Softstarter - compact design

- 3-phase control
- Reduced mechanical stress on drives
- Reduced starting current compared to direkt start
- Open loop connection possible
- Integrated bridging contactor control

Technical data

1. Functions
Electronic motor softstarter for asynchronous motors reducing mechanical stress on drives.
Temperature monitoring of the device.

2. Adjustments

	Adjustment range	
Acceleration time T_{ON}	0s	45s
Retardation time T_{OFF}	0s	45s
Starting torque M_{ON}	0	100%
Stopping torque M_{OFF}	0	100%

3. Indicators

Green LED (Betrieb) ON:	indication of supply voltage
Green LED (Start) ON:	indication of activation
Green LED (U_{Motor}) ON:	output voltage 100%, bypass contactor activated

4. Mechanical design
Metal housing, IP rating IP20
Mounting on mounting plate
Distance to other devices min. 100mm

Mounting position:	cooling fins have to be rightened
Terminals:	depends on power class standard terminals or Cu-rail
Initial torque:	depends on power class
Terminal capacity:	see table

5. Control circuit

Supply voltage:	230V AC
Terminals:	L1-N (7-8)
Tolerance:	±15%
Rated frequency:	48 to 63Hz
Duration of operation	
1.5 to 15kW:	100%
from 18.5kW:	80s 100% only with option DB (100% operation) or bypass contactor

6. Control contact 1-2

Function:	activation of softstart
Connection:	potential free
Loadable:	No
Line length:	max.10m, twisted pair
Control pulse length:	-

7. Signaling contact 3-4-5
1 potential free change-over contact

Function:	indication of 100% output voltage bypass contactor activated
Switching capacity:	1500VA (6A/250V AC)
Fusing:	6A

8. Power circuit

Voltage range:	3~ 110V to 500V AC
Tolerance:	±20%
Rated frequency:	48 to 63Hz
Starting torque:	0% to 100%
Stopping torque:	0% to 100%
Start-up cycles:	60/hour (at medium load)
Bypass contactor:	external (not included)

9. Power classes
(see table page 2)

10. Ambient condition

Ambient temperature:	-25 to +45°C (in accordance with IEC 68-1)
With option DB:	-25 to +55°C
Storage temperature:	-25 to +75°C
Transport temperature:	-25 to +75°C
Relative humidity:	5% to 95% not condensing
Pollution degree:	2 (in accordance with IEC 60664-1)

Technical data

Power classes

Typ	Max. motor power at 3x400V *) (kW)	Max. rated motor current (A)	Max. starting current (5s) (A)	Recom-mended semiconduc-tor fuse (A)	Weight (kg)	Size	Permanent operation of power circuit
Eurostart 1.5	1.5	4	12	10	1.2	A	■
Eurostart 2.2	2.2	5	15	12	1.2	A	■
Eurostart 3	3.0	7	24	16	1.2	A	■
Eurostart 4	4.0	9	32	30	1.2	A	■
Eurostart 5.5	5.5	12	48	35	1.2	A	■
Eurostart 7.5	7.5	16	65	50	2.2	B	■
Eurostart 11	11.0	23	85	63	2.2	B	■
Eurostart 15	15.0	31	110	80	2.2	B	■
Eurostart 18.5	18.5	39	135	80	2.2	B	■
Eurostart 22	22.0	46	175	100	2.2	B	■
Eurostart 30	30.0	64	210	125	4.5	C	□
Eurostart 37	37.0	77	265	160	4.5	C	□
Eurostart 45	45.0	94	325	200	4.5	C	□
Eurostart 55	55.0	115	400	250	4.5	C	□
Eurostart 75	75.0	155	575	350	4.5	C	□

■ = series □ = optional

*) Maximum motor power depends on supply voltage.

If the maximum rated motor current and maximum starting current of the motor are highen than given in the table above, a EUROSTART with adequate current limits has to be selected!

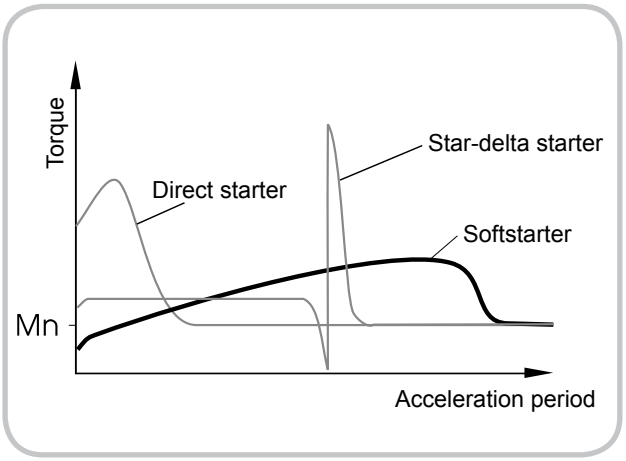
A minimum distance of 100mm to other devices should be considered.

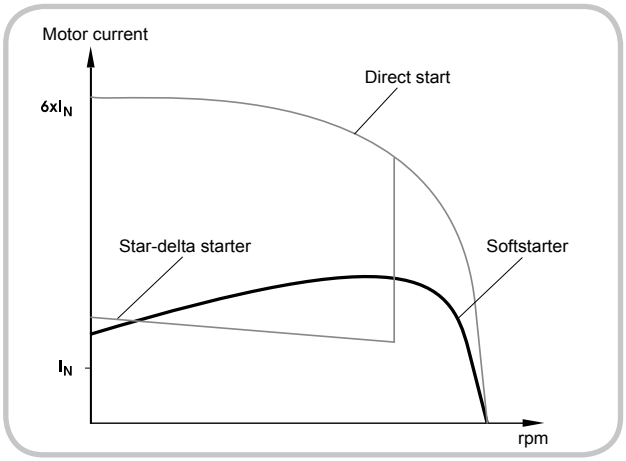
Dimensions

	H	B	T
Size A	200	83	106
Size B	200	85	205
Size C	200	360	140

Advantages of softstarters

The softstarters series MSG are optimized to reduce mechanical stress on drives during the start-up and retardation phase. Therefore the softstarters rise the motor voltage during the start-up phase within the adjusted time from zero to maximum supplying voltage. This ensures a steady increase of the motor torque and protects the machinery from torque shocks.
The slow rise of the motor voltage can be used to reduce the maximum start-up current. The maximum possible reduction of current depend on the type of machinery and adjusted softstarter settings.

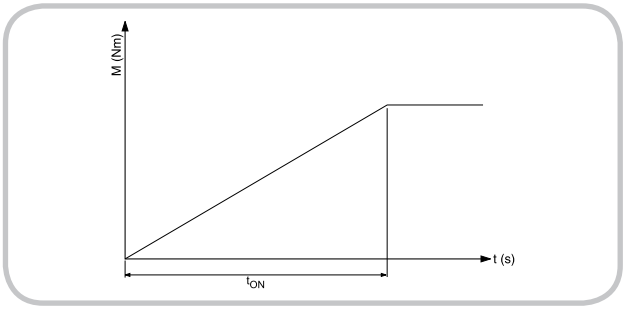




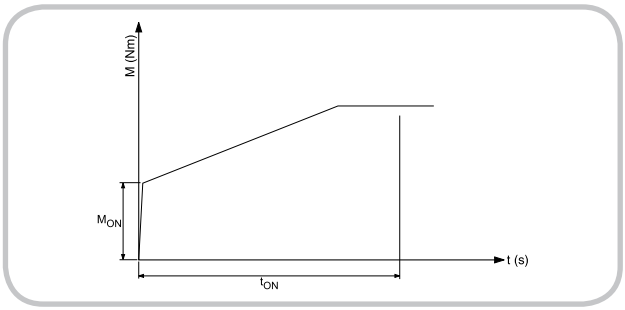
Functions

Softstart and softstopp
In the Eurostart series of softstarters the main circuit is controlled not by mechanical switching components but by semiconductor devices (thyristor modules).
Each phase incorporates two antiparallel-connected thyristors providing partial or full conduction within a half cycle. The conduction (ON-)time is determined by the firing angle of the thyristors, this angle being established by the internal control electronics.

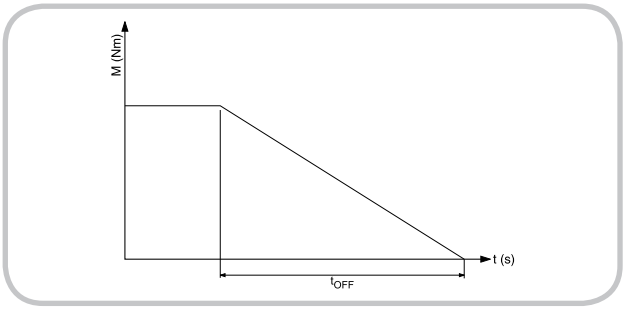
When the unit is activated (LED „Start“ lights up), the voltage at the motor rises to the full AC line voltage as a linear function of the starting time. The timescale for this voltage ramp-up can be set steplessly from 0 to 45 seconds on the T_{ON} control. As the voltage rises, the torque increases continuously so that it just exceeds the load torque. The motor thus starts up with slow acceleration.



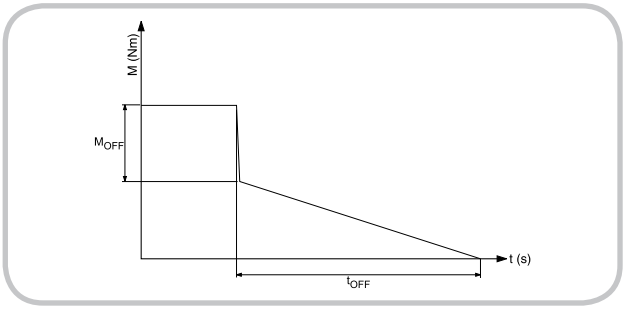
By specifying a system-specific starting torque, the voltage (torque) is increased rapidly when the softstarter is activated, until the starting torque set on the M_{ON} control is reached. It is only then that the voltage begins to increase slowly for the remainder of the starting time until the full line voltage is reached. This makes more effective use of the starting time and further reduces start-induced stress on material.

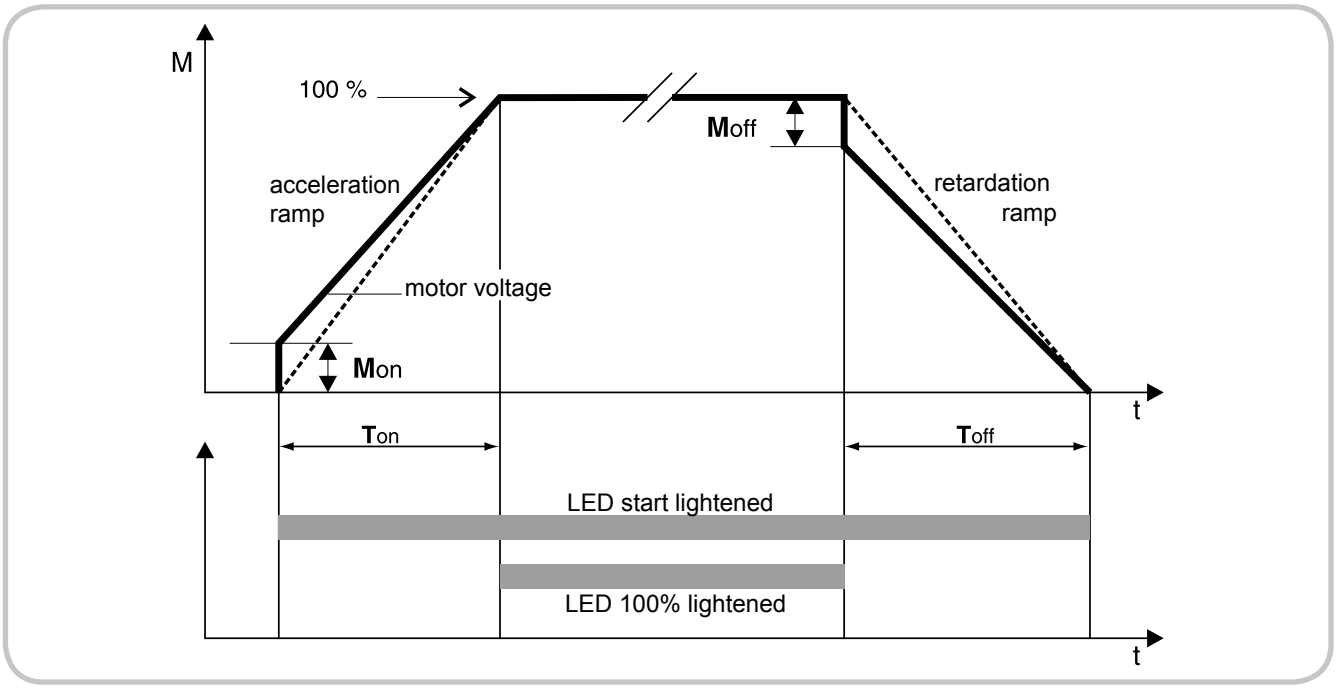


Opening contact 1-2 activates soft stopping. This produces a uniform reduction of the torque from 100% down to 0% across the selected time range. The timescale for this voltage ramp-up can be set steplessly from 0 to 45 seconds on the T_{OFF} control.
The motor thus stopps with slow deceleration. The EUROSTART applies no braking effect to the motor.



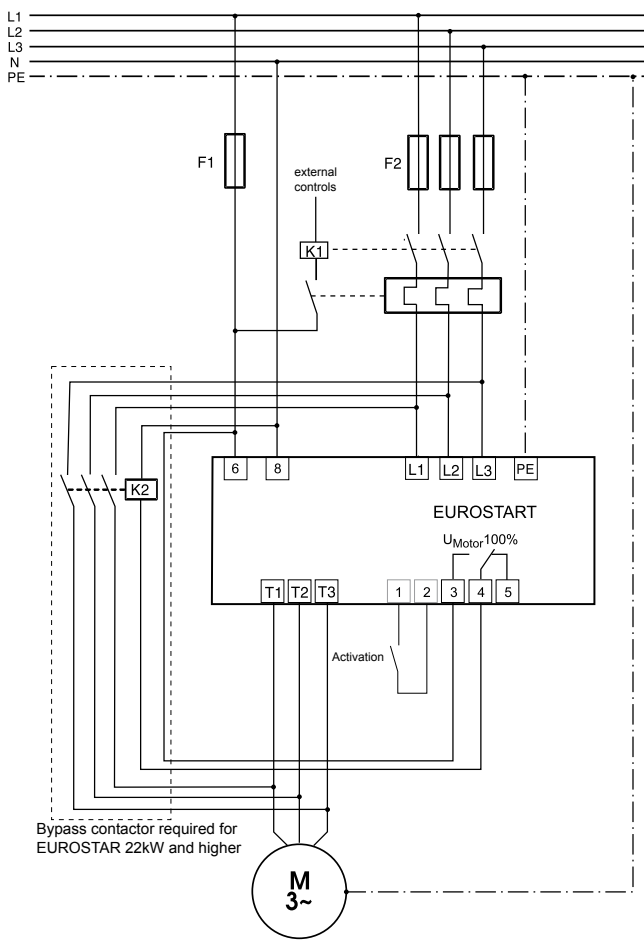
After the softstop has been activated (LED 100% extinguishes), the torque is reduced immediately to the value (0 to 100%) set on the M_{OFF} control and is then reduced uniformly across the selected stopping time (0 to 45s) down to zero (LED Start extinguishes).



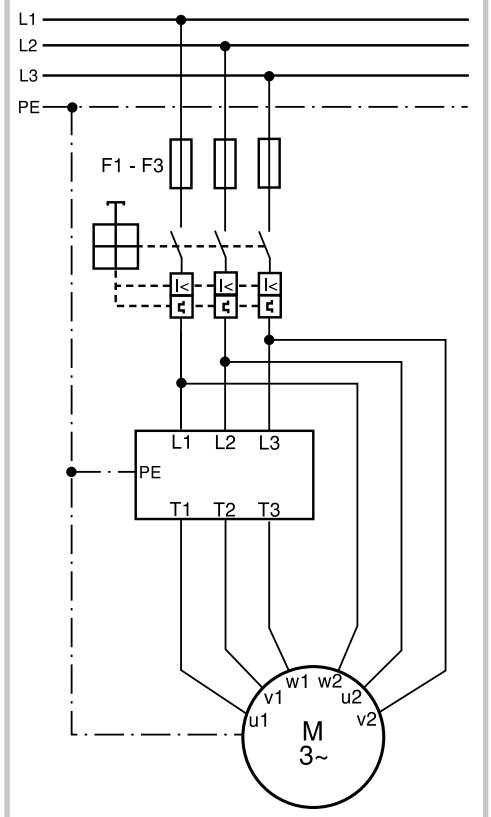


Connections

Standard connection with bypass contactor

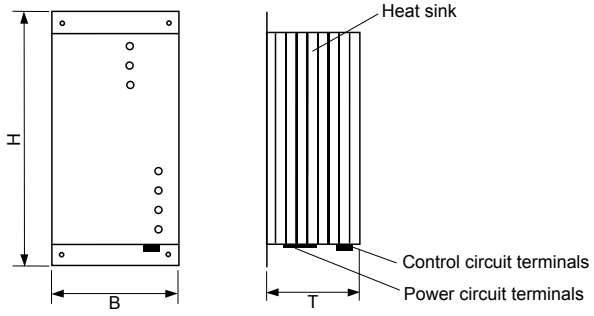


Open loop connection (W3C)



Dimensions

Sizes A and B



Size C