PLANUNGSUNTERLAGEN
PLANNING & INSTALLATION INFORMATION

EMT 930

Studio-Turntable

FRANZ Vertriebsgesellschaft m.b.H.
ELEKTRONIK, MESS- & TONSTUDIO-TECHNIK
D-76345 LAHR, POSTFACH 1520
MECHANICAL INSTALLATION

MOUNTING INTO CONSOLES AND TABLES

In order to provide proper operating conditions the professional turntable EMT 930 should be mounted in a console or a table. The machine should be suspended in the cut out only by means of the 4 springy corners, without fixation in any other place. The connection cables should be flexible.

The correct dimensions of the cut out in desks, tables, consoles, etc. are shown in the following drawing:

![Diagram showing dimensions of the cut out](image)

ELECTRICAL CONNECTION

AC MAINS CONNECTION

The EMT professional turntables are set at the factory to the mains voltage and are equipped with motors for the mains frequency quoted in the order. These data are also entered in the test report sheet.

REMOTE START CONNECTION

If the remote start facility is to be used, the remote control connections (3 cores, unscreened) should be soldered onto the supplied 3-pole Tuchel connector (T 3260/1) as follows:

![Diagram showing remote start connection](image)

24V 0.08 A
CONNECTING THE SIGNAL OUTPUT LINE (8-pole cable plug)

The EMT professional turntables are equipped with the equalizer amplifier EMT 155 in the mono version and with the equalizer amplifier EMT 155 st in the stereo version.

The output lines (twin screened cable) are connected to the eight-pole cable plug in accordance with the following table (see also overall circuit diagram EMT 930):

<table>
<thead>
<tr>
<th>Mono machine equipped with EMT 155</th>
<th>Stereo machine equipped with EMT 155 st</th>
</tr>
</thead>
<tbody>
<tr>
<td>Output</td>
<td>Output left channel</td>
</tr>
<tr>
<td>Pin</td>
<td>Pin</td>
</tr>
<tr>
<td>Core a 4 a</td>
<td>Core a 4 a</td>
</tr>
<tr>
<td>Core b 4 b</td>
<td>Core b 4 b</td>
</tr>
<tr>
<td>Screen (shield) 3 a</td>
<td>Screen (shield) 3 a</td>
</tr>
<tr>
<td>Output right channel</td>
<td></td>
</tr>
<tr>
<td>Pin</td>
<td></td>
</tr>
<tr>
<td>Core a 1 a</td>
<td>Core b 1 b</td>
</tr>
<tr>
<td>Screen (shield) 3 a</td>
<td></td>
</tr>
</tbody>
</table>

Connecting the 8-pole cable plug to the machine:

The pins 2 a and 2 b serve for earthing (grounding). If it is desired to earth (ground) the 0 V (minus) side at a central point of the installation the link between 2 a/2 b and 3 a on the 8-pole connector strip of the machine should be broken (see circuit diagram).
Technical Data

Deck

Turntable diameter 33 cm

Turntable speeds
78 rpm
45 rpm
33 1/3 rpm

Accuracy of turntable speed

78 and 45 rpm
(adjusted for 33 1/3 rpm) max. ± 0.15%

Run-up time at \( T_{\text{amb}} = 20^\circ \text{C} \)

Starting with main switch max. 1 sec.
Instantaneous start max. 0.5 sec.

Wow and flutter at 33 1/3 rpm

measured with EMT 420 A, weighted max. ± 0.075%
in accordance with DIN 45 507
(ANSI S 4.3-1971)

Rumble

referred to a peak velocity
\( \hat{V} = 10 \text{ cm/s at } 1 \text{ kHz} \)

unweighted Mono 46 dB 44 dB
weighted in accordance with Stereo 64 dB 62 dB
DIN 45 539

Mains voltages

50 Hz (special version 60 Hz) 117 V
200 V
220 V
240 V

Maximum power consumption approx. 30 W

Dimensions
490 mm
390 mm
175 mm

Weight 23 kg
(51 lbs)
## Pick-up Cartridges

1. **OF series**  
   (for use with Mono-equalizer-amplifier EMT 155)

<table>
<thead>
<tr>
<th>Type</th>
<th>EMT OFS 25</th>
<th>EMT OFD 25</th>
<th>EMT OFS 65</th>
<th>EMT OFD 65</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Application</strong></td>
<td>Mono</td>
<td>Mono</td>
<td>Mono</td>
<td>Mono</td>
</tr>
<tr>
<td></td>
<td>micro-grooves</td>
<td>standard grooves</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Stylus</strong></td>
<td>Sapphire (OFS 25)</td>
<td>Sapphire (OFS 65)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Diamond (OFD 25)</td>
<td>Diamond (OFD 65)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Tip radius</strong></td>
<td>25 ( \mu \text{m} )</td>
<td>65 ( \mu \text{m} )</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Stylus force</strong></td>
<td>approx. 5 g</td>
<td>approx. 9 g</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(Pick-up head is 4 g heavier than OF 25!)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- **Output level at 1 kHz**  
  (recorded velocity 1 cm/s)  
  - 0.8 mV \( \pm 2 \text{ dB} \)  
  - 0.6 mV \( \pm 2 \text{ dB} \)

- **Frequency range**  
  - 30 Hz – 15 kHz  
  - 30 Hz – 15 kHz

- **Frequency response**  
  - 40 Hz – 12.5 kHz \( \pm 2 \text{ dB} \)  
  - \( \pm 2 \text{ dB} \)

- **Frequency intermodulation**  
  - max. 0.5%  
  - max. 0.5%

- **DC-resistance**  
  - approx. 37 ohms  
  - approx. 25 ohms

**Note:** Stylus assemblies with sapphires are interchangeable.
2. "T" series (stereo and mono)  
(for use with stereo equalizer-amplifier EMT 155 st)

<table>
<thead>
<tr>
<th>Type</th>
<th>TSD 15</th>
<th>TMD 25</th>
<th>TND 65</th>
</tr>
</thead>
<tbody>
<tr>
<td>Application</td>
<td>Stereo</td>
<td>Mono</td>
<td>Mono</td>
</tr>
<tr>
<td></td>
<td>Stereo grooves</td>
<td>Micro-grooves</td>
<td>Standard grooves</td>
</tr>
<tr>
<td>Stylus</td>
<td>Diamond</td>
<td>Diamond</td>
<td>Diamond</td>
</tr>
<tr>
<td>Tip radius</td>
<td>15 μm</td>
<td>25 μm</td>
<td>65 μm</td>
</tr>
<tr>
<td>Stylus force</td>
<td>2 - 3 g</td>
<td>2 - 3 g</td>
<td>2 - 3 g</td>
</tr>
<tr>
<td>Output level at 1 kHz (for 1 cm/s recorded velocity)</td>
<td>0.15 mV +2 dB</td>
<td>0.15 mV +2 dB</td>
<td>0.15 mV +2 dB</td>
</tr>
<tr>
<td>Frequency range</td>
<td>20 Hz - 20 kHz</td>
<td>20 Hz - 20 kHz</td>
<td>20 Hz - 20 kHz</td>
</tr>
<tr>
<td>Frequency response 40 Hz - 12.5 kHz</td>
<td>+2 dB</td>
<td>+2 dB</td>
<td>+2 dB</td>
</tr>
<tr>
<td>Difference in output level between channels 40 Hz - 12.5 kHz</td>
<td>max. 2 dB</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Cross-talk at 1 kHz</td>
<td>min. 25 dB</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Type</td>
<td>TSD 15</td>
<td>TMD 25</td>
<td>TND 65</td>
</tr>
<tr>
<td>------------------</td>
<td>--------</td>
<td>--------</td>
<td>--------</td>
</tr>
<tr>
<td>Frequency</td>
<td>max. 0.5%</td>
<td>max. 0.5%</td>
<td>max. 0.5%</td>
</tr>
<tr>
<td>intermodulation (FIM)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vertical tracking angle</td>
<td>$15^\circ (\pm 2.5^\circ)$</td>
<td>$15^\circ (\pm 2.5^\circ)$</td>
<td>$15^\circ (\pm 2.5^\circ)$</td>
</tr>
<tr>
<td>DC-resistance</td>
<td>2 x 24 ohms</td>
<td>24 ohms</td>
<td>24 ohms</td>
</tr>
<tr>
<td>Compliance</td>
<td>$12 \times 10^{-6}$ cm/dyn</td>
<td>$12 \times 10^{-6}$ cm/dyn</td>
<td>$12 \times 10^{-6}$ cm/dyn</td>
</tr>
<tr>
<td>Equivalent mass at stylus tip</td>
<td>approx. 1 mg</td>
<td>approx. 1 mg</td>
<td>approx. 1 mg</td>
</tr>
</tbody>
</table>

**Note:** The stylus assemblies are not interchangeable.

The above data were obtained using the following test records:

- **Frequency response** - test records DIN 45 541 and QR 2007 (Mono), QR 2009 (Stereo)
- **Distortion** - test records DIN 45 542 Stereo and DGG 99 011 TM Mono

Distortion measurements correspond with test record DIN 45 542 Stereo with "reference level - 6 dB" full modulation (peak velocity 8 cm/s at 1 kHz) and with test record DGG 99 011 TM Mono track 4: full modulation (peak velocity 12 cm/s at 1 kHz).

**Cross-talk** - Test record DIN 45 543
Mono-and Stereo-Equalizer Amplifier
EMT155 and EMT155st

Equalization characteristics
(can be switched during operation)
DIN* 45 536/37 75/318/3180 µs mono and stereo
NAB, RIAA
DIN* 45 533 50/318/3180 µs mono
BBC 25/318/3180 µs
FLAT 0/318/3180 µs

Level variation by switching
less than 1 dB
at 1 kHz

Frequency response
40 Hz to 16 kHz
+ 1 dB
at 30 Hz
- 2 dB
at 12 Hz
-10 dB minimal damping
at 4 Hz
-30 dB descending with 20 dB/octave
below 4 Hz

Input
Level EMT 155
10 mV
Level EMT 155st
1 mV

Impedance
30 Hz to 16 kHz
140 to 200 ohms

Impedance of cartridges
max. 40 ohms

Overload capacity
referred to 1 mV at 1 kHz
12 dB

Output
Gain
at 1 kHz
75 dB (for T-type cartridges)
55 dB (for OF-type cartridges)

Level
matched load impedance
200 ohms + 6 dB (1.55 V)
600 ohms +12 dB (3.1 V)
600 ohms +15 dB (4.4 V)

Output level adjustable
from -60 dB
to +17.5 dB (600 ohms)

Source impedance
30 Hz to 16 kHz
40 ohms

Harmonic distortion (full load)
40 Hz
less than .4%
60 Hz
less than .3%
from 200 Hz to 12 kHz
less than .2%

*DIN refers to German standards.
Intermodulation distortion
(full load) less than 1.0%

test frequencies
50 Hz and 4 kHz
voltage ratio 4:1

Overload capacity
at 1% distortion and
matched load impedance
200 ohms +12 dB (3.1 V)
600 ohms +18 dB (6.2 V)

Signal-to-noise ratio
referred to 1.55 V output
input matched with 20 ohms
unweighted (r.m.s.) better than
weighted (peak) 60 dB
better than 70 dB

Cross-talk figure
(EMT 155st)
from 30 Hz to 16 kHz better than
referred to 4.4 V output 50 dB

Monitoring output
for headphones (300 to 400 ohms) unbalanced

Scratch filter
treble attenuation
(10 dB/octave)
cut-off frequencies adjustable from 2 kHz to 20 kHz

Supply of current
from the power supply of the professional turntables
EMT 927 and EMT 930

All technical specifications are guaranteed for the following
temperature range +5° to +50° Celsius

Dimensions
height 3.54" (90 mm)
width 4.13" (105 mm)
deepth 7.87" (200 mm)

Weight
approx. 3.3 lbs (1.5 kg)

All data subject to change without notice.
INFORMATION FOR ORDERING

Ordering description:

EMT 930 Professional turntable mono, prepared for stereo, turntable diameter 33 cm, chassis construction, turntable speeds 33 1/3, 45 and 78 r.p.m. with transistorized mono equalizer amplifier EMT 155 and one each pickup cartridge (Sapphire) EMT-OFS 25 and OPS 65.

EMT 930st Professional turntable, stereo, turntable diameter 33 cm, chassis construction, turntable speeds: 33 1/3, 45 and 78 r.p.m. with transistorized switchable stereo/mono equalizer amplifier EMT 155st and one stereo pickup cartridge TSD 15.

Standard accessories (supplied with machine):

1 pick-up cartridge TSD 15 (EMT 930 stereo),
1 pick-up cartridge OFS 25 (EMT 930 mono),
1 pick-up cartridge OFS 65 (EMT 930 mono),
1 AC mains cable with plugs,
1 eight-pole cable plug,
1 three-pole Tuchel plug,
1 spare rubber drive pulley with plastic cover,
1 bottle (50cc) of special oil, and small parts

Special accessories (to be ordered separately):

EMT 930-932 H Twin console (steel) for two machines EMT 930 any version, on castors, grey enameled.

EMT 424 Flutter Analyzer for weighted measurements in accordance with DIN 45 507 and IEC Doc. 60 A 12 and for measuring the tracking-distortion on disks (FIM).

EMT He-16 Single channel, direct recording, rapid pen recorder in a special version for use with the EMT 424.

TMD 25 Pickup cartridge with diamond, tip radius 25 \( \mu \text{m} \), for micro-grooves.

TND 65 Pickup cartridge with diamond, tip radius 65 \( \mu \text{m} \), for standard grooves.

OFD 25 Pickup cartridge with diamond, tip radius 25 \( \mu \text{m} \), for micro-grooves.

OFD 65 Pickup cartridge with diamond, tip radius 65 \( \mu \text{m} \), for standard grooves.

EMT 930-PC Dust Hood (transparent plastic) for EMT 930 all versions.

Packing:

Basic packing: Styropor in outer carton
70 x 56 x 50 cm (27.5 x 22 x 20'')
gross weight 25 kg (55 lb)
net weight 23 kg (51 lb)

For overseas shipment: crate with padded corners
92.5 x 77.5 x 66 cm (36.5 x 30.5 x 26'')
gross weight 65 kg (143.5 lb)
**RECOMMENDED SPARE PARTS**

The numbers quoted are intended for 5 years operation. Fractions indicate that we recommend one only spare part where several turntables are operated together. Example: 1/3 = 1 spare part for 3 machines.

<table>
<thead>
<tr>
<th>Description</th>
<th>Part No.</th>
<th>Recommended Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rubber intermediate wheel</td>
<td>7 927 052</td>
<td>2</td>
</tr>
<tr>
<td>Oil felt ring for intermediate wheel</td>
<td>4 312 111</td>
<td>1</td>
</tr>
<tr>
<td>Set of contact springs</td>
<td>4 223 006</td>
<td>1</td>
</tr>
<tr>
<td>Brake shoe</td>
<td>7 930 097</td>
<td>3</td>
</tr>
<tr>
<td>Pilot lamp</td>
<td>4 107 007</td>
<td>1</td>
</tr>
<tr>
<td>Auxiliary turntable</td>
<td>7 930 237 (50 Hz)</td>
<td></td>
</tr>
<tr>
<td>(Please indicate frequency!)</td>
<td>7 930 398 (60 Hz)</td>
<td>1/3</td>
</tr>
<tr>
<td>Braking disk with felt ring</td>
<td>7 930 411</td>
<td>2</td>
</tr>
<tr>
<td>Motor assembly</td>
<td>7 930 006 (50 Hz)</td>
<td></td>
</tr>
<tr>
<td>(Please indicate frequency and serial No.!)</td>
<td>7 930 012 (60 Hz)</td>
<td>1/5</td>
</tr>
<tr>
<td>Bulb for pick-up illumination</td>
<td>4 107 001</td>
<td>1</td>
</tr>
<tr>
<td>Neon bulb for strobe illumination</td>
<td>4 107 014</td>
<td>1/2</td>
</tr>
<tr>
<td>Bottle of oil</td>
<td>7 930 690</td>
<td>1</td>
</tr>
<tr>
<td>Relais</td>
<td>4 223 038</td>
<td>1/3</td>
</tr>
<tr>
<td>Spare pick-up, depending upon the type</td>
<td></td>
<td>2-5</td>
</tr>
<tr>
<td><strong>Precision fuse 500 mA</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>German version (220 V) 5Øx20 mm</td>
<td>4 190 005</td>
<td>2</td>
</tr>
<tr>
<td><strong>Precision fuse 1 A</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>German version (110 V) 5Øx20 mm</td>
<td>4 190 053</td>
<td>2</td>
</tr>
<tr>
<td><strong>Precision fuse 1 A</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>American version (110 V) 1/4&quot; x 1 1/4&quot;</td>
<td>4 190 050</td>
<td>2</td>
</tr>
</tbody>
</table>