

MSR178DP

Description

The MSR178DP is a multi-function time-delay relay for use in safety circuits. It can be configured by the user to perform on-delay, off-delay or single-pulse modes. It is used for applications such as delayed unlocking of safety gates, delayed de-energizing of variable speed controlled motors, or jogging (single pulse) in teaching or setup mode.

The MSR178DP can be used e.g. in conjunction with a power to release or power to lock guard locking switch to time out high inertia machines with significant run down in potentially dangerous equipment. The single-pulse mode enables implementation of two-hand control by use of two normally open contacts. It also can be used as a preset time limited mute dependent bypass in order to clear a blockage in the muting sensor area.

The operating function is selected by external jumpers to Y21 and Y22. The delay time is selected by a combination of external jumpers to Y31 and Y32 and the potentiometer located on the front face.

The input to the MSR178DP can be connected in five different configurations: one normally closed, two normally closed, one normally open, two normally open, or two PNP connections from a light curtain. The normally closed connections are used for off-delay timing. The normally open inputs are used for on-delay timing and the single-pulse function. To generate the single pulse both inputs must be closed within 0.5 seconds. Thus a two-hand control arrangement in accordance with EN 574 Cat. IIIA can be used to trigger the single pulse.

The MSR178DP has three normally open redundant safety outputs. The two normally closed outputs can be connected in series to achieve redundant safety or connected in parallel for auxiliary signaling. External devices can be monitored by the Y11 terminal. Power to the MSR178DP can be either 24V AC/DC (24V/GND terminals) or 115V AC (A3/A2 terminals), or 230V AC (A1/A2 terminals).

The MSR178DP can be used as a standalone control module or in combination with an MSR safety relay to combine instant and delayed safety outputs, as needed.



Features

- Category 4 per EN 954-1
- Stop category 1
- On-/off-delayed, or single-pulse (one shot) operation
- Four time ranges up to 30 mins.

Specifications

Safety Ratings	
Standards	EN 954-1, IEC 61508, EN IEC 62061, ISO 13849-1, IEC/EN 60204-1, IEC 60947-5-1, EN 61812-1, AS 4024.1, ISOTR 12100, B11.19
Safety Classification	Cat. 4 per EN 954-1 (ISO 13849-1), SIL CL3 per EN IEC 62061, PLe per ISO 13849-1
Functional Safety Data * Note: For up-to-date information, visit http://www.ab.com/safety/	PFH _D : < 2.74 x 10 ⁻⁹ MTTF _d : > 285 years Suitable for performance levels PLe (according to ISO 13849-1:2006) and for use in SIL3 systems (according to IEC 62061) depending on the architecture and application characteristics
Certifications	CE Marked for all applicable directives, cULus, c-Tick, and TÜV
Power Supply	
Input Power Entry	24V AC/DC, 115/230V AC 50/60 Hz
Power Consumption	4 W
Inputs	
Safety Inputs	1 or 2 N.O., 1 or 2 N.C., Light Curtain
Input Simultaneity	Infinite for On-/Off-delay, 0.5 s for single pulse function
Input Resistance, Max.	900 Ω
Reset	Automatic
Power On Delay/ Recovery Time	500 ms/300 ms single pulse only
Response Time	<±0.5% (at constant temp)
Outputs	
Safety Contacts	3 N.O.
Auxiliary Contacts	2 N.C.
Thermal Current I_{tth}	6 A
Rated Impulse withstand Voltage	2500V
Switching Current @ Voltage, Min.	10 mA @ 10V DC
Fuses, Output	External 6 A slow blow or 10 A quick blow
Electrical Life (Operations)	230V AC/4 A/880VA cosφ = 0.35...0.1 M 230V AC/1.7 A375VA cosφ = 0.6...0.5 M 30V DC/2 A/60 W = 1 M 10V DC/0.01 A/0.1 W = 2 M
Mechanical Life	2,000,000 operations
Utilization Category	
Inductive: AC-15	6 A/250V AC
Inductive: DC-13	3 A/24V DC
UL:	B300, 6 A/250V AC, 3 A/24V DC
Environmental and Physical Characteristics	
Enclosure Type Rating/ Terminal Protection	IP40 (NEMA 1), DIN VDE 0470-1/ IP20
Operating Temperature [C (F)]	-5...+55 ° (14...131 °)
Vibration	10...55 Hz, 0.35 mm
Shock	10 g, 16 ms, 100 shocks
Mounting	35 mm DIN Rail
Weight [g (lb)]	325 (0.72)
Conductor Size, Max.	0.2...4 mm ² (24... 12 AWG)

* Usable for ISO 13849-1:2006 and IEC 62061. Data is based on the following assumptions:
- Mission time/Proof test interval of 20 years
- Functional test at least once within six-month period

Product Selection

Inputs	Safety Outputs	Auxiliary Outputs	Terminals	Reset Type	Power Supply	Cat. No.
1 or 2 N.O., 1 or 2 N.C., Light Curtain, Two-Hand Control, Enabling Switch	3 N.O.	2 N.C.	Removable	Automatic	24V AC/DC, 115V AC or 230V AC	440R-M23227

Accessories

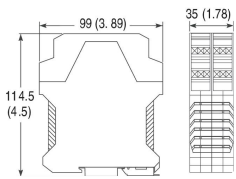
Description	Cat. No.
Bag of 4, 3-Pin Screw Terminal Blocks	440R-A23210
Bag of 4, 3-Pin Spring Clamp Terminal Blocks	440R-A23229

LED Indicators

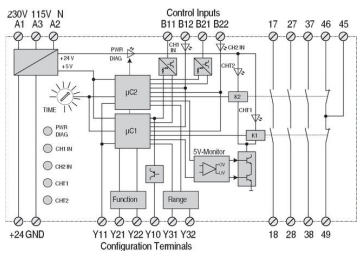
PWR: Green	Power on
Flashing Green/Red	Failure
CH1/2 IN: Static Green	Input closed
Flashing Green	Time lapse
CHT1: Green	Output CH1 Active
CHT2: Green	Output CH2 Active

Approximate Dimensions

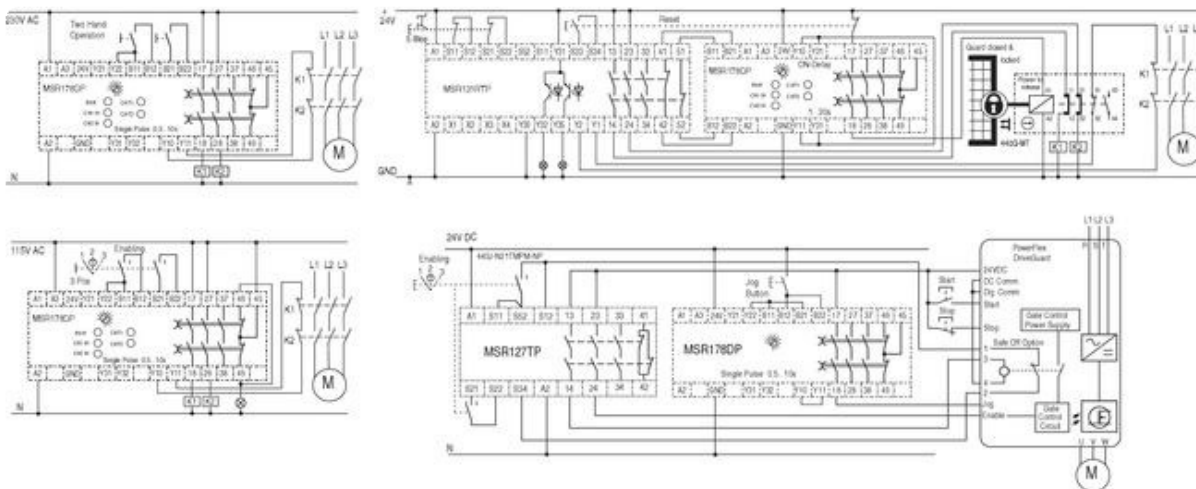
Dimensions are shown in mm (in.). Dimensions are not intended to be used for installation purposes.

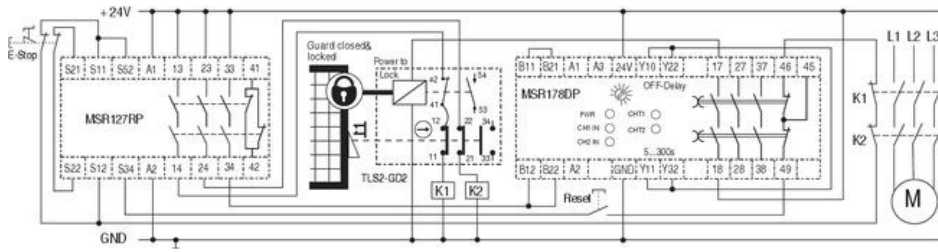


Block Diagram

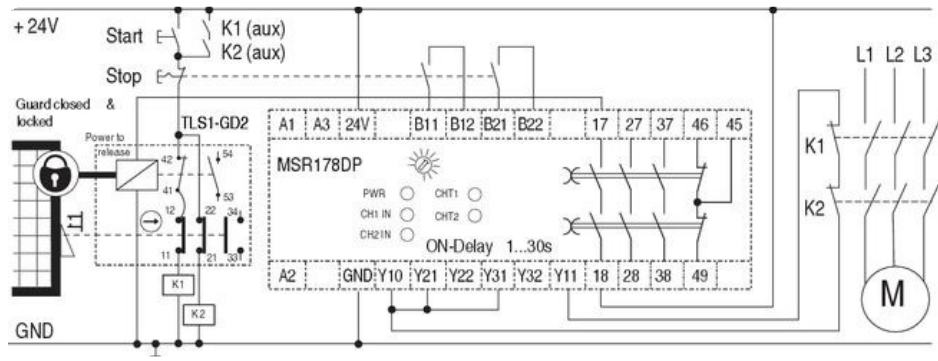


Typical Wiring Diagrams





MSR178DP generates OFF-delayed solenoid release after E-Stop on MSR127



MSR178DP ON-delayed unlocking the Gate after maintained stop switch pressed

Jumper Configuration

Operating Function	
Y10...Y21	ON Delay
Y10...Y22	OFF Delay
B11...Y22	Single Pulse
Time Range	
—	0.5...10 s
Y10...Y31	1...30 s
Y10...Y32	5...300 s
Y10...Y31...Y32	1...30 min
Cross Fault Detection on Inputs	
—	Enabled
B11...B21	Disabled
Feedback Loop	
Y10...Y11	Close before reset

Time Function Diagrams

