Sigma F+E 2.0 | Sigma F+E 3 2.0

Short-circuit and earth fault indicator

HORSTMANN
GERMANY

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

Product features

- Short-circuit and earth fault detection from 3 single-phase current sensors
- Phase-selective fault indication
- Trip current values: load-dependent self-adjustment or fixed values
- Single and double flash mode for operation in radial and ring networks
- With auxiliary supply and capacitor storage available in AC/DC version

Your advantages

- No false trips due to harmonics
- Highly visible LED fault indication
- Detection of high-impedance earth faults
- Clear fault type indication via LED (Sigma F+E 3 2.0)
- Retrofit ready for earth and short-circuit indicators with monitoring/control and fault direction function

Sigma F+E 2.0 and Sigma F+E 3 2.0 are combined short-circuit and earth fault indicators. Due to the measuring principle the earth fault indication is suitable for low-impedance, solidly and isolated earthed neutral networks.

The current is measured via three single-phase current sensors. This allows phase-selective fault detection and indication.

There are two response criteria for short-circuit detection, fixed response values with response delay or auto-adjustment based on load current.

If the current for the selected response criterion – fixed value or self-adjustment – is exceeded, the fault-affected phase will be indicated by a bright flashing LED and remote contact will be activated. A double flashing LED signals a second fault that has occurred within the reset time, e. g. by an automatic reclose attempt and the remote contact will be reactivated.

For testing and commissioning purposes, the trip current values can be reduced to 10 A without changing the DIP switch settings.

Sigma F+E 3 2.0

Two additional LEDs display the fault type. The red LED $I>>$ signals a short-circuit, the yellow LED $I_E>$ signals an earth fault. The L1, L2 and L3 indication fields display the fault-affected phase. In addition, phase-selective (L1, L2, L3) or group-selective ($I>>$, $I_E>$, $I>>$ and $I_E>$) remote signalling is possible.

Sigma F+E 2.0 AC/DC and Sigma F+E 3 2.0 AC/DC

These versions can be connected to auxiliary supply. If the auxiliary power drops out in the event of a fault, the LED indicator can operate using a back-up capacitor for up to 8 hours.

Technical data	Sigma F+E 2.0	Sigma F+E 3 2.0
Short-circuit indicator	▪	
Earth fault indicator	▪	
Earth fault detection method	Earth short-circuit	
I>> short-circuit trip current	▪ 200, 300, 400, 600, 800, 1,000, 2,000 A ▪ Self-adjustment to load current (I_L = load current): I_L < 100 A → I>> = 400 A, I_L > 100 A → I>> = 4 x I_L	
tI>> response delay	40, 80 ms	40, 80, 200, 300 ms
I_E> earth fault trip current	20, 40, 60, 80 100, 120, 160 A	
tI_E> response delay	80, 160 ms	60, 80, 200, 300 ms
Accuracy	±5 % (0 – 630 A) ±10 % (>630 A)	

Indication	3 red phase-selective LEDs:
	  short-circuit 2 or 3 phases (L1, L2, L3) and
	  earth fault 1 phase
		LED indication
		▪ 3 red phase-selective LEDs L1, L2, L3
		▪ 1 red LED short-circuit I>>
		▪ 1 yellow LED earth fault I_E>

Remote signal / communication	2 potential-free relay contact	3 potential-free relay contacts
Remote contact	Potential-free permanent or momentary contact Contact capacity: 230 V AC / 1 A / 62.5 VA max.; 220 V DC / 1 A / 60 W max.	
Reset	▪ By button ▪ Automatic time reset: 1, 2, 4 or 8 h ▪ Remote reset	▪ By button ▪ Automatic time reset: 1, 2, 4 or 8 h ▪ Remote reset ▪ Current restoration ▪ Restoration of auxiliary supply (only AC/DC version)
Power supply		
CT powered	▪	
Internal power supply	Long-life lithium cell, active flashing time >900 h, shelf life ≥20 years AC/DC version: back-up capacitor, max. 8 h	
External auxiliary supply	AC/DC version: 24 – 230 V AC/DC	
Housing	Polycarbonate, IP40	
Temperature range	−30 to +70 °C	

Dimension drawing in catalogue on page 158, M3

Equipment set			Accessories
1 display unit			Connection to remote monitoring
Sigma F+E 2.0	Order no.	37-2111-101	Wall-mounted housings
Sigma F+E 2.0 AC/DC	Order no.	37-2121-101	External signal lamp
Sigma F+E 3 2.0	Order no.	37-5113-101	Disassembly clip
Sigma F+E 3 2.0 AC/DC	Order no.	37-5123-101	Spring clip
3 single-phase current sensors			

Single-phase current sensors

For new installations on bushings

for Sigma 2.0 series, Sigma D series, ComPass series

ABB	
Type: Safelink, SafePlus, SafeRing Ø 79,5 mm / 84 mm	
Order no. 3 x 49-6025-000 or 3 x 49-6025-301	

Driescher	
Type: MINEX, MINEX C, G.I.S.E.L.A. Ø 84 mm	
Order no. 49-6025-601[1)	

EATON	
Type: XIRIA Ø 79,5 mm / 84 mm	
Order no. 3 x 49-6025-000 or 3 x 49-6025-301	

Lucy Electric	
Type: AegisPlus Ø 84 mm	
Order no. 3 x 49-6025-601	

Ormazabal	
Type: ga, gae, ge Ø 84 mm	
Order no. 3 x 49-6025-311	

Schneider Electric	
Type: RM6 Ø 84 mm	
Order no. 3 x 49-6025-301	

Schneider Electric	
Type: FBX Ø 84 mm	
Order no. 1 x 49-6025-622	

Siemens	
Type: 8DJH (cable panel) Ø 84 mm	
Order no. 1 x 49-6025-630	

Siemens	
Type: NXPLUS C, 8DJH (cubicle width 430 mm) Ø 84 mm	
Order no. 3 x 49-6025-611	

For screened connectors only. Insulation level: 0.72 / 3 kV.
1) Without retaining plates. Order no. with retaining plates on request
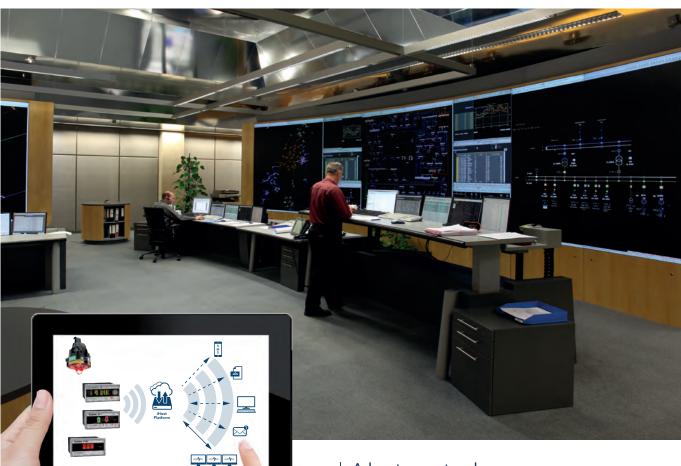
For retrofit on insulated cables

for Sigma 2.0 series, Sigma D series, ComPass series

Conductor Ø [mm]	Cable length [m]	Order no.
15 – 55	3.00	49-6024-001

Conductor [mm]	Cable length [m]	Order no.
15 – 65	3.00	49-6024-010
15 – 78 (1250 A)	3.00	49-6024-130

iHost

Monitor your entire grid around the clock

iHost solution

Horstmann products are in step with the times:

As grids become increasingly complex and heterogeneous, greater demands are placed on the availability of electricity networks. The increasing use of renewable energy sources and the desire for decentralisation play important roles in this development.

The Horstmann solution:

Information based network monitoring – the iHost system reduces power outage times thanks to quicker availability of information.

The iHost system collects data from devices such as from the short-circuit and earth fault indicators in the field (e.g. of the Compass series – see page 44), evaluates the data in a data concentrator and shares it with the control room systems and / or mobile terminals. Fault information and exceeded limits can also be send by e-mail or SMS.

Advantages at a glance:

- Current information about network performance
- Continuous network supervision prevents power outages
- Alerts in the case of faults or irregularities
- Analysis tools for increasing network visibility

Product features:

- 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

iHost

Remote monitoring software for SCADA

iHost Cloud

iHost Cloud

For smaller scale projects or pilot schemes iHost Cloud is the best choice. Quick and easy implementation works without software installation. Handling is very user-friendly – all you need is a web-enabled device, your username and password. Customised notifications in case of a fault or alarms are possible via SMS and e-mail.

iHost Compact

If you want to see the data in your SCADA, iHost Compact is the right choice. With this solution iHost becomes part of your SCADA infrastructure. Installed on a physical or a virtual server iHost is a gateway that processes all data and forwards them directly to your SCADA. With iHost Compact you manage all remote devices installed in the power network.

iHost Compact

Feature	iHost Cloud	iHost Compact		
		Software	Software / hardware	Software/hardware/101
Hardware / Server arrangement	• High availability cluster • Software as a service	Single installation of the ihost software on a customer supplied, pre-installed and virtual server	Single server, Horstmann supplied	Single server, Horstmann supplied with serial interface
Operating system (OS)	Cloud service / data centre	Microsoft Windows Server OS	Microsoft Windows Server OS	Microsoft Windows Server OS
Visualisation	Web browser	SCADA		
SIM cards for smart FCI / RTU	Available on request	Customer supplied SIM with private APN		
iHost licence type	Software included	One-time license fees		
RTU count	1 – 1,000	50 / 250 / 500		
Limits of users / user roles	50 / 3	2 / 2		
Maps	Yes	No		
Notifications	Yes (e-mail / SMS)	No		
Historian	Yes	No		
Data access API	No	No		
SCADA protocols	n/a	IEC60870-5-101[1] IEC60870-5-104 DNP3 (serial)[1] DNP3 (IP)	IEC60870-5-104 DNP3 (IP)	IEC60870-5-101 IEC60870-5-104 DNP3 (serial) DNP3 (IP)
Simultaneous SCADA channels	n/a	2		

1) Customers server hardware must contain serial interface.

iHost Cloud		
1 licence		
Cloud per RTU / year	Order no.	79-1010-000
1 SIM card		
Cloud – 1 SIM-S*	Order no.	79-1040-000
Cloud – 1 SIM-M**	Order no.	79-1041-000
iHost Compact Software		
1 licence		
Compact 50 (SW)	Order no.	79-1110-000
Compact 250 (SW)	Order no.	79-1120-000
Compact 500 (SW)	Order no.	79-1130-000
1 software installation package (remote VPN access)	Order no.	79-1160-000
1 technical support for 12 months	Order no.	79-1150-000
iHost Compact Software / hardware		
1 licence		
Compact 50 (SW/HW)	Order no.	79-1110-100
Compact 250 (SW/HW)	Order no.	79-1120-100
Compact 500 (SW/HW)	Order no.	79-1130-100
1 software installation package (remote VPN access)	Order no.	79-1160-000
1 technical support for 12 months	Order no.	79-1150-000
iHost Compact Software / hardware / 101		
1 licence		
Compact 50 (SW/HW/101)	Order no.	79-1110-101
Compact 250 (SW/HW/101)	Order no.	79-1120-101
Compact 500 (SW/HW/101)	Order no.	79-1130-101
1 software installation package (remote VPN access)	Order no.	79-1160-000
1 technical support for 12 months	Order no.	79-1150-000

Accessories
Smart Navigator 2.0
Reporter 3.0
Reporter 4.0
ComPass AX12
ComPass BX12
Radio Reporter 2.0

*SIM-S: 2G, 3G; 10 MB data volume / month / SIM card
**SIM-M: 2G, 3G, 4G; 20 MB data volume / month / SIM card

iHost

Remote monitoring software for SCADA

iHost Solo

iHost Pro

With iHost Solo and iHost Pro all measured values as well as fault information are transferred directly to your SCADA and are available on mobile devices at the same time. All data is stored in iHost. Installed in your premises these solutions provide you multiple options regarding the use, analysis and visualisation of data.

iHost Solo

iHost Solo is designed for medium sized distribution networks whereas iHost Pro can handle the variety of remote devices, even of large distribution utilities.

iHost Pro

Complete with high availability resilience the system supports all departments of your company. The system can be tailored for user groups depending on their requirements.

Feature	iHost Solo			iHost Pro
	Software	Software / hardware	Software/hardware/101	
Hardware / Server arrangement	Single installation of the ihost software on a customer supplied, pre-installed and virtual server	Single server, Horstmann supplied	Single server, Horstmann supplied with serial interface	Single installation of the ihost software on a customer supplied, pre-installed and virtual server
Operating system (OS)	Microsoft Windows Server OS	Microsoft Windows Server OS	Microsoft Windows Server OS	Microsoft Windows Server OS
Visualisation	Web browser and SCADA			
SIM cards for smart FCI / RTU	Customer supplied SIM with private APN			
iHost licence type	One-time license fees			Annual license fees
RTU count	100 / 500 / 1,000			2,000 / 3,500 / 5,000
Limits of users / user roles	50 / 10			Unlimited / 50
Maps	Yes (option)			
Notifications	Yes (e-mail / SMS)			
Historian	Yes			
Data access API	Yes			
SCADA protocols	IEC60870-5-101[1] IEC60870-5-104 DNP3 (serial)[1] DNP3 (IP)	IEC60870-5-104 DNP3 (IP)	IEC60870-5-101 IEC60870-5-104 DNP3 (serial) DNP3 (IP)	IEC60870-5-101[1] IEC60870-5-104 DNP3 (serial)[1] DNP3 (IP)
Simultaneous SCADA channels	2			10

1) Customers server hardware must contain serial interface.

iHost Solo Software		
1 licence		
Solo 100 (SW)	Order no.	79-1210-000
Solo 500 (SW)	Order no.	79-1220-000
Solo 1000 (SW)	Order no.	79-1230-000
1 software installation package (remote VPN access)	Order no.	79-1260-000
1 technical support for 12 months	Order no.	79-1250-000
iHost Solo Software / hardware		
1 licence		
Solo 100 (SW/HW)	Order no.	79-1210-100
Solo 500 (SW/HW)	Order no.	79-1220-100
Solo 1000 (SW/HW)	Order no.	79-1230-100
1 software installation package (remote VPN access)	Order no.	79-1260-000
1 technical support for 12 months	Order no.	79-1250-000
iHost Solo Software / hardware / 101		
1 licence		
Solo 100 (SW/HW/101)	Order no.	79-1210-101
Solo 500 (SW/HW/101)	Order no.	79-1220-101
Solo 1000 (SW/HW/101)	Order no.	79-1230-101
1 software installation package (remote VPN access)	Order no.	79-1260-000
1 technical support for 12 months	Order no.	79-1250-000
iHost Pro Software		
1 licence		
Pro 2000	Order no.	79-1310-000
Pro 3500	Order no.	79-1320-000
Pro 5000	Order no.	79-1330-000
1 software installation package (remote VPN access)	Order no.	79-1360-000
1 technical support for 12 months	Order no.	79-1350-000

Accessories
Smart Navigator 2.0
Reporter 3.0
Reporter 4.0
ComPass AX12
ComPass BX12
Radio Reporter 2.0

Reporter 3.0
Remote monitoring to iHost

Reporter 3.0

Product features

- Detection and forwarding of digital states as generated e.g. by short-circuit or earth fault indicators, door contacts etc.
- Bidirectional data transfer to iHost
- Internal battery supply / no auxiliary supply necessary

The Reporter 3.0 is used for the remote signalling of short-circuits, earth faults and additional status reports (door contact, temperature sensor etc.) from a medium-voltage network that are reported by short-circuit and earth fault indicators. The received reports are transferred to iHost through a bidirectional data connection. The Reporter 3.0 is housed in robust, weatherproof housing for wall mounting and can be configured using Windows-based PC software and iHost.

Reported short-circuits and earth faults are securely sent to SCADA via the iHost system and can be retrieved by any web-enabled device at any time. Notifications can also be received by e-mail and / or SMS.

Fault indicator with relay contacts

e. g. door contact

Temperature sensor

...

Technical data	Reporter 3.0
Special features	▪ Routine call ▪ Automatic date and time synchronisation ▪ Transmission of signal field strength ▪ Temperature sensor ▪ Fault and status notification via SMS and / or e-mail
Inputs	▪ 16 digital inputs for potential-free relay contacts ▪ 2 analogue inputs (4 – 20 mA)
Communication	Bidirectional data connection to iHost
Indication (inside)	Control LEDs for data reception / connection
Power supply	Replaceable long-life lithium cell 7 – 10 years, min. 1,000 calls
Housing	Glass fibre reinforced polycarbonate, IP66
Installation	Wall mounting
Temperature range	−30 to +70 °C

Dimension drawing in catalogue on page 159, M10

Equipment set			Accessories
1 Reporter 3.0	Order no.	28-7330-022	Fault indicators with relay contacts
1 iHost solution			
iHost Cloud			
iHost Compact			
iHost Solo			
iHost Pro			

Accessories

For short-circuit and earth fault indicators and
integrated voltage detecting systems

Wall-mounted housings

for the installation of short-circuit and earth fault indicators as well as integrated voltage detecting systems outside the
switchgear

W x H x D	W x H x D
125 x 75 x 125 mm	125 x 175 x 125 mm
Order no.	**Order no.**
49-9001-001 bottom cable entry	V49-9001-004-001
49-9001-002 rear cable entry	incl. earthing bar

W x H x D	W x H x D
125 x 75 x 75 mm	290 x 77 x 200 mm
Order no.	**Order no.**
49-9001-006	V49-9001-007-001
	incl. earthing bar

External signal lamps

for installation outside the switchgear

3 LEDs	Order no.
5 m connection cable, with battery, for permanent contact	49-0702-005
10 m connection cable, with battery, for permanent contact	49-0702-010
15 m connection cable, with battery, for permanent contact	49-0702-015

Bicolour 3 LEDs red/green	Order no.
3 m connection cable, with battery	49-0706-001

Bicolour 1 LED red/green	Order no.
2 m connection cable, with battery, without fibre optic cable (see page 57)	49-0704-001

Installation system

for Sigma D series and ComPass series

	Order no.
Tablet for parameter setting during installation or monitoring, incl. cover, pencil, power supply and USB cable	49-6022-010

Temperature sensor PT100

		Order no.
Temperature range	−50 to +180 °C	
Dimension	6 x 50 mm	
Cable length	10 m (silicone, 2 ferrules)	49-9090-013
Protection degree	IP65	

Fibre optic cables

	Order no.
Fibre optic cable 3 m (standard length for short-circuit CTs)	49-0602-009
Fibre optic cable 4 m (standard length for earth fault CTs)	49-0602-001
Fibre optic cable 1,8 m (standard length for external signal lamp)	49-6007-206

Accessories for Opto series

	Order no.
Cutting tool for fibre optic cables	49-0109-003

	Order no.
Transformer with cable for top-hat rail mounting (115 V – 230 V AC / 24 V – 48 V AC)	49-0921-002

	Order no.
Optical testing unit to excite the indicator for connection to the fibre optic cable plug	49-0109-002

Accessories for plug-in housing

	Order no.
Disassembly clip	49-9090-016
Disassembly clip for ComPass B 2.0 / Bs 2.0	49-9090-017

	Order no.
Spring clip suitable for 2 mm front plate thickness (standard)	49-9090-018
Spring clip suitable for 3 mm front plate thickness	49-9090-019