



Special Catalogue Railway

PASSION FOR PERFECTION

Short-circuit indicators

Remote monitoring

**Voltage detectors
and detecting systems**

Earthing devices



Dipl.-Ing. H. Horstmann GmbH is a medium-sized company based in Heiligenhaus near Düsseldorf (Germany). The company was founded in 1946 by Heinrich Horstmann. Since that time it has been a successful family-owned company. Due to its long experience and the ongoing expansion activities in research and development as well as in production facilities Dipl.-Ing. H. Horstmann GmbH is today recognized as the leading manufacturer in medium voltage technology for:

- ▶ Short-circuit and earth fault indicators
- ▶ Solutions for remote monitoring
- ▶ Voltage detectors and voltage detecting systems
- ▶ Earthing devices and accessories

The worldwide distribution is covered by both our own highly qualified sales force and trade agents.

Our products meet the highest quality requirements and are developed and manufactured in our production facilities in Germany. In order to respond to these demands, we have a very high vertical depth of production (e. g. own SMD assembly lines) as well as an own research and development department with state-of-the-art testing and measuring equipment. Besides the electronics manufacturing, we have also a mechanical production facilities.

Since 1996 our company has been certified according to DIN EN ISO 9001.



Manufacturing



Component testing



High voltage laboratory



The safe and reliable transport of passengers and goods is the primary concern of railway network operators. In order to achieve this, not only the trains, but also the tracks need to be monitored and maintained.

Horstmann offers products and system solutions for the rapid location of faults in the event of short-circuits or lightning strikes, as well as for continuous monitoring of railway electrical systems.

In the event of disturbances or outages fault finding is often laborious and time-consuming. It is necessary to drive or walk along the entire electrified section in order to find the fault location.

Horstmann fault indicators divide the electrified sections into sub-sections. In the event of a fault, all fault information is sent to the control room, clearly indicating the exact fault location. This permits maintenance staff to go straight to the fault location and quickly implement the necessary measures. This saves time and money and ensures customer satisfaction for all rail passengers.

When there are no faults, monitoring provides the railway network operator with a full overview of the most important network parameters at all times.

Horstmann also offers products which allow work to safely be carried out on the tracks. This includes voltage detectors for verifying the absence of voltage in overhead lines and voltage detecting systems in power supply installations for overhead contact lines.

Horstmann products are precisely adjusted to the requirements of railway networks and designed for use with the typical frequencies.

- ▶ Smart Navigator 2.0 Rail – Quick location of faults in overhead line systems and on catenary masts
- ▶ Pole Master Rail – Long-distance communication of reports of faults in overhead line systems to the central location
- ▶ BO-A 2.0 – Determining voltage presence or absence in overhead line systems of electrified railways
- ▶ BO-A AC / DC – Focus: Determining the absence of voltage for DC and AC applications with residual voltage
- ▶ Polaris – Electrified sections with autotransformers, monitoring of return currents
- ▶ Wega 2 R1/R2 and Wega 1 R1/R2 – Determining voltage presence or absence in switchgears for powering railways
- ▶ Earthing and short-circuiting device – For safe working in switchgears

Smart Navigator 2.0 Rail

Short-circuit indicator for catenary systems



Smart Navigator 2.0 Rail

Pole Master Rail

PRODUCT FEATURES

- ▶ Intelligent fault detection — reduces outage times
- ▶ Overhead line monitoring — data for the evaluation of the network condition
- ▶ Innovative installation — on live conductors possible and from the ground
- ▶ Remote maintenance — configuration and updates from the control room

Intelligent fault detection

The proven overcurrent detection algorithm detects fault currents reliably under a wide range of network situations. Individual parameter settings tailor the system perfectly for all locations in your catenary system, eliminating false tripping.

The Smart Navigator 2.0 Rail can be quickly and easily mounted in overhead line systems. Typical mounting locations are longitudinal and transverse disconnects, catenary lines, amplifier lines, bypass lines and feeder lines in autotransformer systems.

Fault messages containing information about short-circuits and fault current direction help to clearly identify problem situations. Every fault is signalled to the control room within one minute.

Energy management

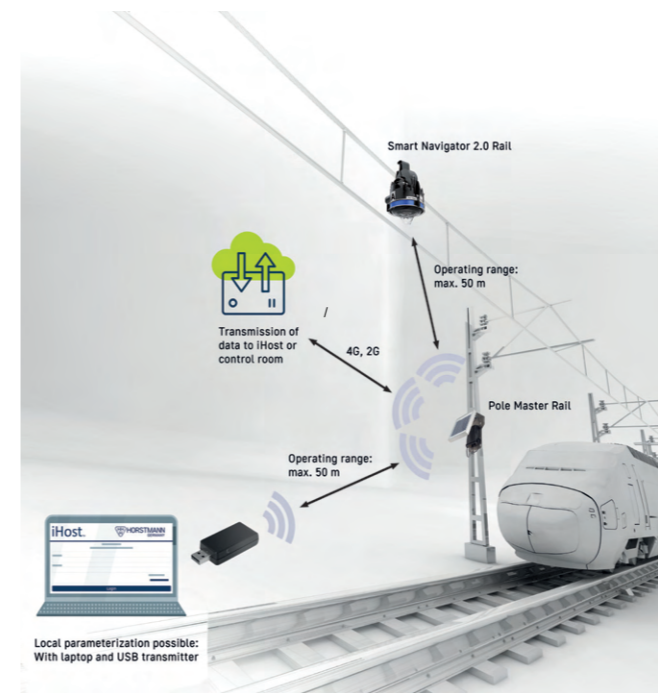
Pole-mounted units with solar panels are used to ensure supply and control room communication. Alternatively, these can be powered from a DC or AC auxiliary power supply.

The high battery capacity of the Smart Navigators guarantees a service life of >10 years, and any load current extends service life.

Clamp

Thanks to the innovative clamping mechanism, unintentional detaching from the overhead line due to environmental influences is impossible.

Using a hot stick, the system can be installed on overhead lines up to 12 metres high, even while energised, and can be quickly and easily removed.



Service

Smart Navigators 2.0 Rail are successfully used internationally, to detect and remotely report network faults.

Therefore, the Smart Navigator 2.0 Rail is tailored to the country-specific radio approvals and the different frequency ranges of the network operators.

We are happy to support you with the connection to your server solution for the control room and the design of the network-specific tripping characteristics. In order to realise your individual projects, we are at your disposal.

Remote signalling and monitoring

Thanks to remote signalling, the complex, high quality and diverse sensor technology enables clear monitoring and thus direct insight into your overhead line network.

Remote maintenance such as software updates or configuration adjustments can be performed via the GSM / LTE connection.

Technical data	Smart Navigator 2.0 Rail
Trip current	10–1,200 A (adjustable)
Current measurement accuracy	±2 A (0–10 A) 3 % (10–600 A)
Indication	Ultra-bright high power LEDs (red, green, yellow), indication for maintenance purposes only. Deactivated in normal operation, as there is a risk of confusion with signalling and control systems
Directional indication	Is supported
Reset	Automatic time reset (1 minute)
Power supply	Smart Navigator 2.0 Rail: Lithium cells, replaceable, shelf life >10 years Pole Master Rail: ▶ Solar supply (12 V DC) ▶ Up to 8 weeks buffer time using integrated backup battery (depending on dial-up interval)
Max. permissible voltage	7.2–46 kV / 16.7 Hz (other frequencies on request)
Withstand current	800 A at <50 °C ambient temperature, 25 kA / 3 s
Temperature measurement range	-40 to +80 °C, ±5 °C for conductor rope
Remote signal	▶ Fault detection ▶ Fault current direction ▶ Data such as temperature, signal field strength and battery status
Server	Cloud solution for fast system integration: iHost Cloud Connection to the control room: iHost Solo or iHost Pro Functionality monitoring
Communication	Smart Navigator 2.0 Rail: ▶ Local: 868 MHz short-range radio (50 m) Pole Master Rail: ▶ WAN: 4G-LTE modem (2G fallback) ▶ WAN: 4G-LTE CAT M1 Modem ▶ Local: 868 MHz short-range radio (50 m)
Cable diameter range	≤33 mm
Adjacent conductor immunity	No influence by adjacent conductors with a horizontal distance of >250 mm from the indicator
Coupling	One Pole Master Rail with up to four Smart Navigator 2.0 Rail
Housing	UV resistant reinforced plastic, IP65
Dimensions	223 x 131 mm (H x W)
Weight	Approx. 1.0 kg
Temperature range	-40 °C to +85 °C

Equipment set	Order No.	Accessories	Page
1 – 4 Smart Navigator 2.0 Rail	44-1200-001	Bird guard for Pole Master Rail	6
1 Pole Master Rail	44-3100-101	USB transmitter	6
		Magnet (Test/Reset)	6
		Installation Tool	6
		Hot Stick	6

Accessories

Smart Navigator 2.0 Rail

Installation tool and extension stick

for Smart Navigator 2.0 Rail installations and removals on overhead line systems



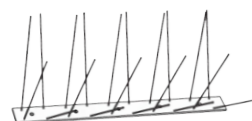
Installation tool	Order No.
To install and uninstall Smart Navigator 2.0 Rail	49-6006-005



USB transmitter	Order No.
for Smart Navigator 2.0 Rail and Pole Master Rail	28-5000-001



Magnet	Order No.
for test and reset	49-6001-002



Bird guard	Order No.
for Pole Master Rail	44-9900-001

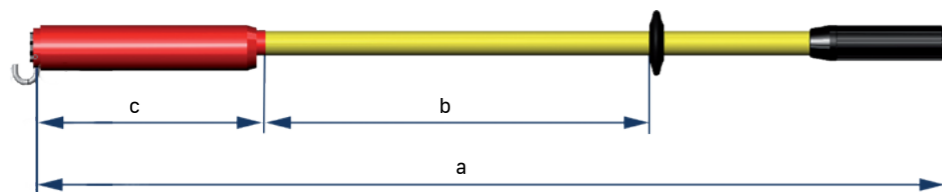
Telescopic stick with universal gear coupling



Telescopic stick with universal gear coupling	Order No.
(length extended: 6.43 m, length retracted: 1.63 m) Rated voltage: 123 kV (only when fully extended)	65-0305-001
length extended approx. 12m, length retracted approx. 1.8m Rated voltage: 132 kV (only when fully extended)	65-0305-004

Hot stick with hook

for overhead installations and removals of Smart Navigator 2.0 Rail



Hot stick with hook (based on DIN VDE V 0681-1)

Nominal voltage range [kV]	Dimensions [mm]			Order No.
	a	b	c	
1-24	1,200	500	310	65-0301-001
1-36	2,000	900	310	65-0301-002
1-36	3,000	900	310	65-0301-003
1-52	2,000	900	310	65-0301-004



Deutsche Bahn approval



BO-A 2.0 Plug-in adapter



BO-A 2.0 with insulating rods (plug-in)

PRODUCT FEATURES

- ▶ VDE version — according to DIN VDE 0681-6
IEC version — based on IEC 61243-1 category S
- ▶ Telescopic and pluggable system — minimal setup
- ▶ Integrated self-test — greater safety
- ▶ Light weight — easy handling and transportation
- ▶ Length of 4.7 m — voltage detection from the ground
- ▶ Automatic frequency detection — Warning when used in networks with different frequencies
- ▶ Use even in precipitation
- ▶ Storage bag - safe transport

The BO-A 2.0 is a voltage detector for medium voltage railway overhead contact lines. It is designed to detect the absence or presence of voltage during maintenance work for example. The voltage detector BO-A 2.0 is developed for 16.7 Hz, 50 Hz and 60 Hz networks. If the voltage detector BO-A 2.0 is used in a network with a deviating frequency, a visual and audible signal is activated. In this case the network situation must be verified. The BO-A 2.0 is designed according to IEC 61243-1 resp. VDE 0681-6, depending on the version. The voltage detector is ready for the worldwide market. According to the German accident prevention standard DGUV Regulation 3 (Table 1c), the device is subject to maintenance tests with minimum intervals of at least 6 years.



BO-A 2.0 indication and control panel

- Green LED: Stand-by state and voltage not present
- Red LED: Voltage present
- Blue button: On/Off button

Technical data	BO-A 2.0
Application	In dry and wet conditions
Indication	“Ready-to-operate state”: green LED (after passed self-test) “Voltage present”: red LED and audible signal “Voltage not present”: green LED and no audible signal
Period of “Stand-by state”	65 s ±15 s
Type of indication	According to group III IEC 61243-1
Nominal voltage / nominal frequency	VDE version: 11 kV / 16.7 Hz or 15 kV / 16.7 Hz IEC version: 15 kV / 16.7 Hz, 25 kV / 50 Hz or 25 kV / 60 Hz
Properties of the insulating rod	Passed test as insulating element for leakage current at 1.2 x Vr for 1 min
Power supply	Replaceable Lithium cells, battery service life: 6 years based on 10 ready-to-operate cycles per day for a total of 230 work days per year
Transportation length	<1,111 mm
Minimum length insulating element	>520 mm
Operating temperature	-25 to +70 °C, climatic class N and W

Nominal voltage [kV]/ nominal frequency [Hz]	Total length a [mm]	Insertion depth b [mm]	Handling	Version	Order no.
15 kV / 16.7 Hz	max. 5,400	1,790	Telescopic rod / plug-in adapter	▶ VDE version ▶ DB approval	50-1510-202
15 kV / 16.7 Hz	max. 5,400	1,790	Telescopic rod / plug-in adapter	▶ IEC version ▶ Automatic self-activation	50-1512-002
15 kV / 16.7 Hz	4,700	1,790	Insulating rods (plug-in)	▶ VDE version ▶ DB approval	50-1510-002
11 kV / 16.7 Hz	4,700	1,790	Insulating rods (plug-in)	▶ VDE version ▶ Automatic self-activation	50-1510-301

Further versions are available depending on the following parameters:

- ▶ Nominal voltage (11 kV, 15 kV, 25 kV),
- ▶ Rated frequency (16.7 Hz, 50 Hz, 60 Hz),
- ▶ Version according to IEC 61243-1 or VDE 0681-6,
- ▶ Handle (telescopic rod/plug-in adapter, universal adapter/telescopic rod, plug-in insulating rod),
- ▶ Optional: Automatic self-activation when connected to live overhead lines.

Simply let us know which version is suitable for your application.



Transportation bag with BO-A 2.0



Pluggable system BO-A 2.0



Transport of one and two storage bags

BO-A AC/DC

DC voltage detector for catenary systems



Deutsche Bahn approval

PRODUCT FEATURES

- ▶ Simple plug-in and telescopic system - quick and easy ready for use
- ▶ Integrated self-test + AC/DC residual voltage indicator - maximum safety
- ▶ Low weight - easy handling and transport
- ▶ Bright LEDs and loud acoustic signals - good visibility in all environmental conditions
- ▶ Shock-resistant and no battery replacement necessary - maintenance-free with long service life
- ▶ DC polarity indicator
- ▶ Can also be used in precipitation
- ▶ Up to max. 4.7 m in length - voltage test from the ground
- ▶ Magnetic earthing contact

The BO-A AC/DC mobile voltage detector is used to determine the absence of voltage on overhead lines. It recognises dangerous DC and AC residual voltages and thus increases user safety.

The BO-A AC/DC is a two-pole voltage tester for overhead lines on trams and electric buses, for example.

If the BO-A AC/DC is applied to a live conductor, an optical and acoustic signal is activated. A DC or AC voltage network is automatically recognised and indicated.

The BO-A AC/DC is designed and tested in accordance with the IEC 61243-1, -2 and DIN VDE 0681-6 standards. It can therefore be used worldwide.

In accordance with DGUV Regulation 3 (Table 1c), the device is subject to the periodic test prescribed every 6 years.



BO-A AC/DC Plug-in adapter telescopic rod | Display



BO-A AC/DC with insulating rods (plug-in)

Technical data	BO-A AC/DC
Use	<ul style="list-style-type: none"> ▶ DC and AC voltage networks from 100 V to 3,000 V ▶ Use in dry and wet conditions
Indication	'Stand-by': green LED (after successful self-test) 'Voltage present': red LED and acoustical signal for DC with static polarity indication (blue/red) for AC without polarity indication 'Voltage not present': green LED, no acoustical signal AC/DC residual voltage indicator: yellow flashing LED for: AC residual voltage detection from 50 V RMS or DC residual voltage detection from $\pm 75V$ DC +_ polarity indicator: detecting DC voltage polarity: red or blue flashing LED
Period of „Stand-by state“	65 s ± 15 s (Automatic self-activation optionally available)
Type of indication	According to group III IEC 61243-1
Nominal voltage / nominal frequency	The following three standard versions are available: <ul style="list-style-type: none"> ▶ Un = 100 V – 300 V ▶ Un = 300 V – 900 V ▶ Un = 1000 V – 3000 V See imprint on type plate, tolerance ± 10 % 16.7–60 Hz
Properties of the insulating stick	Passed test as insulating element for leakage current at $1.2 \times V_r$ for 1 min
Power supply	Replaceable lithium cells, 6 years at approx. 10 ready cycles / day and 230 days / year
Transportation length	<1,100 mm (incl. hook)
Minimum length insulating element	>520 mm
Operating temperature	-25 °C to +65 °C

Nominal voltage [kV] Nominal frequency [Hz]	Total length [mm] ± 50 mm	BO-A AC/DC version	Order No.
100–300 V (AC) / 50 Hz or DC	4,700	Telescopic pole /Plug adapter	50-1600-202
300–900 V (AC) / 50 Hz or DC	4,700	Telescopic pole /Plug adapter	50-1600-203
1000–3000 V (AC) / 50 Hz or DC	4,700	Telescopic pole /Plug adapter	50-1600-204
100–300 V (AC) / 50 Hz or DC	4,700	Telescopic pole /Universal adapter	50-1600-102
300–900 V (AC) / 50 Hz or DC	4,700	Telescopic pole /Universal adapter	50-1600-103
1000–3000 V (AC) / 50 Hz or DC	4,700	Telescopic pole /Universal adapter	50-1600-104
100–300 V (AC) / 50 Hz or DC	4,700	Insulating sticks (pluggable)	50-1600-002
300–900 V (AC) / 50 Hz or DC	4,700	Insulating sticks (pluggable)	50-1600-003
1000–3000 V (AC) / 50 Hz or DC	4,700	Insulating sticks (pluggable)	50-1600-004
1500 V DC (without residual and polarity display)	4,700	Telescopic pole /Plug adapter	50-1504-002

Accessories	Page
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Storage bag	12
Double prong adapter and catch fork	12



BO-A 2.0 indication and control panel

- Yellow LED: Residual voltage indication
- Green LED: Stand-by state and voltage not present
- Red LED: Voltage present
- Red/blue LED: Polarity indication
- Blue button: On/Off button

Transportation and storage bag for BO-A 2.0 and BO-A AC/DC



Product	Dimensions [mm]			Order No.
	L	H	D	
Transportation bag black	1,130	340	100	52-0104-105
Storage bag reflector foil orange	1,130	340	100	52-0104-106
Storage bag reflector foil yellow	1,130	340	100	52-0104-107
Cordura bag black, Horstmann logo in yellow	1,210	300	100	52-0104-018
Cordura bag black, Horstmann logo in blue	1,210	300	100	52-0104-019



Cordura bag black, Horstmann logo in yellow



Storage bag incl. BO-A 2.0 with pluggable insulating poles (example)

Telescopic pole/Plug-in system



Product	Order No.
Plug-in adapter/ telescopic insulating stick according to IEC 62193 and ASTM 1826	52-0108-051
Universal adapter/ telescopic insulating stick according to IEC 62193 and ASTM 1826	65-0305-001
Insulating stick (pluggable)	52-0108-008

Double prong adapter, Catch hook and Earthing bridge

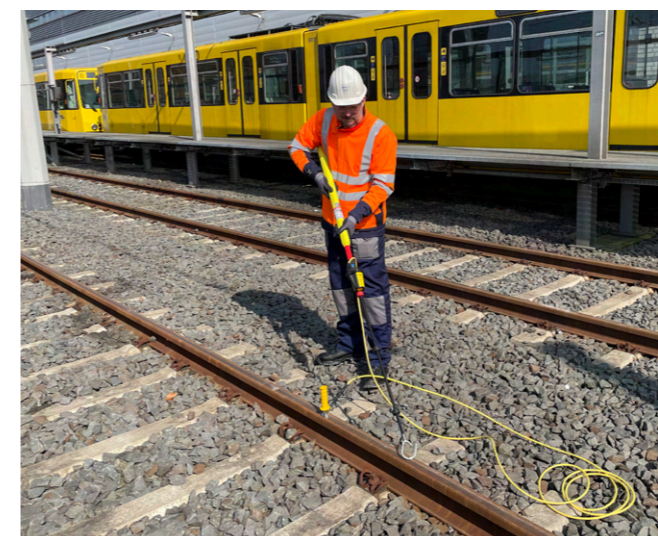
The double prong adapter is designed to make it easier to contact overhead lines, while the catch hook is designed to hook the voltage detector onto overhead lines.



Product	Order No.
Catch hook, screw-on, for attaching to the overhead line (left)	52-0307-010
Double prong adapter, screw-on, for contacting or connecting to the overhead line from below (right)	52-0307-011



Product	Order No.
Earthing bridge for BO-A AC/DC	52-0108-052



Monitoring of return currents in applications with autotransformer



Polaris



Single-phase current sensor

PRODUCT FEATURES

- ▶ Monitoring of lines in the reverse current system of electrical railway supply
- ▶ Monitoring the earth potential
- ▶ Relay for remote signal

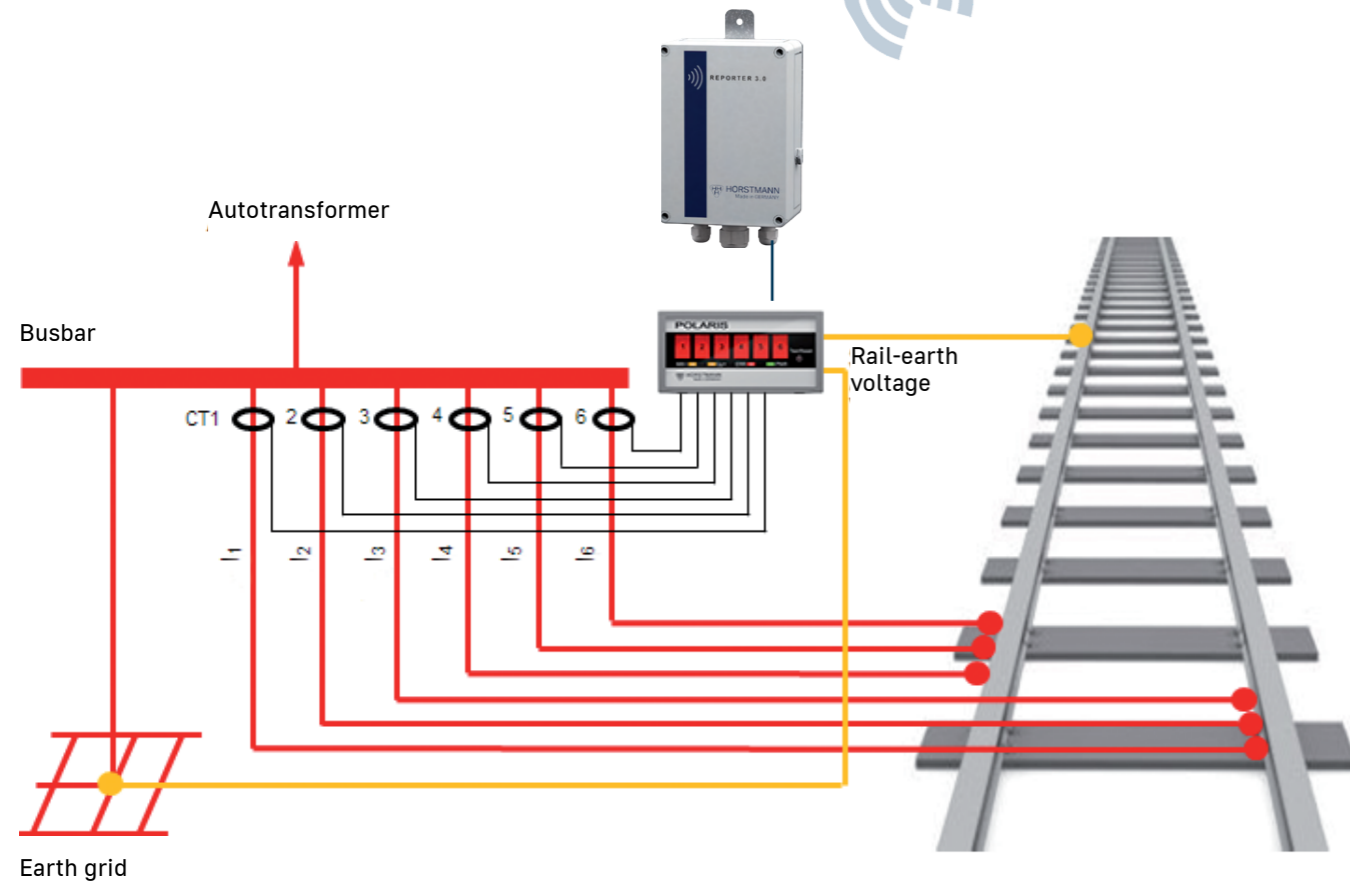
The Polaris performs a continuous monitoring of parallel connecting cables in 2 x 25 kV railway systems, which typically carry the return current.

If the connection of one of these cables deteriorates, it will be detected and selectively displayed. In addition, any undesired increase of the earth potential is detected and displayed.

The above events are remotely reported to the control room. This means that railway asset management can direct the service team to the fault location.



Control room



Technical data	Polaris
Measurement sensors	0 – 630 A
t _{l>>} response delay	500 ms / 1,000 ms / 5 s / 10 s (adjustable)
Threshold inequality	30 %, 40 %, 50 %, 60 % (adjustable)
Trip current earth potential	50 V AC ±2 V
Accuracy	±5 %
Amount of channels	2–6 (adjustable)
Indication	6 red LEDs / 1 per channel 2 yellow LEDs IMB> (unbalanced return current) and VE> (shift in earth potential) 1 red LED ERR (device error) 1 green LED PWR (power supply)
Remote signal	2 relay contacts, changeover contact
Remote contact	Potential-free permanent contact Contact capacity: 230 V AC / 1 A / 62.5 VA; 220 V DC / 1 A / 60 VA
Test / Reset	Manual
Power supply	External auxiliary supply 24 V +10 % / -20 %, 200 mA max.
Housing	Polycarbonate
Dimensions	96 x 48 x 96 mm (W x H x D) for installation housing
Temperature range	-30 to +70 °C

Equipment set	Order No.	Accessories	Order No.
1 Polaris	99-0000-220	Assembly bracket Z-shape	53-0101-004
2–6 single-phase current sensors (depending on application)	49-6024-013	Assembly bracket U-shape	53-0101-005

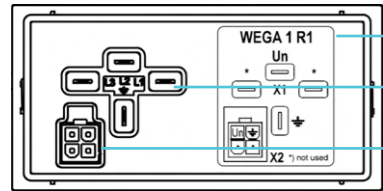
Integrated voltage detecting system for railway networks



Wega 1 R1 Front view

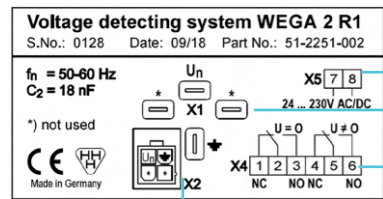


Wega 2 R1 Front view



Connection scheme
Voltage input flat terminal
Connection 4-pole-Compact plug

Wega 1 R1 Rear view

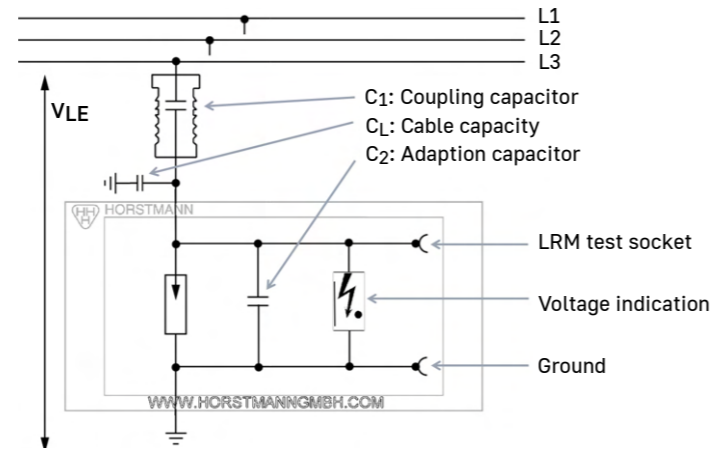


Auxiliary power supply
Voltage input flat terminal
Relay contacts
Connection 4-pole-Compact plug

Wega 2 R1 Rear view

PRODUCT FEATURES

- ▶ According to the current IEC 62271-213:2021 standard
- ▶ Fully encapsulated electronics – High functional reliability
- ▶ Integrated repeat test – maintenance-free
- ▶ Overvoltage indicator
- ▶ Shielded or unshielded cables with flat plugs or system plugs can be connected
- ▶ Use for railway networks with an autotransformer system (2-pole switchgear - 16.7 Hz / 50 Hz / 60 Hz)
- ▶ Operation with capacitive high-voltage supporter
- ▶ LRM interface at the front – Fully compliant with IEC 62271-213
- ▶ Wega 1 R1 and Wega 2 R1 determine the absence of voltage in single-phase railway networks
- ▶ Wega 2 R1: Remote signalling with relay contacts



Principle of an integrated voltage detecting system

Wega 1 R1 and Wega 2 R1 are single-phase voltage testing systems that indicate subsequent medium voltage conditions:

	Voltage present Threshold value for voltage presence indication: 0.17 – 0.78 x Un.
	Voltage present Integrated maintenance test passed
	Voltage present Integrated maintenance test passed Voltage signal too high (overvoltage indication)
	Voltage not present

The display test function built into the front allows the display to be tested when installed and de-energised.

Technical data	Wega 1 R1	Wega 2 R1
Nominal frequency	16,7 / 50 / 60 Hz	
Interface	2 LRM measuring sockets and 1 earth socket LRM system, 14 mm distance between sockets, with captive anti-dust cap	
Indication	▶ LCD display with arrow, dot and wrench tool	▶ LCD display with arrow, dot and wrench tool ▶ LED indication, V=0 and V≠0 and auxiliary power present
Remote signal	Relay contacts, alternating contact	
Power supply	LCD display: fed by measuring voltage	LCD display: fed by measuring voltage Relay via 24 – 230 V AC / DC power supply
Housing	Polycarbonate, IP54	
Dimensions	96 x 48 x 52 mm (L x H x D), cut-out on system side: 92+0,8 x 45+0,6 mm	
Temperature range	25 °C to +65 °C	

Equipment set	Order No.
1 Display unit	
Wega 1 R1, 16,7 Hz	51-1255-004
Wega 1 R1, 50 Hz / 60 Hz	51-1255-003
Wega 2 R1, 16,7 Hz	51-2251-102
Wega 2 R1, 50 Hz / 60 Hz	51-2251-302

Wega 1 R2 | Wega 2 R2

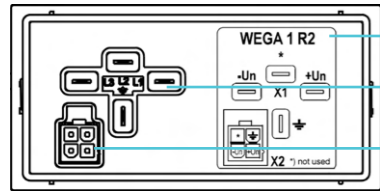
Integrated voltage detecting system for railway networks



Wega 1 R2 Front view

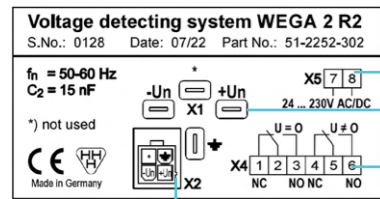


Wega 2 R2 Front view



Connection scheme
Voltage input flat terminal
Connection 4-pole-Compact plug

Wega 1 R2 Rear view



Auxiliary power supply
Voltage input flat terminal
Relay contacts
Connection 4-pole-Compact plug

Wega 2 R2 Rear view

PRODUCT FEATURES

- ▶ According to the current IEC 62271-213:2021 standard
- ▶ Wega 1 R2 and Wega 2 R2 determine the absence of voltage in two-phase railway networks
- ▶ Shielded or unshielded cables with flat plugs or system plugs can be connected
- ▶ Use in single-phase earthed two-phase mains (15 kV / 16,7 Hz und 25 kV / 50 Hz-60 Hz)
- ▶ Operation with capacitive high-voltage supporter
- ▶ Integrated repeat test – maintenance-free
- ▶ Overvoltage indicator
- ▶ LRM interface at the front – Fully compliant with IEC 62271-213
- ▶ Fully encapsulated electronics – High functional reliability
- ▶ Wega 2 R2: Remote signalling with relay contact

Wega 1 R2 and Wega 2 R2 are two-phase voltage detecting systems that indicate subsequent medium voltage conditions:

	Voltage present Threshold value for voltage presence indication: $0.17 - 0.78 \times U_n$.
	Voltage present Integrated maintenance test passed
	Voltage present Integrated maintenance test passed Voltage signal too high (overvoltage indication)
	Voltage not present

The display test function built into the front allows the display to be tested when installed and de-energised.

Technical data	Wega 1 R2	Wega 2 R2
Nominal frequency	16,7 / 50 / 60 Hz	
Interface	1 LRM measuring sockets and 1 earth socket LRM system, 14 mm distance between sockets, with captive anti-dust cap	
Indication	▶ LCD display with arrow, dot and wrench tool	▶ LCD display with arrow, dot and wrench tool ▶ LED indication, V=0 and V≠0 and auxiliary power present
Remote signal	Relay contacts, alternating contact	
Power supply	LCD display: fed by measuring voltage	LCD display: fed by measuring voltage Relay via 24 - 230 V AC / DC power supply
Temperature range	-25 °C to +65 °C	
Housing	Polycarbonate, IP54	
Dimensions	96 x 48 x 52 mm (L x H x D), cut-out on system side: 92+0,8 x 45+0,6 mm	

Equipment set	Order No.
1 Display unit	
Wega 1 R2, 16,7 Hz	51-1256-002
Wega 1 R2, 50 Hz / 60 Hz	51-1256-001
Wega 2 R2, 16,7 Hz	51-2252-303
Wega 2 R2, 50 Hz / 60 Hz	51-2252-302

Single-phase device without connection elements



PRODUCT FEATURES

- ▶ Designed according to IEC 61230 (VDE 0683-100)
- ▶ Cables assembled from highly flexible copper conductors (with transparent insulation)
- ▶ Cable lug on each cable end

Each cable lug is provided with a 13 mm diameter hole. Any type of line or phase clamp can be used for the earthing cables.

Single-phase earthing and short-circuiting cable

Cross section of copper conductor [mm ²]	Rated values ¹⁾ Ir [kA]/tr=1 s	Cable length [mm]	Order no.	Accessories	Page
25	4.9	800	61-0101-015	Line clamps	21
25	4.9	2,000	61-0101-003	Earth clamps	21
25	4.9	2,500	61-0101-016	Earthing sticks	see main catalogue
35	6.9	2,000	61-0102-003	Hot stick	see main catalogue
35	6.9	3,000	61-0102-009	Wall holders	see main catalogue
50	9.9	1,200	61-0103-001		
50	9.9	1,500	61-0103-002		
50	9.9	2,000	61-0103-003		
70	13.8	800	61-0104-018		
70	13.8	1,200	61-0104-001		
70	13.8	1,500	61-0104-002		
70	13.8	2,000	61-0104-003		
95	18.7	1,200	61-0105-001		
95	18.7	1,500	61-0105-002		
95	18.7	3,000	61-0105-009		
95	18.7	4,000	61-0105-008		
95	18.7	5,000	61-0105-010		
120	23.7	1,000	61-0106-012		
120	23.7	1,200	61-0106-001		
120	23.7	1,500	61-0106-002		
120	23.7	2,000	61-0106-003		
120	23.7	3,000	61-0106-006		
150	29.6	1,200	61-0107-001		
150	29.6	1,500	61-0107-002		
150	29.6	2,000	61-0107-003		
150	29.6	2,500	61-0107-009		
150	29.6	3,000	61-0107-006		

¹⁾ Further cable lengths and combinations available on request.

Line clamps with bayonet fitting

Material of universal compact clamp: CuCr, tinned

Material of universal line clamp: brass, tinned

Material of ball tongs: brass, zinc-plated



Ball pin Ø [mm]	Connection to				Rated values Ir [kA]/tr=1 s	Order no.			
	T-connection bolt [mm]	Round conductor [mm]	Flat conductor [mm]			Universal compact clamp	Universal line clamp	Universal line clamp	Ball tong
20	—	—	—	—	18.7	—	—	—	64-0103-001
25	—	—	—	—	29.7	—	—	—	64-0103-002
20	15	4–15	≤25	13.8	—	64-0101-001	—	—	—
20	—	10–20	≤22	13.8	—	—	64-0102-001	—	—
25	15	10–25	≤28	23.7 ¹⁾	—	—	—	64-0102-002	—
20/25	15	10–25	≤28	18.7/23.7 ¹⁾	—	—	—	64-0102-003	—
25/30	15	10–30	≤28	23.7	—	—	—	64-0102-004	—

¹⁾ The rated value for the T-connection bolt is always 13.8 kA.

Earth clamps

Earth clamp for flat conductors

Material: CuNi, zinc-plated



With T-handle

Clamping range [mm]	Rated values Ir [kA]/tr=1 s	Order no.
23	18.7	64-0201-001
38	29.6	64-0201-002



With wing bolt

Clamping range [mm]	Rated values Ir [kA]/tr=1 s	Order no.
23	18.7	64-0201-003
38	29.6	64-0201-004



With bayonet connector

Clamping range [mm]	Rated values Ir [kA]/tr=1 s	Order no.
23	18.7	64-0201-005
38	29.6	64-0201-006



Earthing terminal

Material: brass, zinc-plated / E-Cu

Clamping range [mm]	Rated values Ir [kA]/tr=1 s	Order no.
50	9.9	64-0202-003
70	13.8	64-0202-004
95	18.7	64-0202-005

Cable lug with 13 mm Ø hole

Material: E-Cu, tinned



Cable cross section [mm ²]	Rated values I _r [kA]/tr=1 s	Order no.
50	9.9	64-0205-003
70	13.8	64-0205-004
95	18.7	64-0205-005

Cable lug with captive wing nut

Material: E-Cu, tinned



Cable cross section [mm ²]	Thread	Rated values I _r [kA]/tr=1 s	Order no.
120	M12	23.7	64-0213-001
150	M16	29.6	64-0213-002

Cable lug with captive wing bolt

Material: E-Cu, tinned



Cable cross section [mm ²]	Thread	Rated values I _r [kA]/tr=1 s	Order no.
120	M12	23.7	64-0214-001
150	M16	29.6	64-0214-002

Further clamps and connecting points are in the main catalogue.

Product Range

Our catalogues and supplementary documents feature a selection of our product range. Additionally, a wide variety of customer-specific solutions and configurations are available. Please feel free to contact us if you require customised products or cannot find what you are looking for.

Catalogues, Leaflets, and Instructions for Use

We offer the latest editions of catalogues and leaflets for our customers and interested parties, accessible via our website: <http://www.horstmanngmbh.com>.

For our customers, there is also the option to download the most recent instructions for use of all current devices as PDF files through a password-protected portal.

If you require further documents or have any questions, please do not hesitate to reach out to us. We are here to assist you.

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101101-0001/200/1024