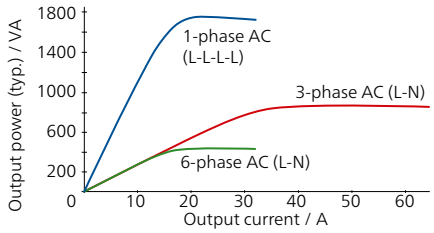
Overview of technical specifications[1]

CMC 356

Current amplifier

Setting range	6-phase AC (L-N)	6 x 0 ... 32 A
	3-phase AC (L-N)	3 x 0 ... 64 A (Group A II B)
	1-phase AC (LL-LN)	1 x 0 ... 128 A (Group A II B)
	DC (LL-LN)	1 x 0 ... ±180 A (Group A II B)
Power	6-phase AC (L-N)	6 x 430 VA typ. at 25 A 6 x 250 W guar. at 20 A
	3-phase AC (L-N)	3 x 860 VA typ. at 50 A 3 x 500 W guar. at 40 A
	1-phase AC (L-L-L-L)	1 x 1740 VA typ. at 25 A 1 x 1100 W guar. at 20 A



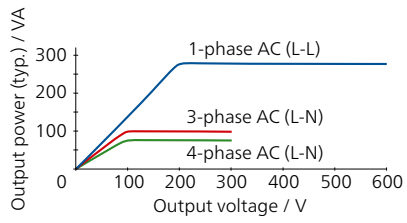
Accuracy	Error < 0.05 % rd.[2] + 0.02 % rg.[2] typ. Error < 0.15 % rd. + 0.05 % rg. guar.
Distortion (THD+N)[3]	< 0.05 % typ., < 0.15 % guar.
Resolution	1 mA
Max. compliance voltage (L-N)/(L-L)/(L-L-L-L)	35 Vpk / 70 Vpk / 140 Vpk

Amplifiers, general

Frequency	Range sine signals[4]	10 ... 1000 Hz
	Range harmonics / interharmonics	Voltage: 10 ... 3000 Hz[5] Current: 10 ... 1000 Hz
	Range transient signals	DC ... 3.1 kHz[5]
	Resolution	< 5 µHz
Phase	Resolution	0.001°
	Error at 50 / 60 Hz	Voltage: 0.02° typ., < 0.1° guar. Current: 0.05° typ., < 0.2° guar.[3]
Bandwidth (-3 dB)		3.1 kHz

Voltage amplifier

Setting range	4-phase AC (L-N)	4 x 0 ... 300 V
	2-phase AC (L-L)	2 x 0 ... 600 V
	DC (L-N)	4 x 0 ... ±300 V
Power	4-phase AC (L-N)	4 x 75 VA typ. at 100 ... 300 V 4 x 50 VA guar. at 85 ... 300 V
	3-phase AC (L-N)	3 x 100 VA typ. at 100 ... 300 V 3 x 85 VA guar. at 85 ... 300 V
	1-phase AC (L-L)	1 x 275 VA typ. at 200 ... 600 V 1 x 250 VA guar. at 200 ... 600 V



Accuracy (at 0 ... 300 V)	Error < 0.03 % rd.[2] + 0.01 % rg.[2] typ. Error < 0.08 % rd. + 0.02 % rg. guar.
Distortion (THD+N)[3]	0.015 % typ., < 0.05 % guar.
Resolution	5 mV / 10 mV in range 150 V / 300 V
Ranges	150 V / 300 V

Low level outputs

Number of outputs	6 (12 with Option LLO-2)
Setting range	0 ... ±10 Vpk

Auxiliary DC supply

Voltage ranges, max. current	0 ... 264 VDC, 0.2 A 0 ... 132 VDC, 0.4 A 0 ... 66 VDC, 0.8 A

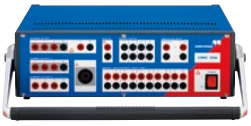
Binary inputs

Number	10 (5 potential groups)
Trigger criteria	Toggling of potential-free contacts or DC voltage compared to threshold voltage
Ranges	20 V / 300 V If equipped with ELT-1[6]: 100 mV / 1 V / 10 V / 100 V / 600 V
Sample rate	10 kHz (resolution 100 µs)

Binary outputs

Type	4 relay 4 transistor
Relay breaking capacity	Imax: 8 A / Pmax: 2000 VA at 300 VAC Imax: 8 A / Pmax: 50 W at 300 VDC

[1] The full technical specifications are available on request. All data specified are guaranteed, except where indicated otherwise. OMICRON guarantees the specified data for one year after factory calibration, within 23 °C ±5 °C / 73 °F ±10 °F in the frequency range from 10 to 100 Hz and after a warm-up phase > 25 minutes
[2] rd. = reading, rg. = range
[3] THD+N: Values at 50/60 Hz, 20 kHz measurement bandwidth
[4] For current outputs amplitude derating at > 380 Hz
[5] Amplitude derating at > 1000 Hz
[6] The ELT-1 hardware option turns the ten binary inputs into multi-functional analog AC and DC voltage measuring inputs and adds two DC measuring inputs (0 … 10 V / 0 … 20 mA) for transducer testing



DC measuring inputs (If option ELT-1 is equipped [1])

Measuring range voltage	0 ... ±10 V
Measuring range current	0 ... ±1 mA, 0 ... ±20 mA

Analog AC + DC measuring inputs (If option ELT-1 is equipped [1,2])

Type	AC + DC analog voltage inputs (current measurement with external current clamps or shunt resistors)
Number	10
Nominal input ranges (RMS values)	100 mV / 1 V / 10 V / 100 V / 600 V
Amplitude accuracy	Error < 0.06 % typ., < 0.15 % guar.

IEC 61850 [3]

Publishing

GOOSE	360 virtual binary outputs, 128 GOOSEs
Sampled Values	IEC 61850-9-2 („9-2LE"), IEC 61869-9

Subscribing

GOOSE	360 virtual binary inputs, 128 GOOSEs

Maximum number of streams

Publishing	RelaySimTest: 4, Test Universe: 3 (1 stream: 4 V + 4 I)

Time synchronization

Internal system clock

Frequency drift	< 0.37 ppm / 24 h < 4.6 ppm / 20 years

CMC 356 to external reference

Absolute timing accuracy (voltage/ current)	< 1 µs typ., < 5 µs guar.
To external voltage	Reference signal on binary input 10: 10 ... 300 V / 15 ... 70 Hz
Precision Time Protocol (PTP)	IEEE 1588-2008 IEEE C37.238 (Power Profile) IEC 61850-9-3 (Utility Profile)

CMC 356s to test objects

IRIG-B, PPS, PPX	Via CMIRIG-B, TICRO 100

[1] The ELT-1 hardware option turns the ten binary inputs into multi-functional analog AC and DC voltage measuring inputs and adds two DC measuring inputs (0 … 10 V / 0 … 20 mA) for transducer testing
[2] Up to three inputs can be used for measuring RMS values, frequency, and phase angle without the EnerLyzer software license. Full functionality requires EnerLyzer software license
[3] The GOOSE and Sampled Values functionality require software licences for the respective configuration modules
[4] For an operational temperature above +30 °C /+86 °F a duty cycle of down to 50 % may apply

Power supply

Nominal input voltage	100 ... 240 VAC, 1-phase (50/60 Hz)

Environmental conditions

Operation temperature [4]	0 ... +50 °C / +32 ... +122 °F
Storage temperature	-25 ... +70 °C / -13 ... +158 °F
Humidity range	Relative humidity 5 ... 95 %, non-condensing

Equipment reliability

Electromagnetic interference (EMI)

International / Europe	IEC/EN 61326-1, IEC/EN 61000-6-4, IEC/EN 61000-3-2/3, CISPR 32 (Class A)/EN 55032 (Class A)
North America	47 CFR 15 Subpart B (Class A) of FCC

Electromagnetic susceptibility (EMS)

International / Europe	IEC/EN 61326-1, IEC/EN 61000-6-2/5, IEC/EN 61000-4-2/3/4/5/6/8/11/16/18

Safety

International / Europe	IEC/EN 61010-1, IEC/EN 61010-2-030
North America	UL 61010-1, UL 61010-2-030, CAN/CSA-C22.2 No. 61010-1, CAN/CSA-C22.2 No. 61010-2-030

Mechanical tests

Vibration	IEC 60068-2-6
Shock	IEC 60068-2-27

Miscellaneous

Weight	16.8 kg / 37.0 lbs
Dimensions (W x H x D, without handle)	450 x 145 x 390 mm / 17.7 x 5.7 x 15.4 in
PC connection	2 PoE (Power over Ethernet) ports USB Type-B port (PC) USB Type-A port (optional Wi-Fi adapter for wireless control)

Certifications

Developed and manufactured under an ISO 9001 registered system