

MSS SOFT STARTS



*Soft Start range for motors
up to 800kW at 400V*



Your partner in industrial automation systems

HIGH SPECIFICATION ELECTRONIC SOFT STARTS

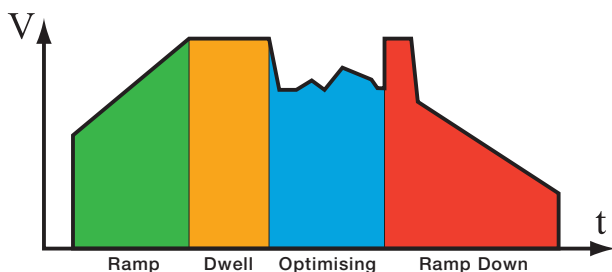
Mitsubishi Electric has added to its already extensive product range the new MSS 'Soft Start' motor control family. Designed to support applications such as pump control in the water industry, ventilation fans and compressors, MSS products control motors ranging from 7.5kW to 800kW.

MSS soft starters operate by gently ramping the voltage applied to the motor. This provides smooth acceleration and deceleration of the motor and load. Because of their simplicity, they are usually a more cost effective solution than inverters, where variable speed is not required.

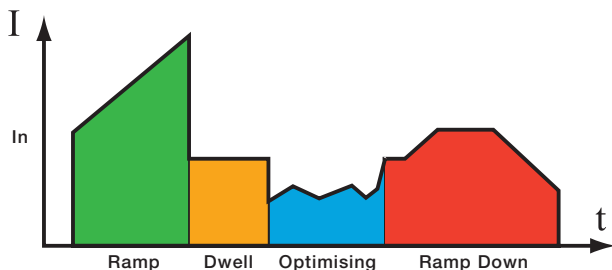
Performance

MSS products greatly reduce initial surge current, giving cleaner power supplies and the controlled application of power to motor also means that the starting torque is applied gradually, reducing wear, maintenance and increasing both motor and power transmission train life. In the case of pumps, ramping the voltage down to reduce the power to the pump progressively also minimises hydraulic shock.

Voltage Profile



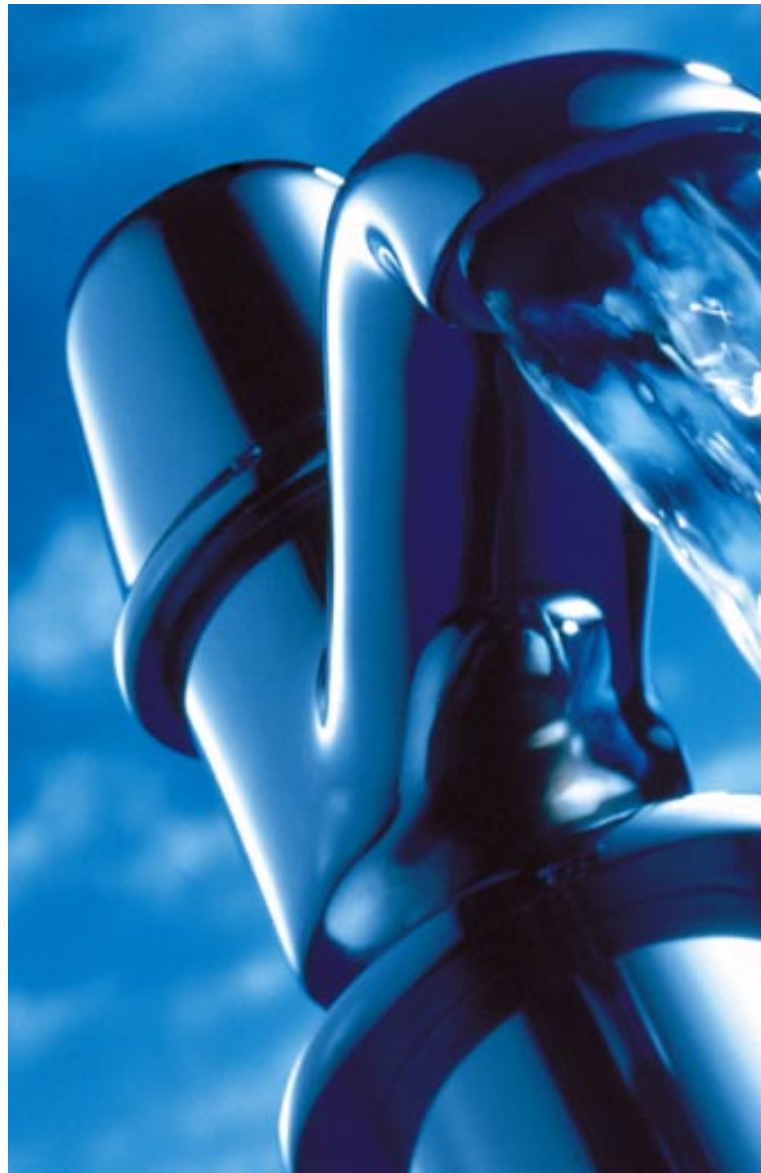
Current Profile



The new range of products allows users to set up an 'applied voltage profile' to start and stop the motor. This defines the voltage level that just begins to turn the load, the duration of the ramp time and final applied voltage. For systems that have a high static inertia a 'Kick Start' can be programmed into the applied voltage profile to ensure that the motor starts correctly.

Major Features...

- Robust design
- Simple to install and commission
- 'Kick Start' with adjustable time and level
- Ramp up times from 0.5s to 4 mins.



Keeping itself in check

The units also include a number of safety and diagnostic features. When the Soft Start is started, it performs internal checks before operating. These test loss of any supply phase or motor phase, short circuit or open circuit thyristor, or other

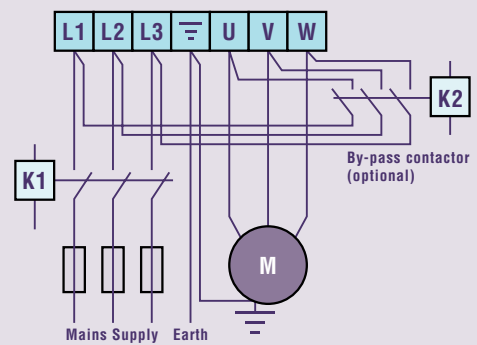
- 'Triple Ramp' soft stop for reducing 'water hammer'
- Energy Optimisation feature
- Adjustable current limit
- Full 6 SCR switching and fault detection



internal fault and when the unit is in operation LEDs indicate the status. Should the load exceed operating limits, a thermal cut-out automatically shuts down the unit when the internal heatsinks get too hot. High speed fuses can be fitted as an option. The units are housed in high quality IP20 sheet metal for panel mounting.

Connection Specifications

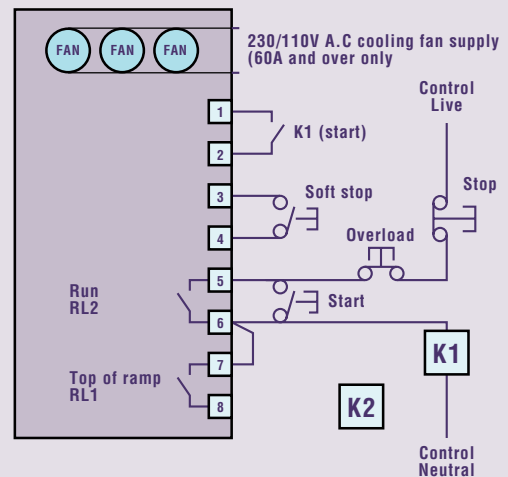
Mains Connection Schematic Drawing



Note:

If power factor corrector capacitors are fitted they must be placed on the live side of K1 and must not be switched on while Soft Starter is running.

Control Connections Utilising All Features



Note:

The start connector across Terminals 1-2 (K1 Auxilliary) can be permanently linked to start up as soon as K1 closes.

RL2 acts as a retaining contact for the start Push-Button. In the event of a fault, RL2 will open 5-6 and re-energise K1, provided the start Push-Button is not made.

SPECIFICATIONS

Electrical Specification	
Input Voltage Range	220 or 400V +/- 10% (3PH) Selectable on PCB
Higher Voltages	Available up to 690V as option
Input Frequency	50/60 Hz. +/- 5%
Overload Rating	5 x In for 5 sec. or 3 x In for 30 sec.
Starts/Hour	12 evenly spaced starts/hour
EU Directives	Meets EMC and LV Directives when installed as per Technical Manuals
Fault Detection	Shut down and lock out for faulty thyristor or loss of phase (supply or motor).
Fuses	Optional integral high speed fuses
Environmental Specification	
Operating Temperature	0 to 40 C, de-rate by 20% up to 50 C
Storage Temperature	-10 to 60 C (1 year max)
Relative Humidity	<95% non-condensing
Rated Altitude	2000M ASL, de-rated by 1% per extra 100M
Ingress Protection	IP20 Sheet Metal Enclosure

Control Specifications	
Initial (Pedestal) Voltage	25-75% of supply voltage
Ramp up time	0.5-60 seconds
Ramp down time	1-120 seconds, independent of Ramp up time
Step Down To Level	50-80% of supply voltage
Kick Start Level	On/Off at 70% or 90% voltage
Kick Start Time	0.25-2 seconds
Ramp Hold Time	Normally 30 seconds
Current Limit Level	1.5-4.5 X rated current
Long Ramp Hold	Extends Ramp Hold Time to 4 minutes
Long Ramp	Multiplies all Ramp Times by 4
LED indications	Ramp Up/Phase Rotation/Power On, Run, In Current Limit, Top Of Ramp
Relays	Run, Top Of Ramp
Relay Contact Rating	1.2KVA, Maximum 250V AC
Therm Cut Out	Automatic shut down on heat-sink over temperature

Model No's/Dimensions/kW Ratings/Terminal Arrangement													
Model	Current A	kW at 400V	Height (mm)	Width (mm)	Depth (mm)	Weight (Kg)	Model	Current A	kW at 400V	Height (mm)	Width (mm)	Depth (mm)	Weight (Kg)
16	16	7.5	325	164	195	10	340	340	186	580	368	228	28
23	11	6.5	325	164	195	10	410	410	225	580	368	228	28
30	15	9	325	164	195	10	475	475	260	720	462	253	45
45	45	22	325	164	195	10	580	580	315	720	462	253	45
60	60	30	430	254	280	15	670	670	375	720	462	253	45
75	75	37	430	254	280	15	800	800	450	910	650	340	120
85	85	45	430	254	280	15	900	900	50	910	650	340	120
120	120	6	430	254	280	15	1100	1,100	63	910	650	340	120
145	145	75	430	254	280	15	1400	1,400	800	910	650	340	120
170	170	90	430	254	280	16	Motor kW ratings are nominal, based on typical 4 pole motors. Soft starters are current rated, to ensure correct rating, match to motor name plate current.						
205	205	110	430	254	280	16							
255	255	132	580	368	228	28							
290	290	150	580	368	228	28							



THE POWER TO INTEGRATE

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