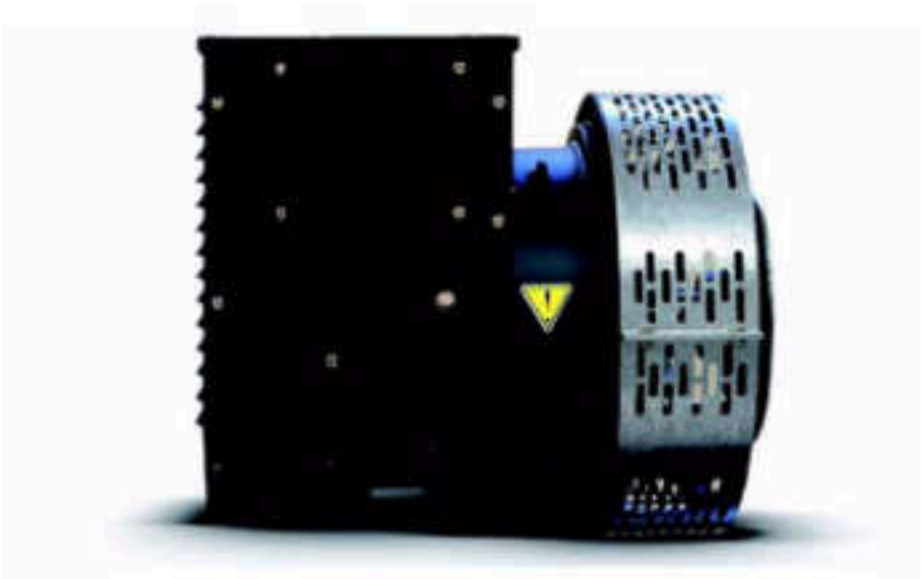
JCB GENERATORS

SERVICE MANUAL



SELF-REGULATING ALTERNATORS

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AVR Accessories

The SX440, SX421, MX341 and MX321 AVRs incorporate circuits which, when used in conjunction with accessories, can provide for parallel operation either with 'droop' or 'astatic' control, VAR/PF control and in the case of the MX321 AVR, short circuit current limiting.

Separate instructions are provided with other accessories available for control panel mounting.

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UFRO (Under Frequency Roll Off) (AVR Types SX460, SX440, SX421, MX341 and MX321)

The AVR incorporates an underspeed protection circuit which gives a voltage/speed (Hz) characteristic. ⇨ *Fig 77. (🗋 55).*

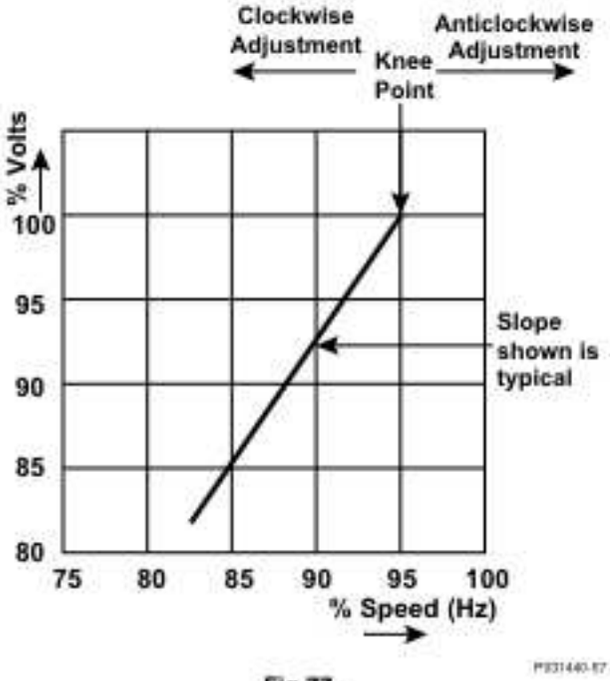


Fig 77.

The UFRO control potentiometer sets the knee point.

Symptoms of incorrect setting are a) the light emitting diode (LED) indicator, just above the UFRO Control potentiometer, being permanently lit when the generator is on load, and b) poor voltage regulation on load, i.e. operation on the sloping part of the characteristic.

Clockwise adjustment lowers the frequency (speed) setting of the knee point and extinguishes the LED. For Optimum setting the LED should illuminate as the frequency falls just below nominal frequency, i.e. 47Hz on a 50Hz generator or 57Hz on a 60Hz generator.

Important: *With AVR Types MX341 and MX321. If the LED is illuminated and no output voltage is present, refer to EXC TRIP and/or OVER/V sections below.*

EXC TRIP (Excitation Trip) AVR Types MX341 and MX321

An AVR supplied from a permanent magnet generator inherently delivers maximum excitation power on a line to line or line to neutral short circuit or large overload. In order to protect the generator windings the AVR incorporates an over excitation circuit which detects high excitation and removes it after a pre-determined time, i.e. 8-10 seconds.

Symptoms of incorrect setting are the generator output collapses on load or small overload, and the LED is permanently illuminated.

The correct setting is 70 volts +/-5% between terminals X and XX.

OVER/V (Over Voltage) AVR Type SX421, MX321

Over voltage protection circuitry is included in the AVR to remove generator excitation in the event of loss of AVR sensing input.

The MX321 has both internal electronic de-excitation and provision of a signal to operate an external circuit breaker.

The SX421 only provides a signal to operate an external breaker, which MUST be fitted if over voltage protection is required.

Incorrect setting would cause the generator output voltage to collapse at no-load or on removal of load, and the LED to be illuminated.

The correct setting is 300 volts +/-5% across terminals E1, E0. Clockwise adjustment of the OVER/V control potentiometer will increase the voltage at which the circuit operates.

Transient Load Switching Adjustments AVR Types SX421, MX341 and MX321

The additional function controls of DIP and DWELL are provided to enable the load acceptance capability of the generating set to be optimised. The overall generating set performance depends upon the engine capability and governor response, in conjunction with the generator characteristics.

It is not possible to adjust the level of voltage dip or recovery independently from the engine performance, and there will always be a 'trade off' between frequency dip and voltage dip.

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4 Poles 60Hz 3 Phase

RPM 1800
Insulation Class H

AVR Controlled Ratings 3ph dedicated 600v 60Hz 1800rpm

Voltage 600 Dedicated

HM Type	MODEL	WEIGHT (kg)	LEADS	AVR	163/27	150/40	125/40	105/40	80/40
	ECP3-1S/4	63	12	SR7/2	8.4	8	7.8	7.3	6.1
	ECP3-2S/4	70	12	SR7/2	10.5	10	9.6	9	7.5
	ECP3-1L/4	82	12	SR7/2	14.3	13.8	13.3	12	10.6
	ECP3-2L/4	91.5	12	SR7/2	17.5	16.9	16.3	15	13
	ECP3-3L/4	96	12	SR7/2	19.3	18.8	18	16.5	14.4
HM160	ECO28-S/4	107	12	SR7/2	21.6	21	20.4	19	16.3
	ECO28-1L/4	122	12	SR7/2	25.8	24.6	24	22	19.1
	ECO28-2L/4	139	12	SR7/2	31.8	30.5	30	27.5	23.8
	ECO28-VL/4	165	12	SR7/2	38.4	37.5	36	32	28.8
HM200	ECO32-2S/4	199	12	SR7/2	47	44	42	40	34
	ECO32-3S/4	214	12	SR7/2	54	51	48	46	38
	ECO32-1L/4	248	12	SR7/2	67	64	60	58	48
	ECO32-2L/4	282	12	SR7/2	80	76	72	69	58
	ECO32-3L/4	298	12	SR7/2	93	89	84	78	68
HM250	ECP34-1S/4	341	12	DSR	114	109	102	92	81
	ECP34-2S/4	419	12	DSR	139	134	126	114	101
	ECP34-1L/4	445	12	DSR	171	165	156	141	125
	ECP34-2L/4	491	12	DSR	196	189	180	163	144
HM280	ECO38-1S/4	510	12	DSR	240	230	220	205	175
	ECO38-2S/4	560	12	DSR	264	253	240	220	193
	ECO38-3S/4	590	12	DSR	300	285	270	250	216
	ECO38-1L/4	680	12	DSR	330	315	300	280	240
	ECO38-2L/4	765	12	DSR	396	378	360	330	288
	ECO38-3L/4	905	12	DSR	444	433	420	385	336
HM355	ECO40-1S/4	1040	12	DSR	525	504	480	440	384
	ECO40-2S/4	1118	12	DSR	589	568	540	490	433
	ECO40-3S/4	1171	12	DSR	655	630	600	540	480
	ECO40-1L/4	1324	12	DSR	721	694	660	600	528
	ECO40-1.5L/4	1380	12	DSR	804	780	744	673	595
	ECO40-2L/4	1586	12	DSR	883	858	816	756	653
	ECO40-VL/4	1693	12	DSR	935	909	865	800	693
	ECO43-1S/4*	1870	12	DSR	1049	1008	960	870	768
	ECO43-2S/4	2090	12	DSR	1220	1173	1116	1020	893
	ECO43-1L/4	2395	12	DSR	1441	1386	1320	1200	1056
	ECO43-2L/4	2660	12	DSR	1704	1638	1560	1440	1248

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