



**Contactless** linear sensor - HALL EFFECT technology - with embedded single-axis MEMS inclinometer (i.e. single axis Z).

Excellent performance, high IP rating, shock and vibration resistance guarantee **sensor performance** in typical mobile hydraulic applications, wherever there's the need to monitor a linear position and a tilt angle at the same time.

The **compact design** - with only 65mm height - and the **CANopen signal output** as well as the **full redundant circuit**, both for the linear position and for the tilt angle measurements, make such a sensor a state-of-the-art multivariable transducer.

#### TECHNICAL SPECIFICATIONS

##### Measurement Range (FS)

strokes 1800mm - 2300mm - 3300mm - 4300mm - 4800mm - 5300mm - 6300mm - 7300mm - 8000mm - 8300mm

##### Supply voltage

+10...36Vdc

##### Output signal

CANopen

##### Electrical connections

M12 connector output, cable output

##### Linearity factory verification@ 25°C

< ± 0.5% FS – linear position

< ± 0.5% FS – tilt angle

##### Long term repeatability (linear position)

< ±3% FS (for 1800mm, 2300mm, 3300 mm)

< ±2% FS (for 4300mm, 4800 mm, 5300 mm, 6300 mm, 7300 mm, 8000 mm, 8300 mm)

##### Resolution

0.1 mm – linear position

0.1 deg – tilt angle

##### Working temperature

-40°C...+85°C

##### Vibrations

20g between 10 Hz ... 2000 Hz according to IEC 60068-2-6

##### Shock

Pulse on 3 axes; 50g 11 ms according to IEC 60068-2-27

##### Electromagnetic compatibility

2014/30/EU Electromagnetic Compatibility (EMC)

##### Life cycles

500.000 max speed 1m/s acc. max 0.5g;

250.000 max speed 2 m/s acc. max 1g

##### Typical speed

max 2m/s, typical 1m/s

##### Typical acceleration

1g

##### IP Protection Level

IP67 with female homologated connector mounted, tightening torque 0.6Nm + low strength threadlocker (M12 connector version)

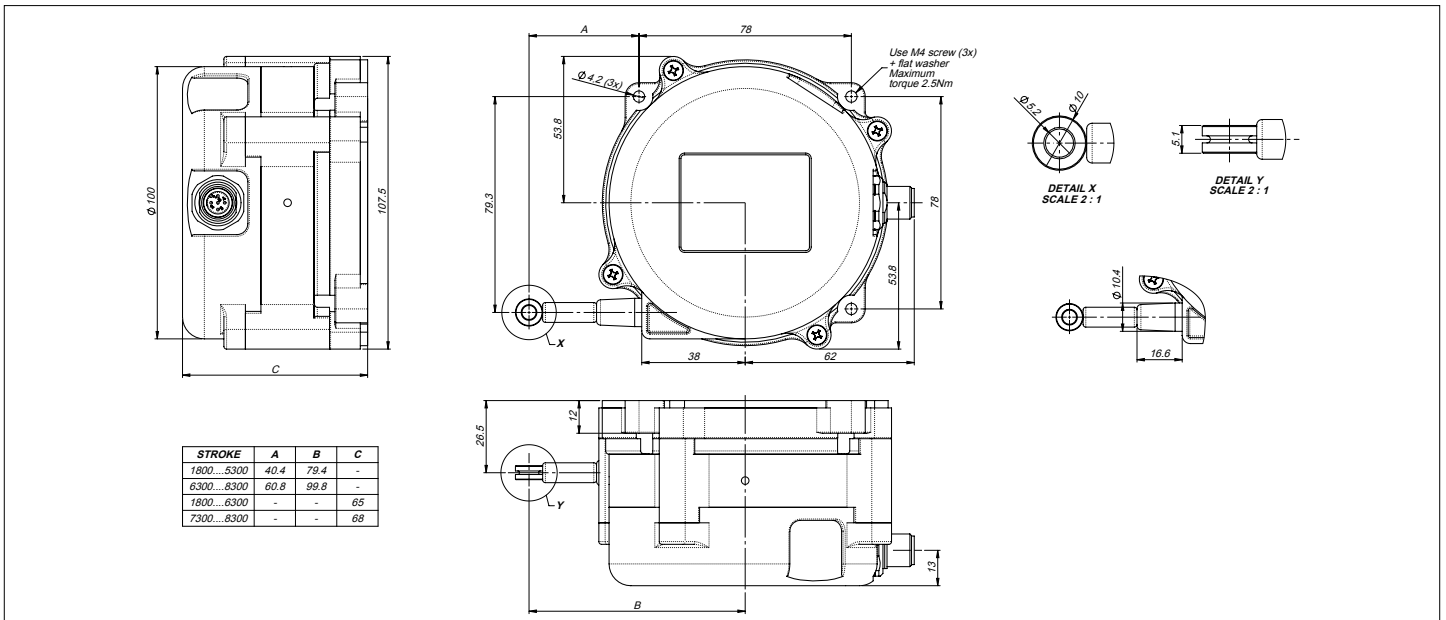
IP67 (cable-PUR version)

##### Constructive material of transducer body and wire

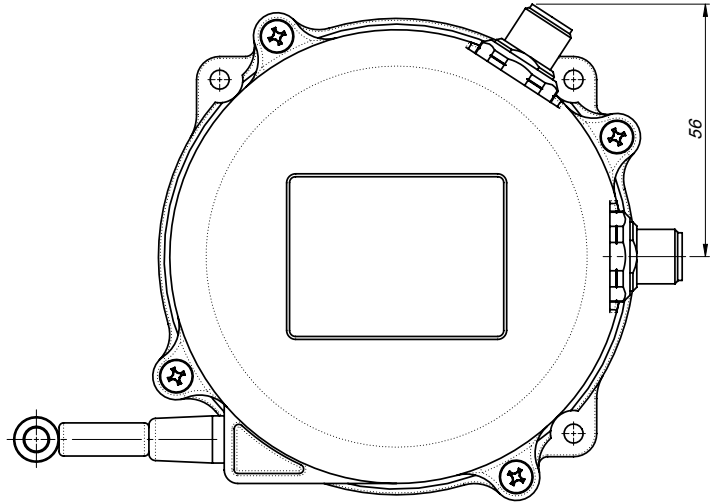
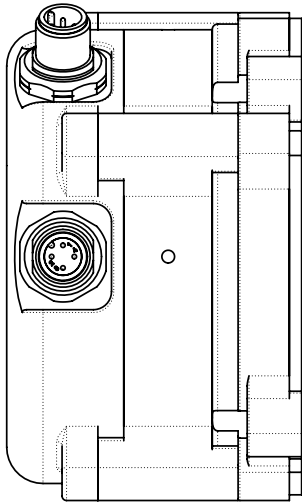
Transducer: PBT

Wire: AISI316 stainless steel, Ø 0.85 mm nylon coating

#### MECHANICAL DIMENSIONS - SINGLE/REDUNDANT - M12 1x VERSION

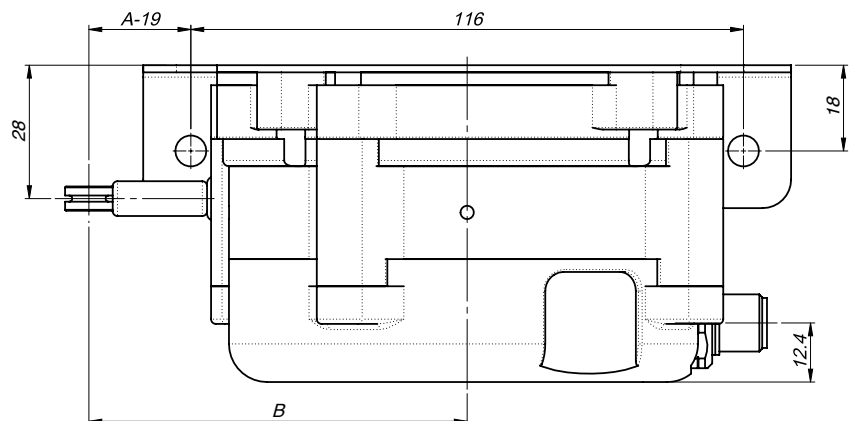
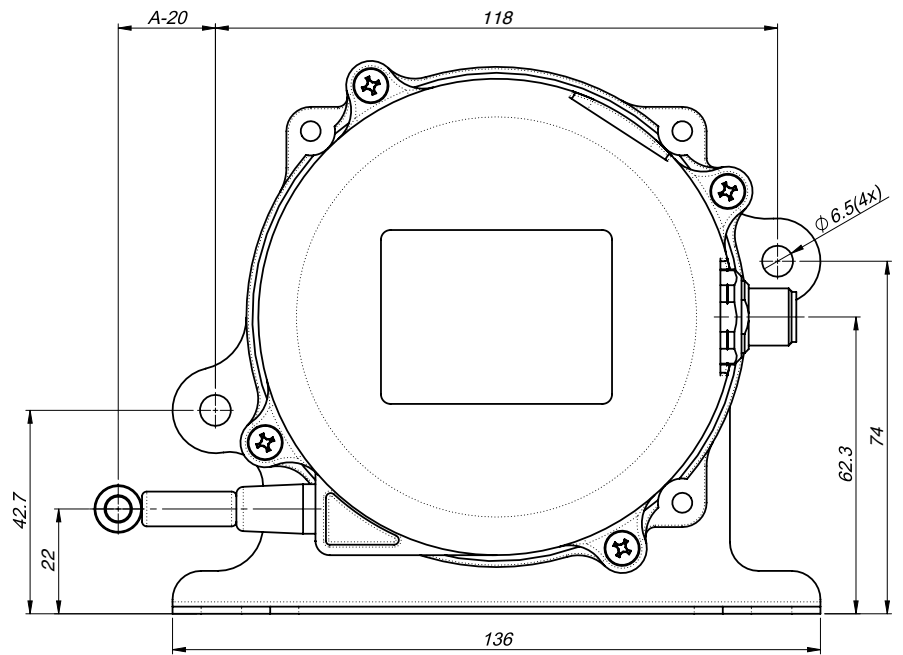
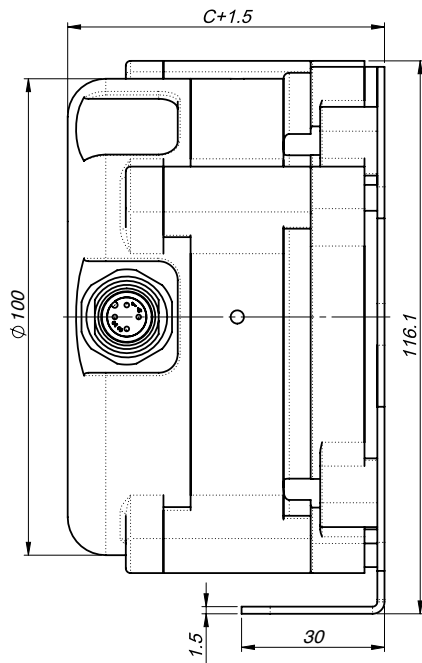


## MECHANICAL DIMENSIONS - REDUNDANT - M12 2x VERSION



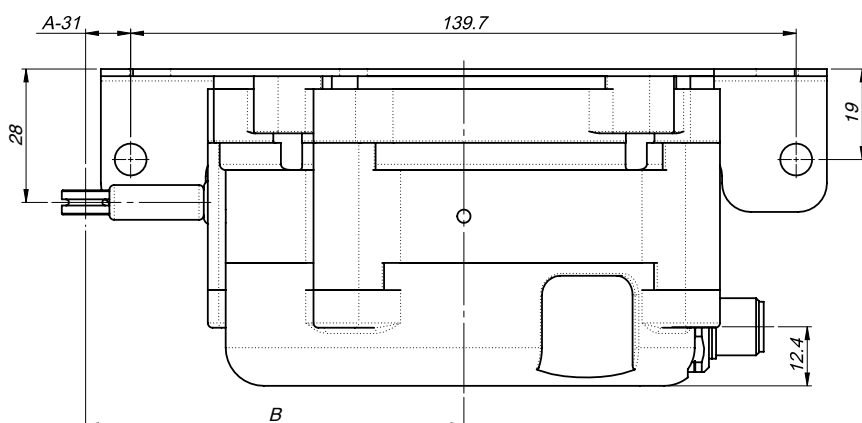
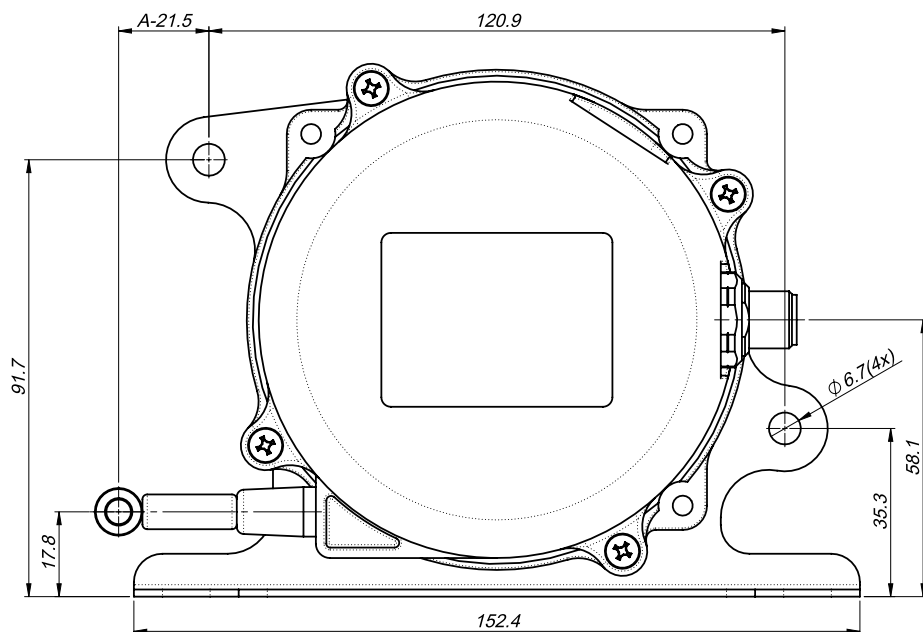
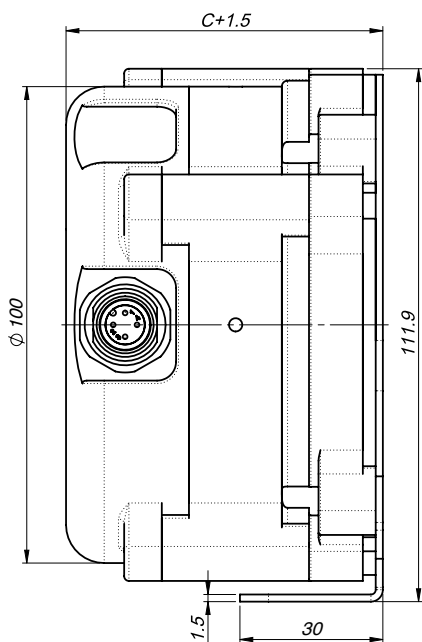
## FIXING FLANGES (optional accessories to order)

### FIXING FLANGE MODEL A - FLA033 (optional)

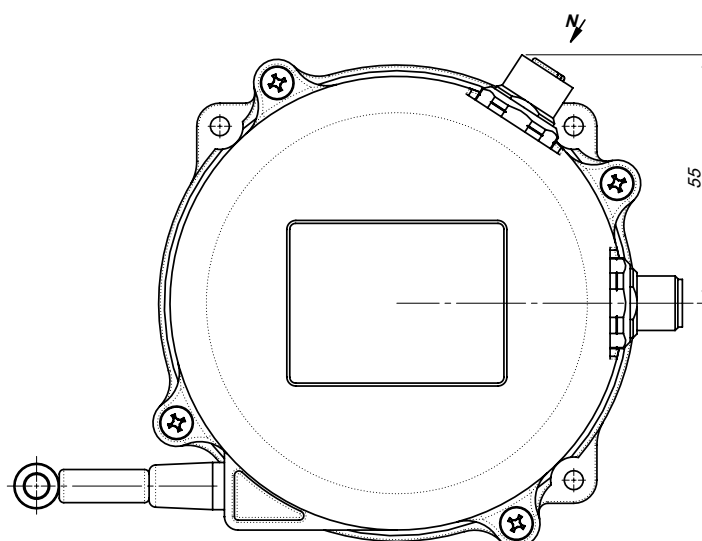
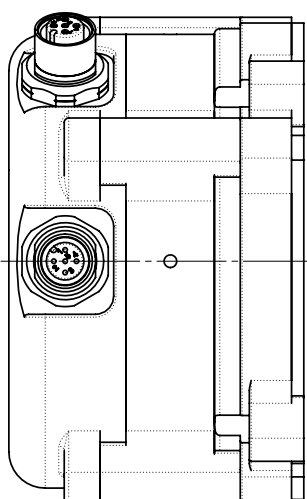


## FIXING FLANGES (optional accessories to order)

### FIXING FLANGE MODEL B - FLA034 (optional)



## MECHANICAL DIMENSIONS - IN-OUT - M12 VERSION

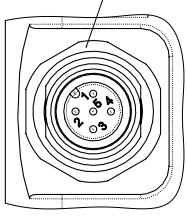


## ELECTRICAL CONNECTIONS - M12 VERSION

SINGLE VERSION  
REDUNDANT VERSION

N-1-S  
N-1-R N-2-R

M12x1 5-pin  
male connector



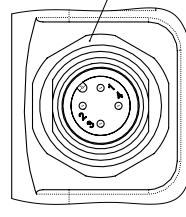
### CAN CONNECTIONS

1. n.c.
2. +SUPPLY
3. GROUND
4. CAN-H
5. CAN-L

SINGLE VERSION  
REDUNDANT VERSION

M-1-S  
M-1-R M-2-R

M12x1 4 pin  
male connector



### ANALOG OUTPUT CONNECTIONS

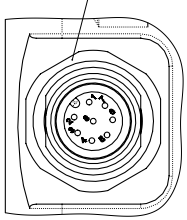
1. +SUPPLY
2. GROUND
3. OUTPUT
4. n.c.

### CAN CONNECTIONS

1. +SUPPLY
2. GROUND
3. CAN-H
4. CAN-L

REDUNDANT VERSION O-1-R

M12x1 8-pin  
male connector

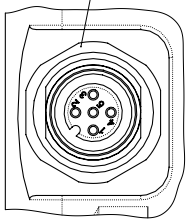


### CAN CONNECTIONS

1. + SUPPLY CH1
2. GROUND CH1
3. CAN-H CH1
4. CAN-L CH1
5. + SUPPLY CH2
6. GROUND CH2
7. CAN-H CH2
8. CAN-L CH2

SINGLE/REDUNDANT/HALF-REDUNDANT IN-OUT VERSION N-3-(S/R/H)

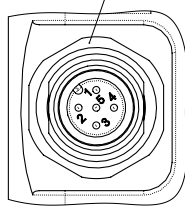
M12x1 5-pin  
female connector



### CAN CONNECTIONS

1. GROUND
2. +SUPPLY
3. GROUND
4. CAN-H
5. CAN-L

M12x1 5-pin  
male connector



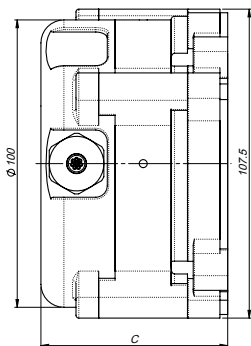
### CAN CONNECTIONS

1. GROUND
2. +SUPPLY
3. GROUND
4. CAN-H
5. CAN-L

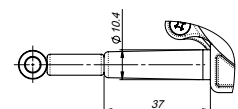
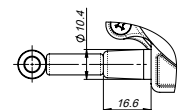
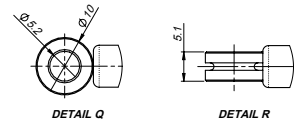
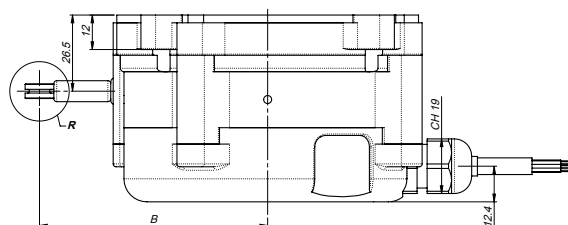
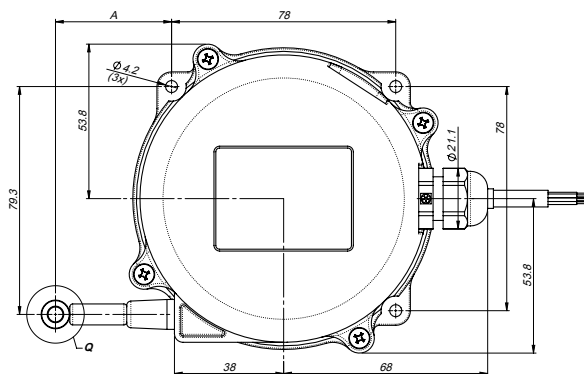
VIEW FROM N

ITEMS MARKED "n.c." MUST NOT BE CONNECTED

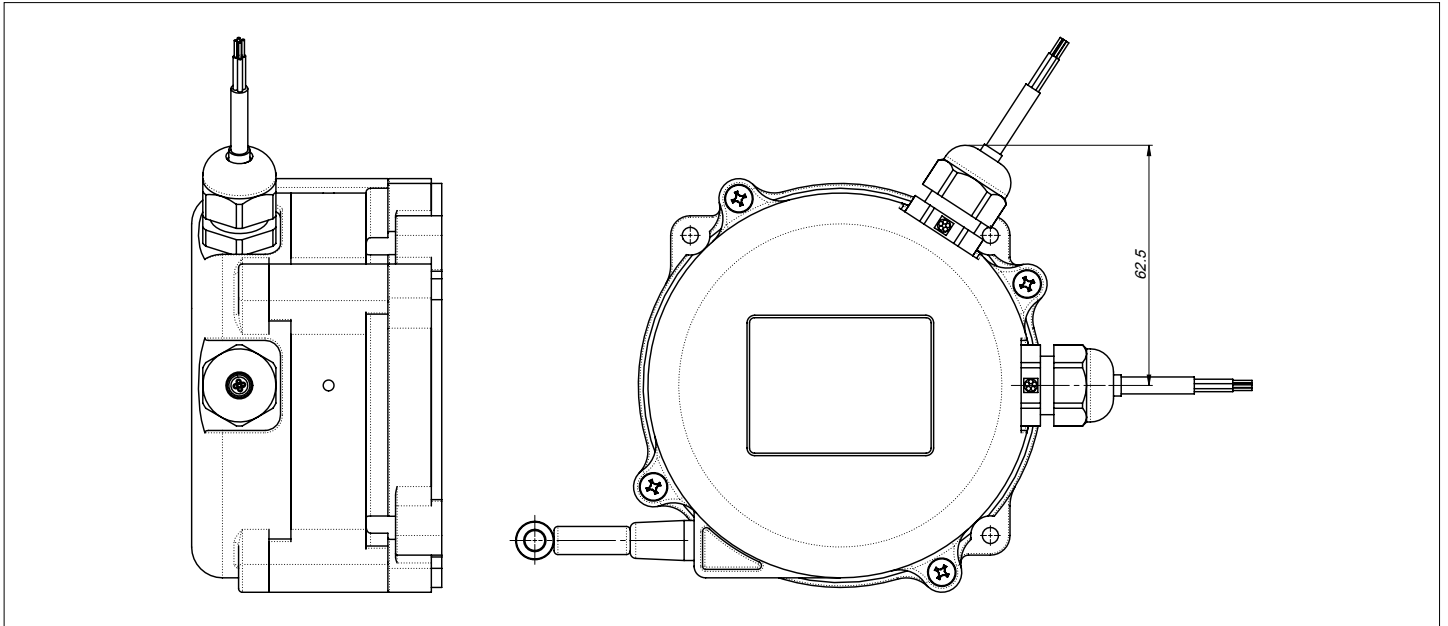
## MECHANICAL DIMENSIONS - SINGLE / REDUNDANT - CABLE VERSION



STROKE	A	B	C
1800...5300	40.4	79.4	-
6300...8300	60.8	99.8	-
1800...6300	-	-	65
7300...8300	-	-	68



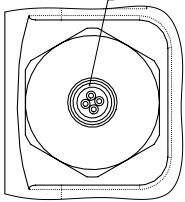
## MECHANICAL DIMENSIONS - REDUNDANT - 2x CABLE VERSION



## ELECTRICAL CONNECTION - CABLE VERSION

### SINGLE VERSION F-S

IEC 60228 Cable  
4 pole 0.34mm<sup>2</sup>  
PUR OD 4.4mm

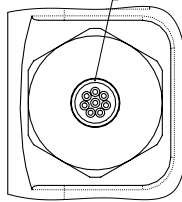


#### CAN CONNECTIONS

RED	+SUPPLY
BLACK	GROUND
BLUE	CAN-H
WHITE	CAN-L

### REDUNDANT VERSION F-R

IEC 60228 Cable  
8 pole 0.34mm<sup>2</sup>  
PUR OD 5.8mm



#### CAN CONNECTIONS

WHITE	+ SUPPLY CH1
BROWN	GROUND CH1
GREEN	CAN-H CH1
YELLOW	CAN-L CH1
GREY	+ SUPPLY CH2
PINK	GROUND CH2
BLUE	CAN-H CH2
RED	CAN-L CH2

# FUNCTIONS: SENSOR OUTPUTS

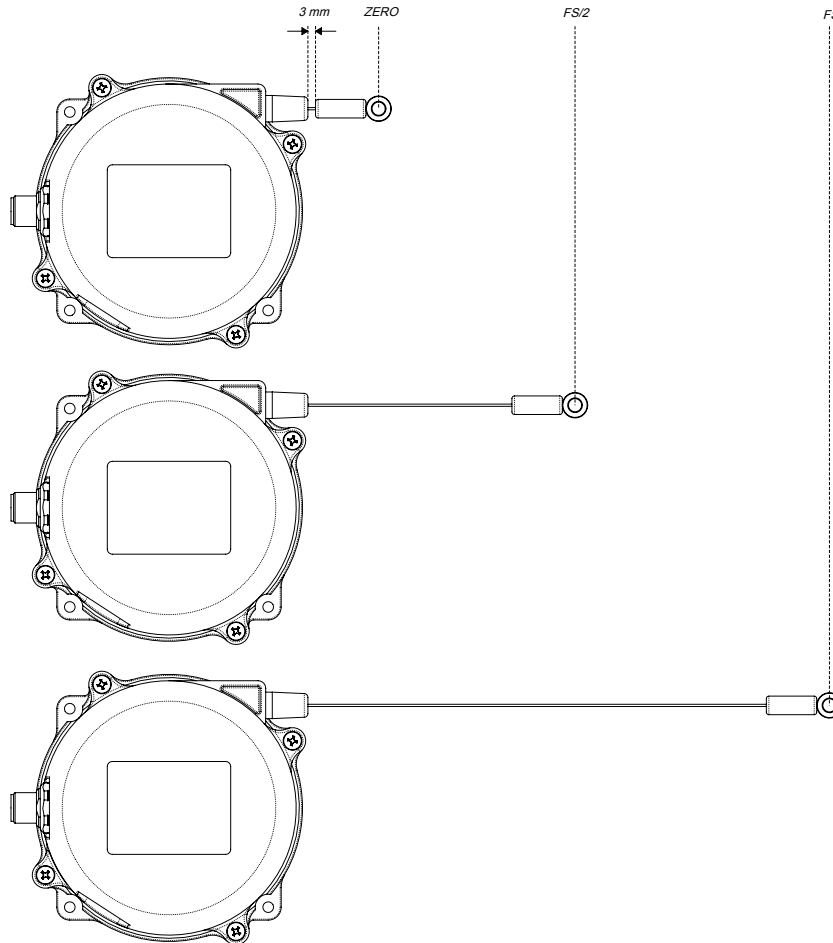


	FIGURE 1	FIGURE 2	FIGURE 3
CH1	0 deg	330 deg	45 deg
CH2	0 deg	30 deg	315 deg

## ORDERING CODE

### GSH-A - Hall-effect wire linear position transducer with single axis tilt angle measurement

TRANSDUCER TYPE	
Hall-effect wire linear position transducer with single axis tilt angle measurement	<b>A</b>

ELECTRICAL CONNECTIONS	
M12 4P connector	<b>M</b>
M12 5P connector	<b>N</b>
M12 8P connector (only for redundant versions)	<b>O</b>
Cable output	<b>F</b>

CONNECTOR OPTIONS	
Cable output	<b>0</b>
1 male M12 4P connector (single or redundant version) or 1 male M12 5P connector (single or redundant version) or 1 male M12 8P connector (only redundant version)	<b>1</b>
2 male M12 5P connectors (only redundant version)	<b>2</b>
1 male M12 5P connector (CANopen IN) and 1 M12 5P female connector (CANopen OUT)	<b>3</b>

CIRCUIT TYPE	
Single	<b>S</b>
Redundant	<b>R</b>

MEASUREMENT RANGE	
measurement range (specify)	
available strokes: 1800mm-2300mm-3300mm-4300mm-4800mm-5300mm-6300mm-7300mm-8000mm-8300mm	<b>XXXX</b>

SUPPLY VOLTAGE	
+10...36 Vdc	<b>H</b>

OUTPUT TYPE	
CANopen output	<b>C1</b>

CERTIFICATES	
<b>0</b>	No certificate attached

ACCESSORIES	
<b>X</b>	No accessories
<b>A</b>	FLA033: fixing flange, A version
<b>B</b>	FLA034: fixing flange, B version
<b>C</b>	CON293: 4-pin female mating connector M12x1; IP67 protection degree
<b>D</b>	CON469: 8-pin female mating connector M12x1; IP67 protection degree
<b>E</b>	CON031: 5-pin female mating connector M12x1; IP67 protection degree

CABLE LENGTH	
<b>10</b>	1 m cable
<b>20</b>	2 m cable
<b>30</b>	3 m cable
<b>50</b>	5 m cable
<b>80</b>	8 m cable
<b>A0</b>	10 m cable
.....	other lengths on request

#### Example of description: GSHAN1R8300HC1 0000X00

<b>GSH</b>	<b>A</b>	<b>N</b>	<b>1</b>	<b>R</b>	<b>8300</b>	<b>H</b>	<b>C1</b>	<b>0</b>	<b>000</b>	<b>X</b>	<b>00</b>
wire transducer inclinometer		M12 5-pole connector	1xM12 5P connector	Redundant	8300mm stroke	+10...36Vdc	CANopen output	No certificate required	Special execution	No accessories	ND

GEFRAN spa reserves the right to make any kind of design or functional modification at any moment without prior notice.

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