

Electrodynamic voltage stabilisers



IREM *Ministab-Sterostab*

Ministab and Sterostab

Electrodynamic voltage stabilisers

Operating principle

Ministab and Sterostab regulate through a series transformer. A static control circuit drives the variable autotransformer that supplies the required voltage to the series transformer either in phase or phase opposition to bring the mains to the rated value.

The three-phase stabilisers are available in two versions:

- 1) the models listed in the T3 tables perform the voltage regulation on the average of the three phases and are therefore suitable for lines with balanced voltage and for a maximum unbalance between phases up to 50%. T3 models, being equipped with just one stabilizing circuit ensuring a common regulation of the 3 phases, are less expensive. They can be connected to input mains without neutral.
- 2) the models listed in the Y3 tables are equipped with one stabilizing circuit for each phase, hence they are suitable for unbalanced mains and a maximum unbalance between phases up to 100%. For their correct operation, neutral is mandatory. Therefore, the input line must have 4 wires (3 phases + neutral).

The voltage regulators do not transform the voltage and deliver in output the input rated value. When input and output voltages are different, an additional isolating transformer or autotransformer are required.

Ministab and Sterostab correctly operate both at 50 and 60 cycles.

General features

Range

IREM voltage regulators are available in power rating from 1 kVA to 4750 kVA.

Upon request we can supply stabilisers with the following characteristics:

- single-phase voltages: 100-110-115-120-127-200-220-230-240-265-277 Volt.
- three-phase voltages: 208-220-230-240-380-400-415-440-460-480-500 Volt
- Frequency: 50 or 60 Hz.
- Indoor versions (IP20, IP21, IP31, IP54), outdoor versions (IP44, IP54), open frame versions IP00 and rack 19"
- Special versions equipped with optional fittings.

AVR sizing

IREM voltage regulators are designed and manufactured to operate indefinitely under the worst conditions declared by the manufacturer. In particular, all power components are sized to operate as follows:

- continuous duty (24h/day, 365 days/year)
- at full load and highest input current (i.e. lowest mains voltage)
- at the max declared operating temperature without derating.

Accuracy

Ministab and Sterostab ensure the "true RMS value" of the voltage with an accuracy range that varies according to the model from $\pm 0.5\%$ to $\pm 1.5\%$, even where strong harmonic distortions are present on the line.

Correction speed

The advanced electronic control circuit ensures a fast response, from 10 to 50 ms/Volt according to the model. A controlled deceleration minimises overshoots.

Overload capacity

This is a typical characteristic of the Ministab and Sterostab regulation system. In fact, they can support without damage overloads up to 10 times the rated current for 10 milliseconds, 5 times for 6 seconds and 2 times for 1 minute.

Efficiency

At full load the range is from 96% for small models to 98% for the larger units.

Unaffected by power factor and load variations

The Ministab and Sterostab operating principle ensures that the equipment accuracy and regulation speed characteristics remain unaltered under any load conditions, with inductive or capacitive loads.

Unaffected by frequency variations

The servomotor control circuit operates correctly with mains frequency variations up to $\pm 5\%$.

Negligible waveform distortion

The high quality materials and their correct use ensure that harmonic distortion is always less than 0.2% under any working conditions.

Low internal impedance

Installation of Ministab and Sterostab in already existing systems does not require new calculations of protection on device since their internal impedance varying from 0.52 to 0.015 ohm does not significantly affect the line impedance.

Operating temperature

Ministab and Sterostab have been designed to operate correctly with a maximum environment temperature of 40°C under the worst conditions: continuous operation, full load, minimum input voltage value.

Reliability

The continual improvements that the Ministab and Sterostab have undergone in over 60 years of activity during which IREM has manufactured over 430,000 stabilisers have obtained an exceptional MTBF for these devices.

Cooling system

According to the type of cabinet and the ambient conditions, AVR cooling is ensured as follows:

- air natural convection
- forced ventilation
- air conditioning
- heat exchangers.

Conformity to standards

Ministab and Sterostab conform to the requirements of the following standards: Electro Magnetic Compatibility 2004/18/EC and following amendments; Low Voltage Electrical Equipment 2006/95/EC and following amendments.

Ministab and Sterostab IP21

Electrodynamic voltage stabilisers

Guide to selection and technical data

M2 Models for SINGLE-PHASE 230V mains

M2..AS Asymmetrical Models for SINGLE-PHASE 230V mains

T3 Models for THREE-PHASE 400V mains with common regulation of the three phases

Y3 Models for THREE-PHASE 400V mains with independent regulation of each phase

Y3..AS Asymmetrical Models for THREE-PHASE 400V mains with independent regulation of each phase

The models listed in the following tables are contained in metallic cabinets characterized by a protection degree IP21. According to the international standards, protection degree IP21 means:

IP2X: protection against solid particle over 12 mm

IPX1: protection against vertical dripping

These AVR's are therefore suitable for INDOOR installation in room without splashes and heavy dust.

The single-phase models M204E, M206E, M208E and the three-phase models T304E, T306E are fitted with a range selector. Therefore, the power ratings that each model can deliver are selected by means of the switching device available on the cabinet. For all other models, it is necessary to specify the power required.

Optional fittings

Ammeter

Frequency meter

Digital multimeter

Remote control

Input or output circuit breaker (with or without earth leakage)

Manual or automatic by-pass

Isolating transformer

Step-up / step-down transformer or autotransformer

Surge arrester / lightning protection

Over/under voltage protection

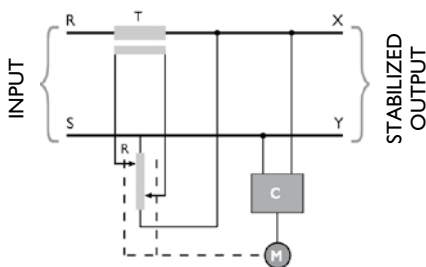
Thermal relay

Soft start

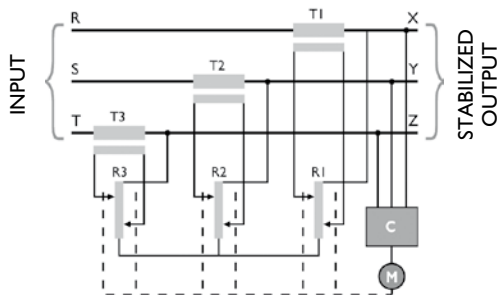
Reversed phase sequence and phase failure protection

Tropicalized versions

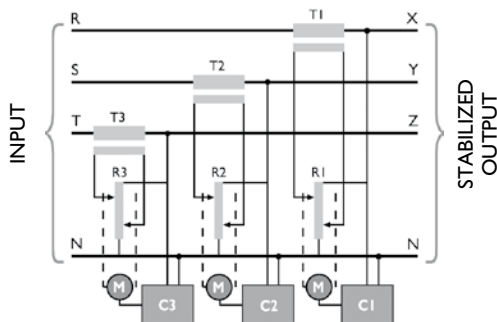
Customized colour (standard colour: RAL 7035).



SINGLE-PHASE M STABILISERS



THREE-PHASE T STABILISERS



THREE-PHASE Y STABILISERS

T = buck-boost transformer
R = variable transformer
C = electronic control circuit
M = servomotor

M2 Models for SINGLE-PHASE 230V 50/60 Hz mains, protection degree IP20 - IP21

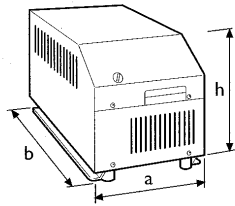


figure A

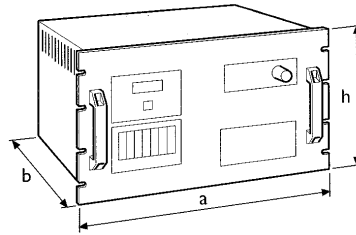


figure B

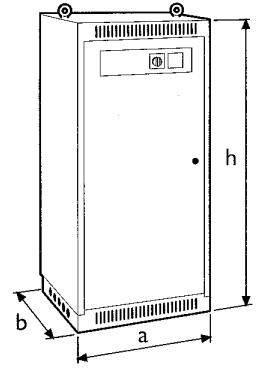
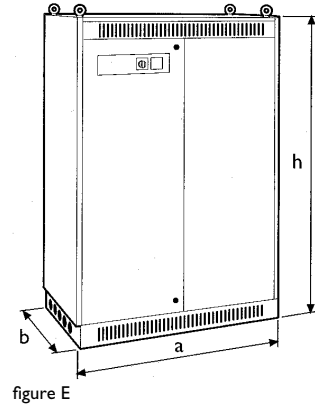
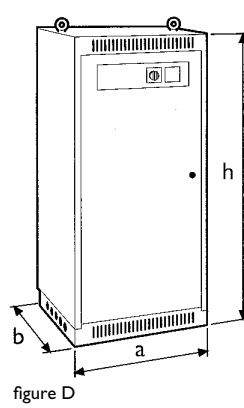


figure D

Ministab

Model	Rated power kVA (**)	Rated current Amps	Voltage variation %	Response time ms/V	Accuracy ±%	Standard fittings	Size mm a x b x h	Weight kg	Figure
M202E-1	1	4,3	±30	13	±1,5	CG	210x450x200	18	A
M204E-1	1	4,3	±25	14					
M204E	2	9	±20	15					
	2,5	11	±15	18					
M204E-3	3	13	±10	25	±1,5	CG	235x410x240	30	A
M206E-2	2	8,7	±30	20					
M206E-3	3	13	±25	21					
M206E	4	17	±20	23					
	5	22	±15	27					
M206E-8	8	35	±10	33	±1,5	CG	275x425x265	37	A
M208E-3	3	13	±30	24					
M208E-4	4	17	±25	25					
M208E	6	26	±20	27					
	7	30	±15	30					
M208E-10	10	43	±10	35	±1,5		290X505X285	55	A
M210E-6	6	26	±30	24					
M210E-8	8	35	±25	25					
M210E-10	10	43	±20	27					
M210E-15	15	65	±15	30	±1,5	V,L	560X396X320	70	A
M210E-20	20	87	±10	35					
M211E-10	10	43	±30	22					
M211E-12	12	52	±25	24					
M211E-15	15	65	±20	28	±0,5	I, L,V FG,PZ, BT*, BS*, PS*	485x500x275	36	B
M211E-22	22	96	±15	31					
M211E-35	35	152	±10	36					
M206L-2	2	9	±30	20					
M206L-3	3	13	±25	20	±0,5	I, L,V FG,PZ, BT*, BS*, PS*	485x500x275	47	B
M206L-4	4	17	±20	23					
M206L-5	5	22	±15	27					
M206L-8	8	35	±10	33					
M208L-3	3	13	±30	24	±0,5	I, L,V FG,PZ, BT*, BS*, PS*	485x500x275	60	B
M208L-4	4	17	±25	25					
M208L-6	6	26	±20	27					
M208L-7	7	30	±15	30					
M208L-10	10	43	±10	35	±0,5	I, L,V FG,PZ, BT*, BS*, PS*	485x500x275	60	B
M210L-6	6	26	±30	21					
M210L-8	8	35	±25	23					
M210L-10	10	43	±20	27					
M210L-15	15	65	±15	30	±1	V,L	650X450X1000	110	D
M210L-20	20	87	±10	35					
M212AN12	12	52	±30	20					
M212AN15	15	65	±25	26					
M212AN21	21	91	±20	30	±15				
M212AN30	30	130	±15	35					
M212AN40	40	174	±10	40					

(**) Power available at constant output voltage, input voltage at minimum, $V_{in} \geq 230V$ and $T_{Amb} +40^{\circ}C$.



Sterostab

Model	Rated power kVA (**)	Rated current Amps	Voltage variation %	Response time ms/V	Accuracy ±%	Standard fittings	Size mm a x b x h	Weight kg	Figure
M213AN16	16	70	±30	8					
M213AN18	18	78	±25	9					
M213AN25	25	109	±20	10	±1	V, L	650x650x1300	187	D
M213AN36	36	157	±15	12					
M213AN56	56	243	±10	18					
M214AN23	23	100	±30	18					
M214AN33	33	143	±25	19					
M214AN40	40	174	±20	21	±1	V, L	650x650x1300	235	D
M214AN57	57	248	±15	24					
M214AN87	87	378	±10	31					
M216AN33	33	143	±30	18					
M216AN43	43	187	±25	19					
M216AN60	60	261	±20	21	±1	V, L	650x650x1800	280	D
M216AN83	83	361	±15	24					
M216AN117	117	509	±10	31					
M217AN47	47	204	±30	22					
M217AN60	60	261	±25	24					
M217AN83	83	361	±20	26	±1	V, L	650x650x1800	340	D
M217AN117	117	509	±15	29					
M217AN177	177	770	±10	31					
M218AN62	62	270	±30	20					
M218AN78	78	339	±25	21					
M218AN105	105	457	±20	23	±1	V, L	1100x650x1800	455	E
M218AN150	150	652	±15	26					
M218AN233	233	1013	±10	31					
M219AN92	92	400	±30	23					
M219AN118	118	513	±25	26					
M219AN167	167	726	±20	28	±1	V, L	1100x650x1800	670	E
M219AN233	233	1013	±15	30					
M219AN350	350	1522	±10	32					

Fittings

V = voltmeter
L = pilot lamp
FG = out of range indication
CG = range selector
I = thermo - magnetic input circuit breaker

PZ = potentiometer
PS* = surge arresters (optional)
BT* = electronic voltage relay (optional)
BS* = tripping coil (optional)

(***) Power available at continuous duty, input voltage at minimum value and $T_{AMB} + 40^{\circ}C$.

T3 Models for **THREE-PHASE 400V 50/60 Hz mains**
with common regulation of the three phases, protection degree IP20 - IP21

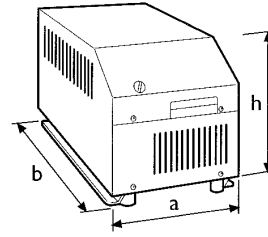


figure A

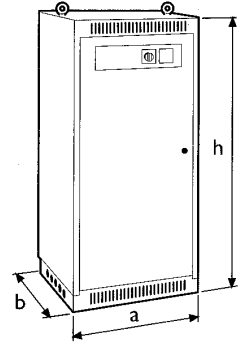


figure D

Ministab

Model	Rated power kVA (**)	Rated current Amps	Voltage variation %	Response time ms/V	Accuracy ±%	Standard fittings	Size mm a x b x h	Weight kg	Figure
T304E-3	3	4	±30	13	±1	CG	600x300x260	45	A
T304E-3,5	3,5	5	±25	15					
T304E	5	7	±20	18					
T304E-9	6	9	±15	21	±1	CG	270x445x480	78	A
T304E-9	9	13	±10	30					
T306E-6	6	9	±30	13					
T306E-6,5	6,5	9,4	±25	15	±1	CG	650x450x1000	122	D
T306E	9	13	±20	18					
T306E-17	12	17	±15	21					
T306E-17	17	25	±10	30	±1	V,L	650x450x1000	122	D
T308AN10	10	14	±30	15					
T308AN13	13	19	±25	16					
T308AN17	17	25	±20	18					
T308AN22	22	32	±15	21					
T308AN31	31	45	±10	21					

Fittings

V = voltmeter

L = pilot lamp

CG = range selector

(**) Power available at continuous duty, input voltage at minimum value and $T_{Amb} + 40^{\circ}C$.

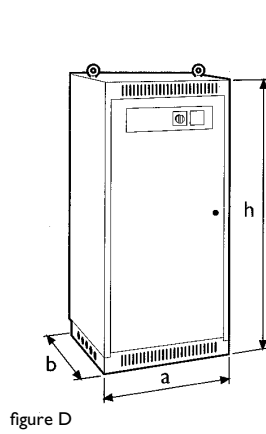


figure D

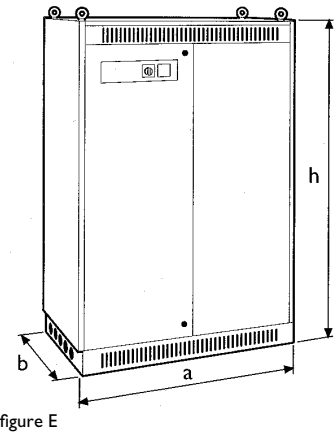


figure E

Sterostab

Model	Rated power kVA (**)	Rated current Amps	Voltage variation %	Response time ms/V	Accuracy ±%	Standard fittings	Size mm a x b x h	Weight kg	Figure
T310AN22	22	32	±30	10					
T310AN30	30	43	±25	11					
T310AN40	40	58	±20	13	±1	V, L	650x650x1300	250	D
T310AN55	55	79	±15	14					
T310AN85	85	123	±10	18					
T312AN35	35	51	±30	10					
T312AN46	46	66	±25	11					
T312AN58	58	84	±20	12	±1	V, L	650x650x1300	280	D
T312AN85	85	123	±15	14					
T312AN115	115	166	±10	18					
T314AN50	50	72	±30	10					
T314AN60	60	87	±25	11					
T314AN80	80	115	±20	12	±1	V, L	650x650x1300	355	D
T314AN120	120	173	±15	14					
T314AN180	180	260	±10	18					
T315AN70	70	101	±30	14					
T315AN90	90	130	±25	16					
T315AN120	120	173	±20	17	±1	V, L	650x650x1800	415	D
T315AN170	170	245	±15	20					
T315AN270	270	390	±10	26					
T316AN100	100	144	±30	12					
T316AN135	135	195	±25	13					
T316AN170	170	245	±20	14	±1	V, L	1100x650x1800	630	E
T316AN250	250	361	±15	17					
T316AN390	390	563	±10	22					
T318AN140	140	202	±30	14					
T318AN180	180	260	±25	16					
T318AN240	240	346	±20	18	±1	V, L	1100x650x1800	900	E
T318AN340	340	491	±15	20					
T318AN540	540	779	±10	26					
T319AN210	210	303	±30	21				1200	
T319AN270	270	390	±25	23					
T319AN360	360	520	±20	26	±1	V, L	1570x1415x2010		E
T319AN510	510	736	±15	29				1320	
T319AN800	800	1155	±10	32					

Fittings

V = voltmeter
L = pilot lamp

(**) Power available at continuous duty, input voltage at minimum value and T_{amb} +40°C.

Y3 Models for **THREE-PHASE 400V 50/60 Hz mains**
with independent regulation of each phase,
protection degree IP20 - IP21

Ministab

Model	Rated power kVA (***)	Rated current Amps	Voltage variation %	Response time ms/V	Accuracy ±%	Standard fittings	Size mm a x b x h	Weight kg	Figure
Y304AN3	3	4	±30	13					
Y304AN4.5	4,5	6	±25	14					
Y304AN6	6	9	±20	16	±1	V, L	650x450x1000	90	D
Y304AN7.5	7,5	11	±15	18					
Y304AN10	10	14	±10	21					
Y306AN6	6	9	±30	11					
Y306AN9	9	13	±25	12					
Y306AN12	12	17	±20	14	±1	V, L	650x450x1000	115	D
Y306AN15	15	22	±15	16					
Y306AN24	24	35	±10	19					
Y308AN9	9	13	±30	13					
Y308AN15	15	22	±25	14					
Y308AN18	18	26	±20	16	±1	V, L	650x450x1000	135	D
Y308AN21	21	30	±15	18					
Y308AN30	30	43	±10	21					
Y310AN18	18	26	±30	13					
Y310AN24	24	35	±25	14					
Y310AN30	30	43	±20	16	±1	V, L	650x450x1000	210	D
Y310AN45	45	65	±15	18					
Y310AN60	60	87	±10	21					
Y311AN30	30	43	±30	13					
Y311AN36	36	52	±25	14					
Y311AN46	46	66	±20	16	±1	V, L	650x650x1300	240	D
Y311AN66	66	95	±15	18					
Y311AN105	105	152	±10	21					
Y312AN36	36	52	±30	14					
Y312AN45	45	65	±25	15					
Y312AN60	60	87	±20	24	±1	V, L	650x650x1300	290	D
Y312AN90	90	130	±15	28					
Y312AN120	120	173	±10	32					

Sterostab

Model	Rated power kVA (***)	Rated current Amps	Voltage variation %	Response time ms/V	Accuracy ±%	Standard fittings	Size mm a x b x h	Weight kg	Figure
Y313AN46	46	66	±30	10					
Y313AN55	55	79	±25	12					
Y313AN75	75	108	±20	14	±1	V, L	650x650x1800	470	E
Y313AN110	110	159	±15	16					
Y313AN170	170	245	±10	18					
Y314AN70	70	101	±30	10					
Y314AN100	100	144	±25	11					
Y314AN120	120	173	±20	12	±1	V, L	1100x650x1800	560	E
Y314AN170	170	245	±15	16					
Y314AN260	260	375	±10	18					
Y316AN100	100	144	±30	10					
Y316AN130	130	188	±25	11					
Y316AN180	180	260	±20	12	±1	V, L	1100x650x1800	625	E
Y316AN250	250	361	±15	16					
Y316AN350	350	505	±10	18					
Y317AN140	140	202	±30	15					
Y317AN180	180	260	±25	16					
Y317AN250	250	361	±20	17	±1	V, L	1100x650x1800	780	E
Y317AN350	350	505	±15	20					
Y317AN530	530	765	±10	26					
Y318AN185	185	267	±30	11					
Y318AN235	235	339	±25	12					
Y318AN315	315	455	±20	13	±1	V, L	1100x1100x1800	1200	E
Y318AN450	450	650	±15	15					
Y318AN700	700	1010	±10	19					

(***) Power available at continuous duty, input voltage at minimum value and T_{Amb} +40°C.

Model	Rated power kVA (**)	Rated current Amps	Voltage variation %	Response time ms/V	Accuracy ±%	Standard fittings	Size mm a x b x h	Weight kg	Figure
Y319AN275	275	397	±30	16					
Y319AN355	355	512	±25	17					
Y319AN500	500	722	±20	19	±1	V, L	1570x1415x2010	1700	E
Y319AN700	700	1010	±15	22					
Y319AN1050	1050	1516	±10	27					
Y320AN410	410	592	±30	13					
Y320AN530	530	765	±25	14					
Y320AN710	710	1025	±20	16	±1	V, L	3 cabinets 1100x1100x1800	2800	3E
Y320AN1000	1000	1443	±15	21					
Y320AN1570	1570	2266	±10	24					
Y322AN550	550	794	±30	16					
Y322AN710	710	1025	±25	18					
Y322AN950	950	1371	±20	22	±1	V, L	3 cabinets 1100x1100x1800	3200	3E
Y322AN1350	1350	1949	±15	26					
Y322AN2100	2100	3031	±10	29					
Y323AN700	700	1010	±30	16					
Y323AN890	890	1285	±25	18					
Y323AN1180	1180	1703	±20	22	±1	V, L	3 cabinets 1570x1415x2010	4200	3E
Y323AN1680	1680	2425	±15	26					
Y323AN2600	2600	3753	±10	29					
Y324AN825	825	1191	±30	16					
Y324AN1050	1050	1516	±25	18					
Y324AN1420	1420	2050	±20	22	±1	V, L	3 cabinets 1570x1415x2010	4500	3E
Y324AN2000	2000	2887	±15	26					
Y324AN3150	3150	4547	±10	29					
Y326AN960	960	1386	±30	16					
Y326AN1250	1250	1804	±25	18					
Y326AN1650	1650	2382	±20	22	±1	V, L	3 cabinets 2030x1415x2015	5000	3E
Y326AN2350	2350	3392	±15	26					
Y326AN3700	3700	5341	±10	29					
Y328AN1100	1100	1588	±30	16					
Y328AN1420	1420	2050	±25	18					
Y328AN1900	1900	2742	±20	22	±1	V, L	3 cabinets 2030x1415x2015	5700	3E
Y328AN2700	2700	3897	±15	26					
Y328AN4200	4200	6062	±10	29					
Y330AN1250	1250	1804	±30	16					
Y330AN1600	1600	2309	±25	18					
Y330AN2130	2130	3074	±20	22	±1	V, L	3 cabinets 2030x1415x2015	6600	3E
Y330AN3000	3000	4330	±15	26					
Y330AN4750	4750	6856	±10	29					
Y332AN1380	1380	1992	±30	18					
Y332AN1770	1770	2555	±25	20	±1	V, L	4 cabinets 1570x1415x2010	7200	4E
Y332AN2360	2360	3406	±20	23					
Y332AN3350	3350	4835	±15	27					
Y334AN1520	1520	2194	±30	18					
Y334AN1950	1950	2815	±25	20	±1	V, L	4 cabinets 2030x1415x2015	7500	4E
Y334AN2600	2600	3753	±20	23					
Y334AN3700	3700	5341	±15	27					
Y336AN1660	1660	2396	±30	18					
Y336AN2130	2130	3074	±25	20	±1	V, L	4 cabinets 2030x1415x2015	7900	4E
Y336AN2840	2840	4099	±20	23					
Y336AN4000	4000	5774	±15	27					
Y338AN1800	1800	2598	±30	18					
Y338AN2300	2300	3320	±25	20	±1	V, L	4 cabinets 2030x1415x2015	8300	4E
Y338AN3080	3080	4446	±20	23					
Y338AN4350	4350	6279	±15	27					
Y340AN1930	1930	2786	±30	18					
Y340AN2500	2500	3609	±25	20	±1	V, L	4 cabinets 2030x1415x2015	8700	4E
Y340AN3300	3300	4763	±20	23					
Y340AN4600	4600	6640	±15	27					
Y342AN2070	2070	2988	±30	18					
Y342AN2660	2660	3839	±25	20	±1	V, L	4 cabinets 2030x1415x2015	9200	4E
Y342AN3550	3550	5124	±20	23					

(**) Power available at continuous duty, input voltage at minimum value and T_{amb} +40°C.

Fittings V = voltmeter L = pilot lamp

M2..AS Asymmetrical Models for SINGLE-PHASE 230V 50/60 Hz mains, protection degree IP20 - IP21

Y3..AS Asymmetrical Models for THREE-PHASE 400V 50/60 Hz mains with independent regulation of each phase, protection degree IP21

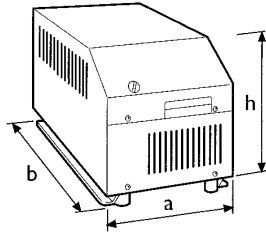


figure A

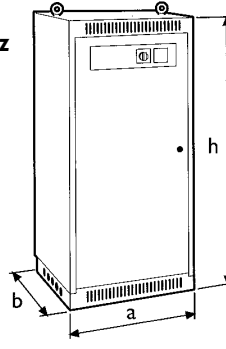


figure D

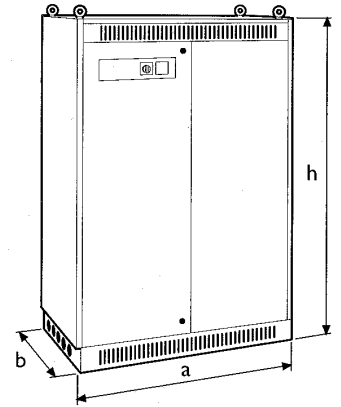


figure E

Ministab

Model	Rated power kVA (**)	Rated current Amps	Voltage variation %	Response time ms/V	Accuracy ±%	Standard fittings	Size mm a x b x h	Weight kg	Figure
M204E-1,1AS	1,1	4,8	+15%, -35%	14	±1.5		210x385x200	20	A
M206E-2,5AS	2,5	11	+15%, -35%	20	±1.5		235x410x240	28	A
M208E-3,5AS	3,5	15	+15%, -35%	23	±1.5		255x425x265	38	A
M210E-7AS	7	30	+15%, -35%	23	±1.5		290x685x285	75	A
M211AN10AS	10	43	+15%, -35%	24	±1	V, L	650x450x1000	110	D
M212AN14AS	14	61	+15%, -35%	24	±1	V, L	650x650x1800	145	D

Sterostab

M213AN18AS	18	78	+15%, -35%	13	±1	V, L	650x650x1300	220	D
M214AN29AS	29	126	+15%, -35%	19	±1	V, L	650x650x1800	280	D
M216AN40AS	40	174	+15%, -35%	19	±1	V, L	650x650x1800	350	D
M217AN59AS	59	257	+15%, -35%	28	±1	V, L	1100x650x1800	490	E
M218AN80AS	80	348	+15%, -35%	21	±1	V, L	1100x650x1800	540	E
M219AN115AS	115	500	+15%, -35%	30	±1	V, L	1100x1100x1800	740	E

Ministab

Y304AN3,3AS	3,3	5	+15%, -35%	8	±1	V, L	650x650x1300	110	D
Y306AN7,5AS	7,5	11	+15%, -35%	12	±1	V, L	650x650x1300	125	D
Y308AN10,5AS	10,5	15	+15%, -35%	14	±1	V, L	650x650x1300	140	D
Y310AN21AS	21	30	+15%, -35%	14	±1	V, L	650x650x1300	280	D
Y311AN30AS	30	43	+15%, -35%	14	±1	V, L	650x650x1800	330	D
Y312AN40AS	40	58	+15%, -35%	15	±1	V, L	650x650x1800	360	E

Sterostab

Y313AN55AS	55	79	+15%, -35%	6	±1	V, L	1100x650x1800	590	E
Y314AN85AS	85	123	+15%, -35%	11	±1	V, L	1100x650x1800	790	E
Y316AN120AS	120	173	+15%, -35%	11	±1	V, L	1100x1100x1800	950	E
Y317AN175AS	175	253	+15%, -35%	16	±1	V, L	1100x1100x1800	1150	E
Y318AN240AS	240	346	+15%, -35%	12	±1	V, L	2 cabinets 1100x1100x1800 + 1100x650x1800	1250 + 450	2E
Y319AN345AS	345	498	+15%, -35%	17	±1	V, L	2 cabinets 1100x1100x1800 + 1100x650x1800	1500 + 480	2E
Y320AN440AS	440	635	+15%, -35%	16	±1	V, L	4 cabinets 1100x1100x1800	3300	4E
Y322AN550AS	550	794	+15%, -35%	18	±1	V, L	4 cabinets 1100x1100x1800	4400	4E
Y324AN800AS	800	1155	+15%, -35%	20	±1	V, L	4 cabinets 1570x1415x2010	5400	4E

(***) Power available at continuous duty, input voltage at minimum value and $T_{Amb} + 40^{\circ}C$.

Fittings V = voltmeter L = pilot lamp

Ministab and Sterostab IP54 indoor

Electrodynamic Voltage Regulators with IP54 protection degree for indoor installation.

Guide to selection and technical data

M2 Models for SINGLE-PHASE 230V mains

M2..AS Asymmetrical Models for SINGLE-PHASE 230V mains

T3 Models for THREE-PHASE 400V mains with common regulation of the three phases

Y3 Models for THREE-PHASE 400V mains with independent regulation of each phase

Y3..AS Asymmetrical Models for SINGLE-PHASE 400V mains with independent regulation of each phase

The models listed in the following tables are contained in metallic cabinets characterized by a protection degree IP54, ensuring protection from dust and splashed water.

According to the international standards, protection degree IP54 means:

IP5X: protection against dust

IPX4: protection against splash from any direction.

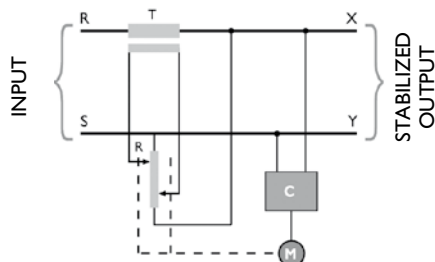
These AVR's are therefore suitable for installation in dusty and very hot indoor environment. Nevertheless they are not suitable for outdoor installation under sun rays where vandalic actions and intrusion attempts can happen, too.

According to the ambient temperature and the amount of dust, two different cooling systems are available: forced ventilation with fans and air conditioning.

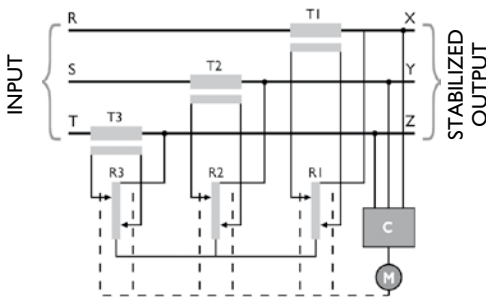
1) The AVR's with forced ventilation by means of fan, identified in the tables by the suffix ...AP, are designed for a max ambient temperature of 40°C.

2) On the contrary, air conditioning always ensures a safe cooling when the ambient temperature exceeds 40°C, when there is high humidity, and/or when the environment is extremely dusty. The models equipped with air conditioner are identified by the suffix ...AK.

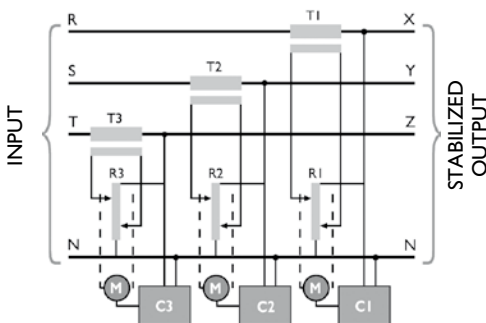
In case of order, it is always necessary to mention the max ambient temperature.



SINGLE-PHASE M STABILIZERS



THREE-PHASE T STABILIZERS



THREE-PHASE Y STABILIZERS

T = buck-boost transformer
R = variable transformer
C = electronic control circuit
M = servomotor

Optional fittings

Ammeter

Frequency meter

Digital multimeter

Remote control

Input or output circuit breaker (with or without earth leakage)

Manual or automatic by-pass

Isolating transformer

Step-up / step-down transformer or autotransformer

Surge arrester (lightning protection)

Over/under voltage protection

Thermal relay

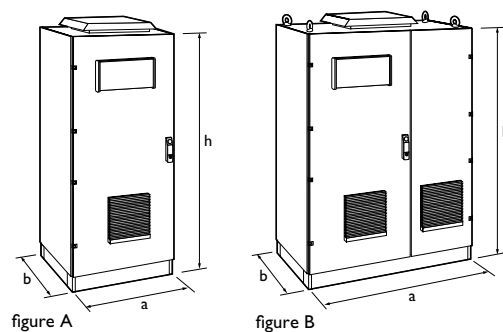
Soft start

Reversed phase sequence and phase failure protection

Tropicalized versions

Customized colours (standard colour: RAL 7035).

M2..AP Models for SINGLE-PHASE 230V 50/60Hz mains, protection degree IP54 INDOOR, forced cooling by means of fan



Ministab

Model	Rated power kVA (**)	Rated current Amps	Voltage variation %	Response time ms/V	Accuracy ±%	Standard fittings	Size mm a x b x h	Weight kg	Figure
M211AP10	10	43	±30	22					
M211AP12	12	52	±25	24					
M211AP15	15	65	±20	28	±1	V,L,OT	650x450x1100	120	A
M211AP22	22	96	±15	31					
M211AP35	35	152	±10	36					
M212AP12	12	52	±30	20					
M212AP15	15	65	±25	26					
M212AP21	21	91	±20	30	±1	V,L,OT	650x450x1100	130	A
M212AP30	30	130	±15	35					
M212AP40	40	174	±10	40					

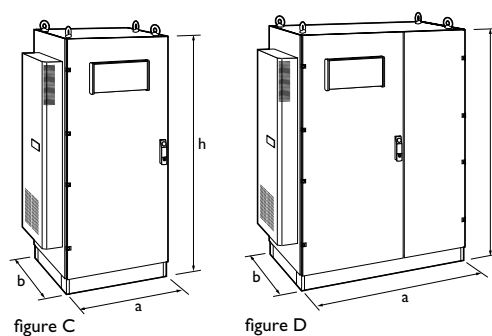
Sterostab

M213AP16	16	70	±30	8					
M213AP18	18	78	±25	9					
M213AP25	25	109	±20	10	±1	V,L,OT	650x650x1400	195	A
M213AP36	36	157	±15	12					
M213AP56	56	243	±10	18					
M214AP23	23	100	±30	18					
M214AP33	33	143	±25	19					
M214AP40	40	174	±20	21	±1	V,L,OT	650x650x1400	250	A
M214AP57	57	248	±15	24					
M214AP87	87	378	±10	31					
M216AP33	33	143	±30	18					
M216AP43	43	187	±25	19					
M216AP60	60	261	±20	21	±1	V,L,OT	650x650x1900	285	A
M216AP83	83	361	±15	24					
M216AP117	117	509	±10	31					
M217AP47	47	204	±30	22					
M217AP60	60	261	±25	24					
M217AP83	83	361	±20	26	±1	V,L,OT	650x650x1900	370	A
M217AP117	117	509	±15	29					
M217AP177	177	770	±10	31					
M218AP62	62	270	±30	20					
M218AP78	78	339	±25	21					
M218AP105	105	457	±20	23	±1	V,L,OT	1100x650x1900	470	B
M218AP150	150	652	±15	26					
M218AP233	233	1013	±10	33					
M219AP92	92	400	±30	23					
M219AP118	118	513	±25	26					
M219AP167	167	726	±20	28	±1	V,L,OT	1100x650x1900	690	B
M219AP233	233	1013	±15	30					
M219AP350	350	1522	±10	32					

(**) Potenza disponibile in servizio continuo a tensione minima di rete e T_{AMB} +40°C.

Fittings V = voltmeter L = pilot lamp OT = overtemperature alarm signal

M2..AK Models for SINGLE-PHASE 230V 50/60Hz mains,
protection degree IP54 INDOOR,
forced cooling by means of air conditioner



Ministab

Model	Rated power kVA (**)	Rated current Amps	Voltage variation %	Response time ms/V	Accuracy ±%	Standard fittings	Size mm a x b x h	Weight kg	Figure
M211AK10	10	43	±30	22					
M211AK12	12	52	±25	24					
M211AK15	15	65	±20	28	±1	V,L,OT	860x450x1000	170	C
M211AK22	22	96	±15	31					
M211AK35	35	152	±10	36					
M212AK12	12	52	±30	20					
M212AK15	15	65	±25	26					
M212AK21	21	91	±20	30	±1	V,L,OT	860x450x1000	180	C
M212AK30	30	130	±15	35					
M212AK40	40	174	±10	40					

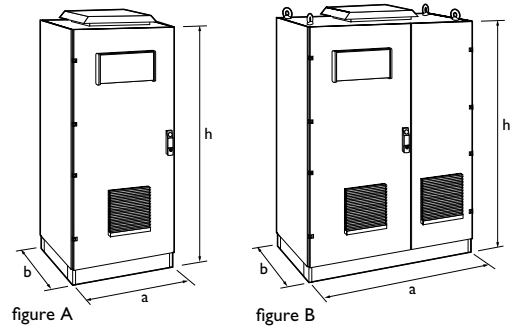
Sterostab

M213AK16	16	70	±30	8					
M213AK18	18	78	±25	9					
M213AK25	25	109	±20	10	±1	V,L,OT	830x650x1300	246	C
M213AK36	36	157	±15	12					
M213AK56	56	243	±10	18					
M214AK23	25	100	±30	18					
M214AK33	30	143	±25	19					
M214AK40	42	174	±20	21	±1	V,L,OT	830x650x1300	296	C
M214AK57	59	248	±15	24					
M214AK87	87	378	±10	31					
M216AK33	33	143	±30	18					
M216AK43	43	187	±25	19					
M216AK60	60	261	±20	21	±1	V,L,OT	830x650x1800	336	C
M216AK83	83	361	±15	24					
M216AK117	117	509	±10	31					
M217AK47	47	204	±30	22					
M217AK60	60	261	±25	24					
M217AK83	83	361	±20	26	±1	V,L,OT	830x650x1800	420	C
M217AK117	117	509	±15	29					
M217AK177	177	770	±10	31					
M218AK62	62	270	±30	20					
M218AK78	78	339	±25	21					
M218AK105	105	457	±20	23	±1	V,L,OT	1340x650x1800	520	D
M218AK150	150	652	±15	26					
M218AK233	233	1013	±10	33					
M219AK92	92	400	±30	23					
M219AK118	118	513	±25	26					
M219AK167	167	726	±20	28	±1	V,L,OT	1340x650x1800	740	D
M219AK233	233	1013	±15	30					
M219AK350	350	1522	±10	32					

Fittings V = voltmeter L = pilot lamp OT = overtemperature alarm signal

(**) Potenza disponibile in servizio continuo a tensione minima di rete e T_{AMB} +40°C.

T3..AP Models for THREE-PHASE 400V 50/60Hz mains with regulation on the average of the three phases, protection degree IP54 INDOOR, forced cooling by means of fan



Ministab

Model	Rated power kVA (**)	Rated current Amps	Voltage variation %	Response time ms/V	Accuracy ±%	Standard fittings	Size mm a x b x h	Weight kg	Figure
T308AP10	10	14	±30	15					
T308AP13	13	19	±25	16					
T308AP17	17	25	±20	18	±1	V, L, OT	650x450x1100	130	A
T308AP22	22	32	±15	21					
T308AP31	31	45	±10	21					

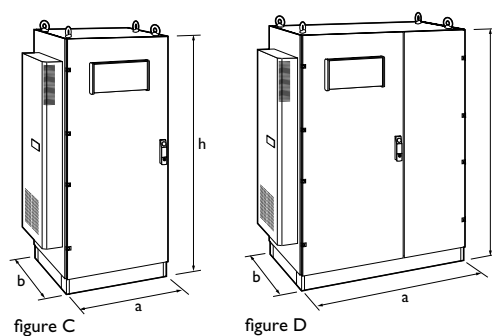
Sterostab

T310AP22	22	32	±30	10					
T310AP30	30	43	±25	11					
T310AP40	40	58	±20	13	±1	V, L, OT	650x650x1400	260	A
T310AP55	55	79	±15	14					
T310AP85	85	123	±10	18					
T312AP35	35	51	±30	10					
T312AP46	46	66	±25	11					
T312AP58	58	84	±20	12	±1	V, L, OT	650x650x1400	290	A
T312AP85	85	123	±15	14					
T312AP115	115	166	±10	18					
T314AP50	50	72	±30	10					
T314AP60	60	87	±25	11					
T314AP80	80	115	±20	12	±1	V, L, OT	650x650x1400	365	A
T314AP120	120	173	±15	14					
T314AP180	180	260	±10	18					
T315AP70	70	101	±30	14					
T315AP90	90	130	±25	16					
T315AP120	120	173	±20	17	±1	V, L, OT	650x650x1900	430	A
T315AP170	170	245	±15	20					
T315AP270	270	390	±10	26					
T316AP100	100	144	±30	12					
T316AP135	135	195	±25	13					
T316AP170	170	245	±20	14	±1	V, L, OT	1100x650x1900	650	B
T316AP250	250	361	±15	17					
T316AP390	390	563	±10	22					
T318AP140	140	202	±30	14					
T318AP180	180	260	±25	16					
T318AP240	240	346	±20	18	±1	V, L, OT	1100x650x1900	930	B
T318AP340	340	491	±15	20					
T318AP540	540	779	±10	26					
T319AP210	210	303	±30	21					
T319AP270	270	390	±25	23				1300	
T319AP360	360	520	±20	26	±1	V, L, OT	1570x1514x2110		B
T319AP510	510	736	±15	29				1420	
T319AP800	800	1155	±10	32					

(**) Potenza disponibile in servizio continuo a tensione minima di rete e T_{AMB} +40°C.

Fittings V = voltmeter L = pilot lamp OT = overtemperature alarm signal

T3..AK Models for THREE-PHASE 400V 50/60Hz mains with regulation on the average of the three phases, protection degree IP54 INDOOR, forced cooling by means of air conditioner



Ministab

Model	Rated power kVA (**)	Rated current Amps	Voltage variation %	Response time ms/V	Accuracy ±%	Standard fittings	Size mm a x b x h	Weight kg	Figure
T308AK10	10	14	±30	15	±1	V, L, OT	830x450x1100	180	C
T308AK13	13	19	±25	16					
T308AK17	17	25	±20	18					
T308AK22	22	32	±15	21					
T308AK31	31	45	±10	21					

Sterostab

T310AK22	22	32	±30	10	±1	V, L, OT	830x650x1300	310	C
T310AK30	30	43	±25	11					
T310AK40	40	58	±20	13					
T310AK55	55	79	±15	14					
T310AK85	85	123	±10	18					
T312AK35	35	51	±30	10	±1	V, L, OT	850x650x1300	380	C
T312AK46	46	66	±25	11					
T312AK58	58	84	±20	12					
T312AK85	85	123	±15	14					
T312AK115	115	166	±10	18					
T314AK50	50	72	±30	10	±1	V, L, OT	830x650x1300	415	C
T314AK60	60	87	±25	11					
T314AK80	80	115	±20	12					
T314AK120	120	173	±15	14					
T314AK180	180	260	±10	18					
T315AK70	70	101	±30	14	±1	V, L, OT	830x650x1800	480	C
T315AK90	90	130	±25	16					
T315AK120	120	173	±20	17					
T315AK170	170	245	±15	20					
T315AK270	270	390	±10	26					
T316AK100	100	144	±30	12	±1	V, L, OT	1340x650x1800	680	D
T316AK135	135	195	±25	13					
T316AK170	170	245	±20	14					
T316AK250	250	361	±15	17					
T316AK390	390	563	±10	22					
T318AK140	140	202	±30	14	±1	V, L, OT	1460x650x1800	1120	D
T318AK180	180	260	±25	16					
T318AK240	240	346	±20	18					
T318AK340	340	491	±15	20					
T318AK540	540	779	±10	26					
T319AK210	210	303	±30	21	±1	V, L, OT	1930x1415x2010	1350	D
T319AK270	270	390	±25	23					
T319AK360	360	520	±20	26					
T319AK510	510	736	±15	29					
T319AK800	800	1155	±10	46					

Fittings V = voltmeter L = pilot lamp OT = overtemperature alarm signal

(**) Potenza disponibile in servizio continuo a tensione minima di rete e T_{AMB} +40°C.

Y3..AP Models for THREE-PHASE 400V 50/60Hz mains with independent regulation on each phase, protection degree IP54 INDOOR, forced cooling by means of fan

Ministab

Model	Rated power kVA (**)	Rated current Amps	Voltage variation %	Response time ms/V	Accuracy ±%	Standard fittings	Size mm a x b x h	Weight kg	Figure
Y306AP6	6	9	±30	11	±1	V, L, OT	650x450x1100	125	A
Y306AP9	9	13	±25	12					
Y306AP12	12	17	±20	14					
Y306AP15	15	22	±15	16					
Y306AP24	24	35	±10	19					
Y308AP9	9	13	±30	13	±1	V, L, OT	650x450x1100	150	A
Y308AP15	15	22	±25	14					
Y308AP18	18	26	±20	16					
Y308AP21	21	30	±15	18					
Y308AP30	30	43	±10	21					
Y310AP18	18	26	±30	13	±1	V, L, OT	650x450x1100	230	A
Y310AP24	24	35	±25	14					
Y310AP30	30	43	±20	16					
Y310AP45	45	65	±15	18					
Y310AP60	60	87	±10	21					
Y311AP30	30	43	±30	13	±1	V, L, OT	650x650x1400	270	A
Y311AP36	36	52	±25	14					
Y311AP46	46	66	±20	16					
Y311AP66	66	95	±15	18					
Y311AP105	105	152	±10	21					
Y312AP36	36	52	±30	14	±1	V, L, OT	650x650x1400	320	A
Y312AP45	45	65	±25	15					
Y312AP60	60	87	±20	24					
Y312AP90	90	130	±15	28					
Y312AP120	120	173	±10	32					

Sterostab

Y313AP46	46	66	±30	10	±1	V, L, OT	650x650x1900	490	A
Y313AP55	55	79	±25	12					
Y313AP75	75	108	±20	14					
Y313AP110	110	159	±15	16					
Y313AP170	170	245	±10	18					
Y314AP70	70	101	±30	10	±1	V, L, OT	1100x650x1900	580	B
Y314AP100	100	144	±25	11					
Y314AP120	120	173	±20	12					
Y314AP170	170	245	±15	16					
Y314AP260	260	375	±10	18					
Y316AP100	100	144	±30	10	±1	V, L, OT	1100x650x1900	645	B
Y316AP130	130	188	±25	11					
Y316AP180	180	260	±20	12					
Y316AP250	250	361	±15	16					
Y316AP350	350	505	±10	18					
Y317AP140	140	202	±30	15	±1	V, L, OT	1100x650x1900	800	B
Y317AP180	180	260	±25	16					
Y317AP250	250	361	±20	17					
Y317AP350	350	505	±15	20					
Y317AP530	530	765	±10	26					
Y318AP185	185	267	±30	11	±1	V, L, OT	1100x1100x1900	1245	B
Y318AP235	235	339	±25	12					
Y318AP315	315	455	±20	13					
Y318AP450	450	650	±15	15					
Y318AP700	700	1010	±10	19					
Y319AP275	275	397	±30	16	±1	V, L, OT	1570x1415x2110	1800	B
Y319AP355	355	512	±25	17					
Y319AP500	500	722	±20	19					
Y319AP700	700	1010	±15	22					
Y319AP1050	1050	1516	±10	27					
Y320AP410	410	592	±30	13	±1	V, L, OT	3 cabinets 1100x1100x1900 cad.	3000	3B
Y320AP530	530	765	±25	14					
Y320AP710	710	1025	±20	16					
Y320AP1000	1000	1443	±15	21					
Y320AP1570	1570	2266	±10	24					

(**) Potenza disponibile in servizio continuo a tensione minima di rete e T_{AMB} +40°C.

Fittings V = voltmeter L = pilot lamp OT = overtemperature alarm signal

Y3..AK Models for THREE-PHASE 400V 50/60Hz mains with independent regulation on each phase, protection degree IP54 INDOOR, forced cooling by means of air conditioner

Ministab

Model	Rated power kVA (**)	Rated current Amps	Voltage variation %	Response time ms/V	Accuracy ±%	Standard fittings	Size mm a x b x h	Weight kg	Figure
Y306AK6	6	9	±30	11					
Y306AK9	9	13	±25	12					
Y306AK12	12	17	±20	14	±1	V, L, OT	830x450x1000	175	C
Y306AK15	15	22	±15	16					
Y306AK24	24	35	±10	19					
Y308AK9	9	13	±30	13					
Y308AK15	15	22	±25	14					
Y308AK18	18	26	±20	16	±1	V, L, OT	830x450x1000	200	C
Y308AK21	21	30	±15	18					
Y308AK30	30	43	±10	21					
Y310AK18	18	26	±30	13					
Y310AK24	24	35	±25	14					
Y310AK30	30	43	±20	16	±1	V, L, OT	830x450x1000	280	C
Y310AK45	45	65	±15	18					
Y310AK60	60	87	±10	21					
Y311AK30	30	43	±30	13					
Y311AK36	36	52	±25	14					
Y311AK46	46	66	±20	16	±1	V, L, OT	830x650x1300	320	C
Y311AK66	66	95	±15	18					
Y311AK105	105	152	±10	21					
Y312AK36	36	52	±30	14					
Y312AK45	45	65	±25	15					
Y312AK60	60	87	±20	24	±1	V, L, OT	830x650x1300	390	C
Y312AK90	90	130	±15	28					
Y312AK120	120	173	±10	32					

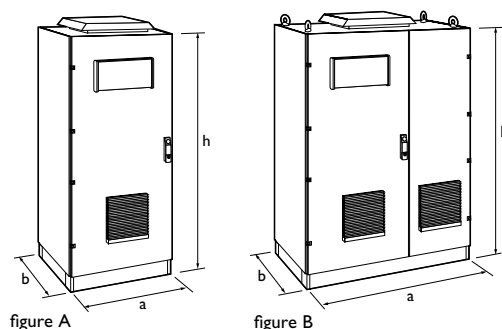
Sterostab

Y313AK46	46	66	±30	10					
Y313AK55	55	79	±25	12					
Y313AK75	75	108	±20	14	±1	V, L, OT	830x650x1800	550	D
Y313AK110	110	159	±15	16					
Y313AK170	170	245	±10	18					
Y314AK70	70	101	±30	10					
Y314AK100	100	144	±25	11					
Y314AK120	120	173	±20	12	±1	V, L, OT	1340x650x1800	630	D
Y314AK170	170	245	±15	16					
Y314AK260	260	375	±10	18					
Y316AK100	100	144	±30	10					
Y316AK135	135	188	±25	11					
Y316AK180	180	260	±20	12	±1	V, L, OT	1340x650x1800	700	D
Y316AK250	250	361	±15	16					
Y316AK350	350	505	±10	18					
Y317AK140	140	202	±30	15					
Y317AK180	180	260	±25	16					
Y317AK250	250	361	±20	17	±1	V, L, OT	1340x650x1800	870	D
Y317AK350	350	505	±15	20					
Y317AK530	530	765	±10	26					
Y318AK185	185	267	±30	11					
Y318AK235	235	339	±25	12					
Y318AK315	315	455	±20	13	±1	V, L, OT	1460x1100x1800	1320	D
Y318AK450	450	650	±15	15					
Y318AK700	700	1010	±10	19					
Y319AK275	275	397	±30	16					
Y319AK355	355	512	±25	17					
Y319AK500	500	722	±20	19	±1	V, L, OT	2030x1415x2110	2050	D
Y319AK700	700	1010	±15	22					
Y319AK1050	1050	1516	±10	27					
Y320AK410	410	592	±30	13					
Y320AK530	530	765	±25	14					
Y320AK710	710	1025	±20	16	±1	V, L, OT	3 cabinets 1460x1100x1800 cad.	3150	3D
Y320AK1000	1000	1443	±15	21					
Y320AK1570	1570	2266	±10	24					

Fittings V = voltmeter L = pilot lamp OT = overtemperature alarm signal

(**) Potenza disponibile in servizio continuo a tensione minima di rete e T_{AMB} +40°C.

M2..APAS *Asymmetrical Models for SINGLE-PHASE 230V 50/60Hz mains* Protection degree IP54 INDOOR, forced cooling by means of fan



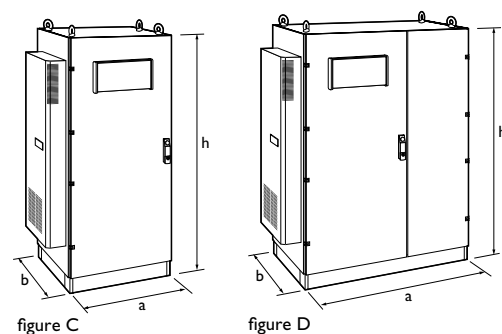
Ministab

Model	Rated power kVA (**)	Rated current Amps	Voltage variation %	Response time ms/V	Accuracy ±%	Standard fittings	Size mm a x b x h	Weight kg	Figure
M211AP10AS	10	43	+15% -35%	24	±1	V, L, OT	650x650x1400	121	A
M212AP14AS	14	61	+15% -35%	24	±1	V, L, OT	650x650x1900	155	A

Sterostab

M213AP18AS	18	78	+15% -35%	13	±1	V, L, OT	650x650x1400	245	A
M214AP29AS	29	126	+15% -35%	19	±1	V, L, OT	650x650x1900	320	A
M216AP40AS	40	174	+15% -35%	19	±1	V, L, OT	650x650x1900	390	A
M217AP59AS	59	257	+15% -35%	28	±1	V, L, OT	1100x650x1900	510	B
M218AP80AS	80	348	+15% -35%	21	±1	V, L, OT	1100x650x1900	570	B
M219AP115AS	115	500	+15% -35%	30	±1	V, L, OT	1100x1100x1900	800	B

M2..AKAS *Asymmetrical Models for SINGLE-PHASE 230V 50/60Hz mains* Protection degree IP54 INDOOR, forced cooling by means of air conditioner



Ministab

M211AK10AS	10	43	+15% -35%	24	±1	V, L, OT	830X650X1300	172	C
M212AK14AS	14	61	+15% -35%	24	±1	V, L, OT	830X650X1800	182	C

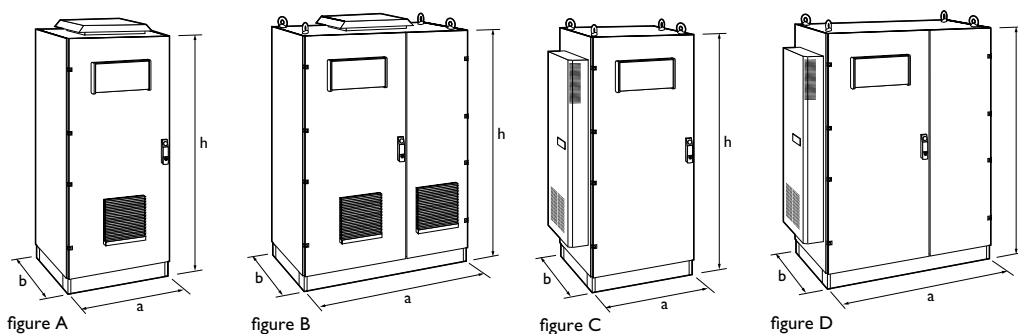
Sterostab

M213AK18AS	18	78	+15% -35%	13	±1	V, L, OT	830X650X1300	296	C
M214AK29AS	29	126	+15% -35%	19	±1	V, L, OT	830X650X1800	370	C
M216AK40AS	40	174	+15% -35%	19	±1	V, L, OT	830X650X1800	440	C
M217AK59AS	59	257	+15% -35%	28	±1	V, L, OT	1340X650X1800	576	D
M218AK80AS	80	348	+15% -35%	21	±1	V, L, OT	1340X650X1800	636	D
M219AK115AS	115	500	+15% -35%	30	±1	V, L, OT	1460X1100X1800	840	D

(**) Potenza disponibile in servizio continuo a tensione minima di rete e $T_{AMB} +40^{\circ}C$.

Fittings V = voltmeter L = pilot lamp OT = overtemperature alarm signal

Y3..APAS *Asymmetrical Models for THREE-PHASE 400V 50/60Hz mains with independent regulation on each phase, protection degree IP54 INDOOR, forced cooling by means of fan*



Ministab

Model	Rated power kVA (**)	Rated current Amps	Voltage variation %	Response time ms/V	Accuracy ±%	Standard fittings	Size mm a x b x h	Weight kg	Figure
Y306AP7,5AS	7,5	11	+15%, -35%	12	±1	V, L, OT	650x650x1400	130	A
Y308AP10,5AS	10,5	15	+15%, -35%	14	±1	V, L, OT	650x650x1400	145	A
Y310AP21AS	21	30	+15%, -35%	14	±1	V, L, OT	650x650x1400	285	A
Y311AP30AS	30	43	+15%, -35%	14	±1	V, L, OT	650x650x1900	345	A
Y312AP40AS	40	58	+15%, -35%	15	±1	V, L, OT	650x650x1900	400	A

Sterostab

Y313AP55AS	55	79	+15%, -35%	11	±1	V, L, OT	1100x650x1900	600	B
Y314AP85AS	85	123	+15%, -35%	11	±1	V, L, OT	1100x650x1900	820	B
Y316AP120AS	120	173	+15%, -35%	11	±1	V, L, OT	1100x1100x1900	960	B
Y317AP175AS	175	253	+15%, -35%	16	±1	V, L, OT	1100x1100x1900	1280	B
Y318AP240AS	240	346	+15%, -35%	12	±1	V, L, OT	1100x1100x1900 + 1100x650x1900	1800	2B
Y319AP345AS	345	498	+15%, -35%	17	±1	V, L, OT	1100x1100x1900 + 1100x650x1900	2200	2B
Y320AP440AS	440	635	+15%, -35%	16	±1	V, L, OT	4x1100x1100x1900 cad.	3500	4B

Y3..AKAS *Asymmetrical Models for THREE-PHASE 400V 50/60Hz mains with independent regulation on each phase, protection degree IP54 INDOOR, forced cooling by means of air conditioner*

Ministab

Y306AK7,5AS	7,5	11	+15%, -35%	12	±1	V, L, OT	830x650x1300	180	C
Y308AK10,5AS	10,5	15	+15%, -35%	14	±1	V, L, OT	830x650x1300	200	C
Y310AK21AS	21	30	+15%, -35%	14	±1	V, L, OT	830x650x1300	340	C
Y311AK30AS	30	43	+15%, -35%	14	±1	V, L, OT	830x650x1800	390	C
Y312AK40AS	40	58	+15%, -35%	15	±1	V, L, OT	830x650x1800	520	C

Sterostab

Y313AK55AS	55	79	+15%, -35%	11	±1	V, L, OT	1340x650x1800	630	D
Y314AK85AS	85	123	+15%, -35%	11	±1	V, L, OT	1460x650x1800	840	D
Y316AK120AS	120	173	+15%, -35%	11	±1	V, L, OT	1460x1100x1800	1010	D
Y317AK175AS	175	253	+15%, -35%	16	±1	V, L, OT	1460x1100x1800	1350	D
Y318AK240AS	240	346	+15%, -35%	12	±1	V, L, OT	1460x1100x1800 + 1460x650x1800	1900	2D
Y319AK345AS	345	498	+15%, -35%	17	±1	V, L, OT	1460x1100x1800 + 1460x650x1800	2300	2D
Y320AK440AS	440	635	+15%, -35%	16	±1	V, L, OT	4 unità 1460X1100X1800	3710	4D

Fittings V = voltmeter L = pilot lamp OT = overtemperature alarm signal

(**) Potenza disponibile in servizio continuo a tensione minima di rete e T_{AMB} +40°C.

Ministab and Sterostab IP54 outdoor

Electrodynamic Voltage Regulators with IP54 protection degree for outdoor installation.

Guide to selection and technical data

M2..XP Models for SINGLE-PHASE 230V 50/60Hz mains, protection degree IP54 OUTDOOR, forced cooling by means of fan

M2..XPAS Asymmetrical Models for SINGLE-PHASE 230V mains, protection degree IP54 OUTDOOR, forced cooling by means of fan

T3..XP Models for THREE-PHASE 400V mains with regulation on the average of the three phases, protection degree IP54 OUTDOOR, forced cooling by means of fan

Y3..XP Models for THREE-PHASE 400V mains with independent regulation on each phase, protection degree IP54 OUTDOOR, forced cooling by means of fan

Y3..XPAS Asymmetrical Models for THREE-PHASE 400V mains with independent regulation on each phase, protection degree IP54 OUTDOOR, forced cooling by means of fan

The models listed in the following tables are contained in metallic cabinets characterized by a protection degree IP54, allowing an outdoor installation, that ensures protection from dust, splashed water and solar irradiation.

According to the international standards, protection degree IP54 means:

IP5X: protection against dust

IPX4: protection against splash from any direction.

In comparison with IP54 indoor models these version are made with

- 1) special metal enclosures protected by means of
 - cathoporesis treatment
 - epoxidic powder coating UV rays resistant
- 2) no screws on the external side of the cabinet,
- 3) specific frame to anchor the stabilizer to the concrete base,
- 4) double top to protect against direct solar irradiation,
- 5) filters with weather-proof protection.

In case of order, it is always necessary to mention the max ambient temperature.

Optional fittings

Ammeter

Frequency meter

Digital multimeter

Remote control

Input or output circuit breaker (with or without earth leakage)

Manual or automatic by-pass

Isolating transformer

Step-up / step-down transformer or autotransformer

Surge arrester (lightning protection)

Over/under voltage protection

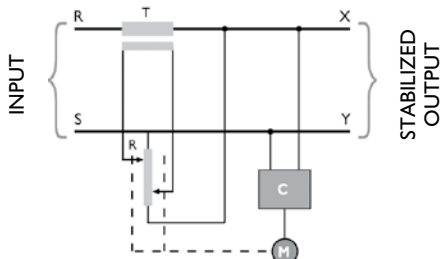
Thermal relay

Soft start

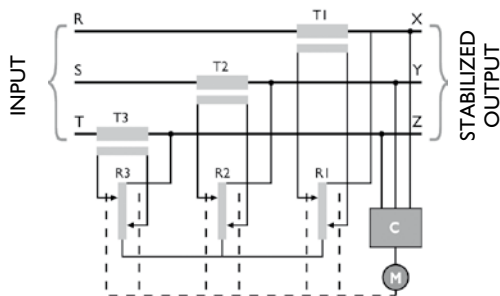
Reversed phase sequence and phase failure protection

Tropicalized versions

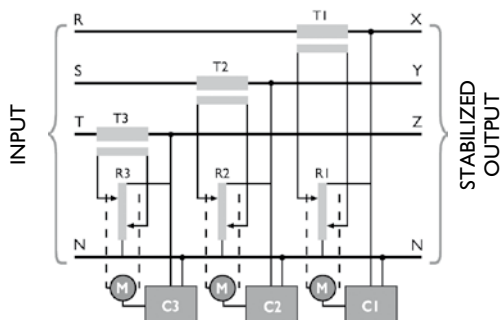
Customized colour (standard colour: RAL 7035).



SINGLE-PHASE M STABILIZERS



THREE-PHASE T STABILIZERS



THREE-PHASE Y STABILIZERS

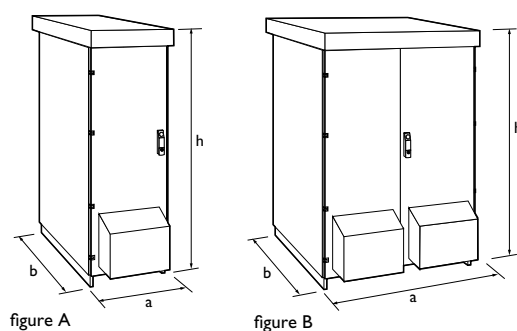
T = buck-boost transformer

R = variable transformer

C = electronic control circuit

M = servomotor

M2..XP Models for SINGLE-PHASE 230V 50/60Hz mains, protection degree IP54 OUTDOOR, forced cooling by means of fan



Ministab

Model	Rated power kVA (**)	Rated current Amps	Voltage variation %	Response time ms/V	Accuracy ±%	Standard fittings	Size mm a x b x h	Weight kg	Figure
M210XP6	6	26	±30	24	±1	V,L,OT	755x625x1130	75	A
M210XP8	8	35	±25	25					
M210XP10	10	43	±20	27					
M210XP15	15	65	±15	30					
M210XP20	20	87	±10	35					
M211XP10	10	43	±30	22					
M211XP12	12	52	±25	24	±1	V,L,OT	755x625x1130	100	A
M211XP15	15	65	±20	28					
M211XP22	22	96	±15	31					
M211XP35	35	152	±10	36					
M212XP12	12	52	±30	20	±1	V,L,OT	755x825x1440	130	A
M212XP15	15	65	±25	26					
M212XP21	21	91	±20	42					
M212XP30	30	130	±15	58					
M212XP40	40	174	±10	64					

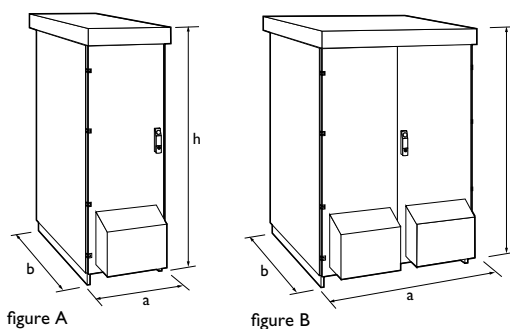
Sterostab

M213XP16	16	70	±30	8	±1	V,L,OT	755x825x1440	195	A
M213XP18	18	78	±25	9					
M213XP25	25	109	±20	10					
M213XP36	36	157	±15	12					
M213XP56	56	243	±10	18					
M214XP23	23	100	±30	18					
M214XP33	33	143	±25	19					
M214XP40	40	174	±20	21					
M214XP57	57	248	±15	24					
M214XP87	87	378	±10	31					
M216XP33	33	143	±30	18	±1	V,L,OT	755x825x1940	285	A
M216XP43	43	187	±25	19					
M216XP60	60	261	±20	21					
M216XP83	83	361	±15	24					
M216XP117	117	509	±10	31					
M217XP47	47	204	±30	22					
M217XP60	60	261	±25	24					
M217XP83	83	361	±20	26					
M217XP117	117	509	±15	29					
M217XP177	177	770	±10	31					
M218XP62	62	270	±30	20	±1	V,L,OT	1195x825x1940	470	B
M218XP78	78	339	±25	21					
M218XP105	105	457	±20	23					
M218XP150	150	652	±15	26					
M218XP233	233	1013	±10	33					
M219XP92	92	400	±30	23					
M219XP118	118	513	±25	26					
M219XP167	167	726	±20	28					
M219XP233	233	1013	±15	30					
M219XP350	350	1522	±10	32					

(**) Potenza disponibile in servizio continuo a tensione minima di rete e T_{AMB} +40°C.

Fittings V = voltmeter L = pilot lamp OT = overtemperature alarm signal

M2..XPAS Asymmetrical Models for SINGLE-PHASE 230V 50/60Hz mains, protection degree IP54 OUTDOOR, forced cooling by means of fan



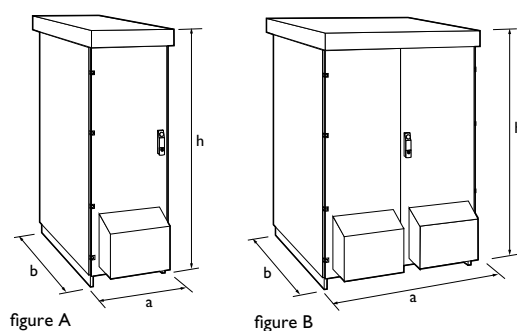
Ministab

Model	Rated power kVA (**)	Rated current Amps	Voltage variation %	Response time ms/V	Accuracy ±%	Standard fittings	Size mm a x b x h	Weight kg	Figure
M210XP7AS	7	30	+15% -35%	23	±1	V, L, OT	755x625x1130	105	A
M211XP10AS	10	43	+15% -35%	24	±1	V, L, OT	755x625x1130	140	A
M212XP14AS	14	61	+15% -35%	24	±1	V, L, OT	755x825x1440	155	A

Sterostab

M213XP18AS	18	78	+15% -35%	13	±1	V, L, OT	755x825x1440	275	A
M214XP29AS	29	126	+15% -35%	19	±1	V, L, OT	755x825x1940	350	A
M216XP40AS	40	174	+15% -35%	19	±1	V, L, OT	755x825x1940	420	A
M217XP59AS	59	257	+15% -35%	28	±1	V, L, OT	1195x825x1940	560	B
M218XP80AS	80	348	+15% -35%	21	±1	V, L, OT	1195x825x1940	620	B
M219XP115AS	115	500	+15% -35%	30	±1	V, L, OT	1195x825x1940	820	B

T3..XP Models for THREE-PHASE 400V 50/60Hz mains with regulation on the average of the three phases, protection degree IP54 OUTDOOR, forced cooling by means of fan



Ministab

Model	Rated power kVA (**)	Rated current Amps	Voltage variation %	Response time ms/V	Accuracy ±%	Standard fittings	Size mm a x b x h	Weight kg	Figure
T308XP10	10	14	±30	15					
T308XP13	13	19	±25	16					
T308XP17	17	25	±20	18	±1	V,L,OT	755x825x1440	150	A
T308XP22	22	32	±15	21					
T308XP31	31	45	±10	21					

Sterostab

T310XP22	22	32	±30	10					
T310XP30	30	43	±25	11					
T310XP40	40	58	±20	13	±1	V, L, OT	755x825x1440	275	A
T310XP55	55	79	±15	14					
T310XP85	85	123	±10	18					
T312XP35	35	51	±30	10					
T312XP46	46	66	±25	11					
T312XP58	58	84	±20	12	±1	V, L, OT	755x825x1440	325	A
T312XP85	85	123	±15	14					
T312XP115	115	166	±10	18					
T314XP50	50	72	±30	10					
T314XP60	60	87	±25	11					
T314XP80	80	115	±20	12	±1	V, L, OT	755x825x1440	390	A
T314XP120	120	173	±15	14					
T314XP180	180	260	±10	18					
T315XP70	70	101	±30	14					
T315XP90	90	130	±25	16					
T315XP120	120	173	±20	17	±1	V, L, OT	755x825x1940	480	A
T315XP170	170	245	±15	20					
T315XP270	270	390	±10	26					
T316XP100	100	144	±30	12					
T316XP135	135	195	±25	13					
T316XP170	170	245	±20	14	±1	V, L, OT	1195x825x1940	710	B
T316XP250	250	361	±15	17					
T316XP390	390	563	±10	22					
T318XP140	140	202	±30	14					
T318XP180	180	260	±25	16					
T318XP240	240	346	±20	18	±1	V, L, OT	1195x825x1940	1040	B
T318XP340	340	491	±15	20					
T318XP540	540	779	±10	26					
T319XP210	210	303	±30	21					
T319XP270	270	390	±25	23				1480	
T319XP360	360	520	±20	26	±1	V, L, OT	1620x1525x2140		B
T319XP510	510	736	±15	29				1540	
T319XP800	800	1155	±10	32					

(**) Potenza disponibile in servizio continuo a tensione minima di rete e T_{AMB} +40°C.

Fittings V = voltmeter L = pilot lamp OT = overtemperature alarm signal

Y3..XP Models for THREE-PHASE 400V 50/60Hz mains with independent regulation on each phase, protection degree IP54 OUTDOOR, forced cooling by means of fan

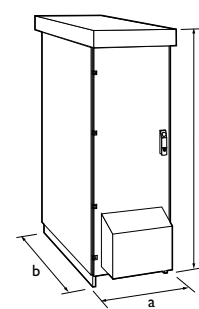


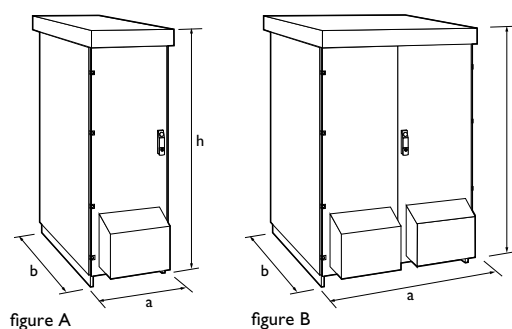
figure A

Ministab

Model	Rated power kVA (**)	Rated current Amps	Voltage variation %	Response time ms/V	Accuracy ±%	Standard fittings	Size mm a x b x h	Weight kg	Figure
Y306XP6	6	9	±30	11					
Y306XP9	9	13	±25	12					
Y306XP12	12	17	±20	14	±1	V, L, OT	755x625x1130	145	A
Y306XP15	15	22	±15	16					
Y306XP24	24	35	±10	19					
Y308XP9	9	13	±30	13					
Y308XP15	15	22	±25	14					
Y308XP18	18	26	±20	16	±1	V, L, OT	755x825x1440	170	A
Y308XP21	21	30	±15	18					
Y308XP30	30	43	±10	21					
Y310XP18	18	26	±30	13					
Y310XP24	24	35	±25	14					
Y310XP30	30	43	±20	16	±1	V, L, OT	755x825x1440	220	A
Y310XP45	45	65	±15	18					
Y310XP60	60	87	±10	21					
Y311XP30	30	43	±30	13					
Y311XP36	36	52	±25	14					
Y311XP46	46	66	±20	16	±1	V, L, OT	755x825x1440	320	A
Y311XP66	66	95	±15	18					
Y311XP105	105	152	±10	21					
Y312XP36	36	52	±30	14					
Y312XP45	45	65	±25	15					
Y312XP60	60	87	±20	24	±1	V, L, OT	755x825x1440	330	A
Y312XP90	90	130	±15	28					
Y312XP120	120	173	±10	32					

(**) Potenza disponibile in servizio continuo a tensione minima di rete e T_{AMB} +40°C.

Y3..XP Models for THREE-PHASE 400V 50/60Hz mains with independent regulation on each phase, protection degree IP54 OUTDOOR, forced cooling by means of fan



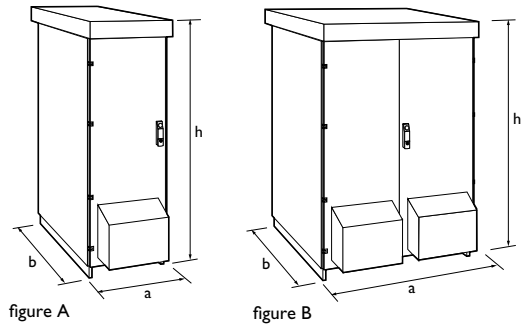
Sterostab

Model	Rated power kVA (**)	Rated current Amps	Voltage variation %	Response time ms/V	Accuracy ±%	Standard fittings	Size mm a x b x h	Weight kg	Figure
Y313XP46	46	66	±30	10	±1	V, L, OT	755x825x1940	510	A
Y313XP55	55	79	±25	12					
Y313XP75	75	108	±20	14					
Y313XP110	110	159	±15	16					
Y313XP170	170	245	±10	18					
Y314XP70	70	101	±30	10	±1	V, L, OT	1195x825x1940	620	B
Y314XP100	100	144	±25	11					
Y314XP120	120	173	±20	12					
Y314XP170	170	245	±15	16					
Y314XP260	260	375	±10	18					
Y316XP100	100	144	±30	10	±1	V, L, OT	1195x825x1940	720	B
Y316XP130	130	188	±25	11					
Y316XP180	180	260	±20	12					
Y316XP250	250	361	±15	16					
Y316XP350	350	505	±10	18					
Y317XP140	140	202	±30	15	±1	V, L, OT	1195x825x1940	890	B
Y317XP180	180	260	±25	16					
Y317XP250	250	361	±20	17					
Y317XP350	350	505	±15	20					
Y317XP530	530	765	±10	26					
Y318XP185	185	267	±30	11	±1	V, L, OT	1195x1310x1940	1295	B
Y318XP235	235	339	±25	12					
Y318XP315	315	455	±20	13					
Y318XP450	450	650	±15	15					
Y318XP700	700	1010	±10	19					
Y319XP275	275	397	±30	16	±1	V, L, OT	1620x1525x2140	1900	B
Y319XP355	355	512	±25	17					
Y319XP500	500	722	±20	19					
Y319XP700	700	1010	±15	22					
Y319XP1050	1050	1516	±10	27					
Y320XP410	410	592	±30	13	±1	V, L, OT	3 cabinets 1195x1310x1940 cad.	3000	3B
Y320XP530	530	765	±25	14					
Y320XP710	710	1025	±20	16					
Y320XP1000	1000	1443	±15	21					
Y320XP1570	1570	2266	±10	24					

(***) Potenza disponibile in servizio continuo a tensione minima di rete e $T_{AMB} +40^{\circ}C$.

Fittings V = voltmeter L = pilot lamp OT = overtemperature alarm signal

Y3..XPAS *Asymmetrical Models for THREE-PHASE 400V 50/60Hz mains with independent regulation on each phase, protection degree IP54 OUTDOOR, forced cooling by means of fan*



Ministab

Model	Rated power kVA (**)	Rated current Amps	Voltage variation %	Response time ms/V	Accuracy ±%	Standard fittings	Size mm a x b x h	Weight kg	Figure
Y308XP10,5AS	10,5	15	+15%, -35%	14	±1	V, L,OT	755x825x1440	165	A
Y310XP21AS	21	30	+15%, -35%	14	±1	V, L,OT	755x825x1440	310	A
Y311XP30AS	30	43	+15%, -35%	14	±1	V, L,OT	755x825x1940	360	A
Y312XP40AS	40	58	+15%, -35%	15	±1	V, L,OT	755x825x1940	400	A

Sterostab

Y313XP55AS	55	79	+15%, -35%	11	±1	V, L,OT	1195x825x1940	610	B
Y314XP85AS	85	123	+15%, -35%	11	±1	V, L,OT	1195x825x1940	830	B
Y316XP120AS	120	173	+15%, -35%	11	±1	V, L,OT	1195x1310x1940	990	B
Y317XP175AS	175	253	+15%, -35%	16	±1	V, L,OT	1195x1310x1940	1340	B
Y318XP240AS	240	346	+15%, -35%	12	±1	V, L,OT	2 cabinets 1193x1310x1940	1820	2B
Y319XP345AS	345	498	+15%, -35%	17	±1	V, L,OT	2 cabinets 1193x1310x1940	2300	2B
Y320XP440AS	440	635	+15%, -35%	16	±1	V, L,OT	4 cabinets 1193x1310x1940	3600	4B

(**) Potenza disponibile in servizio continuo a tensione minima di rete e $T_{AMB} + 40^{\circ}C$.

Fittings V = voltmeter L = pilot lamp OT = overtemperature alarm signal

The products described herein, including without limitation, product features, specifications, designs, availability are subject to change by IREM at any time without notice.

IREM. Experience and Quality

IREM is a leading company in the manufacture of electromechanical and electronic equipment for the control of the mains power in the following sectors:

- **powering of discharge lamps for professional applications;**
- **protection of electric users against line disturbances;**
- **luminous flux regulation in lighting plants;**
- **power generation by micro hydroelectric turbines.**



Since its foundation in 1947, IREM has gained wide recognition due to the reliability and innovative content of its high-tech products. A reliable company deserving the Oscar-ward. In 1992, in Los Angeles, **Mario Celso** - founder of IREM - was granted the "**Scientific-Technical Award**" by the Academy of Motion Picture Arts and Sciences.

Two production plants, a philosophy based on "quality upgrading" as the company's primary concern and direct export exceeding 70% of the global turnover are a warranty of continuity and development. Experience, quality and professional skill: these are the factors that permitted IREM to achieve in 1993 the certification of its quality system in compliance with **UNI EN ISO 9001** standard, a further confirmation of IREM commitment to constant improvement to ensure the maximum satisfaction of the customer and its capacity to guarantee:

- a constant quality standard
- precision and repeatability of all working processes
- dropping of acceptance control at the customer's plant
- identification and traceability of a product through the years.

In year 2000, IREM obtained the certification of its environment management system according to **UNI EN ISO 14001** standard. This certification is a firm demonstration of the company's will to protect the environment not just through its products, but also via precise patterns of behaviour.

In 2014, the company management system has obtained the certification of conformity to BS OHSAS 18001 Standard which sets out the minimum requirements for occupational health and safety management.



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