GIM600R - 1-dimensional

1-dimensional, measuring range 0...360°

CANopen® / SAE J1939

Overview

- Designed for Mobile Maschines
- E1 compliant design
- Load dump protection
- Protection up to IP 69K
- Corrosion protection CX (C5-M)
- Connection cable / cable with M12 connector
- Interface CANopen® / SAE J1939
- Redundant versions (2-channel architecture)
- Applicable up to PLd (ISO 13849)

Picture similar

Technical data

Technical data - electrical ratings

Voltage supply	8...36 VDC
Reverse polarity protection	Yes
Short-circuit proof	Yes
Consumption typ.	15 mA (24 VDC, w/o load) 30 mA (24 VDC, w/o load, redundant)
Initializing time typ.	≤ 1 s after power on
Interface	CANopen® SAE J1939
Measuring range	0...360°
Resolution	1 … 0.001 ° CANopen® 0.1 ° SAE J1939
Accuracy (+25 °C)	Typ. ±0.1°
Repeatability typ.	0.025 ° (+25 °C)
Absolute accuracy max.	±0.26° (+25 °C) ±0.47° (0…+50 °C) (measuring range 0…360°, see general information)
Sensing method	MEMS technology
Sensing rate	1000 Hz (1 ms)
Limit frequency	0.1...30 Hz, 2. order / low-pass filter
Output stages	CAN-Bus compatible ISO 11898
Load dump protection	ISO 16750-2 for 12 V/24 V systems Pulse 5b (test criteria B)
Interference immunity	EN 61000-6-2 ISO 7637-2* ISO 7637-3* ISO 11452-2* ISO 11452-4* ISO 11452-5* EN 61000-4-2 (CD ±8 kV, AD ±15 kV) * Severity level according to ECE R10 (Rev. 6 + Amd 02:2021-12)

Technical data - electrical ratings

Emitted interference	EN 61000-6-3 EN 61000-6-4 ISO 7637-2* CISPR 25:2008 (30...1000 MHz) * Severity level according to ECE R10 (Rev. 6 + Amd 02:2021-12)
MTTF$_d$ (ISO 13849)	High (>100 years) Use in safety functions exclusively based on quick start guide, Application Note and MTTFd reliability prediction (request separately).
Programmable parameters	Preset / zero position Resolution Limit frequency (low-pass filter) Rotating direction
Diagnostic function	Supply voltage monitoring Temperature control
Approval	UL approval / E217823

Technical data - mechanical design

Dimensions W x H x L	72 x 24 x 64 mm
Protection EN 60529	IP 66 IP 67 IP 68 (without connector) IP 69K (without connector)
Material	Housing: polyamide (glass fiber reinforced) Base plate: metal
Corrosion protection	IEC 60068-2-52 Salt mist for ambient conditions CX (C5-M) according to ISO 12944-2
Operating temperature	-40...+85 °C (see general information)
Resistance	EN 60068-2-6 Vibration 30 g, 60-2000 Hz EN 60068-2-27 Shock 200 g, 3 ms EN 60068-2-64 Random vibration 10 grms, 20-1000 Hz
Temperature changes	EN 60068-2-14, -40…+85 °C

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Technical data

Technical data - mechanical design

Weight approx.	150 g
Connection	Flylead connector M12, 5-pin, length 300 mm

Optional

- 3-axis acceleration PDO mappable (see general information)
- GIM140R-compatible SDO baud rate table
- With integrated terminating resistor

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General information

For a precise thermal design, the self-heating of the inclination sensor must be taken into account depending on the mounting and ambient conditions as well as the electronics and supply voltage. As an approximation, 5 K self-heating applies when the sensor is mounted on a painted metal base. If the inclination sensor is operated close to the maximum characteristic values, the actual temperature at the housing of the inclination sensor must be measured. Electromagnetic influences can lead to reduced measuring accuracy (see application note). Reference the zero position of the inclination sensor after installation. Regularly check the zero point stability of the inclination sensor when installed. Acceleration values (optional) are for information purposes only. Further information on request.
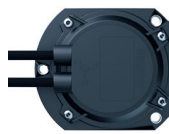
Installation position

When installing 1-dimensional inclination sensors, make sure the rotational axis as shown in the illustration is in a horizontal position, perpendicular to earth gravity. Maximum misalignment ±3°.

The 1-dimensional sensor default position is 0° as shown in the following illustration, but may be configured using the zero setting function.
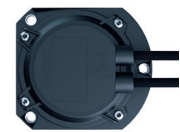
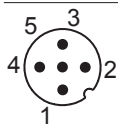| **Inclination angle 0°**	**Inclination angle +90°**	**Inclination angle +180°**	**Inclination angle +270°**

Terminal assignment

Cable with connector M12, 5-pin

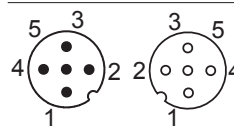| Pin	Assignment	Description
1	CAN_GND	Ground connection relating to CAN
2	+Vs	Voltage supply
3	GND	Ground connection relating to +Vs
4	CAN_H	CAN Bus Signal (dominant High)
5	CAN_L	CAN Bus Signal (dominant Low)

M12 flange connector (male), A-coded

M12-1

Terminal assignment

Cable with connector 2xM12, 5-pin (Bus-in/Bus-out)

Pin	Assignment	Description
1	CAN_GND	Ground connection relating to CAN
2	+Vs	Voltage supply
3	GND	Ground connection relating to +Vs
4	CAN_H	CAN Bus Signal (dominant High)
5	CAN_L	CAN Bus Signal (dominant Low)

M12 flange connector (male / female), A-coded

M12-1   M12-2

Terminal assignment

Cable with connector 2xM12, 5-pin (2x Bus-in)

Pin	Assignment	Description
1	CAN_GND	Ground connection relating to CAN
2	+Vs	Voltage supply
3	GND	Ground connection relating to +Vs
4	CAN_H	CAN Bus Signal (dominant High)
5	CAN_L	CAN Bus Signal (dominant Low)

M12-1   M12-2   M12 flange connector (male), A-coded

For all connection types

Terminals GND and CAN_GND are internally connected and identical in their functions. Max. load on the terminals Vs and GND is 1.5 A each. Daisy chain current max. 1.5 A.

CANopen® features

Device profile	CANopen® CiA DS 301 V4.2 Inclinometer profile DS 410 V2.0 LSS service profile DS 305 V3.0
Default	Resolution 0.1° Limit frequency 5 Hz Baud rate 250 kbit/s Node-ID 1 Node-ID 2 (redundant version) Time-driven: 100 ms

SAE J1939 features

Default	Resolution 0.1° Limit frequency 5 Hz Transmission rate 250 kbit/s Address: 247, 248 (redundant version)

Data transfer

CANopen - PDO Mapping / Node-ID 1 / PDO 1

LSB	MSB	LSB	MSB	LSB	MSB
Byte 0	1	2	3	4	5
Temperature		Inclination angle Slope long = 0 ►360° in steps of 0.1° Increasing angle with clockwise rotation		Reserved	

CANopen - PDO Mapping / Node-ID 2 / PDO 1

LSB	MSB	LSB	MSB	LSB	MSB
Byte 0	1	2	3	4	5
Temperature		Inclination angle Slope long = 0 ►360° in steps of 0.1° Increasing angle with clockwise rotation		Reserved	

SAE J1939 - PGN 65363: 1-dimensional device message

LSB	MSB	LSB	MSB	LSB	MSB	LSB	MSB
Byte 1	2	3	4	5	6	7	8
Inclination angle signed word (resolution 0.1°, rotation direction CW)		Reserved		Temp. signed byte (°C)	Module ID	Error ID	

Data length: 8 bytes
Extended data page: 0
Data page: 0
PF: 255 (Prop. B)
PS: 83
Priority: 6
PG number: 65363 (00FF53h)

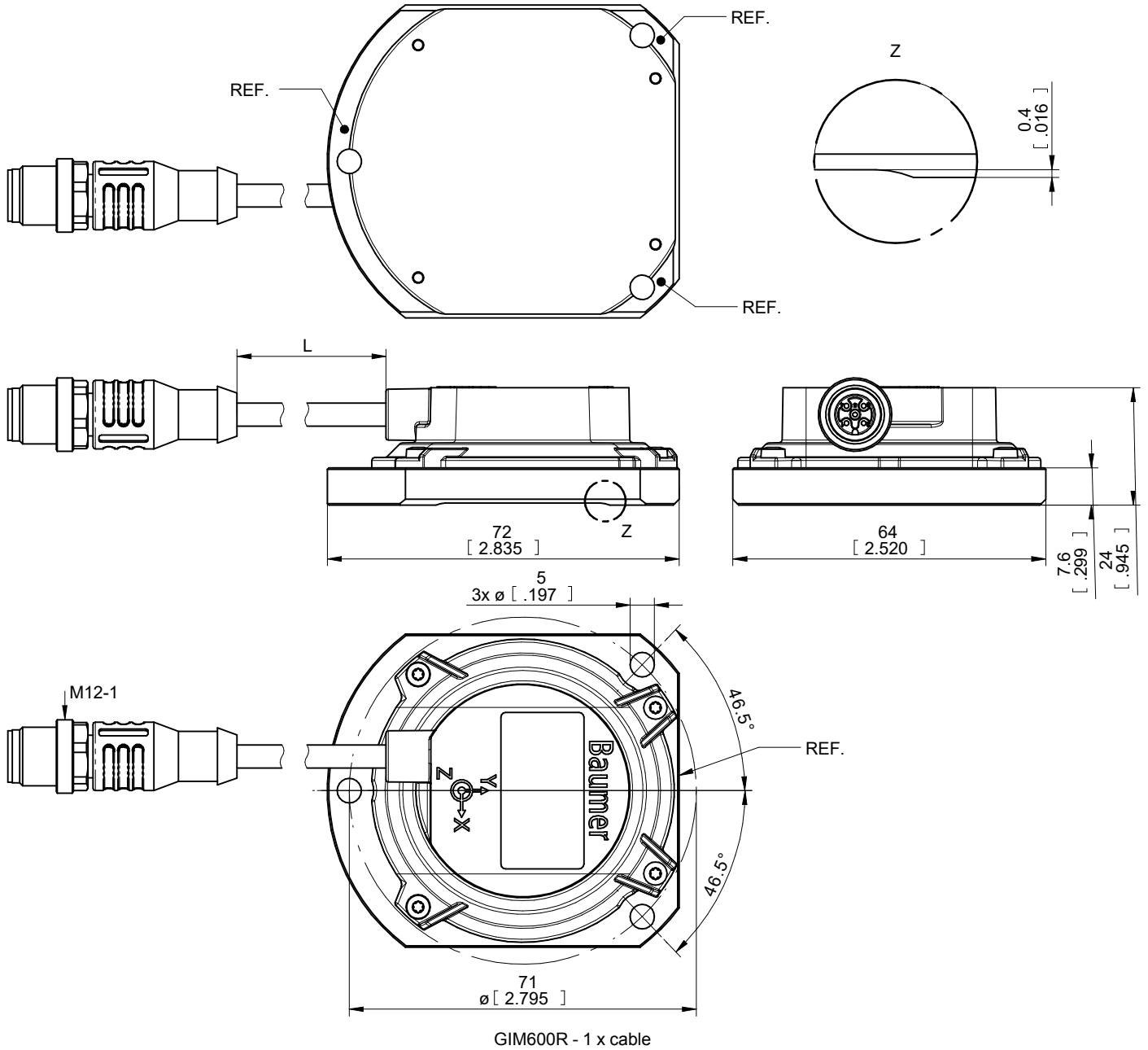Description of data payload:
Byte 1:   Signed word LSB inclination angle (resolution 0.1°)
Byte 2:   Signed word MSB inclination angle (resolution 0.1°)
Byte 3,4: Reserved
Byte 5:   Device temperature signed byte (resolution 1 °C)
Byte 6:   Module ID
Byte 7,8: Error ID

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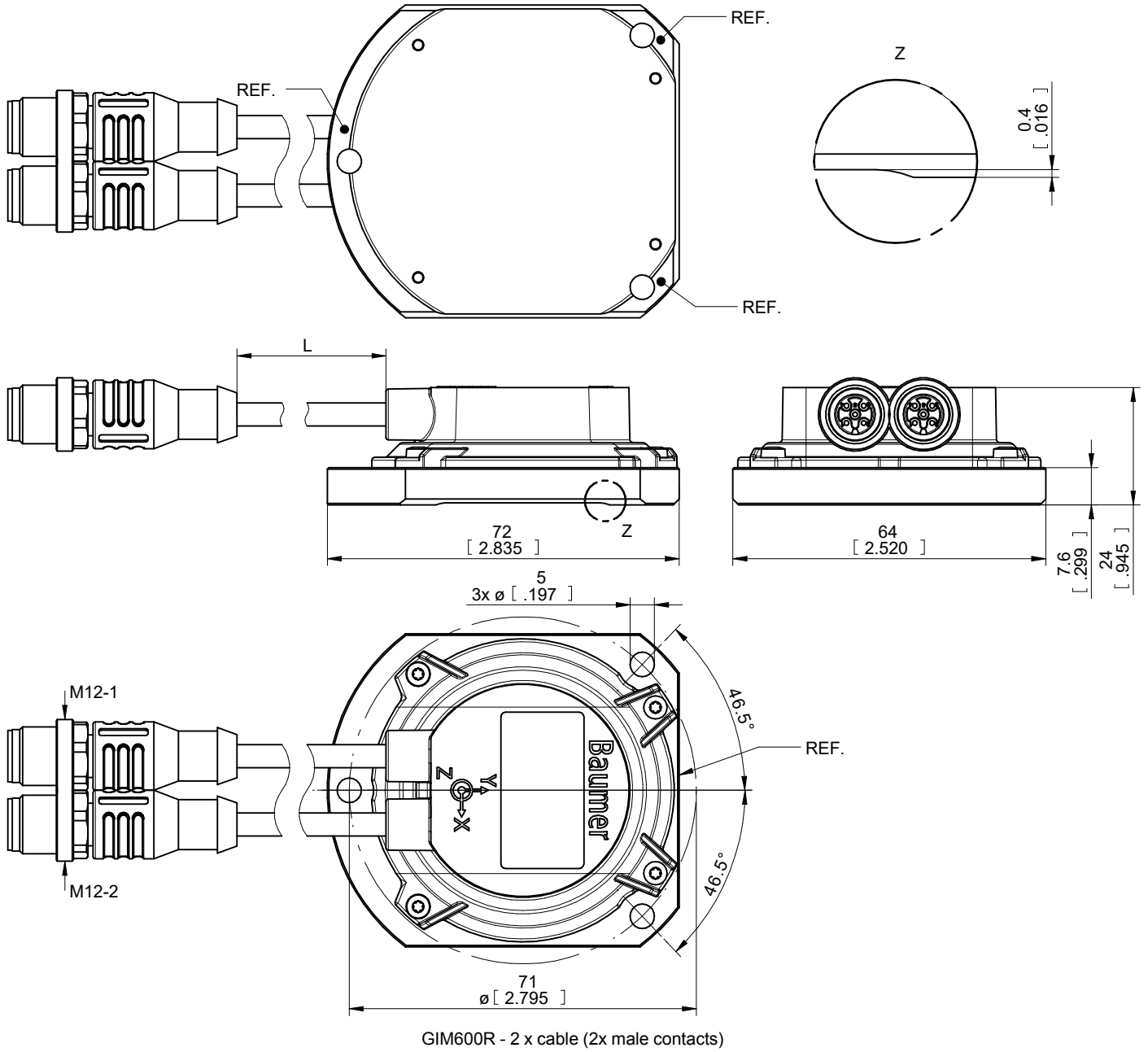
Dimensions

REF.

REF.

REF.

Z

0.4
[.016]

L

72
[2.835]

Z

64
[2.520]

7.6
[.299]

24
[.945]

5
3x ø [.197]

46.5°

46.5°

REF.

M12-1

71
ø [2.795]

GIM600R - 1 x cable

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Dimensions

GIM600R - 2 x cable (2x male contacts)

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Dimensions
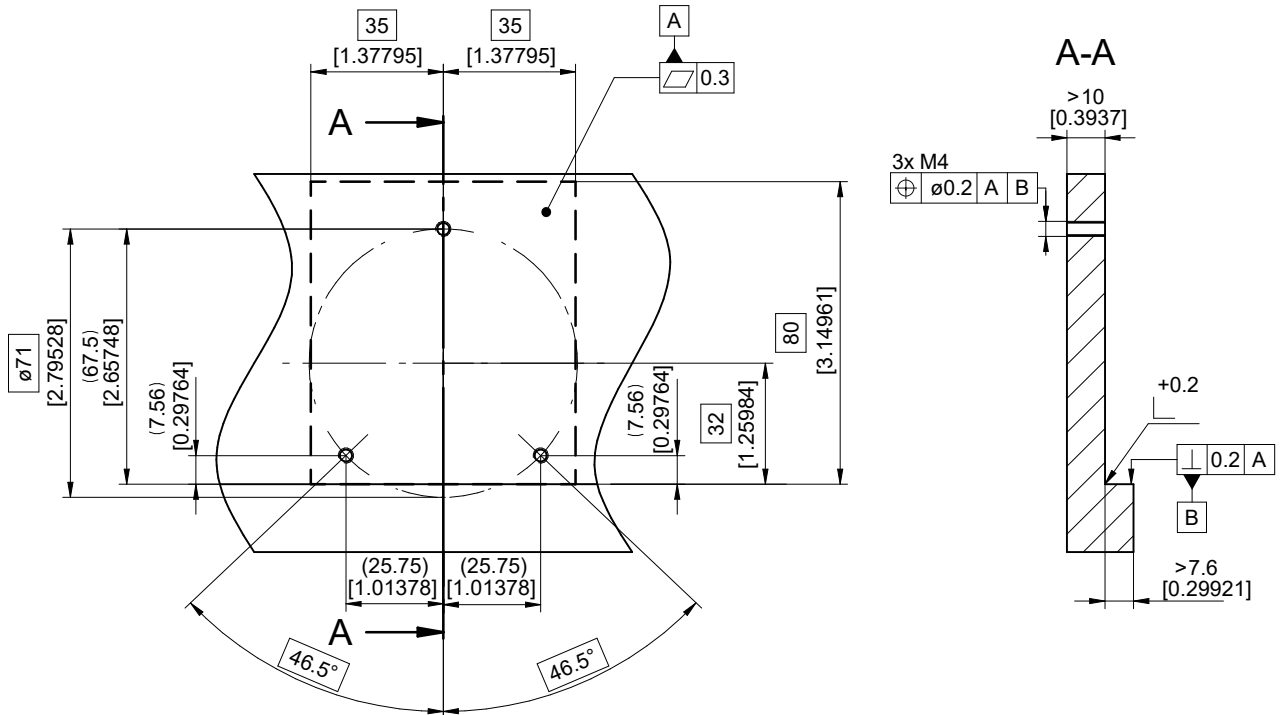

GIM600R - 2 x cable (male and female contacts)
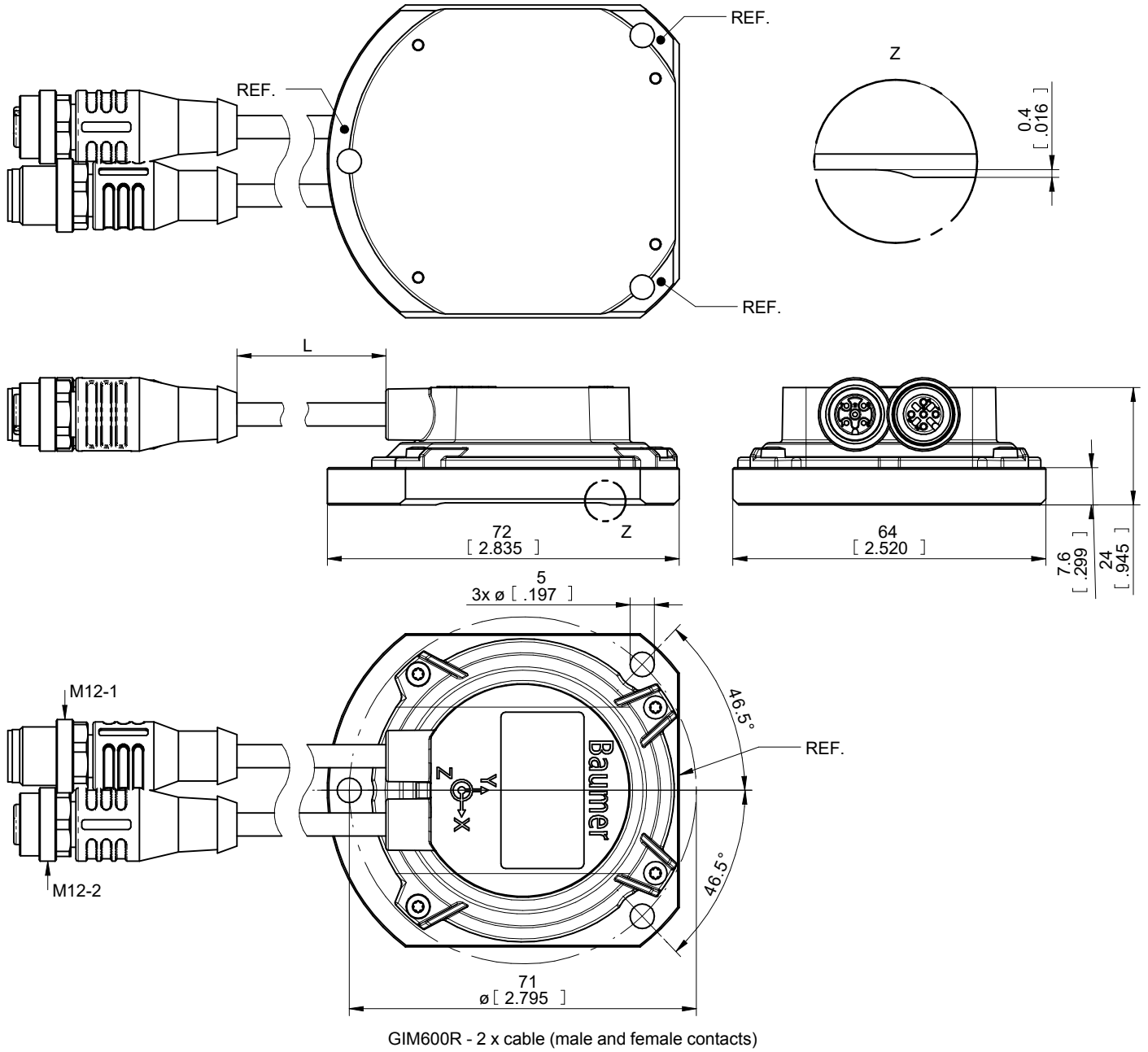
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Dimensions

GIM600R - Drilling pattern / mounting plate

Baumer
Passion for Sensors

Inclination sensors

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CANopen® / SAE J1939

Ordering reference

	GIM600R	-	N	1	36	.	#	##	.	A	/
Product											
GIM600R	GIM600R										
Housing											
Plastic reinforced / base plate metal			N								
Number of axes											
1-dimensional				1							
Measuring range											
0...360°					36						
Connection(1)											
Cable 0.3 m with M12, 5-pin, male contacts							S				
2x cable 0.3 m with M12, 5-pin, male and female contacts (Bus-in/out)							P				
2x cable 0.3 m with M12, 5-pin, 2x male contacts (2x Bus-in)							R				
Voltage supply / interface											
8...36 VDC / CANopen® (1-channel)								C6			
8...36 VDC / CANopen® redundant (2-channel design)								C8			
8...36 VDC / SAE J1939 (1-channel)								C9			
8...36 VDC / SAE J1939 redundant (2-channel design)								CR			
Operating temperature											
-40...+85 °C										A	
Option											
Without option											

(1) Other connection types on request

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