

RF Receiver Type HFE..

Order information

Name	Type	Part No.
RF Receiver 27 MHz	HFE27	133 020 01 AX
RF Receiver 35 MHz	HFE35	133 020 02 AX



- RF receiver for hazardous areas
- Used for wireless radio connections in MR90 systems in underground pit areas
- Explosion Protection category / mode: I M 1 EEx ia I

Description

The RF receiver Type HFE.. is part of the intrinsically safe underground radio system MR90 and it is used for demodulation of frequency modulated receive signals.

The HFE 27 is a frequency modulated RF receiver with a receive frequency range of 26.5 to 27.5 MHz. There are 21 receive channels selectable. The channel spacing is 50kHz.

The HFE 35 is also a frequency modulated RF receiver. Both receivers are in principle equal in mechanical and electrical construction. The receiver circuit is redesigned merely for an operation in the 35 MHz band. Here are also 21 receive channels selectable with a channel spacing of also 50 kHz.

The RF receivers are clip-on modules, which for themselves have no independent function.

An electric connection to the corresponding LF interface NFT01 or to the data radio modem MOD02 is made by a 8-wire connection cable which has to be plugged on the 8-pole pin contact strip of the HFE.. receiver. The module is powered via this strip.

The RF receiver has been designed as double superhet-receiver. The Signals coming in at the coax socket ST-HF1 are conducted through a receiving band-pass filter to an input mixer. This mixer transforms the input signal into the 1st intermediate frequency (10,7 MHz).

The necessary oscillator signal is generated by a synthesizer and is connected to a PLL circuit over a scaler chain set to a divisor according to the selected channel.

A PLL circuit tunes a VCO (voltage controlled oscillator) according to the selected channel and prepares a mute-delay-stage when the VCO has reached lock frequency (lock control). The signal transformed to the 10.7 MHz 1st intermediate frequency is fed to the 2nd mixer through a quartz filter and mixed down to the 2nd intermediate frequency of 455 kHz. The Signal passes through a ceramic filter, IF amplifier and a limiting amplifier. The modulation signal is recovered with a quadrature-modulator.

The so recovered LF signal passes a mute switch, a pre-amplifier and a low-pass filter to the 8-pole pin strip.

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The mute signal (squelch circuit) is also accessible here. The mute delay-time can be switched over by the signal "T_{on}". Using the RF receiver with the LF interface NFT01 the delay-time is 100 ms, using the receiver with the data radio modem MOD02 this time is 10 ms.

For measurement of the received signal strength a 2-pole pin strip provides a logarithmic-proportional DC-signal.

1 V_{DC} corresponds to a receiver input voltage of 1 μV

2 V_{DC} corresponds to a receiver input voltage of 10 μV

3 V_{DC} corresponds to a receiver input voltage of 100 μV

4 V_{DC} corresponds to a receiver input voltage of 1000 μV

On the top-side of the receiver a potentiometer is accessible to set the receive-level threshold value. If the receive level falls below this threshold value the LF output is switched off (mute control / squelch circuit).

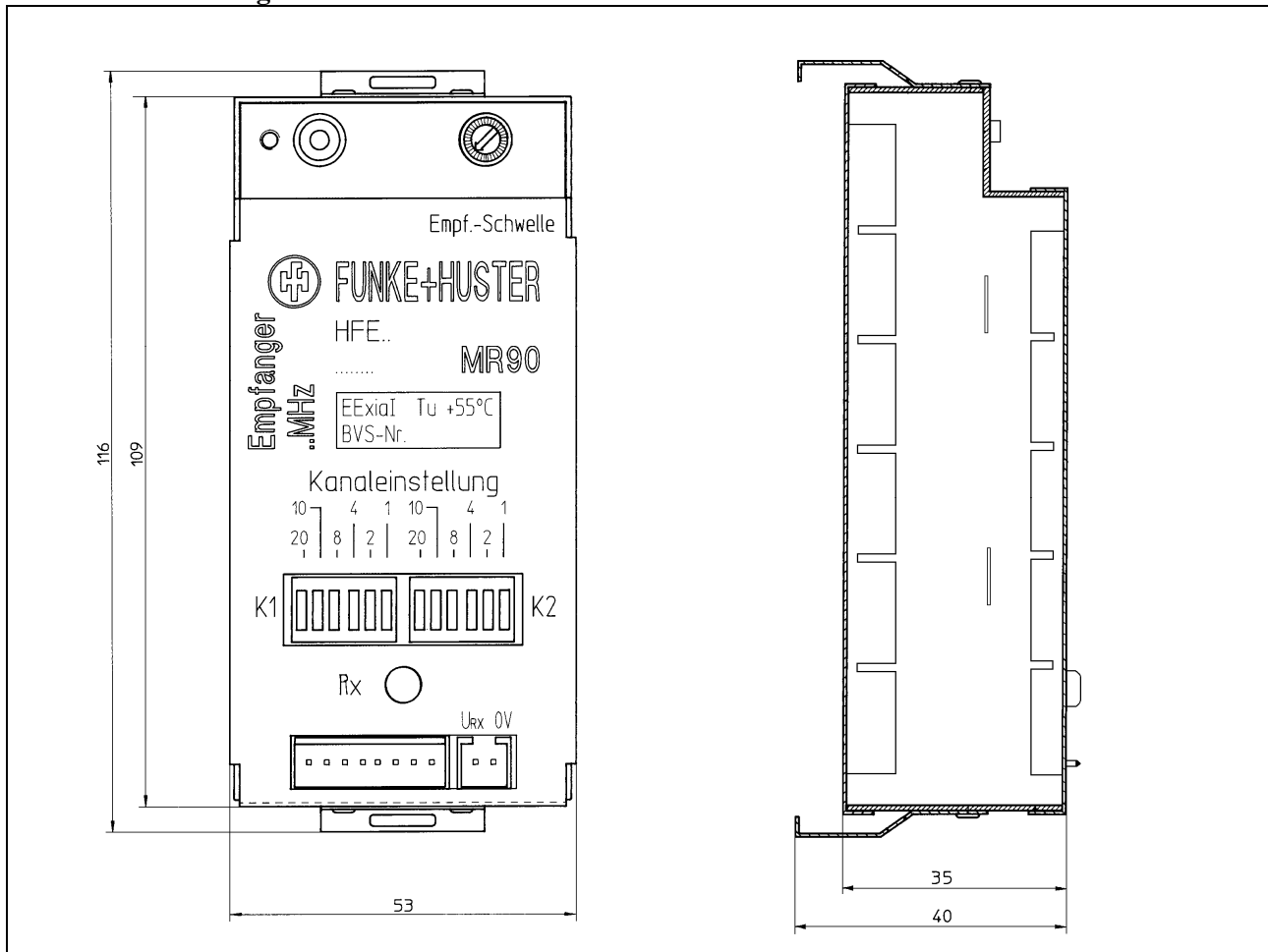
Left stop of the potentiometer ⇒ max. sensitivity

Right stop of the potentiometer ⇒ min. sensitivity.

Construction

The module has a tin plate housing. The electronics inside are placed inside on two printed circuit boards. It is mainly fabricated in SMD technology. At the front-sides of the module there are two clips to fasten the receiver on the corresponding LF interface module NFT01 or data radio modem MOD02.

Dimensional drawing



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