

ISOMETER[®] iso685-...-P

Insulation monitoring device with integrated locating current injector for IT AC systems with galvanically connected rectifiers or converters and for IT DC systems



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SENDER 🖉



ISOMETER® iso685-D-P

Application

- AC, DC or AC/DC main circuits
- AC/DC main circuits with directly connected DC components, such as rectifiers, converters, variable-speed drives
- UPS systems, battery systems
- Heaters with phase control
- Systems including switch-mode power supplies
- IT systems with high leakage capacitances
- · Installations with insulation fault location

Certifications



Device features

- ISOMETER[®] for IT AC systems with galvanically connected rectifiers or inverters and for IT DC systems (IT = unearthed systems).
- Automatic adaptation to the existing system leakage capacitance.
- Combination of **AMP**^{Plus} and other profile-dependent measurement methods.
- Two separately adjustable response value ranges of 1 $k\Omega\ldots$ 10 $M\Omega$ for Alarm 1 and Alarm 2.
- High-resolution graphic LC display for excellent readability and recording of the device status.
- Connection monitoring (monitoring of the measuring lines).
- Automatic device self test.
- Graphical representation of the insulation resistance over time (isoGraph).
- History memory with real-time clock (buffer for three days) for storing 1023 alarm messages with date and time.
- Current or voltage output 0(4)...20 mA, 0...400 μ A, 0...10 V, 2...10 V (galvanically separated), which is analogous to the measured insulation value of the system.
- · Freely programmable digital inputs and outputs.
- Remote setting of certain parameters via the Internet (option; COMTRAXX® gateway).
- Worldwide remote diagnosis via the Internet (made available by Bender Service only).
- RS-485/BS (Bender sensor bus) for communication with other Bender devices.
- ISOnet: Internal separation of the ISOMETER® from the IT system to be monitored (e.g. if several IT systems are interconnected)
- BCOM, Modbus TCP and web server
- · Locating current injection for selective insulation fault location
- · Indication of the insulation faults selectively located by the EDS system
- Parameter setting of EDS systems
- Customer-specific texts for each measuring channel

Product description

The ISOMETER® is an insulation monitoring device for IT systems in accordance with IEC 61557-8 and IEC 61557-9. It is universally applicable in AC, 3(N)AC, AC/DC and DC systems. AC systems may include extensive DC-supplied loads (such as rectifiers, inverters, variable-speed drives).

In combination with the insulation fault locators of the EDS44x series or the appropriate measuring current transformers, an insulation fault location system can be set up with the iso685-...-P.

AC/DC

Insulation monitoring function

The insulation monitoring device ISOMETER[®] continuously monitors the entire insulation resistance of an IT system during operation and triggers an alarm when the value falls below a preset response value. To obtain a measurement, the device has to be connected between the IT system (unearthed system) and the protective earth conductor (PE). A measuring current in the μ A range is superimposed onto the system, which is recorded and evaluated by a micro-controlled measuring circuit. The measuring time depends on the selected measurement profiles, the system leakage capacitance, the insulation resistance and possible system-related disturbances.

The response values and other parameters are set using a commissioning wizard or via different setup menus using the device buttons and a high-resolution graphic LC display. The selected settings are stored in a permanent fail-safe memory. Different languages can be selected for the setup menus and the messages indicated on the display. The device utilises a clock for storing fault messages and events in a history memory with time and date stamp. The settings can be protected against unauthorised modifications by a password. To ensure proper functioning of the connection monitoring, the device requires the setting of the system type 3AC, AC or DC and the required use of the appropriate terminals L1/+, L2, L3/-.

Insulation fault location function

The insulation fault location is carried out by means of insulation fault locators of the EDS44x series and the appropriate measuring current transformers. If the iso685-...-P detects an insulation fault, the insulation fault location is automatically or manually started. In addition, the iso685-...-P generates a locating current, the level of which depends on the existing mains voltage and the insulation fault. The locating current is limited by the iso685-...-P to configurable values in order to avoid malfunctions in control systems. The maximum value can be configured via the respective menu. The locating current pulse is detected by all measuring current transformers on the insulation fault path and evaluated by the insulation fault locators EDS44x.

If the locating current exceeds the response value in the measuring current transformer, the alarm message appears locally on the EDS44x devices or centrally on the iso685. This way, it is easy to locate the fault at a central point by assigning the measuring current transformer/current circuit. All connected EDS44x can be parameterised via the integrated parameterisation function. You can choose if you want to parameterise all channels at a time or each channel separately. A plain text message can be assigned to each channel.

Device variants

iso685-D-P

The device version iso685-D-P features a high-resolution graphic LC display and operating controls for direct operation of the device functions. It cannot be combined with an FP200.

iso685-S-P

The iso685-S-P variant itself does not feature a display and can only be used in combination with an FP200. The iso685-S-P is thereby operated indirectly via the FP200.

Option "W"

Device variants with Option "W" are available for extreme climatic and mechanical conditions.

System setup

In general, an EDS system is constituted by an iso685-...-P as well as one or more EDS44x insulation fault locators with the appropriate measuring current transformers. The information is exchanged between the EDS44x and the iso685-...-P via a backbone bus or a 2-wire sensor bus in order to save time and costs.

The insulation monitoring device iso685-...-P and the insulation fault locators EDS44x constitute a complete IT system monitoring unit. In a system like this, up to 255 channels can be monitored.

The insulation monitoring devices can be connected to various gateways via an Ethernet interface, whereby an almost infinite amount of channels distributed in different IT systems can be monitored.

Measurement method

AMPPlus The iso685-...-P series uses the patented **AMP**^{Plus} measurement method. This measurement method allows concise monitoring of modern power supply systems, also in case of extensive, directly connected DC components and high system leakage capacitances.

Standards

The ISOMETER® has been developed in compliance with the following standards: DIN EN 61557-8 (VDE 0413-8):2015-12, IEC 61557-8:2016-01, DIN EN 61557-9 (VDE 0413-9):2015-10, IEC 61557-9:2014-12

Operating elements



- "EDS" button: starts the insulation fault location permanently manually or stops the insulation fault location immediately.
 "A" button: up, increase value
- 2 "RESET" button: reset messages"<" button: back, select parameter
- 3 "DATA" button: display data values "V" button: down, decrease value
- 4 "MENU" button: start device menu
 "ESC" button: abort, return to the previous menu level
- 5 "TEST" button: carry out self test"> " button: forward, select parameter
- 6 "INFO" button: display information "OK" button: OK, confirm
- 7 LED indication "ON": Operation
- 8 LED indication "PGH ON, SERVICE, ALARM 1, ALARM 2"
- 9 LC display

Ordering information

Nominal system voltage range U _n		Supply voltage U _S		Dicplay	Ontion "W" ¹⁾	Tune		Art No
AC	DC	AC	DC	Display		l		
0690 V; 1460 Hz 01000 V		24240 V; 50400 Hz 24	24 24014	240 V _	-	iso685-D-P		B 9106 7030
	01000 V				-40+70 °C, 3K5, 3M7	iso685W-D-P ¹⁾		B 9106 7030W
			24240 V		-	iso685-S-P + FP200		B 9106 7230
					-40+70 °C, 3K5, 3M7	iso685W-S-P + FP200W ¹⁾		B 9106 7230W

¹⁾ Increased shock and vibration resistance 3K5 and 3M7.

Accessories

Description	Art. No.
A set of screw-type terminals ¹⁾	B 9106 7901
A set of push-wire terminals	B 9106 7902
Enclosure accessories (terminal cover, 2 mounting clips) ¹⁾	B 9106 7903
Front cover 144x72 transparent (for IP65)	B 9806 0005
BB bus 6TE Connector	B 9811 0001

Suitable system components

Description	Туре	Art. no.
Device version without display	iso685-S-P	B 9106 7130
Device version without display	iso685W-S-P	B 9106 7130W
Disalay for front namel mounting	FP200	B 9106 7904
Display for front panel mounting	FP200W	B 9106 7904W

Suitable measuring instruments on request!

¹⁾ included in the scope of delivery

Wiring diagram



- 1 Connection to an AC system U_n
- 2 Connection to a DC system Un
- 3 Linked with two IT systems which can be interconnected via a coupling switch. Information regarding the state of the coupling switch is not necessary.
- 4 Connection to a 3(N)AC system
- 5 Connection to the IT system to be monitored (L1/+, L2, L3/-)
- 6 Separate connection of KE, E to PE
- 7 (K1) Alarm relay 1, available changeover contacts



- 8 (K2) Alarm relay 2, available changeover contacts
- 9 Switchable resistor R for RS-485 bus termination
- 10 Ethernet interface
- 11 Digital interface
- For systems > 690 V and with overvoltage category III a fuse for the connection to the system to be monitored must be provided.

Recommendation: 2A screw-in fuses.

Provide line protection!

According to DIN VDE 0100-430, a line protection shall be provided for the supply voltage.

Note

According to DIN VDE 0100-430, devices for protection against a short circuit can be omitted for the coupling of terminals L1/+, L2 and L3/- to the IT system \leq 690 V to be monitored if the wiring is carried out in such a manner as to reduce the risk of a short-circuit to a minimum. (A short-circuit-proof and earth-fault-proof wiring is recommended).

The connecting lines L1/+, L2, L3/- to the system to be monitored must be carried out as spur lines. No load current may be conducted through the terminals.

Dimension diagram iso685-...-P

Dimensions in mm



Connection to FP200



Digital interface X1

Digital interface	Terminal	Colour
	11	Input 1
	12	Input 2
11 12 13 A B + Q1 Q2 M+ L	13	Input 3
	А	RS-485 A
	В	RS-485 B
	+	+24 V
	Q1	Output 1
Х1	Q2	Output 2
	M+	Analogue output
	T	Ground

Digitale Ausgänge	Digitale Eingänge	Analoger Ausgang
Passive	High-Active	Stromausgang
÷ − ∞ 0.		
Active	Low-Active	Spannungsausgang
X1 X1 ⊥Qx		X1 X1 M. V I
Beispiel	Gerät deaktivieren	7 [- Reset Test

QI

Dimension diagram Panel cut-out FP200





Connection example ISOMETER® with insulation fault locators

System setup



Technical data

Time	response
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Insulation coordination according to IE	C 60664-1/IEC 60664-3
Definitions:	
Measuring circuit (IC1)	(L1/+, L2, L3/-)
Supply circuit (IC2)	A1, A2
Output circuit 1 (IC3)	11. 12. 14
Output circuit 2 (IC4)	21, 22, 24
Control circuit (IC5)	(E, KE), (X1, ETH, X3, X4)
Rated voltage	1000 V
Overvoltage category (OVC)	
Pated impulse voltage:	
	8 14/
IC1/(IC2-5)	0 KV
IC2//IC3-5)	4 KV
IC3/(IC4-5)	4 KV
1(4/1(5)	4 KV
Rated insulation voltage:	
IC1/(IC2-5)	1000 V
IC2/(IC3-5)	250 V
IC3/(IC4-5)	250 V
IC4/IC5	250 V
Pollution degree for accessible parts on the o	putside of the device housing ($U_{\rm n}$ < 690 V) 3
Pollution degree for accessible parts on the o	outside of the device housing
(<i>U</i> _n >690 < 1000 V)	2
Protective separation (reinforced insula	ition) between:
IC1/(IC2-5)	OVC III, 1000 V
IC2/(IC3-5)	OVC III, 300 V
IC3/(IC4-5)	OVC III, 300 V
IC4/IC5	OVC III, 300 V
Voltage test (routine test) according to	IEC 61010-1-
IC2/(IC4 5)	
ICA/IC5	Δ(2.2 kV
	AC 2,2 KV
Supply voltage	
Supply via A1/+, A2/-:	
Supply voltage range $U_{\rm S}$	AC/DC 24240 V
Tolerance of U _S	-20+15%
Maximum permissible input current of U_{S}	650 mA
Frequency range of U_S	DC, 50400 Hz ¹⁾
Tolerance of the frequency range of U_S	-5+15%
Power consumption, typically 50/60 Hz	≤ 12 W/21 VA
Power consumption, typically 400 Hz	≤ 12 W/45 VA
Sunnly via X1:	
Supply via XI.	DC 24 V
Tolerance of <i>Ils</i>	DC -20 +25 %
	DC 20125 /0
IT system being monitored	
Nominal system voltage range Un	AC 0690 V
	DC 01000 V
	AC/DC 0600 V (for UL applications)
Tolerance of Un	AC/DC +15 %
Frequency range of Un	DC, 1460 Hz
Max. AC voltage U ~ in the frequency range f_n	= 110 Hz $U \sim \max = 38 \text{ V/Hz}^2 * (1 + f_n^2)$
Response values	
$\frac{1}{Response value R_{max}}$	
$\frac{1}{1} \sum_{n=1}^{\infty} \frac{1}{n} \sum_{n=1}^{\infty} \frac{1}$	
nesponse value Kan2 (didili 2)	I KS2IV MS2
neiduve uncertainty (acc. to IEC 61557-8)	prome dependent, \pm 15 %, at least \pm 1 kΩ
nysteresis	25 %, at least 1 k()

Response time t_{an} at $R_F = 0.5 \times R_{an}$ ($R_{an} = 1$	10 kΩ) and $C_e = 1 \mu$ F according to IEC 61557-8 profile dependent typ. 4 s (see diagrams in manual)
Response time DC alarm at $C_{\rm e} = 1 \mu F$	profile dependent, typ. 2 s (see diagram in manual)
Start-up delay Tstart-up	0120 s
Measuring circuit	
Measuring voltage Um profile	e dependent, ± 10 V, ± 50 V (see profile overview)
Measuring current /m	≤ 403 μA
Internal resistance R_i, Z_i	≥ 124 kΩ
Permissible extraneous DC voltage Ufg	≤ 1200 V
Permissible system leakage capacitance	Ce profile dependent, 01000 μF
Measuring circuit for insulation faul	t location (EDS):
Locating current /L	1/1.8/2.5/5/10/25/50 mA
Measuring ranges	
	10 4/01
Measuring range <i>t</i> _n	10460 Hz
I olerance measurement of <i>f</i> _n	±1%±0.1Hz
Voltage range measurement of <i>t</i> _n	AC 25690 V
Measuring range Un	AC 25690 V
	DC 251000 V
Voltage range measurement of Un	AC/DC > 10 V
Tolerance measurement of U _n	±5 % ±5 V
Measuring range Ce	01000 µF
Tolerance measurement of Ce	±10 % ±10 µF
Frequency range measurement of Ce	DC, 30460 Hz
Min. insulation resistance measurement	of Ce
dependin	g on the profile and coupling mode, typ. $> 10 \text{ k}\Omega$
Display	
Indication	graphic display 127 x 127 pixels 10 x 10 mm ²
Display range measured value	
	0.1 13220 1132
LEDs	
ON (operation LED)	green
ON (operation LED) PGH ON	green yellow
ON (operation LED) PGH ON SERVICE	green yellow yellow
ON (operation LED) PGH ON SERVICE ALARM 1	green yellow yellow yellow yellow
ON (operation LED) PGH ON SERVICE ALARM 1 ALARM 2	green yellow yellow yellow yellow yellow
ON (operation LED) PGH ON SERVICE ALARM 1 ALARM 2 Digital inputs	green yellow yellow yellow yellow
ON (operation LED) PGH ON SERVICE ALARM 1 ALARM 2 Digital inputs Number	green yellow yellow yellow yellow
ON (operation LED) PGH ON SERVICE ALARM 1 ALARM 2 Digital inputs Number Operating mode, adjustable	green yellow yellow yellow yellow 3 active high active low
ON (operation LED) PGH ON SERVICE ALARM 1 ALARM 2 Digital inputs Number Operating mode, adjustable Eurotions off test reset deactivate devi	green yellow yellow yellow yellow 3 active high, active low re start initial measurement insulation fault location
ON (operation LED) PGH ON SERVICE ALARM 1 ALARM 2 Digital inputs Number Operating mode, adjustable Functions off, test, reset, deactivate devised Valtage	green yellow yellow yellow yellow 3 active high, active low re, start initial measurement, insulation fault location low DC -3 5 V. High DC 11 - 32 V
ON (operation LED) PGH ON SERVICE ALARM 1 ALARM 2 Digital inputs Number Operating mode, adjustable Functions off, test, reset, deactivate device Voltage Cable length Y1 (unchickled cable)	green yellow yellow yellow yellow 3 active high, active low ce, start initial measurement, insulation fault location Low DC -35 V, High DC 1132 V
ON (operation LED) PGH ON SERVICE ALARM 1 ALARM 2 Digital inputs Number Operating mode, adjustable Functions off, test, reset, deactivate devic Voltage Cable length X1 (unshielded cable) Cable length X1	green yellow yellow yellow yellow gellow 3 active high, active low ce, start initial measurement, insulation fault location Low DC -35 V, High DC 1132 V ≤ 10 m
ON (operation LED) PGH ON SERVICE ALARM 1 ALARM 2 Digital inputs Number Operating mode, adjustable Functions off, test, reset, deactivate devic Voltage Cable length X1 (unshielded cable) Cable length X1	green yellow yellow yellow yellow 3 active high, active low ce, start initial measurement, insulation fault location Low DC -35 V, High DC 1132 V ≤ 10 m
ON (operation LED) PGH ON SERVICE ALARM 1 ALARM 2 Digital inputs Number Operating mode, adjustable Functions off, test, reset, deactivate devic Voltage Cable length X1 (unshielded cable) Cable length X1 (shielded cable, shield connected to earth (PE) on or	green yellow yellow yellow yellow 3 active high, active low ce, start initial measurement, insulation fault location Low DC -35 V, High DC 1132 V ≤ 10 m
ON (operation LED) PGH ON SERVICE ALARM 1 ALARM 2 Digital inputs Number Operating mode, adjustable Functions off, test, reset, deactivate devie Voltage Cable length X1 (unshielded cable) Cable length X1 (shielded cable, shield connected to earth (PE) on or Digital outputs	green yellow yellow yellow yellow 3 active high, active low ce, start initial measurement, insulation fault location Low DC -35 V, High DC 1132 V ≤ 10 m
ON (operation LED) PGH ON SERVICE ALARM 1 ALARM 2 Digital inputs Number Operating mode, adjustable Functions off, test, reset, deactivate devi Voltage Cable length X1 (unshielded cable) Cable length X1 (shielded cable, shield connected to earth (PE) on or Digital outputs Number	green yellow yellow yellow yellow gellow 3 active high, active low ce, start initial measurement, insulation fault location Low DC -35 V, High DC 1132 V ≤ 10 m are end, recommended: J-Y(St)Y min. 2x0,8) ≤ 100 m
ON (operation LED) PGH ON SERVICE ALARM 1 ALARM 2 Digital inputs Number Operating mode, adjustable Functions off, test, reset, deactivate devi Voltage Cable length X1 (unshielded cable) Cable length X1 (shielded cable, shield connected to earth (PE) on or Digital outputs Number Operating mode, adjustable	green yellow yellow yellow yellow gellow 3 active high, active low ce, start initial measurement, insulation fault location Low DC -35 V, High DC 1132 V ≤ 10 m we end, recommended: J-Y(St)Y min. 2x0,8) ≤ 100 m 2 active, passive
ON (operation LED) PGH ON SERVICE ALARM 1 ALARM 2 Digital inputs Number Operating mode, adjustable Functions off, test, reset, deactivate devi Voltage Cable length X1 (unshielded cable) Cable length X1 (shielded cable, shield connected to earth (PE) on or Digital outputs Number Operating mode, adjustable Functions off, Ins. al	green yellow yellow yellow yellow yellow 3 active high, active low ce, start initial measurement, insulation fault location Low DC -35 V, High DC 1132 V ≤ 10 m e end, recommended: J-Y(St)Y min. 2x0,8) ≤ 100 m 2 active, passive arm 1, Ins. alarm 2, connection fault, DC- alarm ³),
ON (operation LED) PGH ON SERVICE ALARM 1 ALARM 2 Digital inputs Number Operating mode, adjustable Functions off, test, reset, deactivate devi Voltage Cable length X1 (unshielded cable) Cable length X1 (shielded cable, shield connected to earth (PE) on or Digital outputs Number Operating mode, adjustable Functions off, Ins. al DC+ alarm ³	green yellow yellow yellow yellow yellow gre, start initial measurement, insulation fault location Low DC -35 V, High DC 1132 V ≤ 10 m e end, recommended: J-Y(St)Y min. 2x0,8) ≤ 100 m 2 active, passive arm 1, Ins. alarm 2, connection fault, DC- alarm ³⁾ , , symmetrical alarm, device fault, common alarm,
ON (operation LED) PGH ON SERVICE ALARM 1 ALARM 2 Digital inputs Number Operating mode, adjustable Functions off, test, reset, deactivate devi Voltage Cable length X1 (unshielded cable) Cable length X1 (shielded cable, shield connected to earth (PE) on or Digital outputs Number Operating mode, adjustable Functions off, Ins. al DC+ alarm ³³ measurement complete, de	green yellow yellow yellow yellow yellow ge, start initial measurement, insulation fault location Low DC -35 V, High DC 1132 V ≤ 10 m e end, recommended: J-Y(St)Y min. 2x0,8) ≤ 100 m 2 active, passive arm 1, Ins. alarm 2, connection fault, DC- alarm ³), , symmetrical alarm, device fault, common alarm, vice inactive, DC offset alarm, common alarm EDS
ON (operation LED) PGH ON SERVICE ALARM 1 ALARM 2 Digital inputs Number Operating mode, adjustable Functions off, test, reset, deactivate devi Voltage Cable length X1 (unshielded cable) Cable length X1 (shielded cable, shield connected to earth (PE) on or Digital outputs Number Operating mode, adjustable Functions off, Ins. al DC+ alarm ³³ measurement complete, devi Voltage	green yellow yellow yellow yellow yellow yellow ge, start initial measurement, insulation fault location Low DC -35 V, High DC 1132 V ≤ 10 m e end, recommended: J-Y(St)Y min. 2x0,8) ≤ 100 m 2 active, passive arm 1, Ins. alarm 2, connection fault, DC- alarm ³⁾ , symmetrical alarm, device fault, common alarm, vice inactive, DC offset alarm, common alarm EDS passive DC 032 V, active DC 0/19.232 V
ON (operation LED) PGH ON SERVICE ALARM 1 ALARM 2 Digital inputs Number Operating mode, adjustable Functions off, test, reset, deactivate devi Voltage Cable length X1 (unshielded cable) Cable length X1 (shielded cable, shield connected to earth (PE) on or Digital outputs Number Operating mode, adjustable Functions off, Ins. al DC+ alarm ³¹ measurement complete, devi Voltage Max. current internal sum X1	green yellow yellow yellow yellow yellow yellow greater and the second second second second second greater and the second secon
ON (operation LED) PGH ON SERVICE ALARM 1 ALARM 2 Digital inputs Number Operating mode, adjustable Functions off, test, reset, deactivate devi Voltage Cable length X1 (unshielded cable) Cable length X1 (shielded cable, shield connected to earth (PE) on or Digital outputs Number Operating mode, adjustable Functions off, Ins. al DC+ alarm ³³ measurement complete, devi Voltage Max. current internal sum X1 Max. current external per channel	green yellow yellow yellow yellow yellow yellow ge start initial measurement, insulation fault location Low DC -35 V, High DC 1132 V ≤ 10 m e end, recommended: J-Y(St)Y min. 2x0,8) ≤ 100 m 2 active, passive arm 1, Ins. alarm 2, connection fault, DC- alarm ³⁾ , symmetrical alarm, device fault, common alarm, vice inactive, DC offset alarm, common alarm EDS passive DC 032 V, active DC 0/19.232 V max. 200 mA max. 1 A
ON (operation LED) PGH ON SERVICE ALARM 1 ALARM 2 Digital inputs Number Operating mode, adjustable Functions off, test, reset, deactivate devi Voltage Cable length X1 (unshielded cable) Cable length X1 (shielded cable, shield connected to earth (PE) on or Digital outputs Number Operating mode, adjustable Functions off, Ins. al DC+ alarm ³¹ measurement complete, devi Voltage Max. current internal sum X1 Max. current external per channel Cable length X1 (unshielded cable)	green yellow yellow yellow yellow yellow yellow greater initial measurement, insulation fault location Low DC -35 V, High DC 1132 V ≤ 10 m we end, recommended: J-Y(St)Y min. 2x0,8) ≤ 100 m active, passive arm 1, Ins. alarm 2, connection fault, DC- alarm ³⁾ , symmetrical alarm, device fault, common alarm, vice inactive, DC offset alarm, common alarm EDS passive DC 032 V, active DC 0/19.232 V max. 200 mA max. 1 A ≤ 10 m
ON (operation LED) PGH ON SERVICE ALARM 1 ALARM 2 Digital inputs Number Operating mode, adjustable Functions off, test, reset, deactivate devi Voltage Cable length X1 (unshielded cable) Cable length X1 (shielded cable, shield connected to earth (PE) on or Digital outputs Number Operating mode, adjustable Functions off, Ins. al DC+ alarm ³³ measurement complete, devi Voltage Max. current internal sum X1 Max. current external per channel Cable length X1 (unshielded cable) Cable length X1 (unshielded cable)	green yellow yellow yellow yellow yellow gellow yellow se start initial measurement, insulation fault location Low DC -35 V, High DC 1132 V ≤ 10 m se end, recommended: J-Y(St)Y min. 2x0,8) ≤ 100 m 2 active, passive arm 1, Ins. alarm 2, connection fault, DC- alarm ³⁾ , symmetrical alarm, device fault, common alarm, vice inactive, DC offset alarm, common alarm EDS passive DC 032 V, active DC 0/19.232 V max. 200 mA max. 1 A ≤ 10 m

Analogue output

Number	1
Operating mode	linear, midscale point 28/120 k Ω
Functions	insulation value, DC offset
Current	020 mA (< 600 Ω), 420 mA (< 600 Ω), 0400 μ A (< 4 kΩ)
Voltage	$010 \text{ V} (> 1 \text{ k}\Omega), 210 \text{ V} (> 1 \text{ k}\Omega)$
Tolerance	±20 %

Interfaces

Field bus:	
Interface/protocol	web server/Modbus TCP/BCOM
Data rate	10/100 Mbit/s, autodetect
Max. amount Modbus requests	< 100/s
Cable length	≤ 100 m
Connection	RJ45
IP address	DHCP/manual 192.168.0.5
Network mask	255.255.255.0
BCOM address	system-1-0
Function	communication interface
ISOnet:	
Number ISOnet devices	≤ 20
Sensor bus:	
Interface/protocol	RS-485/BS
Data rate	9.6 kBaud/s
Cable length	≤ 1200 m
Cable: twisted pair, one end of shield connected to PE	recommended: J-Y(St)Y min. 2x0.8
Connection	terminals X1.A, X1.B
Terminating resistor at the beginning and at the	end of the transmission path
	120 Ω , can be connected internally
Device address, BS bus	190
	1

Switching elements

-	
Number of switching elements	2 changeover contacts
Operating mode	N/C operation/N/O operation
Contact 11-12-14 off, Ins. a	larm 1, Ins. alarm 2, connection fault, DC- alarm ³⁾ ,
DC+ alarm ³	³⁾ , symmetrical alarm, device fault, common alarm,
measurement complete, de	evice inactive, DC offset alarm, common alarm EDS
Contact 21-22-24 off, Ins. a	larm 1, Ins. alarm 2, connection fault, DC- alarm ³⁾ ,
DC+ alarm ³	³⁾ , symmetrical alarm, device fault, common alarm,
measurement complete, de	evice inactive, DC offset alarm, common alarm EDS
Electrical endurance under rated operation	ing conditions, number of cycles 10.000
Contact data acc. to IEC 60947-5-1:	
Utilisation category	AC-13/AC-14/DC-12/DC-12/DC-12
Rated operational voltage	230 V/230 V/24 V/110 V/220 V
Rated operational current	5 A/3 A/1 A/0.2 A/0.1 A
Rated insulation voltage \leq 2000 m NN	250 V
Rated insulation voltage \leq 3000 m NN	160 V
Minimum contact rating	1 mA at AC/DC \ge 10 V
Environment/EMC	
ЕМС	IEC 61326-2-4 4)
Ambient temperatures:	
Operating temperature	-25…+55 °C
Transport	-40…+85 °C
Long-term storage	-40…+70 °C
Classification of climatic conditions acc.	to IEC 60721:
Stationary use (IEC 60721-3-3)	3K5 (except condensation and formation of ice)
Transport (IEC 60721-3-2)	2K3
Long-term storage (IEC 60721-3-1)	1K4
Classification of mechanical conditions a	acc. to IEC 60721:
Stationary use (IEC 60721-3-3)	3M4
Transport (IEC 60721-3-2)	2M2
Long-term storage (IEC 60721-3-1)	1M3
Area of application	≤ 3000 m NN

Connection	
Connection type pluggable screw-type term	ninal or push-wire terminal
Screw-type terminals:	
Nominal current	\leq 10 A
Tightening torque	0.50.6 Nm (57 lb-in)
Conductor sizes	AWG 24-12
Stripping length	7 mm
rigid/flexible	0.22.5 mm ²
flexible with ferrules, with/without plastic sleeve	0.252.5 mm ²
Multiple conductor, rigid	0.21 mm ²
Multiple conductor, flexible	0.21.5 mm ²
Multiple conductor, flexible with ferrule without plastic sleeve	0.251 mm ²
Multiple conductor, flexible with TWIN ferrule with plastic sleev	e 0.51.5 mm ²
Push-wire terminals:	
Nominal current	\leq 10 A
Conductor sizes	AWG 24-12
Stripping length	10 mm
rigid/flexible	0.22.5 mm ²
flexible with ferrules, with/without plastic sleeve	0.252.5 mm ²
Multiple conductor, flexible with TWIN ferrule with plastic sleev	e 0.51.5 mm ²
Push-wire terminals X1:	
Nominal current	≤ 8 A
Conductor sizes	AWG 24-16
Stripping length	10 mm
rigid/flexible	0.21.5 mm ²
flexible with ferrule without plastic sleeve	0.251.5 mm ²
flexible with TWIN ferrule with plastic sleeve	0.250.75 mm ²
Other	
Operating mode	continuous operation
Mounting (0°) display oriented, cooling slots mus	st be ventilated vertically ⁵⁾
Degree of protection internal components	IP40
Degree of protection terminals	IP20
DIN rail mounting acc. to	IEC 60715
Screw fixing	3 x M4 with mounting clip
Enclosure material	polycarbonate
Flammability class	V-0
ANSI code	64
Dimensions (W x H x D)	108 x 93 x 110 mm

Option "W" data different from the standard version

Rated operational current of switching eleme	ents max. 3 A (for UL applications)
Ambient temperatures:	
Operating temperature	-40…+70 °C
	-40+65 °C (for UL applications)
Transport	-40+85 °C
Long-term storage	-40…+70 °C
Classification of climatic conditions acc. to IE	C 60721:
Stationary use (IEC 60721-3-3) 3K5	(condensation and formation of ice possible)
Classification of mechanical conditions acc. to	DIEC 60721:
Stationary use (IEC 60721-3-3)	3M7

- ¹⁾ At a frequency > 200 Hz, the connection of X1 must be insulated. Only permanently installed devices which at least have overvoltage category CAT2 (300V) may be connected.
- ²⁾ Indication limited outside the temperature range -25...+55 °C.
- ³⁾ For $U_n \ge 50$ V only.

Weight

- ⁴⁾ This is a class A product. In a domestic environment, this product may cause radio interference. In this case, the user may be required to take corrective actions.
- ⁵⁾ Recommendation: Devices mounted at 0 ° (display-oriented, cooling slots must be ventilated vertically).

For devices mounted at an angle of 45°, the max. working temperature is reduced by 10 °C. For devices mounted at an angle of 90°, the max. working temperature is reduced by 20 °C.

< 510 g



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