Product Information

FHF Bergbautechnik GmbH & Co. KG

Radio Station Type MRST3...

Order information

Name	Type	Part No.
Radio Station 1080 x 1080 mm (Sheet-steel / stainl.-steel)	MRST300 to MRST309	xxx xxx xx AX
Radio Station 700 x 700 mm (Sheet-steel / stainl.-steel)	MRST310 to MRST319	xxx xxx xx AX
Radio Station 700 x 500 mm (Sheet-steel / stainl.-steel)	MRST320 to MRST329	xxx xxx xx AX
Radio Station 700 x 315 mm (Sheet-steel /stainl.-steel)	MRST330 to MRST339	xxx xxx xx AX
Radio Station 500 x 315 mm (Sheet-steel / stainl.-steel)	MRST340 to MRST349	xxx xxx xx AX
Radio Station 315 x 248 mm (Sheet-steel / stainl.-steel)	MRST350 to MRST359	xxx xxx xx AX
Radio Station 400 x 405 x 165 mm (Synthetic housing)	MRST30	xxx xxx xx AX
Radio Station 650 x 250 x 120 mm (Synthetic housing)	MRST31	xxx xxx xx AX
Radio Station 400 x 250 x 120 mm (Synthetic housing)	MRST32	xxx xxx xx AX
Radio Station 360 x 160 x 90 mm (Synthetic housing)	MRST33	xxx xxx xx AX
Radio Station 260 x 160 x 90 mm (Synthetic housing)	MRST34	xxx xxx xx AX

- **Transmission of Speech, Signal Tones and Data**
- **Light Weight**
- **Rugged Construction**
- **Explosion protection category / mode: I M2 EEx ib I**

Application, Functionality, Construction

The radio station type MRST3.. is available in different stages of extension and size for use in firedamp atmospheres to transmit speech, signalling tones and process data.
Depending on built-in equipment and size the applications ‚electronic shaft hammer', Cage Telephony and Signalling System' and ‚Cage control and monitoring device' can be realized.
The radio station complies with explosion protection mode EEx ib I, category I M2.
The housing of the radio station MRST3.. is made out of 2-3 mm thick blue lacquered / powder coated sheet-steel with housing protection class IP54 according to IEC529. In addition stainless steel is also available as housing material.
A window of double-pane security glass can be built into the front cover. Radio stations with sheet-steel or stainless steel housing are designated by a three-digit number (e.g. MRST341).
The housing of the versions/types MRST30 to MRST34 is made of synthetic material (glass fiber reinforced polyester, colour: black, surface resistance ≤ $10^9\Omega$). For these types no glass window is available. Radio stations with synthetic housings are designated by a two-digit number (e.g. MRST30).

Appended to the type name, characters for function designation can be added if needed (SchT = Electronic Shaft Hammer, FTS = Cage Telephony and Signalling System, KSTG = Cage Control and Monitoring Device).
Control and display elements (switches, push-buttons, LED) can be placed in various combinations and arrangements in the housing's lid. The lid can be delivered with hinges (not MRST30 to MRST34) and can be locked by screws or turning bolts (sash fasteners). A loudspeaker (impedance 8Ω or 16Ω) can be built also into the lid.

In the side walls of the housing cable glands and / or plug-in connectors certified for intrinsically safe circuits can be installed. Unused bore holes can be used for mounting of certified circuit terminators/terminations units or they can be sealed with blanking plugs.
In addition plug-in connectors for one or more microphones type MIK4/2 and for one antenna type ANTM02 or ANTM03/ are mountable.
On the rear side of the housing there are four tapped blind holes with M8 threads or weld on straps (not for MRST30 to MRST34) to mount the housing.

A so-called station unit (consisting of various MR90 and ZM51 electronic modules) is mounted into the MRST3... radio station. For connection of the external circuits modular terminal strips mounted on 35 mm DIN mounting rails are available.
Modules and terminal blocks are assembled on mounting plates, which also carry cable ducts and cable routing loops.
The radio station type MRST3... is manufactured in various sizes /dimensions.

A station unit wired as shown in the survey diagram UP8102A300-I (3) can be built into the MRST3... radio station. The survey diagram is part of this operation manual.
A station unit consists of a LF / RF transceiving part using the following modules:

Table 1: Transmission-technologic part of radio stations MRST3.. station unit

Count	Name	Type	Certification Number	Protect. Mode
Consisting of up to 3 in the following mentioned, in any way combined base components				
up to 1	i/i coupler module	iKO02	BVS 03 ATEX E 258 U	I M1 EEx ia I
up to 2	LF interface *)	NFT01	BVS 03 ATEX E 121 U	I M1 EEx ia I
up to 2	modem *)	MOD02	BVS 03 ATEX E 234 U	I M1 EEx ia I
and an optional loudspeaker				
1	loudspeaker **)	ATR41xx		--
and an adapter component				
1	leaky feeder interface	ASK01	BVS 03 ATEX E 240 U	I M1 EEx ia I
or 1	antenna interface	AANT01	BVS 03 ATEX E 239 U	I M1 EEx ia I

*) On the base components NFT01 and MOD02 a transmitter component type HFS... (Cert.No. BVS 03 ATEX E 117 U, I M1 EEx ia I) and a receiver component type HFE... (Cert.No. BVS 03 ATEX E 117 U, I M1 EEx ia I) is fixed respectively.

**) Loudspeaker 8Ω, type ATR4108NFMV0, acc. to drawing W58706A115-I (4)
Loudspeaker 16Ω, type ATR4116NFMV0, acc. to drawing W58706A116-I (4)

The above mentioned modules are mounted on an isolated mounting plate in all sheet-steel variants of the MRST3... radio station. For the synthetic housing variants MRST30 to MRST34 there is no isolated mounting plate needed.

The part of a station unit which collects and outputs process data consists of the following modules:
(The slots for the station-unit's electronic modules on the mounting rails are filled with the following modules optional, each modules fills one slot on the rail).

Table 2: Z51 Modules of a MRST3.. radio stations station unit

Count	Name	Type	Testing protocol / Certification	Protection Mode
	Power Supply Modules			
1	EMC filter	F10 or F10 W	BVS 03 ATEX E 136 U	I M1 EEx ia I
1	Remote powered DC-DC converter	Z51-FGW11E	BVS PP 02.1064 EG	EEx ia I
	Input / Output Modules			
up to 8 *)	Digital inputs	Z51-DE44	BVS 03 ATEX E 120 U	I M2 EEx ia I
	or	Z51-DE87	BVS 03 ATEX E 120 U	I M2 EEx ia I
	or	Z51-DE88	BVS 03 ATEX E 120 U	I M2 EEx ia I
	or	Z51-DE88/1	BVS 03 ATEX E 120 U	I M2 EEx ia I
	or	Z51-DE88W/1	BVS 03 ATEX E 120 U	I M2 EEx ia I
up to 8 *)	Digital outputs	Z51-DA44	BVS 04 ATEX E 059 U	I M2 EEx ia I
	or	Z51-DA86	BVS 04 ATEX E 059 U	I M2 EEx ia I
up to 5 *)	Analogue inputs	Z51-AE2..	BVS 03 ATEX E 144 U	I M2 EEx ia I I M2 EEx ib I
*) Sum of Digital - Inputs - Outputs and Analogue input modules connected to the Z51-FGW11E output circuit can be up to eight.				

The radio station's electronic modules listed in table 2 above each have a plastic, on 35mm DIN rails mountable housing, containing electronic components arranged on PCB's.
The I/O modules and the associated Data Radio Modem MOD02 are connected each other with a standard 20-core I/O BUS ribbon cable, connecting pin connector ST2 of the modem with the corresponding I/O BUS connectors of the I/O modules.
The radio stations power supply is made by a power supply with a nominal voltage of 12 V, which is approved and certified acc. to protection mode "Intrinsically Safety". The wiring of the 12 V power supply is shown in the UP8102A300-I (3) survey diagram.
The station unit's components MOD02, ASK01 (or AANT01), NFT01 and iKO02 are directly powered from the 12 V power supply.
The station unit's modules Z51-DE**, Z51-DA** and Z51-AE** are powered with 5V by a remote powered DC/DC converter type Z51-FGW11E, optionally using EMC filter F10.
The Z51-FGW11E generates an output voltage of 5 V connected to the supply terminal 1.4 (0 V) and 1.5 (+5 V) of the MOD02 and by this powers the I/O modules via the 20-core I/O BUS ribbon cable.
Intrinsically safe circuits of the MR90- and ZM51 modules intended to be connected to external intrinsically safe circuits are directed to terminals or plug-in connectors.

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