

Level meter VU/PPM 30 LED and gain reduction meter 10 LED

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SCOPE OF VALIDITY

This manual applies to the following modules:

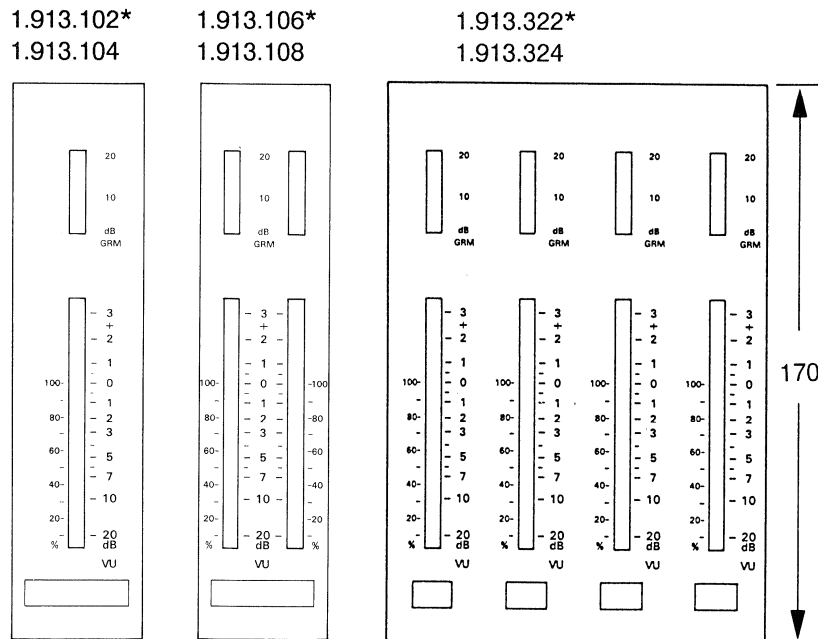
Display	1 Channel	2 Channels	4 Channels	PCB Nr.
PPM	1.913.101	1.913.105	1.913.321	1.913.295
VU	1.913.102	1.913.106	1.913.322	1.913.295
PPM / GRM	1.913.103	1.913.107	1.913.323	1.913.295/297
VU / GRM	1.913.104	1.913.108	1.913.324	1.913.295/297

VU / PPM 30 LED

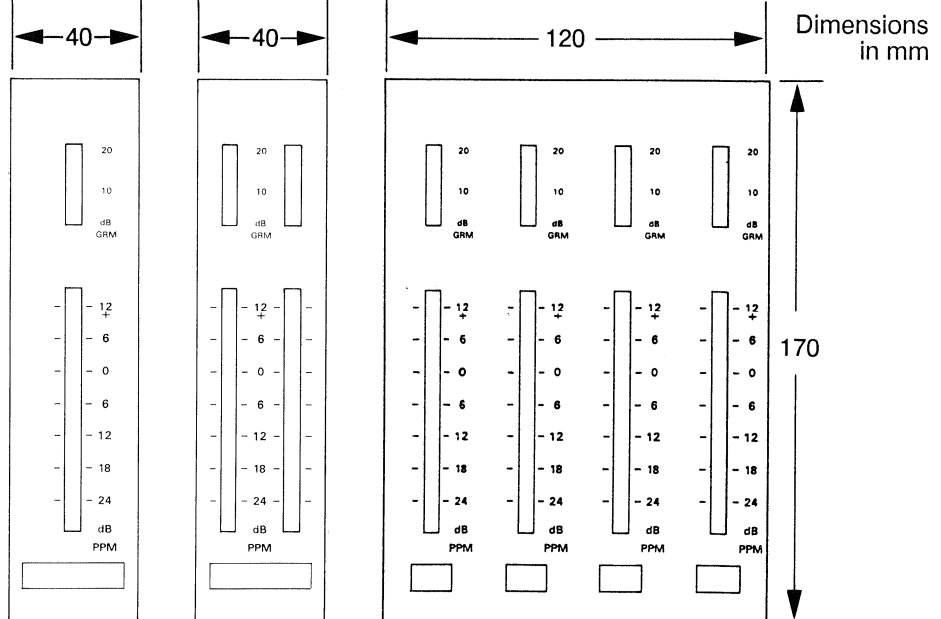
1. General

The **STUDER output meter VU-PPM 30 LED** has been developed for installation into the display panel of STUDER mixing consoles. Instruments with VU (volume unit) or PPM (peak program meter) characteristic are available. In place of the bar indication, an optional dot indication is available. The instruments listed below are equipped with the two PCBs 1.913.295 (VU/PPM) and 1.913.297 (GRM) corresponding to the table on page 1. The circuit diagram relating to the corresponding circuit board number should be consulted.

«Volume Unit Meters»



«Peak Program Meters»

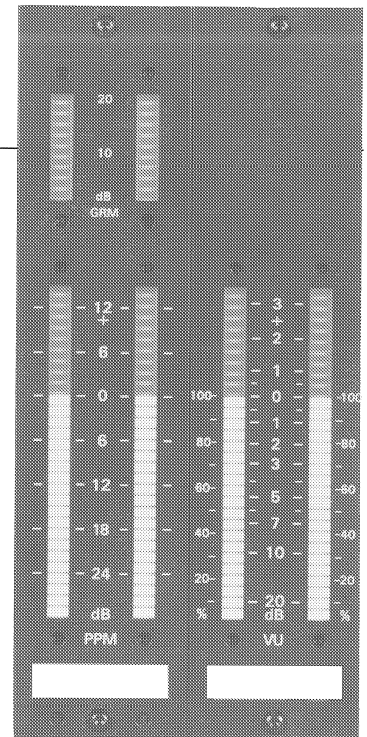


1.913.101*	1.913.105*	1.913.321*
1.913.103	1.913.107	1.913.323

* = Version without gain reduction meter (GRM)

2. Functional description

- PPM:** The peak program meter is a quasi-peak value instrument with a long release time. When a signal voltage corresponding to a level of 0 dB is applied for 10 ms, the resulting indication should be -1 dB. The desired decay time to -20dB is 1.7 s.
- VU-meter:** The VU-meter indicates signals according to the standard defined by ANSI 1954. When a signal with a duration of 300 ms is applied, the indication should be 99% of the reference value. The rise and decay time on the VU-meter are identical. The factory set lead is 6 dB.
- Gain reduction meter:** When the limiter/compressor is switched on, the GRM indicates the magnitude of the gain reduction.



3. Technical data

PCB 1.913.295

General:

$$0 \text{ dBu} \hat{=} 0.775 V_{\text{eff}}$$

Input sensitivity of the reference indication:	-1 dBu... +16 dBu		
Input impedance	> 10 k Ω		
Supply:	<u>DC \pm 15 V</u>	or	<u>DC +24 V</u>
Current consumption: Quiescent	45mA	/	35 mA
Medium load	58mA	/	56mA
Full load	80mA	/	80 mA

VU-meter:	Indicating range:	-20VU... +30VU
	Accuracy:	\pm 1 segment
	(precond.: -10VU... +3VU/0°...50°C/31.5Hz...16kHz)	
	Response time to -1VU:	207(\pm 30)ms

PP-meter:	Indicating range:	-30dBu... +15dBu
	Accuracy:	\pm 1 segment
	(precond.: -30dB... +15dB/0°...50°C/31.5Hz...16kHz)	
	Dynamic behavior:	
	Jumper normal: 0dB for 10 ms	\rightarrow indication: -1dB \pm 0.5dB
	Jumper normal: 0dB for 3ms	\rightarrow indication: -4dB \pm 1dB
	Jumper fast: 0dB for \sim 100 μ s	\rightarrow indication: 1dB
	Decay time 0...-20dB:	1.7(\pm 0.3)s

Circuit board sizes:	Height x depth, with connector:	96 mm x 95 mm
	Width:	18 mm
	Center between M3 mounting holes:	85.1 mm (3.35")

4. Block diagram

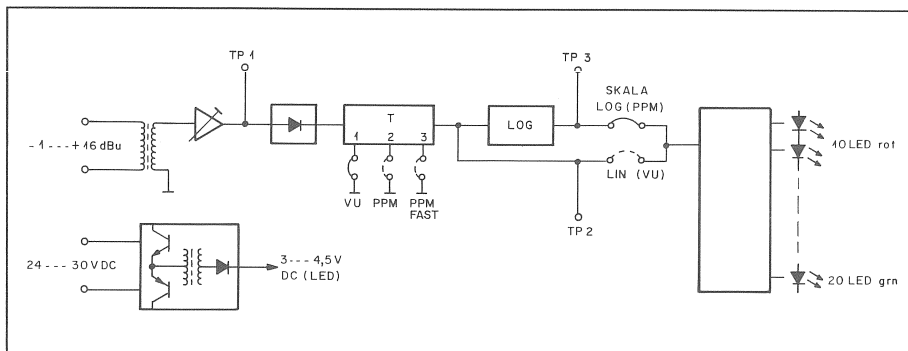


Fig. 2 VU-PPM block diagram: The settings VU/PPM/PPM fast or lin/log are established with the jumpers JS 1 and JS 2 respectively (see Fig. 3)

5. Alignment instructions VU/PP meter

PCB 1.913.295

Measuring instruments:

- AC voltmeter $R_i \geq 20 \text{ k}\Omega$
- DC voltmeter $R_i \geq 100 \text{ k}\Omega$, preferably digital VM
- Generator, 31.5Hz...16kHz, 0...16dBu; attenuator with 10dB increments.

Alignment elements

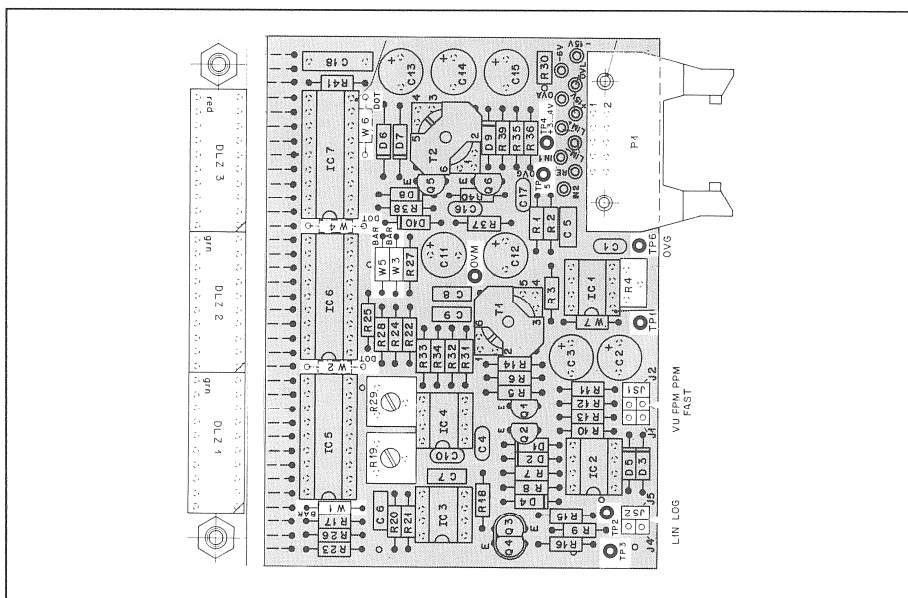


Fig. 3 Alignment elements of the VU/PPM 30 LED

Aligning the line level:

From the generator feed line level (-1dBu ... +16dBu) to the input. Align with R4 until all green LEDs are light and the red LEDs are still dark.
 [on TP3: 2.5(±0.1)V]

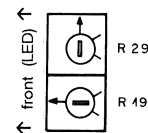
6. Maintenance instructions

PCB 1.913.295

Test input range: **Generator:** 1 kHz on input, level: -1dBu ... +16 dBu
AC VM: Hot to TP 1, cold to TP 6 (0V G)
 U_{TP1} adjustable with R4 to 290(±10)mV AC

Rectifier and indication: Both jumpers set to the VU/LIN position.
Generator: 1kHz with 0dBu level on input
 U_{TP1} : Adjust with R4 to 290(±2)mV AC. All green LEDs must be light.
DC VM: Hot to TP2, cold to TP6.
 $U_{TP2} = -380(±15)mV DC$
DC VM: Hot to TP3, cold to TP6
 $U_{TP3} = +2.575(±0.1)V DC$. All green LEDs are light.
Check: Adjust the generator level in such a way that:
 $U_{TP3} = +3.8(±0.1)V DC$. All diodes are light.
 $U_{TP3} = +0.17(±0.02)V DC$. Only the lowest green LED is light.

Logarithmation (PPM): Both jumpers are set to PPM/LOG.
Generator: 1kHz with +6dBu level on input.
Set U_{TP2} with R4 to 1.18(±0.05V) DC.
The two trimmers have the following basic setting:

**Alignment procedure:**

DC VM: hot to TP3, cold to TP6.

A: Align the upper value with R19. Desired: $U_{TP3} = 3.06(±0.10)V$.
All green LEDs and 4 red LEDs are light. Indication +6dB.

B: Attenuation by 30 dB with attenuator.

C: Align the lower value with R29. Desired: $U_{TP3} = 0.56(±0.02)V$.
4 green LEDs are light. Indication -24 dB

Repeat the procedure A → B → C → A → ... several times.

DC/DC converter: To check, connect the DC VM hot to TP4, cold to TP5. Generator with line level on input causes all green LEDs to light.
Supply voltage: +24 V DC →TP4 = 3.1(±0.1)V
 +30 V DC →TP4 = 4.1(±0.1)V

7. Gain reduction meter

PCB 1.913.297

Connecting the GRM:

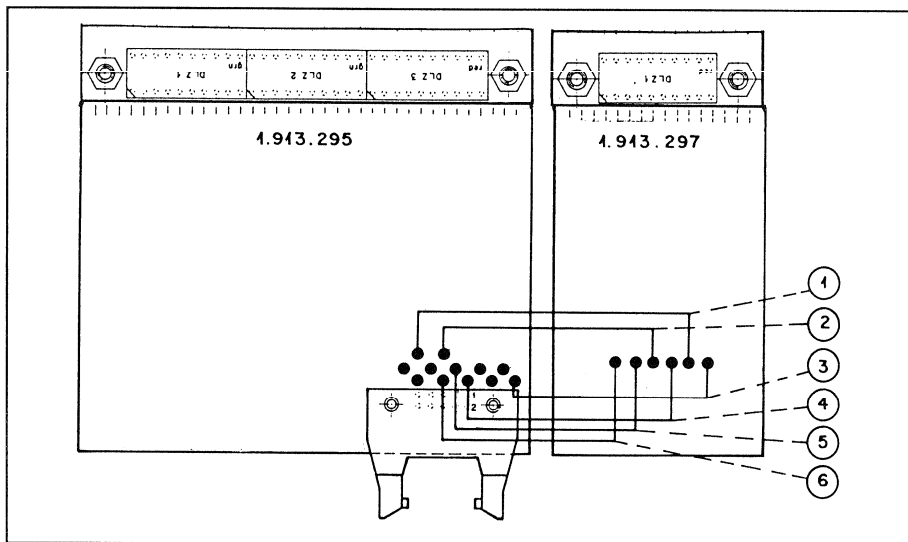


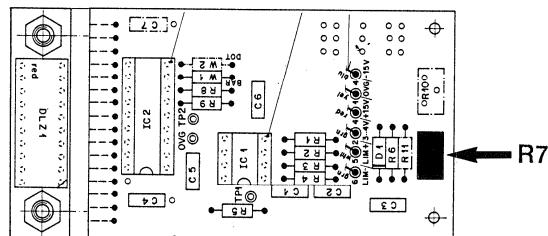
Fig. 4 Connection GRM - VU/PPM.

Conductor assignment of the connection cable:

	Color	Signal
1	yellow	0 VG
2	green	+3... +4,5 V
3	blue	- 15 V
4	red	+ 15 V
5	white	LIM +
6	grey	LIM -

Aligning the GRM:

- Limiter switched off
- Feed a test signal via an input channel. Set the level on the master output to nominal level + 20 dB.
- Switch on the limiter
- Align with R7 to a GRM indication of + 20 dB.



Technical data:

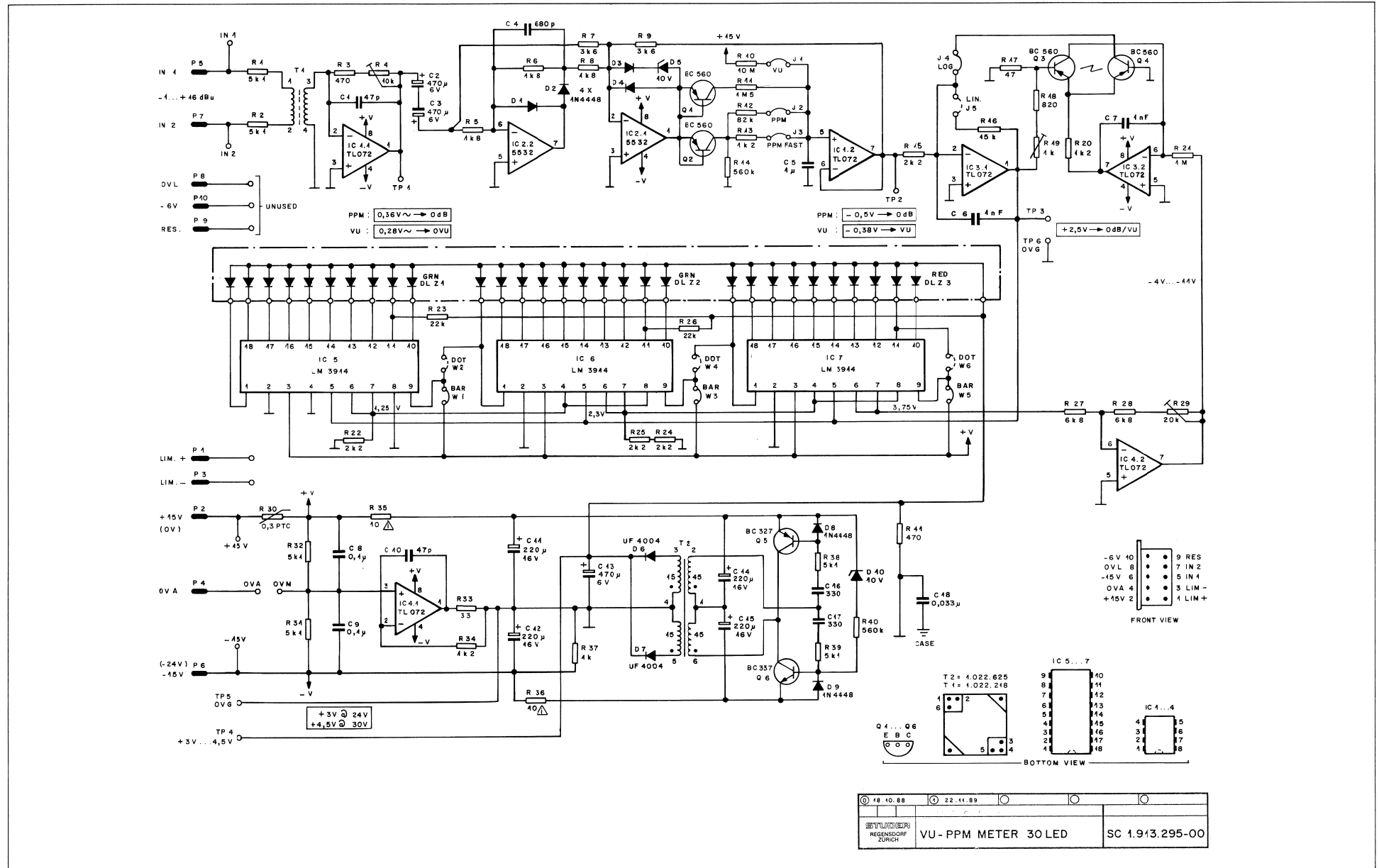
Supply The GRM indicator is supplied by the switching regulator of the basic unit 1.913.295: 24 ... 30 VDC.
 Current consumption: quiescent 10mA
 full load 25mA

Indication Voltage range: min. control 0V ... +2V DC
 max. control 0V ... +11V DC

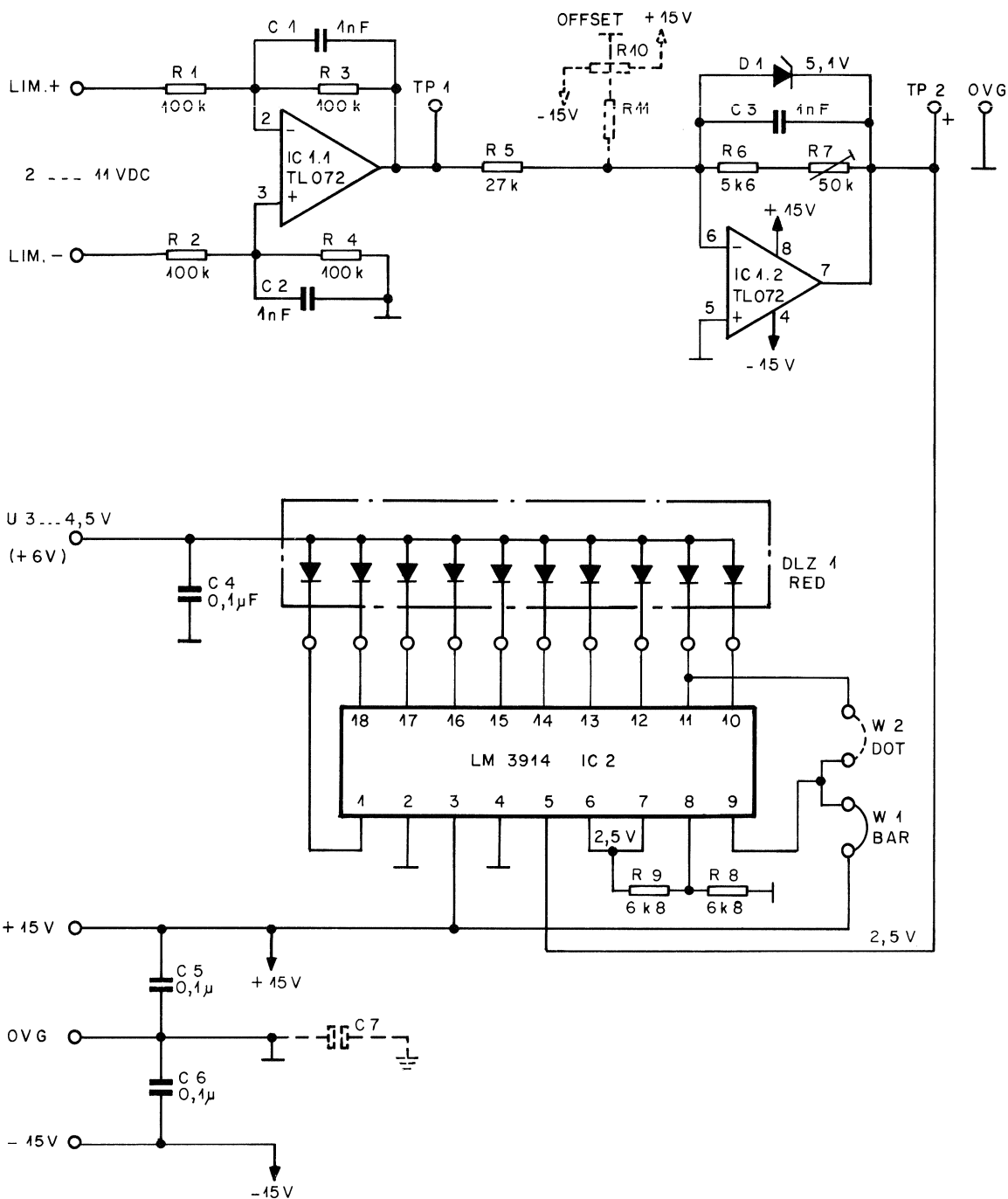
Circuit board dimensions: Height x depth: 45 mm x 85 mm
 Width: 18 mm
 Center between M3 mounting holes: 39.4 mm (1.55")

8. Diagrams / Schemata

VU- / PP - Meter 30 LED 1.913.295.00



Gain Reduction Meter 1.913.297.00

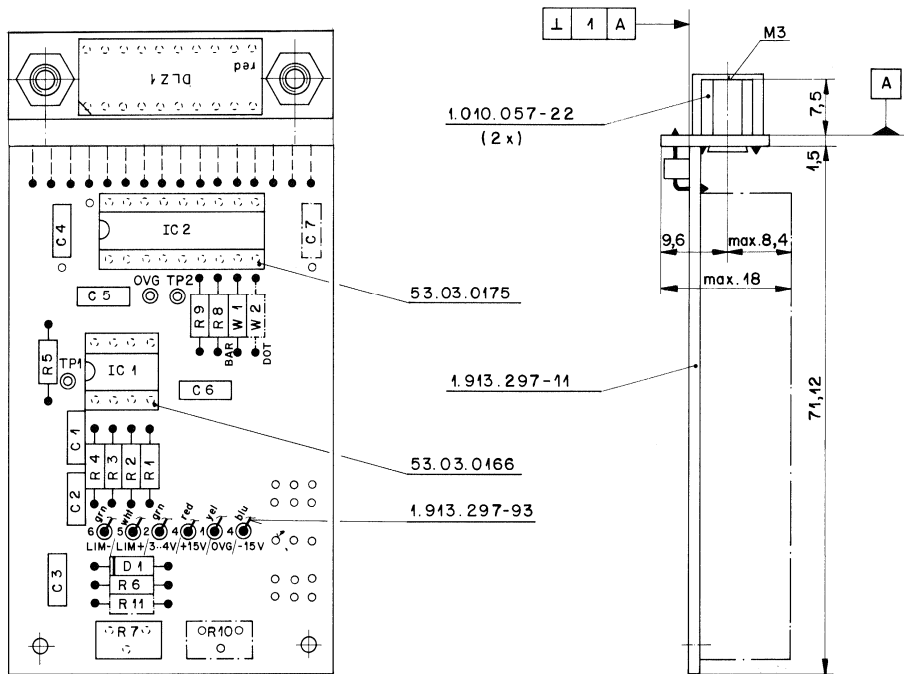


SPECIFICATIONS : UNIT WILL SUPPLIED BY VU/PPM METER 1.913.295.00 / 24V... 30V
 CURRENT WILL INCREASE BY → IDLE : 10mA / LOAD : 25mA

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STUDER REGENSDORF ZÜRICH	GRM METER 10 LED	SC 1.913.297.00	

VU / PPM 30 LED

Gain Reduction Meter 1.913.297.00



Schilder 1.913.297-04 / 43.01.0108
aufgeklebt nach Fabrikationsmuster.

IND.	POS.NO.	PART NO.	VALUE	SPECIFICATIONS / EQUIVALENT	MANUF.	IND.	POS.NO.	PART NO.	VALUE	SPECIFICATIONS / EQUIVALENT	MANUF.
C...	01	59.06.5102	1 nF	5% PE							
C...	02	59.06.5102	1 nF	5% PE							
C...	03	59.06.5102	1 nF	5% PE							
C...	04	59.06.0104	0.1 uF	PE							
C...	05	59.06.0104	0.1 uF	PE							
C...	06	59.06.0104	0.1 uF	PE							
D...	01	50.04.1112	ZPD 5.1	V 5W 5.1V SI	any						
DLZ...	01	50.04.2150	10 LED	DISPLAY RED	HP						
IC...	01	50.09.0101	TL 072	dual op. amp.	NS, TI						
IC...	02	50.11.0119	LM3914	led bar/dot lin.	NS						
MP...	01	1.913.297.11	1 pcs	GRM METER 10 LED PCB	St						
MF...	02	1.010.057.22	2 pcs	Hexagon post NSM7.4							
MF...	03	53.03.0166	1 pcs	8-pin IC-socket							
MF...	04	53.03.0175	1 pcs	18-pin IC-socket							
MF...	05	54.11.0132	16 pcs	connection							
MF...	06	54.02.0471	9 pcs	plug (Rund - Steckstift)							
MF...	07	1.913.297.93	Li-Li	6 cable connections	St						
R...	01	57.11.3104	100 kOhm	1% 0.25W							
R...	02	57.11.3104	100 kOhm	1% 0.25W							
R...	03	57.11.3104	100 kOhm	1% 0.25W							
R...	04	57.11.3104	100 kOhm	1% 0.25W							
(00) R...	05	57.11.3473	47 kOhm	0.25W							
(01) R...	05	57.11.3273	27 kOhm	0.25W							
(00) R...	06	57.11.3103	10 kOhm	0.25W							
(00) R...	06	57.11.3562	5.6 kOhm	0.25W							
R...	07	58.01.9503	50 kOhm	10% 0.50W trim							
R...	08	57.11.3682	6.8 kOhm	1% 0.25W							
R...	09	57.11.3682	6.8 kOhm	1% 0.25W							
W...	01	57.11.3000		Wire link BAR, W2 DOT							

ORIG 88/10/31 (01) 89/11/22