

# 24V DRIVE, HIGH SPEED LINE THERMAL PRINTER 4" MECHANISM, WITH OR WITHOUT CUTTER

## FTP-642MCL001/002 FTP-642MCL301/302

### ■ OVERVIEW

FTP-642MCL/FTP-622DCL Series is an ultra high speed line thermal printer driven by 24 VDC, printing on 4-inch wide paper (112 mm/114 mm) .

This printer is compact and light weight, and the design allows easy head maintenance, head cleaning and head replacement.

This printer is suitable for a variety of applications, such as POS terminals, ticket machines, coupon machines, label printers, medical instruments, etc. A printer with a specially designed cutter is also available.

### ■ HIGHLIGHTS

- **Ultra high speed printing**  
It can print at 80 mm/s (640 dotlines/s) maximum by using Fujitsu Components' unique head drive control.
- **Compact and lightweight**  
This printer has a low profile of only 20 mm, and a light weight of approximately 125 g.
- **Low power consumption**  
The peak current for head driving is approximately 4.1 A (at 80 mm/s printing speed, 50% printing ratio).
- **Easy head access**  
It is designed for easy head cleaning and head replacement.
- **Paper auto loading function**  
Thermal paper can be loaded without head-up lever operation.
- **ESC/POS™<sup>\*1</sup> Commands**  
The commands conform to ESC/POS™.
- **Auto Cutter**  
Printer with auto cutter (full cut/partial cut ) is also available.
- **UL Recognized**  
File No.E171434

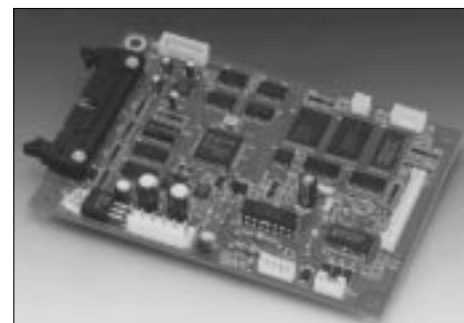
\*1 ESC/POS™ is a registered trademark of SEIKO EPSON Corp.



**FTP-642MCL001**



**FTP-622CU101**



**FTP-622DCL001**

## ■ DESIGNATION

| Item              |                                       | Part number                     |
|-------------------|---------------------------------------|---------------------------------|
| Printer mechanism | Standard                              | FTP-642MCL001/002 <sup>*2</sup> |
|                   | With Auto cutter                      | FTP-642MCL301/302 <sup>*3</sup> |
| Interface board   | Centronics Standard                   | FTP-622DCL001/011 <sup>*4</sup> |
|                   | Serial (RS-232C)                      | FTP-622DSL001/011 <sup>*5</sup> |
| LSI(MCU)          |                                       | FTP-622CU101 <sup>*6</sup>      |
| Cables            | Thermal head cable                    | FTP-622Y001                     |
|                   | Parallel (centronics) Interface cable | FTP-622Y201                     |
|                   | Serial (RS-232C) Interface cable      | FTP-622Y301                     |
|                   | Power cable                           | FTP-622Y401                     |

\*2: 001 is for front paper insertion (curl path) and 002 is for rear paper insertion (straight path).

\*3: Constructed with mechanism+cutter+attachment. 301 is for front paper insertion (curl path) and 302 is for rear paper insertion (straight path).

\*4: 001 /011 supports ANK and 101 supports ANK + Kanji (pages 98-103).

\*5: 001/011/012 supports ANK and 111 supports ANK + Kanji (pages 98-103).

\*6: CU101 supports Kanji and cutter control.

## ■ GENERAL SPECIFICATIONS

| Item   |            | Specifications   |                         |
|--|------------|--|-------------------------|
| Part number  |            | FTP-642MCL001/002  | FTP-642MCL301/302       |
| Printing method  |            | Thermal-sensitive line dot method  |                         |
| Dot structure  |            | 832 dots/line  |                         |
| Dot pitch (Horizontal)   |            | 0.125 mm (8 dot/mm)—Dot density  |                         |
| Dot pitch (Vertical)   |            | 0.125 mm (8 dot/mm)—Line feed pitch  |                         |
| Effective printing area  |            | 104 mm   |                         |
| Paper width  | MCL001/301 | 112 mm   |                         |
|  | MCL002/302 | 114 mm   |                         |
| Paper thickness  |            | 60~100 μm <sup>*1</sup>  | 60~100 μm <sup>*1</sup> |
| Cutting type   |            | -----  | full or partial         |
| Number of columns  |            | 69 columns/line (24×12 dot font)   |                         |
| Maximum printing speed   |            | 640 dot line/s (80 mm/s)   |                         |
| Character types  |            | Alphanumeric KANA: 159<br>JIS KANJI (FTP-622DCL101/111): approx.6800<br>International characters: 195  |                         |
| Character composition, dimensions (H×W),<br>Number of characters |            | 24 × 12 dots, (3.0 × 1.5 mm), 69 columns<br>24 × 24 dots, (3.0 × 3.0 mm), 34 columns<br>16 × 8 dots, (2.0 × 1.0 mm), 104 columns<br>16 × 16 dots, (2.0 × 2.0 mm), 54 columns |                         |

(Continued)

# FTP-642MCL001/002/301/302

(Continued)

| Item                                |                       | Specifications   |   |
|-------------------------------------|-----------------------|--|---|
| Part number                         |                       | FTP-642MCL001/002  | FTP-642MCL301/302                       |
| Interface                           |                       | Centronics (ESC/POS™), RS232C  |   |
| Power supply                        | For head              | 24VDC ± 5%, Voltage<br>Current : average <sup>*2</sup> ( ): Peak<br>1.61 (2.03) A (at 80 mm/s printing speed, 25% printing ratio)<br>1.17 (2.03) A (at 50 mm/s printing speed, 25% printing ratio)<br>1.08 (1.16) A (at 30 mm/s printing speed, 25% printing ratio)  |   |
|                                     | For motor             | 24VDC ± 5%, 1.0 A maximum  | 24VDC ± 5%, 1.0 A maximum               |
|                                     | For cutter            | -----  |   |
|                                     | For logic             | 5VDC ± 5%, 0.5 A maximum   |   |
| Dimension                           | Mechanism (cutter)    | 138 (W) × 48 (D) × 20 (H) mm (excluding lever)   | 147 (W) × 69 (D) × 42 (H) mm (w/cutter) |
|                                     | Interface board       | 131 (W) × 89 (D) × 24 (H) mm   |   |
| Weight (Mechanism+Cutter)           |                       | approximately 125 g  | approximately 450 g (w/cutter)          |
| Expected life                       | Mechanism             | Pulse durability : 1 × 10 <sup>8</sup> pulse/dot (using Fujitsu Takamisawa's standard driving method)<br>Wear resistance : 50 km (at 25% printing ratio)   |   |
|                                     | Cutter                | -----  | 3 × 10 <sup>5</sup> cuts                |
| Environmental conditions            | Operating temperature | 0 to +50°C <sup>*3</sup>   |   |
|                                     | Operating humidity    | 20 to 85% RH (no condensation)   |   |
|                                     | Storage temperature   | -20 to +60°C (excluding paper)   |   |
|                                     | Storage humidity      | 5 to 95% RH (no condensation)  |   |
| Detection                           | Head temperature      | By thermistor (applied energy control, abnormal temperature detection)   |   |
|                                     | Paper out/Mark detect | By photointerrupter  |   |
|                                     | Head-up               | By microswitch   |   |
| Recommended thermal sensitive paper |                       | For front insertion use (112 mm width) : FTP-040PU001, FTP-040P0701<br>For rear insertion use (114 mm width) : FTP-040P0020, FTP-040P0702<br>*Recommended papers<br>· Oji paper : PD150R, PD160R, PD170R<br>· NIPPON paper : TF50KS-E, TF60KS-E, TF60KJ-R<br>· MITSUBISHI paper Mills : P220VBB-1, AFP-235 |   |

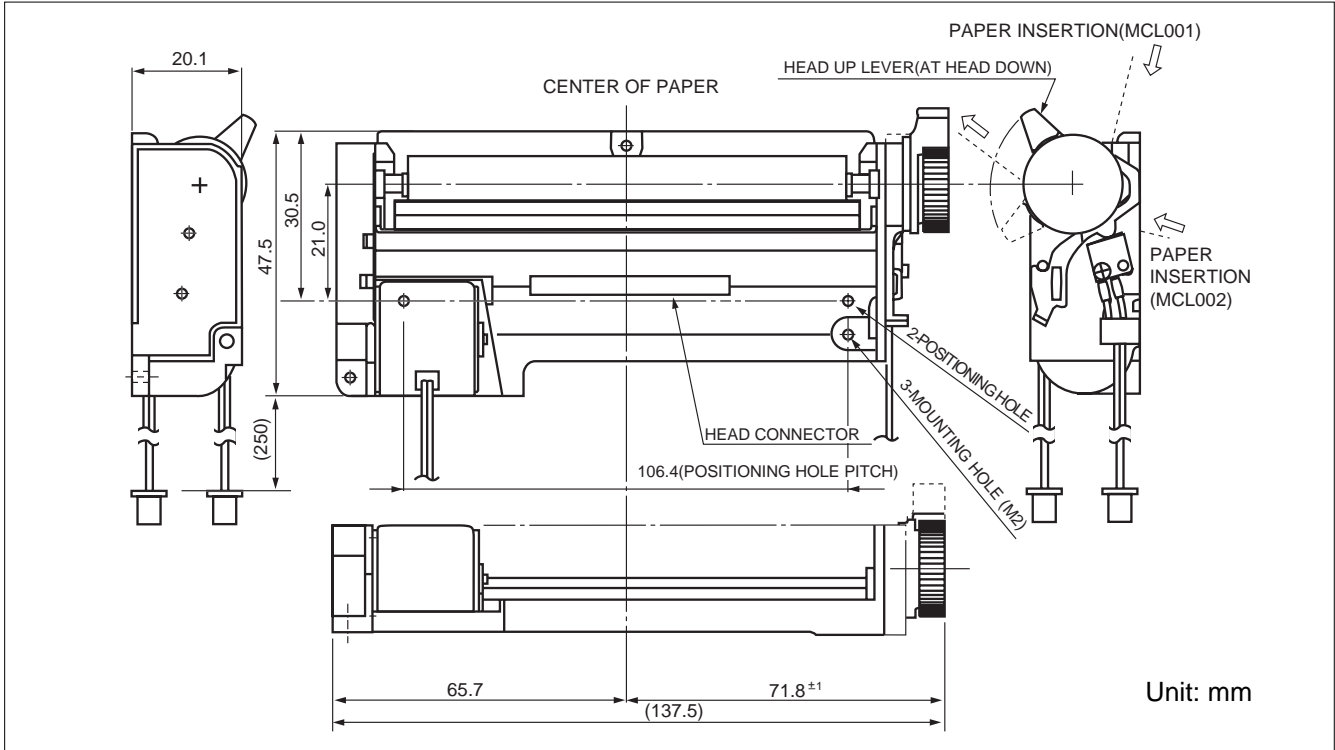
\*1: There may be exceptions.

\*2: 24 VDC, minimum head resistance.

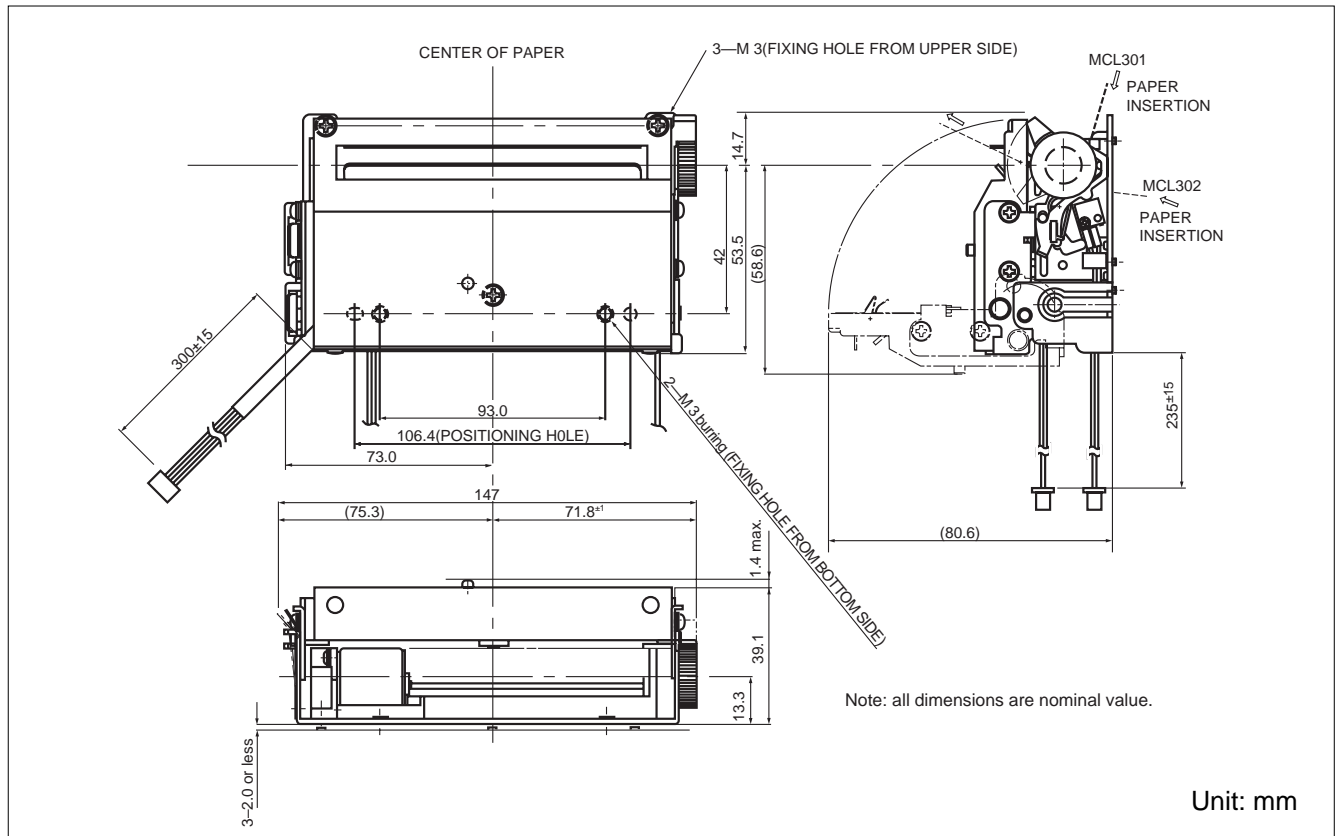
\*3: Guarantee: +5°C ~+40°C.

## ■ DIMENSIONS

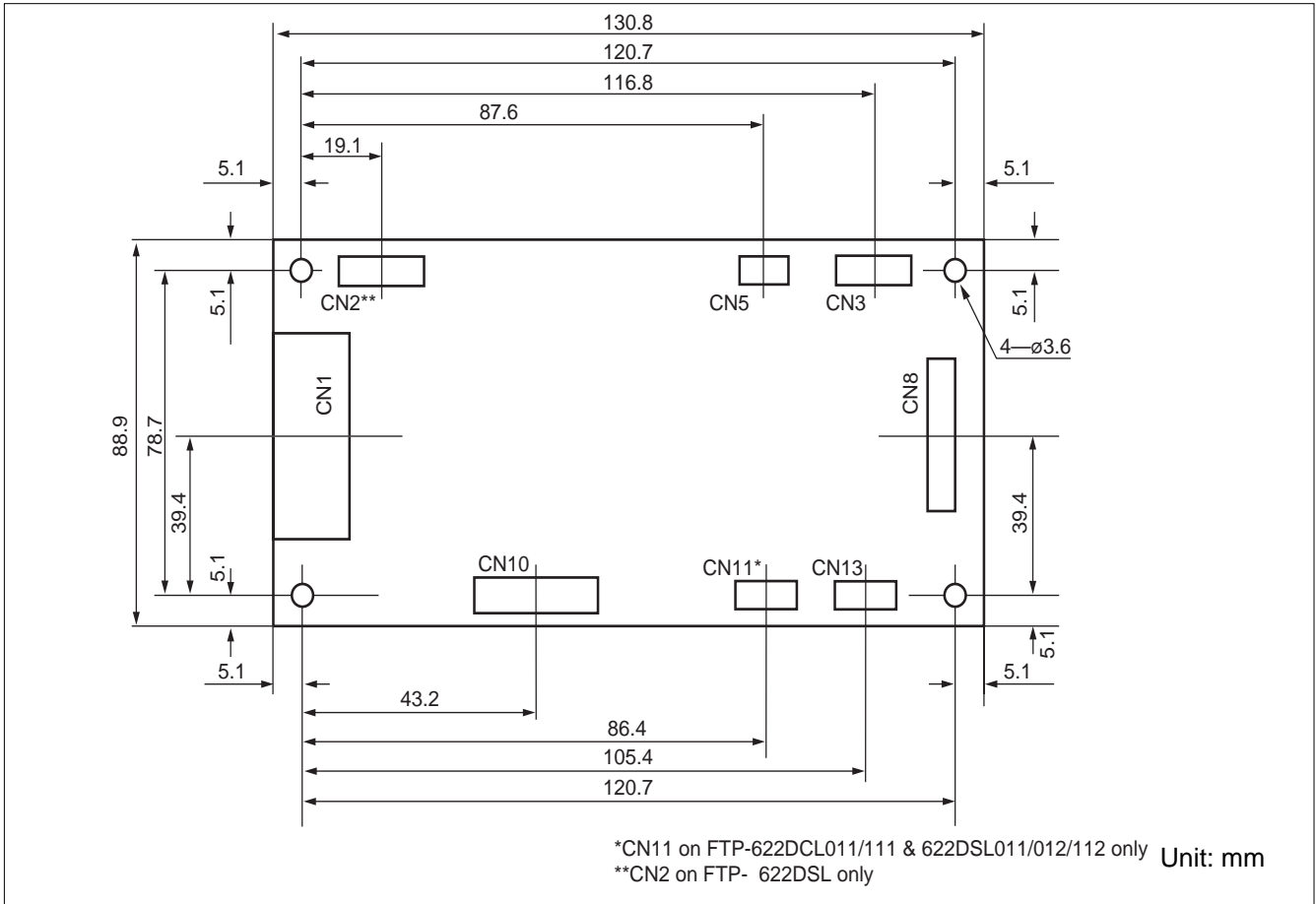
### Mechanism



### Mechanism with cutter



## Interface board



## ■ CONNECTOR PIN ASSIGNMENT FOR PRINTER MECHANISM

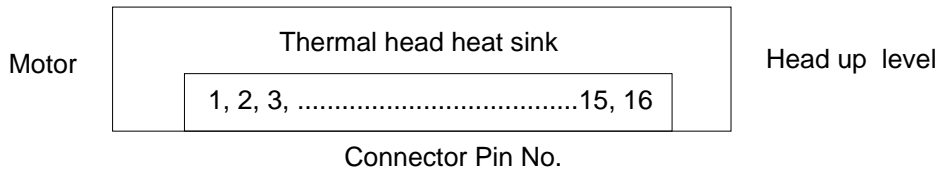
### 1. Thermal Head

Head side : B16B-PH-K-S-2.2 (J.S.T.) or equivalent

Board side: PHR-16 (J.S.T.) or equivalent

| No. | Signal                   | Comment                    |
|-----|--------------------------|----------------------------|
| 1   | VH                       | Power for head             |
| 2   | VH                       | Power for head             |
| 3   | GND                      | Head ground                |
| 4   | GND                      | Head ground                |
| 5   | $\overline{\text{STB1}}$ | Print enable signal 1      |
| 6   | $\overline{\text{STB2}}$ | Print enable signal 2      |
| 7   | $\overline{\text{STB3}}$ | Print enable signal 3      |
| 8   | TH*1                     | Temperature detection      |
| 9   | $\overline{\text{STB4}}$ | Print enable signal 4      |
| 10  | $\overline{\text{LAT}}$  | Print data latching signal |
| 11  | $\overline{\text{STB5}}$ | Print enable signal 5      |
| 12  | VDD                      | Power for logic            |
| 13  | CLK                      | Data transmission clock    |
| 14  | DIN                      | Print data output signal   |
| 15  | GND                      | Head ground                |
| 16  | VH                       | Power for head             |

\*1: Symbol: "—" means a negative logic signal



### 2. Motor connectors

Motor side : PHR-4 (J.S.T.) or equivalent

Board side : B4B-PH-K-S (J.S.T.) or equivalent

| No. | Signal                | Comment                        |
|-----|-----------------------|--------------------------------|
| 1   | $\overline{\text{B}}$ | Stepping motor coil excitation |
| 2   | B                     | Stepping motor coil excitation |
| 3   | $\overline{\text{A}}$ | Stepping motor coil excitation |
| 4   | A                     | Stepping motor coil excitation |

### 3. Sensor connectors

Sensor : PHR-5 (J.S.T.) or equivalent

Board side : B5B-PH-K-S (J.S.T.) or equivalent

| No. | Signal | Comment                   |
|-----|--------|---------------------------|
| 1   | VSEN   | Power for paper sensor    |
| 2   | PHE    | Photo interrupter emitter |
| 3   | PHK    | Photo interrupter cathode |
| 4   | SW1    | Head up detect switch 1   |
| 5   | SW2    | Head up detect switch 2   |

## 4. Cutter

Mech side : EHR-4 (J.S.T.) or equivalent

Board side : B4B-EH (J.S.T.) or equivalent

| No | Cable Color | Name                       |
|----|-------------|----------------------------|
| 1  | White       | Home position 1            |
| 2  | White       | Home position 2            |
| 3  | Red         | Motor energizing signal M+ |
| 4  | Black       | Motor energizing signal M- |

## ■ FUNCTION

|    | ITEM   |     | ITEM                             |
|----|--|-----|----------------------------------|
| 1. | Test printing                                  | 8.  | Cutter trouble detection         |
| 2. | Paper-out detection                            | 9.  | Motor power save                 |
| 3. | Paper near end detection                       | 10. | Mark detection                   |
| 4. | Head-up detection                              | 11. | MCU trouble detection            |
| 5. | Abnormal temperature detection of thermal head | 12. | Power on/off sequence protection |
| 6. | Blown fuse detection                           | 13. | Motor protection                 |
| 7. | Abnormal voltage detection of head             | 14. | Hardware timer                   |

## ■ INTERFACE, COMMAND, OPTIONS

Please refer to the FTP-622DCL DATA SHEET and the FTP-622DSL DATA SHEET for Interface, Command, and Options.

|   |   |  |
|---|---|--|
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