Device Overview Main Catalogue

Edition 2025

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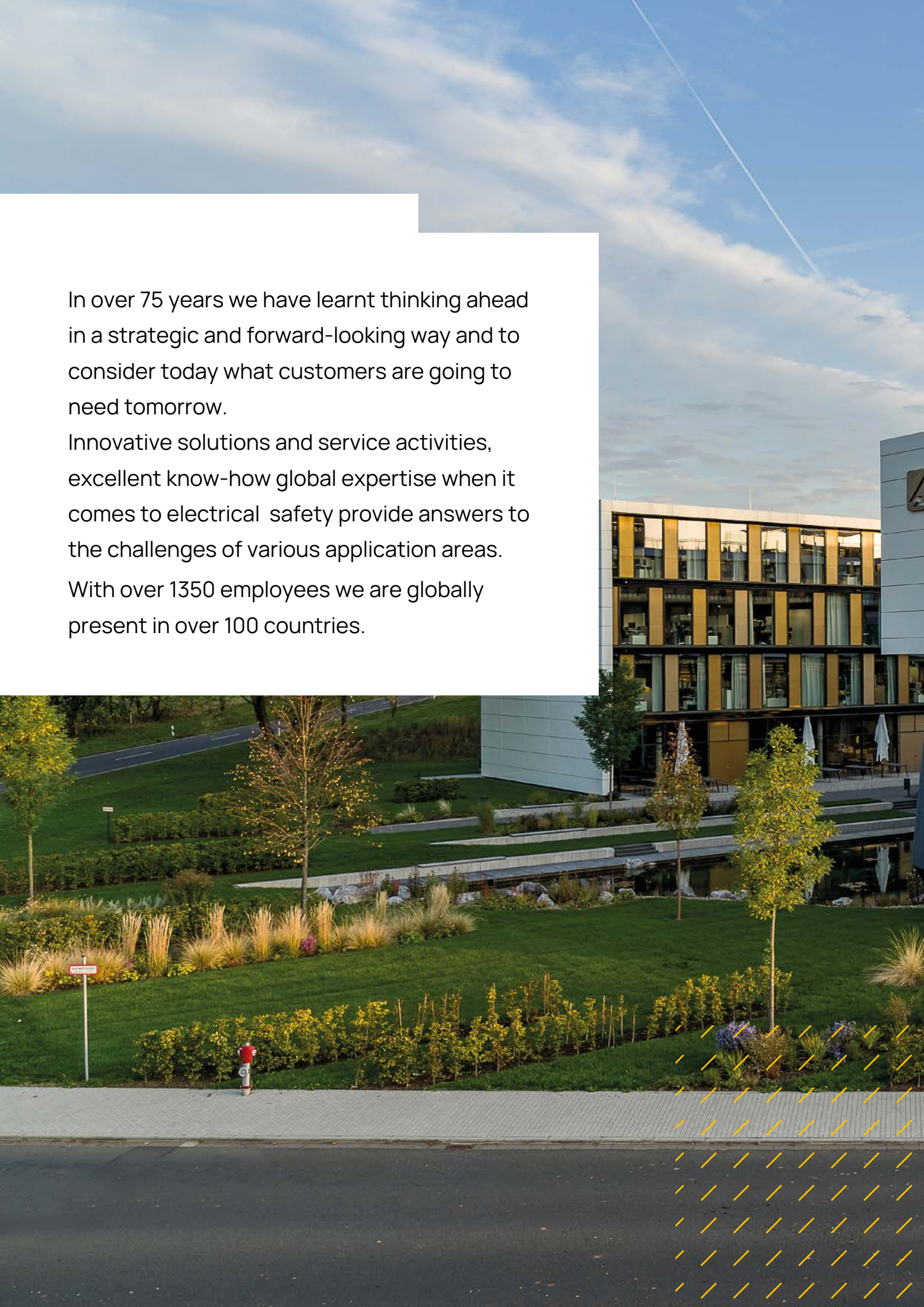
BENDER



In over 75 years we have learnt thinking ahead in a strategic and forward-looking way and to consider today what customers are going to need tomorrow.
Innovative solutions and service activities, excellent know-how global expertise when it comes to electrical safety provide answers to the challenges of various application areas.
With over 1350 employees we are globally present in over 100 countries.

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Device overview insulation monitoring devices ISOMETER®

					
		ISOMETER® iso685-…	**ISOMETER® iso685-…-B**	**ISOMETER® iso685-…-P**	**ISOMETER® isoNAV685-D**
Catalogue page		**12**	**16**	**20**	**26**
Special applications		–	–	–	Quick response to combined resistance and offset voltage measurement
Circuits	**Control circuits**	✓	✓	✓	✓
	Auxiliary circuits	✓	✓	✓	✓
	Main circuits	✓	✓	✓	✓
Voltage system	**3(N)AC**	✓	✓	✓	✓
	AC	✓	✓	✓	✓
	AC/DC	✓	✓	✓	✓
	DC	✓	✓	✓	–
Nominal system voltage U_n		AC, 3(N)AC 0…690 V, DC 0…1000 V	AC, 3(N)AC 0…690 V, DC 0…1000 V	AC, 3(N)AC 0…690 V, DC 0…1000 V	AC, 3(N)AC 0…690 V (60 Hz)
Tolerance of U_n		+ 15 %	+ 15 %	+ 15 %	+ 15 %
System leakage capacitance C_e µF		≤ 1000	≤ 1000	≤ 1000	≤ 1000
Response value R_{an} kΩ		1…10000	1…10000	1…10000	1…10000
Coupled systems		–	✓	✓	–
Locating current injector for insulation fault location		–	–	✓	–
Installation	**DIN rail**	✓	✓	✓	✓
	Screw mounting	✓	✓	✓	✓
	Panel mounting/ wall fastening	✓	✓	✓	–
Interfaces	**Web server**	✓	✓	✓	✓
	Modbus	TCP/RTU	TCP/RTU	TCP/RTU	TCP
	BCOM	✓	✓	✓	✓
	BS	✓	✓	✓	✓
	BMS	–	–	–	–
	isoData	✓	✓	✓	–
Product details (Products on www.bender.de/en)					

	Type	C. p.	Suitable system components			
	FP200	**49**	✓	✓	✓	–
Coupling devices	**AGH150W-4**	**382**	✓	✓	–	–
	AGH204S-4	**384**	✓	✓	–	–
	AGH520S	**385**	✓	✓	–	–
	AGH675S-7	**386**	–	–	–	–
	AGH676S-4	**388**	✓	✓	–	–

				
ISOMETER® isoNAV685-D-B	**ISOMETER® isoHR685W-...-B**	**ISOMETER® isoRW685W-D**	**ISOMETER® isoRW685W-D-B**	**ISOMETER® IRDH275BM-7**
31	**36**	**41**	**45**	**51**
De-energised loads/ frequency converters	Installations with a high level of insulation	Railway	Railway	AC, DC or AC/DC medium voltage systems
✓	✓	✓	✓	–
✓	✓	✓	✓	–
✓	✓	✓	✓	✓
✓	✓	✓	✓	✓
✓	✓	✓	✓	–
✓	✓	✓	✓	✓
✓	✓	✓	✓	✓
offline (AC 0…690 V) (DC 0…1000 V)	AC 0…1000 V, 3AC 0…690 V, DC 0…1300 V	AC, 3(N)AC 0…690 V, DC 0…1000 V	AC, 3(N)AC 0…690 V, DC 0…1000 V	AC, 3(N)AC, DC 0…15,5 kV (absolute)
–	+ 15 %	+ 15 %	+ 15 %	+ 15 %
≤ 1000	≤ 1000	≤ 1000	≤ 1000	≤ 5
10…1000	1…3000000	1…10000	1…10000	100…10000
–	✓	–	–	–
–	–	–	–	–
✓	✓	✓	✓	✓
✓	✓	✓	✓	✓
–	✓	–	–	–
✓	✓	✓	✓	–
TCP	TCP/RTU	TCP/RTU	TCP/RTU	–
✓	✓	✓	✓	–
✓	✓	✓	✓	–
–	–	–	–	✓
–	✓	✓	✓	–
		Suitable system components		
–	✓	–	–	–
–	✓	✓	✓	–
–	✓	✓	✓	–
–	✓	✓	✓	–
–	–	–	–	✓
–	✓	✓	✓	–

Device overview insulation monitoring devices ISOMETER®

					
		ISOMETER® iso415R	ISOMETER® IR420-D4	ISOMETER® IR425	ISOMETER® iso1685DP
Catalogue page		55	58	61	64
Special applications		–	–	–	–
Circuits	Control circuits	✓	✓	✓	–
	Auxiliary circuits	✓	✓	✓	–
	Main circuits	–	–	–	✓
Voltage system	3(N)AC	–	–	–	–
	AC	✓	✓	✓	✓
	AC/DC	✓	–	✓	✓
	DC	✓	–	✓	✓
Nominal system voltage U_n		Depending on variant	AC 0…250 V	AC/DC 0… 300 V	AC 0…1000 V, DC 0…1500 V
Tolerance of U_n		-30 %…+15 %	+ 20 %	+ 20 %	+10 %, +5%
System leakage capacitance C_e µF		≤ 25	≤ 20	≤ 20	≤ 2000
Response value R_{an} kΩ		5…1000	1…200	1…200	0.2…1000
Coupled systems		–	–	–	✓
Locating current injector for insulation fault location		–	–	–	–
Installation	DIN rail	✓	✓	✓	–
	Screw mounting	✓	✓	✓	✓
	Panel mounting/ wall fastening	–	–	–	–
Interfaces	Web server	–	–	–	–
	Modbus	RTU	–	–	RTU
	BCOM	–	–	–	–
	BS	–	–	–	–
	BMS	–	–	–	✓
	isoData	–	–	–	–
Product details (Products on www.bender.de/en)					

	Type	C. p.	Suitable system components			
	FP200	49	–	–	–	–
Coupling devices	AGH150W-4	382	–	–	–	–
	AGH204S-4	384	–	–	–	–
	AGH520S	385	–	–	–	–
	AGH675S-7	386	–	–	–	–
	AGH676S-4	388	–	–	–	–

						
	ISOMETER® isoHV1685D	**ISOMETER® isoLR1685DP**	**ISOMETER® isoHR1685DW**	**ISOMETER® IR1575**	**ISOMETER® IR427**	**ISOMETER® isoMED427x-(PT)**
	67	**70**	**73**	**76**	**79**	**83**
	–	Induction furnace	insulated elevating work platforms	–	Medical locations	Medical locations
	–	–	–	–	–	✓
	–	–	–	–	–	–
	✓	✓	✓	✓	✓	✓
	–	–	–	✓	–	–
	✓	✓	✓	✓	✓	✓
	✓	✓	✓	✓	–	–
	✓	✓	✓	✓	–	–
	AC 0…2000 V, DC 0…3000 V	AC 0…690 V, DC 0…690 V	AC 0…1000 V, DC 0…1500 V	AC, 3(N) AC 0…400 V DC 0…400 V	AC 70…330 V	AC 70…230 V
	+10 %, +5%	+10 % +5%	+10 %, +5%	+ 20 %	+ 15 %	+ 15 %
	≤ 2000	≤ 2000	≤ 1	≤ 60	≤ 5	≤ 5
	0.2…1000	0,02…100	100…1000	2…1000	50…500	50…500
	✓	✓	■	–	–	–
	–	–	–	–	–	✓
	–	–	–	–	✓	✓
	✓	✓	✓	–	✓	✓
	–	–	–	✓	–	–
	–	–	–	–	–	–
	RTU	RTU	RTU	–	–	–
	–	–	–	–	–	–
	–	–	–	–	–	–
	✓	✓	✓	✓	–	✓
	–	–	–	–	–	–
			Suitable system components			
	–	–	–	–	–	–
	–	–	–	–	–	–
	–	–	–	–	–	–
	–	–	–	–	–	–
	–	–	–	–	–	–
	–	–	–	–	–	–

Device overview insulation monitoring devices ISOMETER®

					
		ISOMETER® isoLR275	**ISOMETER® isoPV**	**ISOMETER® isoPV425**	**ISOMETER® isoPV1685RTU**
Catalogue page		**86**	**89**	**93**	**97**
Special applications		Installations with a low level of insulation	Photovoltaic	Photovoltaic	Photovoltaic
Circuits	**Control circuits**	–	–	–	–
	Auxiliary circuits	–	–	–	–
	Main circuits	✓	✓	✓	✓
Voltage system	**3(N)AC**	✓	✓	✓	✓
	AC	✓	✓	✓	✓
	AC/DC	✓	✓	✓	✓
	DC	✓	✓	✓	✓
Nominal system voltage U_n		via AGH-LR 3(N)AC 0…690 V DC 0…1000 V	via AGH-PV 3(N)AC 0…793 V DC 0…1000 V	DC 0…1000 V, AC 0…690 V , 15…460 Hz	AC 0…1000 V DC 0…1500 V
Tolerance of U_n		+ 15 % + 10 %	+ 10 %	+ 15 %	+ 6 %
System leakage capacitance C_e µF		≤ 500	≤ 2000	≤ 500	≤ 2000
Response value R_{an} kΩ		0.2…100	0.2…100	1…990	0.2…990
Coupled systems		–	✓	–	–
Locating current injector for insulation fault location		–	–	–	–
Installation	**DIN rail**	✓	✓	✓	–
	Screw mounting	✓	✓	✓	✓
	Panel mounting/ wall fastening	–	–	–	–
Interfaces	**Web server**	–	–	–	–
	Modbus	–	–	RTU	RTU
	BCOM	–	–	–	–
	BS	–	–	–	–
	BMS	✓	✓	✓	✓
	isoData	–	–	✓	–
Product details (Products on www.bender.de/en)					

	Type	C. p.	Suitable system components			
	FP200	**49**	–	–	–	–
Coupling devices	**AGH150W-4**	**382**	–	–	–	–
	AGH204S-4	**384**	–	–	–	–
	AGH520S	**385**	–	–	–	–
	AGH675S-7	**386**	–	–	–	–
	AGH676S-4	**388**	–	–	–	–

					
ISOMETER® isoPV1685P	**ISOMETER® isoPV1685DP**	**ISOMETER® IR420-D6**	**ISOMETER® IR423**	**ISOMETER® IR123**	**ISOMETER® isoGEN423**
100	**103**	**106**	**109**	**112**	**115**
Photovoltaic	Photovoltaic	Disconnected loads	Mobile generators	Mobile generators	Generators acc. to standard DIN VDE 0100-551
–	–	–	–	–	–
–	–	–	–	–	–
✓	✓	✓	✓	✓	✓
–	✓	✓	–	–	✓
–	✓	✓	✓	✓	✓
–	✓	–	–	–	✓
✓	✓	✓	–	–	✓
DC 0…1500 V	AC 0…1000 V DC 0…1500 V	offline (AC 0…400 V)	AC 0…250 V	AC 100…250 V	3(N)AC, AC 0…400 V, DC 0…400 V
+ 6 %	+10 %, +5%	–	+ 20 %	+ 20 %	+25 %
≤ 2000	≤ 4000	≤ 10	≤ 5	≤ 1	≤ 5
0.2…990	0.2…200	100…10000	1…200	46/23	5…200
–	✓	–	–	–	–
✓	✓	–	–	–	–
–	–	✓	✓	–	✓
✓	✓	✓	✓	✓	✓
–	–	–	–	–	–
–	–	–	–	–	–
–	RTU	–	–	–	RTU
–	–	–	–	–	–
–	–	–	–	–	–
✓	✓	–	–	–	✓
–	–	–	–	–	✓

Suitable system components

–	–	–	–	–	–
–	–	✓	–	–	–
–	–	✓	–	–	–
–	–	✓	–	–	–
–	–	–	–	–	–
–	–	–	–	–	–

Device overview insulation monitoring devices ISOMETER®

		 ISOMETER® isoRW425	 ISOMETER® isoUG425	 ISOMETER® isoES425	 ISOMETER® isoHV425
Catalogue page		**118**	**121**	**124**	**127**
Special applications		Railway	Unearthed DC systems	Energy storage VDE-AR-E 2510-2	–
Circuits	**Control circuits**	–	–	–	–
	Auxiliary circuits	–	–	–	–
	Main circuits	✓	✓	✓	✓
Voltage system	**3(N)AC**	✓	–	–	✓
	AC	✓	–	✓	✓
	AC/DC	✓	–	✓	✓
	DC	✓	✓	✓	✓
Nominal system voltage U_n		AC/DC 0…400 V	DC 12…120 V	3 (N)AC, AC 0…400 V, DC 0…400 V	with AGH422 AC 0…1000 V, DC 0…1000 V
Tolerance of U_n		+ 25 %	+20 %	+25 %	+10 %
System leakage capacitance C_e µF		≤ 300	≤ 50	≤ 100	≤ 150
Response value R_{an} kΩ		1…990	2…100	2…990	11…500
Coupled systems		–	–	–	–
Locating current injector for insulation fault location		–	–	–	–
Installation	**DIN rail**	✓	✓	✓	✓
	Screw mounting	✓	✓	✓	✓
	Panel mounting/ wall fastening	–	–	–	–
Interfaces	**Web server**	–	–	–	–
	Modbus	RTU	RTU	–	RTU
	BCOM	–	–	–	–
	BS	–	–	–	–
	BMS	✓	✓	✓	✓
	isoData	✓	✓	✓	✓
Product details (Products on www.bender.de/en)					

	Type	C. p.	Suitable system components			
	FP200	**49**	–	–	–	–
Coupling devices	**AGH150W-4**	**382**	–	–	–	–
	AGH204S-4	**384**	–	–	–	–
	AGH520S	**385**	–	–	–	–
	AGH675S-7	**386**	–	–	–	–
	AGH676S-4	**388**	–	–	–	–

			
ISOMETER® IR155	**ISOMETER® isoCHA425**	**ISOMETER® isoCHA425HV**	**ISOMETER® iso175**
131	**135**	**138**	**142**
Electric mobility	Electric mobility	Electric mobility	Electric mobility
–	–	–	–
–	–	–	–
✓	✓	✓	✓
–	–	–	–
–	–	–	–
–	–	–	–
✓	✓	✓	✓
DC 0…1000 V	DC 0…400 V	DC 0…1000 V with AGH420-1/AGH421-1	AC 0…800 V DC 0…1000 V
+ 0 %	+25 %	+10 %	+25 %
≤ 1	≤ 5	≤ 5	≤ 10
100…10000	230 48	600 120	30…2000
–	–	–	–
–	–	–	–
–	✓	✓	–
✓	–	–	✓
–	–	–	–
–	–	–	–
–	RTU	RTU	–
–	–	–	–
–	–	–	–
–	✓	✓	–
–	✓	✓	–
Suitable system components			
–	–	–	–
–	–	–	–
–	–	–	–
–	–	–	–
–	–	–	–
–	–	–	–

Device overview Equipment for insulation fault location ISOSCAN®

					
		ISOSCAN® EDS440	**ISOSCAN® EDS441**	**ISOSCAN® EDS441-LAB**	**ISOSCAN® EDS440-LAF**
Catalogue page		**148**	**148**	**148**	**148**
Special applications		–	–	High-resistance insulation faults in case of high system leakage capacitances and low test current value	Use with flexible strap transformers CTAF
Application		stationary	stationary	stationary	stationary
Circuits	**Control circuits**	–	✓	✓	–
	Main circuits	✓	–	–	✓
Voltage system	**3(N)AC**	✓	–	–	✓
	AC	✓	✓	✓	✓
	AC/DC	✓	✓	✓	✓
	DC	✓	✓	✓	✓
Nominal voltage U_n max		see Locating current injector (e. g. ISOMETER® iso685-D-P)	AC 20…276 V, DC 20…308 V	AC 20…276 V, DC 20…308 V	see Locating current injector (e. g. ISOMETER® iso685-D-P)
System leakage capacitance C_e µF		acc. to characteristic curve	acc. to characteristic curve	acc. to characteristic curve	acc. to characteristic curve
Response value R_{an} kΩ		acc. to characteristic curve	acc. to characteristic curve	acc. to characteristic curve	acc. to characteristic curve
Installation	**DIN rail**	✓	✓	✓	✓
	Screw mounting	✓	✓	✓	✓
Interfaces	**BB**	EDS440-S	EDS441-S	–	–
	BS	EDS440-L	EDS441-L	✓	✓
	BMS	–	–	–	–
Product details (Products on www.bender.de/en)					

	Type	C. p.	Suitable system components			
Suitable ISOMETER®s with integrated PGH	**iso685-D-P**	**20**	✓	✓	✓	–
	isoMED427P	**83**	–	✓	–	–
	isoPV1685P	**100**	–	–	–	–
	iso1685DP	**64**	–	–	–	–
Measuring current transformers	**CTAC…**	**359**	✓	✓	–	–
	CTAS…	**362**	✓	✓	–	–
	W…	**365**	✓	–	✓	–
	WS…	**367**	✓	✓	–	–
	WS…S	**369**	✓	–	–	–
	WR…S(P)	**371**	✓	–	✓	–
	CTUB100	**376**	–	–	✓	–
	CTAF…	**–**	–	–	–	✓
Power supply unit	**AN410**	**403**	–	–	✓	–
	AN450	**405**	–	–	✓	–
	STEP-PS	**400**	–	–	✓	–
Relay module	**IOM441**	**411**	✓	✓	✓	✓

		
ISOSCAN® EDS150	**ISOSCAN® EDS151**	**ISOSCAN® EDS30…**
155	**158**	**161**
–	Medical locations	EDS3096PG for de-energised systems
stationary	stationary	portable
–	✓	✓
✓	–	✓
✓	–	✓
✓	✓	✓
✓	✓	✓
✓	✓	✓
see Locating current injector (e. g. ISOMETER® iso685-D-P)	AC 20…276 V, DC 20…308 V	dependent on type
acc. to characteristic curve	acc. to characteristic curve	acc. to characteristic curve
acc. to characteristic curve	acc. to characteristic curve	acc. to characteristic curve
–	–	–
✓	✓	–
–	–	–
–	–	–
✓	✓	–

Suitable system components

–	–	✓
–	✓	✓
✓	–	✓
✓	–	✓
–	–	–
–	–	–
–	–	–
–	–	–
–	–	–
–	–	–
–	–	–
–	–	–
✓	✓	–
✓	✓	–
–	–	–
–	–	–

Device overview residual current monitors LINETRAXX®

						
		LINETRAXX® RCM420	**LINETRAXX® RCMA420**	**LINETRAXX® RCMA423**	**LINETRAXX® SmartDetect RCMS410**	**LINETRAXX® SmartDetect RCMS425-L**
Catalogue page		**174**	**177**	**180**	**183**	**186**
Special applications		–	–	–	–	–
Type of distribution system	**TN/TT**	✓	✓	✓	✓	✓
	IT	–	–	–	–	–
Residual currents	⏦	✓	✓	✓	✓	✓
	⎓	–	✓	✓	✓	✓
Rated frequency range		42…2000 Hz	0…2000 Hz	0…2000 Hz	0…20000 Hz	0…20000 Hz
Number of measuring channels		1	1	1	4	4
Response value	$I_{\Delta n1}$	50…100 % x $I_{\Delta n2}$	50…100 % x $I_{\Delta n2}$	50…100 % x $I_{\Delta n2}$	10…100 % x $I_{\Delta n}$	10…100 % x $I_{\Delta n}$
	$I_{\Delta n2}$	10 mA…10 A	10…500 mA	30 mA…3 A	6 mA…30 A (Type A, Type F) 10 mA…10 A (Type B, Type B+)	6 mA…30 A (Type A, Type F) 10 mA…10 A (Type B, Type B+)
Response delay t_{on}		0…10 s	0…10 s	0…10 s	0…10 s	0…10 s
Start-up delay t		0…10 s	0…10 s	0…10 s	0…999 s	0…999 s
Delay on release t_{off}		0…300 s	0…99 s	0…99 s	0…999 s	0…999 s
Operating principle, alarm relays		N/C operation or N/O operation	N/C operation or N/O operation	N/C operation or N/O operation	N/C operation or N/O operation + Multifunctional digital and analogue inputs and outputs	N/C operation or N/O operation + Multifunctional digital and analogue inputs and outputs
Installation	**DIN rail**	✓	✓	✓	✓	✓
	Screw mounting	✓	✓	✓	✓	✓
Interfaces	**BMS**	–	–	–	–	–
	Modbus	–	–	–	RTU	RTU
	NFC	–	–	–	✓	✓
Product details (Products on www.bender.de/en)						

	Type	C. p.	Suitable system components				
Measuring current transformers	**CTAC…**	**359**	✓	–	–	✓	✓
	CTAS…	**362**	✓	–	–	✓	✓
	W…	**365**	✓	–	–	✓	✓
	WS…	**367**	✓	–	–	✓	✓
	WS…S	**369**	✓	–	–	✓	✓
	WR…S(P)	**371**	✓	–	–	✓	✓
	WF…	**373**	–	–	–	–	–
	CTUB100	**376**	–	✓	✓	✓	✓
	CTBS25	**380**	–	–	–	✓	✓
RS-485 repeater	**DI-1DL**	**408**	–	–	–	–	–
Power supply units	**STEP-PS**	**400**	–	–	–	✓	✓

						
	LINETRAXX® SmartDetect RCMS425-D	**LINETRAXX® RCMS460/RCMS490**	**LINETRAXX® RCMS150 series**	**LINETRAXX® MRCDB423**	**LINETRAXX® MRCDB300 series**	**LINETRAXX® RCMB300 series**
	190	**194**	**201**	**204**	**208**	**212**
	–	–	Monitoring of final circuits, DGUV Regulation 3 (German Social Accident Insurance)	Additional protection (MRCD applications)	Additional protection (MRCD applications)	–
	✓	✓	✓	✓	✓	✓
	–	–	–	–	–	–
	✓	✓	✓	✓	✓	✓
	✓	✓	✓	✓	✓	✓
	0…20000 Hz	0…2000 Hz	0…1000 Hz	0…2000 Hz	DC…100000 Hz	DC…100000 Hz
	4	12 (per device) 1080 (per system)	6 virtual 12	1	–	–
	10…100 % x $I_{\Delta n}$	10…100 % x $I_{\Delta n2}$ min. 5 mA	50…100 % x $I_{\Delta n2}$	50…100 % von $I_{\Delta n2}$	50…100 % x $I_{\Delta n2}$	50…100 % x $I_{\Delta n2}$
	6 mA…30 A (Type A, Type F) 10 mA…10 A (Type B, Type B+)	10 mA…10 A (Type B) 6 mA…20 A (Type A)	3…300 mA (Type B) 3…300 mA (DC)	30 mA…3 A	30 mA…3 A	30 mA…3 A
	0…10 s	0…99 s	0…600 s	0…10 s	0 s…60 min	50 ms…60 min
	0…999 s	0…99 s	0.5…600 s	1 s	0 s…60 min	0 s…60 min
	0…999 s	0…999 s	0…600 s	–	0 s…60 min	0 s…60 min
	Multifunctional digital and analogue inputs and outputs	N/C operation or N/O operation	–	N/C operation	N/C operation or N/O operation	N/C operation or N/O operation
	✓	✓	✓	✓	partly	partly
	✓	✓	✓	✓	✓	✓
	–	✓	✓	–	–	–
	RTU	–	RTU	–	RTU	RTU
	✓	–	–	–	–	–

Suitable system components

✓	✓	–	–	–	–
✓	✓	–	–	–	–
✓	✓	–	–	–	–
✓	✓	–	–	–	–
✓	✓	–	–	–	–
✓	✓	–	–	–	–
–	✓	–	–	–	–
✓	✓	–	✓	–	–
✓	✓	–	–	–	–
–	✓	✓	–	–	–
✓	✓	✓	–	✓	✓

Device overview residual current monitors LINETRAXX®

		 LINETRAXX® RCMB330	 LINETRAXX® CEP410R-2	 LINETRAXX® RCM410R	 RCMB131-01
Catalogue page		**216**	**219**	**222**	**225**
Special applications		–	Monitoring at central earthing point (CEP)	–	Monitoring of final circuits, integration in power distribution units (PDUs)
Type of distribution system	**TN/TT**	✓	✓	✓	✓
	IT	–	–	–	–
Residual currents	⏦	✓	✓	✓	✓
	⎓	✓	–	✓	✓
Rated frequency range		DC…100000 Hz	42…70 Hz	42…70 Hz	DC…2000 Hz
Number of measuring channels		–	1	–	–
Response value	$I_{\Delta n1}$	50…100 % x $I_{\Delta n2}$	50…100 % x $I_{\Delta n}$	50…100 % x $I_{\Delta n}$	3,5…100 mA (DC)
	$I_{\Delta n2}$	30…500 mA	10 mA…30 A	10 mA…30 A	3,5…100 mA (r.m.s.)
Response delay t_{on}		50 ms…60 min	0…10 s	0…10 s	–
Start-up delay t		0 s…60 min	0…900 s	0…900 s	–
Delay on release t_{off}		0 s…60 min	0…900 s	0…900 s	–
Operating principle, alarm relays		–	N/C operation or N/O operation	N/C operation or N/O operation	–
Installation	**DIN rail**	✓	✓	✓	✓
	Screw mounting	✓	✓	✓	✓
Interfaces	**BMS**	–	–	–	–
	Modbus	RTU	RTU	RTU	RTU
	NFC	–	✓	✓	–
Product details (Products on www.bender.de/en)					

	Type	C. p.	Suitable system components			
Measuring current transformers	**CTAC…**	**359**	–	✓	✓	–
	CTAS…	**362**	–	✓	✓	–
	W…	**365**	–	✓	✓	–
	WS…	**367**	–	✓	✓	–
	WS…S	**369**	–	✓	✓	–
	WR…S(P)	**371**	–	✓	✓	–
	WF…	**373**	–	–	–	–
	CTUB100	**376**	–	–	–	–
	CTBS25	**380**	–	–	–	–
RS-485 repeater	**DI-1DL**	**408**	–	–	–	–
Power supply units	**STEP-PS**	**400**	✓	✓	✓	✓

			
RCMB131-02	**RCMB132-01**	**RCMB104**	**RDC104-4**
227	**229**	**231**	**234**
Monitoring of final circuits, integration in power distribution units (PDUs)	Monitoring of final circuits, integration in power distribution units (PDUs)	Electric vehicle charging systems	Electric vehicle charging systems
✓	✓	✓	✓
–	–	–	–
✓	✓	✓	✓
✓	✓	✓	✓
DC…2000 Hz	DC…2000 Hz	0…2000 Hz	0…2000 Hz
–	–	–	–
3,5…100 mA (DC)	3,5…100 mA (DC)	DC 6 mA (RCMB104-1) r.m.s. 5 mA (RCMB104-2)	–
3,5…100 mA (r.m.s.)	3,5…100 mA (r.m.s.)	r.m.s. 30 mA (RCMB104-1) r.m.s. 20 mA (RCMB104-2)	DC 6 mA
–	–	–	–
–	–	–	–
–	–	–	–
–	–	–	–
✓	✓	–	–
✓	✓	–	–
–	–	–	–
–	RTU	–	–
–	–	–	–

Suitable system components

–	–	–	–
–	–	–	–
–	–	–	–
–	–	–	–
–	–	–	–
–	–	–	–
–	–	–	–
–	–	–	–
–	–	–	–
–	–	–	–
✓	✓	–	–

Device overview neutral grounding resistance monitoring (NGR) LINETRAXX®

					
		LINETRAXX® NGRM500	**LINETRAXX® NGRM550**	**LINETRAXX® NGRM700**	**LINETRAXX® NGRM750**
Catalogue page		**240**	**240**	**245**	**245**
Special applications		Neutral grounding resistance monitoring (NGR monitoring)	Neutral grounding resistance monitoring (NGR monitoring)	Neutral grounding resistance monitoring (NGR monitoring)	Neutral grounding resistance monitoring (NGR monitoring)
System type	**HRG**	✓	–	✓	–
	LRG	–	✓	–	✓
Fault currents		✓	✓	✓	✓
		✓	✓	✓	✓
Phase monitoring L1, L2, L3		–	–	✓	✓
System voltage L-L*		600…25000 V	600…25000 V	600…25000 V	600…25000 V
Harmonic analysis	**RMS 0…32**	✓	✓	✓	✓
	Analysis range	✓	✓	✓	✓
Relay operating mode		Configurable fail-safe or non-fail-safe	Configurable fail-safe or non-fail-safe	Configurable fail-safe or non-fail-safe	Configurable fail-safe or non-fail-safe
Communication		Webserver, BCOM, Modbus RTU, Modbus TCP	Webserver, BCOM, Modbus RTU, Modbus TCP	Webserver, BCOM, Modbus RTU, Modbus TCP	Webserver, BCOM, Modbus RTU, Modbus TCP
Maximum altitude		2000 m	2000 m	5000 m	5000 m
Mounting	**Detachable HMI for front panel mounting**	–	–	✓	✓
	DIN rail	✓	✓	–	–
	Screw mounting	–	–	✓	✓
Product details (Products on www.bender.de/en)					

* Freely configurable in the device, taking suitable coupling devices into account.

Device overview coupling devices for NGR monitoring

		CTUB103	RC48N	CD1000	CD1000-2	CD5000	CD14400	CD25000
								
Catalogue page		**251**	**254**	**257**	**259**	**261**	**263**	**265**
Special applications		AC/DC sensitive measuring current transformer	Ground-fault neutral-grounding monitor	Coupling device for HRG applications	Coupling device for HRG applications	Coupling device for HRG applications	Coupling device for HRG applications	Coupling device for HRG applications
System voltage L-L (U_{NGR} voltage)		–	–	Up to U_{LL} = 690 V (U_{NGR} = 400 V)	Up to U_{LL} =1000 V (U_{NGR} = 600 V)	Up to U_{LL} = 4300 V (U_{NGR} = 2500 V)	Up to U_{LL} =14400 V (U_{NGR} = 8400 V)	Up to U_{LL} =25 kV (U_{NGR} = 14.5 kV)
Mounting	**Screw mounting**	✓	✓	✓	✓	✓	✓	✓
	DIN rail mounting	✓	✓	–	–	–	–	–
Product details (Products on www.bender.de/en)								

Recommended minimum value R_{NGR} (tripping level 50 %)

		CD1000			CD1000-2				CD5000		CD14400					CD25000
	U_{sys}	400 V	600 V	690 V	400 V	600 V	690 V	1000 V	2400 V	4200 V	6 kV	6.6 V	7.2 kV	11 kV	14.4 kV	25 kV
I_{NGR}	1 A	231 Ω	346 Ω	398 Ω	231 Ω	346 Ω	398 Ω	577 Ω	1386 Ω	–	–	–	–	–	–	–
	5 A	46 Ω	69 Ω	80 Ω	46 Ω	69 Ω	80 Ω	115 Ω	277 Ω	485 Ω	693 Ω	762 Ω	831 Ω	1270 Ω	1663 Ω	–
	10 A	*(23 Ω)*	35 Ω	40 Ω	*(23 Ω)*	35 Ω	40 Ω	58 Ω	139 Ω	242 Ω	346 Ω	381 Ω	416 Ω	635 Ω	831 Ω	1443 Ω
	15 A	*(15 Ω)*	*(23 Ω)*	*(27 Ω)*	*(15 Ω)*	*(23 Ω)*	*(27 Ω)*	38 Ω	92 Ω	162 Ω	231 Ω	254 Ω	277 Ω	423 Ω	554 Ω	962 Ω
	20 A	–	*(17 Ω)*	*(20 Ω)*	–	*(17 Ω)*	*(20 Ω)*	29 Ω	69 Ω	121 Ω	*(173 Ω)*	191 Ω	208 Ω	318 Ω	416 Ω	722 Ω
	25 A	–	–	*(16 Ω)*	–	–	*(16 Ω)*	*(23 Ω)*	55 Ω	97 Ω	*(139 Ω)*	*(152 Ω)*	*(166 Ω)*	254 Ω	333 Ω	577 Ω
	30 A	–	–	–	–	–	–	*(19 Ω)*	*(46 Ω)*	81 Ω	*(115 Ω)*	*(127 Ω)*	*(139 Ω)*	212 Ω	277 Ω	481 Ω
	40 A	–	–	–	–	–	–	–	*(35 Ω)*	61 Ω	*(87 Ω)*	*(95 Ω)*	*(104 Ω)*	*(159 Ω)*	208 Ω	361 Ω
	50 A	–	–	–	–	–	–	–	*(28 Ω)*	*(48 Ω)*	–	*(76 Ω)*	*(83 Ω)*	*(127 Ω)*	*(166 Ω)*	289 Ω
	100 A	–	–	–	–	–	–	–	–	*(24 Ω)*	–	–	–	–	*(83 Ω)*	*(144 Ω)*

Temperature range -40…+70 °C, field calibration at 25 °C

(Limited temperature range 0…+40 °C, field calibration at 25 °C)

Device overview charge controller

				
		CC613	**ICC1324**	**ICC1314**
Catalogue page		**270**	**274**	**278**
Modem		4G modem (optional)	4G modem (optional)	2G/4G modem (optional)
Integrated patented 6 mA DC fault current detection		✓	✓	✓
Integrated Powerline Communication (PLC)		✓	✓	✓
Emergency Opener		✓	✓	✓
WiFi module		–	✓ (optional)	✓ (optional)
Integrated power supply unit		–	✓	✓
Interface	**Ethernet**	✓	✓	✓
	Modbus	✓	✓	✓
Variant	**Enclosure for DIN rail mounting**	✓	–	–
	PCB version	–	✓	✓
Product details (Products on www.bender.de/en)				

Device overview accessories charge controller

						
		CTBC17	DPM2x16FP	RFID105-L1	RFID114	RFID117-L1
Catalogue page		281	285	286	287	288
Special applications		Measuring current transformer	Display module	RFID module	RFID module	RFID module
For series	CC613	✓	✓	✓	✓	✓
	ICC1324	✓	–	–	–	–
	ICC1314	–	–	–	–	–
	RCMB104	✓	–	–	–	–
	RCD104	✓	–	–	–	–
Product details (Products on www.bender.de/en)						

			
		HMI140 / 145 / 150	IPM1300
Catalogue page		289	291
Special applications		Interface module	Power modul
For series	CC613	–	–
	ICC1324	✓	–
	ICC1314	✓	✓
	RCMB104	–	–
	RCD104	–	–
Product details (Products on www.bender.de/en)			

Device overview Universal Devices for Power Quality and Energy Measurement PEM

		LINETRAXX® PEM353
	Catalogue page	296
Normative requirements	Accuracy class according to IEC 62053-22	0.5 s
	DIN EN 50160 (report)	–
	DIN EN 61000-4-7 (harmonic)	Class II
	DIN EN 61000-4-15 (flicker) DIN EN 61000-4-30 (PQ measurement method)	–
Parameters	Phase voltages/Line voltages	✓
	Phase currents	✓
	Neutral current I_4	✓ (PEM353-N only)
	Neutral current I_4 (calculated)	✓
	Frequency / phase angle	✓
	Reactive and active power import/ Reactive and active power export	✓
	Voltage unbalance/current unbalance	✓
	Power	per phase and total S in kVA, P in kW, Q in kvar
	Displacement factor cos (φ)/power factor λ	✓
	Total harmonic distortion (THD_U/THD_I)	up to the 31rd
	Harmonic components voltage	up to the 31rd
	Harmonic components current	up to the 31rd
	Transient detection	–
	Overvoltage (swell)	–
	Undervoltage (sag)	–
	Flicker severity P_{ST}	–
Features	Data recorder / HighSpeed data recorder	5/0
	Waveform recorder	–
	Digital inputs	4
	Digital outputs	2 (PEM353-P only)
	Relay outputs (RO)	2 (PEM353, PEM353-N only)
Technical aspects	Voltage supply	AC/DC 95…250 V (47…440 Hz)
	Sampling rate	3,2 kHz
	Temperature	-25…+55 °C
	Communication	Modbus RTU
	Product details (Products on www.bender.de/en)	

Energy meter and Measuring current transformer for universal measuring devices

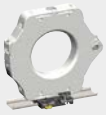
	 CTB31/CTB41/CTB51	 KBR18/KBR32
Catalogue page	**301**	**301**
Type	Measuring current transformer	Measuring current transformer
Product details (Products on www.bender.de/en)		

Device overview measuring and monitoring relays LINETRAXX®

							
		LINETRAXX® VME420	**LINETRAXX® VME421H**	**LINETRAXX® VMD258**	**LINETRAXX® ES258**	**LINETRAXX® VMD420**	**LINETRAXX® VMD421H**
Catalogue page		**306**	**309**	**312**	**315**	**316**	**319**
Special applications		–	–	Power plant	Energy backup for device series VMD258	–	–
Application	**Voltage monitoring**	✓	✓	✓	–	✓	✓
	Current monitoring	–	–	–	–	–	–
Voltage monitoring	**AC**	*U*<, *U*>	*U*<, *U*>	–	–	–	–
	3AC	–	–	*U*<, *U*>	–	*U*<, *U*>	*U*<, *U*>
	3(N)AC	–	–	–	–	*U*<, *U*>	*U*<, *U*>
	DC	*U*<, *U*>	*U*<, *U*>	–	–	–	–
Measuring range/ nominal system voltage U_n		AC/DC systems 0…300 V	**VME421H-D-1** AC/DC systems 9,6…150 V VMD421H-D-2 70…300 V	3AC 690/500/480/440/ 400/230/110/100 V	–	(L-N) 0…288 V (L-L) 0…500 V	(L-N) 0…288 V (L-L) 0…500 V
Frequency		*f*<, *f*>	*f*<, *f*>	–	–	*f*<, *f*>	*f*<, *f*>
Phase sequence		–	–	–	–	✓	✓
Phase failure		–	–	–	–	✓	✓
Asymmetry		–	–	–	–	✓	✓
Supply voltage U_s		external	system	system	–	external	system
Current monitoring	**1 AC with *U*s**	–	–	–	–	–	–
	3 AC with *U*s	–	–	–	–	–	–
Special function		–	–	–	–	–	–
Installation	**DIN rail**	✓	✓	✓	✓	✓	✓
	Screw mounting	✓	✓	✓	✓	✓	✓
Product details (Products on www.bender.de/en)							

							
LINETRAXX® VMD423/VMD423H	**LINETRAXX® VMD460-NA**	**LINETRAXX® VMD461**	**LINETRAXX® CME420**	**LINETRAXX® CMD420/CMD421**	**LINETRAXX® CMS460**	**LINETRAXX® GM420**	**RC48C**
322	**325**	**330**	**336**	**339**	**342**	**345**	**348**
Interface Protection System/Decoupling protection relay	Interface Protection System/Decoupling protection relay	Interface Protection System/Decoupling protection relay	–	–	–	Loop monitoring	Residual current/loop monitoring
✓	✓	✓	–	–	–	–	–
–	–	–	✓	✓	✓	–	✓
–	*U*<, *U*<<, *U*>, *U*>>, U_{10min}>	*U*<, *U*<<, *U*<<<, *U*>, *U*>>, *U*>>>	–	–	–	–	–
–	*U*<, *U*<<, *U*>, *U*>>, U_{10min}>	*U*<, *U*<<, *U*<<<, *U*>, *U*>>, *U*>>>	–	–	–	–	–
U<, *U*>, U_{10min}>	*U*<, *U*<<, *U*>, *U*>>, U_{10min}>	*U*<, *U*<<, *U*<<<, *U*>, *U*>>, *U*>>>	–	–	–	–	–
–	–	–	–	–	–	–	–
(L-N) 0…288 V (L-L) 0…500 V	(L-N) 0…300 V (L-L) 0…520 V	**VMD461** (L-N) AC 50…260 V (L-L) AC 87…450 V (DC+ / DC–) DC 50…450 V **VMD461 +CD440** (L-N) AC 250…690 V (L-L) AC 440…1200 V (DC+/DC-) DC 250…1200 V	–	–	–	–	–
f<, *f*>	*f*<, *f*<<, *f*>, *f*>>	f<, f<<, f<<<, f>, f>>, f>>>	–	–	–	–	–
✓	✓	✓	–	–	–	–	–
✓	✓	✓	–	–	–	–	–
✓	✓	✓	–	–	–	–	–
external (VMD423) system (VMD423H)	external	external	–	–	–	extern	extern
–	–	–	*I*<, *I*>	–	*I*<, *I*>	–	–
–	–	–	–	*I*<, *I*>	*I*<, *I*>	–	–
–	RS-485 interface, Islanding detection: -ROCOF (df/dt) -Vector shift	RS-485 interface, Islanding detection: -ROCOF (df/dt) -Vector shift	–	–	RS-485 interface	Monitoring of conductor loops for interruption	Monitoring of conductor loops for interruption and short circuit by using an termination device
✓	✓	✓	✓	✓	✓	✓	✓
✓	✓	✓	✓	✓	✓	✓	✓

Device overview measuring current transformers

																									
		CTAC…					CTAS…			W0-S20…W5-S210, W10/600							WS…/WS…-8000					WS…S			
Catalogue page		359					362			365							367					369			
Type		Type A					Type A			Type A							Type A					Type A			
Eigenschaft							split-core										split-core					split-core			
	CT type	CTAC20(/01)	CTAC35(/01)	CTAC60	CTAC120	CTAC210	CTAS50(/01)	CTAS80(/01)	CTAS120(/01)	W10/600	W0-S20	W1-S35	W2-S70	W3-S105	W4-S140	W5-S210	WS20x30	WS50x80	WS80x120	WS20x30-8000	WS50x80-8000	WS50x80S	WS80x80S	WS80x120S	WS80x160S
Dimensions (mm)	Inside diameter	20	35	60	120	210	50	80	120	10	20	35	70	105	140	210	–	–	–	–	–	–	–	–	–
	Width x height	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	20 x 30	50 x 80	80 x 120	20 x 30	50 x 80	50 x 80	80 x 80	80 x 120	80 x 160
	Strip length	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Device family	EDS440	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	–	–	✓	✓	✓	✓
	EDS441	✓	✓	–	–	–	✓	✓	✓	–	–	–	–	–	–	–	–	–	–	✓	✓	–	–	–	–
	EDS441-LAB	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	✓	✓	–	–	–	–
	MRCDB423	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	RCM420	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	–	–	✓	✓	✓	✓
	RCMA420	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	RCMA423	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	RCMS460/490	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	–	–	✓	✓	✓	✓
	RCMS410	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	–	–	✓	✓	✓	✓
	RCMS425	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	–	–	✓	✓	✓	✓
	NGRM…	–	✓	✓	–	–	✓	✓	✓	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Produktdetails (Produktbereich auf www.bender.de)																									

WR…S(P)				WF…						CTUB100-CTBC…										CTBS25
371				373						376										380
Type A				Type A						Type B										Type B
				flexible																split-core
WR70x175S(P)	WR115x305S(P)	WR150x350S(P)	WR200x500S(P)	WF170	WF250	WF500	WF800	WF1200	WF1800	CTUB101-CTBC20(P)	CTUB101-CTBC35(P)	CTUB101-CTBC60(P)	CTUB101-CTBC120(P)	CTUB101-CTBC210(P)	CTUB102-CTBC20(P)	CTUB102-CTBC35(P)	CTUB102-CTBC60(P)	CTUB102-CTBC120(P)	CTUB102-CTBC210(P)	CTBS25
–	–	–	–	–	–	–	–	–	–	20	35	60	120	210	20	35	60	120	210	25
70 x 175	115 x 305	150 x 350	200 x 500	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
–	–	–	–	170	250	500	800	1200	1800	–	–	–	–	–	–	–	–	–	–	–
✓	✓	✓	✓	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	✓	✓	✓	–	–	–
–	–	–	–	–	–	–	–	–	–	✓	✓	✓	✓	✓	–	–	–	–	–	–
✓	✓	✓	✓	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
–	–	–	–	–	–	–	–	–	–	✓	✓	✓	✓	✓	–	–	–	–	–	–
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✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	–	–	–	–	–	✓	✓	✓	✓	✓	✓
✓	✓	✓	✓	–	–	–	–	–	–	–	–	–	–	–	✓	✓	✓	✓	✓	✓
✓	✓	✓	✓	–	–	–	–	–	–	–	–	–	–	–	✓	✓	✓	✓	✓	✓
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

Device overview coupling devices

						
		AGH150W-4	**AGH204S-4**	**AGH520S**	**AGH675S-7/ AGH675S-7MV**	**AGH676S-4**
Catalogue page		**382**	**384**	**385**	**386**	**388**
Application		Extension of the nominal voltage range for ISOMETER®s	Extension of the nominal voltage range for ISOMETER®s	Extension of the nominal voltage range for ISOMETER®s	Extension of the nominal voltage range for ISOMETER®s	Extension of the nominal voltage range for ISOMETER®s
Nominal system voltage U_n		AC 0…1150 V, DC 0…1760 V	3(N)AC 0…1650 V, DC 0…1840 V	AC/3(N)AC 0…7200 V	AC, 3(N)AC, DC 0…7.2 kV AC, 3(N)AC, DC 0…15.5 kV	AC/3(N)AC 0…12 kV
Device family	**IRDH275BM-7**	–	–	–	✓	–
	IR420-D64	–	–	–	–	✓
	iso685-D	✓	✓	✓	–	✓
	iso685-S	✓	✓	✓	–	✓
Product details (Products on www.bender.de/en)						

Device overview isolating transformers, transformers for operating theatre lights

				
		ES710	**DS0107**	**ESL0107**
Catalogue page		**390**	**395**	**398**
Application		Design of medical IT systems	Supply of three-phase loads in group 0, 1 or 2 medical locations	Supply of operating theatre luminaires
Type of distribution system		single-phase	three-phase	single-phase
Voltages	**Input**	AC 230 V	3AC 400 V	AC 230 V (±5 %, ±10 %)
	Output	AC 230 V	3NAC 230 V	AC 23…28 V
	Frequency range	50…60 Hz	50…60 Hz	50…60 Hz
Power		3150 VA 4000 VA 5000 VA 6300 VA 8000 VA 10000 VA	2000 VA 3150 VA 4000 VA 5000 VA 6300 VA 8000 VA 10000 VA	120 VA 160 VA 280 VA 400 VA 630 VA 1000 VA
Design type	**vertical**	✓	✓	✓
	horizontal	✓	✓	–
	encapsulated (protection class B)	✓	✓	–
Product details (Products on www.bender.de/en)				

Device overview power supply units

			
	STEP-PS	**AN410**	**AN450**
Catalogue page	**400**	**403**	**405**
Application	for measuring current transformers	for DC 24 V power supply	for voltage supply
Rated voltage	DC 24 V	DC 24 V	AC 20 V, 50…60 Hz
Rated input voltage U_{IN}	AC 85…264 V, 45…65 Hz DC 95…250 V	AC 90…264 V DC 120…370 V	AC 230 V, 50…60 Hz AC 127 V, 50…60 Hz
Product details (Products on www.bender.de/en)			

Device overview measuring instruments

				
	7204	**7220**	**9604**	**9620**
Catalogue page	**407**	**407**	**407**	**407**
Input current	0…400 µA	0…20 mA	0…400 µA	0…20 mA
Dimensions (mm)	72 x 72	72 x 72	96 x 96	96 x 96
Device family iso685…	–	✓	✓	✓
Product details (Products on www.bender.de/en)				

Device overview interface converters and repeaters

		 DI-1DL	 DI-2USB
Catalogue page		**408**	**410**
Application		Interface repeater BMS bus	Interface converter BMS/USB
Input	**Input**	RS-485	RS-485
	Connection	screw-type terminal	screw-type terminal
	Cable length	≤ 1200 m	≤ 1200 m
Output	**Output**	RS-485	USB
	Connection	screw-type terminal	USB Type B
	Cable length	≤ 1200 m	≤ 5 m
	Expansion of bus devices	≤ 30	–
Supply voltage U_s		AC 85…260 V, 50…60 Hz	via USB
Particular features		–	Driver CD
Product details (Products on www.bender.de/en)			

Device overview relay module

	 IOM441
Catalogue page	**411**
Application	for extension of EDS44x applications
Relay number	12 N/O contacts
Supply voltage U_s	via BB bus
Interface	BB bus
Connection	push-wire terminal / BBbus PCB
Relay operation	configurable
Product details (Products on www.bender.de/en)	

Device overview condition monitors/gateways

							
		COMTRAXX® EDGE500IP	**COMTRAXX® COM465IP**	**COMTRAXX® COM465DP**	**COMTRAXX® COM465ID**	**COMTRAXX® COM463BC**	**COMTRAXX® CP907-I**
	Catalogue page	**413**	**417**	**421**	**425**	**429**	**431**
	Application	Condition monitor with / gateway functionality					
Parameterisation	**Web server**	✓	✓	✓	✓	✓	✓
	System-wide device parameterisation	✓	✓	✓	✓	–	✓
	Visualisations	✓	✓	✓	✓	–	✓
	Individual alarms	✓	✓	✓	✓	–	✓
	E-mail notification	✓	✓	✓	✓	✓	✓
	Third-party device integration	✓	✓	✓	✓	–	✓
	Complex connections	✓	✓	✓	✓	–	✓
	System documentation	✓	✓	✓	✓	–	✓
	Device/system backup	✓	✓	✓	✓	–	✓
	Virtual devices	100 per 16 channels	100 per 16 channels	100 per 16 channels	100 per 16 channels	-	100 per 16 channels
	History memory	20,000 data records	20,000 data records	20,000 data records	20,000 data records	-	20,000 data records
	Data logger	30 per 10,000 data records	30 per 10,000 data records	30 per 10,000 data records	30 per 10,000 data records	-	30 per 10,000 data records
Interface	**Modbus RTU**	✓	✓	✓	–	✓	✓
	BMS	✓	✓	✓	–	✓	✓
	USB-C	2	–	–	–	–	–
	Ethernet	2	1	1	1	1	1
	Protocol input	BMS (internal) /BCOM / Modbus RTU/TCP	BMS (internal / external) / BCOM / Modbus RTU/TCP	BMS (internal / external) / BCOM / Modbus RTU/TCP	isoData / Modbus TCP	BMS (external) / BCOM	BMS (internal) / BCOM /
	Protocol output	Modbus RTU/TCP / SNMP / MQTT	Ethernet / Modbus RTU/TCP / SNMP / PROFINET / MQTT	Ethernet / Modbus RTU/TCP / SNMP / PROFINET / PROFIBUS DP / MQTT	Ethernet / Modbus TCP / OPC-UA5	Ethernet	Ethernet / Modbus RTU/TCP / SNMP / PROFINET / MQTT
Inputs/outputs	**Digital inputs (potential-free)**	8	–	–	–	–	–
	N/C or N/O operation	selectable	–	–	–	–	–
	Relay outputs	4	–	–	–	–	–
	N/C or N/O operation	selectable	–	–	–	–	–
	Installation	DIN rail	DIN rail	DIN rail	DIN rail	DIN rail	Panel mounting, surface mounting, flush mounting
	Supply voltage U_s	DC 24 V	AC/DC 24…240 V	AC/DC 24…240 V	AC/DC 24…240 V	AC/DC 24…240 V	DC 24 V
	Product details (Products on www.bender.de/en)						

Device overview alarm indicator and test combinations

					
		COMTRAXX® CP9xx	**COMTRAXX® CP305**	**COMTRAXX® MK2430**	**Visualisation**
	Catalogue page	**434**	**437**	**441**	**444**
Messages/ displays	**MEDICS® systems**	✓	✓	✓	✓
	RCMS Residual current monitoring system	✓	✓	✓	✓
	EDS insulation fault locator	✓	✓	✓	✓
Installation type	**Flush-mounting**	✓	✓	✓	✓
	Cavity wall mounting	✓	✓	✓	✓
	Cable-duct mounting	–	✓	✓	–
	Panel mounting	✓	✓	✓	✓
	Surface mounting	✓	✓	✓	–
Inputs/outputs	**Digital inputs (potential free)**	12	12	0/12	–
	N/O or N/C operation	selectable	selectable	selectable	–
	Relay outputs	1	2	1	–
	N/O or N/C operation	programmable	programmable	programmable	–
	Common alarm	programmable	programmable	programmable	–
	System fault alarm	programmable	programmable	programmable	–
Parameter setting/text message	**Languages selectable**	> 25	> 25	2	programmable
	Standard display	Graphic LCD (7", 15.6", 24")	5" TFT touch display	4 x 20 characters	–
	Additional text display	✓	✓	3 x 20 characters	–
	Standard texts	✓	✓	✓	–
	Freely configurable text messages	✓	✓	200	–
	History memory, maximum number of data records	20,000	1000	250	–
	Real-time clock	✓	✓	✓	–
	Parameterisation software	integrated	integriert	TMK-Set V 4.xx (USB, BMS)	–
	Messages/alarms, medical gases	acc. to EN475, EN737-3	acc. to EN475, EN737-3	acc. to EN475, EN737-8	–
Interfaces	**RS-485 (BMS protocol)**	✓	✓	✓	–
	BMS address range	1…150	1…90	1…150	–
	Master redundancy, BMS internal	✓	✓	✓	–
	Modbus RTU address range	1…247	1…30	–	–
	USB	✓	–	✓	–
	Ethernet (TCP/IP)	✓	✓	–	✓
	Supply voltage Us	DC 24 V/AC 250 V	AC 18…28 V/DC 18…30 V	AC/DC 24 V	–
	Stored energy time in the event of power failure	≥ 15 s	≥ 2 s	≤ 15 s	–
	Product details (Products on www.bender.de/en)				

Device overview ATICS® switchover and monitoring devices

			
		ATICS®-…-ISO	**ATICS®-…-DIO**
Catalogue page		**448**	**452**
Application		Unearthed safety power supplies	Safety power supplies
Rated insulation voltage		2-pole: 250 V	2-pole: 250 V 4-pole: 400 V
Voltages	**Nominal system voltage U_n**	AC 230 V (AC 160…276 V)	2-pole: AC 230 V 4-pole: 3N AC 400/230 V
	Frequency range	48…62 Hz	48…62 Hz
Insulation monitoring Measuring range		10 kΩ…1 MΩ	–
Insulation monitoring Response value R_{an1}		50…500 kΩ	–
Digital inputs/relays		1/1	4/4
Interface/protocol		RS-485/BMS	RS-485/BMS
Connection	**Pluggable screw terminals**	✓	✓ (up to 125 A)
	Screw terminals	–	✓ (160 A)
Installation	**DIN rail**	✓	✓
	Screw mounting	4 x M5	6 x M5
Product details (Products on www.bender.de/en)			

Device overview UNIMET® test systems

					
		UNIMET® 300ST	UNIMET® 400ST	UNIMET® 610ST	UNIMET® 810ST
	Catalogue page	458	461	465	468
Application	Electrical equipment	✓	✓	✓	✓
	Electric hospital and care beds	✓	✓	–	✓
	Medical electrical equipment	✓[1)]	✓	–	✓
	Electrical machines	–	–	✓	–
Voltages	Supply voltage U_s	AC 230 V	AC 230 V	AC 230 V	AC 100…120 V, AC 220…240 V
	Voltage measurement Measuring range	AC 90…264 V	AC 90…264 V	AC 90…264 V	AC 90…264 V
	Load current measurement	0.01…16 A	0.01…16 A	0.01…16 A	0.01…16 A
Test sequence	manual	✓	✓	✓	✓
	semi-automatic	–	–	✓	✓
	automatic	✓	✓	✓	✓
	Data exchange	UNIData300	UNIData300/400	UNIMET® 610ST Control Center	UNIMET® 810ST Control Center
	Product details (Products on www.bender.de/en)				

[1)] Medical electrical equipment without patient connections

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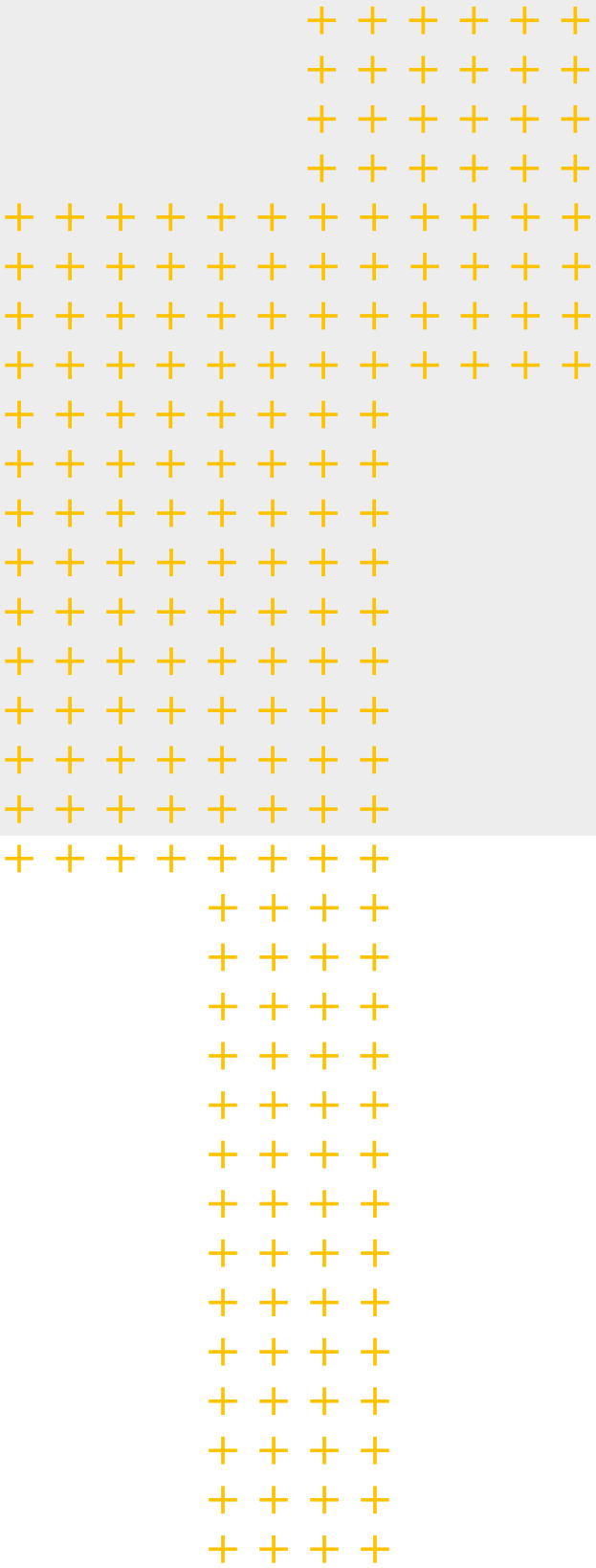

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