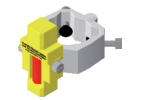
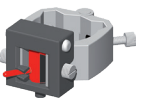


Short-circuit and earth fault indicators



Function	Rotor indicator	Fluid indicator	Opto F 3.0 / Opto F+E 3.0	Alpha M / Alpha E	Sigma 2.0 / Sigma 2.0 AC/DC	Sigma F+E 2.0 / Sigma F+E 2.0 AC/DC	Sigma F+E 3 2.0 / Sigma F+E 3 2.0 AC/DC	Sigma D	Sigma D+	Sigma D++	Sigma DM	ComPass A	ComPass B	ComPass B 2.0	ComPass Bs 2.0	ComPass D	Earth Zero	Earth Zero Typ Flag	Earth 4.0
Short-circuit indication / earth short-circuit indication	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	—	—	—
Earth fault indication	—	—	■ (F+E 3.0)	—	—	■	■	■	■	■	■	■	■	■	■	■	—	■	■
Directional indication	—	—	—	—	—	—	—	■	■	■	■	—	■	■	■	■	—	—	—
Monitoring	—	—	—	—	—	—	—	—	—	—	—	■	■	■	■	■	—	—	—
Control function and programmable logic	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1 switchgear	2 switchgears	—	—	—
Neutral Earthing System																			
Short-term / low-impedance earthed	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Isolated earthed	—	—	—	—	—	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Resonant earthed (with Petersen coil)	—	—	—	—	—	—	—	—	■	■	■	—	■	■	■	■	—	—	—
Short-circuit trip current values																			
I>> Short-circuit trip current / earth short-circuit trip current	150—2.000 A (fixed settings)	400, 600, 1.000 A (fixed settings)	400, 600, 800 or 1.000 A	400, 600, 800, 1.000 A	200, 300, 400, 600, 800, 1.000, 2.000 A, self-adjustment	200, 300, 400, 600, 800, 1.000, 2.000 A, self-adjustment	200, 300, 400, 600, 800, 1.000, 2.000 A, self-adjustment	DIP: 200, 300, 400, 600, 800, 2.000 A, self-adjustment SW: 50—2.000 A	DIP: 200, 300, 400, 600, 800, 2.000 A, self-adjustment SW: 50—2.000 A	DIP: 200, 300, 400, 600, 800, 2.000 A, self-adjustment SW: 50—2.000 A	DIP: 400, 800, 1.000, 2.000 A, self-adjustment SW: 50—2.000 A	20—2.000 A	50—2.000 A	10—2.000 A, self-adjustment	10—2.000 A self-adjustment	10—2.000 A self-adjustment	—	—	—
ti>> Response delay	100 ms	200 ms	40, 60, 80, 100, 200, 300 or 500 ms	100 ms	40, 80 ms	40, 80 ms	40, 80, 200, 300 ms	DIP: 40, 80 ms, SW: 40 ms—60 s	DIP: 40, 80 ms, SW: 40 ms—60 s	DIP: 40, 80 ms, SW: 40 ms—60 s	DIP: 40, 80 ms, SW: 40 ms—60 s	40 ms—60 s	40 ms—60 s	20 ms—60 s	20 ms—60 s	20 ms—60 s	—	—	—
Earth fault detection methods																			
IE> Earth fault trip current	—	—	F+E 3.0 : 10, 20, 40 or 80 A or 40, 80, 120 or 160 A	—	—	20, 40, 60, 80, 100, 120 or 160 A	20, 40, 60, 80, 100, 120 or 160 A	DIP: off, 20, 40, 60, 80, 100, 120, 160 A SW: 20—1.000 A	DIP: off, 20, 40, 60, 80, 100, 120, 160 A SW: 20—1.000 A	DIP: off, 20, 40, 60, 80, 100, 120, 160 A SW: 20—1.000 A	SW: 20—1.000 A	20—1.000 A	20—1.000 A	10—1.000 A	10—1.000 A	10—1.000 A	25, 50, 75, 100 A	25, 50, 75, 100 A	25, 50, 60, 80 A
IEP> Active residual current cos φ	—	—	—	—	—	—	—	—	5—200 A	5—200 A	5—200 A	—	1—200 A	—	1—200 A	1—200 A	—	—	—
IEQ> Reactive current sin φ	—	—	—	—	—	—	—	—	5—200 A	5—200 A	5—200 A	—	1—200 A	—	1—200 A	1—200 A	—	—	—
IET> Transient earth fault method	—	—	—	—	—	—	—	—	10—500 A	10—500 A	10—500 A	—	—	—	10—500 A	10—500 A	—	—	—
VNE> Neutral point displacement voltage (permanent earth fault)	—	—	—	—	—	—	—	—	—	—	—	—	0—100%	—	1—100%	1—100%	—	—	—
IE> Pulse (stroke)	—	—	—	—	—	—	—	—	1—100 A	1—100 A	1—100 A	—	—	—	1—200 A	1—200 A	—	—	—
Response delay	—	—	60, 100 oder 200 ms (F+E 3.0)	—	—	80, 160 ms	60, 80, 200 oder 300 ms	DIP: 80, 160 ms, SW: 40 ms—60 s	DIP: 80, 160 ms, SW: 40 ms—60 s	DIP: 80, 160 ms, SW: 40 ms—60 s	SW: 40 ms - 60 s	40 ms—60 s	40 ms—60 s	40 ms—60 s	40 ms—60 s	40 ms—60 s	80, 160 ms	80, 160 ms	80, 160 ms
Reset																			
Manual/ Remote	■/—	—	■/■	M: ■/— E: ■/■	■/■	■/■	■/■	■/■	■/■	■/■	■/■	■/■	■/■	■/■	■/■	■/■	■/—	■/—	■/■
Automatic time reset	—	■	■	—	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Current- / voltage- / auxiliary supply restoration	—	—	—/■/■	—	—	AC/DC: —/—/■	—	AC/DC: —/—/■	■/—/—	AC/DC: ■/—/■	■/■/—	■/■/—	■/■/—	■/■/—	■/■/■	■/■/■	—/■/—	—/■/—	—/■/—
Test																			
Manual/ Remote	—	—	■/■	■/—	■/■	■/■	■/■	■/■	■/■	■/■	■/■	■/■	■/■	■/■	■/■	■/■	■/—	■/—	■/■
Communication																			
Relay contacts	on request	on request	F 3.0: 1	F+E 3.0: 2	1	1	2	3	4	4	4	—	4	4	4	4	1	1	3
Ethernet/ IEC 60870-5-104	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	■	—	—	—
RS485 / Modbus-RTU	—	—	—	—	—	—	—	—	—	—	■	■	■	■	■	■	—	—	—
USB port	—	—	—	—	—	—	—	■	■	■	■	—	—	—	■	■	—	—	—
Parameter setting																			
Manual / remote / software via USB	—	—	■/—/—	■/—/—	■/—/—	■/—/—	■/—/—	■/—/■	■/—/■	■/—/■	■/—/■	■/—/■	■/■/—	■/■/—	■/■/■	■/■/■	■/—/—	■/—/—	■/—/—
Power supply																			
Long-life lithium cell / capacitor	—/—	—/—	■/—	■(E)/—	■/—	AC/DC: —/■	■/—	AC/DC: —/■	■/—	■/—	■/—	■/—	■/—	■/—	■/—	■/—	■/—	■/—	■/—
CT powered	■	■	—	■	■	—	■	—	■	■	■ (not IET>)	■ (not IET>)	—	—	—	—	■	■	■
External auxiliary supply [V AC/DC]	—	—	24—60 V AC, 12—110 V DC	—	—	24—230	—	24—230	—	24—230	—	—	—	—	—	—	—	—	—
Number of current transformers (CT) / current sensor (S)																			
Phase current / summation current	—	—	F 3.0: 3/— (MWG) F+E 3.0: 3/1 (MWG)	3/— (MWG)	3/— (S)	3/— (S)	3/— (S)	3/— (S)	3/— (S)	3/1, opt. 3/— (S)	3/—, opt. 3/1 (S)	3/— (S)	3/— (S)	2/1, opt. 3/— for IE> 10 A (S)	3/—, opt. 3/1 or 2/1 (S)	3/—, opt. 3/1 or 2/1 (S)	—/1 (MWG)	—/1 (MWG)	—/1 (MWG)
Voltage coupling																			
Capacitive / resistive	—	—	—	—	—	—	—	■/—	■/—	■/—	■/—	—	■/—	■/■	■/■	■/■	—	—	—

In case of any questions, please do not hesitate to contact us:



Dipl.-Ing. H. Horstmann GmbH
Humboldtstraße 2–10
42579 Heiligenhaus, Germany
T +49 2056 976-0
info@horstmannmbh.com
www.horstmannmbh.com

Product matrix

Short-circuit and earth fault indicators

Remote monitoring

Voltage detectors and detecting systems

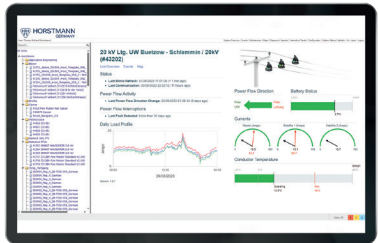
Integrated voltage detecting systems

Function	Wega 1	Wega 1 V	Wega 2	Wega 2 V	Wega T1
3 phase VDIS according to IEC 62271-213	■	■	■	■	—
Capacitive voltage coupling for ComPass B series and Sigma D series	■	■	■	■	Connection to transformer
Overvoltage indication	■	■	■	■	■
Integrated permanent maintenance test	■	■	■	■	■
Integrated display test (without auxiliary supply)	■	■	■	■	■
Fully enclosed electronics	■	■	■	■	■
Adjustable C2 capacity	—	■	—	■	Vario variant
Assembly set for retrofit	—	■	—	■	■
Nominal voltage / nominal frequency	■	■	■	■	■
Nominal voltage of switchgear	from 1 kV	from 1 kV	from 1 kV	from 1 kV	from 1 kV
Nominal frequency 50 Hz / 60 Hz	■	■	■	■	■
Display	■	■	■	■	■
LCD display / LED indication	■ / —	■ / —	■ / ■	■ / ■	■ / —
Display powered by measured voltage	■	■	■	■	■
LCD symbols	■	■	■	■	■
Voltage present	■	■	■	■	■
Threshold value: 0.1 — 0.45 x Vnom	■	■	■	■	■
Voltage present	■	■	■	■	■
Integrated maintenance test passed	■	■	■	■	■
Voltage present	■	■	■	■	■
Integrated maintenance test passed	■	■	■	■	■
Voltage signal too high (overvoltage)	■	■	■	■	■
Voltage not present	■	■	■	■	■
Interface	■	■	■	■	Test point
Front accessible, fully featured LRM interface, also in compliance with LRM system according to IEC 61243-5	■	■	■	■	■
Earth socket	■	■	■	■	■
Communication	■	■	■	■	■
Relay contacts	—	—	■	■	—
Connections	■	■	■	■	■
Flat connector	■	■	■	—	■
System connector (AMP)	■	■	■	■	Vario variant
Power supply	■	■	■	■	■
External auxiliary supply	—	—	■	■	—

Remote monitoring solutions

Function	Reporter 3.0	Reporter 4.0
SCADA	■	■
iHost	■	■
Data source	■	■
Short-circuit and earth fault indicator	■	■
Information	■	■
Short-circuit and earth fault indication	■	■
Monitoring	—	■
Communication	■	■
Inputs	■	■
Analogue	2 (4—20 mA)	8 (4—20 mA)
Digital	16	16
Modbus	—	47 Modbus (digital) 60 Modbus (analogue)
Interfaces / Protocol	—	RS-485 / Modbus-RTU
Mobile network	4G / 2G	4G / 2G
Power supply	■	■
External auxiliary supply	—	■
Back-up battery (rechargeable)	—	(100—240 V AC)
Long-life lithium cell	■	—
Housing	■	■
Material	Glas fibre reinforced polycarbonate	Glas fibre reinforced polyester
Degree of protection	IP66	IP66
Dimensions (W x H x D)	136 × 245 × 88 mm	291 × 362 × 186 mm
Cable ducts	3	4
Lock	Screws	Padlock
Mounting	Wall	Wall
Temperature range	-30 °C to +70 °C	-20 °C to +65 °C

iHost — Monitor your entire grid around the clock



Data concentrator for short-circuit and earth fault indicators

- ▶ Bundles and processes all data received from remote field devices
- ▶ Provides data access at any time in various ways and devices

Central management of all field devices - with one click

- ▶ Grid monitoring: system overview, data analysis, health checks
- ▶ Configuration and firmware updates

Data on demand

- ▶ Customised visualisation of data and alarms
- ▶ Individual notifications, generated automatically

Embedded database

- ▶ Grid data available from day one of installation
- ▶ Flexible data provision for asset management, planning, engineers and further user

Full flexibility

- ▶ Data to be stored in Horstmann cloud
- ▶ On premise installation with SCADA connection over IEC 60870-5-101 / -104 or DNP3 serial / IP

Voltage detectors / Phase comparators

Function	FL-I	Comet BL-I / Comet BL-A	Comet BK-I / Comet BK-A	Comet BS-I / Comet BS-A	BO-A 2.0	BO-A AC / DC	Compare 2.0	PG II
Environmental conditions	■	■	■	■	■	■	■	■
Indoor*	■	BL-I: ■	BK-I: ■	BS-I: ■	■	■	■	■
Indoor and outdoor**	—	BL-A: ■	BK-A: ■	BS-A: ■	■	■	■	—
Signalling	■	■	■	■	■	■	■	■
Visual	■	■	■	■	■	■	■	■
Visual and audible	—	■	■	■	■	■	—	—
Further functions	■	■	■	■	■	■	■	■
Self-test	—	■	■	■	■	■	■	—
Test principle: capacitive / resistive	■ / —	■ / —	■ / —	■ / —	■ / —	— / ■	■ / —	— / ■
Voltage detection for Overhead lines	■	■	■	■	■	■	■	■
AC / DC	■ / —	■ / —	■ / —	■ / —	■ / —	■ / ■	■ / —	■ / —
Nominal voltage [kV]**	■	■	■	■	■	■	■	■
0,1 – 3	—	—	—	—	—	■	—	—
5	—	■	—	—	—	—	—	■
6	■	—	—	—	—	—	—	■
10	■	■	—	—	—	—	—	■
11	—	■	—	—	■	—	—	—
15	—	—	—	—	■	—	—	—
20	■	■	—	—	—	—	—	■
25	—	—	—	—	■	—	—	—
30	—	■	—	—	—	—	—	■
5 – 10	—	—	—	■	—	—	—	—
6 – 10	—	■	■	—	—	—	—	—
10 – 20	—	■	■	■	—	—	■	■
20 – 30	—	■	—	■	—	—	—	—
20 – 36	—	—	—	—	—	—	■	—
Voltage range selectable	—	—	—	■	—	—	■	—
Technical data	■	■	■	■	■	■	■	■
Length [mm]****	1.270—1.370	1.270—1.570	900—955	1.570	1.111—4.700	1.100—4.700	1.420	1.220—1.420
Weight [g]****	700—1.000	700—1.000	750—850	850—1.000	3.340	3.800—4.060	900	1.600

* Can be used outside, but not under wet conditions!
** Can be used under wet conditions.

*** Other voltage ranges on request.
**** Length and weight vary depending on the version.