

Automatic Train Protection System MIREL VZ1

Type **VZ1**

Illustrative picture

MIREL VZ1 automatic train protection (ATP) is a mobile component based train protection system. It is constructed for use on rail vehicles on track sections and stations with integrated ATP system components with linear transmission as well as on rails and stations without ATP. MIREL VZ1 ATP is an open system, which may be supplemented by another system for transmitting route information to the vehicle in the future.

MIREL VZ1 ATP also secures three basic functionalities: verification, information and safety interlocks. It is designed to monitor driver vigilance, transmit signals on the signal repeater as well as monitor maximum speed with respect to the maximum design speed of the rail vehicle, the defined train speed and received signals. Other functions are monitored to check for a match between the selected direction and the actually travelled direction as well as the ability to remotely control a rail vehicle.

MIREL VZ1 ATP includes a central unit, signal repeaters located in the driver's cab and horns. A serial data connection links the central unit to the signal repeaters. MIREL VZ1 ATP can be operated on in one or two driver's cabs in a single rail vehicle. It can also be configured for use on rail locomotives that allow the transmission of signals to dispatching stations and for locomotives that are not operating on coded tracks. The MIREL VZ1 ATP can be operated on rail locomotives on any track and on control wagons.

MIREL VZ1 ATP is powered from the batteries of the rail locomotive. MIREL VZ1 ATP equipment configuration is selected based on the voltage supplied by these batteries. Operation and control of the automatic train protection system is performed exclusively from the driver's cab via an installed signal repeater and other equipment including the vigilance button and other control elements installed on the driver's dash. No interference into the main machinery of the rail vehicle is necessary in order to service the MIREL VZ1 ATP.

The MIREL VZ1 ATP is a digital electrical system constructed on the basis of the most modern electronic components and is designed as fail-safe equipment. A dual processor central unit, a special set of supervisory circuits, two channel signal transmission, four channel speed measurement and measurement of distance passed all serve to ensure safe operations. The use of a component structured central unit meets the most demanding criteria for reliability and endurance.



Nomenclature

VZ1.0.**USWK**

- Configuration range of information transfer, range of possible use
- Software version
- Supply voltage 2 → 24V, 4 → 48V

Modifications

Designation	Central unit	Signal repeater	Horn
VZ1.0. 204A	VZ1ZJ.0.204CHS	2x VZ1NO.0.2C04	2x VZ1HP.PD.201
VZ1.0. 204B	VZ1ZJ.0.204CS	2x VZ1NO.0.2C04	-
VZ1.0. 204E	VZ1ZJ.0.204CS	2x VZ1NO.0.2C04	2x VZ1HP.PD.201
VZ1.0. 204F	VZ1ZJ.0.204CPS	2x VZ1NO.0.2C04	2x VZ1HP.PD.201
VZ1.0. 204G	VZ1ZJ.0.204CS	1x VZ1NO.0.2C04	1x VZ1HP.PD.201
VZ1.0. 204I	VZ1ZJ.0.204CH6S	2x VZ1NO.0.2C04	2x VZ1HP.PD.201
VZ1.0. 204J	VZ1ZJ.0.204CH6S	1x VZ1NO.0.2C04	1x VZ1HP.PD.201
VZ1.0. 204K	VZ1ZJ.0.204CHPS	2x VZ1NO.0.2C04	2x VZ1HP.PD.201H
VZ1.0. 204L	VZ1ZJ.0.204CHS	2x VZ1NO.0.2C04	2x VZ1HP.PD.201H
VZ1.0. 204LP	VZ1ZJ.0.204CHS	2x VZ1NO.P.2C04	2x VZ1HP.FD.201H
VZ1.0. 204M	VZ1ZJ.0.204CS	2x VZ1NO.0.2C04	2x VZ1HP.PD.201H
VZ1.0. 204MP	VZ1ZJ.0.204CS	2x VZ1NO.P.2C04	2x VZ1HP.FD.201H

Designation	Central unit	Signal repeater	Horn
VZ1.0.204P	VZ1ZJ.0.204CES	1x VZ1NO.0.2C04	1x VZ1HP.PD.201
VZ1.0.204Q	VZ1ZJ.0.204CH6S	2x VZ1NO.0.2C04	2x VZ1HP.PD.201H
VZ1.0.204R	VZ1ZJ.0.204CEH6S	2x VZ1NO.0.2C04	2x VZ1HP.PD.201
VZ1.0.204S9	VZ1ZJ.0.204CHS	2x VZ1NO.0.2C04	-
VZ1.0.204T	VZ1ZJ.0.204CHS	1x VZ1NO.0.2C04	1x VZ1HP.PD.201
VZ1.0.204UP	VZ1ZJ.0.204CPS	2x VZ1NO.P.2C04	2x VZ1HP.FD.201H
VZ1.0.204V	VZ1ZJ.0.204CS	1x VZ1NO.0.2C04	1x VZ1HP.PD.201H
VZ1.0.204W	VZ1ZJ.0.204EH6	2x VZ1NO.0.2C04	2x VZ1HP.PD.201
VZ1.0.204Y1	VZ1ZJ.0.204CEPS	1x VZ1NO.0.2C04	1x VZ1HP.PD.201H
VZ1.0.204Y2P	VZ1ZJ.0.204H6	2x VZ1NO.P.2C04	2x VZ1HP.FD.201H
VZ1.0.204Y3	VZ1ZJ.0.204CES	2x VZ1NO.0.2C04	2x VZ1HP.PD.201H
VZ1.0.204Y4	VZ1ZJ.0.204CES	1x VZ1NO.0.2C04	1x VZ1HP.PD.201H
VZ1.0.204Y5	VZ1ZJ.0.204CS	2x VZ1NO.0.2C04	2x VZ1HP.FD.201H
VZ1.0.204S15	VZ1ZJ.0.2S04CS	2x VZ1NO.0.2C04	2x VZ1HP.P.2
VZ1.0.404A	VZ1ZJ.0.404CHS	2x VZ1NO.0.4C04	2x VZ1HP.PD.401
VZ1.0.404E	VZ1ZJ.0.404CS	2x VZ1NO.0.4C04	2x VZ1HP.PD.401
VZ1.0.404F	VZ1ZJ.0.404CPS	2x VZ1NO.0.4C04	2x VZ1HP.PD.401
VZ1.0.404L	VZ1ZJ.0.404CHS	2x VZ1NO.0.4C04	2x VZ1HP.PD.401H
VZ1.0.404M	VZ1ZJ.0.404CS	2x VZ1NO.0.4C04	2x VZ1HP.PD.401H

Modifications prepared for new applications

Designation	Central unit	Signal repeater	Horn	Notes
VZ1.0.204Y1	VZ1ZJ.0.204CEPS	1x VZ1NO.0.2C04	1x VZ1HP.PD.201H	WF793

Specifications

Catalogue sheet was prepared based on the following specifications:

Number	Version	Name
257VZ1	190121	Technical conditions
738VZ1	081020	Set of functional requirements for on-board train protection systems and vigilance equipment for MAV RI working on the basis of the assessment of received 75 Hz signals
759VZ1	190313	Technical description of changes to MIREL VZ1 automatic train protection – integration of MAV RI functions
1122VZ1	200827	Installation manual
153VZ1	190111	Operating manual
154VZ1	190111	Maintenance manual, diagnostics

Modifications not recommended for new applications

Designation	Central unit	Signal repeater	Horn	Substitute
VZ1.0.203A	VZ1ZJ.0.203CHS	2x VZ1NO.0.2C03	2x VZ1HP.PD.201	VZ1.0.204A
VZ1.0.203B	VZ1ZJ.0.203CS	2x VZ1NO.0.2C03	-	VZ1.0.204B
VZ1.0.203C	VZ1ZJ.0.203H	2x VZ1NO.0.2C03	-	-
VZ1.0.203D	VZ1ZJ.0.203CS	2x VZ1NO.0.2C03	2x VZ1HP.P.2	-
VZ1.0.203E	VZ1ZJ.0.203CS	2x VZ1NO.0.2C03	2x VZ1HP.PD.201	VZ1.0.204E
VZ1.0.203F	VZ1ZJ.0.203CPS	2x VZ1NO.0.2C03	2x VZ1HP.PD.201	VZ1.0.204F
VZ1.0.203G	VZ1ZJ.0.203CS	1x VZ1NO.0.2C03	1x VZ1HP.PD.201	VZ1.0.204G
VZ1.0.203I	VZ1ZJ.0.203CH6S	2x VZ1NO.0.2C03	2x VZ1HP.PD.201	VZ1.0.204I
VZ1.0.203J	VZ1ZJ.0.203CH6S	1x VZ1NO.0.2C03	1x VZ1HP.PD.201	VZ1.0.204J
VZ1.0.203K	VZ1ZJ.0.203CHPS	2x VZ1NO.0.2C03	2x VZ1HP.PD.201H	VZ1.0.204K
VZ1.0.203L	VZ1ZJ.0.203CHS	2x VZ1NO.0.2C03	2x VZ1HP.PD.201H	VZ1.0.204L
VZ1.0.203M	VZ1ZJ.0.203CS	2x VZ1NO.0.2C03	2x VZ1HP.PD.201H	VZ1.0.204M
VZ1.0.203N	VZ1ZJ.0.2S03CS	2x VZ1NO.S.203	2x VZ1HP.PD.201H	-
VZ1.0.203Q	VZ1ZJ.0.203CH6S	2x VZ1NO.0.2C03	2x VZ1HP.PD.201H	VZ1.0.204Q
VZ1.0.204C	VZ1ZJ.0.204H	2x VZ1NO.0.2C04	-	-
VZ1.0.204N	VZ1ZJ.0.2S04CS	2x VZ1NO.S.204	2x VZ1HP.PD.201H	-
VZ1.0.403A	VZ1ZJ.0.403CHS	2x VZ1NO.0.4C03	2x VZ1HP.PD.401	VZ1.0.404A
VZ1.0.403D	VZ1ZJ.0.403CS	2x VZ1NO.0.4C03	2x VZ1HP.P.4	-
VZ1.0.403E	VZ1ZJ.0.403CS	2x VZ1NO.0.4C03	2x VZ1HP.PD.401	VZ1.0.404E
VZ1.0.403F	VZ1ZJ.0.403CPS	2x VZ1NO.0.4C03	2x VZ1HP.PD.401	VZ1.0.404F
VZ1.0.403M	VZ1ZJ.0.403CS	2x VZ1NO.0.4C03	2x VZ1HP.PD.401H	VZ1.0.404M
VZ1.0.203S1	VZ1ZJ.0.2S03CS	2x VZ1NO.S.203	2x VZ1HP.0.2P	-
VZ1.0.203S3	VZ1ZJ.0.203CS	2x VZ1NO.0.2C03	2x VZ1HP.0.2P	-
VZ1.0.203S9	VZ1ZJ.0.203CHS	2x VZ1NO.0.2C03	-	VZ1.0.204S9
VZ1.0.203S13	VZ1ZJ.0.203CS	1x VZ1NO.0.2C03	1x VZ1HP.P.2	-
VZ1.0.203S14	VZ1ZJ.0.2S03CS	2x VZ1NO.S.203	2x VZ1HP.P.2	-
VZ1.0.203S15	VZ1ZJ.0.2S03CS	2x VZ1NO.0.2C03	2x VZ1HP.P.2	VZ1.0.204S15
VZ1.0.203S16	VZ1ZJ.0.2S03CS	2x VZ1NO.0.2C03	2x VZ1HP.PD.201	-
VZ1.0.204S3	VZ1ZJ.0.204CS	2x VZ1NO.0.2C04	2x VZ1HP.0.2P	-
VZ1.0.204S10	VZ1ZJ.0.204CES	2x VZ1NO.0.2C04	-	-
VZ1.0.204S11	VZ1ZJ.0.204CEHS	2x VZ1NO.0.2C04	-	-
VZ1.0.204S12	VZ1ZJ.0.204CEH6S	2x VZ1NO.0.2C04	-	-
VZ1.0.403S4	VZ1ZJ.0.403CS	2x VZ1NO.0.4C03	2x VZ1HP.D.4P01	-
VZ1.0.403S5	VZ1ZJ.0.403CS	2x VZ1NO.0.4C03	2x VZ1HP.0.4L	-
VZ1.0.403S6	VZ1ZJ.0.403CS	2x VZ1NO.0.4C03	2x VZ1HP.D.4L01	-
VZ1.0.403S7	VZ1ZJ.0.403CHS	2x VZ1NO.0.4C03	2x VZ1HP.D.4L01	-
VZ1.0.403S14	VZ1ZJ.0.4S03CS	2x VZ1NO.S.403	2x VZ1HP.P.4	-
VZ1.0.404S4	VZ1ZJ.0.404CS	2x VZ1NO.0.4C04	2x VZ1HP.D.4P01	-
VZ1.0.404S5	VZ1ZJ.0.404CS	2x VZ1NO.0.4C04	2x VZ1HP.0.4L	-
VZ1.0.404S6	VZ1ZJ.0.404CS	2x VZ1NO.0.4C04	2x VZ1HP.D.4L01	-
VZ1.0.404S7	VZ1ZJ.0.404CHS	2x VZ1NO.0.4C04	2x VZ1HP.D.4L01	-
VZ1.0.404S8	VZ1ZJ.0.404CEHS	2x VZ1NO.0.4C04	2x VZ1HP.D.4L01	-