

Data sheet

Starting Torque Limiter

Type TCI (Soft Start)



Starting Torque Limiters are designed for the soft starting of single and three phase AC motors. The controller allows smooth starting of all AC induction motors thus eliminating the damaging effects of high starting torque surges.

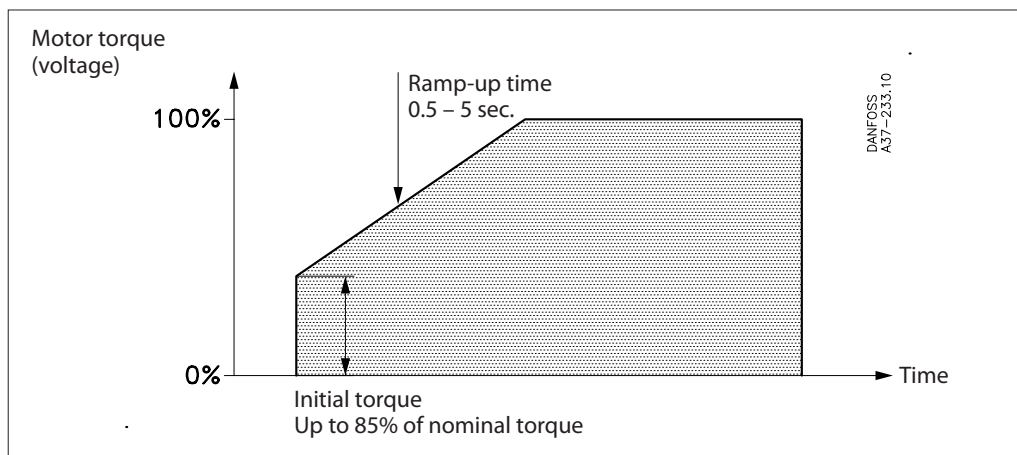
The TCI controller is easily installed between a standard motor starter and the motor, and features adjustable ramp-up time and initial torque.

Typical applications are conveyors, fans, compressors etc.

Features

- Ramp-Up time adjustable from 0.5 – 5 sec.
- Initial torque adjustable up to 85%
- Single and three phase operation
- LED Status indication
- Unlimited start/stop operations per hour
- IP20 Protection
- Compact modular design
- DIN rail mountable
- EN 60947-4-2
- CE, CSA, NRTL/C and C-tick

Adjustments



Selection Guide

Type	Operational Voltage	Motor current max.	Motor power max.	Dimensions	Code no.
	[V AC]	[A]	[kW]	[mm]	
TCI 15	208 – 240	15	4.0 kW / 5.5 HP	45	037N0045
TCI 25	208 – 240	25	7.5 kW / 10 HP	45	037N0046
TCI 15	400 – 480	15	7.5 kW / 10 HP	45	037N0045
TCI 25	400 – 480	25	11 kW / 15 HP	45	037N0046
TCI 15	480 – 600	15	7.5 kW / 10 HP	45	037N0047
TCI 25	480 – 600	25	18.5 kW / 25 HP	45	037N0048
TCI 25	690 V AC 1)	25	18.5 kW / 25 HP	45	037N0049

1) 037N0049 for 690 V AC is not CSA/NRTL/C approved

Technical Data

Control Circuit Specifications	TCI 15	TCI 25
Operational current AC 3, AC 53a and AC 58a (motor load)	15 A	25 A
Motor size at: 208 – 240 V AC 400 – 480 V AC 480 – 600 V AC	0.1 – 4.0 kW (0.18 – 5 HP) 0.1 – 7.5 kW (0.18 – 10 HP) 0.1 – 7.5 kW (0.18 – 10 HP)	0.1 – 7.5 kW (0.18 – 10 HP) 0.1 – 11 kW (0.18 – 15 HP) 0.1 – 18 kW (0.18 – 25 HP)
Minimum operational current	50 mA	
Overload current profile	X-Tx: 8-3	
Overload relay trip class	Class 10	
Semiconductor protection fusing type 1 co-ordination type 2 co-ordination I ² t (t = 10 ms)	100 A gL/gG 6300 A ² s	100 A gL/gG 6300 A ² s

Control specifications

Ramp-up time	Adjustable from 0,5 – 5 seconds
Initial torque	Adjustable from 0 – 85% of nominal torque
EMC immunity	Meets requirements of EN50082-1 and EN 50082-2

Insulation specifications

Rated insulation voltage, U _i	660 V
Rated impulse withstand voltage, U _{imp}	4 KV
Installation category	III

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Technical Data (continued)

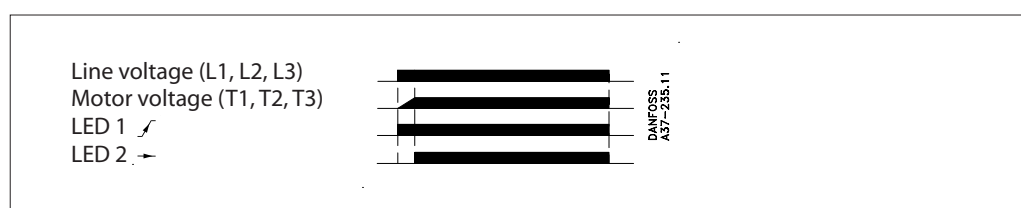
Thermal specifications and environment

Power dissipation, continuously duty	1 W/A
Power dissipation, intermittent duty	1 W/A. x duty cycle
Operating temperature range	-5 – 40 °C
Cooling method	Natural convection
Mounting	Vertical (see also general mounting instructions)
Max. temperature with limited current	60 °C, see derating for high temperatures in chart below
Storage temperature range	-20 – 80 °C
Protection degree / pollution degree	IP20 / IP3

Materials

Housing	Self extinguishing PPO UL94V1
Heat sink	Aluminum black anodized
Base	Electroplated steel

Functional diagram



Soft start function

As soon as the TCI controller is connected to mains voltage, it soft starts the motor according to the settings.

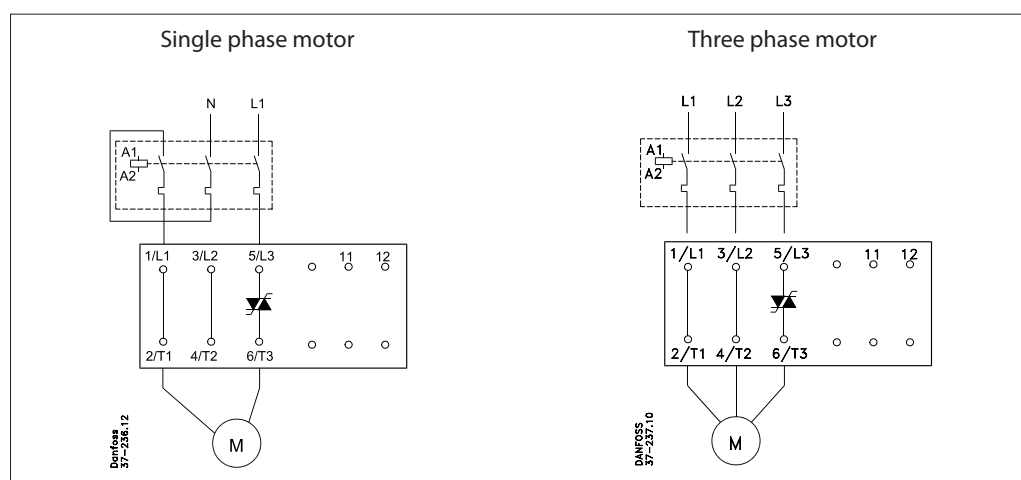
Ramp up

During ramp up, the controller will gradually increase the voltage to the motor until it reaches full line voltage. The motors speed will depend on the actual load on the motor. A motor with little or no load will reach full speed before the voltage has reached its maximum value.

Initial torque

The initial torque is used to set the initial starting voltage. This way it is possible to adapt the controller to an application requiring a higher starting torque.

Wiring



Overload and Short Circuit Protection

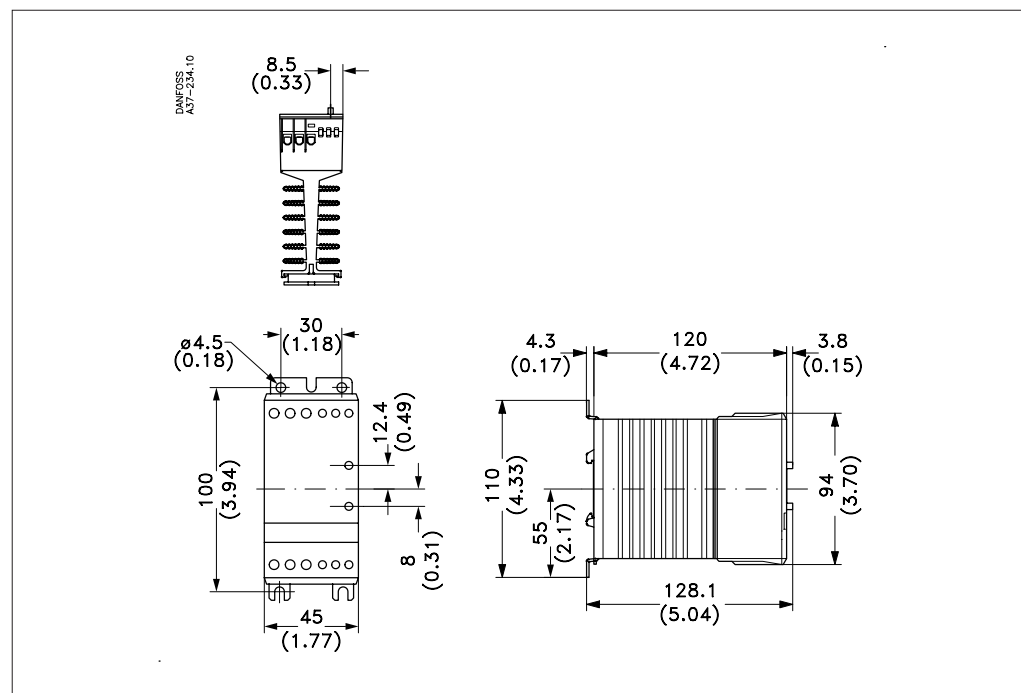
Overload and short circuit protection is easily achieved by installing a circuit breaker on the line side of the motor controller. Select the circuit breaker from the table according to motor full load current.

Be aware of the maximum prospective short circuit current breaking capacity. For further information please refer to the data sheet on the circuit breaker.

380 – 415 V AC

Soft start type	Motor full load current [A]	Danfoss CTI 25M	Max. prospective short-circuit current I _{cc}	
			Co-ordination 1 [kA]	Co-ordination 2 [kA]
TCI 15	0.10 – 0.16	047B3140	50	50
	0.16 – 0.25	047B3141	50	50
	0.25 – 0.40	047B3142	50	50
	0.40 – 0.63	047B3143	50	50
	0.63 – 1.0	047B3144	50	50
	1.0 – 1.60	047B3145	50	50
	1.6 – 2.5	047B3146	50	50
	2.5 – 4.0	047B3147	50	50
TCI 25	4.0 – 6.3	047B3148	50	50
	6.3 – 10.0	047B3149	50	10
	10 – 16	047B3150	10	5
	14.5 – 20.0	047B3151	8	3
	18 – 25	047B3152	8	3

Dimensions [mm] (inch)



Operating at high temperatures

If the ambient temperature exceeds 40 °C the current must be derated according to table.

380 - 415 V AC

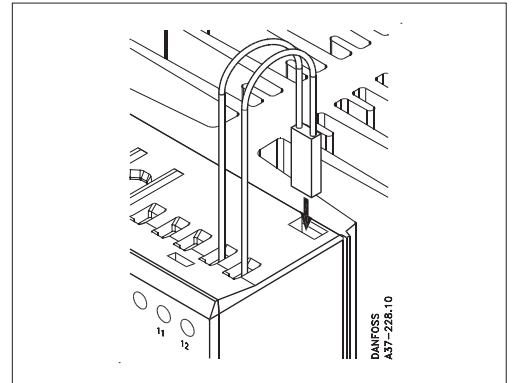
Ambient temperature	Continues current		Duty-cycle rating (15 min. max. on-time)	
	TCI 15	TCI 25	TCI 15	TCI 25
°C	[A]	[A]	[A]	[A]
50	15	25	15, 100% duty-cycle	25, 100% duty-cycle
60	15	20	15, 100% duty-cycle	25, 80% duty-cycle

Overheat protection

If required the controller can be protected against overheating by inserting a thermostat in the slot on the right-hand side of the controller.

Order: UP 62 thermostat 037N0050

The thermostat is connected in series with the control circuit of the main contactor. When the temperature of the heat sink exceeds 100 °C the main contactor will be switched OFF. A manual reset is necessary to restart this circuit.

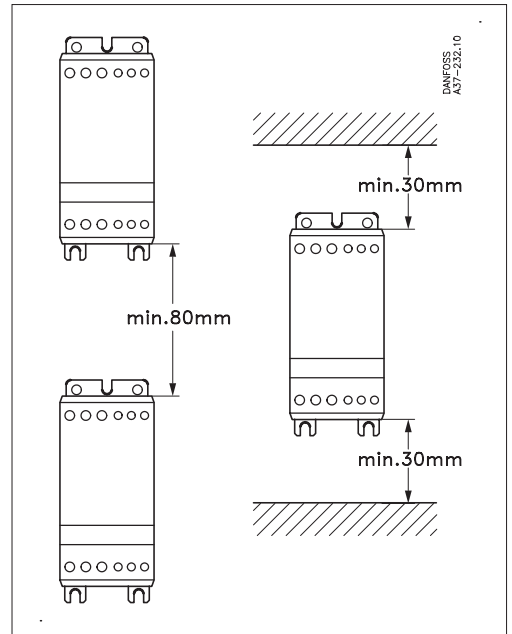


Mounting instructions

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