BRIEF INFORMATION

Flasher Units

- For vehicles with 12 V and 24 V on-board voltage
- Generate an intermittent on/off signal to control the flashing of indicator lights
- ISO 13207 compliant flasher unit for LED lights

PRODUCT FEATURES

Application
Flasher units are essential components in automotive and signaling systems. Their primary function is to control the flashing of indicator lights, ensuring that signals are visible and easily understood by other road users. This intermittent flashing is not just a design choice – it significantly improves safety by drawing attention to the signal, reducing the risk of accidents during lane changes, turns, or hazard situations.

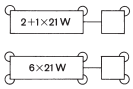
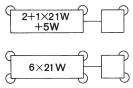
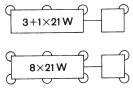
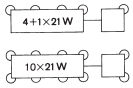
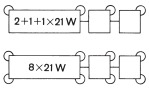
Design and function
In flashing circuits, it is common to separate electrical and control circuits. Based on this principle, we distinguish between:

- **Single-Circuit Flasher Units**
  These control one circuit, typically used for basic indicator systems where only one set of lights needs to flash.
- **Dual-Circuit Flasher Units**
  Designed to manage two separate circuits, often used in vehicles with additional signaling requirements, such as trailers or advanced lighting systems.
- **Pulse Generators**
  These provide precise timing pulses for more complex electronic control systems, ensuring consistent and accurate flashing patterns.

With the increasing use of LED technology in automotive lighting, flasher units must meet specific standards to ensure proper functionality. ISO 13207-compliant flasher units for LED lights guarantee compatibility, reliability, and adherence to international regulations. These units are designed to handle the unique electrical characteristics of LEDs, such as low current consumption and fast response times, while maintaining consistent flashing performance.

FUNCTIONAL PRINCIPLE

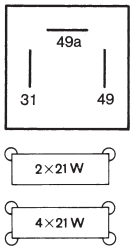
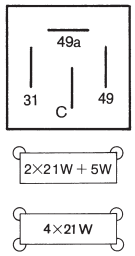
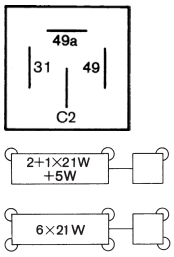
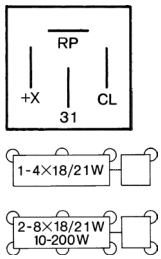
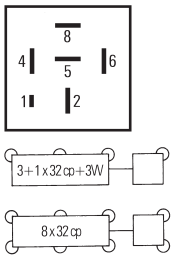
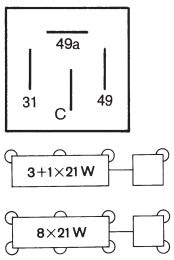
Each flasher unit is assigned a separate output load or a permissible number of flashing indicator lights. This specific load case variant may not be exceeded or undercut, as otherwise the failure control will fail to work correctly. Some typical load cases which are supported are shown below:

Scenario	Direction indicators	Hazard warning lights	Pictogram
Towcar only	2 x 21 W	4 x 21 W	
	2 x 21 W + 0 ... 5 W	4 x 21 W + 2 x 5 W	
Towcar + 1 trailer	2 + 1 x 21 W	6 x 21 W	
	2 + 1 x 21 W + 0 ... 5 W	6 x 21 W + 2 x 5 W	
	3 + 1 x 21 W	8 x 21 W	
	3 + 1 x 27 W (32 CP) + 3 W (SAE)	8 x 27 W (32 CP) + 2 x 3 W (SAE)	–
	4 + 1 x 21 W	10 x 21 W	
Towcar + 2 trailers	2 + 1 + 1 x 21 W	8 x 21 W	

In addition to the load cases above, there are other use cases which do not feature failure control. These variants can be found from page 9 onwards.

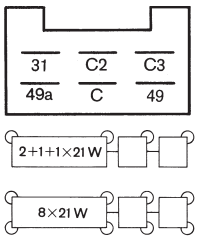
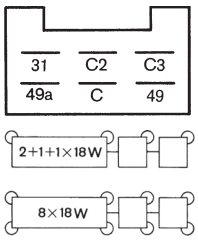
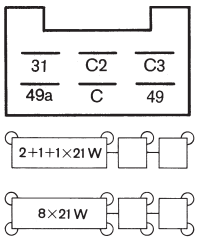
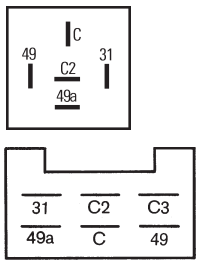
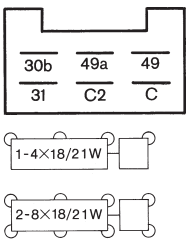
In addition to the variants above FORVIA HELLA also offers pulse generators for flashing circuits. In principle, these are flasher units without failure control. In contrast to the above-mentioned types, pulse generators can already be operated with small loads (e.g. 1 W).

PROGRAM OVERVIEW

Product picture	Circuit diagram	Description	Part number	VPE**
FLASHER UNIT TOW CAR 12 V, WITH BRACKET				
		12 V, 10–140 W, 3-pole, universal, pulse generator, without failure control Flashing frequency*: 90 ± 15 per minute Bright-light time*: 50 ± 8 % Voltage range: 9 V to 16 V, Temperature range: -40 °C to +85 °C, Bracket: yes	**4AZ 001 879-041*** **	1
		12 V, 4-pole Flashing frequency*: 80 ± 15 per minute Bright-light time*: 50 ± 10 % Voltage range: 11 V to 15 V, Temperature range: -20 °C to +60 °C, Bracket: yes	**4DB 001 887-041**	1
FLASHER UNIT TOW CAR + 1 TRAILER, 12 V, WITH BRACKET				
		12 V, 4-pole, 31 + C2 on top of housing Flashing frequency*: 87.5 ± 12.5 per minute Bright-light time*: 50 ± 3 % Voltage range: 9 V to 16 V, Temperature range: -40 °C to +85 °C, Bracket: yes	**4DM 003 360-021**	1
			4DM 003 360-027	200
		12 V, 4-pole, Universal, pulse generator, without failure control Flashing frequency*: 90 ± 20 per minute Bright-light time*: 50 ± 10 % Voltage range: 9 V to 16 V, Temperature range: -40 °C to +85 °C, Bracket: yes	**4AZ 003 787-081*** **	1
		12 V, 6-pole, universal, pulse generator, without failure control Flashing frequency*: 97 ± 10 per minute Bright-light time*: 50 ± 5 % Voltage range: 10 V to 15 V, Temperature range: -30 °C to +70 °C, Bracket: yes	**4AZ 006 252-027*** **	100
LED FLASHER UNIT TOW CAR + 1 TRAILER, 12 V, WITH BRACKET				
		12 V, 4-pole Flashing frequency*: 90 ± 30 per minute Bright-light time*: 57.5 ± 17.5 % Voltage range: 10 V to 15 V, Temperature range: -40 °C to +85 °C, Bracket: yes	**4DW 009 492-111**	1

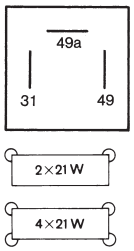
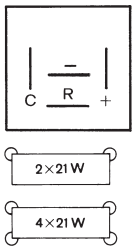
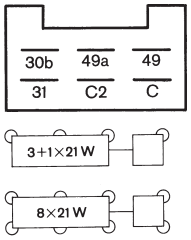
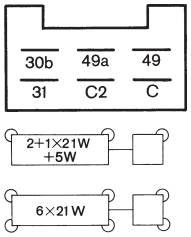
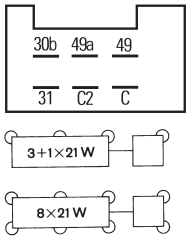
* At room temperature and test voltage / ** Packaging unit / *** not permitted according to StVZO

PROGRAM OVERVIEW

Product picture	Circuit diagram	Description	Part number	VPE**
FLASHER UNIT TOW CAR + 2 TRAILERS, 12 V, WITH BRACKET				
		12 V, 6-pole Flashing frequency*: 90 ± 15 per minute Bright-light time*: 50 ± 5 % Voltage range: 9 V to 16 V, Temperature range: -40 °C to +85 °C, Bracket: yes	**4DN 008 768-117**	99
		12 V, 6-pole Flashing frequency*: 90 ± 15 per minute Bright-light time*: 50 ± 5 % Voltage range: 9 V to 16 V, Temperature range: -40 °C to +85 °C, Bracket: yes, bracket set, three different brackets	**4DN 008 768-191**	1
			4DN 008 768-197	99
		12 V, 6-pole Flashing frequency*: 90 ± 30 per minute Bright-light time*: 52.5 ± 22.5 % Voltage range: 10.8 V to 15 V, Temperature range: -40 °C to +85 °C, Bracket: yes	**4DN 996 173-017**	250
LED FLASHER UNIT TOW CAR + 2 TRAILERS, 12 V, WITH BRACKET				
		12 V, 5-pole Flashing frequency*: 90 ± 30 per minute Bright-light time*: 57.5 ± 17.5 % Voltage range: 10 V to 15 V, Temperature range: -40 °C to +85 °C, Bracket: yes	**4DN 009 492-101**	1
FLASHER UNIT TOW CAR + 1 TRAILER, 12 V/24 V, WITH BRACKET				
		12 V/24 V, 6-pole Flashing frequency*: 90 ± 15 per minute Bright-light time*: 37.5 ± 5.5 % Voltage range: 10 V to 32 V, Temperature range: -20 °C to +70 °C, Bracket: yes	**4DZ 004 019-021**	1

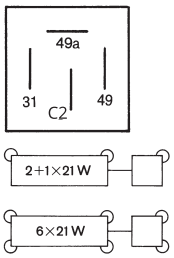
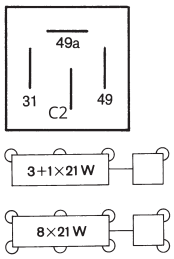
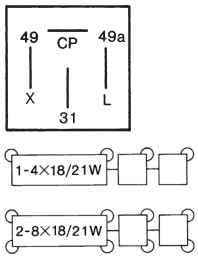
* At room temperature and test voltage / ** Packaging unit

PROGRAM OVERVIEW

Product picture	Circuit diagram	Description	Part number	VPE**
FLASHER UNIT TOW CAR 24 V, WITH BRACKET				
		24 V, 3-pole, universal, pulse generator, without failure control Flashing frequency*: 90 ± 15 per minute Bright-light time*: 50 ± 8 % Voltage range: 18 V to 32 V, Temperature range: -40 °C to +85 °C, Bracket: yes	**4AZ 001 879-051*** **	1
		24 V, 4-pole Flashing frequency*: 85 ± 15 per minute Bright-light time*: 50 ± 5 % Voltage range: 20 V to 30 V, Temperature range: -20 °C to +60 °C, Bracket: yes	**4DB 009 123-041**	1
FLASHER UNIT TOW CAR + 1 TRAILER, 24 V, WITH BRACKET				
		24 V, 6-pole Flashing frequency*: 90 ± 15 per minute Bright-light time*: 53.5 ± 8.5 % Voltage range: 21.6 V to 30 V, Temperature range: -40 °C to +85 °C, Bracket: yes	**4DW 003 944-071**	1
		24 V, 6-pole Flashing frequency*: 90 ± 15 per minute Bright-light time*: 48.5 ± 8.5 % Voltage range: 21.6 V to 30 V, Temperature range: -40 °C to +85 °C, Bracket: yes	**4DM 003 944-091**	1
		24 V, 6-pole Flashing frequency*: 90 ± 20 per minute Bright-light time*: 53.5 ± 8.5 % Voltage range: 21.6 V to 30 V, Temperature range: -40 °C to +85 °C, Bracket: yes	**4DW 003 944-105**	1

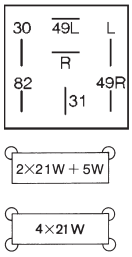
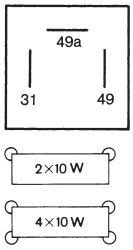
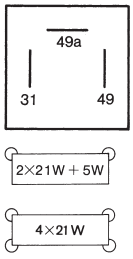
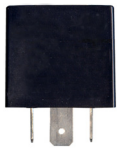
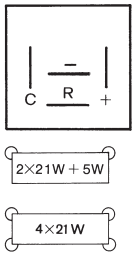
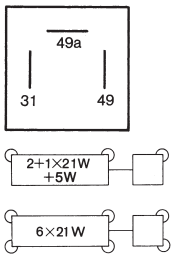
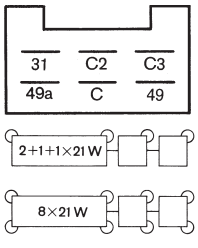
* At room temperature and test voltage / ** Packaging unit / *** not permitted according to StVZO

PROGRAM OVERVIEW

Product picture	Circuit diagram	Description	Part number	VPE**
LED FLASHER UNIT TOW CAR + 1 TRAILER, 24 V, WITH BRACKET				
		24 V, 4-pole Flashing frequency*: 90 ± 30 per minute Bright-light time*: 57.5 ± 17.5 % Voltage range: 18 V to 32 V, Temperature range: -40 °C to +85 °C, Bracket: yes	**4DM 009 492-001**	1
		24 V, 4-pole Flashing frequency*: 90 ± 30 per minute Bright-light time*: 57.5 ± 17.5 % Voltage range: 18 V to 32 V, Temperature range: -40 °C to +85 °C, Bracket: yes	**4DW 009 492-011**	1
FLASHER UNIT TOW CAR + 2 TRAILER, 24 V, WITH BRACKET				
		24 V, 4-pole, universal, pulse generator, without failure control Flashing frequency*: 90 ± 15 per minute Bright-light time*: 46.5 ± 8.5 % Voltage range: 20 V to 32 V, Temperature range: -40 °C to +85 °C, Bracket: yes	**4AZ 003 787-071*** **	1

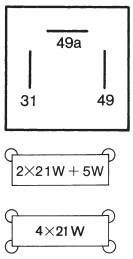
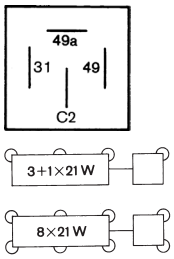
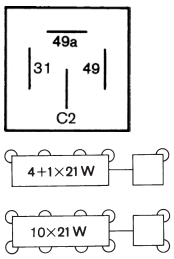
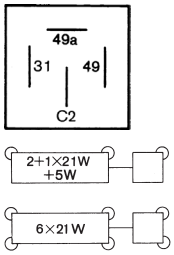
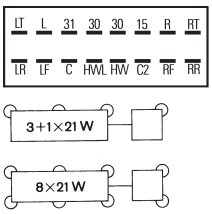
* At room temperature and test voltage / ** Packaging unit / *** not permitted according to StVZO

PROGRAM OVERVIEW

Product picture	Circuit diagram	Description	Part number	VPE**
FLASHER UNIT TOW CAR 12 V, WITHOUT BRACKET				
		12 V, 7-pole Flashing frequency*: 87.5 ± 17.5 per minute Bright-light time*: 52.5 ± 7.5 % Voltage range: 9 V to 16 V, Temperature range: -40 °C to +85 °C, Bracket: no	**4DB 006 716-041**	1
		12 V, 3-pole, for motorbikes Flashing frequency*: 90 ± 30 per minute Bright-light time*: 57.5 ± 17.5 % Voltage range: 10 V to 15 V, Temperature range: -40 °C to +85 °C, Bracket: no	**4DB 003 750-707**	250
		12 V, 3-pole Flashing frequency*: 90 ± 30 per minute Bright-light time*: 50 ± 5 % Voltage range: 10 V to 15 V, Temperature range: -40 °C to +85 °C, Bracket: no	**4DB 003 750-712**	1
			4DB 003 750-717	150
		12 V, 4-pole Flashing frequency*: 87.5 ± 12.5 per minute Bright-light time*: 50 ± 3 % Voltage range: 10 V to 15 V, Temperature range: -40 °C to +70 °C, Bracket: no	**4DB 007 218-001**	1
FLASHER UNIT TOW CAR + 1 TRAILER, 12 V, WITHOUT BRACKET				
		12 V, 5-pole, 31 + C2 on top of housing Flashing frequency*: 87 ± 18 per minute Bright-light time*: 50 ± 3 % Voltage range: 10 V to 15 V, Temperature range: -30 °C to +60 °C, Bracket: no	**4DM 005 698-021**	1
FLASHER UNIT TOW CAR + 2 TRAILER, 12 V, WITHOUT BRACKET				
		12 V, 6-pole Flashing frequency*: 90 ± 15 per minute Bright-light time*: 50 ± 5 % Voltage range: 9 V to 16 V, Temperature range: -40 °C to +85 °C, Bracket: no	**4DN 008 768-101**	1

* At room temperature and test voltage / ** Packaging unit

PROGRAM OVERVIEW

Product picture	Circuit diagram	Description	Part number	VPE**
FLASHER UNIT TOW CAR 24 V, WITHOUT BRACKET				
		24 V, 3-pole Flashing frequency*: 87.5 ± 12.5 per minute Bright-light time*: 50 ± 3 % Voltage range: 20 V to 30 V, Temperature range: -40 °C to +85 °C, Bracket: no	**4DB 003 675-011**	1
FLASHER UNIT TOW CAR + 1 TRAILER, 24 V, WITHOUT BRACKET				
		24 V, 4-pole, silent Flashing frequency*: 95 ± 20 per minute Bright-light time*: 50 ± 10 % Voltage range: 20 V to 30 V, Temperature range: -30 °C to +70 °C, Bracket: no	**4DW 004 513-021**	1
		24 V, 4-pole, silent Flashing frequency*: 95 ± 20 per minute Bright-light time*: 50 ± 10 % Voltage range: 20 V to 30 V, Temperature range: -30 °C to +70 °C, Bracket: no	**4DW 004 513-031**	1
		24 V, 4-pole Flashing frequency*: 90 ± 15 per minute Bright-light time*: 48.5 ± 8.5 % Voltage range: 20 V to 30 V, Temperature range: -40 °C to +85 °C, Bracket: no	**4DM 004 639-061** **4DM 004 639-067**	1 180
		24 V, 16-pole Flashing frequency*: 90 ± 25 per minute Bright-light time*: 52 ± 8 % Voltage range: 20 V to 30 V, Temperature range: -30 °C to +70 °C, Bracket: no	**4DN 007 431-201**	1

* At room temperature and test voltage / ** Packaging unit

FAILURE CONTROL AND ELECTRICAL CONNECTION

All FORVIA HELLA LED direction indicators with integrated electronics for failure control run checks on themselves and generate a single pulse. This pulse is evaluated by the electronic ballasts. The ballasts simulate a 21 W bulb. This makes operation with conventional flasher units possible.

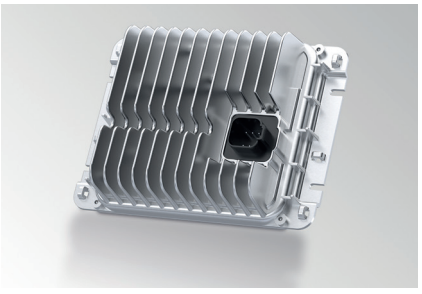
In the event of a defect in the lamp, which can occur even if a single LED fails, the above-mentioned impulse is not generated. The ballasts switch off the bulb simulation and the flasher unit reports the defect to the driver. By measuring the lamp current during the time window of 10 ms, it is possible to directly compare the FORVIA HELLA LED lamp and a bulb version.

If the vehicle manufacturer does not provide direction indicator failure control via the vehicle electrical system, FORVIA HELLA offers the following solutions:

FORVIA HELLA provides electronic ballasts that make it possible to display the direction indicator failure for various vehicle assemblies and modifications. This is necessary if the vehicle manufacturer does not guarantee direction indicator failure control via the vehicle's electrical system:

ISO 13207-compliant LED lamps and LED flasher units
LED flasher unit: towing vehicle

Simulation devices for cold check in switched-off state
Simulation device for cold check



LED lamp control units for function monitoring
LED lamp control unit

THE RIGHT SOLUTION FOR YOUR VEHICLE ELECTRONICS

ISO 13207-1 SOLUTION →

RETROFITTING / EQUIPING THE VEHICLE

Start →

Is a direction indicator relay installed in the vehicle?

Yes →

No ↓

Switch on vehicle ignition and remove the bulb of a direction indicator lamp without pressing the direction indicator switch.

A flasher unit failure is shown.

Yes →

No ↓

Press the direction indicator switch.

A flasher unit failure is shown.

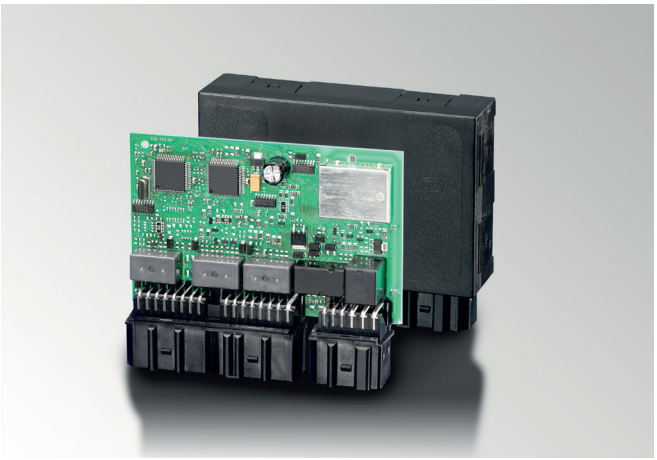
Yes →

No

Vehicle not ECE-compliant.

RETROFITTING / EQUIPPING TRAILERS →

Solution 1:



Light control unit with integrated check of the failure pulse in accordance with ISO 13207-1.

Vehicle manufacturers' light control units are able to check the failure pulse in a standardised and unified manner in accordance with ISO 13207-1.

Therefore interim solutions 1 – 3 will not be necessary since communication takes place directly with the direction indicator lamps. FORVIA HELLA recommends this solution.

(Since trailers do not currently have their own vehicle electrical system, this solution must be integrated in the towing vehicle.)

Solution 1:
By means of monitoring in compliance with ISO 13207-1 in the vehicle manufacturer's vehicle electrical system.

Light control unit already integrated in the vehicle by the manufacturer.

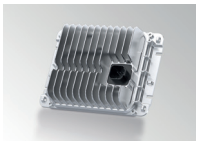
Solution 2:
Replacement of the existing flasher unit by an LED flasher unit from FORVIA HELLA with ISO pulse.

One flasher unit is required per vehicle. Any possible combination of bulbs and FORVIA HELLA LED direction indicators is permitted: from a full package with bulbs through mixed versions right up to a full package with LED lights. Bulbs or FORVIA HELLA LED direction indicator lamps are also permitted on trailers.

Solution 3:
Using simulation device for cold check.

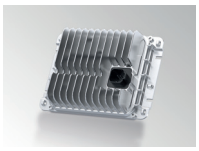
One simulation device is required per LED lamp.

Solution 4:
Using LED lamp control unit from FORVIA HELLA with ISO pulse.



Two LED direction indicators per vehicle can be monitored with one simulation device (only one simulation device can be used per vehicle).

Solution 5:
Using LED lamp control unit from FORVIA HELLA with ISO pulse.



Failure control

2BA 013 334-021

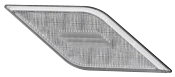
2BA 011 172-031

2SD 013 155-001

2VP 340 960-011

2VD 012 381-...

2SD 013 342-121



PROGRAM OVERVIEW – Solutions 2–4:

Variant	Rated voltage	Temperature range	Protection class	Part number
Solution 2: LED flasher unit (Technical details on the next page)				
3 direction indicators on the vehicle/ towing vehicle 1 direction indicator on an optional trailer	12 V	-40 °C to +85 °C	IP 54	**4DW 009 492-111**
	24 V			**4DW 009 492-011**
2 direction indicators on the vehicle/ towing vehicle 1 direction indicator on optional trailers	12 V			**4DN 009 492-101**
	24 V			**4DM 009 492-001**
Solution 3: Simulation device for cold check				
Simulation device	12 V	-40 °C to +85 °C	IP 54[1)]	**5DS 009 602-011**
	24 V			**5DS 009 602-001**
Solution 4: LED lamp control unit				
Basic control unit	12 V	-40 °C to +50 °C	IP 6K9K	**5DS 227 488-001[2)]**
	24 V			**5DS 227 488-101[2)]**
Premium control unit	24 V	-40 °C to +50 °C	IP 6K9K	**5DS 227 489-101[2)]**

[1)] Contacts underneath

[2)] * The LED control unit does not generate a load supplement in the event of a hazard warning light flashing. This must also be taken into account.

LED FLASHER UNIT WITH ISO-PULS

For controlling direction indicators in accordance with ISO 13207-1

LED direction indicators conforming to ISO 13207 can "communicate" with the flasher unit. The flasher unit checks a firmly defined energy requirement at a firmly defined time: Exactly 21 W at the time of 100 – 130 ms after each switching on of the direction indicator. The energy requirement or "pulse" corresponds to that of a bulb in this case, meaning that the flasher unit notices no difference between a bulb and an LED lamp that conforms to ISO 13207.

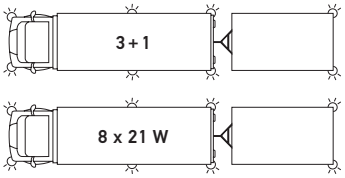
The advantage: Bulbs and ISO LED lamps can be operated in any combination on a flasher unit that conforms to ISO 13207. This is relevant both for vehicles that are frequently operated with different trailers and also for manufacturers who wish to offer several variants of the lighting system without having to modify the underlying electronics

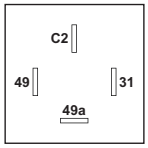
TECHNICAL DETAILS

Technical data		
Rated voltage	12 V	24 V
Operating voltage	10,5 – 15 V	18 – 32 V
Rated load	4DN 009 492-101: 2+1+1 x 21 W (84 W) 4DW 009 492-111: 3+1 x 21 W (84 W)	4DM 009 492-001: 2+1 x 21 W (63 W) 4DW 009 492-011: 3+1 x 21 W (84 W)
Failure control	EP / EPP	EP
Flashing frequency	75 – 110 Hz	70 – 110 Hz
Bright-light time	40 – 60 %	
Protection class	IP 54	
Operating temperature	-40 °C to +85 °C	
Storage temperature	-40 °C to +85 °C	
Connection	Flat connector DIN 46244 A6: 6.3 x 0.8 mm	

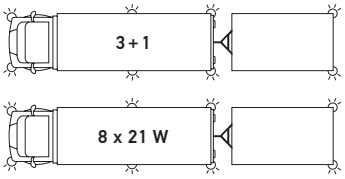
Dimensional sketch

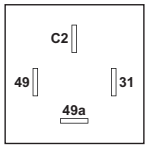
12 V, LED flasher unit 3+1



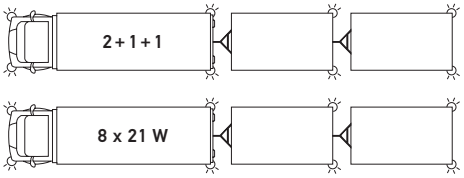


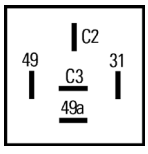
24 V, LED flasher unit 3+1



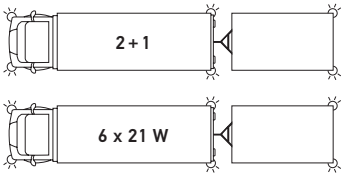


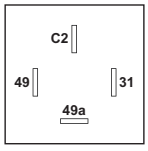
12 V, LED flasher unit 2+1+1





24 V, LED flasher unit 2+1





PROGRAM OVERVIEW

Description	Lamp failure indication	Load	C2	C3	Frequency (49a)	Part number
12 V, LED flasher unit 3+1	Lamp failure control tractor: High frequency Lamp failure control C2: 1. Trailer C2 lamp off	1 x 21 W	Off	–	F2	**4DW 009 492-111**
		2 x 21 W	Off	–	F2	
		3 x 21 W	Off	–	F1	
		(3+1) x 21 W	F1	–	F1	
24 V, LED flasher unit 3+1	Lamp failure control tractor: High frequency Lamp failure control C2: 1. Trailer C2 lamp off	1 x 21 W	Off	–	F2	**4DW 009 492-011**
		2 x 21 W	Off	–	F2	
		3 x 21 W	Off	–	F1	
		(3+1) x 21 W	F1	–	F1	
12 V, LED flasher unit 2+1+1	Lamp failure control tractor: High frequency Lamp failure control C2: 1. Trailer C2 lamp off Lamp failure control C3: 2. Trailer C3 lamp off	1 x 21 W	Off	Off	F2	**4DN 009 492-101**
		2 x 21 W	Off	Off	F1	
		(2+1) x 21 W	F1	Off	F1	
		(2+1+1) x 21 W	F1	F1	F1	
24 V, LED flasher unit 2+1	Lamp failure control tractor: High frequency Lamp failure control C2: 1. Trailer C2 lamp off	1 x 21 W	Off	–	F2	**4DM 009 492-001**
		2 x 21 W	Off	–	F1	
		(2+1) x 21 W	F1	–	F1	

F1: normal flashing frequency, F2: increased flashing frequency