mecotron®
Safety relay ESTOP-2
For emergency stop monitoring

- Emergency Stop monitoring
- 2 safety output circuits
- 2 LED displays
- 3 supply voltage versions
- Safety category 3

Description

The safety module ESTOP-2 for emergency stop monitoring is used for safety breaking one or more circuits and is designed to be incorporated in emergency stop or safety circuits in accordance with relevant standard EN 60204-1. These modules meet the requirements of European standards EB-EN 418 for emergency stops and EN 60204-1 for safety circuits. These standards cover cases where a single emergency stop device must break several circuits (indirect action emergency stop).

Conforming to standards

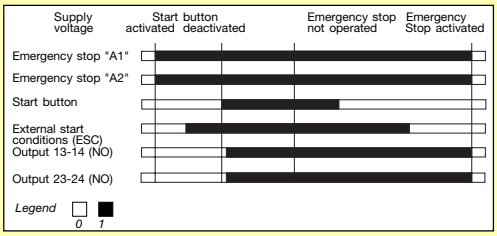
- Product : EN 954-1 - category 3
- Machine : assemblies EU-machine-guidelines 89/392 EWG
  IEC 204-1, EN 292, EN 418
  EN 60204-1, BS 2771-1, DIN VDE 0113-1, NF C 79-130, NF E 09-053
- Approvals :

Supply voltage	P/N
24 V AC/DC	2 450 800 00
115 V AC (50/60 Hz)	2 450 800 10
230 V AC (50/ 60 Hz)	2 450 800 20

Accessories	P/N
Adapter for screw mounting	3 430 029 01

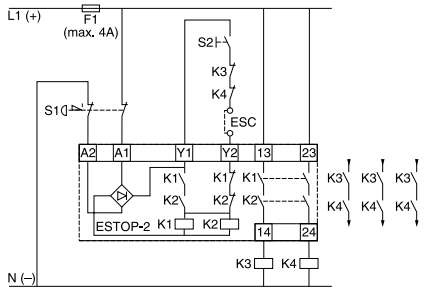
Technical data

Input circuit			
Supply voltage - Power consumption	**A1-A2**	24 V AC/DC	- < 3 VA / W
	A1-A2	115 V AC	- < 3 VA
	A1-A2	230 V AC	- < 3 VA
Supply voltage tolerance	24 V AC/DC		-10 % ... +10 %
	115 V AC		-15 % ... +15 %
	230 V AC		-15 % ... +10 %
Rated frequency AC variance	115 V AC		50...60 Hz
	230 V AC		50...60 Hz
Stop monitoring circuit			single-channel or dual-channel
Voltage potential			Supply voltage
Current over the command device			approx. 60 mA
Cross circuit protection			-
Feedback circuit	**Y1-Y2**		
Feedback method			Relay / contactors, force guided
Voltage potential in feedback loop			24 V DC
Display of operating status (LED)			
Supply voltage			LED, green
Output relay energized			LED, green
Output circuit / Safety exits	**13-14, 23-24**		Relay, 2 NO contacts, force guided, internal monitored
Rated operational voltage			300 V
Rated operational current	AC 12 (resistive)		2.5 A (at 240 V)
Rated operational current	AC 15 (inductive)		0.75 A (at 240 V)
Rated operational current	DC 12 (resistive)		2.5 A (at 24 V)
Rated operational current	DC 13 (inductive)		1.25 A (at 24 V)
Mechanical life (max.)			10 x 10^6 operations
Electrical life (max.)	(on AC 12 / 240 V / 2.5 A)		6 x 10^5 operations
Short-circuit protection, max. fuse rating			4 A / fast, type gL
Other details			
Impulse withstand voltage V_{imp}			4 kV
Operating temperature range			-20°C ... +55°C
Storage temperature range			-25°C ... +85°C
Mounting position			any
Mounting to DIN rail (EN 50022)			snap-on fastening/screw mounting using adapter
Terminal capacity			2 x 14 AWG (2 x 2.5 mm^2)
Weight			approx. 0.44 lb (200 g)
Dimensions (W x H x D)			22.5 x 78 x 120 mm



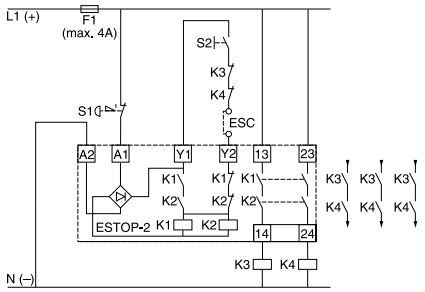
Wiring diagrams

Emergency stop button with 2 NC contacts



ESC = External start conditions

Emergency stop button with 1 NC contact



ESC = External start conditions

Safety relay mecotron® ESTOP-3

For emergency stop monitoring

- Emergency-stop monitoring
- 3 Safety output circuits
- 2 LED function displays
- Safety category 3

Operation

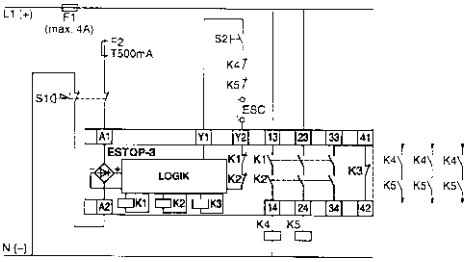
The ESTOP-3 module provides a safety oriented interruption of safety circuits. It can be integrated in emergency-stop or safety circuits in accordance with EN 60204-1. This module corresponds to the European standards EN 418 for emergency-stop equipment and EN 60204-1 (safety circuits). These standard cover cases where a single command must open several circuits (emergency stop by indirect action).
ESTOP-3 offers 3 outputs with immediate opening contacts for safety circuits of stop category 0 as well as an auxiliary NC contact.

Conforming to the standards

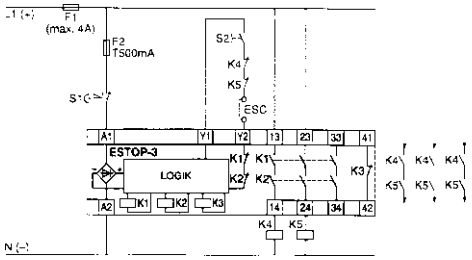
- Product: EN 954-1 - category 3
- Machine assemblies: EU-machine guidelines 89/392 EWG
  IEC 204-1, EN 292, EN 418
  EN 60204-1, BS 2771-1, DIN VDE 0113-1,
  NF C 79-130, NF E 09-053
- Approvals:

Wiring examples

Emergency-stop button with two NC contacts / 2 channels



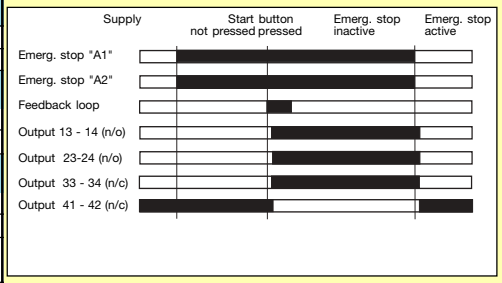
Emergency-stop button with one NC contact / 1 channel



ESC = External starting conditions

Supply voltage	Ref. no.:
24 V AC/DC	2 450 801 00

Accessories	Ref. no.:
Adapter for screw mounting	3 430 029 01



Technical data

Input circuit				
Supply voltage - power consumption	**A1-A2**	24 V AC/ DC	-	≤ 5.0 VA/ 3.5 W
Tolerance of supply voltage	24 V AC/DC	24 V AC	-	-20% ... +10%
		24 V DC	-	-20% ... +20%
Rated frequency AC variances	115 V AC			
	230 V AC			
Emergency-stop circuits		single-channel or dual-channel		
Voltage potential		Supply voltage		
Current via indication device		approx. 200 mA		
Cross-circuit protection				
Feedback circuit	**Y1-Y2**			
Feedback method		Relay/ contactor, force guided		
Voltage potential in feedback loop		24 V DC		
Display of operational status				
Supply voltage		LED green		
Output relay energized		LED green		
Output circuit	**13-14, 23-24, 33-34,41-42**	Relay, volt-free, force guided, internal monitored		
Safety outputs/ auxiliary circuit		3 NO contact	/	1 NC contact
Rated operational voltage		300 V max.	/	300 V max.
Rated operational current	AC 12 (resistive)	5 A (at 230 V)	/	2 A (at 230 V)
Rated operational current	AC 15 (inductive)	1.5 A (at 230 V)	/	2 A (at 230 V)
Rated operational current	DC 12 (resistive)	5 A (at 24 V)	/	2 A (at 24 V)
Rated operational current	DC 13 (inductive)	1.25 A (at 24 V)	(L/R=100 ms)	2 A (at 24 V)
Mechanical life max.		10×10^6 operations		
Electrical life max. (acc. to AC 12 / 240 V / 5 A)		3×10^5 operations		
Short-circuit proof, max. fuse rating		4 A , operating class gL		
Other details				
Limit of accum. currents at simultaneous load on several output circuits		Sum current $I_{th} < 10$ A		
Impulse voltage withstand V_{imp}		4 kV		
Response time of the output relays		< 40 ms		
Operating temperature range		-10°C ... +55°C		
Storage temperature range		-25°C ... +85°C		
Mounting position		any		
Mounting on DIN rail (EN 50022)		Snap-on mounting/screw mounting by adapter		
Wire size stranded with wire end ferrule		14 AWG (2.5 mm^2)		
Weight		approx. 0.66 lb (300 g)		
Dimensions (W x H x D)		22.5 x 78 x 120 mm		

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Safety relays
ESTOP-2a and ESTOP-2b
provides a safety interruption of one or several circuits

- Emergency Stop monitoring and monitoring of protective guards
- Cross circuit protection
- Start button monitoring / configurable
- 2 safety outputs
- 2 auxiliary transistor-outputs
- Monitoring of safety-mats (ESTOP-2b)
- 4 LED displays
- 3 supply voltage versions

Description

The ESTOP-2a (ESTOP-2b) module provides a safety oriented interruption of one or several circuits and is designed to be integrated in emergency stop or safety circuits conforming to EN 60204-1. It meets the requirements of the European standard EN 418 for emergency stop equipment and EN 60204-1 for safety circuits. These standards concern the applications where a single command must open several circuits (emergency stop by indirect action). The module also meets the safety requirements for electrical monitoring of limit switches on protective equipment.

ESTOP-2a : The module is equipped with two voltage free safety outputs of stop category 0 (EN 418, EN 60204).

ESTOP-2b : In addition to the two voltage free safety outputs of stop category 0 (EN 418, EN 60204-1), the module is equipped with two semiconductor outputs for signalling functions. Additionally it is possible to monitor sensor mats with the ESTOP-2b.

The module is designed for use with one or two input channels. For extended fault detection and increased safety level, we recommend the use of two input channels. In this operation mode, the connection cables are integrated in the monitoring and all initial faults will be detected.

Conforming to standards

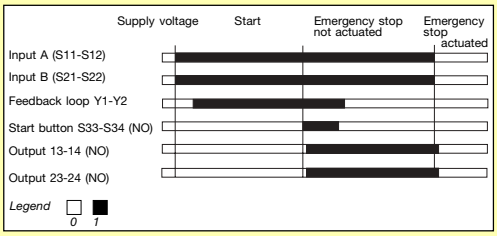
- Product : EN 954-1 - category 4
- Machine assemblies : EU-machine-guidelines 89/392 EWG
  IEC 204-1, EN 292, EN 418
  EN 60204-1, BS 2771-1, DIN VDE 0113-1, NF C 79-130, NF E 09-053
- Approvals :

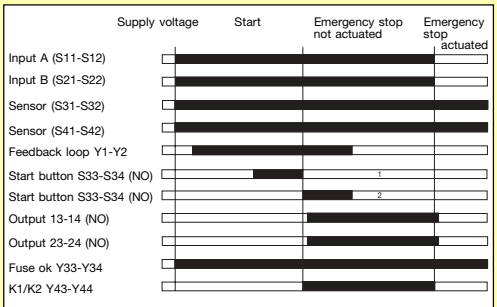
ESTOP-2a Supply voltage	P/N
24 V AC/DC	2 450 803 00
115 V AC (50/60 Hz)	2 450 803 10
230 V AC (50 Hz)	2 450 803 20

ESTOP-2b Supply voltage	P/N
24 V AC/DC	2 450 804 00
115 V AC (50/60 Hz)	2 450 804 10
230 V AC (50/60 Hz)	2 450 804 20

Technical data

Input circuit		
Supply voltage - power consumption	A1-A2	24 V AC/DC - < 7 VA / W
	A1-A2	115 V AC - < 10 VA
	A1-A2	230 V AC - < 10 VA
Supply voltage tolerance	24 V AC/DC	-20 % ... +10 %
	115 V AC	-15 % ... +15 %
	230 V AC	-15 % ... +10 %
Rated frequency AC variance	115 V AC	50...60 Hz
	230 V AC	50...60 Hz
Stop monitoring circuit	**S11-S12, S21-S22, B1**	single-channel or dual-channel
Voltage potential $V_{S11/S21}$	24 V AC/DC	VA1-A2-3 V
	115 V AC	> 42 V
	230 V AC	> 42 V
Synchronous time between Input A and Input B		approx. 300 ms
Cross circuit protection		through internal electronic fuse
Max. line resistance RL		50 Ω
Other Inputs		
Connection of an external start button	**S33-S34**	volt-free
Start button monitoring configurable (ESTOP-2b)	**Y3-Y4**	open-monitoring/linked-no monitoring
Connection of short circuit making sensor mats, safety mats or other volt-free contacts (ESTOP-2b)	**S31-S32** **S41-S42**	volt-free
Max. resistance between	**S31-S32, S41-S42**	50 Ω
Feedback circuit	**Y1-Y2**	
Feedback method		Relay / contactors, force guided
Voltage potential in feedback loop	24 V DC	
Display of operating status (LED)		
Supply voltage/internal electronic fuse		LED, green
Input A (S11-S12)		LED, green
Input B (S21-S22)		LED, green
Output relay energized		LED, green
Output circuit, safety outputs	**13-14, 23-24**	Relay, 2 NO contacts, volt-free, force guided, internal monitored
Rated operational voltage		300 V
Rated operational current	AC 12 (resistive)	2.5 A (at 240 V)
Rated operational current	AC 15 (inductive)	0.75 A (at 240 V)
Rated operational current	DC 12 (resistive)	2.5 A (at 24 V)
Rated operational current	DC 13 (inductive)	1.2 A (at 24 V) L/R = 50 ms
Short circuit protection, max. fuse rating		4 A type gL
Response time of the output relays		< 40 ms
Output circuit, auxiliary circuit		2 transistor-outputs, NO contact function
Transistor-output (ESTOP-2b)	**Y33-Y34**	typ. 24 V/20 mA, status of the internal electronic fuse
Transistor-output (ESTOP-2b)	**Y43-Y44**	typ. 24 V/20 mA, status of the output relays K1, K2
Other details		
Impulse withstand voltage V_{imp}		4 kV
Mechanical life (max.)		10 x 10^6 operations
Electrical life (max.)	(on AC 12 / 240 V / 2.5 A)	6 x 10^5 operations
Operating temperature range		-10°C ... +55°C
Storage temperature range		-25°C ... +85°C
Mounting position		any
Mounting to DIN rail (EN 50022)		snap-on fastening/screw mounting using adapter
Terminal capacity		2 x 14 AWG (2 x 2.5 mm²)
Weight 24 V AC/DC / 115 V AC and 230 V AC		approx. 0.77 lb (350 g) / approx. 0.99 lb (450 g)
Dimensions (W x H x D)		45 x 78 x 120 mm





1 With start button monitoring, Y3-Y4 open
2 Without start button monitoring, Y3-Y4 shorted out

Accessories	P/N
Adapter for screw mounting	3 430 029 01

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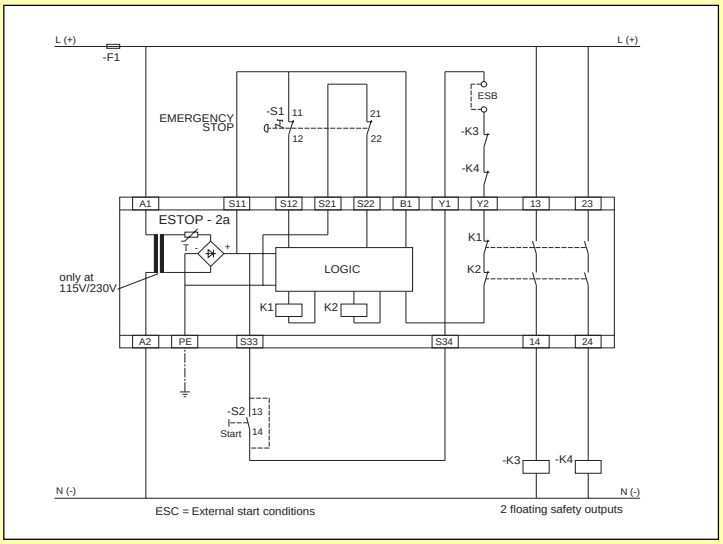
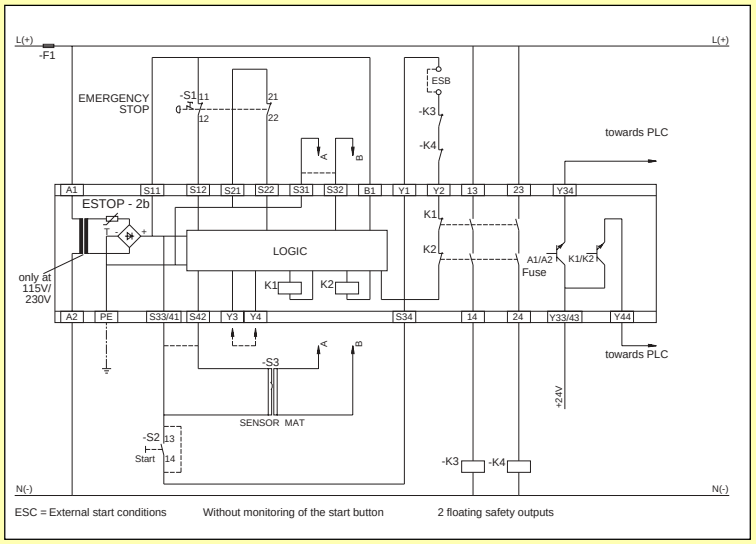
Safety relays ESTOP-2a and ESTOP-2b
provide a safety interruption of one or several circuits

Wiring diagram ESTOP-2a

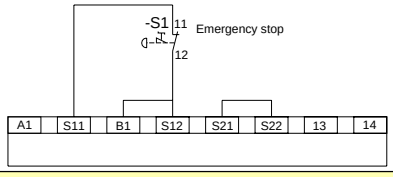


ESTOP-2b

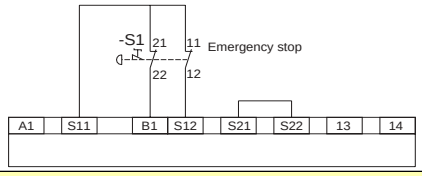


Wiring diagram

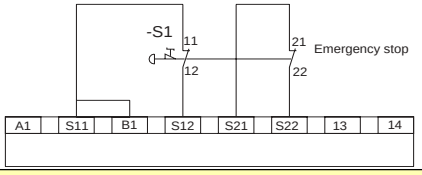
One channel connection of the button



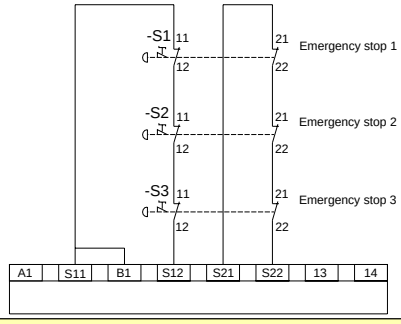
Two channel connection of the button, without short-circuit detection



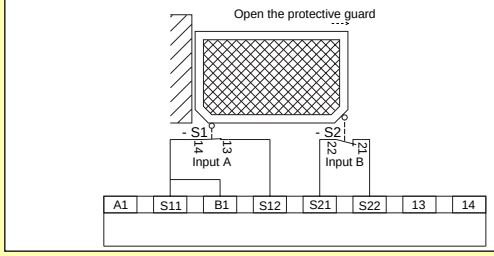
Two channel connection of the button, with short-circuit detection



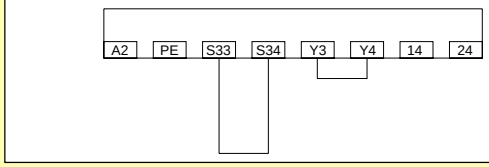
Connection of several emergency stop buttons



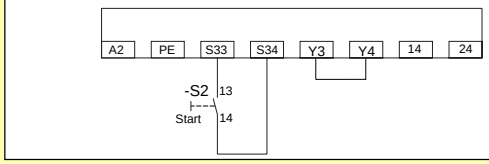
Protective guard (closed)



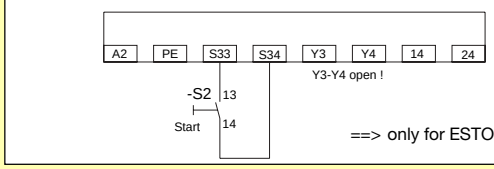
Without start button (automatic start)



With start button, without monitoring (switching on at the positive edge)



With start button, with monitoring (switching on at the negative edge)



mecotron®
Safety relays
ESTOP-3a and ESTOP-3b
provide a safety interruption of one or several circuits

- Emergency Stop monitoring and monitoring of protective guards
- Cross circuit protection
- start button monitoring / configurable (ESTOP-3b)
- 3 safety outputs
- 1 NC auxiliary output
- 2 auxiliary transistor-outputs
- Monitoring of safety mats
- 4 LED displays
- 3 supply voltage versions

Description

The ESTOP-3a (ESTOP-3b) module provides a safety oriented interruption of one or several circuits and is designed to be integrated in emergency stop or safety circuits conforming to EN 60204-1. It meets the requirements of the European standard EN 418 for emergency stop equipment and EN 60204-1 for safety circuits. These standards concern the applications where a single command must open several circuits (emergency stop by indirect action). The module also meets the safety requirements for electrical monitoring of limit switches on protective equipment.

ESTOP-3a :The module is equipped with three voltage free safety outputs of stop category 0 (EN 418, EN 60204-1) and one voltage free NC contact.

ESTOP-3b : In addition to the three voltage free safety outputs of stop category 0 (EN 418, EN 60204-1), the module is equipped with a voltage free NC contact and two semiconductor outputs for signalling functions.
Additionally it is possible to monitor sensor mats with the ESTOP-3b.

The module is designed for use with one or two input channels. For extended fault detection, and increased safety level, we recommend the use of two input channels. In this operation mode, the connection cables are integrated in the monitoring and all initial faults will be detected.

Conforming to standards

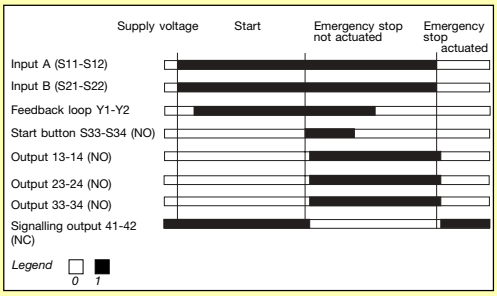
- Product : EN 954-1 - category 4
- Machine assemblies : EU-machine-guidelines 89/392 EWG
  IEC 204-1, EN 292, EN 418
  EN 60204-1, BS 2771-1, DIN VDE 0113-1,
  NF C 79-130, NF E 09-053
- Approvals :

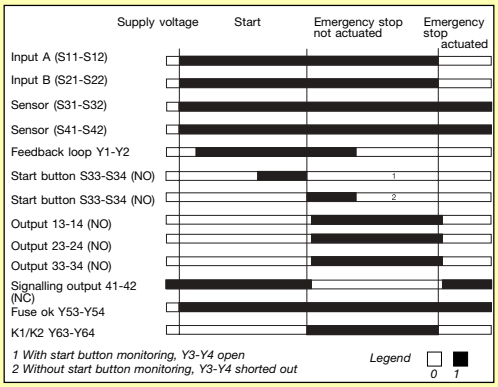
ESTOP-3a Supply voltage	P/N
24 V AC/DC	2 450 805 00
115 V AC (50/60 Hz)	2 450 805 10
230 V AC (50 Hz)	2 450 805 20

ESTOP-3b Supply voltage	P/N
24 V AC/DC	2 450 806 00
115 V AC (50/60 Hz)	2 450 806 10
230 V AC (50/60 Hz)	2 450 806 20

Technical data

Input circuit			
Supply voltage - Power consumption	**A1-A2**	24 V AC/DC	- < 7 VA / W
	A1-A2	115 V AC	- < 10 VA
	A1-A2	230 V AC	- < 10 VA
Supply voltage tolerance	24 V AC/DC	-20 % ... +10 %	
	115 V AC	-15 % ... +15 %	
	230 V AC	-15 % ... +10 %	
Rated frequency AC variance	115 V AC/ 230 V AC	50...60 Hz	
Stop monitoring circuit	**S11-S12, S21-S22, B1**	single-channel or dual-channel	
Voltage potential $V_{S11/S21}$	24 V AC/DC	V_{A1-A2}-3 V	
	115 V AC	> 42 V	
	230 V AC	> 42 V	
Synchronous time between Input A and Input B		approx. 300 ms	
Cross circuit protection		through internal electronic fuse	
Max. line resistance R_L		50 Ω	
Other inputs			
Connection of an external start button	**S33-S34**	volt-free	
Start button monitoring configurable (ESTOP-3b)	**Y3-Y4**	open-monitoring/linked-no monitoring	
Connection of short circuit making sensor mats, safety mats or other voltfree contacts (ESTOP-3b)	**S31-S32** **S41-S42**	volt-free	
Max. resistance between	**S31-S32, S41-S42**	50 Ω	
Feedback circuit	**Y1-Y2**		
Feedback method		Relay / contactors, force guided	
Voltage potential in feedback loop		24 V DC	
Display of operational status (LED)			
Supply voltage/internal electronic fuse		LED, green	
Input A (S11-S12)		LED, green	
Input B (S21-S22)		LED, green	
Output relay energized		LED, green	
Output circuit	**13-14, 23-24, 33-34, 41-42**	Relay, volt-free, force guided, internal monitored	
Safety outputs / auxiliary circuit		3 NO contacts /	1 NC contact
Rated operational voltage		300 V /	300 V
Rated operational current	AC 12 (resistive)	5 A (at 240 V) /	2.5 A (at 240 V)
Rated operational current	AC 15 (inductive)	1.5 A (at 240 V) /	0.75 A (at 240 V)
Rated operational current	DC 12 (resistive)	5 A (at 24 V) /	2.5 A (at 24 V)
Rated operational current	DC 13 (inductive)	1.5 A (at 24 V) L/R= 50 ms	1.2 A (at 24 V)
Short-circuit protection, max. fuse rating		6 A type gL /	4 A type gL
Other outputs		2 transistor-outputs, NO-function	
Transistor-output (ESTOP-3b)	**Y33-Y34**	typ. 24 V/20 mA, status of the internal electronic fuse	
Transistor-output (ESTOP-3b)	**Y43-Y44**	typ. 24 V/20 mA, status of the output relays K1, K2	
Other details			
Limit of accum. currents at simultaneous load on several output circuits		Σ current I_{th} < 8 A	
Impulse withstand voltage V_{imp}		4 kV	
Response time of the output relays		< 40 ms	
Mechanical life (max.)		10 x 10^6 operations	
Electrical life (max.)	(on AC 12 / 240 V / 2.5 A)	6 x 10^5 operations	
Operating temperature range		-10°C ... +55°C	
Storage temperature range		-40°C ... +85°C	
Mounting position		any	
Mounting to DIN rail (EN 50022)		snap-on fastening/screw mounting using adapter	
Terminal capacity		2 x 14 AWG (2 x 2.5 mm²)	
Weight 24 V AC/DC / 115 V AC and 230 V AC		approx. 0.77 lb (350 g) / approx. 0.99 lb (450 g)	





Note:
Dimensions (W x H x D), 90 x 78 x 120 mm

Accessories	P/N

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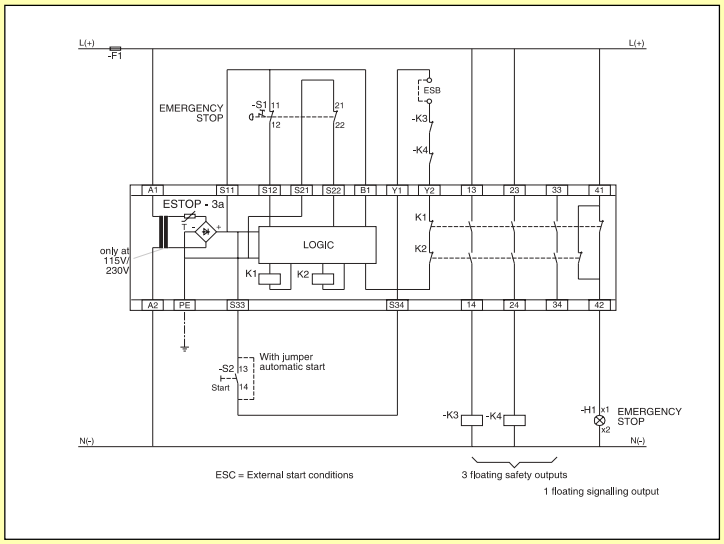
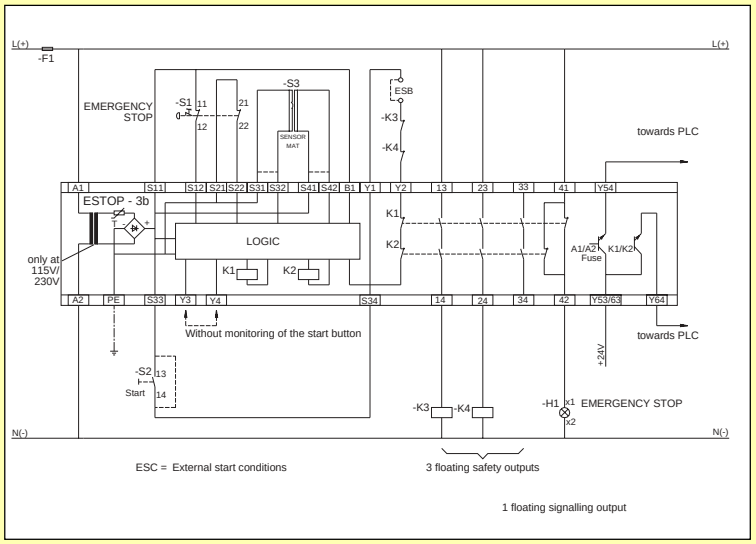
Safety relays ESTOP-3a and ESTOP-3b
provide a safety interruption of one or several circuits

Wiring diagram ESTOP-3a

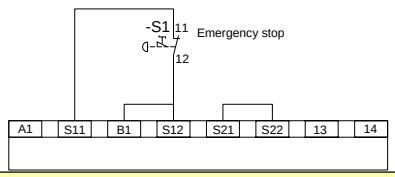


Wiring diagram ESTOP-3b

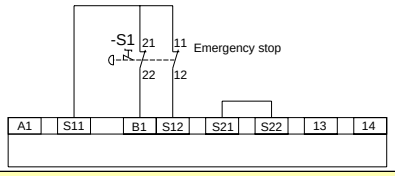


Wiring diagram

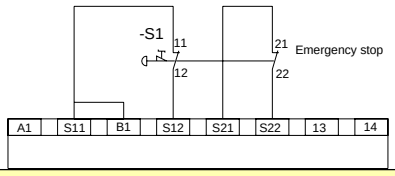
One channel connection of the button



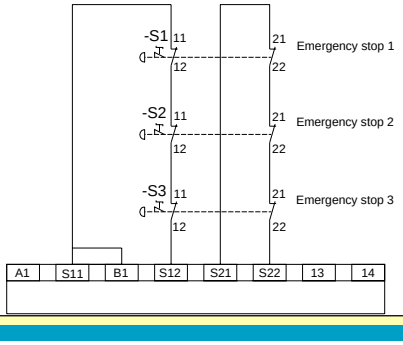
Two channel connection of the button, without short circuit detection



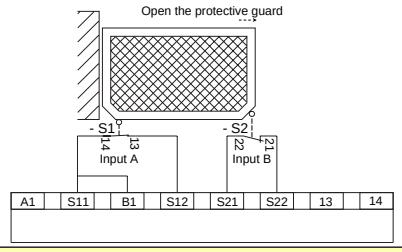
Two channel connection of the button, with short circuit detection



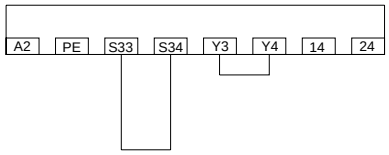
Connection of several emergency stop buttons



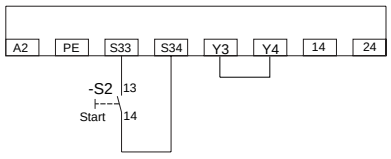
Protective guard (closed)



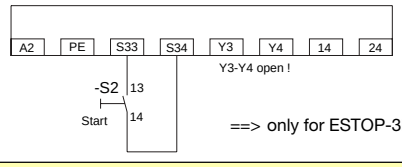
Without start button (automatic start)



With start button, without monitoring (switching on at the positive edge)



With start button, with monitoring (switching on at the negative edge)



mecotron®
Safety relays
ESTOP-6a and ESTOP-6b
provide a safety interruption of one or several circuits

- Emergency Stop monitoring and monitoring of protective guards
- Cross circuit protection
- Start button monitoring / configurable (ESTOP-6b)
- 6 safety outputs
- 1NC contact and 2 auxiliary transistor-outputs
- Monitoring of safety mats
- 4 LED displays
- 3 supply voltage versions

Description

The ESTOP-6a (ESTOP-6b) module provides a safety oriented interruption of one or several circuits and is designed to be integrated in emergency stop or safety circuits conforming to EN 60204-1. It meets the requirements of the European standard EN 418 for emergency stop equipment and EN 60204-1 for safety circuits. These standards concern the applications where a single command must open several circuits (emergency stop by indirect action). The module also meets the safety requirements for electrical monitoring of limit switches on protective equipment.

ESTOP-6a : The module is equipped with six voltage free safety outputs of stop category 0 (EN 418, EN 60204-1) and one voltage free NC contact.

ESTOP-6b : In addition to the six voltage free safety outputs of stop category 0 (EN 418, EN 60204-1), the module is equipped with a voltage free NC contact and two semiconductor outputs for signalling functions.
Additionally it is possible to monitor sensor mats with the ESTOP-6b.

The module is designed for use with one or two input channels. For extended fault detection and increased safety level, we recommend the use of two input channels. In this operation mode, the connection cables are integrated in the monitoring and all initial faults will be detected.

Conforming to standards

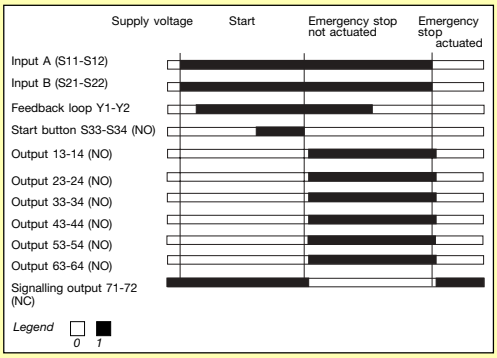
- Product : EN 954-1 - category 4
- Machine assemblies : EU-machine-guidelines 89/392 EWG
  IEC 204-1, EN 292, EN 418
  EN 60204-1, BS 2771-1, DIN VDE 0113-1, NF C 79-130, NF E 09-053
- Approvals :

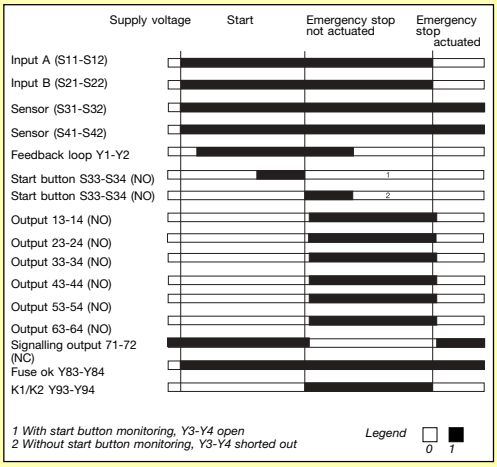
ESTOP-6a Supply voltage	P/N
24 V AC/DC	2 450 807 00
115 V AC (50/60 Hz)	2 450 807 10
230 V AC (50 Hz)	2 450 807 20

ESTOP-6b Supply voltage	P/N
24 V AC/DC	2 450 808 00
115 V AC (50/60 Hz)	2 450 808 10
230 V AC (50/60 Hz)	2 450 808 20

Technical data

Input circuit			
Supply voltage - Power consumption	**A1-A2**	24 V AC/DC	- < 7 VA / W
	A1-A2	115 V AC	- < 10 VA
	A1-A2	230 V AC	- < 10 VA
Supply voltage tolerance	24 V AC/DC	-20 % ... +10 %	
	115 V AC	-15 % ... +15 %	
	230 V AC	-15 % ... +10 %	
Rated frequency AC variance	115 V AC	50...60 Hz	
	230 V AC	50...60 Hz	
Stop monitoring circuit	**S11-S12, S21-S22, B1**	single-channel or dual-channel	
Voltage potential $V_{S11/S21}$	24 V AC/DC	V_{A1-A2}-3 V	
	115 V AC	> 42 V	
	230 V AC	> 42 V	
Synchronous time between Input A and Input B		approx. 300 ms	
Cross circuit protection		through internal electronic fuse	
Max. line resistance R_L		50 Ω	
Other Inputs			
Connection of an external start button	**S33-S34**	volt-free	
Start button monitoring configurable (ESTOP-6b)	**Y3-Y4**	open-monitoring/linked-no monitoring	
Connection of short circuit making sensor mats,	**S31-S32**	volt-free	
safety mats or other volt-free contacts (ESTOP-6b)	**S41-S42**		
Max. resistance between	**S31-S32, S41-S42**	50 Ω	
Feedback circuit	**Y1-Y2**		
Feedback method		Relay / contactors, force guided	
Display of operating status (LED)			
Supply voltage/internal electronic fuse		LED, green	
Input A (S11-S12)		LED, green	
Input B (S21-S22)		LED, green	
Output relay energized		LED, green	
Output circuit	**13-14, ... , 63-64, 71-72**	Relay, volt-free, force guided, internal monitored	
Safety outputs / auxiliary circuit		6 NO contacts / 1 NC contact	
Rated operational voltage		300 V / 300 V	
Rated operational current	AC 12 (resistive)	5 A (at 240 V) / 2.5 A (at 240 V)	
Rated operational current	AC 15 (inductive)	1.5 A (at 240 V) / 0.75 A (at 240 V)	
Rated operational current	DC 12 (resistive)	5 A (at 24 V) / 2.5 A (at 24 V)	
Rated operational current	DC 13 (inductive)	1.5 A (at 24 V) L/R= 50 ms 1.2 A (at 24 V)	
Short-circuit protection, max. fuse rating		6 A type gL / 4 A type gL	
Response time of the output relays		< 40 ms	
Other outputs		2 transistor-outputs, NO-function	
Transistor-output (ESTOP-6b)	**Y33-Y34**	typ. 24 V/20 mA, status of the internal electronic fuse	
Transistor-output (ESTOP-6b)	**Y43-Y44**	typ. 24 V/20 mA, status of the output relays K1, K2	
Other details			
Limit of accum. currents at simultaneous load on several output circuits		Σ current I_{th} < 8 A	
Impulse withstand voltage V_{imp}		4 kV	
Mechanical life (max.)		10 x 10^6 operations	
Electrical life (max.)	(on AC 12 / 240 V / 5 A)	6 x 10^5 operations	
Operating temperature range		-10°C ... +55°C	
Storage temperature range		-40°C ... +85°C	
Mounting position		any	
Mounting on DIN rail (EN 50022)		snap-on fastening/screw mounting using adapter	
Terminal capacity		2 x 14 AWG (2 x 2.5 mm²)	
Weight 24 V AC/DC / 115 V AC and 230 V AC		approx. 1.32 lb (600 g) / approx. 1.54 lb (700 g)	





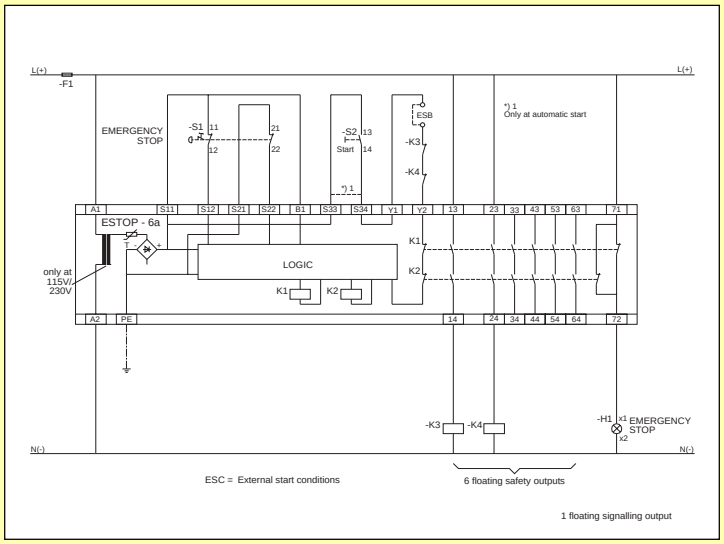
1 With start button monitoring, Y3-Y4 open
2 Without start button monitoring, Y3-Y4 shorted out

Note:
Dimensions (W x H x D), 90 x 78 x 120 mm

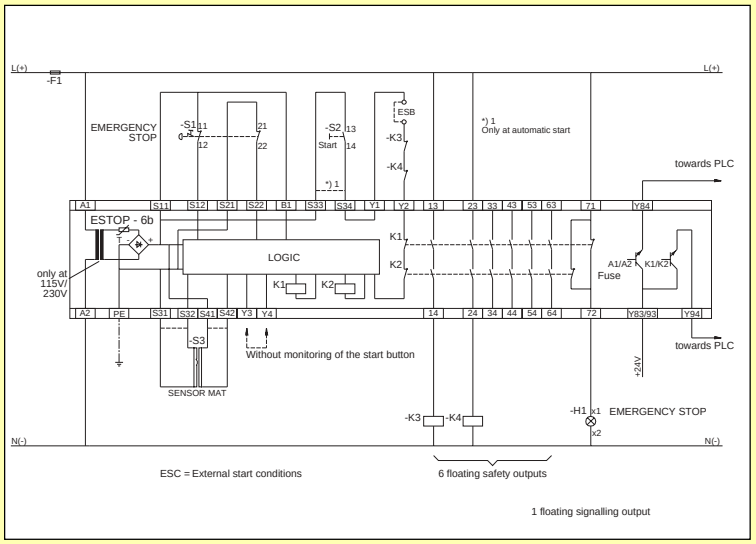
Accessories	P/N

mecotron®
Safety relays ESTOP-6a and ESTOP-6b
provide a safety interruption of one or several circuits

Wiring diagram ESTOP-6a

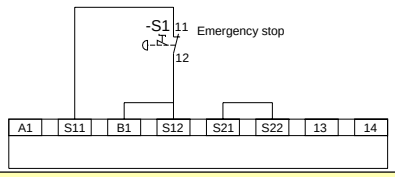


ESTOP-6b

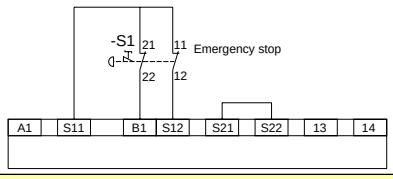


Wiring diagram

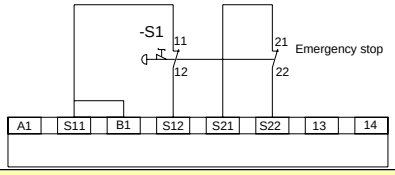
One channel connection of the button



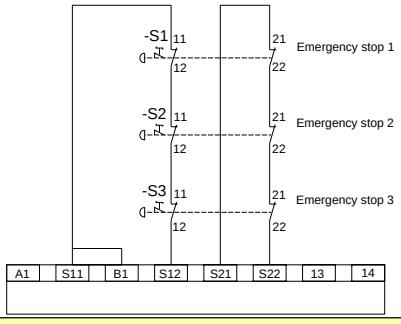
Two channel connection of the button, without short circuit detection



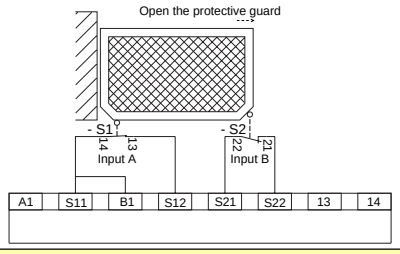
Two channel connection of the button, with short circuit detection



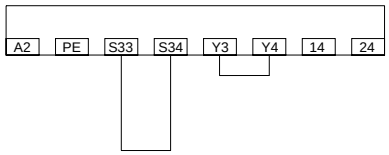
Connection of several emergency stop buttons



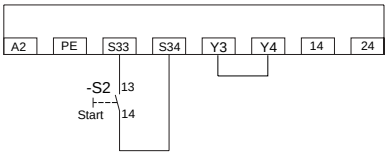
Protective guard (closed)



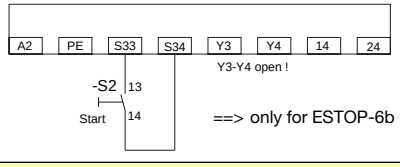
Without start button (automatic start)



With start button, without monitoring (switching on at the positive edge)



With start button, with monitoring (switching on at the negative edge)



mecotron®
Delay on release
Safety relay ESTOP-3+2
For emergency stop monitoring

- Emergency Stop monitoring and monitoring of protective guards
- Cross circuit protection
- Start button monitoring / configurable
- 3 safety outputs instantaneous opening
- 2 safety outputs delayed on release
- Set delay time adjustable between 0...30 s
- 1 NC contact as an auxiliary circuit
- 4 LED displays
- 3 supply voltage versions

Description

The safety module ESTOP-3+2 for emergency stop monitoring is used for safety breaking one or more circuits and is designed to be incorporated in emergency stop or safety circuits in accordance with relevant standards EN 60204-1. These modules meet the requirements of European standards BS-EN 418 for emergency stops and EN 60204-1 for safety circuits. These standards cover cases where a single emergency stop device must break several circuits (indirect action emergency stop). Module ESTOP-3+2 also meets the safety requirements for electrical monitoring of limit switches in safety guards.

Conforming to standards

- Product: EN 954-1 - category 4
- Machine assemblies: EU-machine-guidelines 89/392 EWG
  IEC 204-1, EN 292, EN 418
  EN 60204-1, BS 2771-1, DIN VDE 0113-1,
  NF C 79-130, NF E 09-053
- Approvals:

In addition to three outputs with instantaneous opening for stop category 0, module ESTOP-3+2 has two additional outputs with delayed opening for stop category 1, which allow controlled deceleration of motor components in order to obtain final stopping (for example braking of the motor by variable speed drive). At the end of the preset time delay, the power supply is switched off by opening the time delay output circuits. The time delay on the two output circuits between terminals 57-58 and 67-68 is adjustable from 0 to 30 seconds by means of a 12-position selector switch.
Stopping of the machine is achieved by pressing the emergency stop control. One or more emergency stop buttons, as required by the installation, allow the stop instruction to be transmitted to module ESTOP-3+2, which in turn controls stopping of several independent safety circuits. Restarting of the machine is possible when the emergency stop button is released. Restarting is achieved by pressing the start button.The function of the start button on module ESTOP-3+2 is determined by the terminal connections. When terminals Y3-Y5 are linked, the start button is included in the monitoring circuit and the safety outputs are activated after the output signal impulse ceases when the start button is released. When terminals Y3-Y4 are linked, the safety outputs are activated immediately after the start button is operated. This configuration allows the safety module to function automatically as soon as the safety guard is closed, provided that the start button is shorted.
Maximum fault detection will be achieved when the module is used in conjunction with one (or more) emergency stop(s) with 2 NC contacts. The feedback loop allows autochecking of any relay used to increase the number of output contacts and/or to increase the breaking capacity. Any relay used for this purpose must be provided with mechanically linked contacts. Several emergency stop buttons may be connected in series with a single module.

Supply voltage	P/N
24 V AC/DC	2 450 802 00
115 V AC (50/60 Hz)	2 450 802 10
230 V AC (50/60 Hz)	2 450 802 20

Technical data

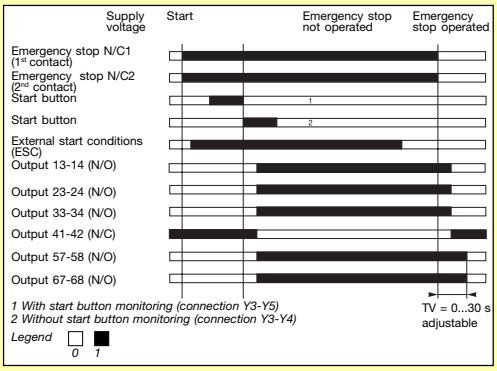
Input circuit				
Supply voltage - Power consumption	**A1-A2**	24 V AC/DC	- < 8 VA / W	
	A1-A2	115 V AC	- < 10 VA	
	A1-A2	230 V AC	- < 10 VA	
Supply voltage tolerance	24 V AC/DC	-20 % ... +10 %		
	115 V AC	-15 % ... +15 %		
	230 V AC	-15 % ... +10 %		
Rated frequency AC variance	115 V AC	50...60 Hz		
	230 V AC	50...60 Hz		
Stop monitoring circuit	**S11-S12, S21-S22, B1**	single-channel or dual channel		
Voltage potenial $V_{S11/S21}$	24 V AC/DC	V_{A1-A2}-3 V		
	115 V AC	> 42 V		
	230 V AC	> 42 V		
Synchronous time between Input A and Input B		approx. 75 ms		
Cross circuit protection		through internal electronic fuse		
Max. line resistance R_L		50 Ω		
Other inputs	**S33, Y3-Y4, S31-S32, S41-S42**			
Connection of an external start button	**Y1-S33**	volt-free		
Start button monitoring configurable	**Y3-Y4/Y3-Y5**	linked-no monitoring/linked-monitoring		
Feedback circuit	**Y1-Y2**			
Feedback method		Relay / contactors, force guided		
Display of operating status (LED)				
Supply voltage/internal electronic fuse		LED, green		
Input A (S11-S12)		LED, green		
Input B (S21-S22)		LED, green		
State of the time delayed output relays		LED, green		
Output circuit	**13-14, 23-24, 33-34, 57-58, 67-68, 71-72**	Relay, volt-free, force guided, internal monitored		
Safety outputs		3 NO contacts	2 NO contacts	
Auxiliary circuits				1 NC contact
		instantaneous opening Stop-category 0	delayed opening Stop-category 1	instantaneous closing Stop-category 0
Rated operational voltage		300 V		300 V
Rated operational current	AC 12 (resistive)	5 A (at 240 V)		2.5 A (at 240 V)
Rated operational current	AC 15 (inductive)	1.5 A (at 240 V)		0.75 A (at 240 V
Rated operational current	DC 12 (resistive)	5 A (at 24 V)		2.5 V (at 230 V)
Rated operational current	DC 13 (inductive)	4 A (at 24 V)	L/R=50 ms	2 A (at 230 V)
Short-circuit protection, max. fuse rating		6 A, fast / type gL		4 A fast / type gL
Other details				
Limit of accum. currents at simultaneous load on several output circuits		Σ current I_{th} < 8 A		
Impulse withstand voltage V_{imp}		4 kV		
Response time of the output relays		< 20 ms		
Mechanical life (max.)		10×10^6 operations		
Electrical life (max.)	(on AC 12 / 230 V / 2.5 A)	6×10^5 operations		
Operating temperature range		-10°C ... +55°C		
Storage temperature range		-40°C ... +85°C		
Mounting position		any		
Mounting on DIN rail (EN 50022)		snap-on mounting/screw mounting using adapter		
Terminal capacity		2 x 14 AWG (2 x 2.5 mm^2)		
Weight 24 V AC/DC / 115 V AC and 230 V AC		approx. 1.43 lb (650 g) / approx. 1.87 lb (850 g)		
Dimensions (W x H x D)		90 x 78 x 120 mm		

Accessories	P/N
Sealable shroud	3 440 005 01

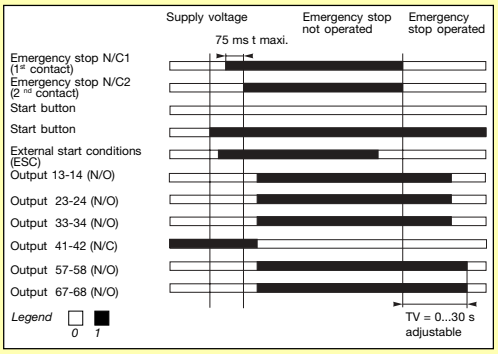
mecotron®
Delay on release
Safety relay ESTOP-3+2
For emergency stop monitoring

Functional diagram

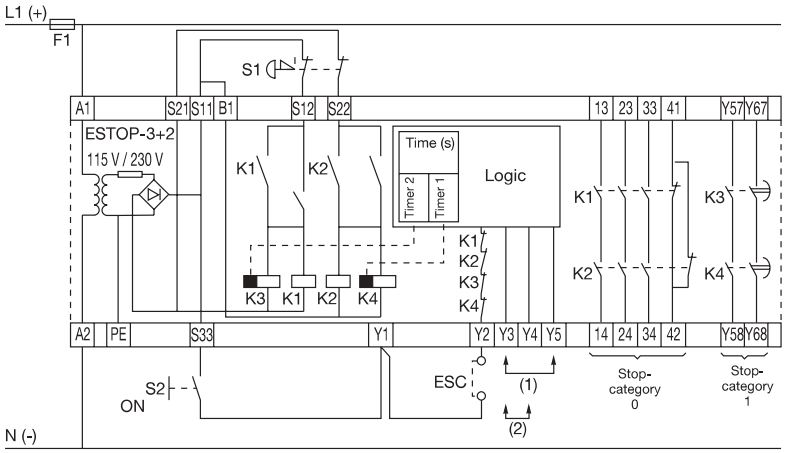
With start button
1 = monitoring, 2 = not monitoring



Without start button
Link from Y2 to S33



Connecting diagram



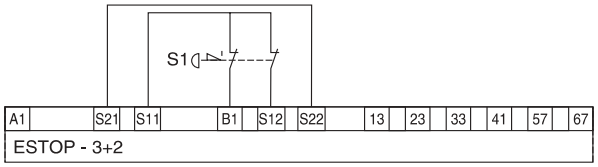
S1 : Emergency stop button with 2 N/C contacts (recommended application) Output 41-42 must not be used as a safety circuit.

(1) With start button monitoring
(2) Without start button monitoring

ESC : External start conditions
Y1-Y2 : Feedback loop

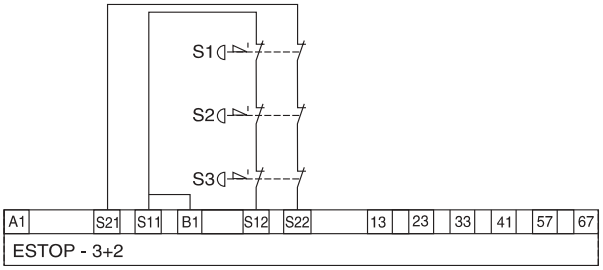
Wiring diagram

Connection with one emergency stop button
(without cross circuit monitoring)

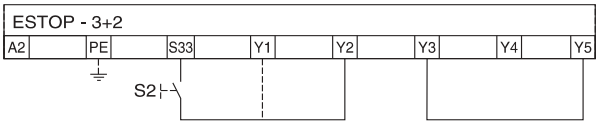


S1: Emergency stop button with 2 contacts
(a short-circuit between the 2 inputs is not detected)

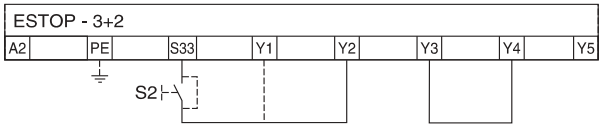
Connection of several emergency stop buttons



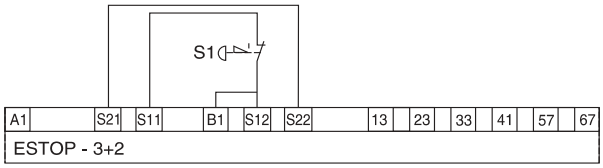
Configuration with start button monitoring



Configuration without start button monitoring



Monitoring of an emergency stop with one contact



S1: Emergency stop button with 1 N/C contact
Not all faults are detected: a short-circuit on the emergency stop button is not detected