ENERDIS®
CHAUVIN ARNOUX GROUP

ENERIUM Range
Power monitors

Power monitors for all electrical networks compliant with the IEC 61557-12 standard

Optical head for:
-programming
-reading the data
-upgrading the firmware

Ethernet output (Modbus/TCP)
RS485 output (Modbus/Jbus RTU)

Screenless version for DIN-rail mounting or plate mounting

Up to 8 on-off or analogue inputs/outputs

Screen displays

Display
Real-time display of instantaneous , average…
Time/date-stamped recording of min and max values

Recording
Indices and consumption curves (electricity ,water ,gas).
Temperature curves and trend curves

Qualimetry
Measurement of THD per phase on U ,I and In.
Spectral analysis per phase up to the 50th order on U ,I and In

Graphics
For easier data analysis .Fresnel diagram .Gauge for V ,U, I ,P

Qualimetry
Log of the last 1024 events (dips ,outages ,overvoltages, overcurrents).
Waveform capture (V-U-I-In)
Statistical analysis graphs as per EN50160

16 alarms
Programmable ,viewing of alarms log ,recording of the last 64 events

Customizable screens
3 screens with 4 display lines each to organize the information as you wish

Quick programming
Current transformer ratios and communication parameters can be set on the front panel or remotely

Indication of connection errors

Preventive maintenance
Installation operating time .
Operating time of monitored equipment

Energy performance

PRODUCT ADVANTAGES

- **8 LOAD CURVES**
- **16 PROGRAMMABLE ALARMS**
- **FOR GRAPHICS** easier data analysis
- **SPECTRAL ANALYSIS** per phase up to the 50th and In order on U ,I
- **QUALIMETRY** according to EN50160 STANDARD

Description

A complete range of 6 power monitors ideal for:
- **LV/MV/HV network supervision**
- **installation sizing**
- **energy management**
- **electrical network quality applications**

Functional specification

	Power monitor					
	Flush-mounting 96 x 96			Flush-mounting 144 x 144		
						
	Enerium 30	Enerium 50	Enerium 150	Enerium 100	Enerium 200	Enerium 300
	ELECTRICAL ENERGY			MULTI-ENERGY		POWER QUALITY
Functional specifications						
Accuracy class (IEC61557-12)	1	0.5	0.5	0.5	0.5 or 0.2	0.2
Format	96 x 96 mm	96 x 96 mm	96 x 96 mm	144 x 144 mm	144 x 144 mm	144 x 144 mm
Graphic LCD screen	✓	✓	✓	✓	✓	✓
Version without display	-	-	-	Enerium 110	Enerium 210	Enerium 310
Mounting	Flush-mounted, DIN rail* or plate-mounted*	Flush-mounted, DIN rail* or plate-mounted*	Flush-mounted, DIN rail* or plate-mounted*	Flush-mounted ,DIN rail* or plate-mounted* (Enerium 110)	Flush-mounted ,DIN rail* or plate-mounted* (Enerium 210)	Flush-mounted ,DIN rail* or plate-mounted* (Enerium 310)
Harmonics						
Max .order	-	25	50	25	50	50
Recording functions						
8 load curves	-	✓	✓	-	✓	✓
4 trend curves	-	-	✓	✓	✓	1
Alarms						
Number of alarms	2	16	16	16	16	16
Time/date-stamped events recorded-		64	64	64	64	64
Qualimetry functions						
Qualimetry according to EN50160	-	-	-	-	-	✓
V ,U ,I and In waveform capture	-	-	-	-	-	✓
Storage of last 1024 events(dips ,outages , overvoltages)with time/date-stamping	-	-	-	-	-	✓
Inputs /outputs						
Max .number	1	2	2	8	8	8
Inputs (optional)						
On-off (pulses or alarm)	-	0 ,1 or 2	0 ,1 or 2	0 ,2 ,4 ,6 or 8	0 ,2 ,4 ,6 or 8	0 ,2 ,4 ,6 or 8
Analogue	-	-	-			
Outputs (optional)						
On-off (pulses or alarm)	1	0 ,1 or 2	0 ,1 or 2	0 ,2 ,4 ,6 or 8	0 ,2 ,4 ,6 or 8	0 ,2 ,4 ,6 or 8
Analogue	0	0 or 2	0 or 2	0 ,2 or 4	0 ,2 or 4	0 ,2 or 4
Graphics						
Fresnel	-	-	✓	✓	✓	✓
Gauges	✓	-	✓	-	-	-
Histograms of harmonic orders	-	-	✓	-	✓	✓
Communication interface						
Optical /USB	-	Front	Front	Front or rear	Front or rear	Front or rear
Ethernet or RS485	RS485	✓	✓	✓	✓	✓
Metrological LED	-	-	-	✓	✓	✓
Other functions						
Programming on front panel	✓	✓	✓	✓	✓	✓
Programming via software	-	✓	✓	✓	✓	✓

* With mounting kit (cf .p74)

Measurements

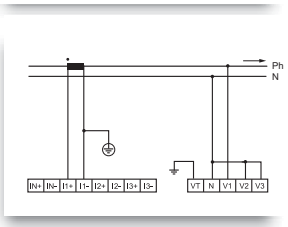
	1 S	min	max	average	min average	max average
V ,U	●	○	●	●		○
Vearth	○	○	○	○		○
	●	○	●	●		○
In (calculated or measured)	●	○	●	●	○	○
P (4 quadrants)	●		○	○		
Pt (4 quadrants)	●	●	●	●		○
Q (4 quadrants)	●		○	○		
Qt (4 quadrants)	●	○	●	●		○
S	●		○	○		
St	●	●	●	●		○
FP (4 quadrants)	●			○		
Fpt (4 quadrants)	●			●	○	○
Cosϕ (4 quadrants)	○			○		
Cosϕt (4 quadrants)	○	○	○	○	○	○
Tanϕt (4 quadrants)	●			●	○	○
Frequency	●	○	●	○		
V crest factor	○			○		○
I crest factor	○			○		○
U unbalance	○			○		○
Harmonics on V ,U ,I	○					
Harmonics on In	○			●		
THD V ,U ,I	●		○	●		○
THD In	●					○
Active energy (receiver ,generator)	●					
Reactive energy Qcad1 ,2 ,3 ,4	●					
Apparent energy receiver ,generator	●					
On-off input pulse mode	○					
Analogue input Enerium 100/200)	○	○	○	○	○	○
Voltage presence hour meter (U)	○					
Load hour meter I	●					
Auxiliary power supply hour meter	●					

○ Except on Enerium 30

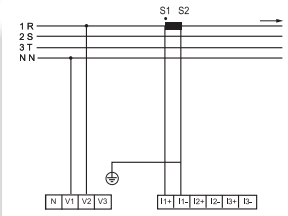
)1(on Enerium 30/50/150, calculated only

Connection diagrams

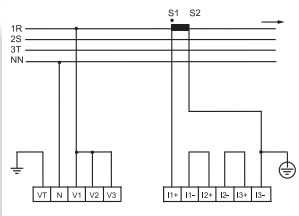
Single-phase



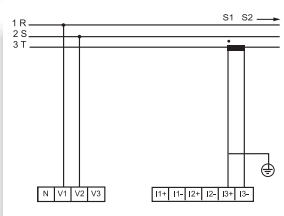
Balanced 3-phase,
4 wires - 1 CT
Except on Enerium 30



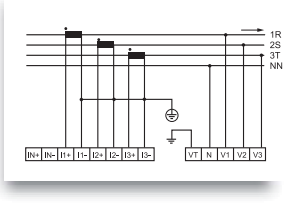
Balanced 3-phase,
4 wires - 1 CT
Enerium 30 only



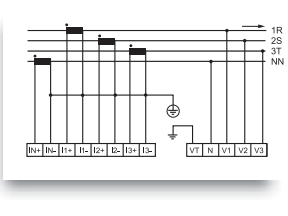
Balanced 3-phase,
3 wires - 1 CT
Enerium 30 only



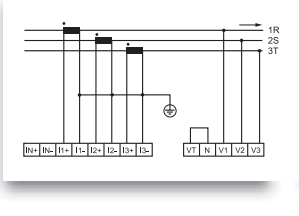
Unbalanced 3-phase,
4 wires - 3 CTs



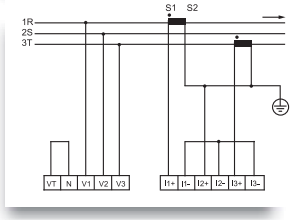
Unbalanced 3-phase,
4 wires - 4 CTs
Except on Enerium 30/50/150



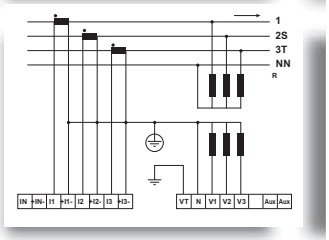
Unbalanced 3-phase,
3 wires - 3 CTs



Unbalanced 3-phase,
3 wires - 2 CTs



Example of connection to VT



Trend curves

(except on Enerium 30/50)

1S VALUES	
V ,Vearth (except on Enerium 150	●
U12 ,U23 ,U31 except on Enerium 150	●
I1 ,I2 ,I3 ,In	●
Pt	●
Qt	●
St	●
Pft	●
U unbalance	●
THD V ,U ,I ,In	●
Analogue inputs (Enerium 100/200 onl	●
AVERAGE VALUES	
V1 ,V2 ,V3	●
U12 ,U23 ,U31	●
I1 ,I2 ,I3 ,In	●
Gen:P1 ,P2 ,P3 ,Pt	●
Rec:P1 ,P2 ,P3 ,Pt	●
Analogue inputs (Enerium 100/200 only)	●
Gen :Pf1 ,PF2 ,PF3 ,PF	●
Rec :PF1 ,PF2 ,PF3 ,PFt	●
Gen : Cos ϕ1 ,Cosϕ2 ,Cosϕ3 ,Cosϕt	●
Rec : Cos ϕ1 ,Cosϕ2 ,Cosϕ3 ,Cos	●
Tanϕt	●
Frequency	●
Crest factor V1 ,V2 ,V3	●
Crest factor I1 ,I2 ,I3	●
HD U12 ,U23 ,U31	●
THD I1 ,I2 ,I3 ,Ineutral	●
THD V1 ,V2 ,V3	●

Load curves

AVERAGE VALUES	
Pt Gen ,Pt ,Rec	●
Qcad1 ,Qcad2 ,Qcad3 ,Qcad4,	●
St Gen ,St Rec	●
On-off inputs	●
Analogue inputs (Enerium 200 only)	●

Alarms

1S VALUES	
V1 ,V2 ,V3	●
Vearth	○
U12 ,U23 ,U31	●
I1,I2 ,I3 ,In	●
Pt	●
Qt	●
St	●
Pft	●
Cosϕt	○
Tanϕt	●
Frequency	●
U unbalance	○
THD V ,U ,I ,In	○
3 hour meters :network presence ,on-load presence ,aux .source	○
Analogue inputs (Enerium 100/200 only)	○
AVERAGE VALUES	
Pt Gen ,Pt Rec	○
Qt Gen ,Qt Rec	○
St	○
Tanϕt (except on Enerium 30/50/150)	○
Analogue inputs (Enerium 100/200 only)	○
ON-OFF INPUTS (Enerium 100/200 only)	●

○ Except Enerium 30

Analogue outputs (option)

1S VALUES	
V1 ,V2 ,V3 ,Vearth	●
U12 ,U23 ,U31	●
I1 ,I2 ,I3 ,In	●
Pt	●
Q1 ,Q2 ,Q3	●
Qt	●
S1 ,S2 ,S3	●
St	●
PF1 ,PF2 ,Pf3	●
Pft	●
Cosϕ1 ,Cosϕ2 ,Cosϕ3	●
Cosϕt,	●
Tanϕt,	●
Frequency	●

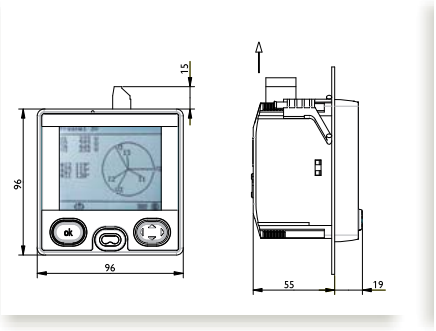
General specifications

	ENERIUM 30 Class 1	ENERIUM 50/150 Class 0.5 s	ENERIUM 100/200 Class 0.5 s	ENERIUM 200 Class 0.2 s	ENERIUM 300 Class 0.2 s
Electrical network					
Max .phase-to-phase voltage measured	650 kV				
VT ratio	VT primary :100 V to 650 kV VT secondary :100 V to 480 V				
Max .current measured	25,000 A				
CT ratio	CT primary :1 A to 25,000 A CT secondary :1 A or 5 A				
Max .power measured	2 GW				
Voltage inputs (AC)					
Measurement range	5 to 130 %of Vn for Vn =57.7 /230 V (ph-N) 5 to 130 %of Un for Un =100 /400 V (ph-ph)				
Crest factor	2				
Measurement accuracy (U and V)	0.5 %from 20 % to 130 %of Un /Vn	0.2 %from 20 %to 130 %of Un/Vn			
Overvoltage	Transient U =800 V for 24 hours Permanent 130 %of 400 V =520 V				
Frequency	50 /60 Hz	50 /60 Hz or 400 Hz 50 /60 Hz		50 /60 Hz or 400 Hz	50 /60 Hz
Consumption	< 0.1 VA	< 0.15 VA	< 0.1 VA		
Input impedance	0.45 MΩ	0.44 MΩ	1 MΩ		
Current inputs(AC)					
Measurement range	1 %to 130 %of In for In =5 A				
Istart current	5 mA				
Crest factor	3				
Measurement accuracy	0.5 %from ≥ 10 % to ≤ 130 %	0.2 %from ≥ 10 %to ≤ 130 % 0.5 %from ≥ 5 %to ≤ 10 % 1 %from ≥ 1 %to ≤ 5 %			
Acceptable overload	Transient I =250 A for 1 second Permanent 130 %of 5 A =6.5 A				
Consumption	>0.15 VA				
Compliance with standards					
IEC62053-22	Active energy Class 1	Active energy Class 0.5 s		Active energy Class 0.2 s	
IEC62053-23	Reactive energy Class 2	Reactive energy Class 0.5 s			
IEC61557-12 PMD SD/SS	V,I Class 0.5 P,S Class 0.5	V,I Class 0.2 P,S Class 0.5	class 0.5	class 0.2	class 0.2
	Active energy Class 1 Reactive energy Class 2	Active energy Class 0.5 Reactive energy Class 0.5		Active energy Class 0.2 Reactive energy Class 0.5	
Multi-measurement (accuracies)					
Active power and energy	1 %for 5 %In ≤ I ≤ Imax	0.5 %for 5 %In ≤ I ≤ Imax		0.2 %for 5 %In ≤ I ≤ Imax	
Reactive power and energy	2 %for 5 %In ≤ I ≤ Imax	0.5 %for 5 %In ≤ I ≤ Imax			
Apparent power and energy	1 %for 5 %In ≤ I ≤ Imax	0.5 %for 5 %In ≤ I ≤ Imax			
Power factor (PF) and cosϕ	±0.05 counts when 0.5 inductive <PF < 0.5 ±0.1 counts when 0.2 inductive < PF < 0.2 capacitive	±0.02 counts when 0.5 inductive < PF < 0.5 capacitive ±0.05 counts when 0.2 inductive < PF < 0.2 capacitive			
Frequency	±0.1 %from 42.5 to 69 Hz				
Sampling frequency	6.4 kHz to 50 Hz				
THD-I .THD-V and THD-U	±0.5 counts				
Harmonics order by order	–	±0.5 counts			

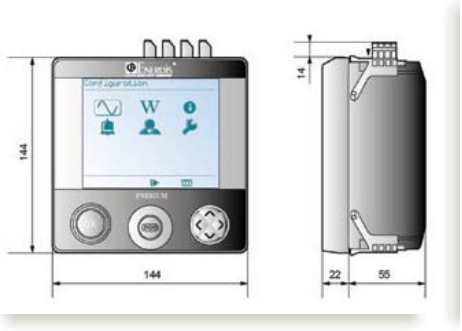
	ENERIUM 30 Class 1	ENERIUM 50/150 Class 0.5 s	ENERIUM 100/200 Class 0.5 s	ENERIUM 200 Class 0.2 s	ENERIUM 300 Class 0.2 s
RS485 output					
Connection	2 wires ,half-duplex				
Protocol	ModBus /JBus RTU mode				
Speed(configurable)	2,400 -4,800 -9,600 -19,200 -34,800 (115,200 on ENERIUM 50/150)				
Parity	Even ,odd or none				
JBus addresses	1 to 247				
Ethernet output					
Type	-	RJ45 -8 pins			
Protocol	-	ModBus/TCP			
Speed (configurable)	-	Compatible with 10 ,100 and 1,000 base T			
Auxiliary power supply					
Power supply	110 to 400 Vac (>10 VA) 42.5 Hz to 69 Hz 155 to 565 Vdc	80 to 265 Vac (>15 VA) 42.5 to 69 Hz 110 to 375 Vdc 19 to 57 Vdc (>7.5 W)	80 to 265 Vac (>20 VA) - 42.5 to 69 Hz 110 to 375 Vdc 19 to 57 Vdc (>10 W)		
Digital inputs (on-off or metering pulse)					
Operating voltage	-	Up to 70 Vdc max.	High level :10 to 110 Vdc Low level :0 to 5 Vac		
Min .signal width	-	High :30 ms Low :30 ms			
Consumption	-	>0.5 W			
Pulse or alarm relay outputs					
Type	Static relay				
Operating voltage	70 Vdc max 33 Vac max	24 to 110 Vdc ±20 % 24 to 230 Vac ±10%			
Max .current	100 mA	100 mA			
Compliance with standard	IEC 62053-31				
Analogue inputs					
Scale	-	-	Configurable between -20 to +20 mA		
Power consumption	-	-	>50 mW		
Input impedance	-	-	50 Ω		
Analogue outputs					
Scale	-	Configurable between -20 to +20 mA			
Acceptable overload	-	500 Ω			
Response time	-	>500 ms			
Storage					
Non-volatile memory	Configuration parameters –Recordings (curves ,alarms ,min-max ,qualimetry events log ,IEC 50160 statistics)				
RAM	Capture of waveforms				
Environmental specifications					
Operating temperature	-10 °C to +55 °C (K55 according to IEC61557-12)				
Operating humidity	95 %at 40 °C				
Storage temperature	-25 °C to +70 °C				
Safety specifications					
Pollution	2				
Behaviour in fire	UL 94 ,severity V1				
Installation category	3				

Dimensions (in mm)

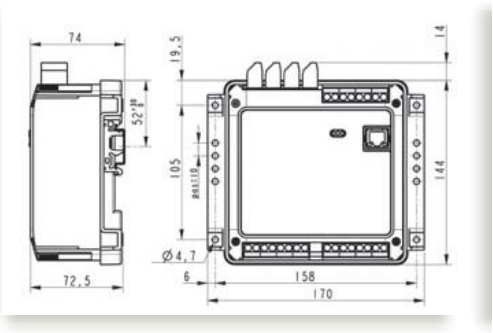
ENERIUM 30/50/150



ENERIUM 100/200/300

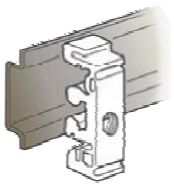


ENERIUM 110/210/310



Accessories

Kit for DIN-rail or plate mounting



T O O R D E R

Standard ENERIUM

Model	Frequency	Accuracy class	Power supply	Communication	On-off inputs	On-off outputs	Analogue outputs	Reference
ENERIUM 30	50 /60 HZ	1	230 to 400 Vac/Vdc	-	0	0	0	P01330821
ENERIUM 30	50 /60 HZ	1	230 to 400 Vac/Vdc	-	0	1	0	P01330822
ENERIUM 30	50 /60 HZ	1	230 to 400 Vac/Vdc	RS485	0	0	0	P01330823
ENERIUM 30	50 /60 HZ	1	230 to 400 Vac/Vdc	RS485	0	1	0	P01330824
ENERIUM 50	50 /60 HZ	0.5 s	80 to 265 Vac /110 to 375 Vdc	RS485	0	0	0	P01330805
ENERIUM 50	50 /60 HZ	0.5 s	80 to 265 Vac /110 to 375 Vdc	Ethernet	0	0	0	P01330806
ENERIUM 50	50 /60 HZ	0.5 s	80 to 265 Vac /110 to 375 Vdc	RS485	1	1	0	P01330807
ENERIUM 50	50 /60 HZ	0.5 s	80 to 265 Vac /110 to 375 Vdc	Ethernet	1	1	0	P01330808
ENERIUM 150	50 /60 HZ	0.5 s	80 to 265 Vac /110 to 375 Vdc	RS485	0	0	0	P01330809
ENERIUM 150	50 /60 HZ	0.5 s	80 to 265 Vac /110 to 375 Vdc	Ethernet	0	0	0	P01330810
ENERIUM 150	50 /60 HZ	0.5 s	80 to 265 Vac /110 to 375 Vdc	RS485	0	2	0	P01330811
ENERIUM 150	50 /60 HZ	0.5 s	80 to 265 Vac /110 to 375 Vdc	Ethernet	0	2	0	P01330812
ENERIUM 100	50 /60 HZ	0.5 s	80 to 265 Vac /110 to 375 Vdc	RS485	0	0	0	P01330831
ENERIUM 100	50 /60 HZ	0.5 s	80 to 265 Vac /110 to 375 Vdc	RS485	2	2	0	P01330832
ENERIUM 200	50 /60 HZ	0.5 s	80 to 265 Vac /110 to 375 Vdc	RS485	4	2	0	P01330833
ENERIUM 200	50 /60 HZ	0.5 s	80 to 265 Vac /110 to 375 Vdc	Ethernet	2	2	2	P01330834
ENERIUM 210	50 /60 HZ	0.5 s	80 to 265 Vac /110 to 375 Vdc	Ethernet	8	0	0	P01330835

Configured products

ENERIUM | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |

1 Model

50	ENERIUM 50 –Electrical energy – Load curves - Format 96 x 96
150	ENERIUM 50 +Trend curves - Format 96 x 96
100	ENERIUM 100 –Multi-energy - Trend curves - Format 144x144
110	ENERIUM 100 screenless version - Format 144x144
200	ENERIUM 100 +Load curves - Format 144x144
210	ENERIUM 200 screenless version - Format 144x144
300	ENERIUM 200 +Power quality
310	ENERIUM 300 screenless version

Frequency of network measured

0	50 /60 Hz
1	400 Hz (except on Enerium 100 /200 class 0.5s /300)

3 Auxiliary power supply

0	80 to 265 Vac / 110 to 375 Vdc
1	19.2 to 58 Vdc

4 Communication

0	RS485
1	Ethernet

Note :with choices 5, 6, 7 and 8, it is possible to have a maximum of 8 inputs and/or outputs (ENERIUM 100-110/200-210).
Note :for the Enerium 50/150 ,choices 5 and 6 only allow the following combinations :0-0, 1-1, 2-0, 0-2.

Metering (or On-Off) inputs

0	none
1	1 input (only on ENERIUM 50/150)
2	2 inputs
4	4 inputs (except on ENERIUM 50/150)
6	6 inputs (except on ENERIUM 50/150)
8	8 inputs (except on ENERIUM 50/150)

6 On-Off outputs

0	none
1	input (only on ENERIUM 50/150)
2	2 inputs
4	4 inputs (except on ENERIUM 50/150)
6	6 inputs (except on ENERIUM 50/150)
8	8 inputs (except on ENERIUM 50/150)

7 Analogue inputs (ENERIUM 100/200 only)

0	none
2	2 analogue inputs
4	4 analogue inputs
6	6 analogue inputs
8	8 analogue inputs

8 Analogue outputs

0	none
2	2 outputs
4	4 outputs (except on ENERIUM 50/150)

9 Accuracy class

5	0.5 s (except on ENERIUM 300)
2	0.2s (ENERIUM 200/210/300/310 only)

Example:Enerium 200, frequency 50/60 Hz ,80 to 264 Vac auxiliary power supply ,RS485 communication ,2 on-off inputs, no on-off outputs ,no analogue inputs, no analogue outputs, Class 0.2s
<=order ENERIUM 200 01020002 • 1-200 • 2-0 • 3-1 • 4-0 • 5-2 • 6-0 •7-0 •8-0 •9-2

Accessories

Optical head for ENERIUM 50/150	**P01330403**
Optical head for ENERIUM 100/110 -200/210 –300/310	**P01330401**
DIN-rail mounting kit for ENERIUM 30/50/150	**P01330830**
DIN-rail mounting kit for ENERIUM 100/200/300	**P01330360**
690 V /400 V resistive voltage adapter (for wind-turbine applications)	**P01330402**
Power supply for On-Off inputs 85 to 256 Vac/12 Vdc –3.5 A (42 W)	**ACCJ1004**

Software

E.set	**P01330501**
E.View	**P01330601**
E.View+	**P01330610**

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