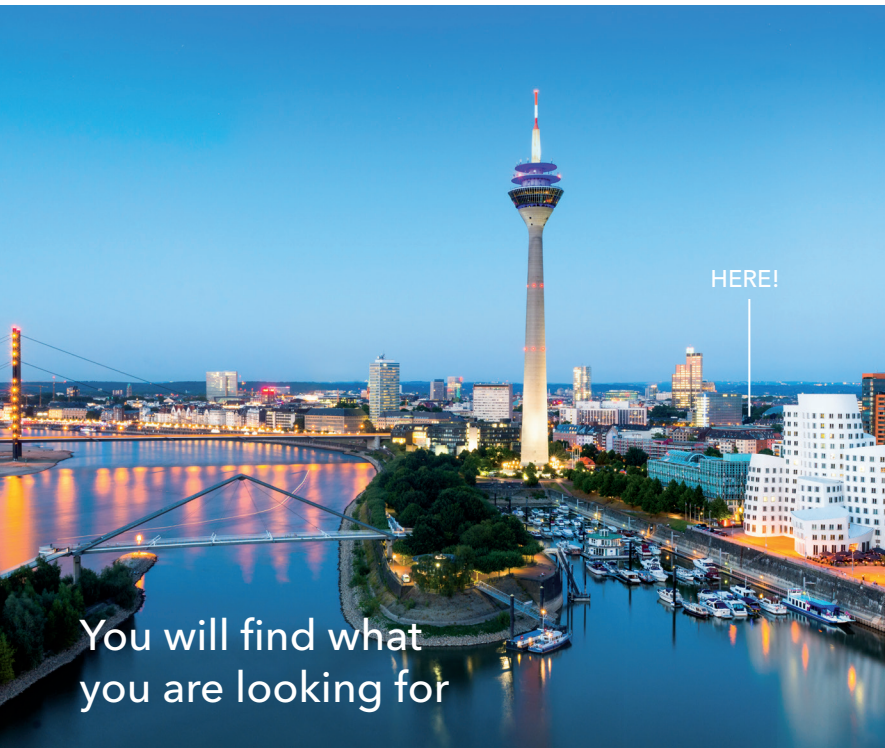




Short-circuit and earth fault indicators

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	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
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	-	-	-	
tl>> 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	1–200 A	1–200 A	-	-	-	
IEQ> Reactive current sin sin φ	-	-	-	-	-	-	-	5–200 A	5–200 A	5–200 A	1–200 A	-	1–200 A	1–200 A	1–200 A	1–200 A	-	-	-	
IE> Transient earth fault method	-	-	-	-	-	-	-	10–100 A	10–100 A	10–500 A	10–500 A	-	10–500 A	10–500 A	10–500 A	10–500 A	-	-	-	
VNE> Neutral point displacement voltage (permanent earth fault)	-	-	-	-	-	-	-	-	-	-	1–100 %	-	0–100 %	1–100 %	1–100 %	1–100 %	-	-	-	
ΔIE> Pulse (stroke)	-	-	-	-	-	-	-	1–100 A	1–100 A	1–100 A	1–100 A	-	-	1–200 A	1–200 A	1–200 A	-	-	-	
Response delay	-	-	60, 100 or 200 ms (F+E 3.0)	-	-	80, 160 ms	60, 80, 200 or 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: -/■/■	■/-/■	■/■/■	■/■/■	■/■/■	■/-/■	■/■/■	■/■/■	■/■/■	■/■/■	-/■/-	-/■/-	-/■/-	
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	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: -/■	■/-	AC/DC: -/■	■/-	■/-	■/-	■/-	■/-	■/-	■/-	■/-	■/-	
CT powered	■	■	-	■	■	-	■	-	■	-	■ (not IET>)	-	-	-	-	-	■	■	■	
External auxiliary supply [V AC/DC]	-	-	24–60 V AC, 12–110 V DC	-	-	24–230	-	24–230	-	24–230	-	24–230	24–230	24–230	24–230	24–230	24–230	-	-	
Number of current transformers (CT)/current sensor (S)																				
Phase current/summation current	-	-	F 3.0: 3/- (CT) F+E 3.0: 3/1 (CT)	3/- (CT)	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 IEG> 10 A (S)	3/-, opt. 3/1 or 2/1 (S)	3/-, opt. 3/1 or 2/1 (S)	3/-, opt. 3/1 or 2/1 (S)	-/1 (CT)	-/1 (CT)	-/1 (CT)	
Voltage coupling																				
Capacitive/resistive	-	-	-	-	-	-	-	■/-	■/-	■/-	■/-	-	■/-	■/■	■/■	■/■	-	-	-	

Product matrix
Solutions for underground cables



You will find what you are looking for

- 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					
Front accessible, fully featured LRM interface, also in compliance with LRM system according to IEC 61243-5	■	■	■	■	Test point
Earth socket	■	■	■	■	■
Communication					
Relay contacts	-	-	■	■	-
Connections					
Flat connector	■	■	■	-	■
System connector (AMP)	■	■	■	■	Vario variant
Power supply					
External auxiliary supply	-	-	■	■	-

Remote monitoring solutions for underground networks

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)
Outputs		
Digital	-	8
Interfaces / Protocol	-	Modbus
Mobile network	4G / 2G	4G / 2G
Power supply		
External auxiliary supply	-	(100–240 V AC)
Back-up battery (rechargeable)	-	■
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 x 245 x 88 mm	250 x 410 x 180 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 from SCADA

- 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

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: ■ BL-A: ■	BK-I: ■ BK-A: ■	BS-I: ■ BS-A: ■	■	■	■	■
Indoor and outdoor**	-	-	-	-	-	-	-	-
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 BS-I: 850 BS-A: 1.000	1.111–4.700	1.100–4.700	1.420	1.220–1.420
Weight [g]****	700–1.000	700–1.000	750–850		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.