



# Technical Catalogue

## Softstarters



Emotron TSA  
4 - 1800 kW, 200 - 690 V  
Emotron MSF 2.0  
7.5 - 1500 kW, 200 - 690 V

## Emotron TSA softstarter - with built-in bypass



Emotron TSA softstarters take motor control to a new level. Soft torque starting, intelligent load monitoring and smart stops are all included and accompanied by a robust and compact design. By developing the Emotron TSA range of electronic softstarters CG has taken a major step towards the ideal motor controller for applications where variable speed is not required. You simply get everything except variable speed!



GOST R  
(Pending)

### Main features

- Compact and robust softstarter with wide power range: 4kW - 1.8 MW, 200 - 690V, 3 ph.
- Integrated bypass with proven contactor technology.
- 3-phase torque control for optimal performance.
- Torque control start and stop modes for smooth low-current starts and pump stops without water hammering.
- High capacity dynamic vector braking available for high inertia stopping.
- Coated boards as standard extends lifetime in harsh environments.
- Real-time clock.
- Multilingual control panel.
- Jog forward/reverse with adjustable speed.
- Motor  $I^2t$  protection and isolated thermistor input as standard. PT100 inputs as option.
- Load monitor function for protection of your load machinery.
- IP20 protection for sizes 16-820 A, IP00 for sizes 1000 - 1800 A.
- Fulfills EMC First environment-category C2.

## Emotron TSA softstarter with integrated bypass

### Typical motor power at mains voltage 400 V and 460 V

Rating according to AC53b norm.

Model	Normal duty (Start curr= $3 \times I_{n\_soft}$ <sup>(1)</sup> )			Heavy duty (Start curr= $5 \times I_{n\_soft}$ <sup>(2)</sup> )			Frame size - Dimensions H1/H2 x W x D [mm] <sup>(3)</sup>
	Power @ 400V [kW]	Power @ 460V [hp]	Rated current [A]	Power @ 400V [kW]	Power @ 460V [hp]	Rated current [A]	
TSA52-016	7.5	10	16	4	5	10	Frame size 1 246/340 x 126 x 188
TSA52-022	11	15	22	5.5	7.5	12	
TSA52-030	15	20	30	7.5	10	18	
TSA52-036	18.5	25	36	7.5	15	21	
TSA52-042	22	30	42	11	20	25	
TSA52-056	30	40	56	15	25	33	
TSA52-070	37	50	70	22	30	42	Frame size 2 246/340 x 126 x 188
TSA52-085	45	60	85	22	40	51	
TSA52-100	55	75	100	30	40	60	
TSA52-140	75	100	140	45	60	84	Frame size 3 285/380 x 196 x 235
TSA52-170	90	125	170	55	75	102	
TSA52-200	110	150	200	55	100	120	
TSA52-240	132	200	240	75	100	144	Frame size 4 373/512 x 254 x 260
TSA52-300	160	250	300	90	125	180	
TSA52-360	200	300	360	110	150	216	
TSA52-450	250	350	450	160	200	270	

(1) Normal duty: Start current =  $3 \times I_{n\_soft}$ , Start time = 15 s (size 1) or 30 s (Size 2 - 4), 10 starts / hour.

(2) Heavy duty: Start current =  $5 \times I_{n\_soft}$ , Start time = 15 s (size 1) or 30 s (Size 2 - 4), 10 starts / hour.

(3) H1= Height of enclosure, H2=Total height

## Emotron TSA softstarter with integrated bypass

### Typical motor power at mains voltage 525 V

Rating according to AC53b norm.

Model	Normal duty (Start curr= $3 \times I_{n\_soft}$ <sup>(1)</sup> )		Heavy duty (Start curr= $5 \times I_{n\_soft}$ <sup>(2)</sup> )		Frame size - Dimensions H1/H2 x W x D [mm] <sup>(3)</sup>
	Power @525 V [kW]	Rated current [A]	Power @525 V [kW]	Rated current [A]	
TSA52-016	11	16	5.5	10	Frame size 1 246/340 x 126 x 188
TSA52-022	15	22	7.5	12	
TSA52-030	18.5	30	11	18	
TSA52-036	22	36	11	21	
TSA52-042	30	42	15	25	
TSA52-056	37	56	22	33	
TSA52-070	45	70	22	42	Frame size 2 246/340 x 126 x 188
TSA52-085	55	85	30	51	
TSA52-100	75	100	37	60	
TSA52-140	90	140	55	84	Frame size 3 285/380 x 196 x 235
TSA52-170	110	170	75	102	
TSA52-200	132	200	75	120	
TSA52-240	160	240	90	144	Frame size 4 373/512 x 254 x 260
TSA52-300	200	300	132	180	
TSA52-360	250	360	160	216	
TSA52-450	315	450	180	270	

(1) Normal duty: Start current =  $3 \times I_{n\_soft}$ , Start time = 15 s (size 1) or 30 s (Size 2 - 4), 10 starts / hour.

(2) Heavy duty: Start current =  $5 \times I_{n\_soft}$ , Start time = 15 s (size 1) or 30 s (Size 2 - 4), 10 starts / hour.

(3) H1= Height of enclosure, H2=Total height

## Emotron TSA softstarter with integrated bypass

### Typical motor power at mains voltage 575 V and 690 V

Rating according to AC53b norm.

Model	Normal duty (Start curr= $3 \times I_{n\_soft}$ <sup>(1)</sup> )			Heavy duty (Start curr= $5 \times I_{n\_soft}$ <sup>(2)</sup> )			Frame size - Dimensions H1/H2 x W x D [mm] <sup>(3)</sup>
	Power @ 575V [hp]	Power @ 690V [kW]	Rated current [A]	Power @ 575 V [hp]	Power @ 690V [kW]	Rated current [A]	
TSA69-016	15	11	16	7.5	7.5	10	Frame size 1 246/340 x 126 x 188
TSA69-022	20	18.5	22	10	11	12	
TSA69-030	25	22	30	15	15	18	
TSA69-036	30	30	36	20	18.5	21	
TSA69-042	40	37	42	25	22	25	
TSA69-056	50	45	56	30	30	33	
TSA69-070	60	55	70	40	37	42	Frame size 2 246/340 x 126 x 188
TSA69-085	75	75	85	50	45	51	
TSA69-100	100	90	100	60	55	60	
TSA69-140	125	132	140	75	75	84	Frame size 3 285/380 x 196 x 235
TSA69-170	150	160	170	100	90	102	
TSA69-200	200	200	200	125	110	120	
TSA69-240	250	250	240	150	132	144	Frame size 4 373/512 x 254 x 260
TSA69-300	300	315	300	150	160	180	
TSA69-360	350	355	360	200	200	216	
TSA69-450	450	450	450	250	250	270	

(1) Normal duty: Start current =  $3 \times I_{n\_soft}$ , Start time = 15 s (size 1) or 30 s (Size 2 - 4), 10 starts / hour.

(2) Heavy duty: Start current =  $5 \times I_{n\_soft}$ , Start time = 15 s (size 1) or 30 s (Size 2 - 4), 10 starts / hour.

(3) H1= Height of enclosure, H2=Total height

# Emotron MSF softstarter, the heavy duty solid state softstarter

Emotron MSF softstarter the proven softstarter for heavy duty applications.



## Main features

- Robust metal enclosure softstarter with power range: 4 kW - 1.6 MW, 200 - 690 V, 3-ph.
- Solid state 3-phase control type softstarter with heavy duty nominal rating.
- Torque control start and stop modes for minimized start currents.
- Dynamic vector braking and counter current braking modes available.
- Motor  $I^2t$  protection and isolated thermistor input as standard.
- Load monitor function for protection of load machinery.
- IP20 protection for sizes 17 - 835 A, IP00 for sizes 1000 - 1400 A.



## Emotron MSF softstarter, 525 V type

### Typical motor power at mains voltage 400 V

Rating according to AC53a norm

Model (525 V)	Normal duty AC-53a 5.0-30:50-10			Heavy duty AC-53a 3.0-30:50-10			Frame size - Dimensions H x W x D [mm]
	Power @ 400V [kW]	Power @ 460V [hp]	Rated current [A]	Power @ 400V [kW]	Power @ 460V [hp]	Rated current [A]	
<b>MSF-017</b>	11	15	22	7.5	10	<b>17</b>	Frame size 1 320 x 126 x 260
<b>-030</b>	18.5	25	37	15	20	<b>30</b>	
<b>-045</b>	30	40	60	22	30	<b>45</b>	
<b>-060</b>	37	50	72	30	40	<b>60</b>	
<b>-075</b>	45	60	85	37	60	<b>75</b>	
<b>-085</b>	45	75	96	45	60	<b>85</b>	
<b>-110</b>	75	100	134	55	75	<b>110</b>	Frame size 2 400 x 176 x 260
<b>-145</b>	75	125	156	75	100	<b>145</b>	
<b>-170</b>	110	150	210	90	125	<b>170</b>	Frame size 3B 500 x 260 x 260
<b>-210</b>	132	200	250	110	150	<b>210</b>	
<b>-250</b>	132	200	262	132	200	<b>250</b>	
<b>-310</b>	200	300	370	160	250	<b>310</b>	Frame size 4 532 x 547 x 278
<b>-370</b>	250	350	450	200	300	<b>370</b>	
<b>-450</b>	315	450	549	250	350	<b>450</b>	
<b>-570</b>	400	600	710	315	500	<b>570</b>	Frame size 5 687 x 640 x 302
<b>-710</b>	450	700	835	400	600	<b>710</b>	
<b>-835</b>	500	800	960	450	700	<b>835</b>	
<b>-1000</b>	630	900	1125	560	800	<b>1 000</b>	Frame size 6 900 x 875 x 336
<b>-1400</b>	900	1250	1650	800	1000	<b>1 400</b>	

## Emotron MSF softstarter, 525 V type

### Typical motor power at mains voltage 525 V

Rating according to AC53a norm.

Model (525 V)	Normal duty AC-53a 5.0-30:50-10		Heavy duty AC-53a 3.0-30:50-10		Frame size - Dimensions H x W x D [mm]
	Power @ 525 V [kW]	Rated current [A]	Power @ 525 V [kW]	Rated current [A]	
MSF-017	15	22	11	17	Frame size 1 320 x 126 x 260
-030	22	37	18,5	30	
-045	37	60	30	45	
-060	45	72	37	60	
-075	55	85	45	75	
-085	55	96	55	85	
-110	90	134	75	110	Frame size 2 400 x 176 x 260
-145	110	156	90	145	Frame size 3B 500 x 260 x 260
-170	132	210	110	170	
-210	160	250	132	210	
-250	160	262	160	250	Frame size 4 532 x 547 x 278
-310	250	370	200	310	
-370	315	450	250	370	
-450	400	549	315	450	Frame size 5 687 x 640 x 302
-570	500	710	400	570	
-710	560	835	500	710	
-835	710	960	560	835	Frame size 6 900 x 875 x 336
-1000	800	1125	710	1 000	
-1400	1250	1650	1000	1 400	



## Emotron MSF softstarter, 690 V type

Typical motor power at mains voltage 575 V and 690 V

Model (690 V)	Normal duty AC-53a 5.0-30:50-10			Heavy duty AC-53a 3.0-30:50-10			Frame size - Dimensions H x W x D [mm]
	Power @ 575V [hp]	Power @ 690V [kW]	Rated current [A]	Power @ 575V [hp]	Power @ 690V [kW]	Rated current [A]	
<b>MSF-017</b>	20	18,5	22	15	15	<b>17</b>	Frame size 1 320 x 126 x 260
<b>-030</b>	30	30	37	25	22	<b>30</b>	
<b>-045</b>	50	55	60	40	37	<b>45</b>	
<b>-060</b>	60	55	72	50	55	<b>60</b>	
<b>-075</b>	75	75	85	75	55	<b>75</b>	
<b>-085</b>	75	90	90	75	75	<b>85</b>	
<b>-110</b>	125	110	134	100	90	<b>110</b>	Frame size 2 400 x 176 x 260
<b>-145</b>	150	132	156	150	132	<b>145</b>	
<b>-170</b>	200	200	210	150	160	<b>170</b>	Frame size 3B 500 x 260 x 260
<b>-210</b>	250	250	250	200	200	<b>210</b>	
<b>-250</b>	250	250	262	250	250	<b>250</b>	
<b>-310</b>	400	355	370	300	315	<b>310</b>	Frame size 4 532 x 547 x 278
<b>-370</b>	500	400	450	400	355	<b>370</b>	
<b>-450</b>	600	560	549	500	400	<b>450</b>	
<b>-570</b>	700	630	640	600	560	<b>570</b>	Frame size 5 687 x 640 x 302
<b>-710</b>	800	800	835	700	710	<b>710</b>	
<b>-835</b>	900	900	880	800	800	<b>835</b>	
<b>-1000</b>	1250	1120	1125	1000	1000	<b>1 000</b>	Frame size 6 900 x 875 x 336
<b>-1400</b>	1500	1600	1524	1500	1400	<b>1 400</b>	

## General specifications for Emotron TSA and MSF

### General

Model	TSA	MSF
Mains voltage:	200-525 V, +10%/-15% 200-690 V, +10%/-15%	200-525 V, ±10% 200-690 V, +5%/-10%
Control supply voltage	100-240 V +10%/-15%, Single phase	100 - 240 V ±10%, Single phase 380 - 500 V ±10%
Number of fully controlled phases	3	3
Mains and control frequency	50/60 Hz, ±10%	50/60 Hz, ±10%
Power loss (% of P <sub>mot</sub> )	0.2 %* if 10 starts/hour	0.6 %

\* see Emotron TSA instruction manual chapter 13 for details.

### Environmental conditions

Parameter	Normal operation
Nominal ambient temperature	0°C–40°C (see also Table 1 )
Atmospheric pressure	86–106 kPa
Relative humidity, non-condensing	Max 95%, non-condensing
Contamination, according to IEC 60721-3-3	Chemically active substances, class 3C3 (conformal coating - all printed circuit boards are coated in Emotron TSA, optional with Emotron MSF). Mechanically active substances, class 3S1 (no sand; dust <0.01 mg/m <sup>3</sup> , deposited <0.4 mg/(m <sup>2</sup> *h)). Biological conditions, class 3B1 (no risk for harmful biological attacks - mould, fungus, animals, etc).
Vibrations	According to IEC 60721-3-3: Mechanical conditions, class 3M4 (2 - 9 Hz, 3.0 mm and 9 - 20 Hz, acc. 1 g (10 m/s <sup>2</sup> ))
Altitude	0–1,000 m Max 4,000 m by derating 1%/100 m in excess of 1,000 m.

Parameter	Storage condition
Temperature	-25 to +70 °C
Atmospheric pressure	86 –106 kPa
Relative humidity, non-condensing	Max 95%, non-condensing

## Operation at higher temperatures

The Emotron softstarter is made for operating at maximum 40 °C ambient temperature.

However, it is possible to use Emotron softstarter at higher temperatures with reduced output current rating (derating).

Table 1 shows ambient temperatures as well as possible derating for higher temperatures.

Table 1 Ambient temperature and possible derating

Model	Rated max temp.	Possible output current derating
Emotron TSA	40 °C	-2%/ °C to max +15 °C (55 °C)
Emotron MSF	40 °C	-2%/ °C to max +10 °C (50 °C)

## Dimensions and weights

The tables below give an overview of the dimensions, weights, cooling and mounting.

### Emotron TSA

Emotron TSA Model	Frame size	Dim. H1/H2 x W x D [mm]	Weight [kg]	Cooling/Mounting
TSA -016 to -056	1	246/340 x 126 x 188	5.5	Convection / Vertical
TSA -070 to -100	2	246/340 x 126 x 188	5.7	Fan / Vertical & Horizontal
TSA -140 to -200	3	285/380 x 196 x 235	13	Fan / Vertical & Horizontal
TSA -240 to -450	4	373/512 x 254 x 260	23,5	Fan / Vertical & Horizontal

H1 = Enclosure height

H2 = Total height including cable interface

### Emotron MSF

Emotron MSF Model	Frame size	Dim. H x W x D [mm]	Weight [kg]	Cooling/Mounting
MSF -017 to -030	1	320 x 126 x 260	6.7	Convection / Vertical
MSF -045 to -085	1	320 x 126 x 260	6.9	Fan / Vertical & Horizontal
MSF -110 to -145	2	400 x 176 x 260	12	Fan / Vertical & Horizontal
MSF -170 to -250	3B	500 x 260 x 260	20	Fan / Vertical & Horizontal
MSF -310 to -450	4	532 x 547 x 278	46	Fan / Vertical & Horizontal
MSF -570 to -835	5	687 x 640 x 302	80	Fan / Vertical & Horizontal
MSF -1000 to -1400	6	900 x 875 x 336	175	Fan / Vertical & Horizontal

## Basic I/O data

	Emotron TSA	Emotron MSF
<b>Control signal inputs: Analogue (differential), 1 input</b>		
Analogue voltage/current Resolution Input impedance	0-10V, 2-10V / 0-20 mA, 4-20 mA 12 bit Volt signal 20 k $\Omega$ , Current signal 250 $\Omega$ .	0-10V, 2-10V / 0-20 mA, 4-20 mA 10 bit Volt signal 125 k $\Omega$ , Current signal 100 $\Omega$ .
<b>Digital: 4 inputs</b>		
Input voltage Max. input voltage Input impedance	0-4 V $\rightarrow$ 0; 8-27 V $\rightarrow$ 1. Max. 37 V for 10 sec. $\leq$ 3.3 VDC: 4.7 k $\Omega$ . - $\geq$ 3.3 VDC: 3.6 k $\Omega$	0-3 V $\rightarrow$ 0; 8-27 V $\rightarrow$ 1 Max. 37 V for 10 sec 0 VDC: 2.2 k $\Omega$ .
<b>Control signal outputs: Analogue, 1 channel</b>		
Output voltage/current Min. load impedance for voltage signal <sup>1)</sup> Maximum load impedance for current signal <sup>1)</sup> Resolution	0-10 V, 2-10 V / 0-20 mA, 4-20 mA 700 $\Omega$ 700 $\Omega$ 12 bit	0-10V, 2-10V / 0-20 mA, 4-20 mA 700 $\Omega$ 750 $\Omega$ . 8 bits
<b>Relays, 3 pcs</b>		
Contacts	Relay 1 and 2: 1-pole closing contact (NO). Relay 3: 1-pole change-over contact (NO/NC). 250 VAC 8A or 24 VDC 8A resistive. 250 VAC, 3A inductive. Min. 100 mA.	Relay 1 and 2 : 1-pole closing contact (NO). Relay 3: 1-pole change-over contact (NO/NC). 8 A, 250 VAC or 24 VDC resistive load; 3 A, 250 VAC inductive load (PF 0.4).
<b>Reference voltages</b>		
Output voltage Short-circuit current( $\infty$ ) Output voltage (for AnIn) Short-circuit current( $\infty$ )	+24 VDC $\pm$ 5% Max current 50 mA  +10VDC $\pm$ 5% Max 10 mA short circuit and overload proof.	+12 VDC $\pm$ 5% Max current 50 mA

<sup>1)</sup> For max 1 % inaccuracy.

See "User interface data" on page 13 for connection data and default settings.

## Emotron TSA recommended load fuse

Recommended slow fuses for protection against overload.

TSA model	Fuse [A]
- 016	20
- 022	25
- 030	35
- 036	40
- 042	50
- 056	63
- 070	80
- 085	80

TSA model	Fuse [A]
- 100	100
- 140	160
- 170	200
- 200	224
- 240	250
- 300	315
- 360	315
- 450	425

## Emotron TSA semiconductor fuses

TSA model	Maximum value fuse [A]	i <sup>2</sup> t fuse at 700V [A <sup>2</sup> s]
- 016	50	1 500
- 022	70	2 800
- 030	100	3 600
- 036	125	6 900
- 042	150	11 000
- 056	175	14 000
- 070	250	42 000
- 085	300	55 000
- 100	400	99 000
- 140	500	160 000
- 170	600	222 000
- 200	700	332 000
- 240	800	433 000
- 300	1 000	950 000
- 360	1 200	1 470 000
- 450	1 400	1 890 000

## Emotron MSF semiconductor fuses

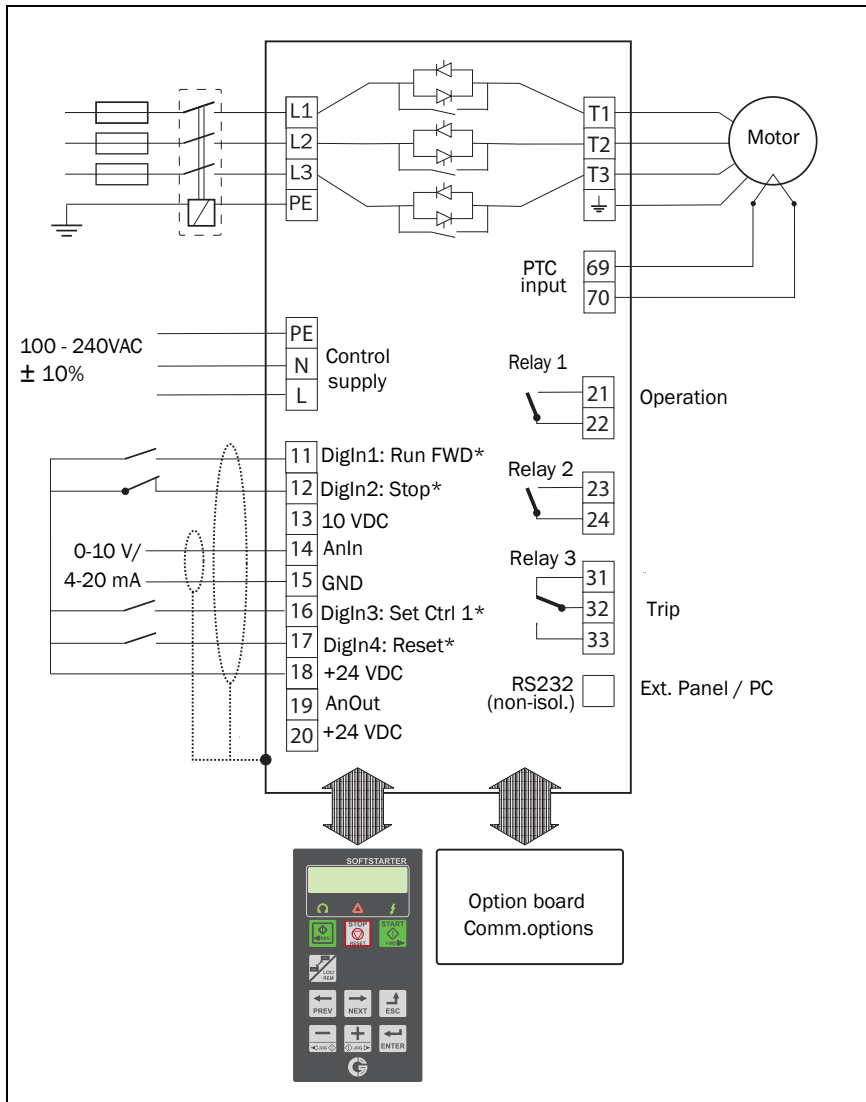
MSF model	Maximum value fuse [A]	i <sup>2</sup> t fuse at 700V [A <sup>2</sup> s]
- 017	FWP-80A	2 400
- 030	FWP-125A	7 300
- 045	FWP-150A	11 700
- 060	FWP-175A	16 700
- 075	FWP-250A	42 500
- 085	FWP-300A	71 200
- 110	FWP-350A	95 600
- 145	FWP-450A	250 000
- 170	FWP-700A	300 000
- 210	FWP-700A	300 000
- 250	FWP-800A	450 000
- 310	FWP-800A	450 000
- 370	FWP-1000A	600 000
- 450	FWJ-1200A	1 470 000
- 570	FWJ-1400A	1 890 000
- 710	FWJ-1800A	3 710 000
- 835	FWJ-2000A	5 320 000
- 1000	FWJ-2000A	5 320 000
- 1400		<12 000 000

## Emotron MSF UL/cUL fuses

MSF model	Fuse type for UL	Max rating [A]	Fuse type for cUL	Max rating [A]
- 017	Any UL listed fuse	80	Bussman, FWP	80
- 030	Any UL listed fuse	125	Bussman, FWP	125
- 045	Any UL listed fuse	225	Bussman, FWP	150
- 060	Any UL listed fuse	250	Bussman, FWP	175
- 075	Any UL listed fuse	300	Bussman, FWP	250
- 085	Any UL listed fuse	350	Bussman, FWP	300
- 110	Any UL listed fuse	500	Bussman, FWP	350
- 145	Any UL listed fuse	600	Bussman, FWP	450
- 170	Any UL listed fuse	800	Bussman, FWP	700
- 210	Any UL listed fuse	1000	Bussman, FWP	700
- 250	Any UL listed fuse	1000	Bussman, FWP	800
- 310	Any UL listed fuse or circuit breaker	1400	Any CSA listed fuse or circuit breaker	1400
- 370	Any UL listed fuse or circuit breaker	1800	Any CSA listed fuse or circuit breaker	1800
- 450	Any UL listed fuse or circuit breaker	2100	Any CSA listed fuse or circuit breaker	2100
- 570	Any UL listed fuse or circuit breaker	2100	Any CSA listed fuse or circuit breaker	2100
- 710	Any UL listed fuse or circuit breaker	2500	Any CSA listed fuse or circuit breaker	2500
- 835	Any UL listed fuse or circuit breaker	2800	Any CSA listed fuse or circuit breaker	2800
- 1000	-	-		-
- 1400	-	-		-

User interface data

Emotron TSA

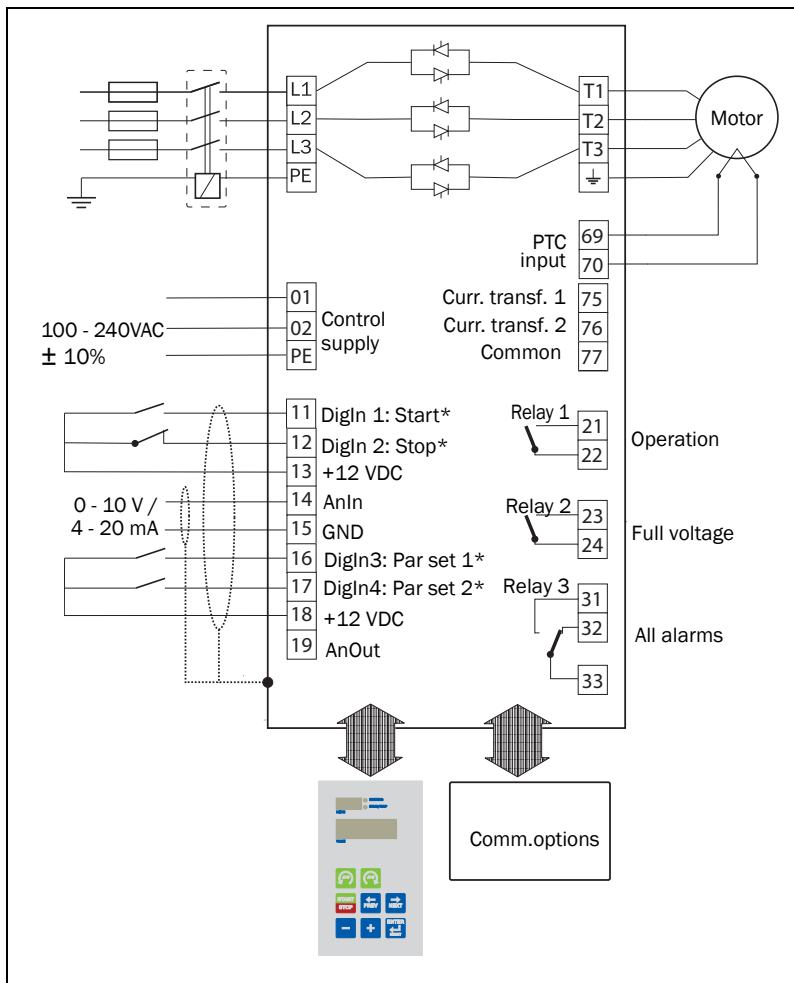


	Name:	Function (Default):
<b>Control board terminals</b>		
11	DigIn 1	Run FWD
12	DigIn 2	Stop
13	10 VDC	Supply voltage for analogue input
14	AnIn	Process value
15	GND	Signal ground (Common)
16	DigIn 3	Set Ctrl 1
17	DigIn 4	Reset
18	+24 V	+24VDC Supply voltage
19	AnOut	0 to motor nom. current
20	+24 V	+24VDC Supply voltage
<b>Power board terminals</b>		
PE		Protective Earth
N		Control supply voltage
L		100 - 240 VAC ± 10%
21	Relay 1	NO
22		C
23	Relay 2	NO
24		C
31	Relay 3	NO
32		C
33		NC
69		PTC thermistor input
70		(isolated)

All analogue & digital inputs and outputs are programmable.

\*) Default selection

Emotron MSF



\*) Default selection

	Name:	Function (Default):
<b>Control board terminals</b>		
11	DigIn 1	Start
12	DigIn 2	Stop
13	12 VDC	Supply voltage for analogue input
14	AnIn	
15	GND	Signal ground
16	DigIn 3	Par set 1
17	DigIn 4	Par set 2
18	+12 V	+12VDC Supply voltage
19	AnOut	0 to motor nominal current
<b>Power board terminals</b>		
PE		Protective Earth
N		Control supply voltage
L		100 - 240 VAC ± 10%
21	Relay 1	NO
22		C
23	Relay 2	NO
24		C
31	Relay 3	NO
32		NC
33		C
69		PTC thermistor input
70		
75		L1/T1 Current transformer
76		L3 / T3 Current transformer
77		Common for 75 - 76

All analogue & digital inputs and outputs are programmable.

## Standard options for Emotron TSA

Support for 2 option boards plus 1 communication option.

### I/O board



3 extra relay outputs (230 V<sub>AC</sub>/5 A NO/NC). 3 extra 24 V / 3.2 kΩ (AC or DC) differential digital inputs, all programmable. Inputs providing 50 V<sub>AC/DC</sub> isolation between channels.

Maximum 2 I/O boards can be built -in per TSA softstarter.

Part no. 01-3876-51

### PTC/PT100 board



1 PTC isolated input conforming to DIN 44081/44082. Max 6 PTC thermistors can be connected in series to PTC input. Also including 3 PT100 inputs, 2/3/4-wire, conforming to EN 60751.

Maximum 2 PTC/PT100 boards can be built -in per TSA softstarter

Part no. 01-3876-58

### Fieldbus - Profibus



Fieldbus option module for Profibus DP or DP V1 communication. Use 9-pin D-sub connector. Baud rates: 9.6 kbits/s - 12 Mbits/s supported.

Typical TSA response time = 10 ms (not including any fieldbus delays).

Part no. 01-5385-55

### Fieldbus - DeviceNet



Fieldbus option module for DeviceNet communication. Baud rates: 125 - 500 kbits/s supported. Typical TSA response time = 10 ms (not including any fieldbus delays).

Part no. 01-5385-56

### Ethernet - Modbus/TCP



Industrial Ethernet option module for Modbus/TCP protocol. RJ45 type connector. Baud rates: 10 or 100 Mbits/s supported.

Typical TSA response time = 10 ms (not including any ethernet delays).

Part no. 01-5385-59

### Ethernet - EtherCAT



Industrial Ethernet option module for EtherCAT protocol. Baud rate: 100 Mbits/s. Typical TSA response time = 10 ms (not including any ethernet delays).

Part no. 01-5385-60



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### Ethernet - Profinet IO 1-port



Industrial Ethernet option module for Profinet IO (RT) protocol.  
 Baud rate: 100 Mbits/s  
 Typical TSA response time = 10 ms  
 (not including any ethernet delays).

Part no. 01-5385-61

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### Ethernet - Profinet IO 2-port



Industrial Ethernet option module for Profinet IO (RT) protocol.  
 Baud rate: 100 Mbits/s  
 Typical TSA response time = 10 ms  
 (not including any ethernet delays).

Part no. 01-5385-62

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### USB isolated



Isolated USB serial communication module. For Modbus RTU comm.protocol.  
 Baud rates: 2.4 - 115.2 kbits/s supported.  
 Typical TSA response time = 10 ms

Part no. 01-5385-63

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### RS485 isolated



Isolated RS485 serial communication module. For Modbus RTU comm.protocol.  
 Baud rate: 2.4 - 115.2 kbits/s supported.  
 Typical TSA response time = 10 ms

Part no. 01-5385-54

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### External control panel



External control panel IP54 suitable for mounting on a cabinet door.  
 Kit complete with control panel, mounting frame and 3 m cable

Part no. 01-5406-00

## EmoSoftCom



Connect a PC with a standard RS232 cable to D-sub on top of TSA unit or via USB/RS485 /Modbus - TCP Comm. modules (Optional). EmoSoftCom PC software makes it possible to perform signal recordings

and save/load parameter backup data, for example during service & maintenance.

## Standard options for Emotron MSF

Support for 1 communication option.

### External control panel (ECP)



External control panel IP54 suitable for mounting on a cabinet door.

Part no. 01-3060-00

### Serial communication



Modbus RTU (RS232/RS485) for serial communication.

Part no. 01-1733-00

### Fieldbus - Profibus



Fieldbus option for Profibus DP communication.

Part no. 01-1734-01

### Fieldbus - DeviceNet



Fieldbus option for DeviceNet communication.

Part no. 01-1736-01

## Cable entry box

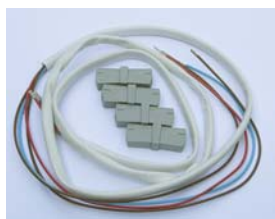


Cable entry box for connection of cable glands.  
For MSF size 1 (017 - 085).

Part no. 01-2553-00

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## Cable set for external current transformers



Extension cable set for externally mounted current transformers. Used with bypass contactors.

Part no. 01-2020-00

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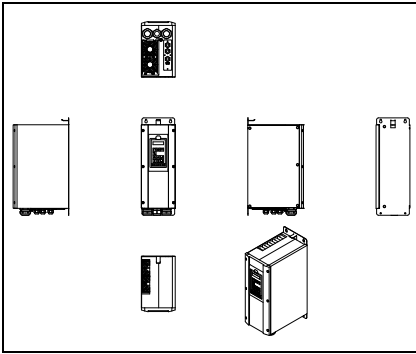
## Coated boards



All option boards are also available as coated, recommended e.g. for sewer pump applications (sulphide) or installations with occasional high humidity (if machine room installation or tropical climate).  
IEC60721-3-3 gases class 3C3, solid particles class 3S2.

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## CAD drawings available on the web



2D and 3D CAD drawings for Emotron AC drives, softstarters and monitors are available via our website. These will assist anyone working with our products, for example, consultants, installers or machine builders. Visit [www.emotron.com](http://www.emotron.com) for direct access to all CAD documents.

Emotron is now CG

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