recordable Disc (Recording Speed)

With the recommended discs, the following speeds of recording are available.

(Table 4.6-1) Recording speed

CD-R	24x (CAV), 8 - 24x (ZCLV), 8 - 16x (ZCLV), 8x (CLV)
CD-RW	8 - 24x (ZCLV), 8 - 20x (ZCLV), 8 - 16x (ZCLV), 8 - 10x (ZCLV), 8x (CLV), 4x (CLV)
DVD-R	8x (CAV), 2 - 8x (ZCLV), 2 - 6x (ZCLV), 2 - 4x (ZCLV), 2x (CLV)
DVD-R DL	2 - 6x (ZCLV), 2 - 4x (ZCLV), 2x (CLV)
DVD-RW	2 - 6x (ZCLV), 2 - 4x (ZCLV), 2x (CLV), 1x (CLV)
DVD-RAM	3 - 5x (ZCLV), 3x (ZCLV), 2x (ZCLV)
DVD+R	8x (CAV), 2.4 - 8x (ZCLV), 2.4 - 6x (ZCLV), 2.4 - 4x (ZCLV), 2.4x (CLV)
DVD+R DL	2.4 - 6x (ZCLV), 2.4 - 4x (ZCLV), 2.4x (CLV)
DVD+RW	2.4 - 4x (ZCLV), 2.4x (CLV)
DVD+RW (HS)	3.3 - 8x (ZCLV), 3.3 - 6x (ZCLV), 3.3x (CLV)

5. PERFORMANCE

5.1 Operating Performance

(Table 5.1: Operating Performance)

(1) Average random access time	140msec average (CD-ROM, 24x) 150msec average (DVD-ROM, 8x)
(2) Disc speed	Refer to Table 4.2-1
(3) Data transfer rate	
(a) Read sustained	1545 to 3600kB/sec (CD-ROM Mode1) 4469 to 10816kB/sec (DVD-ROM)
(b) Programmed I/O	16.7MB/sec max (Mode 0 to 4)
(c) Multi-word DMA	16.7MB/sec max (Mode 0 to 2)
(d) Ultra DMA	16.7MB/sec max (Mode 0 to 2)
(4) Starting time	
(a) When power is switched on/when disc is loaded	CD-ROM:12sec typ (excluding the multi-session CD) DVD-ROM:13sec typ (excluding dual layer and multi-border)
(b) Return time from the standby mode	CD-ROM: 4sec or less DVD-ROM: 4sec or less
(5) Data buffer capacity	0.5MB

5.2 Acoustic Noise

- | | |
|---------------|---------------------------------|
| (1) Operating | : 45dBA or less (distance 0.5m) |
| (2) Ejecting | : 65dBA or less (distance 0.5m) |
| (3) Others | : 35dBA or less (distance 0.5m) |

6. ENVIRONMENTAL CONDITIONS

The environmental conditions as specified here do not include the environmental conditions of the disc. The environmental conditions of the disc should follow the specifications of the applicable disc.

(Table 6: Environmental Conditions)

(1) Ambient temperature	
(a) During operation	4 to 45C (Surface temperature on the top cover and the main frame; 5 to 55C) The recording speed may be limited or reduced even in the above temperature due to the temperature sensitive function in the pickup.
(b) During non-operation	-20 to 60C
(c) During transportation (packaged)	-40 to 65C
(2) Temperature gradient	
(a) During operation	11C/hour or less (non-condensing)
(b) During non-operation/transportation	0C/hour or less (non-condensing)
(3) Relative humidity	
(a) During operation	8 to 80% (non-condensing) provided that the maximum wet-bulb temperature is 29.4C or less.
(b) During non-operation/transportation	5 to 95% (non-condensing) Provided that the maximum wet-bulb temperature is 29.4C or less.
(4) Vibrations	
(a) During operation	When installed horizontally: 2.9m/s ² (0.3G) or less When installed vertically : 1.96m/s ² (0.2G) or less Provided that the sweep frequency is 10 to 500Hz and sweep rate, 1oct/min. expecting recording mode.
(b) Transportation (packaged)	9.6m/s ² (2G) or less Provided that the sweep frequency is 10 to 500Hz and sweep rate, 1oct/min
(5) Shock	
(a) During operation (free from malfunction)	When installed horizontally: 68.6m/s ² (7G) or less (half-sine shock; 11msec, intervals; 10sec) When installed vertically : 49m/s ² (5G) or less (half-sine shock pulse; 11msec, intervals; 10sec) expecting recording mode and CD-DA play mode.
(b) During operation (while the CD-DA is playing)	19.6m/s ² (2G) or less (half-sine shock pulse; 11msec, intervals; 10sec)
(c) During non-operation/transportation	588m/s ² (60G) or less (half-sine shock pulse; 11msec) 1960m/s ² (200G) or less (half-sine shock pulse; 2msec) However, tray ejection is allowed.

(6) Dust	Office environment
(7) Cooling	Natural air cooling

7. Drive Configuration

- (1) Vender ID : 1BCF
- (2) Product ID : 0C31

8. RELIABILITY

(Table 8: Reliability)

(1) Mean time between failure (MTBF)	60000POH or more (the frequency of use should be 10% at normal temperature and humidity)
(2) Mean time to repair (MTTR)	30minutes
(3) Loading/ejecting life	10000 times or more
(4) Power ON/OFF life	60000 times or more
(5) Laser diode life	
(a) CD	MTTF 100000 hours (Duty 40% pulse 380mW, 85C)
(b) DVD	MTTF 31700 hours (Duty 35% pulse 280mW, 85C)
(6) Seeking life	2 x 10 ⁶ times or more (Random access, 25C, duty; 20% or less)
(7) Error rate	
(a) Read error rate	
CD	Mode1 and Mode2 (Form1): Once per 10 ¹² bits or less Mode2 (Form2) and CD-DA: Once per 10 ⁹ bits or less
DVD	Once per 10 ¹² bits or less
(b) Seek error rate	Once per 10 ⁶ bits or less
(8) Self-diagnosis	
(a) When power is ON	Various controllers, ROM, RAM, buffer, ECC circuit, etc
(b) When disc is inserted	Servo circuit, signal processors, etc.

9. SAFETY AND EMC STANDARD

The drive complies with the following standards.

- (1) Safety standards : UL
- (2) EMC standards : FCC

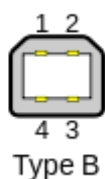
10. FRONT INDICATOR

- (1) Location : Refer to Fig. 3.1-1
- (2) Color : Green
- (3) Light conditions
 - (a) Continuous on
 - + During seek
 - + Transfer of the read data to the host is under way.
 - (b) Flashing with a period of 3 second (Duty 50%)
 - + During write
 - + While audio is being played
 - (c) Flashing with a period of 1 second (Duty 50%)
 - + From POR or tray loading to the end of TOC read (when the disc present)
 - + From POR or tray loading to the end of detecting the disc (when the disc is not present). If an error which is considered to arise from the disc occurs, flashing continues until the disc is ejected. If an error which seems to rest with drive's hardware, flashing continues until the power is switched OFF.
 - (d) Flashing with a period of 0.5 second (Duty 50%)
 - + During ejection

11. INTERFACE CONNECTOR

- (1) USB : TYPE B (4 pin)
- (2) Pin assignment : Refer to Table 11-1, Fig. 11-1

(Table 11-1) USB TYPE B



NAME	TYPE
1	VBUS
2	D-
3	D+
4	GND

12. INTERFACE CABLE

Cable for USB2.0 (TYPE B), it comes with Drive.

13. POWER INTERFACE

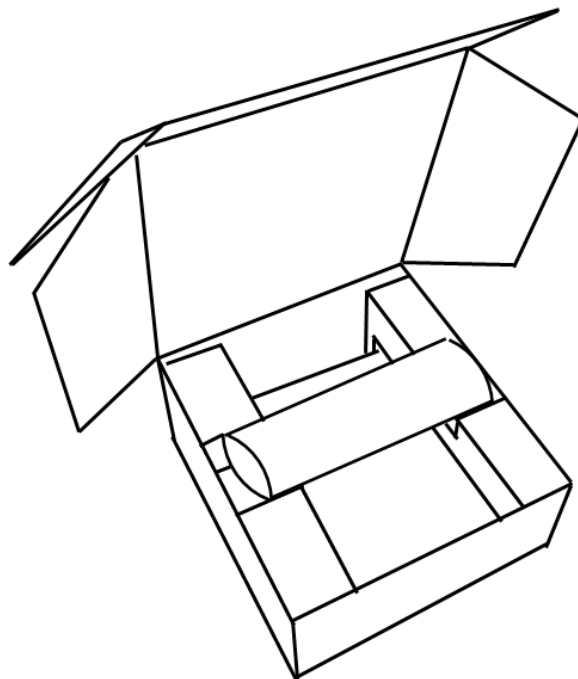
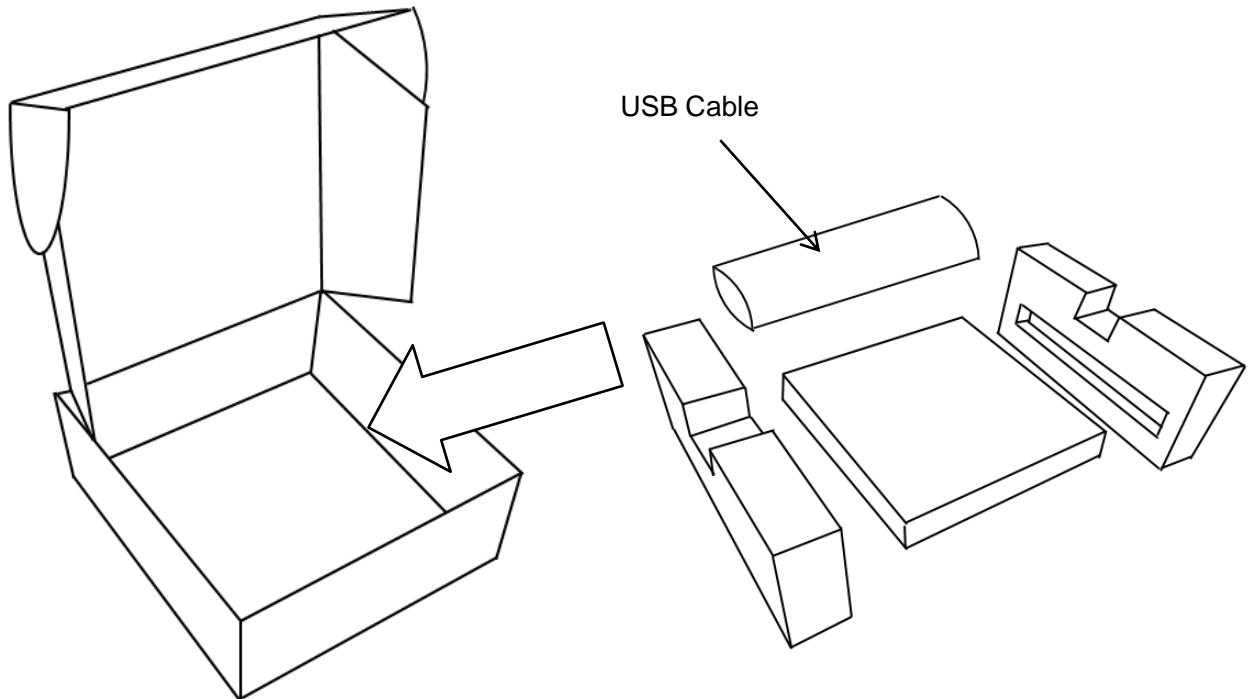
Mode	Average current max (A)	Peak current max (A)
Standby/Sleep/USB suspend	0.6 / 0.6 / 0.06	-
Write 24x (CD-R)	1.0	-
Active	0.9	-
Random access (Duty 100%)	1.2	1.5
During starting/seek	-	1.7
During eject	-	0.9

Remarks: 1. The supply voltage should be 5V + 5%

2. Does not include pulse-like current below 1 msec.

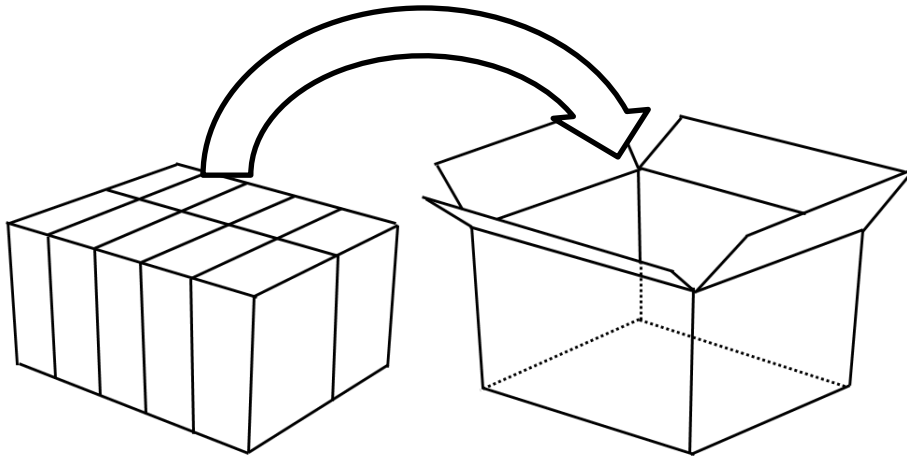
14. Packing

14.1 Item Box



(Fig 14.1)

14.2 Aggregate Box



Size 41cm x 37cm x 20cm

15. OTHERS

15.1 RoHS Compliance

The drive complies with European directive “2011/65/EU”

15.2 Safety of Laser products

When selling this unit or a system with this unit to an end user, print the following text in the instruction manual or enclose the separate sheet on which the following text is printed with the instruction manual.

This product complies with Standard IEC60825-1: 2007.

This product has been designed and manufactured according to FDA regulations “title 21.CFR. chapter1, subchapter J. based on the radiation Control for Health and Safety Act of 1968”, and is classified as a class 1 laser product. There is no hazardous invisible laser radiation during operation because invisible laser radiation emitted inside of the product is completely confined in the protective housings.

The label required in this regulation is shown below.

CAUTION

Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.

	Optical pickup
Laser output	: Less than 95mW (DVD) and 130.7mW (CD) on the objective lens
Wavelength	: 783nm (CD) typ : 661nm (DVD) typ
Standard	: IEC60825-1: 2007

15.3 Label Information

