11 Specifications

11.1 General

Specifications are valid for an ambient temperature of +25°C and nominal input voltage. The specifications are subject to change without further notice.

System designation

An ODEN AT-system consists of a control unit an one, two or three current units. There are three different versions of the current units: S-unit (standard), X-unit (extra 30/60 V outlet) and H-unit (high current). The system designation indicates the number and version of current units included.

Example: ODEN AT/2X
2 = Number of current units
X = Version of current unit (S, X or H

Environment

Application field	The instrument is intended for use in medium-voltage substations and industrial environments.
Temperature	
Operating	0°C to +50°C (+32°F to +122°F)
Storage & transport	-25°C to +55°C (-13°F to +127°F)
Humidity	5% – 95% RH, Non-condensing.

CE-marking

LVD	Low Voltage Directive 73/23/ EEC am. by 93/68/EEC
EMC	EMC Directive 89/336/EEC am. by 91/263/EEC, 92/31/EEC and 93/68/ EEC

General

Mains voltage	• 240 V AC 50/60 Hz • 400 V AC 50/60 Hz • 480 V AC 60 Hz The mains voltage must be between -14% and +10% of the nominal input voltage stated
Mains inlet	IEC 60309-2, 63 A
Power consumption	The power consumption for Oden AT depends on the generated output current, see sections 11.2, 11.4 and 11.6 for details.
Input current	Output current x open circuit voltage / input voltage
Protection	The output transformer has a built-in thermal cut-out, and the primary side is protected by a miniature circuit breaker
Dimensions	
Control unit AT	570 x 310 x 230 mm (22.4" x 12.2" x 9")
Current unit S, X H	570 x 310 x 155 mm (22.4" x 12.2" x 6")
Weight	
Control unit AT	25 kg (55 lbs)
Current unit S	42 kg (92.6 lbs)
Current unit X	45 kg (99.3 lbs)
Current unit H	49 kg (108 lbs)

Display

Type	LCD
Available languages	English, German, French, Spanish, Swedish.

Measurement section

Ammeters

Measurement method	AC, true RMS
Inaccuracy	1% of range ±1 digit

Ammeter 1

Ranges	0 – 4800 A / 0 –15 kA 0 – 9600 A / 0 – 30 kA 0 – 960 A / 0 – 3 kA

Ammeter 2

Ranges	0 – 2.000 A / 0 – 20.00 A
Maximum current	20 A (The input is not protected by a fuse)
Dielectric withstand	Galvanically isolated

Voltmeter

Measurement method	AC, true RMS
Ranges	0 – 0.2 V, 0 – 2 V, 0 – 20 V, 0 – 200 V, AUTO
Inaccuracy	1% of range ±1 digit
Input resistance (Rin)	240 kΩ (range 0 – 200 V) 24 kΩ (other ranges)
Dielectric withstand	2.5 kV

Timer

Presentation	In seconds, mains frequency cycles or hours and minutes
Ranges	0.000 – 99999.9 s 0 – 9999 cycles 0.001s – 99 h 59 min
Inaccuracy	±(1 digit + 0.01% of value) For the stop condition in INT-mode 1 ms shall be added to the specified measurement error.

Stop input

Max. input voltage	250 V AC / 275 V DC

Phase angle

Range	0 – 359°
Resolution	1°
Accuracy	±2° (For voltage and current readings that are higher than 10% of the selected range)

Z, P, R, X, S, Q and power factor (cos φ)

For these measurements the result is calculated using two or three items. The accuracy depends on the errors for the items included (U, I and sometimes φ).

Imax

Stores highest current value that exists ≥100 ms

INT-level

Threshold indicating that current is interrupted, can be set to 0.7 or 2.1% of range for Ammeter 1

11.2 Output specifications for 240 V Oden AT systems at 50 Hz

Specifications are valid at nominal input voltage and ambient temperature +25 °C, (77 °F) and with the current adjustment set to 100%. The specified times refer to the maximum loading time during a single load period, they are not valid during repeated use.

Important

Exceeding the currents and load times specified could cause damage to the equipment.

The specified output voltage is the voltage at the output terminals. The voltage drop in the current cables and connections between current units in series is not included.

Nominal input voltage: 240 V AC

Oden AT/1S (240 V)

OUTPUT HIGH I

Output (A)	Voltage (V)	Time on
0	6.0	Continuous
1000	5.3	Continuous
2000	4.6	3 min
3000	3.9	1 min
4000	3.2	40 sec
5000	2.5	30 sec
6000	2.0	20 sec
7000	1.3	3 sec

Input current: Output current/40 (approximate)

Oden AT/2S (240 V)

OUTPUT HIGH I - Units in PARALLEL

Output (A)	Voltage (V)	Time on
0	6.0	Continuous
1000	5.6	Continuous
2000	5.3	Continuous
3000	5.0	8 min
4000	4.6	2 min
6000	3.9	60 sec
8000	3.2	3 sec

Input current: Output current/40 (approximate)

OUTPUT HIGH I - Units in SERIES

Output (A))	Voltage (V)	Time on
0	12.0	Continuous
1000	10.5	Continuous
2000	9.0	3 min
3000	7.6	1 min
4000	6.0	3 sec

Input current: Output current/20 (approximate)

Oden AT/3S (240 V)

OUTPUT HIGH I - Units connected in PARALLEL

Output (A)	Voltage (V)	Time on
0	6.0	Continuous
1000	5.8	Continuous
2000	5.5	Continuous
2500	5.4	Continuous
4000	5.1	8 min
6000	4.6	2 min
8000	4.2	3 sec

Input current: Output current/40

OUTPUT HIGH I - Units in SERIES

Output (A)	Voltage (V)	Time on
0	18.0	Continuous
840	16.1	Continuous
1000	15.9	30 min
2000	13.7	2 min
2600	12.4	3 sec

Input current: Output current/13 (approximate)

Oden AT/1X (240 V)

OUTPUT HIGH I

See section 11.2 Oden AT/1S (240 V)

OUTPUT 0 – 30 V/60 V - Switch pos: 0 – 30 V

Output (A)	Voltage (V)	Time on
0	30	Continuous
160	27	Continuous
300	25	3 min
600	21	12 sec
1200	8	2 sec

Input current: Output current/8 (approximate)

OUTPUT 0 – 30 V/60 V - Switch pos: 0 – 60 V

Output (A)	Voltage (V)	Time on
0	60	Continuous
80	55	Continuous
150	50	3 min
300	40	12 sec
600	17	2 sec

Input current: Output current/4 (approximate)

Oden AT/2X (240 V)

OUTPUT HIGH I

See section 11.2 Oden AT/2S (240 V)

OUTPUT 0 – 30 V/60 V - Switch pos: 0 – 30 V
Units in PARALLEL

Output (A)	Voltage (V)	Time on
0	30	Continuous
320	28	Continuous
600	25	3 min
1200	20	12 sec
1600	17	2 sec

Input current: Output current/8 (approximate)

OUTPUT 0 – 30 V/60 V - Switch pos: 0 – 30 V
Units in SERIES

Output (A)	Voltage (V)	Time on
0	60	Continuous
160	54	Continuous
300	50	3 min
600	40	12 sec
800	33	2 sec

Input current: Output current/4 (approximate)

OUTPUT 0 – 30 V/60 V - Switch pos: 0– 60 V
Units in SERIES

Output (A)	Voltage (V)	Time on
0	120	Continuous
80	110	Continuous
150	100	3 min
300	82	12 sec
400	67	1 sec

Input current: Output current/2 (approximate)

Oden AT/3X (240 V)

OUTPUT HIGH I

See section 11.2 Oden AT/3S (240 V)

OUTPUT 0 – 30 V/60 V - Switch pos: 0 – 30 V
Units in PARALLEL

Output (A)	Voltage (V)	Time on
0	30	Continuous
480	27	Continuous
600	26	4 min
1200	23	1 min
1600	21	3 sec

Input current: Output current/8 (approximate)

OUTPUT 0 – 30 V/60 V - Switch pos: 0 – 30 V
Units in SERIES

Output (A)	Voltage (V)	Time on
0	90	Continuous
160	82	Continuous
300	75	3 min
500	65	3 sec

Input current: Output current/2.7 (approximate)

OUTPUT 0 – 30 V/60 V - Switch pos: 0 – 60 V
Units in SERIES

Output (A)	Voltage (V)	Time on
0	180	Continuous
80	165	Continuous
150	150	3 min
250	125	3 sec

Input current: Output current/1.3 (approximate)

Oden AT/1H (240 V)

OUTPUT HIGH I

Output (A)	Voltage (V)	Time on
0	3.6	Continuous
1000	3.4	Continuous
1250	3.4	Continuous
2000	3.2	5 min
3000	3.0	2 min
4000	2.8	1 min 30 sec
5000	2.6	1 min
6000	2.4	40 sec
8000	1.9	20 sec
10000	1.5	12 sec
11000	1.3	5 sec

Input current: Output current/66 (approximate)

Oden AT/2H (240 V)

OUTPUT HIGH I - Units in PARALLEL

Output (A)	Voltage (V)	Time on
0	3.6	Continuous
2000	3.4	Continuous
2500	3.4	Continuous
4000	3.2	5 min
6000	3.0	2 min
8000	2.8	1 min 30 sec
10000	2.6	1 min
13000	2.2	2 sec

Input current: Output current/66 (approximate)

OUTPUT HIGH I - Units in SERIES

Output (A)	Voltage (V)	Time on
0	7.3	Continuous
1250	6.7	Continuous
2000	6.3	5 min
3000	5.9	2 min
4000	5.4	1 min
6000	4.4	5 sec

Input current: Output current/33 (approximate)

Oden AT/3H (240 V)

OUTPUT HIGH I - Units in PARALLEL

Output (A)	Voltage (V)	Time on
0	3.6	Continuous
2000	3.5	Continuous
3800	3.4	Continuous
6000	3.2	5 min
8000	3.1	3 min
10000	2.9	1 min 30 sec
13000	2.7	2 sec

Input current: Output current/66 (approximate)

OUTPUT HIGH I - Units in SERIES

Output (A)	Voltage (V)	Time on
0	11.0	Continuous
1250	10.0	Continuous
2000	9.5	5 min
3000	8.7	2 min
4300	7.8	2 sec

Input current: Output current/22 (approximate)