Operating Instructions Multifunctional Power Monitor with System Analysis

A230 / A230S

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Dispose of damaged instruments properly!

Safety notes

Installation and commissioning should only be carried out by trained personnel.

Check the following points before commissioning:

- that the maximum values for all the connections are not exceeded, see the “Technical data” section,
- that the connection wires are not damaged, and that they are not live during wiring,
- that the power flow direction, and the phase rotation are correct.

The instrument must be taken out of service if safe operation is no longer possible (e.g. visible damage). In this case, all the connections must be switched off. The instrument must be returned to the factory or to an authorized service dealer.

It is forbidden to open the housing and to make modifications to the instrument. The instrument is not equipped with an integrated circuit breaker. During installation check that a labeled switch is installed and that it can easily be reached by the operators.

Unauthorized repair or alteration of the unit invalidates the warranty.

Contents

Brief description

The A230 measures 144 x 144 x 46mm. The A230S measures 96 x 96 x 46 mm. Both are suitable for mounting in a control panel. Features include: Four-quadrant measurement for power system and consumption analysis in single- and multi-phase AC systems, three large LED displays with four digits plus sign (Outputs are available for direct display and further processing.), configurable display settings for user-specific presentation, integrated energy meters, pulse counters, and limit value indication, comprehensive average value and max./min. value functions, harmonic analysis and THD measurement, determination of the neutral wire current, asymmetry factor and neutral point voltage shift, two switched outputs for control of pulse counters or signalling limit alarms.

Technical data

(for more detailed information please see spec sheet, which can be download at www.ohiosemitronics.com)

Measured inputs

Nominal frequency:	50, 60 Hz
Nominal input voltage:	Phase-phase: 500 V Phase - N: 290 V
Nominal input current:	5 A or 1 A

Continuous input rating

10 A at 346 V in single-phase AC system 10 A at 600 V in three-phase system

Momentary input rating

Input amount	Number of peaks	Duration of overload	Interval between two overload events
577 V LN	10	1 s	10 s
100 A	10	1 s	100 s
100 A	5	3 s	5 min

Measurment ranges

U, I, S:	≤ 120% of nominal value
P, Q:	≤ ± 120% of nominal value
F:	45 to 65 Hz
cosφ:	± 1

Display

The measurement display is 4 digits (frequency) and right justified. Energy values are displayed with 8 digits.

Zero value suppression

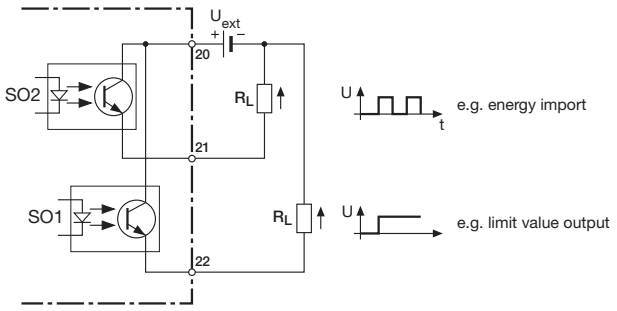
PF (cosφ):	Display ---, if Sx < 0.2% Snom
Currents:	Display 0, if Ix < 0.1% Inom
unbalanced U:	Display 0, if Ø U < 5% Unom

Pulse/Limit value outputs

Depending on the function selected, the two digital outputs can be used either as pulse outputs for actual and reactive energy or as limit signals.

The outputs are passive, and are galvanically isolated from all the other circuits by opto-couplers. They are suitable to drive tariff devices (S0-standard DIN 43 864), or 24 V relays.

U_{ext} ≤ 40 V DC (OFF: leakage current ≤ 0.1 mA)
I_L ≤ 150 mA (ON: terminal voltage ≤ 1.2 V)



Limit value outputs

The measured values can be freely allocated.

Pulse outputs

Active and reactive energy pulses can be generated for the control of electronic and electromechanical counters.

Power supply*

DC-, AC power pack 45 to 400 Hz
85 to 253 V AC/DC or
20 to 70 V AC/DC

Power consumption: < 3 VA (without extension module)

* For dc power supplies > 125 V the auxiliary circuit should include an external fuse.

Reference conditions

according to IEC 688 and EN 60 688

Sine wave 50 - 60 Hz, 15 - 30°C, application group II

Measurement accuracy (related to nominal value)

Current, voltage	± 0.2%
Power	± 0.5%
Power factor	± 0.5%
Energy	± 0.5%
Frequency	± 0.02 Hz (abs.)

Environmental conditions

Operating temperature:	-10 to +55 °C
Storage temperature:	-25 to +70 °C
Relative humidity:	≤ 75%
Altitude:	2000 m max.

Only for indoor use

Safety

Protection class:	II (voltage inputs with protection impedances)
Measuring category:	III
Pollution degree:	2
Measurement voltage:	300 V
Test voltage:	Between current inputs, power supply, digital outputs, terminals of the plugged-in module: 3700 V / 50 Hz / 1 min. On voltage inputs: 4.25 kV 1.2/50 µs
Module connections:	The pin rail at the back is connected to the voltage inputs via a protection impedance. Only the permitted modules can be plugged-in!
Enclosure protection:	Front IP 66, terminals IP 20

Commissioning

The multifunctional power monitor is made operational by switching on the power supply. The following appears sequentially on the display:

1. **Segment tests**: all the segments of the displays and all the LEDs are lit for 2 s.

2. Software version: e.g. A230 1.04
3. The 3 **line voltages** at power-on.

Loss of the power supply

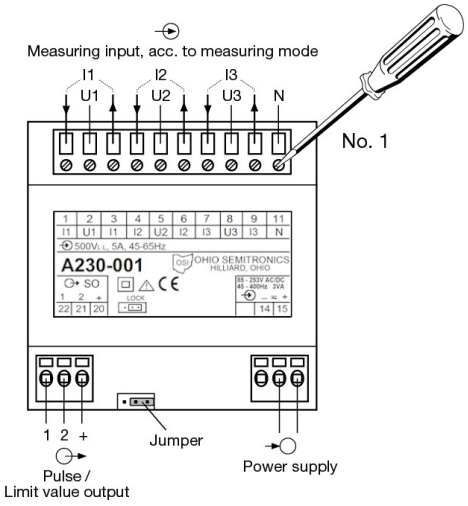
All the values configured remain during a loss of the power supply.
On reconnecting the power supply, the last **mode** selected is displayed.

Maintenance

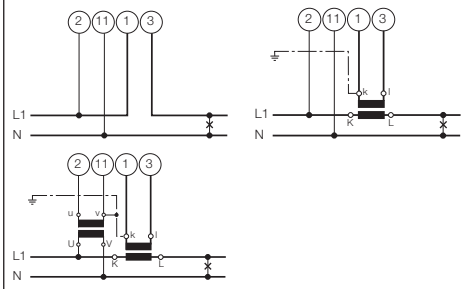
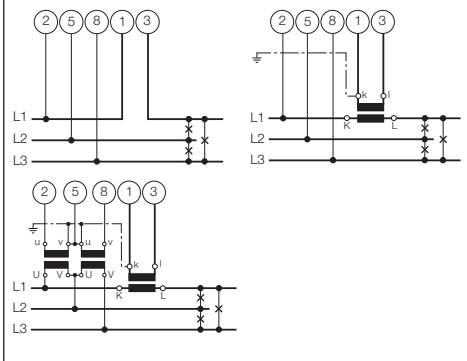
No maintenance is required.

Electrical connections

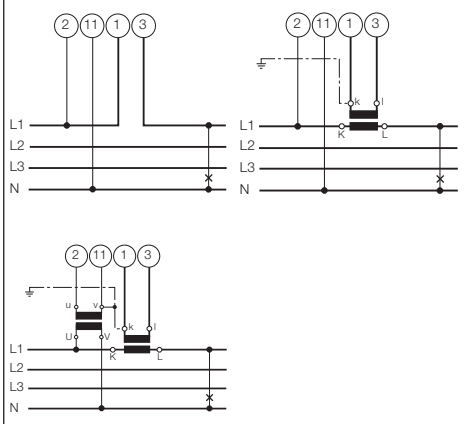
(Electrical connections are identical for the A230 and A230S).



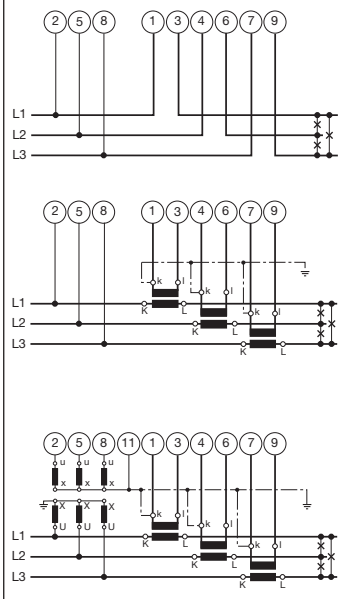
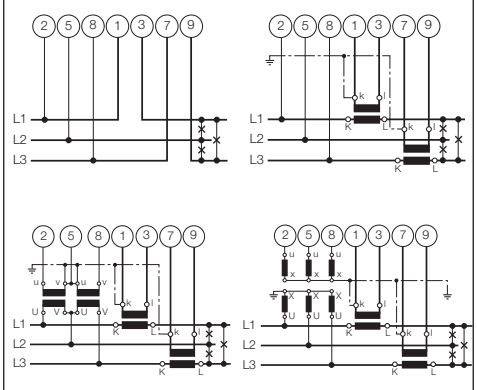
Connection Modes

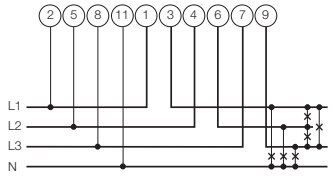
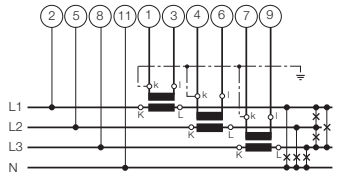
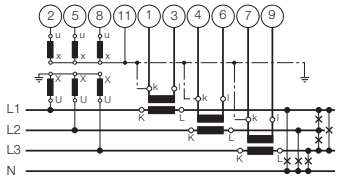
System/ application	Terminals
Single phase AC system 	
3-wire 3-phase **symmetric load** I: L1 	 Connect the voltage according to the following table for current measurement in L2 or L3:

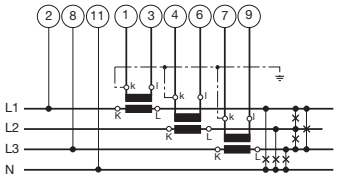
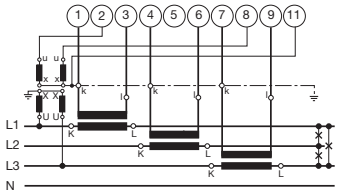
Current transf.	Terminals		2	5	8
L2	1	3	L2	L3	L1
L3	1	3	L3	L1	L2

System/ application	Terminals
4-wire 3-phase **symmetric load** I: L1 	 Connect the voltage according to the following table for current measurement in L2 or L3:

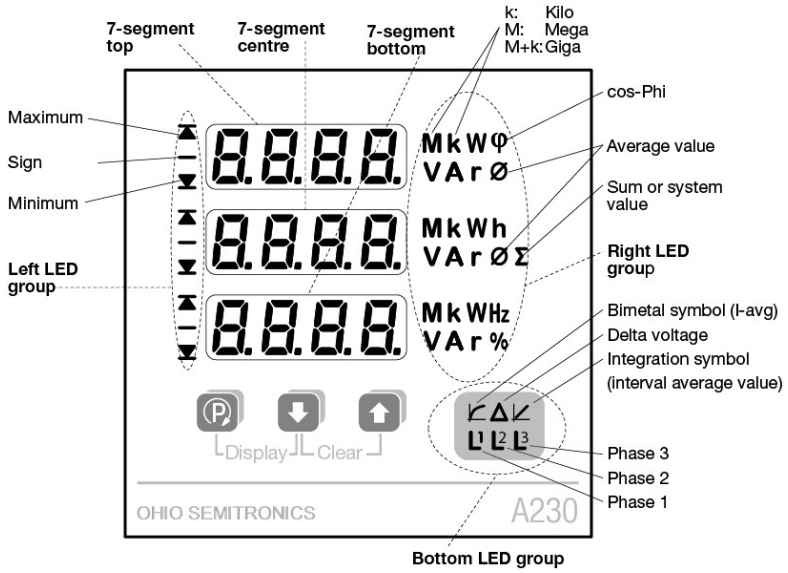
Current transf.	Terminals		2	11
L2	1	3	L2	N
L3	1	3	L3	N

3-wire 3-phase **asymmetric load** 	 3 single-pole insulated voltage transformers in high-voltage system
3-wire 3-phase **asymmetric load**, Aron 	

System/ application	Terminals
4-wire 3-phase **asymmetric load** 	   3 single-pole insulated voltage transformers in high-voltage system

System/ application	Terminals
4-wire 3-phase **asymmetric load**, Open-Y 	 Low-voltage system  2 single-pole insulated voltage transformers in high-voltage system

Measured value display



Abbreviations and symbols

oL	Overload, out-of-range indicator
U.nE	Neutral point/zero voltage shift (**U** **n**eutral-**e**arth)
unb.U	Voltage asymmetry factor (**unb**alance **U**)
in	Neutral current
SYSt.	System power
x.xx i φ	Power factor incoming inductive
x.xx c φ	Power factor incoming capacitive
- x.xx i φ	Power factor outgoing inductive
- x.xx c φ	Power factor outgoing capacitive
inc	Incoming
out	Outgoing
ind	Inductive
CAP	Capacitive
.H	Energy high tariff
.L	Energy low tariff
thd.U	THD-U (**T**otal **h**armonic **d**istortion, U)
thd.i	THD-I (**T**otal **h**armonic **d**istortion, I)
trnd	Interval power: Trend
t-0...t-4	Interval power: last to fifth-from-last interval
H2.U...H15.U	2nd - 15th harmonic U
H2.i...H15.i	2nd - 15th harmonic I

Available measurement data (system configuration: 4-wire asymmetric load)	left LED group (t c b)	Example 7-segm. display top	Example 7-segm. display centre	Example 7-segm. display bottom	right LED group	bottom LED group
Phase voltages: U1, U2, U3		230.2	231.1	229.9	V	L1 L2 L3
Maximum values: U1-max, U2-max, U3-max	▲ ▲ ▲	235.1	236.4	231.2	V	L1 L2 L3
Minimum values: U1-min, U2-min, U3-min	▼ ▼ ▼	227.8	226.6	225.7	V	L1 L2 L3
Delta voltages: U12, U23, U31		400.0	402.5	398.4	V	Δ
Maximum values: U12-max, U23-max, U31-max	▲ ▲ ▲	405.2	406.4	403.3	V	Δ
Minimum values: U12-min, U23-min, U31-min	▼ ▼ ▼	395.5	397.4	396.8	V	
Neutral point/zero voltage shift: UNE and UNE-max	▲	U.nE	2.3	8.6	V	
Voltage asymmetry factor (unbalanced U)	▲	unb.U	1.4	6.2	%	
Phase currents: I1, I2, I3		11.54	10.98	10.23	A	L1 L2 L3
Maximum values: I1-max, I2-max, I3-max	▲ ▲ ▲	12.65	11.86	11.07	A	L1 L2 L3
Average values: I1avg, I2avg, I3avg (bimetal-15minutes)		7.23	6.86	6.46	A	⌐ L1 L2 L3
Max. average values: I1avg-max, I2avg-max, I3avg-max (slave pointer -15 minutes)	▲ ▲ ▲	7.98	7.48	6.98	A	⌐ L1 L2 L3
Neutral current: IN and IN-max	▲	in	1.13	2.75	A	
Active power: P1, P2, P3	a)	2240	2032	1491	W	L1 L2 L3
Maximum values: P1-max, P2-max, P3-max	▲ ▲ ▲ a)	2554	2825	2482	W	L1 L2 L3
Active power, system: P and P-max	▲ a)	SYSt.	5.76	7.86	kW	
Reactive power: Q1, Q2, Q3	b)	1078	393	721	VAr	L1 L2 L3
Maximum values: Q1-max, Q2-max, Q3-max	▲ ▲ ▲ b)	1704	561	1027	VAr	L1 L2 L3
Reactive power, system: Q and Q-max	▲ b)	SYSt.	2.19	3.29	kVAr	
Apparent powers: S1, S2, S3		2281	2157	2089	VA	L1 L2 L3
Maximum values: S1-max, S2-max, S3-max	▲ ▲ ▲	3066	2874	2682	VA	L1 L2 L3
Apparent power, system: S and S-max	▲	SYSt.	6.64	8.11	kVA	
Power factors: PF1, PF2, PF3	a)	0.82c	0.97c	0.92c	φ	L1 L2 L3
PF-system, PF-min-inductive-incoming, PF-min-capacitive-incoming	a) ▼ ▼	0.90c	- - - i	0.72c	φ	
PF-system, PF-min-inductive-outgoing, PF-min-capacitive-outgoing	a) ▬ ▼ ▬ ▼	0.90c	- - - i	- - - c	φ	
Frequency: F-max, F-actual, F-min	▲ ▼	50.14	50.03	49.78	Hz	
Active power incoming EP high tariff		4589	2356	inc.H	kWh ∑	
Active power incoming EP low tariff c)		1234	5678	inc.L	kWh ∑	
Active power outgoing EP high tariff		4589	2356	out.H	kWh ∑	
Active power outgoing EP low tariff c)		1234	5678	out.L	kWh ∑	
Reactive power inductive EQ high tariff d)		9876	5432	ind.H	kVarh ∑	
Reactive power inductive EQ low tariff c) d)		1234	9876	ind.L	kVarh ∑	
Reactive power capacitive EQ high tariff d)		76	5432	CAP.H	kVarh ∑	
Reactive power capacitive EQ low tariff c) d)		234	9876	CAP.L	kVarh ∑	
Reactive power incoming EQ high tariff e)		9876	5432	inc.H	kVarh ∑	
Reactive power incoming EQ low tariff c) e)		1234	9876	inc.L	kVarh ∑	
Reactive power outgoing EQ high tariff e)		76	5432	out.H	kVarh ∑	
Reactive power outgoing EQ low tariff c) e)		234	9876	out.L	kVarh ∑	
P-system, Q-system, S-system		5.76	2.19	6.64	kW kVAr kVA	
Average U1-U2-U3, average I1-I2-I3, P-system		230.4	10.92	5.76	VØ AØ kW	
PF-system, P-system, Q-system		0.90c	5.76	2.19	φ kW kVAr	
P-system, S-system, frequency		5.76	6.64	50.03	kW kVA Hz	
P1, Q1, S1		2240	1078	2485	W VAr VA	L1
P2, Q2, S2		2032	393	2070	W VAr VA	L2
P3, Q3, S3		1491	721	2089	W VAr VA	L3
U1, I1, P1		230.2	11.54	2240	V A W	L1
U2, I2, P2		231.1	10.98	2032	V A W	L2
U3, I3, P3		229.9	10.23	1491	V A W	L3

Continued on following page!

Available measurement data (system configuration: 4-wire asymmetric load)	left LED group (t c b)	Example 7-segm. display top	Example 7-segm. display centre	Example 7-segm. display bottom	right LED group	bottom LED group
THD-U1, THD-U1-max	▲	thd.U	2.5	8.0	%	L1
THD-U2, THD-U2-max	▲	thd.U	2.6	8.3	%	L2
THD-U3, THD-U3-max	▲	thd.U	2.4	3.9	%	L3
THD-I1, THD-I1-max	▲	thd.I	2.4	10.8	%	L1
THD-I2, THD-I2-max	▲	thd.I	2.5	9.5	%	L2
THD-I3, THD-I3-max	▲	thd.I	2.4	4.6	%	L3
Interval active power: Trend-incoming		P.inc	5.23	trnd	kW ∑	◿
Interval active power: Maximum-incoming Minimum-incoming	▲ ▼	P.inc	6.02	1.56	kW ∑	◿
Interval active power: last interval (t-0) incoming to fifth last interval (t-4) incoming		P.inc P.inc	3.91 5.52	tfi0 to tfi4	kW ∑ kW ∑	◿ ◿
Interval active power: Trend-outgoing		P.out	0.00	trnd	kW ∑	◿
Interval active power: Maximum-outgoing Minimum-outgoing	▲ ▼	P.out	0.00	0.00	kW ∑	◿
Interval active power: last interval (t-0) outgoing to fifth last interval (t-4) outgoing		P.out P.out	0.00 0.00	tfi0 to tfi4	kW ∑ kW ∑	◿ ◿
Interval react. power: Trend-inductive d)		Q.ind	0.00	trnd	kVAr ∑	◿
Interval react. power: Maximum-inductive d) Minimum-inductive	▲ ▼	Q.ind	0.00	0.00	kVAr ∑	◿
Interval react. power: last interval (t-0) inductive d) to fifth last interval (t-4) inductive		Q.ind Q.ind	0.00 0.00	tfi0 to tfi4	kVAr ∑ kVAr ∑	◿ ◿
Interval react. power: Trend-capacitive d)		Q.cap	2.17	trnd	kVAr ∑	◿
Interval react. power: Maximum-cap.,Minimum-cap.d)	▲ ▼	Q.cap	2.53	0.78	kVAr ∑	◿
Interval react. power: last interval (t-0) capacitive d) to fifth last interval (t-4) capacitive		Q.cap Q.cap	1.41 1.14	tfi0 to tfi4	kVAr ∑ kVAr ∑	◿ ◿
Interval react. power: Trend-incoming e)		Q.inc	2.17	trnd	kVAr ∑	◿
Interval react. power: Maximum-incoming e) Minimum-incoming	▲ ▼	Q.inc	2.53	0.78	kVAr ∑	◿
Interval react. power: last interval (t-0) incoming e) to fifth last interval (t-4) incoming		Q.inc Q.inc	1.41 1.14	tfi0 to tfi4	kVAr ∑ kVAr ∑	◿ ◿
Interval react. power: Trend-outgoing e)		Q.out	0.00	trnd	kVAr ∑	◿
Interval react. power: Maximum-outgoing e) Minimum-outgoing	▲ ▼	Q.out	0.00	0.00	kVAr ∑	◿
Interval react. power: last interval (t-0) outgoing e) to fifth last interval (t-4) outgoing		Q.out Q.out	0.00 0.00	tfi0 to tfi4	kVAr ∑ kVAr ∑	◿ ◿
Interval appar. power: Trend		S	5.23	trnd	kVA ∑	◿
Interval appar. power: Maximum, Minimum	▲ ▼	S	6.02	1.56	kVA ∑	◿
Interval appar. power: last interval (t-0) to fifth last interval (t-4)		S S	3.91 5.52	tfi0 to tfi4	kVA ∑ kVA ∑	◿ ◿
2nd harmonic U1: H2-U1, H2-U1-max to 15th harmonic U1: H15-U1, H15-U1-max	▲ ▲	H2.U to H15.U	0.1 0.5	1.2 1.8	% %	L1 L1
2nd harmonic U2: H2-U2, H2-U2-max to 15th harmonic U2: H15-U2, H15-U2-max	▲ ▲	H2.U to H15.U	0.1 0.7	0.4 2.0	% %	L2 L2
2nd harmonic U3: H2-U3, H2-U3-max to 15th harmonic U3: H15-U3, H15-U3-max	▲ ▲	H2.U to H15.U	0.2 1.5	1.5 2.8	% %	L2 L2

Continued on following page!

Available measurement data (system configuration: 4-wire asymmetric load)		left LED group (t c b)	Example 7-segm. display top	Example 7-segm. display centre	Example 7-segm. display bottom	right LED group	bottom LED group
2nd harmonic I1:	H2-I1, H2-I1-max	▲	H2.1	0.4	2.2	%	L1
to			to				
15th harmonic I1:	H15-I1, H15-I1-max	▲	H15.1	0.9	4.8	%	L1
2nd harmonic I2:	H2-I2, H2-I2-max	▲	H2.1	0.3	1.8	%	L2
to			to				
15th harmonic I2:	H15-I2, H15-I2-max	▲	H15.1	0.8	5.2	%	L2
2nd harmonic I3:	H2-I3, H2-I3-max	▲	H2.1	0.5	3.2	%	L2
to			to				
15th harmonic I3:	H15-I3, H15-I3-max	▲	H15.1	1.1	5.8	%	L2

a) incoming: no sign Outgoing: - sign

b) incoming inductive, outgoing capacitive: no sign
incoming capacitive, outgoing inductive: - sign

c) Tariff switching via digital input or controlled via the bus only (optional extension module required)

d) only active if the Q definition is set to “ind/cap” (display configuration 7 : Q.tot)

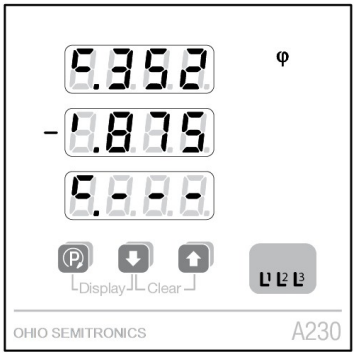
e) only active if the Q definition is set to “inc/out” (display configuration 7 : Q.tot)

Determination of measured quantities

Measurement calculations are made in accordance with DIN 40 110, with the exception of reactive power. This is calculated by the A230/A230S as a signed value. Transducers and displays can, under certain conditions, display different values for the reactive power in the same power system. The reason is the different calculation methods.

Trend values display the predicted value for the current interval.

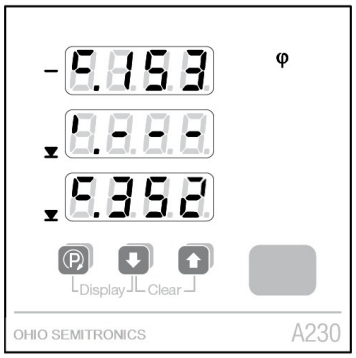
Example: Power factor 4-quadrant display



PF-L1, PF-L2, PF-L3 actual
(Matrix table 4-wire asymmetric load: field a-6)

Actual power factors per phase:
top: PF L1 = incoming / capacitive / 0.352
centre: PF L2 = outgoing / inductive / 0.875
bottom: PF L3 = cannot be measured

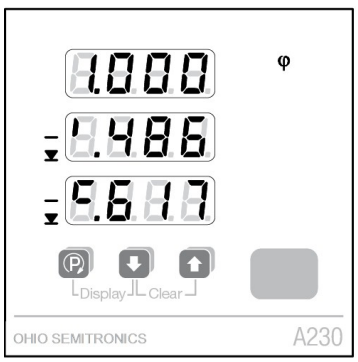
(---: apparent power < 1% of nominal input power
→ PF cannot be measured



PF-system-actual and PF-min-incoming
(Matrix table 4-wire asymmetric load: field b-6)

top: PF system actual = outgoing / capacitive / 0.153
(---: apparent power < 1% of nominal input power
→ PF cannot be measured

centre: PF minimum incoming inductive = no measued value
bottom: PF minimum incoming capacitive = 0.352
(Minimum: lowest value of PF1, PF2 or PF3)
(---: no measured value in the quadrants concerned)



PF-system-actual and PF-min-outgoing
(Matrix table 4-wire asymmetric load: field c-6)

top: PF system actual = incoming / —— / 1.000
(---: apparent power < 1% of nominal input power
→ PF cannot be measured

centre: PF minimum outgoing inductive = 0.486
bottom: PF minimum outgoing capacitive = 0.617
(Minimum: lowest value of PF1, PF2 or PF3)
(---: no measured value in the quadrants concerned)

Display modes

FULL — All the display values in accordance with the matrix tables can be displayed (factory setting).

USEr — Only the pre-configured display values are displayed. The factory pre-configured values are shown in the matrix tables with a gray background.

LOOP — Automatically changing display. The display time and the values to be displayed are pre-configurable.

The factory pre-configured values are shown in the matrix tables with a bold outline. The factory setting for the display time is 4 seconds.

Preferred display

You may select a preferred display which is shown automatically after a specified time without user interaction. This keeps the normal appearance of the device always the same. There are two different possibilities to define a preferred display:

Preferred display in Loop mode

In Loop mode a display can be set which would normally be displayed all the time. In addition, any other value can be selected, as in the full mode. After the specified reset time period (2 - 32 s), the display automatically returns to the preferred display.

Configuration
The Loop mode can be blocked with the mode lock 17. The reset time is configured with the display interval configuration 18. Set the required window to “on” in the display configuration under No. 20 (Menu Disp). Set all the other display elements to “off”.

Preferred display in User Mode

Only the User mode is active. Out of the available displays, a preferred display can be selected which is automatically displayed after a predefined time without user interaction. All other display contents may be directly displayed using the push-buttons. The delay until the preferred display is shown is 4 min. in version 4.00 of the base model software, and 10 min. in versions 4.01 and higher.

Configuration
The User mode can be blocked with the mode lock 17. Use the buttons to show the display which should serve as the preferred display. Select it as the preferred display by pressing (P) and ↑ at the same time. The same procedure may be used to switch-off the preferred display. The displays which should be displayable in the User mode may be set to “on” in the “Menu Disp” menu under No. 21. All other elements should be set to “off”.

Duration of the display

It may be difficult to read the measured values when they change quickly. Therefore the write interval can be increased in the “Display settings” menu.

Operation

Changing the display mode

By simultaneously pressing the buttons (P) and ↓ (display) for a longer time, the display mode changes and then remains in the last mode displayed when the buttons are released (factory setting: FULL). If the mode cannot be changed, the mode lock is switched on.

Locking — In the display configuration menu (Menu Disp), changing the display modes can be blocked with the mode lock 16.

Navigation

X axis (a, b, c, ...) — With each press of the (P) button, the displayed values advance one window to the right, in accordance with the matrix table and any previously configured settings. (endless loop).

Y axis (1, 2, 3, ...) — With each press of the ↑ (or ↓) buttons, the displayed values advance one window upwards as far as the top window (or respectively one window downwards as far as the bottom window) in accordance with the matrix table and any previous configuration settings.

Brightness (13 levels)

brighter — Press and hold the ↑ button.

darker — Press and hold the ↓ button.

Clearing the max./min. values and meters

Simultaneously pressing and holding the ↑ and ↓ buttons (clear) deletes the max. (or min.) values displayed and the associated stored values. The energy meters are reset in the same way.

Locking — The reset function for the energy meters can be locked by setting the jumper at the rear of the instrument in the LOCK position.

Display window

▲ = Maximum, ▼ = Minimum

Matrix table 4L, asymmetric load

Q measured values are in italics: depending on the Q definition **7**, either the values for incoming/outgoing or the values for inductive/capacitive are displayed.

	a	b	c	d	e	f	g	h
1	U1 U2 U3	U1 ▲ U2 ▲ U3 ▲	U1 ▼ U2 ▼ U3 ▼	U12 U23 U31	U12 ▲ U23 ▲ U31 ▲	U12 ▼ U23 ▼ U31 ▼	UNE UNE ▲	unb. U unb. U ▲
2	I1 I2 I3	I1 ▲ I2 ▲ I3 ▲	I1avg I2avg I3avg	I1avg ▲ I2avg ▲ I3avg ▲	IN IN ▲			
3	P1 P2 P3	P1 ▲ P2 ▲ P3 ▲	P P ▲					
4	Q1 Q2 Q3	Q1 ▲ Q2 ▲ Q3 ▲	Q Q ▲					
5	S1 S2 S3	S1 ▲ S2 ▲ S3 ▲	S S ▲					
6	PF1 PF2 PF3	PF PF ▼-inc-ind PF ▼-inc-cap	PF PF ▼-out-ind PF ▼-out-cap					
7	F ▲ F F ▼							
8	..... EP_inc HT	..... EP_inc LT	..... EP_out HT	..... EP_out LT				
9	..... EQ *inc/ind* HT	..... EQ *inc/ind* LT	..... EQ *out/cap* HT	..... EQ *out/cap* LT				
10	P Q S	U Ø I Ø P	PF P Q	P S F				
11	P1 Q1 S1	P2 Q2 S2	P3 Q3 S2	U1 I1 P1	U2 I2 P2	U3 I3 P3		
12	thd.U1 thd.U1 ▲	thd.U2 thd.U2 ▲	thd.U3 thd.U3 ▲					
13	thd.I1 thd.I1 ▲	thd.I2 thd.I2 ▲	thd.I3 thd.I3 ▲					
14	P.inc-int-Trend	P.inc-int- ▲ P.inc-int- ▼	P.inc-int t-0	P.inc-int t-1	P.inc-int t-2	P.inc-int t-3	P.inc-int t-4	
15	P.out-int-Trend	P.out-int- ▲ P.out-int- ▼	P.out-int t-0	P.out-int t-1	P.out-int t-2	P.out-int t-3	P.out-int t-4	
16	Q.*inc/ind*-int-Trend	Q.*inc/ind*-int- ▲ Q.*inc/ind*-int- ▼	Q.*inc/ind*-int t-0	Q.*inc/ind*-int t-1	Q.*inc/ind*-int t-2	Q.*inc/ind*-int t-3	Q.*inc/ind*-int t-4	
17	Q.*out/cap*-int-Trend	Q.*out/cap*-int- ▲ Q.*out/cap*-int- ▼	Q.*out/cap*-int t-0	Q.*out/cap*-int t-1	Q.*out/cap*-int t-2	Q.*out/cap*-int t-3	Q.*out/cap*-int t-4	
18	S.int-Trend	S.int- ▲ S.int- ▼	S.int t-0	S.int t-1	S.int t-2	S.int t-3	S.int t-4	

	a	b	c	d	e	f	g	h	i	j	k	l	m	n
19	H2.U1 H2▲.U1	H3.U1 H3▲.U1	H4.U1 H4▲.U1	H5.U1 H5▲.U1	H6.U1 H6▲.U1	H7.U1 H7▲.U1	H8.U1 H8▲.U1	H9.U1 H9▲.U1	H10.U1 H10▲.U1	H11.U1 H11▲.U1	H12.U1 H12▲.U1	H13.U1 H13▲.U1	H14.U1 H14▲.U1	H15.U1 H15▲.U1
20	H2.U2 H2▲.U2	H3.U2 H3▲.U2	H4.U2 H4▲.U2	H5.U2 H5▲.U2	H6.U2 H6▲.U2	H7.U2 H7▲.U2	H8.U2 H8▲.U2	H9.U2 H9▲.U2	H10.U2 H10▲.U2	H11.U2 H11▲.U2	H12.U2 H12▲.U2	H13.U2 H13▲.U2	H14.U2 H14▲.U2	H15.U2 H15▲.U2
21	H2.U3 H2▲.U3	H3.U3 H3▲.U3	H4.U3 H4▲.U3	H5.U3 H5▲.U3	H6.U3 H6▲.U3	H7.U3 H7▲.U3	H8.U3 H8▲.U3	H9.U3 H9▲.U3	H10.U3 H10▲.U3	H11.U3 H11▲.U3	H12.U3 H12▲.U3	H13.U3 H13▲.U3	H14.U3 H14▲.U3	H15.U3 H15▲.U3
22	H2.I1 H2▲.I1	H3.I1 H3▲.I1	H4.I1 H4▲.I1	H5.I1 H5▲.I1	H6.I1 H6▲.I1	H7.I1 H7▲.I1	H8.I1 H8▲.I1	H9.I1 H9▲.I1	H10.I1 H10▲.I1	H11.I1 H11▲.I1	H12.I1 H12▲.I1	H13.I1 H13▲.I1	H14.I1 H14▲.I1	H15.I1 H15▲.I1
23	H2.I2 H2▲.I2	H3.I2 H3▲.I2	H4.I2 H4▲.I2	H5.I2 H5▲.I2	H6.I2 H6▲.I2	H7.I2 H7▲.I2	H8.I2 H8▲.I2	H9.I2 H9▲.I2	H10.I2 H10▲.I2	H11.I2 H11▲.I2	H12.I2 H12▲.I2	H13.I2 H13▲.I2	H14.I2 H14▲.I2	H15.I2 H15▲.I2
24	H2.I3 H2▲.I3	H3.I3 H3▲.I3	H4.I3 H4▲.I3	H5.I3 H5▲.I3	H6.I3 H6▲.I3	H7.I3 H7▲.I3	H8.I3 H8▲.I3	H9.I3 H9▲.I3	H10.I3 H10▲.I3	H11.I3 H11▲.I3	H12.I3 H12▲.I3	H13.I3 H13▲.I3	H14.I3 H14▲.I3	H15.I3 H15▲.I3

Matrix table 3L, asymmetric load

▲ = Maximum, ▼ = Minimum

Q measured values are in italics: depending on the Q definition **7**, either the values for incoming/outgoing or the values for inductive/capacitive are displayed.

	a	b	c	d	e	f	g
1	U12 U23 U31	U12 ▲ U23 ▲ U31 ▲	U12 ▼ U23 ▼ U31 ▼				
2	I1 I2 I3	I1 ▲ I2 ▲ I3 ▲	I1avg I2avg I3avg	I1avg ▲ I2avg ▲ I3avg ▲			
3	P P ▲						
4	Q Q ▲						
5	S S ▲						
6	PF PF ▼-inc-ind PF ▼-inc-cap	PF PF ▼-out-ind PF ▼-out-cap					
7	F ▲ F F ▼						
8	..... EP_inc HT	..... EP_inc LT	..... EP_out HT	..... EP_out LT			
9	..... EQ *inc/ind* HT	..... EQ *inc/ind* LT	..... EQ *out/cap* HT	..... EQ *out/cap* LT			
10	P Q S	U Ø I Ø P	PF P Q	P S F			
11	thd.U12 thd.U12 ▲	thd.U23 thd.U23 ▲	thd.U31 thd.U31 ▲				
12	thd.I1 thd.I1 ▲	thd.I2 thd.I2 ▲	thd.I3 thd.I3 ▲				
13	P.inc-int-Trend	P.inc-int- ▲ P.inc-int- ▼	P.inc-int t-0	P.inc-int t-1	P.inc-int t-2	P.inc-int t-3	P.inc-int t-4
14	P.out-int-Trend	P.out-int- ▲ P.out-int- ▼	P.out-int t-0	P.out-int t-1	P.out-int t-2	P.out-int t-3	P.out-int t-4
15	Q.*inc/ind*-int-Trend	Q.*inc/ind*-int- ▲ Q.*inc/ind*-int- ▼	Q.*inc/ind*-int t-0	Q.*inc/ind*-int t-1	Q.*inc/ind*-int t-2	Q.*inc/ind*-int t-3	Q.*inc/ind*-int t-4
16	Q.*out/cap*-int-Trend	Q.*out/cap*-int- ▲ Q.*out/cap*-int- ▼	Q.*out/cap*-int t-0	Q.*out/cap*-int t-1	Q.*out/cap*-int t-2	Q.*out/cap*-int t-3	Q.*out/cap*-int t-4
17	S.int-Trend	S.int- ▲ S.int- ▼	S.int t-0	S.int t-1	S.int t-2	S.int t-3	S.int t-4

	a	b	c	d	e	f	g	h	i	j	k	l	m	n
18	H2.U12 H2▲.U12	H3.U12 H3▲.U12	H4.U12 H4▲.U12	H5.U12 H5▲.U12	H6.U12 H6▲.U12	H7.U12 H7▲.U12	H8.U12 H8▲.U12	H9.U12 H9▲.U12	H10.U12 H10▲.U12	H11.U12 H11▲.U12	H12.U12 H12▲.U12	H13.U12 H13▲.U12	H14.U12 H14▲.U12	H15.U12 H15▲.U12
19	H2.U23 H2▲.U23	H3.U23 H3▲.U23	H4.U23 H4▲.U23	H5.U23 H5▲.U23	H6.U23 H6▲.U23	H7.U23 H7▲.U23	H8.U23 H8▲.U23	H9.U23 H9▲.U23	H10.U23 H10▲.U23	H11.U23 H11▲.U23	H12.U23 H12▲.U23	H13.U23 H13▲.U23	H14.U23 H14▲.U23	H15.U23 H15▲.U23
20	H2.U31 H2▲.U31	H3.U31 H3▲.U31	H4.U31 H4▲.U31	H5.U31 H5▲.U31	H6.U31 H6▲.U31	H7.U31 H7▲.U31	H8.U31 H8▲.U31	H9.U31 H9▲.U31	H10.U31 H10▲.U31	H11.U31 H11▲.U31	H12.U31 H12▲.U31	H13.U31 H13▲.U31	H14.U31 H14▲.U31	H15.U31 H15▲.U31
21	H2.I1 H2▲.I1	H3.I1 H3▲.I1	H4.I1 H4▲.I1	H5.I1 H5▲.I1	H6.I1 H6▲.I1	H7.I1 H7▲.I1	H8.I1 H8▲.I1	H9.I1 H9▲.I1	H10.I1 H10▲.I1	H11.I1 H11▲.I1	H12.I1 H12▲.I1	H13.I1 H13▲.I1	H14.I1 H14▲.I1	H15.I1 H15▲.I1
22	H2.I2 H2▲.I2	H3.I2 H3▲.I2	H4.I2 H4▲.I2	H5.I2 H5▲.I2	H6.I2 H6▲.I2	H7.I2 H7▲.I2	H8.I2 H8▲.I2	H9.I2 H9▲.I2	H10.I2 H10▲.I2	H11.I2 H11▲.I2	H12.I2 H12▲.I2	H13.I2 H13▲.I2	H14.I2 H14▲.I2	H15.I2 H15▲.I2
23	H2.I3 H2▲.I3	H3.I3 H3▲.I3	H4.I3 H4▲.I3	H5.I3 H5▲.I3	H6.I3 H6▲.I3	H7.I3 H7▲.I3	H8.I3 H8▲.I3	H9.I3 H9▲.I3	H10.I3 H10▲.I3	H11.I3 H11▲.I3	H12.I3 H12▲.I3	H13.I3 H13▲.I3	H14.I3 H14▲.I3	H15.I3 H15▲.I3

Matrix table single phase, 3L and 4L symmetric load

▲ = Maximum, ▼ = Minimum

Q measured values are in italics: depending on the Q definition **7**, either the values for incoming/outgoing or the values for inductive/capacitive are displayed.

	a	b	c	d	e	f	g
1	U ▲ U U ▼						
2	I I ▲	lavg lavg ▲					
3	P P ▲						
4	Q Q ▲						
5	S S ▲						
6	PF PF ▼-inc-ind PF ▼-inc-cap	PF PF ▼-out-ind PF ▼-out-cap					
7	F ▲ F F ▼						
8	..... EP_inc HT	..... EP_inc LT	..... EP_out HT	..... EP_out LT			
9	..... EQ *inc/ind* HT	..... EQ *inc/ind* LT	..... EQ *out/cap* HT	..... EQ *out/cap* LT			
10	P Q S	U I P	PF P Q	P S F			
11	thd.U thd.U ▲						
12	thd.I thd.I ▲						
13	P.inc-int-Trend	P.inc-int- ▲ P.inc-int- ▼	P.inc-int t-0	P.inc-int t-1	P.inc-int t-2	P.inc-int t-3	P.inc-int t-4
14	P.out-int-Trend	P.out-int- ▲ P.out-int- ▼	P.out-int t-0	P.out-int t-1	P.out-int t-2	P.out-int t-3	P.out-int t-4
15	Q.*inc/ind*-int-Trend	Q.*inc/ind*-int- ▲ Q.*inc/ind*-int- ▼	Q.*inc/ind*-int t-0	Q.*inc/ind*-int t-1	Q.*inc/ind*-int t-2	Q.*inc/ind*-int t-3	Q.*inc/ind*-int t-4
16	Q.*out/cap*-int-Trend	Q.*out/cap*-int- ▲ Q.*out/cap*-int- ▼	Q.*out/cap*-int t-0	Q.*out/cap*-int t-1	Q.*out/cap*-int t-2	Q.*out/cap*-int t-3	Q.*out/cap*-int t-4
17	S.int-Trend	S.int- ▲ S.int- ▼	S.int t-0	S.int t-1	S.int t-2	S.int t-3	S.int t-4

	a	b	c	d	e	f	g	h	i	j	k	l	m	n
18	H2.U H2▲.U	H3.U H3▲.U	H4.U H4▲.U	H5.U H5▲.U	H6.U H6▲.U	H7.U H7▲.U	H8.U H8▲.U	H9.U H9▲.U	H10.U H10▲.U	H11.U H11▲.U	H12.U H12▲.U	H13.U H13▲.U	H14.U H14▲.U	H15.U H15▲.U
19	H2.I H2▲.I	H3.I H3▲.I	H4.I H4▲.I	H5.I H5▲.I	H6.I H6▲.I	H7.I H7▲.I	H8.I H8▲.I	H9.I H9▲.I	H10.I H10▲.I	H11.I H11▲.I	H12.I H12▲.I	H13.I H13▲.I	H14.I H14▲.I	H15.I H15▲.I

Programming (Programming diagram on page 18)

Any parameter may be displayed at any time. To enable modifications, the jumper on the backside of the device must be removed (not in LOCK position).

(1) Change from the display level to the menu level by pressing the Ⓟ button for a longer time.
(2) Select the desired menu item by pressing the Ⓟ button for a shorter time.
(3) Use ⬇ to enter the level where the desired parameter is displayed.
(4) Pressing Ⓟ briefly will force the selectable element to flash.
(5) The flashing content may be modified using the ⬇ / ⬆ buttons.
(6) To acknowledge, briefly press the Ⓟ button.
(7) If the next 7-segment display, the decimal point, or a unit of measurement flashes: continue at (5).
(8) If additional parameters are to be modified at the same menu item, change to the required parameter with the ⬇ or ⬆ buttons and continue at (4).
(9) If modifications are to be made in other menu columns, return to the menu level with the ⬆ button, and continue at (2).
(10) Return to the display level by pressing the Ⓟ button for a longer time.

The navigation steps for the selection of display elements under "Menu Disp" differ from the above description between steps (4) and (8) (see configuration diagram Nos. 20 and 22).

Hints

All settings will remain stored in nonvolatile memory even in the event of a power failure.

The system configuration, transformer ratios and Q definition must be set first since further measurand selections, alarm limit settings, and other values will depend on them.

As an alternative to configuring the various options with the display buttons, convenient A200*plus* configuration software is available (with the MM/COM201 and MM/COM203 extension modules). Using this software, configuration data can be stored on the PC for later reuse.


LOCK

Locking the configuration

When the jumper is placed in the LOCK position, the configuration of all parameters is disabled.

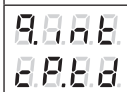
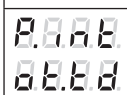
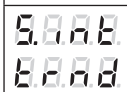
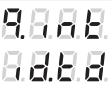
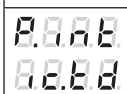
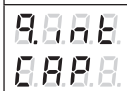
Factory Default

Jumper:	not in the LOCK position
Connecting mode:	4-wire asymmetric load
Transformer ratio:	1:1
Q definition:	inductive / capacitive
Limit value / S01:	Off
Limit value / S02:	Off
Synchronizing interval:	15 min.
Display mode:	FULL, duration of the display 0.0 s
Brightness:	middle value

Parameter Overview

The following table shows all the parameters together with their adjustable ranges or possible selections. The numbers with a black background (xx) refer to the corresponding positions in the navigation diagram on page 18.

No.	Top display fields	Bottom display field	Meaning	Hints
1	SYSTEM TYPE		System configuration	
		4LAV	4-line system, unbalanced load, Open-Y	(**4** **l**ines **u**nbalanced, **O**pen-Y)
		4LUN	4-line system, unbalanced load	(**4** **l**ines **u**nbalanced)
		3LUA	3-line system, unbalanced load, Aron	(**3** **l**ines **u**nbalanced, **A**ron configuration)
		3LUN	3-line system, unbalanced load	(**3** **l**ines **u**nbalanced
		4LBA	4-line system, balanced load	(**4** **l**ines **b**alanced)
		3LBA	3-line system, balanced load	(**3** **l**ines **b**alanced)
		1LNA	Single-line system	(**1** **l**ine)
2	EASY PHASE	MATH	Load type for energy recovery: Mathematical	4-quadrant display, ind-cap-ind-cap
		ELEC	Load type for energy recovery: Electrical	4-quadrant display, ind-ind-cap-cap
3	VOLT PRIM	0.500 V 100 V to 999 kV	Primary rating of an external input voltage transformer (PT) (measured line-to-line)	Enter any 3-digit number (in multiples of 10) followed by the appropriate unit selection.
4	VOLT SEC	0.500 V 100 V to 999 V	Secondary rating of an external input voltage transformer (measured line-to-line)	
5	CURR PRIM	0.5.00 A 1.00 A to 999 kA	Primary rating of an external input current transformer (CT)	
6	CURR SEC	0.5.00 A 0.1 A to 9,99 A	Secondary rating of an external input current transformer	

No.	Top display fields	Bottom display field	Meaning	Hints		
7			Q definition for meters, pulse outputs and power average values	(**Q-tot**alizers)		
			Q-incoming Q-outgoing	(**inc**oming) (**out**going)		
			Q-inductive Q-capacitive	(**ind**uctive) (**cap**acitive)		
8			Operating mode of both digital outputs “out.1” and “out.2”	(Mode)		
			Output switched-off	Control via extension module is still possible		
			Energy pulse output	The output generates energy pulses depending on the rate set under 14. The measurands to output may be selected under 13.		
			Alarm output	If the alarm limit 10 is exceeded the output will be active (current flows). If the measurand is below limit 11 the output will be passive. The source of the measurand is selected under 9.		
9			Alarm limit settings	This selection is presented only if operating mode 8 was previously set to “ALM”.		
				System Configuration		
				‘1L‘ ‘3Lb‘ ‘4Lb‘	‘3Lu‘ ‘3Lu.A‘	‘4Lu‘ ‘4Lu.0‘
		 or	**Q int**erval (Reactive power interval) (**cap**./**out**g. per Q-definition 7) **Trend**	●	●	●
			**P int**erval (Active power interval) **out**going (Outgoing) **Trend**	●	●	●
			**S int**erval (Apparent power interval) **Trend**	●	●	●
		 or	**Q int**erval (Reactive power interval) (**ind**./**inc**. per Q-definition 7) **Trend**	●	●	●
			**P int**erval (Active power interval) **inc**oming (Incoming) **Trend**	●	●	●
		 or	**Q int**erval (Reactive power interval) (**cap**./**out**g. per Q-definition 7)	●	●	●
			**P int**erval (Active power interval) **out**going (Outgoing)	●	●	●
			**unb**alance **U** (Voltage asymmetry factor)			●
			**U n**eutral-**e**arth (Neutral point/zero voltage shift)			●
			THD current	●	○	○
			THD voltage	●	○	○
			Frequency	●	●	●

No.	Top display fields	Bottom display field	Meaning	Hints		
9	A.SEt		Alarm limit settings (continuation)	System configuration ‘1L‘ ‘3Lb‘ ‘4Lb‘	‘3Lu‘ ‘3Lu.A‘	‘4Lu‘ ‘4Lu.0‘
		In.nEU	**I n**eutral (Neutral current)			●
		S.int	**S int**erval (Apparent power interval)	●	●	●
		Q.int ind. inc. or	**Q int**erval (Reactive power interval) (**ind**./**inc**. per Q-definition 7)	●	●	●
		P.int inc.	**P int**erval (Active power interval) **inc**oming (incoming)	●	●	●
		PF	**P**ower **f**actor (cos phi)	●	●	○
		S	Apparent power	●	●	○
		Q	Reactive power	●	●	○
		P	Active power	●	●	○
		U	Voltage	●		
		U.LnE	**U L**ine-**N**eutral (Phase voltage)			○
		U.LL	**U L**ine-**L**ine (Line to line voltage)		○	○
		I.AvG	**I Av**era**g**e (Phase current, bimetal)	●	○	○
		I	Phase current	●	○	○
				○: ‘A.on‘ = OR-operation of line-measurands ‘A.off‘ = AND-operation of line-measurands		
10	out.1 / .2 A.on	0.0 V	Alarm limit for triggering the ON-state	The maximum values of the alarm limits are based on the configured measurement range, and are dependent upon the ratios of any input CTs and PTs used, as well as the system configuration.		
11	out.1 / .2 A.oFF	0.0 V	Alarm limit for triggering the OFF-state			
12	out.1 / .2 A.dEL	1.0	Response **and** Dropout delay of the alarm	Selectable range: 0.3 to 999.9 s		
13	out.1 / .2 E.Pul		Energy pulse output settings	(Reactive energy per Q definition 7)		
		CAP.L out.L or	Reactive energy capacitive / outgoing low tariff	(**cap**acitive **l**ow tariff) or (**out**going **l**ow tariff)		
		CAP.H out.H or	Reactive energy capacitive / outgoing high tariff	(**cap**acitive **h**igh tariff) or (**out**going **h**igh tariff)		
		ind.L inc.L or	Reactive energy inductive / incoming low tariff	(**ind**uctive **l**ow tariff) or (**inc**oming **l**ow tariff)		
		ind.H inc.H or	Reactive energy inductive / incoming high tariff	(**ind**uctive **h**igh tariff) or (**inc**oming **h**igh tariff)		
		out.L	Active energy outgoing low tariff	(**out**going **l**ow tariff)		
		out.H	Active energy outgoing high tariff	(**out**going **h**igh tariff)		
		inc.L	Active energy incoming low tariff	(**inc**oming **l**ow tariff)		
		inc.H	Active energy incoming high tariff	(**inc**oming **h**igh tariff)		

No.	Top display fields	Bottom display field	Meaning	Hints
14	aUE.1 /.2 E.rAtE	1.000 Wh 1 to 5000 / Wh to GWh	Number of pulses per displayed energy unit. After entering a number from 1 to 5000 you may input the scaling: Basic unit (-), kilo (k), Mega (M) or Giga (Mk)	**E**nergy **rate**
15	SYnC t.InE	0.015 1 to 60 minutes	Time interval in minutes for the calculation of power intervals 0 = Interval controlled via the bus	For external synchronization, the displayed value is not relevant
16	dISP t.InE	0.0.00 0.0 to 7.5 seconds	Duration of the display To stabilize the display, the duration can be set to max. 7.5 s; in steps of 0.5 s	The set duration only affects the display.
17	MOdE LOCK		Locking the ability to change the display mode	
		LOOP	Only the Loop mode is enabled	Loop: Automatically changing pre-configured display values
		USEr	Only the User mode is enabled	User: Pre-configured display values
		FULL	Only the Full mode is enabled	Full: Full display values
		oFF.0	All display modes are enabled	
18	LOOP t.InE	0004 2 – 32 sec.	Display time in Loop mode	
19	LOOP FLAG		Configuration of the display values in Loop mode	Enter 20 : briefly press Ⓟ
20	LOOP	1-A.0 on.0.0	Position in the matrix table Display element on/off	See “matrix table” (page 9 to 11) Navigation X: Press Ⓟ shortly Navigation Y: Press ⬆ or ⬇ shortly on/off: Press ⬆ **and** ⬇ for a longer time Exit: Press Ⓟ for a longer time (back to 17)
21	USEr FLAG		Configuration of the display values in User mode	Enter 22 : Press Ⓟ shortly
22	USEr	1-A.0 on.0.0	Position in the matrix table Display element on/off	See “matrix table” (page 9 to 11) Navigation X: Press Ⓟ shortly Navigation Y: Press ⬆ or ⬇ shortly on/off: Press ⬆ **and** ⬇ for a longer time Exit: Press Ⓟ for a longer time (back to 21)

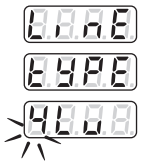
Examples

Example 1: Programming the system configuration (3-line, unbalanced load)

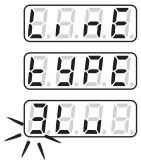
1. Press Ⓟ > 2 s

2. Press ⬇ (present setting is displayed)

3. Press Ⓟ (alterable parameter flashes)



4. Press ⬇ / ⬆ to select desired setting



5. Press Ⓟ (adopt new setting).
Display stops flashing

6. Press Ⓟ > 2 s to return to display level

Example 2: Programming voltage transformer ratio and synchronization interval

1. Press Ⓟ > 2 s

2. Press Ⓟ (transformer ratio menu)

3. Press ⬇ (present setting of primary voltage)

4. Press Ⓟ (leftmost digit flashes)

5. Press ⬇ / ⬆ until desired number appears

6. Press Ⓟ (middle digit flashes)

7. Press ⬇ / ⬆ until desired number appears

8. Press Ⓟ (rightmost digit flashes)

9. Press ⬇ / ⬆ until desired number appears

10. Press Ⓟ (decimal point flashes)

11. Press ⬇ / ⬆ until the decimal point is in the desired position and the kilo/Mega display is correct

12. Press Ⓟ (takes over new value).
The display stops flashing

13. Press ⬇ (present setting of secondary voltage)

14. Programming procedure same as for primary voltage (1 to 12)

15. Press ⬆ until the upper display field shows

16. Press Ⓟ four times

17. Press ⬇ (present setting of synchronization interval in minutes)

18. Press Ⓟ (left digit flashes)

19. Press ⬇ / ⬆ until desired number appears

20. Press Ⓟ (right digit flashes)

21. Press ⬇ / ⬆ until desired number appears

22. Press Ⓟ (adopts new value).
The display stops flashing

23. Press Ⓟ > 2 s (return to display level)

Declaration of conformity A230

CE **EG - KONFORMITÄTSERKLÄRUNG**
EC DECLARATION OF CONFORMITY
CAMILLE BAUER

Dokument-Nr./ Document.No.:	A230.DOC
Hersteller/ Manufacturer:	**Camille Bauer AG** Switzerland
Anschrift / Address:	**Aargauerstrasse 7** **CH-5610 Wohlen**
Produktbezeichnung/ Product name:	**Multifunktionales Leistungsmessgerät mit Netzanalyse** Multifunctional Power Monitor with System Analysis
Typ / Type:	**SINEAX A 230**

Das bezeichnete Produkt stimmt mit den Vorschriften folgender Europäischer Richtlinien überein, nachgewiesen durch die Einhaltung folgender Normen:

The above mentioned product has been manufactured according to the regulations of the following European directives proven through compliance with the following standards:

Nr. / No.	Richtlinie / Directive
2004/108/EG 2004/108/EC	Elektromagnetische Verträglichkeit - EMV-Richtlinie Electromagnetic compatibility - EMC directive

EMV / EMC	Fachgrundnorm / Generic Standard	Messverfahren / Measurement methods
Störaussendung / Emission	EN 61000-6-4 : 2007	EN 55011 : 2007+A2:2007
Störfestigkeit / Immunity	EN 61000-6-2 : 2005	IEC 61000-4-2: 1995+A1:1998+A2:2001 IEC 61000-4-3: 2006+A1:2007 IEC 61000-4-4: 2004 IEC 61000-4-5: 2005 IEC 61000-4-6: 2008 IEC 61000-4-8: 1993+A1:2000 IEC 61000-4-11: 2004

Nr. / No.	Richtlinie / Directive
2006/95/EG 2006/95/EC	Elektrische Betriebsmittel zur Verwendung innerhalb bestimmter Spannungsgrenzen – Niederspannungsrichtlinie – CE-Kennzeichnung : 95 Electrical equipment for use within certain voltage limits – Low Voltage Directive – Attachment of CE marking : 95

EN/Norm/Standard	IEC/Norm/Standard
EN 61010-1: 2001	IEC 61010-1: 2001

Ort, Datum / Place, date: Wohlen, 17. Februar 2009

Unterschrift / signature:

M. Ulrich
Leiter Technik / Head of engineering

J. Brem
Qualitätsmanager / Quality manager

Declaration of conformity A230S

CE **EG - KONFORMITÄTSERKLÄRUNG**
EC DECLARATION OF CONFORMITY
CAMILLE BAUER

Dokument-Nr./ Document.No.:	A230S.DOC
Hersteller/ Manufacturer:	**Camille Bauer AG** Switzerland
Anschrift / Address:	**Aargauerstrasse 7** **CH-5610 Wohlen**
Produktbezeichnung/ Product name:	**Multifunktionales Leistungsmessgerät mit Netzanalyse** Multifunctional Power Monitor with System Analysis
Typ / Type:	**SINEAX A 230S**

Das bezeichnete Produkt stimmt mit den Vorschriften folgender Europäischer Richtlinien überein, nachgewiesen durch die Einhaltung folgender Normen:

The above mentioned product has been manufactured according to the regulations of the following European directives proven through compliance with the following standards:

Nr. / No.	Richtlinie / Directive
2004/108/EG 2004/108/EC	Elektromagnetische Verträglichkeit - EMV-Richtlinie Electromagnetic compatibility - EMC directive

EMV / EMC	Fachgrundnorm / Generic Standard	Messverfahren / Measurement methods
Störaussendung / Emission	EN 61000-6-4 : 2007	EN 55011 : 2007+A2:2007
Störfestigkeit / Immunity	EN 61000-6-2 : 2005	IEC 61000-4-2: 1995+A1:1998+A2:2001 IEC 61000-4-3: 2006+A1:2007 IEC 61000-4-4: 2004 IEC 61000-4-5: 2005 IEC 61000-4-6: 2008 IEC 61000-4-8: 1993+A1:2000 IEC 61000-4-11: 2004

Nr. / No.	Richtlinie / Directive
2006/95/EG 2006/95/EC	Elektrische Betriebsmittel zur Verwendung innerhalb bestimmter Spannungsgrenzen – Niederspannungsrichtlinie – CE-Kennzeichnung : 95 Electrical equipment for use within certain voltage limits – Low Voltage Directive – Attachment of CE marking : 95

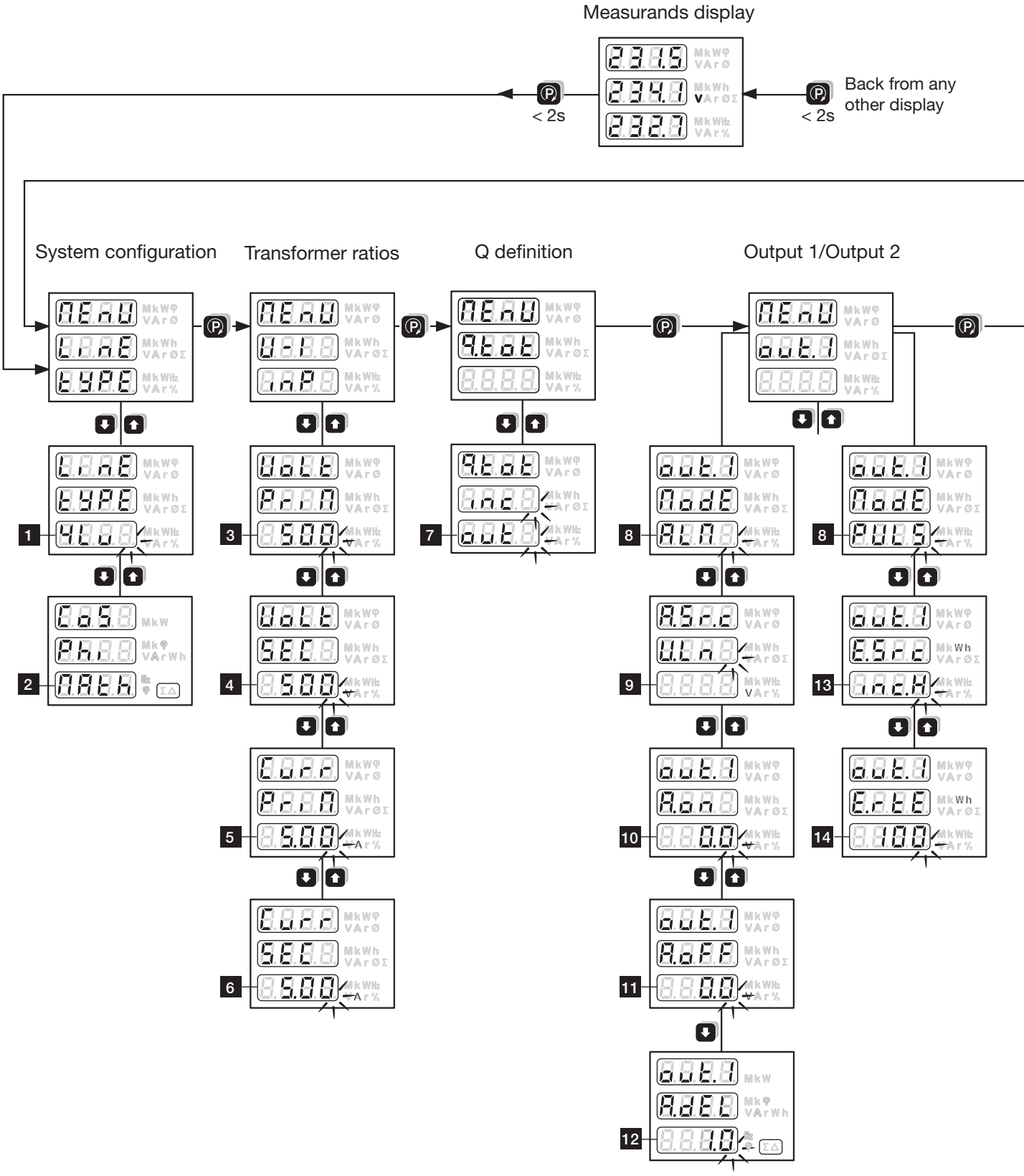
EN/Norm/Standard	IEC/Norm/Standard
EN 61010-1: 2001	IEC 61010-1: 2001

Ort, Datum / Place, date: Wohlen, 17. Februar 2009

Unterschrift / signature:

M. Ulrich
Leiter Technik / Head of engineering

J. Brem
Qualitätsmanager / Quality manager

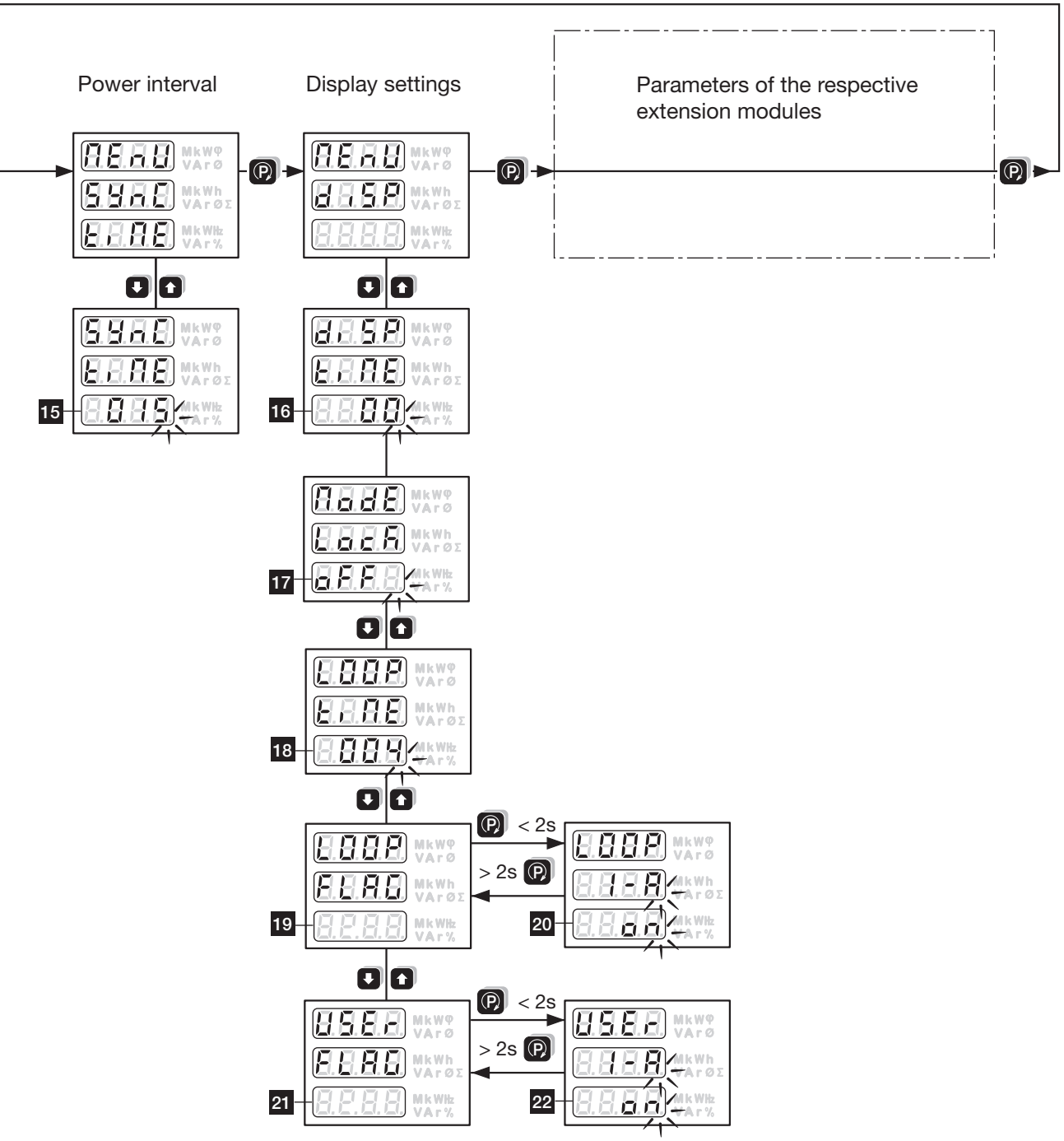


configurable element

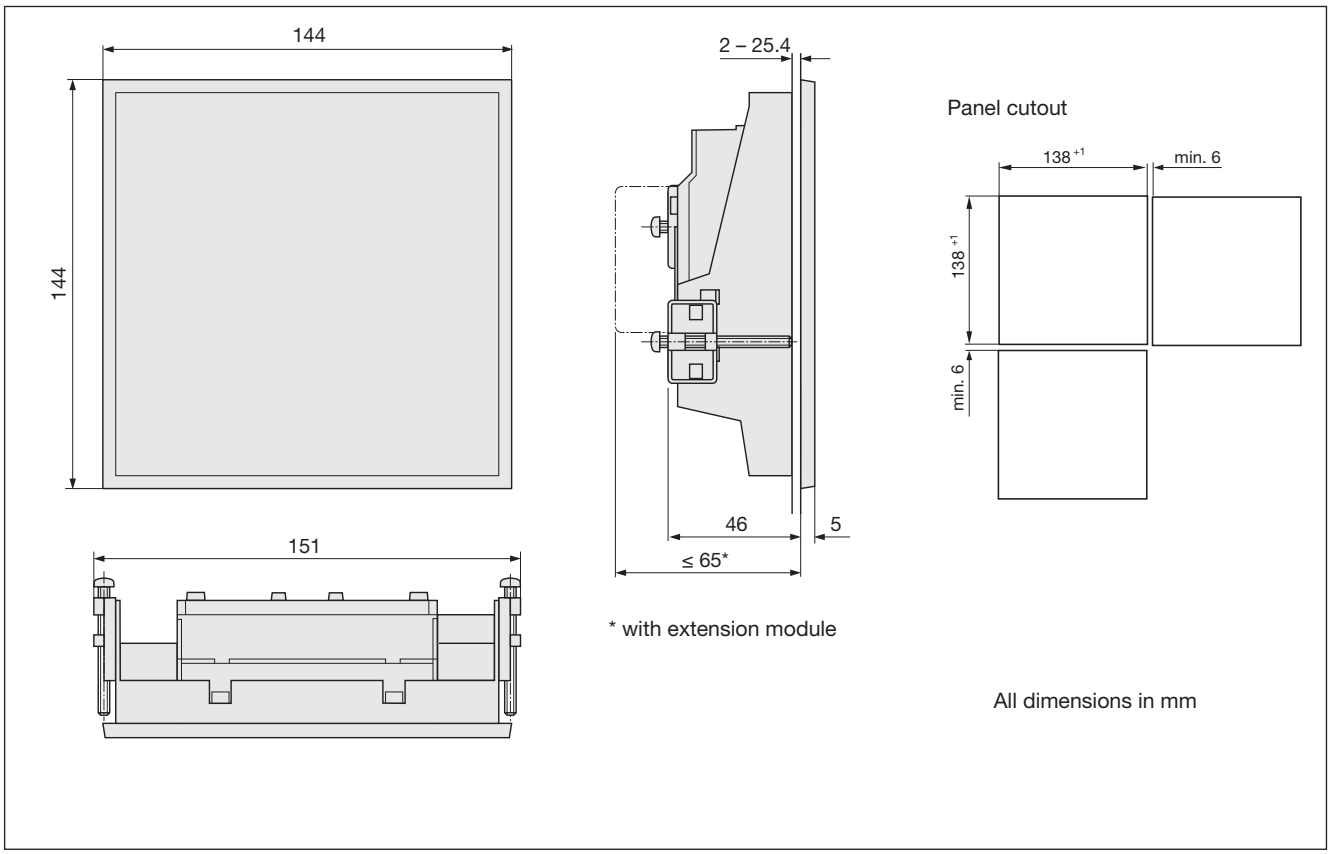
Display level

Menu level

Parameter level



Dimensional drawing A230



Dimensional drawing A230S