

# Correvit SF Race

## Non-contact optical sensors with new ECU

Type 18019042, 18019043,  
18020334, 18026148

Patent No. DE 43 13 497 C2

Correvit SF Race sensors with a special ECU are designed to measure longitudinal and transverse speed in racing applications.

- Developed for measurement of tire slip angle
- Speed range 0,3 ... 400 km/h
- Small and lightweight
- Measurement accuracy  $<\pm 0,5\%$
- Adjustable filter time (unfiltered, moving average 8 ... 512 ms)
- Improved signal processing

### Description

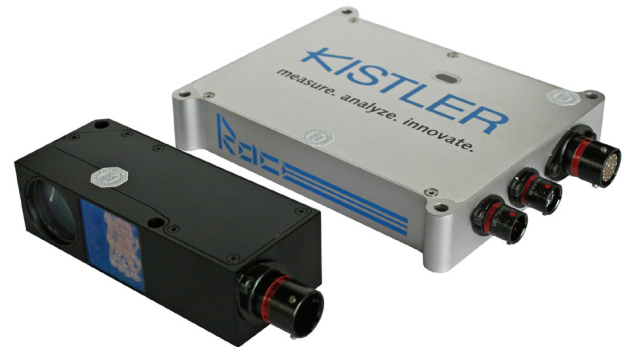
Correvit SF Race sensors are an advanced development of the Formula-1 proven Correvit SFII sensor, with its long-life, vibration-resistant, infrared LED illumination. Consistent miniaturization and a low weight enable universal mounting positions, e.g. below the vehicle near the center of gravity. The applied state-of-the-art technology delivers improved performance, even under harsh environmental conditions.

Equipped with CAN bus, SF Race sensors permit simultaneous measurement of longitudinal, transverse, magnitude speed, and angle. Thanks to high-speed data transfer via CAN Bus, the SF Race sensors can be used with all common data acquisition systems.

SF Race sensors are available with a protection glass (SF Race P) that prevents damage to the optics and the illumination source and can be easily replaced without use of special tools.

### Application

High-precision, slip-free measurement of distance, longitudinal and transversal speed as well as angle for vehicle dynamics testing.



### Technical data

Performance specifications		SF Race	SF Race P
Speed range	km/h	0,3 ... 400	
Distance resolution	mm	2,08	
Measurement accuracy <sup>1)</sup>	%FSO	$<\pm 0,5$	
Angle range	°	$\pm 30$	
Angle resolution <sup>2)</sup>	°	$<\pm 0,1$	
Angle measurement accuracy	°	$<\pm 0,5$	
Measurement frequency	Hz	250	
Working distance and range	mm	180 $\pm$ 50	

### Interfaces

CAN (Motorola/Intel)		2.0B
RS-232C		only for service purposes <sup>3)</sup>

<sup>1)</sup> With calibration on test surface, determined with distance  $>200$  m

<sup>2)</sup> Determined at 50 km/h and default settings

<sup>3)</sup> According to FIA rules, not usable for customers

**Technical data (continuation)**

System specifications		SF Race	SF Race P
Power supply	V	10 ... 28	
Power consumption at 12 V	W	28	
Temperature range sensor head <sup>4)</sup>			
Operation	°C	-25 ... 50	
Storage	°C	-40 ... 85	
Relative humidity <sup>5)</sup>	%	5 ... 80	
Temperature range electronics			
Operation (PCB temp.)	°C	-25 ... 75	
Storage	°C	-40 ... 85	
Relative humidity <sup>5)</sup>	%	5 ... 80	
Degree of protection			
Sensor head (cable mounted)		IP67	
Electronics (cable mounted)		IP67	
Dimensions (LxWxH)			
Sensor head <sup>6)</sup>	mm	100x28x40	100x33x45
Electronics (approx.) <sup>6)</sup>	mm	128x106x22	
Weight			
Sensor head <sup>6)</sup>	grams	180	250
Electronics (approx.) <sup>6)</sup>	grams	350	
Shock			
30 positive/negative	g ms	30, half-sine 15	
15 positive/negative	g ms	80, half-sine 11	
Vibration	g Hz	10 10 ... 150	
Expected lifetime	km	≥10 000	
Illumination		LED-IR 850 nm laser class 1	
Case material		anodized aluminum	

<sup>4)</sup> Internal sensor head temperature must not exceed 75 °C  
<sup>5)</sup> Non-condensing  
<sup>6)</sup> Without connector

**Dimensions**

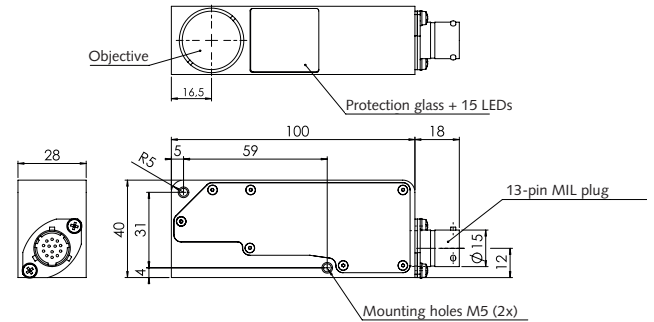


Fig. 1: Correvit SF Race sensor dimensions

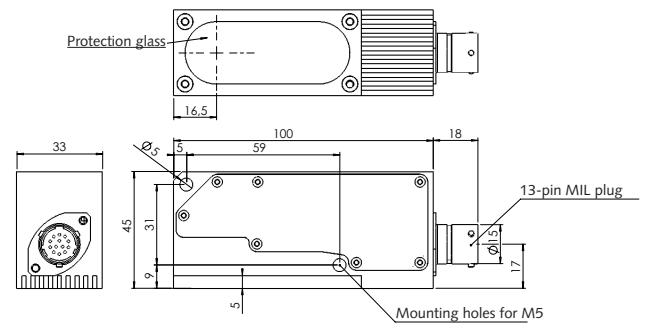


Fig. 2: Correvit SF Race P sensor dimensions

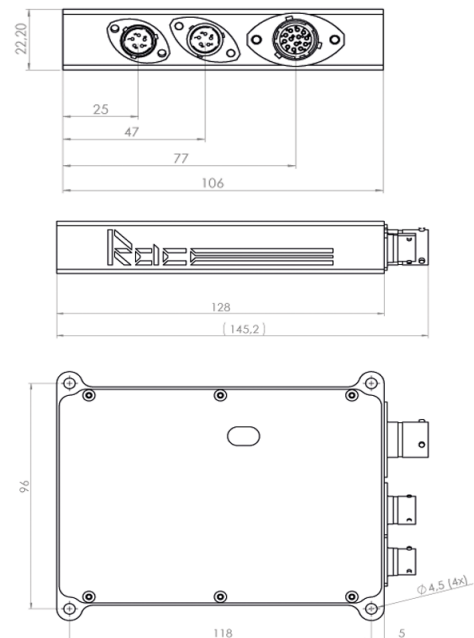


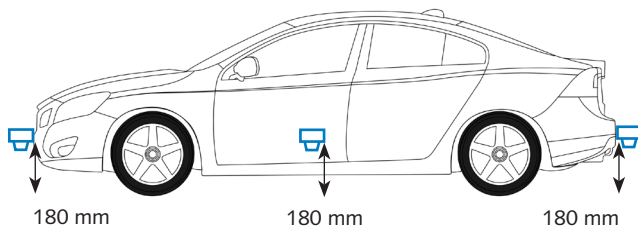
Fig. 3: Correvit SF Race/SF Race P electronics dimensions

CSFRA\_003-240e-01.19

## Mounting

With Kistler mounting equipment (see optional accessories).

When mounting the sensor at the vehicle, the mounting distance from the lower surface of the sensor body (not including protection glass and/or spray guard) to the road must be within the specified range of  $180 \pm 50$  mm.



□ longitudinal mounting only!

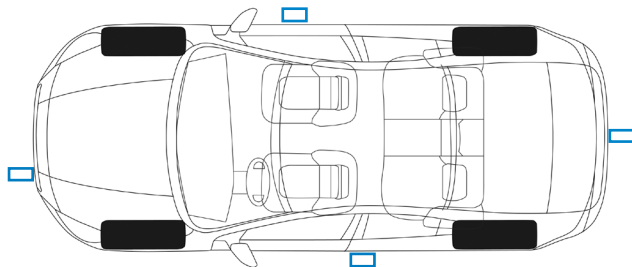


Fig. 3: Possible mounting positions

## Included accessories

- Power cable, MIL, 5 pin, 2 x bunch, l = 2 m
- Sensor cable, l = 5 m
- Connection cable CAN, l = 2 m
- Connection cable RS-232C, l = 2 m
- USB adapter
- Mini folding rule
- USB stick software + manuals
- Sensor calibration 2-axis sensors
- Cooling element left/right, black
- Screw set for SF
- Transport case, complete

## Ordering no.

18012480  
18013298  
18012476  
18012475  
55065718  
55064207  
55158846  
44000669  
55063822  
55086107  
55066886

## Optional accessories

- 3-point suction holder
- 8-point magnetic holder

## Ordering no.

18012595  
18012490

## Ordering code

- SF-Race sensor without protection glass...
  - ... with switchable CAN terminating resistor
  - ... without CAN terminating resistor
- SF-Race sensor with protection glass...
  - ... with switchable CAN terminating resistor
  - ... without CAN terminating resistor

## Ordering no.

18019042  
18026148  
18019043  
18020334