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Energy Management

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Control



Types	Energy Meter		Energy Analyzer	
	EM10 DIN	EM11 DIN	EM11 DIN	EM24 DIN
				
	 	 	   	
Dimensions (mm) H x W x D	90 x 18 x 67	90 x 18 x 67	90 x 71 x 65	
Description	1 DIN module	1 DIN module	4 DIN modules	
Function	1-phase energy meter kWh	1-phase energy analyzer V_{LN} , A, Hz, W, W_{dmd} , var, PF, kWh, kvarh. TRMS method	3-phase energy analyzer Sys: V_{LL} , V_{LN} , var, VA, W_{dmd} , W, VA_{dmd} , Hz, kWh, kvarh, hour counter, gas and water Max: A_{dmd} , W_{dmd} , VA_{dmd} . Single-phase: V_{LL} , V_{LN} , A, W, var, VA, PF, A_{dmd} , kWh, kvarh. TRMS method	
Input Specifications				
Range code	120VAC [AV7] 230VAC [AV8] Ib: 5A, Imax: 32AAC; 1-phase	120VAC [AV7] 230VAC [AV8] Ib: 5A, Imax: 32AAC; 1-phase	120/208V _{L-L} [AV6]; 400V _{L-L} [AV5] In: 1/5A, Imax: 10AAC; 120/208V _{L-L} [AV0]; 400V _{L-L} [AV9] Ib: 10A, Imax: 64AAC; 3-phase unbal. load	
Accuracy		±0.5% RDG (V, A)	±0.5% RDG (V, A)	
Active energy	Class 1 (EN62053-21)	Class 1 (EN62053-21)	Class 1 (EN62053-21)	
Reactive energy		Class 2 (EN62053-23)	Class 2 (EN62053-23)	
Display	5+1 DGT (energies), LCD	4 DGT (inst. variables) 5+1 DGT (energies), LCD	3x4 DGT (inst. variables) 8 DGT (energies), LCD	
Output Specifications				
Out 1 (Pulse)	1-open collector	1-open collector	2-open collector	
Out 1 (Alarm)		1-relay	2-relay	
Out 2 (Serial communication)			RS485 (2-wire)	
Inputs			3 (W_{dmd} sync.; tariff selec.; utility meters)	
General Specifications				
Power supply	Self power supply [X]	Self power supply [X]	Self power supply [X]. Auxiliary power supply: 18 to 60VAC/DC [L], 115/230VAC [D], according to the model	
Approvals/Marks	CE, MID certification	CE	CE and revenue approvals	
Ordering References	See page 217	See page 218	See page 218	



Types

	Energy Meter		
	EM3-DIN	EM4-DIN	WM22 DIN
			
	  	   	  
Dimensions (mm) H x W x D	90 x 162.5 x 63	90 x 162.5 x 63	90 x 162.5 x 63
Description	MODULAR	MODULAR	MODULAR
Function	2-phase, 3-phase unbalanced 3 or 4 wires energy meter. Direct connection up to 90 A. 6+1 digits electro-mechanical display.	3-phase energy meter. Direct connection up to 90 A. Back-lighted LCD display. 3 1/2 digits instantaneous variables read out, 8+ 7 1/2 dgt energy read out. Measurement of system and phase variables, energy by timeperiods, m ³ H ₂ O and m ³ GAS.	3-phase power analyzer. Direct connection up to 90 A. Back-lighted LCD display. 4 x 3 1/2 digits instantaneous variables read out, 7 1/2 digits energy read out. Measurement of system and phase variables. Measurement of THD.
Input Specifications			
Range code	208V _{L-L} [AV8], 220V _{L-L} [AV2], 400V _{L-L} [AV9], 660V _{L-L} [AV3]/20(90)AAC. 3-phase unbalanced load [3]	100V _{L-L} [AV6], 208V _{L-L} [AV4], 400V _{L-L} [AV5], 660V _{L-L} [AV7] 5(10) AAC; 208V _{L-L} [AV0] [AV8 self p.s.], 220V _{L-L} [AV2], 400V _{L-L} [AV1] [AV9 self p.s.], 660V _{L-L} [AV3] 20(100) AAC;	100V _{L-L} [AV6], 208V _{L-L} [AV4], 400V _{L-L} [AV5], 660V _{L-L} [AV7] 5(10) AAC; 208V _{L-L} [AV0], 400V _{L-L} [AV1], 220V _{L-L} [AV2] 660V _{L-L} [AV3] 20(100) AAC
Accuracy			
Active energy	Class 2: (EN61036)	Class 1: (EN61036)	±0.5% RDG (A,V) Class 1: (EN61036)
Reactive energy	Class 3: (EN61268)	Class 2: (EN61268)	Class 2: (EN61268)
Display	6+1 digits (electro-mechanical)	3 1/2-digit backlighted LCD (8-digit for energy)	1000 samples /s @ 50Hz
Output Specifications			
Out 1 (Pulse)	Dual pulse outputs (NPN transistor) [O]	Dual pulse output module (NPN trans.) [O]	Dual pulse output module (NPN trans.) [O]
Out 1 (Alarm)		1 alarm output module [O] (NPN trans.) 30 VDC/100 mA Max.	1 alarm + 1 pulse output module [O] (NPN tr) 30 VDC//100 mA Max.
Out 2 (Serial communication)		RS422/485 serial port [SO]	1 analogue output : 0 to 20 mADC [A1], or 0 to 10 VDC [V1]
Inputs		2 digital inputs module [D]	RS422/485 serial port [SO]
General Specifications			
Power supply	Self power supply [X]: 400VAC, 208VAC VL-L Auxiliary power supply: 230VAC[D], 115VAC[C]	Self power supply: [X] 400VAC, 208VAC, 220VAC VL-L Auxiliary power supply: 230[D], 115[C], 48[B], 24 [A]VAC, 18 to 60 VDC [4], 77 to 143 VDC [5]	Self power supply: [X] 400VAC 208VAC VL-L Auxiliary power supply: 230[D], 115[C], 48[B], 24 [A]VAC 18 to 60 [4] 77 to 143 VDC [5]
Approvals/Marks	CE	CE	CE
Ordering References	See page 218	See page 218	See page 218





Types

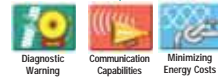
Multifunction Indicator

WM12-DIN



Power Analyzer

WM14 DIN



WM14 Advanced



Dimensions
(mm) H x W x D
Description

90 x 107.8 x 64,5
3-phase multifunction power indicator. System: V_{LL} , V_{LN} , An, VA, V_{Admd} , W_{dmd} , W, var, PF, Hz. Max: A, W_{dmd} . Single phase: V_{LL} , V_{LN} , A, VA, W, var, PF

90 x 107.8 x 64,5
3-phase power analyzer. System: V_{LL} , An, PF, W, var, VA, W_{dmd} , V_{Admd} , Hz, kWh, kvarh, hour meter; Max: A, A_{dmd} , W_{dmd} ; Single phase: V_{LL} , V_{LN} , A, A_{dmd} , PF, W, var, VA.

90 x 107.8 x 64,5
3-phase power analyzer. System: V_{LL} , V_{LN} , An, PF, W, var, VA, W_{dmd} , V_{Admd} , Hz, kWh, kvarh, hour meter; Max: W_{dmd} , V_{Admd} . Single phase: V_{LL} , V_{LN} , A, A_{dmd} , PF, W, var, VA, THD (A,V); Max: V_{LN} , A, A_{dmd} , W. Min: V_{LN} , A, PF.

Input Specifications

Range Code

400/660 V_{L-L} /5(6)AAC [AV5]
100/208 V_{L-L} /5(6)AAC [AV6]

400/660 V_{L-L} /5(6)AAC [AV5]
100/208 V_{L-L} /5(6)AAC [AV6]

400/660 V_{L-L} /5(6)AAC [AV5]
100/208 V_{L-L} /5(6)AAC [AV6]

Accuracy

$\pm 0.5\%$ FS (V, A)

0.5 FS (V, A), 2 (kWh), 3 (kvarh)

0.5 FS (V, A), 1 (kWh), 2 (kvarh)

Display

3x3 digits
LED

3x3 digits, LED
8+1 digits (energy)

3x3 digits, LED
8+1 digits (energy)

Display refresh time

1.5 times/s

1.5 times/s

5 times/s (2 times/s FFT on)

Output Specifications

Serial communication output

RS 485 port (on request) [S]

RS 485 port (on request) [S]

RS422/485 (on request) [S1]

Alarm output

2 (relays) with PLC-type control function on 16 variables (AND/OR) [R]

Pulse output

2 (open collector) [O]

General Specifications

Power supply

24 VAC [A]
48 VAC [B]
115 VAC [C]
230 VAC [D]
18 to 60 VDC [3]

24 VAC [A]
48 VAC [B]
115 VAC [C]
230 VAC [D]
18 to 60 VDC [3]

18 to 60VAC/DC [L],
90 to 260VAC/DC [H]

Approvals/Marks

CE - UL

CE

CE

Note

Advanced version [AX]

Ordering References











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Types

	Transducer	Compact Power Transducer	
	CVT DIN	CPT DIN	CPT DIN Advanced
			
		  	  
Dimensions (mm) H x W x D	89 x 71.5 x 58.5	45 x 83.5 x 98.5	45 x 83.5 x 98.5
Description	Single phase transducer	N.A.	N.A.
Function	1-phase AC, DC. Measurements V, A, Hz.	Compact power transducer. 4 DGT data format instantaneous variable, 8+1 DGT format energy variables, 5+2 DGT data format hours. TRMS method. Sys: V_{LL} , An, PF, W, var, VA, W_{dmd} , VA_{dmd} , Hz, kWh, kvarh, hour meter; Max: W_{dmd} ; Single-ph: V_{LL} , V_{LN} , A, A_{dmd} , PF, W, var, VA.	Compact power transducer. 4 DGT data format instantaneous variable, 8+1 DGT format energies, 5+2 DGT format hours. TRMS method. Sys: V_{LL} , V_{LN} , An, PF, W, var, VA, W_{dmd} , VA_{dmd} , Hz, kWh, kvarh, hour; Max: W_{dmd} , VA_{dmd} . Sing. ph: V_{LL} , V_{LN} , A, A_{dmd} , PF, W, var, VA, THD (A,V); Max: V_{LN} , A, A_{dmd} , W. Min: V_{LN} , A, PF.
Input Specifications			
Range code	1 A/100 VAC [AV1] 60 mVDC/ 10 VDC [AV2] 5 A/100 VAC [AV4] 5 A/500 VAC [AV5] 200VDC/ 1ADC [AV6] 45 to 55Hz [F1] 55 to 65Hz [F2] 350 to 450Hz [F3]	120/208VAC [AV6], 400/690VAC [AV5], 1AAC and 5AAC	120/208VAC [AV6], 400/690VAC [AV5], 1AAC and 5AAC
Accuracy	0.5% FS	±0.5% RDG (A,V)	±0.5% RDG (A,V)
Active energy		kWh: class 2	kWh: class 2 (EN62053-21)
Reactive energy		kvarh: class 3	kvarh: class 3 (EN62053-23)
Sampling Rate		1.5 times/s	1.5 times/s
Output Specifications			
Pulse			2 (open collector) [0-2]
Alarm			2 (relays) with PLC-type control function on 16 variables (AND/OR) [R]
Analogue	0 to 20 mA [1], 4 to 20 mA [2] 0 to 10 V [3], 0 to ±1 V [4]		Up to 3: 20mA [A1-3], 10VDC [V1-3]
Serial communication		RS422/485, [S1] RS232 (Modbus) [S2]	RS422/485, [S1] RS232 (Modbus) [S2]
Dupline			Active and reactive energies [DB]
General Specifications			
Power supply	24 VAC [A] 48 VAC [B] 115 VAC [C] 230 VAC [D]	18 to 60VAC/DC [L], 90 to 260VAC/DC [H]	18 to 60VAC/DC [L], 90 to 260VAC/DC [H]
Approvals/Marks	CE	CE; cURus	CE; cURus
Note		Basic version [BX]	Advanced version [AX]
Ordering References	See page 216	See page 219	See page 219





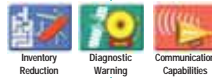
Modular Power Transducer

Types

SPT M

PQT 90

PQT H



Dimensions
(mm) H x W x D
Description

90 x 90 x 140
MODULAR
3-phase power quality transducer.
System: V_{LN} , V_{LL} , An, PF, W, Wdmd, var, VA, VAdmd, Hz, Single phase: V_{LN} , V_{LL} , A, PF, W, VA, THD (V, A); Max: W (standard), A [A]

90 x 90 x 140
MODULAR
3-phase power quality transducer.
32 bit μ P based. Alarm outputs, SMS messages. Measurement of all instantaneous variables. Energy, water and gas metering. 2MB memory+ Real time clock (on request).

90 x 90 x 140
MODULAR
Smart power quality transducer.
Sys: V_{LN} , V_{LL} , An, W, var, VA, PF, Hz, kWh, kvarh, Single-phase: V_{LN} , V_{LL} , A, W, var, VA, PF, THD-V, THD-A. THD and single H up to the 63rd H (V, A).

Input Specifications
Range code

57/100V_{L-L}/5(6)AAC [AV6],
120/208V_{L-L}/5(6)AAC [AV4],
230/400V_{L-L}/5(6)AAC [AV5],
380/660V_{L-L}/5(6)AAC [AV7]

240/415 VAC-1/5 AAC [AV5]
400/690 VAC-1/5 AAC [AV7]

120/208V_{L-L} [AV6];
400/690V_{L-L} [AV5]
In: 1/5A, I_{max}: 10AAC

Accuracy
Active energy
Reactive energy
Sampling Rate

± 0.5 FS (V, A)

1.5 times/s

Class 0.5 (A, V)
Class 1 (EN61036)
Class 2 (EN61260)
10 times/s

$\pm 0.2\%$ RDG (V, A)
Class 0.5 (EN62053-22)
Class 2 (EN62053-23)
10 times/s

Output Specifications
Pulse

Up to 2 single/dual open collector or relay modules

Up to 2 single/dual open collector or relay modules

Up to 16, by: single/dual or quadruple open collector or relay modules

Alarm

Up to 2 single/dual open collector or relay modules

Up to 16, by: single dual or quadruple open collector or relay modules

Analogue

Up to 1 (mA/V) analogue output module

Up to 2 single/dual analogue output modules

Up to 8, by single/dual (mA/V) output modules
RS422/485, RS232+RTC modules. Optical port (ANSI C12.18/Modbus)

Serial communication

RS 485 port (on request) [S1]
RS 232 port (on request) [S]

RS 422/485 port, RS232 port + RTC+2MB data module

Internet/Ethernet port

Internet/Ethernet comm. with WEB server capability [E1]

Inputs

Up to 3 (W/VAdmd sync.)

Up to 6 digital inputs

Up to 12 (W_{dmd}, VA_{dmd} sync.; tariff, contact status reading)

General Specifications
Power supply

24 VAC [A]
48 VAC [B]
115 VAC [C]
230 VAC [D]
18 to 60 VAC/DC [L]
90 to 260 VAC/DC [H]

18 to 60 VAC/DC [L]
90 to 260 VAC/DC [H]

18 to 60VAC/DC [L],
90 to 260VAC/DC [H]

Approvals/Marks

CE - UL - CSA

CE - UL - CSA

CE, cURus, CSA

Ordering References

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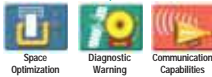
Control



Types

Multifunction Indicator

WM12 96



Dimensions (mm) H x W x D	96 x 96 x 46
Description	3-phase multifunction indicator. System: V_{LL} , V_{LN} , A, An, VA, V_{Admd} , W, W_{dmd} , var, PF, Hz. Max: A, W_{dmd} Single phase: V_{LL} , V_{LN} , A, VA, W, var, PF

Power Analyzer

WM14 96 Basic/Profibus



Dimensions (mm) H x W x D	96 x 96 x 46
Description	3-phase power analyzer. System: V_{LL} , An, PF, W, var, VA, W_{dmd} , V_{Admd} , Hz, kWh, kvarh, hour meter; Max: A, A_{dmd} , W_{dmd} ; Single phase: V_{LL} , V_{LN} , A, A_{dmd} , PF, W, var, VA.

WM14 96 Advanced



Dimensions (mm) H x W x D	96 x 96 x 46
Description	3-phase power analyzer. System: V_{LL} , V_{LN} , An, PF, W, var, VA, W_{dmd} , V_{Admd} , Hz, kWh, kvarh, hour meter; Max: W_{dmd} , V_{Admd} . Single phase: V_{LL} , V_{LN} , A, A_{dmd} , PF, W, var, VA, THD (A,V); Max: V_{LN} , A, A_{dmd} , W. Min: V_{LN} , A, PF.

Input Specifications

Range Code	400/660V _{L-L} /5(6)AAC [AV5] 100/208V _{L-L} /5(6)AAC [AV6]	400/660V _{L-L} /5(6)AAC [AV5] 100/208V _{L-L} /5(6)AAC [AV6]	400/660V _{L-L} /5(6)AAC [AV5] 100/208V _{L-L} /5(6)AAC [AV6]
Accuracy	0.5 FS (V, A)	0.5 FS (V, A) 2 (kWh) 3 (kvarh)	0.5 FS (V, A), 1 (kWh), 2 (kvarh)
Display	3x3 digits, LED	3x3 digits, LED 8+1 digits (energy)	3x3 digits, LED 8+1 digits (energy)
Display refresh time	1.5 times/s	1.5 times/s	5 times/s (2 times/ FFT on)

Output Specifications

Serial communication output	RS 485 port (on request) [S]	RS 485 port (on request) [S] Profibus DP port [DG] (on request)	RS422/485 (on request) [S1]
Alarm output			2 (relays) with PLC-type control function on 16 variables (AND/OR) [R] 2 (open collector) [O]
Pulse output			

General Specifications

Power supply	24 VAC [A] 48 VAC [B] 115 VAC [C] 230 VAC [D] 18 to 60 VDC [3]	24 VAC [A] 48 VAC [B] 115 VAC [C] 230 VAC [D] 18 to 60 VDC [3]	18 to 60VAC/DC [L], 90 to 260VAC/DC [H]
Approvals/Marks	CE - UL - CSA	CE	CE
Note			Advanced version [AX]

Ordering References

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Energy Analyzer

Modular Power Analyzer

Types

EM26 96

WM23 96

WM24 96



Dimensions
(mm) H x W x D
Description

96 x 96 x 61.5
3-phase energy analyzer
Sys: V_{LL} , V_{LN} , An, var, VA, W
 W_{dmd} , VA_{dmd} , VA, Hz, %THD-V,
%THD-A, kWh, kvarh,
hour counter, gas and water
Max: A_{dmd} , W_{dmd} , VA_{dmd} .
Single-phase: V_{LL} , V_{LN} , A, W, var,
VA, PF, A_{dmd} . kWh, kvarh;
TRMS method

96 x 96 x 124
MODULAR
3-phase power quality
analyzer
System: V_{LN} , V_{LL} , An,
VA, VA_{dmd} , W, W_{dmd} ,
var, PF, Hz, THD
Single phase: V_{LN} , V_{LL} ,
A, W, var, PF, THD;
Max: W (standard), A [A]

96 x 96 x 124
MODULAR
3-phase universal
utility meter
System: V_{LN} , VA, VA_{dmd} ,
W, W_{dmd} , var, PF, Hz,
total/partial kWh, (4 tariff)
total/partial kvarh, gas,
H₂O. Single phase: V_{LN} ,
A, W, var, PF

Input Specifications

Range Code

120/208V_{L-L} [AV6],
400/660V_{L-L} [AV5]
In: 1/5A, I_{max}: 10AAC
3-phase unbal. load

57/100V_{L-L}/5(6)AAC [AV6],
120/208V_{L-L}/5(6)AAC [AV4],
230/400V_{L-L}/5(6)AAC [AV5],
380/660V_{L-L}/5(6)AAC [AV7]

57/100V_{L-L}/5(6)AAC [AV6],
120/208V_{L-L}/5(6)AAC [AV4],
230/400V_{L-L}/5(6)AAC [AV5],
380/660V_{L-L}/5(6)AAC [AV7]

Accuracy

±0.5% RDG (V, A)

±0.5 FS (V, A)

±0.5% RDG (V, A)

Display

3x4 digits (inst. variables)
8 digits (energies) LCD

4x3 1/2 digits
LCD (back lighted).

4x3 1/2 digits LCD,
8 digits (energy)

Display refresh time

1.5 times/s

1.5 times/s

1.5 times/s

Output Specifications

Serial communication
port

RS485 (2-wire)

RS 485 port (on request) [S1]
RS 232 port (on request) [S]

RS 485 port (on request) [S1]
RS 232 port (on request) [S]

Alarm output

2-relay

Up to 2 single/dual open
collector or relay modules

Up to 2 single/dual open
collector or relay modules

Pulse output

2-open collector

Up to 2 single/dual
open collector or relay
modules

Digital input

3 (W_{dmd} sync.; tariff selec.;
utility meters)

Up to 3 (W/ VA_{dmd} sync.)

Up to 3 (time per. mngt.)

Analogue output

None

Up to 1 (mA/V)
analog. output module

General Specifications

Power supply

18 to 60VAC/DC [L]
90 to 260VAC/DC [H]

24 VAC [A]
48 VAC [B]
115 VAC [C]
230 VAC [D]
18 to 60 VAC/DC [L]
90 to 260 VAC/DC [H]

24 VAC [A]
48 VAC [B]
115 VAC [C]
230 VAC [D]
18 to 60 VAC/DC [L]
90 to 260 VAC/DC [H]

Approvals/Marks

CE

CE - UL - CSA

CE - UL - CSA

Ordering References

See page 219

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Modular Power Quality Analyzer

Types

WM3 96

WM4 96

WM5 96



Dimensions
(mm) H x W x D
Description

96 x 96 x 124
MODULAR
3-phase power quality analyzer
System: V_{LN} , V_{LL} , An, VA, VAdmd, W, Wdmd, var, PF, Hz, THD total/partial kWh, kvarh (4 tariff)
Single phase: V_{LN} , V_{LL} , A, W, var, PF, THD

96 x 96 x 124
MODULAR
Universal utility meter and power analyzer.
32 bit μ P based.
Load profile indication.
Alarm outputs, SMS messages.
Measurement of all instantaneous variables.
Energy, water and gas metering.

96 x 96 x 124
MODULAR
Smart power quality analyzer.
Sys: V_{LN} , V_{LL} , An, W, var, VA, PF, Hz, kWh, kvarh, Single-phase: V_{LN} , V_{LL} , A, W, var, VA, PF, THD-V, THD-A.
THD and single H up to the 63rd H (V, A)

Input Specifications

Range Code

433 VAC-1/5 AAC [AV5]
690 VAC-1/5 AAC [AV7]

433 VAC-1/5 AAC [AV5]
690 VAC-1/5 AAC [AV7]

120/208V_{L-L} [AV6],
400/690V_{L-L} [AV5]
In: 1/5A, I_{max}: 10AAC
 $\pm 0.2\%$ RDG (V, A)

Accuracy

$\pm 0.5\%$ RDG (V, A)

$\pm 0.5\%$ RDG (V, A)

$\pm 0.2\%$ RDG (V, A)

Display

4x4 digits backligh. LCD
4x9 digits (energy).

4x4 digits backlighted LCD
4x9 digits (energy).

4x4 digits backlighted LCD
4x9 digits (energy)

Display refresh time

10 times /s

10 times/s

10 times/s

Output Specifications

Serial communication port

RS 422/485 port
RS232 port + RTC

RS 422/485 port,
RS232 port + RTC +
2MB data or RS232
Internet/Ethernet comm. with
WEB server capability [E1]

RS422/485, RS232+RTC
modules. Optical port (ANSI
C12.18/ Modbus)

Internet/Ethernet port

Alarm output

Up to 2 single/dual
open collector or relay
modules

Up to 2 single/dual
open collector or relay
modules

Up to 16, by: single,
dual or quadruple open
collector or relay modules

Pulse output

Up to 2 single/dual
open collector or relay
modules

Up to 2 single/dual
open collector or relay
modules

Up to 16, by: single
dual or quadruple open
collector or relay modules

Digital input

Up to 3 digital inputs

Up to 6 digital inputs

Up to 12 (W_{dmd} , V_{Admd} sync.;
tariff: contact status reading)

Analogue output

Up to 2 single/dual
analog output modules

Up to 8, made by single/dual
(mA/V) output modules

General Specifications

Power supply

18 to 60 VAC/DC [L]
90 to 260 VAC/DC [H]

18 to 60 VAC/DC [L]
90 to 260 VAC/DC [H]

18 to 60VAC/DC [L],
90 to 260VAC/DC [H]

Approvals/Marks

CE - UL - CSA

CE - UL - CSA

CE, cURus, CSA

Ordering References

See page 220

See page 220

See page 220

