

**FLUKE®**

**Fluke 54100 Video Signal Generator  
Fluke 54200 TV Signal Generator**



**The purest signals, the widest choice**



## It's all you need for accurate multi-standard video and TV signal testing

Meet the 54000 Series from Fluke, a range of easy to use instruments to test TVs, VCRs, set top boxes and other video equipment. According to any video standard. And with today's widest choice of highly accurate signals.

### Covers all video standards

- Meets CCIR, EBU, FCC, ITU and EIA analog television standards
- More than 500 digitally generated test patterns for PAL, NTSC and SECAM, including 16:9 and 4:3 aspect ratios
- High precision setting and indication for video, chrominance and RF amplitudes
- Very stable RF terrestrial output with internal/external modulation, group delay pre-correction and a level up to 100 mV

### Two models

There are two compact models in the series. The Fluke 54100 Video Signal Generator is the obvious choice for testing video circuitry. The Fluke 54200 TV Signal Generator offers additional sound test signals and a highly stable RF output, making it ideal for complete testing of TV sets, VCRs or other related equipment. Both models offer selectable TV standards (PAL, NTSC, SECAM), text functions and a choice of signal outputs. You can choose from a number of readily available pre-configurations, or select an instrument that precisely matches your testing requirements, specifying options from a range of stereo sound, data services and interface functions. You'll find all details on the separate option and ordering information inserts.

### All applications

The digitally generated test signals of the Fluke 54000 Series comply with the recommendations of the CCIR, EBU, FCC, ITU and EIA standards for analog television. This versatility, combined with the high signal quality (stability and purity) makes them ideal for testing TV receivers, VCRs, camcorders, observation systems and set-top decoder boxes, and also for checking the performance of individual sub-assemblies or components used in these products.

### Easy to Use

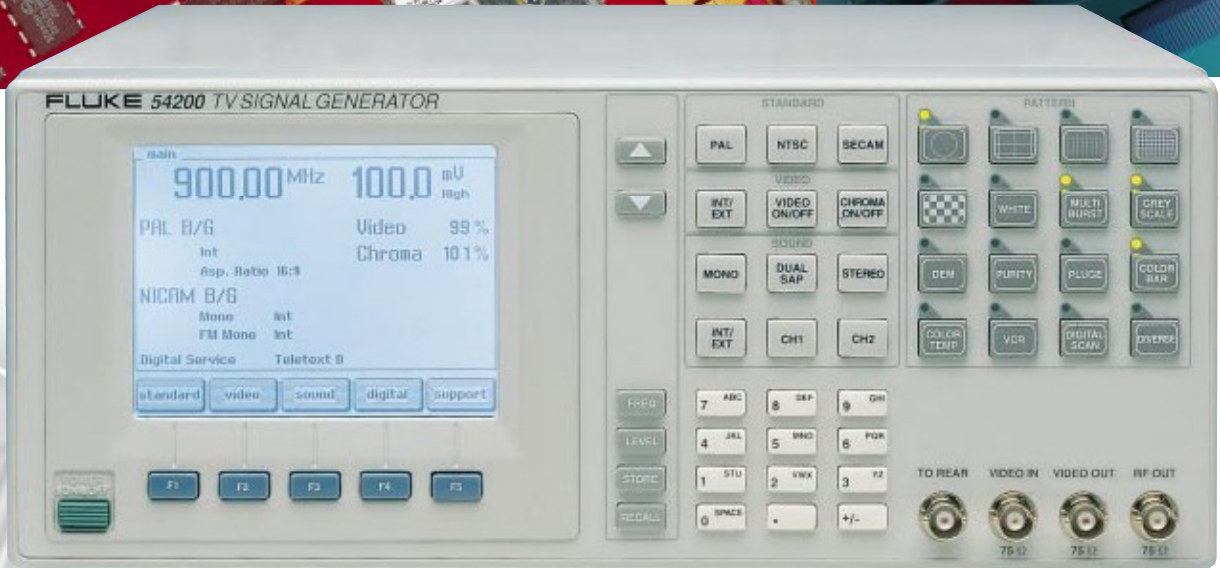
These generators are excellent examples of Fluke's reputation for easy-to-use instruments:

- Select the main functions directly on the front-panel keyboard. More advanced functions can be accessed using soft keys and the large LCD (Liquid Crystal Display) with its familiar graphical interface.
- Accurately set luminance and chrominance amplitudes with the up and down keys or the numerical keyboard.
- Store up to 99 different test situation settings for later instantaneous recall.
- Finally, to make it even more convenient, a number of country specific settings have been pre-programmed. Just think of the time this will save you.

### Just what you need

Whether you work in development, production, quality assurance, installation, maintenance or repair, there's always a model to suit your needs, thanks to the standard capabilities of these instruments, together with the range of options. Their ease of use and compact size makes them ideal, both for personal use on the bench and for use by a group of engineers. Need to make automated measurements? It's simple with the Fluke 54000 Series, as you can remotely control *all* functions via the optional combined IEEE-488 (GPIB) and RS-232 interface.





#### Multi or single standard

The Fluke 54100 Video Signal Generator and the Fluke 54200 TV Signal Generator are available with PAL, NTSC and/or SECAM video standard options. You can select any combination of these standards to create a single, double or triple standard unit. The appropriate sub standards (system B, D, G, I, K, K1, L, M or N) are enabled automatically.

#### Wide range of patterns

The Fluke 54000 Series are today's most versatile generators. On all models you will find the test patterns and capabilities you'll need to test and align the total video signal path. There are over 500 test patterns – for calibrating geometry (in 4:3 and 16:9 aspect ratios), synchronization, focusing, static and dynamic convergence. You'll find signals for checking bandwidth, interference (such as cross-color), amplitude response, tracking and clipping. As well as for color reproduction, cut-off setting, high-voltage stability, analog-to-digital conversion, and much more. And your test results will always be reliable, as all test patterns are digitally generated to ensure high stability and precise timing.

#### Stable RF output (Fluke 54200 only)

You need to do tuner and IF tests? The terrestrial output on the Fluke 54200 TV Signal Generator is just what you need. Its highly stable signal covers the entire RF frequency range from 32 to 900 MHz. And you can set the frequency directly with 50 kHz resolution. For fast and precise reference, you can enter the amplitude either in mV or dB $\mu$ V and the maximum output level is as high as 100 mV for the entire bandwidth. Group delay pre-correction, also known as group delay filtering, allows you to test applications that need accurate luminance and chrominance timing.

**Technical Specifications**



Fluke 54100 Video Signal Generator



Fluke 54200 TV Signal Generator

**OUTPUTS**

**CVBS VIDEO**

Voltage (V<sub>pp</sub> in 75Ω): 1V (nominal setting)  
 Setting range: 0 to 1.5V  
 Tolerance: 5%, 2% for nominal setting at reference temperature  
 Resolution: 10 mV  
 Impedance: 75Ω  
 Polarity: Positive, negative  
 Coupling: DC

**CVBS SYNC, LINE SYNC and FIELD SYNCHRONISATION**

Voltage (V<sub>pp</sub> in 75Ω): 2V  
 Tolerance: 0.3V  
 Impedance: 75Ω  
 Polarity: Negative  
 Coupling: DC

**EURO AV CONTROL VOLTAGES**

Aspect Ratio: Automatically or off  
 Fast Blanking: Automatically or off

**TERRESTRIAL RF CARRIER (54200 only)**

Frequency: 32 to 900 MHz  
 Tolerance: 10 kHz  
 Resolution: 50 kHz  
 Spectral purity: ≤ -60 dBc inside actual TV channel  
 ≤ -30 dBc outside actual TV channel  
 Voltage (V<sub>rms</sub> in 75Ω): 100 mV for high range  
 10 mV for low range  
 Attenuation: 0 to 80 dB for high range  
 0 to 60 dB for low range  
 Readout: mV, dBμV  
 Resolution: 0.01 mV for voltage ≤ 10 mV  
 0.1 mV for voltage > 10 mV  
 1 dB for dBμV indication  
 Tolerance: 3 dB  
 Flatness: ≤ 2 dB for 32 to 900 MHz  
 Impedance: 75Ω  
 Modulation: Double sideband AM  
 Internal, external  
 Group delay: 2 different types (or off)

**INPUTS**

**VIDEO IN (54200 only)**

Voltage (V<sub>pp</sub>): 1V (nominal)  
 Impedance: 75Ω  
 Polarity: Positive  
 Coupling: DC

**VIDEO**

**SYNCHRONISATION**

Reference: CCIR Rep. 624-4, 1990  
 ANSI/ SMPTE 170M-1994  
 System: 625 lines (50 Hz)  
 525 lines (59.94 Hz)  
 Line frequency: 15.625 kHz for 625 line system  
 15.734265 kHz for 525 line system  
 Tolerance: 3 ppm for +5 to +45 °C  
 1 ppm at reference temperature  
 Aging: ≤ 2 ppm per year  
 Level: -43% for 625 line system  
 -40 IRE for 525 line system  
 Tolerance: 3% for 625 line system  
 3 IRE for 525 line system

**LUMINANCE**

Reference: CCIR Rep. 624-4, 1990  
 ANSI/ SMPTE 170M-1994  
 Blanking level: 0% (0 IRE)  
 Black level: 0% for 625 line system  
 +7.5 IRE for 525 line system  
 White level: 100% (100 IRE)  
 Tolerance: 2% for 625 line system  
 2 IRE for 525 line system

**CHROMINANCE**

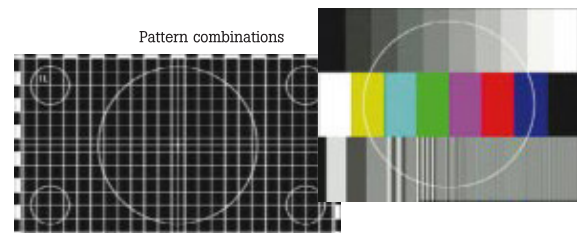
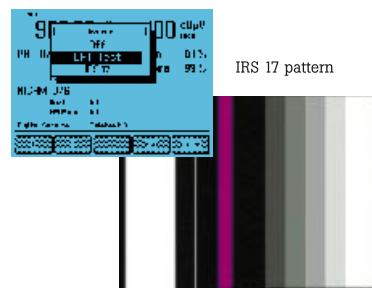
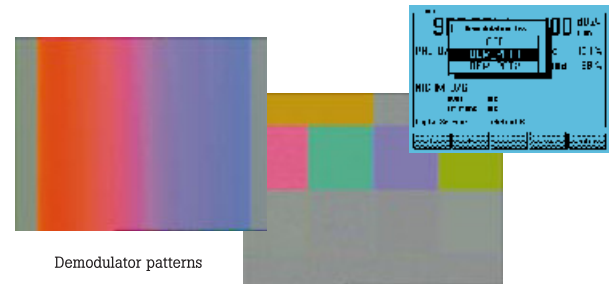
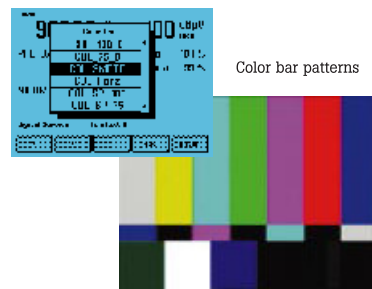
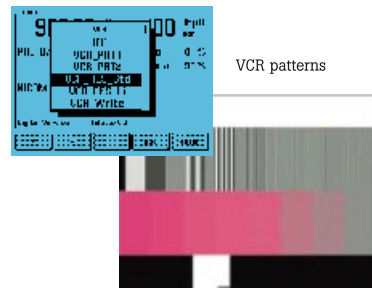
Reference: CCIR Rep. 624-4, 1990  
 ANSI/SMPTE 170M-1994  
 System: PAL B, D, G, I, K, M, N  
 NTSC M  
 NTSC with 4.433619 MHz  
 SECAM B, D, G, K, K1, L  
 4.433619 MHz for PAL B, D,  
 G, I, K and NTSC 4.43  
 3.575611 MHz for PAL M  
 3.582056 MHz for PAL N  
 3.579545 MHz for NTSC M  
 4.406250 and  
 4.250000 MHz for SECAM  
 Carrier frequency: 3 ppm for +5 to +45 °C  
 1 ppm at reference  
 temperature  
 Tolerance: ≤ 2 ppm per year  
 Aging: ≤ 2 ppm per year  
 Phase tolerance (PAL/NTSC): 2°, 1° at reference temperature  
 Level: 100% (nominal setting)  
 Setting range: 0% to 150%  
 Resolution: 1%

*Values stated without tolerances are typical values*

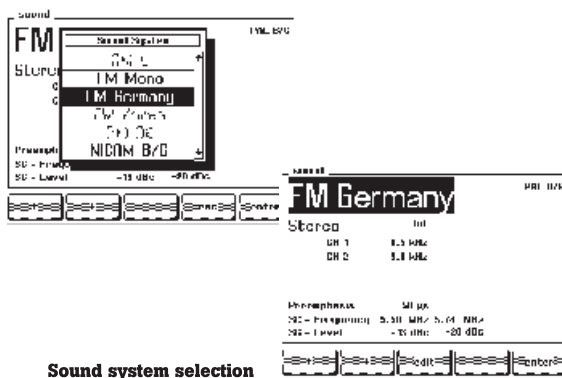
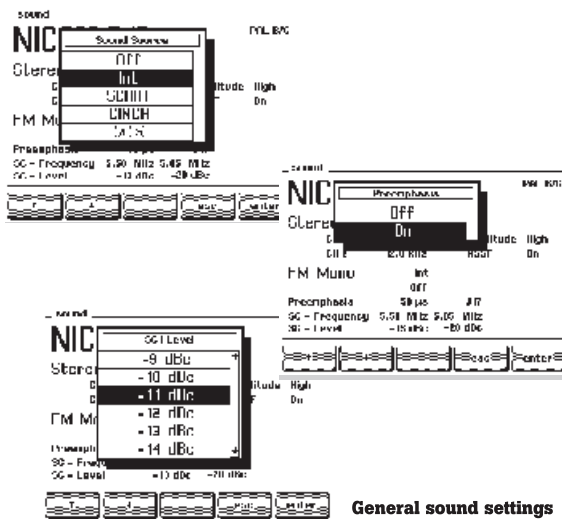
# Technical Specifications (cont.)

## PATTERNS

- Reference: ITU Rec. 471-1/1994 and SMPTE EG27-1994 for color bar  
SMPTE EG1-1990 for SMPTE color bar  
CCIR Rec. 473-5, 1990 and  
CCIR Rec. R26-1981 for IRS 17  
CCIR Rec. 473-5, 1990 for multi burst  
CCIR Rep. 1221 for PLUGE
- Aspect ratio: 4:3, 16:9
- Circle: 4 additional circles in 16:9 mode
- Center cross: With border castellations (overscan indication selectable between 2% or 3%)
- White: 0, 5, 15 to 100% (5% steps) for 625 line system  
7.5, 15 to 100 IRE (5 IRE steps) for 525 line system
- Purity: Red, green, blue, cyan, magenta, yellow, white, black (100/0/75/0 for 625 line system and 100/7.5/75/7.5 for 525 line system)
- Dots: 17x13 dots in 4:3 mode, 23x13 dots in 16:9 mode  
With center indication
- Crosshatch: 18x14 lines in 4:3 mode, 24x14 lines in 16:9 mode  
With center and top/left indication (selectable)
- Checkerboard: 12x9 squares in 4:3 mode, 16x9 squares in 16:9 mode
- PLUGE: -1.6, 0, 1.6, 100% for 625 line system  
4.8, 7.5, 10.7, 100 IRE for 525 line system
- Grey scale: 10 steps linear staircase
- VCR: VCR test (2 types)  
Resolution test (2 types)  
Writing current
- Multi burst: 0.5, 1.0, 2.0, 4.0, 4.8, 5.8 MHz for 625 line system  
0.5, 1.0, 2.0, 3.0, 3.58, 4.2 MHz for 525 line system
- Digital scan: With time intervals  
ADC check (2 types)  
Moving block
- Color bar: Progressive scan check (3 types)  
75/0/75/0, 100/0/75/0, 75/0/100/25, 100/0/100/25 for 625 line system  
75/7.5/75/7.5, 100/7.5/75/7.5 for 525 line system  
SMPTE color bar  
Horizontal color bar (75/0/75/0 for 625 line system and 75/7.5/75/7.5 for 525 line system)
- DEM: Demodulator test (2 types)
- Color temperature: 3 different sizes with adjustable levels for center and border
- Diverse: EHT test (Reference rectangle with switching white/black window)  
IRS 17 (Available as full field test pattern as well as reference line 17, only for 625 line system)
- Pattern combination: Circle with every other pattern (except progressive scan) or combination  
Center cross / crosshatch / dots / purity  
Grey scale / white / multi burst / color bar



## That sounds just right....



### Push-button mono sound test signals

To help you test the mono sound capabilities of TV receivers and VCRs, standard audio test signals are available with every selected stereo sound option on the Fluke 54200 TV Signal Generator. Several tone frequencies allow you to test the complete path for audio sound. Operation is simple, as you can select the main sound test functions directly on the front panel. More specific settings, such as sound carrier level, frequency and pre-emphasis, can be modified via soft keys.

### Multi-system analog stereo

The analog stereo option supports various two-carrier analog stereo systems, including BG, A2 and Mk stereo. The B and G stereo systems are often referred to as German or 'Zweiton' stereo. A2 stereo is used in combination with both SECAM and PAL television standards. It is transmitted in several eastern European countries and is also known as PAL/SECAM system DK stereo. Mk is a two-carrier NTSC stereo sound system and is used in Korea. For all these two-carrier stereo systems, the analog stereo option generates the appropriate pilots and delivers tone frequencies in mono, stereo or dual mode. Tone frequencies of 0.5, 1.0 and 3.0 kHz are included and for system M and N the lowest frequency is 0.3 kHz. Using these analog sound functions, you can test a variety of audio parameters, such as channel separation, signal to noise and harmonic distortion. All signals are generated digitally, to ensure high signal stability and purity.

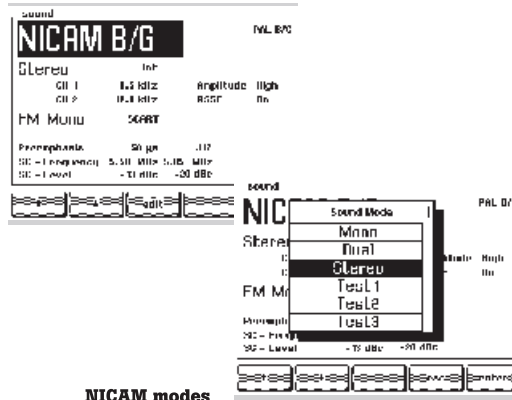
- Analog stereo containing German, Korean and DK stereo
- NICAM stereo
- BTSC sound test signals (MTS Stereo plus SAP)

**Versatile NICAM digital sound**

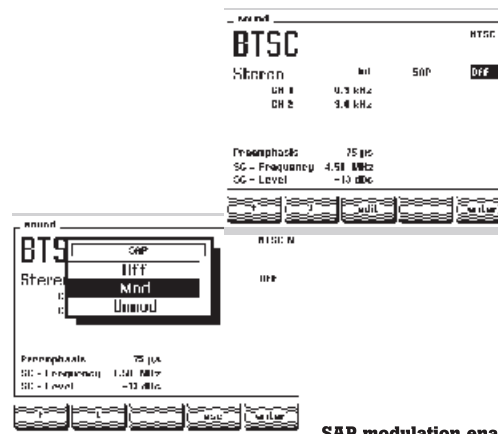
If you need digital sound capabilities, you should specify this option. NICAM, also available in SECAM, is compatible with the existing PAL terrestrial TV and cable TV standards, and adds two high-quality digital sound channels. Suitable TV sets can receive two mono channels (this is called dual channel) for simultaneous translation of foreign-language programs, stereo signals or transparent transmission of data. The option provides mono, stereo and dual tone modes to check the digital sound performance. For channel 1, tone frequencies of 0.5, 1.0, 1.5 and 3.0 kHz are available, while you can modulate channel 2 with a signal frequency of 1.0, 1.5, 3.0 and 12 kHz. Both digital sound channels have selectable low- or high-amplitude signals to test the NICAM expander of the TV receiver. You can check the operation of the QPSK demodulator and NICAM decoder with three special test signals. You can also use these to perform a level adjustment or measurement. A high/low selectable RSSF (Reserve Sound Switching Flag) indicates that the analog (mono) and digital sound carriers are transmitting different information, or that there are errors in the digital transmission.

**BTSC sound (MTS Stereo plus SAP)**

In combination with NTSC and PAL TV standards, this sound option generates BTSC sound signals or Multi channel Television Sound (MTS). Apart from mono and stereo sound, a Second Audio Program (SAP) is also available. You can select various test tone frequency (0.3, 1.0 and 3.0 kHz) and mode combinations, as well as special test signals. These special test signals give you an easy functional test for channel separation, signal to noise ratio, level gaining and harmonic distortion of the stereo and SAP decoders. All sound signals are digitally generated which ensures high stability, and they are available both at the RF output or, via baseband processing, at the precision MPX output.



NICAM modes



SAP modulation enabling

## Technical specifications

### OUTPUTS SOUND CARRIER

|                                   |   |
|-----------------------------------|---|
| Voltage (V <sub>pp</sub> in 50Ω): | 142 mV for mono carrier and system B, G<br>200 mV for mono carrier and system D, I, K, K1, L, M, N<br>63.2 mV for stereo and NICAM (system B, D, G, I, K) carrier<br>28.3 mV for NICAM (system L) carrier |
| Setting range:                    | 112.5 to 356 mV for mono carrier<br>28.3 mV, 35.6 mV, 63.2 mV for stereo and NICAM carrier  |
| Tolerance:                        | 2 dB  |
| Resolution:                       | 1 dB  |
| Impedance:                        | 50Ω   |
| Connector:                        | BNC rear  |

### AUDIO and EURO AV

|   |                          |
|---|--------------------------|
| Voltage (V <sub>rms</sub> in open circuit): | 500 mV                   |
| Tolerance:                                  | 5%                       |
| Impedance:                                  | 600Ω                     |
| Connector:                                  | Cinch rear, EURO AV rear |

### BTSC MPX and FM STEREO PILOT

|   |          |
|---|----------|
| Voltage (V <sub>rms</sub> in open circuit): | 550 mV   |
| Tolerance:                                  | 5%       |
| Impedance:                                  | 600Ω     |
| Connector:                                  | BNC rear |

### NICAM DATA and NICAM CLOCK

|                                   |   |
|-----------------------------------|---|
| Frequency:                        | 728 kHz   |
| Tolerance:                        | 3 ppm for +5 to +45°C<br>1 ppm at reference temperature<br>≤ 2 ppm per year |
| Aging:                            |   |
| Voltage (V <sub>pp</sub> in 50Ω): | 1V  |
| Tolerance:                        | 10%   |
| Impedance:                        | 50Ω   |
| Connector:                        | BNC rear  |

### INPUTS

#### AUDIO, EURO AV and MTS

|                              |                                    |
|------------------------------|------------------------------------|
| Voltage (V <sub>rms</sub> ): | 500 mV (nominal)                   |
| Impedance:                   | 0.1 MΩ                             |
| Connector:                   | Cinch rear, EURO AV rear, BNC rear |

### MONO SOUND CARRIER

|                |  |
|----------------|--|
| Frequency:     | 4.5 MHz for system M, N<br>5.5 MHz for system B, G<br>6.0 MHz for system I<br>6.5 MHz for system D, K, K1, L |
| Tolerance:     | 3 ppm for +5 to +45°C<br>1 ppm at reference temperature<br>≤ 2 ppm per year                                  |
| Aging:         |  |
| Level:         | -13 dBc for system B, D, G, K, K1<br>-10 dBc for system I, L, M, N   |
| Setting range: | -5 to -15 dBc  |
| Tolerance:     | 2 dB at reference temperature  |
| Resolution:    | 1 dB   |

### MODULATION

|                   |  |
|-------------------|--|
| Frequency:        | 0.5, 1.0, 3.0 kHz for system B, D, G, I, K, K1, L<br>0.3, 1.0, 3.0 kHz for system M, N<br>FM for system B, D, G, I, K, K1, M, N<br>AM for system L |
| Type:             |  |
| Deviation:        | 27 kHz for system B, D, G, I, K, K1<br>13.5 kHz for system M, N  |
| Tolerance:        | 5%   |
| Pre-emphasis:     | 50 μs for system B, D, G, I, K, K1<br>75 μs for system M, N  |
| Modulation depth: | 54% for system L   |

### STEREO SOUND CARRIER 1

|       |         |
|-------|---------|
| Data: | As Mono |
|-------|---------|

### SOUND CARRIER 2

|                |  |
|----------------|--|
| Frequency:     | 5.7421875 MHz for system B, G<br>6.2578125 MHz for system D, K (A2)<br>4.724 MHz for system Mk |
| Tolerance:     | 3 ppm for +5 to +45°C<br>1 ppm at reference temperature<br>≤ 2 ppm per year                    |
| Aging:         |  |
| Level:         | -20 dBc  |
| Setting range: | -20, -25, -27 dBc  |
| Tolerance:     | 3 dB at reference temperature  |

### MODULATION

|               |  |
|---------------|--|
| Frequency:    | 0.5, 1.0, 3.0 kHz for system B, D, G, K<br>0.3, 1.0, 3.0 kHz for system Mk<br>FM |
| Type:         |  |
| Deviation:    | 27 kHz for system B, D, G, K<br>13.5 kHz for system Mk                           |
| Tolerance:    | 5%   |
| Pre-emphasis: | 50 μs for system B, D, G, K<br>75 μs for system Mk                               |



## Technical specifications (cont.)

### **IDENTIFICATION**

Reference: CCIR Rec. 707  
 Frequency:  $f_{\text{H}}$  / 133 for stereo and system B, D, G, K  
 $f_{\text{H}}$  / 105 for stereo and system M  
 $f_{\text{H}}$  / 57 for dual  
 Tolerance: 3 ppm for +5 to +45°C  
 1 ppm at reference temperature  
 Aging:  $\leq 2$  ppm per year  
 Type: AM  
 Modulation depth: 50%  
 Tolerance: 5%

### **NICAM STEREO SOUND CARRIER 1**

Data: As Mono

### **SOUND CARRIER 2**

Frequency: 5.85 MHz for system B, D, G, K, L  
 6.875 MHz for system D, K  
 6.552 MHz for system I  
 Tolerance: 3 ppm for +5 to +45°C  
 1 ppm at reference temperature  
 Aging:  $\leq 2$  ppm per year  
 Level: -20 dBc for system B, D, G, I, K  
 -27 dBc for system L  
 Setting range: -20, -25, -27 dBc  
 Tolerance: 3 dB at reference temperature

### **MODULATION**

Reference: NICAM-728  
 CCITT Rec J17  
 Frequency: 0.5, 1.0, 1.5, 3.0 kHz for channel 1  
 1.0, 1.5, 3.0, 12 kHz for channel 2  
 Demodulator pattern  
 Decoder pattern  
 Unmodulated carrier  
 Type: QPSK  
 Mode: Mono, Dual, Stereo, Test  
 Bit-rate: 728 kbits/s  
 Tolerance: 3 ppm for +5 to +45°C  
 1 ppm at reference temperature  
 Aging:  $\leq 2$  ppm per year  
 Level: High, low  
 RSSF: On, off

### **BTSC STEREO SOUND CARRIER**

Frequency: 4.5 MHz for system M, N  
 Tolerance: 3 ppm for +5 to +45°C  
 1 ppm at reference temperature  
 Aging:  $\leq 2$  ppm per year  
 Level: -10 dBc  
 Setting range: -5 to -15 dBc  
 Tolerance: 2 dB at reference temperature  
 Resolution: 1 dB

### **MODULATION**

Frequency: 0.3, 1.0, 3.0 kHz for channel 1  
 1.0, 3.0 kHz for channel 2 (3.1 and 8.0 kHz in Test modes)  
 5.0 kHz for SAP (0.3 and 1.0 kHz in Test modes)  
 Type: FM with BTSC base band  
 Base band: Main channel  
 Identification pilot  
 Stereo sub channel  
 SAP sub channel  
 Base band type: FM modulated (BTSC compressed) for stereo sub channel  
 AM modulated with suppressed carrier (BTSC compressed) for SAP subchannel  
 Mode: Mono, stereo, SAP  
 Tolerance: 5%  
 Pre-emphasis: 75  $\mu$ s

### **IDENTIFICATION**

Frequency:  $f_{\text{H}}$   
 Tolerance: 3 ppm for +5 to +45°C  
 1 ppm at reference temperature  
 Aging:  $\leq 2$  ppm per year

#### **Fluke Corporation**

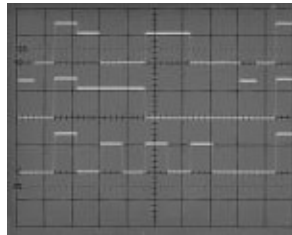
P.O. Box 9090, Everett, WA 98206

#### **Fluke Europe B.V.**

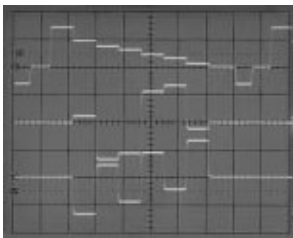
P.O. Box 1186,  
 5602 BD Eindhoven,  
 The Netherlands

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 +1(425) 356-5500  
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 Web access: <http://www.fluke.com>

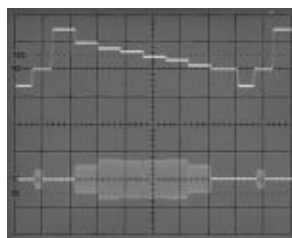
## Making the right connections



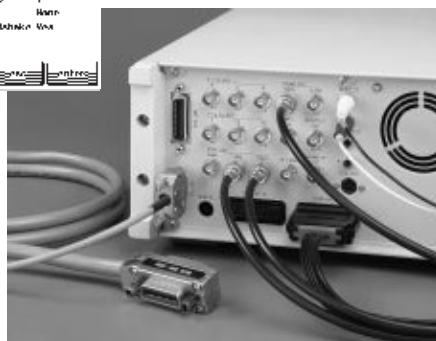
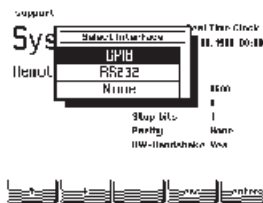
RGB signals



YCrCb signals



YC signals



Fully programmable via IEEE-484 and RS-232

### Multiple outputs

For some measurements, a composite video signal is not enough. So, the Fluke 54000 Series' RGB, YC and YCrCb option gives you additional separate output signals for red, green and blue (RGB), luminance (Y), chrominance (C) and component outputs Cr and Cb. The RGB and YC signals are available at separated connectors and on the EURO AV (SCART) connector. The RGB signal is ideal to control devices such as components or subassemblies directly at color decoded level. You can even include synchronization signals in the individual RGB signals. You'll need the YC output signals – which are also provided via a special connector and cable – for testing the S-VHS/Hi-8 input of video recorders. These VCRs eliminate cross-color effects by separately processing the Y and C signals, which gives better color reproduction. The component outputs Cr and Cb (also known as R-Y and B-Y) are phase related to U and V ( $U = 0.49 \times Cb$ ,  $V = 0.88 \times Cr$ ). These component signals are used in the professional video area and in applications where color conversions or pattern processing are tested.

### Fully programmable

You can include the Fluke 54000 Series generators in an automated test environment with the interface option. Offering a combined IEEE-488 and RS-232 interface, this option makes the instrument fully programmable from a remote location. The IEEE-488 interface often forms the basis of fully automated test environments, while the RS-232 serial interface is mostly used to control the instrument economically from a PC in a stand alone application. All the instrument's standard, function and mode settings can be changed or retrieved via the IEEE-488 or RS-232 interface.

### Interface options

- RGB, YC (S-VHS/Hi-8), YCrCb output signals available
- Fully programmable via combined IEEE-488 and RS-232 interface

## Technical specifications

### **RGB OUTPUTS**

Voltage (V<sub>pp</sub> in 75Ω): 700 mV  
 Tolerance: 5%  
                   2% at reference temperature  
 Impedance: 75Ω  
 Polarity: Positive  
 Coupling: DC  
 Blanking level: 0V  
 Offset: ± 200 mV  
 Synchronisation: Selectable in R, G, B or off (only  
                           for BNC outputs)  
 Connector: BNC rear,  
                   EURO AV rear

### **YC OUTPUTS**

Luminance voltage  
 (V<sub>pp</sub> in 75Ω): 1V  
 Tolerance: 5%  
                   2% at reference temperature  
 Coupling: DC  
 Blanking level: 0V  
 Offset: ± 200 mV  
 Chrominance level: 100%  
 Tolerance: 5%  
                   2% at reference temperature  
 Impedance: 75Ω  
 Polarity: Positive  
 Coupling: AC  
 Connector: S-VHS rear,  
                   EURO AV rear

### **YCrCb OUTPUTS**

Voltage (V<sub>pp</sub> in 75Ω): 700 mV  
 Tolerance: 5%  
                   2% at reference temperature  
 Impedance: 75Ω  
 Polarity: Positive  
 Coupling: DC  
 Blanking level: 0V  
 Offset: ± 200 mV  
 Connector: BNC rear

### **IEEE-488 INTERFACE**

Allows selection and control of all functions  
 Reference: ANSI/IEEE Std. 488-1987  
 Compatibility: IEEE-488.2-1987  
 Interface functions: AH1, SH1, L4, T6, RL1, SR1, DC1  
 Connector: Amphenol rear (RFI/EMI shielded)

### **RS-232 INTERFACE**

Allows selection and control of all functions  
 Command set As IEEE-488 interface  
 Baud rate: 110 to 19200  
 Data bits: 7, 8  
 Stop bits: 1, 2  
 Parity check: Odd, even, no  
 Handshake: Software, hardware  
 Connector: 9 pin D-type rear (male)

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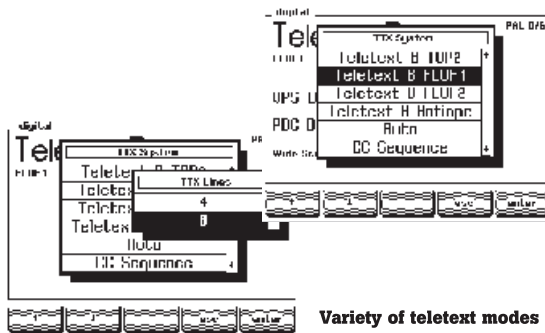
P.O. Box 9090, Everett, WA 98206

#### **Fluke Europe B.V.**

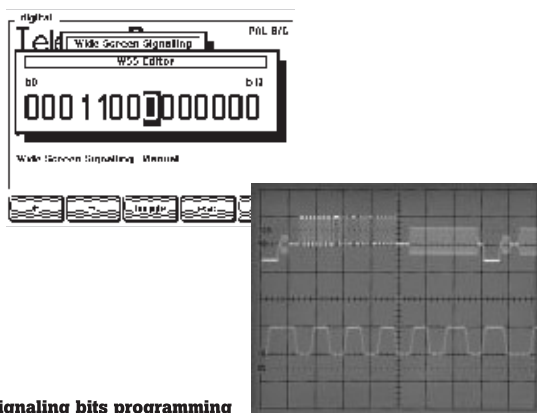
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 5602 BD Eindhoven,  
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 or Fax: +1 (425) 356-5116  
 Web access: <http://www.fluke.com>

## Reading between the lines



Variety of teletext modes



Wide Screen Signaling bits programming

### **Powerful teletext capabilities**

With this data services option, you add powerful teletext test capabilities to your Fluke 54000 Series instrument to meet the highly specialized requirements for checking and aligning teletext receivers and decoders. You will have a selection of over ten teletext pages with special contents for decoder testing at your disposal, for use with the PAL and/or SECAM standards. This option also supports Wide Screen Signaling (WSS) and includes Didon Antiope teletext signals as well as test facilities for FLOF (Full Level One Features), TOP (Table Of Pages) and VPT (Video Programming by Teletext).

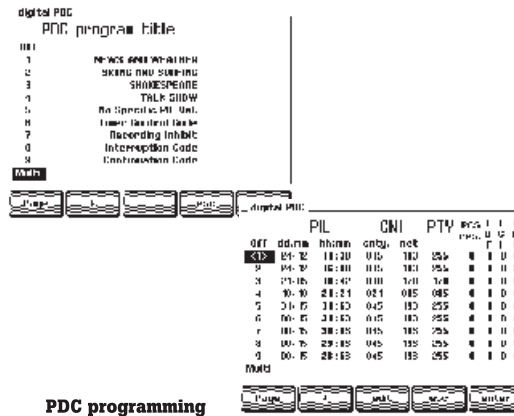
### **Wide Screen Signaling support**

The need for additional signaling has increased substantially, because of the variety of broadcast transmissions and television set capabilities. The Wide Screen Signaling (WSS) bits are present in line 23 of the video signal and contain information about the aspect ratio, audio and data services of the transmission. With WSS, which is included with the teletext option, your Fluke 54000 Series generator automatically transmits the appropriate signaling according to the generator setting. In manual mode, you can program the WSS bits independently to set them to your specific requirements.

- Teletext (TOP, FLOF and VPT)
- Wide Screen Signaling (WSS) bits support
- Easy programmable Program Delivery Control (PDC) and Video Program System (VPS) test functions
- Closed Caption (line 21 data services) testing

**Easily programmable PDC and VPS**

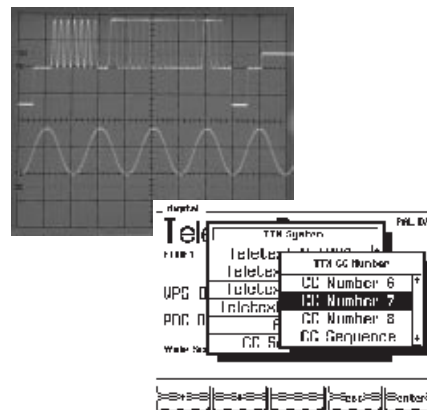
PDC and VPS test facilities are available optionally with the teletext option. Both systems use control information transmitted with the program to start and stop recording of that program on a VCR. For optimum flexibility, you can use any of nine coded PDC or VPS signals and both types of signal can even be transmitted simultaneously. When testing PDC, you can program PIL (date & time), CNI (country & network), PTY, PTL and the program name. You can even test multi labeling. In VPS mode, you can set information on date, transmission time, country indication, TV channel, stereo/dual/mono sound, adult/general program content and the program name. Special PDC and VPS signals such as timer control code, recording inhibit/terminate code, interruption code and continuation code are also available. Programming of the codes for both PDC and VPS is simple, using the instrument's large display and softkeys.



**PDC programming**

**Versatile Closed Caption testing**

Closed Caption is also known as line 21 data services for NTSC. It is a visual representation of the information that is simultaneously transmitted on the audio part of a television signal. In the USA, TV sets with screen sizes of 13" and up must have a Closed Caption decoder. Closed Caption is not only used in NTSC countries such as the USA, Korea and Japan, but it can be and is used with the PAL standard as well. The Closed Caption option on the Fluke 54000 Series offers you both caption and text modes in one of four operating channels. It provides eight factory pre-coded Closed Caption memories with a selection of different types of information and modes, such as roll-up, pop-on and paint-on. All line 21 decoder capabilities can easily be tested, as memory 9 is an automatic Closed Caption sequence of memories 1 to 8.



**Selecting the Closed Caption content**

## Technical specifications

### **WSS**

Reference: ETSI, ETS 300 294, November 1994  
PALplus system description, Revision 3.0,  
January 1994  
Rec. ITU-R BT.1119

System: 625 line system  
Data line: 23 (field 1)  
Signalling method: Bi-phase coding, NRZ-L  
Clock frequency: 5 MHz  
Tolerance: 3 ppm for +5 to +45 °C  
1 ppm at reference temperature  
Aging: ≤ 2 ppm per year  
Level: 500 mV for '1' at 700 mV maximum video  
level  
Black level for '0'  
Tolerance: 5% for '1'  
3% of sync amplitude for '0'

### **PDC**

Reference: EBU SPB 459 Revision 2  
Specification of the domestic video Program  
Delivery Control system  
February 1992

System: TELETEXT UK (CCIR system B)  
Programming: All parameters  
Labeling: Single, multi

### **VPS**

Reference: Technische Richtlinie ARD/ZDF  
Nr. 8 R 2  
Video Program System  
EBU SPB 459 Revision 2  
Specification of the domestic video Program  
Delivery Control system  
February 1992

System: 625 line system  
Data line: 16  
Signalling method: Bi-phase modulation  
Clock frequency: 5.0 MHz  
Tolerance: 3 ppm for +5 to +45 °C  
1 ppm at reference temperature  
Aging: ≤ 2 ppm per year  
Level: 500 mV for '1' at 700 mV maximum video  
level  
Black level for '0'  
Tolerance: 5% for '1'  
3% of sync amplitude for '0'  
Programming: All parameters

### **CLOSED CAPTION**

Reference: FCC 47 CFR Part 15  
Report No: E-7709-C  
Draft EIA-608

System: 525 line system  
625 line system  
Data line: 21 (field 1 and field 2)  
Signalling method: Binary NRZ  
Clock frequency: 503.4965 kHz for 525 line system  
500 kHz for 625 line system  
Tolerance: 3 ppm for +5 to +45 °C  
1 ppm at reference temperature  
Aging: ≤ 2 ppm per year  
Level: 50 IRE (50%) for '1'  
0 IRE (0%) for '0'  
Tolerance: 5 IRE for '1'  
1 IRE for '0'  
Operation mode: CC1 to CC4  
T1 to T4

### **TELETEXT DIDON ANTIPOE (CCIR system A)**

Reference: CCIR Rec. 653-1  
CCIR Doc. 11/345-E

System: 625 line system  
Data line: 20, 21, 333, 334  
Signalling method: Binary NRZ  
Clock frequency: 6.203125 MHz  
Tolerance: 3 ppm for +5 to +45 °C  
1 ppm at reference temperature  
Aging: ≤ 2 ppm per year  
Level: 7/3 of sync amplitude for '1'  
Black level for '0'  
Tolerance: 0 to -10% for '1'  
3% of sync amplitude for '0'

### **TELETEXT UK (CCIR system B)**

Reference: CCIR Rec. 653-1  
CCIR Doc. 11/282-E

System: 625 line system  
Data line: 13, 14, 20, 21, 326, 327, 333, 334 for 8  
line mode  
20, 21, 333, 334 for 4 line mode

Signaling method: Binary NRZ  
Clock frequency: 6.9375 MHz  
Tolerance: 3 ppm for +5 to +45 °C  
1 ppm at reference temperature  
Aging: ≤ 2 ppm per year  
Level: 66% of the difference between black level  
and peak white level  
Black level for '0'  
Tolerance: 6% for '1'  
2% of sync amplitude for '0'

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## Ordering Information

| Fluke 54200<br>TV Signal Generator,<br>including RF Output and<br>Analog Sound | Multi standard      |              |              |              | Dual Standard |              |              |              | Single standard |              |              |              |              |              |              |              |              |
|--|---------------------|--------------|--------------|--------------|---------------|--------------|--------------|--------------|-----------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
|  | PAL, NTSC,<br>SECAM |              |              |              | PAL, NTSC     |              | PAL, SECAM   |              | PAL             | NTSC         | SECAM        |              |              |              |              |              |              |
|  | 54200M01/nnn        | 54200M02/nnn | 54200M03/nnn | 54200M04/nnn | 54200PN1/nnn  | 54200PN2/nnn | 54200PN3/nnn | 54200PN4/nnn | 54200PS1/nnn    | 54200PS2/nnn | 54200PS3/nnn | 54200P01/nnn | 54200P02/nnn | 54200N01/nnn | 54200N02/nnn | 54200S01/nnn | 54200S02/nnn |
| RF Output 32....900 MHz  | •                   | •            | •            | •            | •             | •            | •            | •            | •               | •            | •            | •            | •            | •            | •            | •            | •            |
| Analog stereo sound  | •                   | •            | •            | •            | •             | •            | •            | •            | •               | •            | •            | •            | •            | •            | •            | •            | •            |
| Teletext, PDC, VPS   | •                   |              |              |              | •             |              |              |              | •               |              |              | •            |              |              |              | •            |              |
| Closed Caption   | •                   |              |              |              |               | •            |              |              |                 |              |              |              |              | •            |              |              |              |
| Nicam Sound  | •                   | •            |              |              |               |              |              |              |                 |              |              | •            |              |              |              | •            |              |
| BTSC Sound   | •                   | •            |              |              |               | •            |              |              |                 |              |              |              |              | •            | •            |              |              |
| RGB, Y/C, YCrCb,<br>IEEE, RS-232   | •                   | •            | •            |              | •             | •            | •            |              | •               | •            |              | •            | •            | •            | •            | •            | •            |

| Fluke 54100<br>Video Signal Generator | Multi standard        |              |              | Dual Standard |              |              |              | Single standard |              |              |              |              |              |              |
|---------------------------------------|-----------------------|--------------|--------------|---------------|--------------|--------------|--------------|-----------------|--------------|--------------|--------------|--------------|--------------|--------------|
|                                       | PAL & NTSC<br>& SECAM |              |              | PAL & NTSC    |              | PAL & SECAM  |              | PAL             | NTSC         | SECAM        |              |              |              |              |
|                                       | 54100M01/nnn          | 54100M02/nnn | 54100M03/nnn | 54100PN1/nnn  | 54100PN2/nnn | 54100PN3/nnn | 54100PS1/nnn | 54100PS2/nnn    | 54100P01/nnn | 54100P02/nnn | 54100N01/nnn | 54100N02/nnn | 54100S01/nnn | 54100S02/nnn |
| Teletext & PDC & VPS                  | •                     |              |              | •             |              |              | •            |                 | •            |              |              |              | •            |              |
| Closed Caption                        | •                     |              |              |               | •            |              |              |                 |              |              | •            |              |              |              |
| RGB & Y/C & YCrCb &<br>IEEE & RS-232  | •                     | •            |              | •             | •            | •            | •            | •               | •            | •            | •            | •            | •            | •            |

### Operating manual languages and line cord options (replace 'nnn' in above typenumbers by the following)

| linecord:             | European | US-style | UK-style | Swiss | Australian |
|-----------------------|----------|----------|----------|-------|------------|
| user manual language: |          |          |          |       |            |
| English               | /001     | /003     | /004     |       | /008       |
| French                | /011     | /013     |          |       |            |
| German                | /021     |          |          | /025  |            |

Example: "Fluke 54100PN1/025" is the ordering code for a 54100 Video Signal Generator that supports the PAL and NTSC standards, provides Teletext, PDC and VPS data services, is equipped with RGB, Y/C and YCrCb optional outputs and an IEEE and an RS-232 remote control bus, that is delivered with a Swiss line cord and a user manual in the German language.

### Included with the instrument

| Fluke 54200                        | Fluke 54100                        |
|------------------------------------|------------------------------------|
| User Manual 54200                  | User Manual 54100                  |
| Line cord                          | Line cord                          |
| Cable SCART – SCART                | Cable SCART – SCART                |
| Cable SCART – 3 * Cinch male       | Cable SCART – 3 * Cinch male       |
| RF cable BNC – IEC-169-2           | Y/C Cable (only with Y/C output)   |
| Adaptor IEC-169-2 – F-male         | Statement of Calibration Practices |
| Y/C Cable (only with Y/C output)   |                                    |
| Statement of Calibration Practices |                                    |

### Rackmount

For mounting the generator in a 19" rack, an optional rackmount kit Fluke 54091 is available. Front height is 3 HE (133.5 mm).

### Calibration Certificate

As a standard, a 'Statement of Calibration Practices' is delivered with every instrument. On request, a Certificate of Calibration, stating calibration data, will be included at a nominal fee.

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A0569UEN Rev C 03/01



## General Specifications

### ENVIRONMENTAL CONDITIONS

|   |  |
|---|--|
| Environment:                                | Laboratory equipment Class 5<br>(MIL-T-28800D)   |
| Warming-up time:                            | 30 min   |
| Recalibration interval:                     | 12 months  |
| Temperature:                                | +22 to +24 °C for reference temperature<br>0 to +50 °C for operating<br>-20 to +71 °C for non-operating                  |
| Reliability:                                | MTBF = 20,000 hours  |
| Humidity, altitude,<br>vibration and shock: | MIL-T-28800D (Class 5)   |
| Safety:                                     | EN 61010-1 +/A2, Class I<br>IEC 1010-1 +A1 +A2, Class I<br>CAN/CSA-C22.2 No 1010.1, Class I                              |
| EMC:  | EN 55011, Group 1, Class B<br>VDE 0875, Part 11, Group 1, Class B<br>CISPR 11, Group 1, Class B<br>FCC Part 15J, Class A |

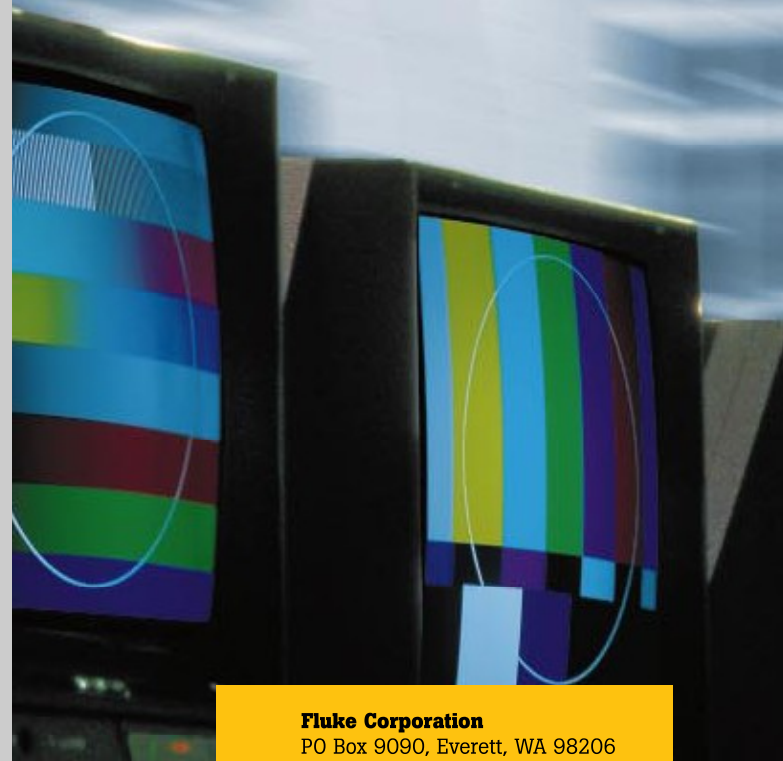
### POWER REQUIREMENTS

|                         |               |
|-------------------------|---------------|
| Line voltage operating: | 90 to 264V    |
| Line frequency:         | 47.5 to 63 Hz |
| Power consumption:      | 60W           |

### DIMENSIONS and WEIGHT

|         |  |
|---------|--|
| Width:  | 323 mm (12.72 in)  |
| Height: | 147 mm (5.79 in)<br>132.5 mm (5.22 in) without feet (≈3HE) |
| Depth:  | 417 mm (16.42 in)  |
| Weight: | Net 9.8 kg (21.6 lb)<br>Shipping 11.4 kg (25.1 lb)         |

*Values stated without tolerances are typical values*



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