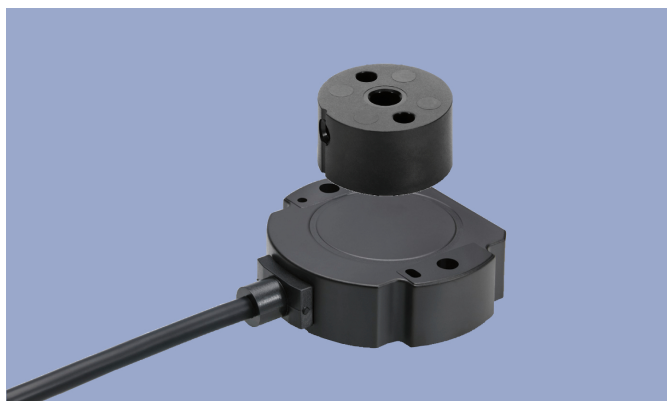


**Project item**  
Please contact your local distributor or our technical support  
Phone (+49) 711 4489-250  
support@novotechnik.de

**NOVOHALL**  
**Rotary Sensor**  
**Touchless**

**RFC-4800**  
SSI

**Industrial**



**Special Features**

- Touchless hall technology
- Electrical range 360°
- 2 part design, mechanically decoupled
- Wear-free
- High protection class IP67, IP68, IP69
- Resolution 12 bits
- Temperature range -40 °C to +85 °C
- For high rotational speeds up to 30,000 rpm
- Other configurations see separate data sheets

**Applications**

- Manufacturing Engineering (textile machinery, packaging machinery, sheet metal and wire machinery)
- Automation technology
- Medical Engineering

The 2 part design consisting of sensor and magnetic position marker offers great flexibility when mounting. The absence of shaft and bearing makes the assembly much less sensitive to axial and radial application tolerances - separate couplings are obsolete. Measurements can be made transmissively through any non-ferromagnetic material. The sensor is perfectly suitable for use in harsh environmental conditions through the completely encapsulated electronics.

**Description**

Material	Housing: high grade, temperature resistant plastic
Mounting	With 2 pan head screws M4x20 (included in delivery)
Fastening torque of mounting	250 Ncm
Electrical connection	Connector M12x1, A-coded with cable L = 0.15 m / Cable 4x 2x 0.25 mm <sup>2</sup> (AWG 24), TPE, shielded

**Mechanical Data**

Dimensions	See dimension drawing
Mechanical travel	continuous
Weight (w/o connection)	approx. 50 g

## Ordering Specifications

### Ordering Specifications

Preferred types printed in bold

- Delivery time up to 25 pcs. within 10 working days EXW
- Best low-volume pricing

#### Interface

**4: Synchronous-Serial Interface (SSI)**

#### Interface parameters

- 11: Ub = 5 VDC, rising output characteristic cw**
- 12: Ub = 5 VDC, rising output characteristic ccw
- 41: Ub = 24 VDC, rising output characteristic cw**
- 42: Ub = 24 VDC, rising output characteristic ccw

#### Electrical connection

- 432: Cable, 8-pole, shielded, L = 1 m**
  - 436: Cable, 8-pole, shielded, L = 3 m**
  - 440: Cable, 8-pole, shielded, L = 5 m
  - 450: Cable, 8-pole, shielded, L = 10 m
  - 531: Connector M12x1, 8-pin, with cable, shielded, L = 0.15 m**
- Cable versions and assembled connectors on request

**R F C - 4 8 0 2 - 2 1 2 - 4 4 1 - 4 3 2**

Series

#### Mechanical version

- 4801: Elongated hole mounting
- 4802: Round hole mounting**

#### Resolution

- 12: 12 bits**
- Other resolutions on request

#### Interface

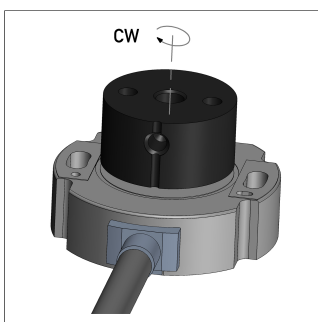
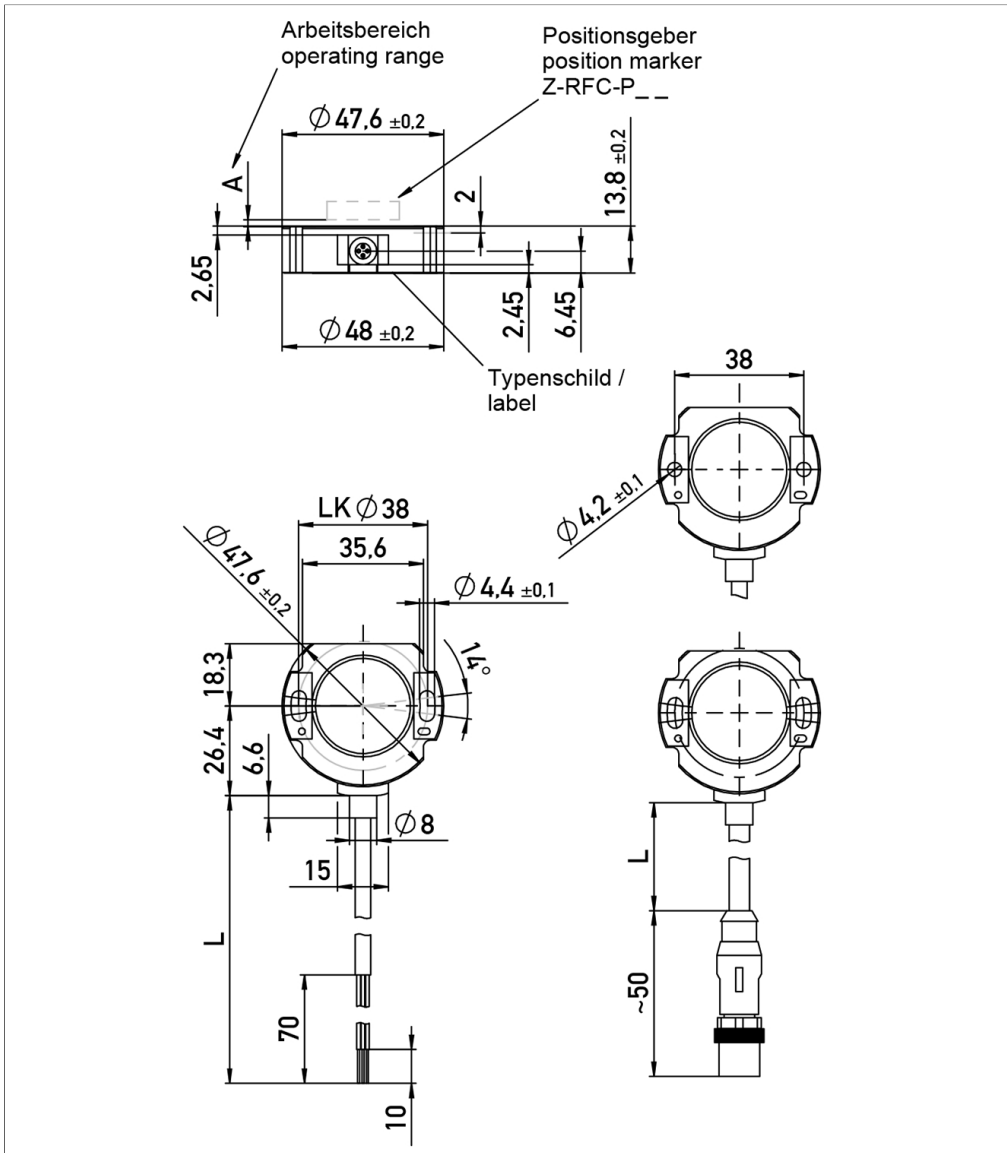
**2: Digital Interface**

### Accessories included in delivery

- 2x Pan head screws M4x20

**Drawing**

CAD data see  
[www.novotechnik.de/en/download/cad-data/](http://www.novotechnik.de/en/download/cad-data/)



When the marking of the position marker is pointing towards the cable, the sensor output is near the electrical center position.

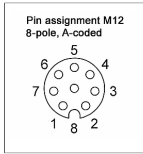
## Technical Data

Type	RFC-48_-2_-41_-_-_- Supply voltage 5 VDC	RFC-48_-2_-44_-_-_- Supply voltage 24 VDC
Measuring range	360°	
Protocol	SSI 13 bits (12 bits data + 1 stop bit)	
Coding	Gray	
Inputs	RS-422 compatible, CLK lines via optocoupler galvanically isolated	
Monoflop time (tm)	16 µs	
Update rate (internal)	2 000 kHz	
Resolution	12 bits	
Max. operational speed position marker	30 000 rpm, higher speeds on request	
Independent linearity	typ. ±0.5 %FS	
Repeatability	≤ ±0.2°	
Hysteresis	≤ ±0.7°, lower hysteresis on request	
Temperature error	±0.375 %FS	
Supply voltage Ub	5 VDC (4.5 ... 5.5 VDC)	24 VDC (18 ... 30 VDC)
Current consumption w/o load	typ. 27 mA	typ. 10 mA
Polarity protection	yes (supply lines)	
Short circuit protection	yes (all outputs vs. GND and supply voltage)	yes (all outputs vs. GND)
Ohmic load at outputs	≥ 120 Ω	
Max. clock rate	1 MHz	
Insulation resistance (500 VDC)	≥ 10 MΩ	
<b>Environmental Data</b>		
Max. operational speed	Mechanically unlimited	
Vibration IEC 60068-2-6	20 g, 5 ... 2000 Hz, Amax = 0.75 mm	
Shock IEC 60068-2-27	50 g, 6 ms	
Protection class DIN EN 60529	IP67 (connector M12), IP67 / IP68 / IP69	
Operating temperature	-25 ... +85°C (connector M12), -40 ... +85°C	
Life	Mechanically unlimited	
Functional safety	If you need assistance in using our products in safety-related systems, please contact us	
MTTF (IEC 60050)	1476 years	1111 years
Traceability	Serial number on type labeling; production batch of the sensor assembly and relevant sensor components	
Conformity/Approval	CE, UKCA see <a href="https://www.novotechnik.de/en/downloads/certificates/declarations-of-conformity-eu/uk">https://www.novotechnik.de/en/downloads/certificates/declarations-of-conformity-eu/uk</a> WEEE see <a href="https://www.novotechnik.de/en/downloads/certificates/eu-directive-weee/">https://www.novotechnik.de/en/downloads/certificates/eu-directive-weee/</a>	
<b>EMC Compatibility</b>		
EN 61000-4-2 ESD (contact/air discharge)	4 kV, 8 kV	
EN 61000-4-3 Electromagnetic fields (RF)	10 V/m	
EN 61000-4-4 Fast transients (burst)	1 kV	
EN 61000-4-6 Cond. disturbances (HF fields)	10 V eff.	
EN 61000-4-8 Magnetic fields	30 A/m	
EN 55016-2-3 Radiated disturbances	Industrial and residential area	

FS = Full scale: Signal span according to electrical measuring range

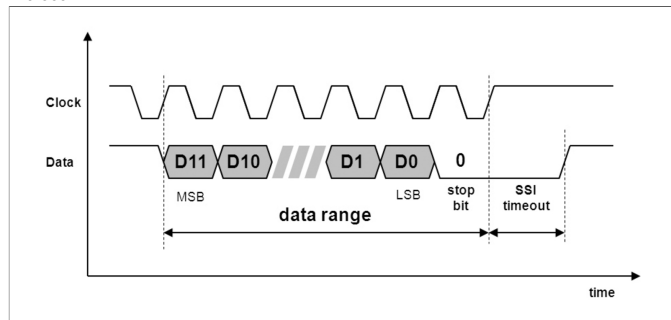
**Connection Assignment**

Signal	Connector code 5_ _	Cable code 4_ _
Supply voltage Ub	Pin 1	WH
GND	Pin 2	BN
CLK -	Pin 3	GN
CLK +	Pin 4	YE
Data -	Pin 5	GY
Data +	Pin 6	PK
Not assigned	Pin 7	BU
Not assigned	Pin 8	RD

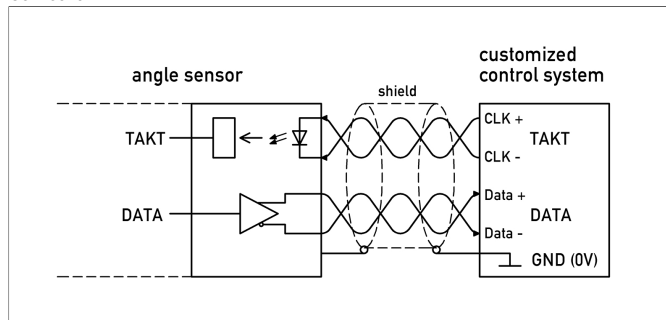


## Technical Data Output Characteristics

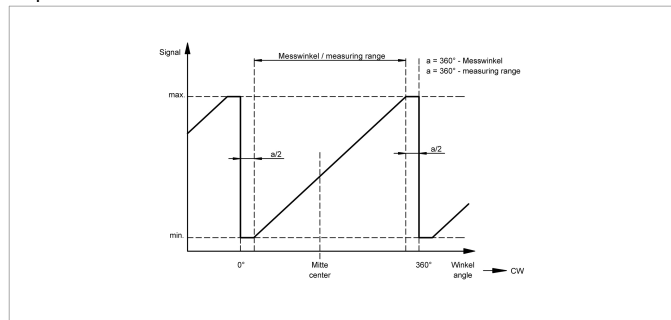
### Protocol



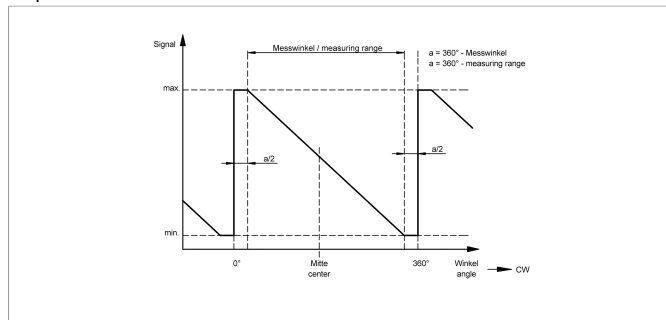
### Connection



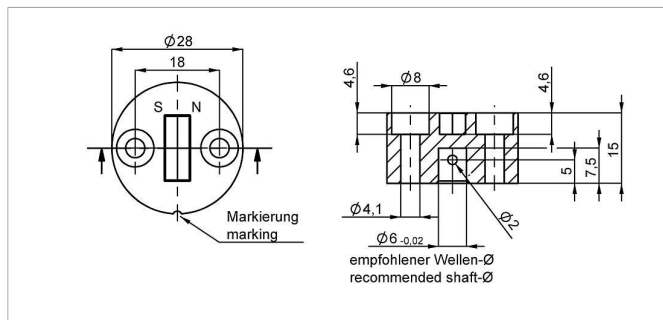
### Output characteristic



### Output characteristic



## Position Markers

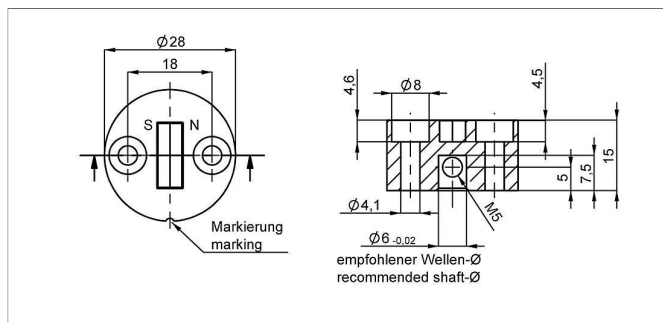
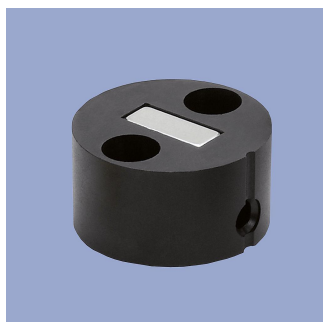


### Z-RFC-P02

Position marker for frontal fixation with 2 cylinder head screws M4x20 (with screw lock) or with locking pin (both included in delivery).

Material PF  
Max. permitted  $\pm 3$  mm  
radial offset  
Operating temp.  $-40 \dots +125^\circ\text{C}$

P/N	Pack. unit [pcs]
40005661	1
400056080	25

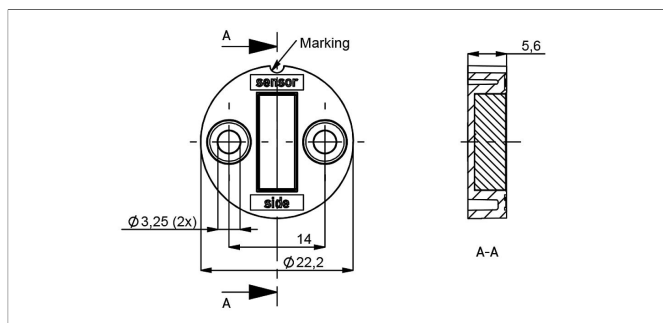


### Z-RFC-P08

Position marker for fixation with threaded pin M5 (included in delivery).

Material PF  
Max. permitted  $\pm 3$  mm  
radial offset  
Operating temp.  $-40 \dots +125^\circ\text{C}$

P/N	Pack. unit [pcs]
400056070	1
400056084	25

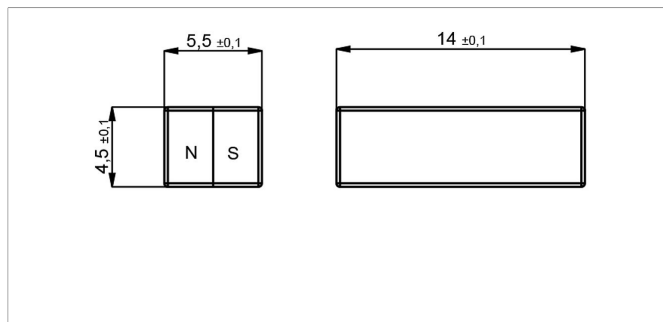


### Z-RFC-P31

Position marker for frontal fixation with 2 cylinder screws M3x8 (included in delivery).

Material PBT-GF  
Max. permitted  $\pm 3$  mm  
radial offset  
Operating temp.  $-40 \dots +125^\circ\text{C}$

P/N	Pack. unit [pcs]
400056088	1
400056089	25



### Z-RFC-P04

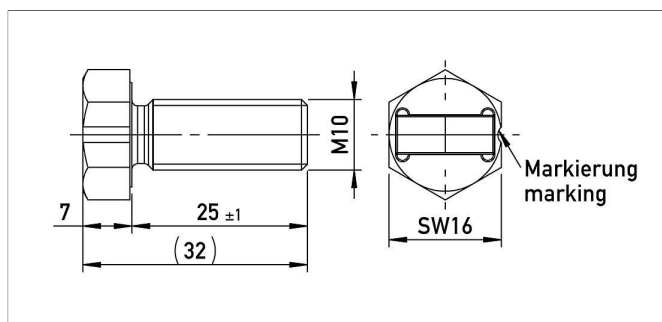
Magnet for direct application onto customer's shaft (see user manual).

We recommend mounting on non-magnetizable materials, otherwise the specified working distances will vary (e.g. reduction of approx. 20% with axial mounting on a magnetizable shaft).

Max. permitted  $\pm 3$  mm  
radial offset  
Operating temp.  $-40 \dots +125^\circ\text{C}$

P/N	Pack. unit [pcs]
40005669	1
400056082	50

## Position Markers



### Z-RFC-P20

Screw position marker M10 x 25 mm, similar DIN 933

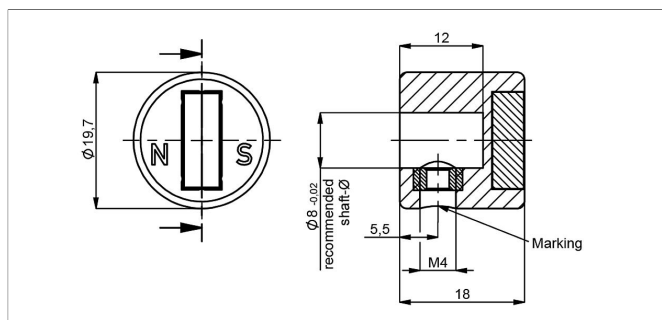
Material Aluminium, anodized

Max. permitted  $\pm 3$  mm

radial offset

Operating temp.  $-40 \dots +125^{\circ}\text{C}$

P/N	Pack. unit [pcs]
400104758	1
400104759	25



### Z-RFC-P23

Position marker for fixation with threaded pin M4 (included in delivery)

Caution: For orientation of the output characteristic please follow the user manual of the position marker!

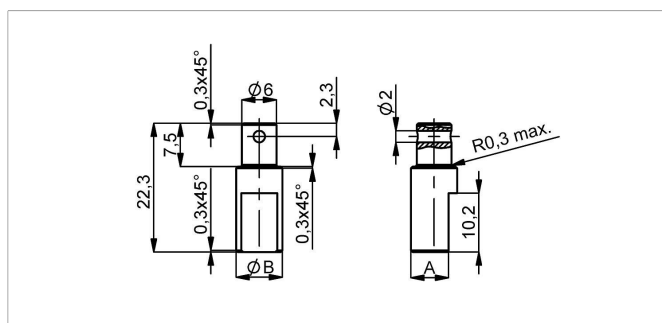
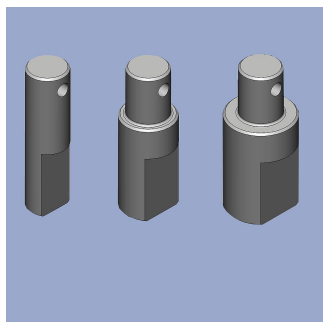
Material PA6-GF

Max. permitted  $\pm 3$  mm

radial offset

Operating temp.  $-40 \dots +125^{\circ}\text{C}$

P/N	Pack. unit [pcs]
400056074	1
400056085	25



### Z-RFC-S01/S02/S03

Shaft adapter for fixation at position marker Z-RFC-P02/P41 with locking pin

Material Stainless steel 1.4305

P/N	Type	ØB / A [mm]
400056206	Z-RFC-S01	6 / 4.5
400056207	Z-RFC-S02	8 / 6.5
400056208	Z-RFC-S03	10 / 8.5



## Position Markers

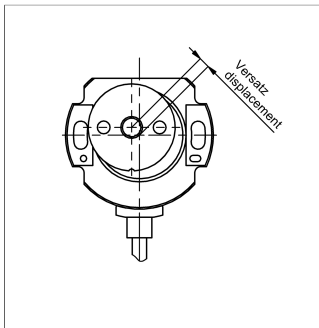
### Working Distances Position Markers [mm] - One-channel Versions

**Z-RFC-P02 / P04 / P08**

**Z-RFC-P20 / P23 / P31**

0 ... 1.4

### Lateral Magnet Offset



Lateral magnet offset will cause additional linearity error. The angle error, which is caused by radial displacement of sensor and position marker depends on the used position marker or magnet.

### Additional Linearity Error at Radial Displacement - One-channel Versions

**Z-RFC-P02 / P04 / P08**

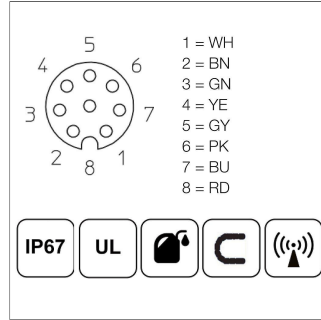
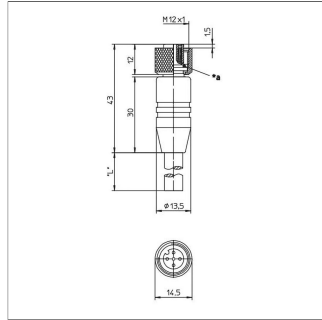
**Z-RFC-P20 / P23 / P31**

0.5 mm:  $\pm 0.4^\circ$

1.0 mm:  $\pm 1.1^\circ$

2.0 mm:  $\pm 3.5^\circ$

**Connector System  
M12**



**EEM-33-86/90/92**  
M12x1 Mating female connector, 8-pin, straight, A-coded, with molded cable, shielded, IP67, open ended  
Plug housing PA  
Cable sheath PUR, Ø = max. 8 mm, -25 ... +80°C (moved), -50 ... +80°C (fixed)  
Lead wires PP, 0.25 mm<sup>2</sup>

P/N	Type	Length
400005629	EEM-33-86	2 m
400005635	EEM-33-90	5 m
400005637	EEM-33-92	10 m

**IP67** Protection class IP67 DIN EN 60529

**IP68** Protection class IP68 DIN EN 60529

Very good Electromagnetic Compatibility (EMC) and shield systems

Very good resistance to oils, coolants and lubricants

**C** Suited for applications in dragchains

**UL** UL - approved

CAN-Bus

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