ASM®

perfect in sensors.

POSIHALL®

Magnetic Multiturn Angle Sensors

Product catalog

Company Profile

ASM - Sensors for Displacement. Angle. Inclination.

With more than 35 years of company tradition ASM is your expert partner for mechatronic displacement, angle and inclination sensors. ASM global headquarters in Moosinning, Germany, represent the heart of the company and are the center for sensor research, development and manufacturing. With a global sales network of more than 30 distributors and company subsidiaries ASM ensures worldwide accessibility to its customers.

The ASM product program includes various sensor technologies and comprises seven product lines offering a broad range of innovative solutions to measure linear displacement, angle and inclination.

Product range

POSIWIRE® Cable Extension Position Sensors
POSITAPE® Tape Extension Position Sensors
POSICHRON® Magnetostrictive Position Sensors
POSIMAG® Magnetic Scale Position Sensors
POSIROT® Magnetic Angle Sensors
POSIHALL® Magnetic Multiturn Angle Sensors
POSITILT® Inclination Sensors

Quality and reliability

ASM high-quality products are subjected to a stringent quality management certified according to DIN EN ISO 9001:2008. Your application specific requests are evaluated by ASM product specialists in a comprehensive technical consultation to find out which solution best meets your requirements – this can be a standard or a customer specific technology solution.

Advantages at a glance

The absolute POSIHALL® magnetic multiturn-angle sensors measure angular positions over multiple revolutions using a non-contact magnetic measuring principle, which allows wear free operation.
POSIHALL® angle sensors operate reliably and precisely even with high levels of vibrations and shocks and under extreme temperatures of -40°C to +85°C. The rugged stainless steel housing with completely enclosed electronics provides extra protection against extreme environmental conditions, which makes them the ideal solution for Heavy Duty applications in the field of mobile working machines. Due to their robust design POSIHALL® sensors are far superior to optical angle encoders in this specific area.

Technical advantages:

- Measuring range: up to 31x360° (PH36), up to 255x360° (PH58, PH68)
- Non-contact magnetic measuring principle
- Absolute angular position tracking (True Power On)
- Resistant to shock, vibration, and dirt due to rugged stainless steel housing with completely enclosed electronics.
- Integral shielding against magnetic fields
- Protection class up to IP69
- Multiple output types: analog, CANopen, SSI

POSIHALL® : The Functional Principle

POSIHALL® sensors detect the absolute angular position of a shaft over multiple revolutions by utilizing a gear coupled, ASM-patented Multihall sensor array that applies a magnetic Nonius principle. POSIHALL® sensors are mounted directly onto the machine's rotation axis or onto ASM POSIWIRE®/ POSITAPE® sensors for measuring the rotations of the cable drum.

Applications

POSIHALL® multiturn-angle sensors are used for applications, where more than one revolution has to be measured. Their robust design makes POSIHALL® multiturn-angle sensors perfectly suited for outdoor applications with severe temperature fluctuations, high humidity and strong vibrations.

Mobile Working Machines

POSIHALL® angle sensors are used in rotating assemblies of mobile machines such as heavy-duty cranes, lifting platforms, asphalt pavers, railroad construction machines, harvesting and agricultural machines. They are highly resistant to dirt, dust, oil and water and service a high level of precision, reliability and a long service life, even under heavy load applications.

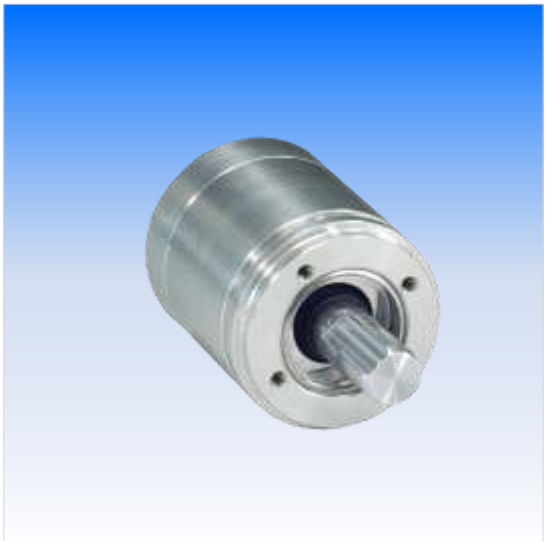
Outdoor Applications

Due to their sealed sensor housing POSIHALL® angle sensors are especially suited for use in outdoor applications such as wind power stations. POSIHALL® multiturn-angle sensors measure precisely and reliably the pitch adjustment of the rotor blades as well as the nacelle adjustment. The non-contact magnetic Multihall technology is able to reliably detect measuring data even if the machine housing is filled with water or oil – e.g. as a result of leaks in seals, bearings or other connecting devices to the surrounding system.

Selection guide			
	PH36	**PH58**	**PH68**
Measurement range	up to 31 x 360°	up to 255 x 360°	up to 255 x 360°
Redundant version optional	-	•	•
Analog outputs			
Voltage 0.5 ... 10 V	•	•	•
Voltage 0.5… 4.5V, U_B: 5V	•	•	•
Voltage 0.5… 4.5V, U_B: 8 … 36 V	•	•	•
Current 4 ... 20 mA	•	•	•
Digital outputs			
SSI	•	-	-
CANopen	•	•	•
CAN SAE J1939	•	•	•
Protection class			
Shaft	IP67	IP67	IP67
Housing	IP67/IP69 (IP69-with mating connector only)		

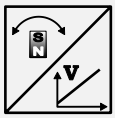
PH36

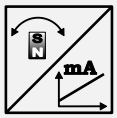
Analog output



Sensor features

- **Magnetic Multiturn Angle Sensor in a housing of 36 mm ∅**
- **Up to 31 revolutions**
- **With 6 mm or 10 mm shaft**
- **Protection class IP67/IP69**
- **Analog output**





Specifications

Output	Voltage 0.5 ... 4.5 V Voltage 0.5 ... 10 V Current 4 ... 20 mA, 3 wire
Measurement range	Up to 31 x 360° (31 revolutions)
Resolution	Up to 16 bit
Repeatability	0.1°
Linearity	±(2°+ 0.015% f.s.)
Protection class	IP67 shaft IP67/69 housing (with IP69 compatible connector)
Housing material	Aluminum (housing), stainless steel (shaft)
Mounting	Clamps, mounting plate
Connection	Connector M12 axial, 5 pin
Revolutions	10,000 r.p.m. max.
Allowable shaft load	20 N radial, 10 N axial
Bearing life expectancy	1.5 x 10^{10} rev. (4500 h per 6000 r.p.m)
Temperature range	-40 ... +85°C
Shock	DIN EN 60068-2-27:2010, 100 g/11 ms, 100 shocks
Vibration	DIN EN 60068-2-6:2008, 20 g 10 Hz-2 kHz, 10 cycles
Weight	approx. 120 g
EMC	DIN EN 61326-1:2013

Order code

PH36	–	1	–	2	–	3	–	4	–	5

1 Shaft

V01	= shaft 6 mm
V02	= shaft 10 mm

2 Measurement range (in revolutions)

1T	= 1 revolution
2T	= 2 revolutions
	up to
31T	= 31 revolutions

3 Output

U2	= Voltage 0.5 ... 10 V
U6	= Voltage 0.5 ... 4.5 V
U8	= Voltage 0.5 ... 4.5 V
I1	= Current 4 ... 20 mA, 3 wire

4 Signal characteristics

CW	= Signal increasing CW
CCW	= Signal increasing CCW

5 Connection

M12A5	= Connector M12 axial, 5 pin

Order example

PH36	–	V01	–	31T	–	I1	–	CW	–	M12A5

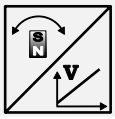
Accessories:

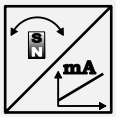
Connector cable (see page 48)

Analog output, programmable / tare function

Sensor features

- **Magnetic Multiturn Angle Sensor in a housing of 36 mm ∅**
- **Up to 31 revolutions**
- **With 6 mm or 10 mm shaft**
- **Protection class IP67/IP69**
- **Analog output, programmable / tare function**





Specifications

Output	Voltage 0.5 ... 4.5 V, programmable / tare function Voltage 0.5 ... 10 V, programmable / tare function Current 4 ... 20 mA, 3 wire, programmable / tare function
Measurement range	Up to 31 x 360° (31 revolutions)
Resolution	Up to 16 bit
Repeatability	0.1°
Linearity	±(2°+ 0.015% f.s.)
Protection class	IP67 shaft IP67/69 housing (with IP69 compatible connector)
Housing material	Aluminum (housing), stainless steel (shaft)
Mounting	Clamps, mounting plate
Connection	Connector M12 axial, 5 pin
Revolutions	10,000 r.p.m. max.
Allowable shaft load	20 N radial, 10 N axial
Bearing life expectancy	1.5 x 10^{10} rev. (4500 h per 6000 r.p.m)
Temperature range	-40 ... +85°C
Shock	DIN EN 60068-2-27:2010, 100 g/11 ms, 100 shocks
Vibration	DIN EN 60068-2-6:2008, 20 g 10 Hz-2 kHz, 10 cycles
Weight	approx. 120 g
EMC	DIN EN 61326-1:2013

Order code

PH36	–	1	–	2	–	3	–	4	–	5

1 Shaft

V01	= shaft 6 mm
V02	= shaft 10 mm

2 Measurement range (in revolutions)

1T	= 1 revolution
2T	= 2 revolutions
	up to
31T	= 31 revolutions

3 Output

U2/PMU	= Voltage 0.5 ... 10 V, programmable
U6/PMU	= Voltage 0.5 ... 4.5 V, programmable
U8/PMU	= Voltage 0.5 ... 4.5 V, programmable
I1/PMU	= Current 4 ... 20 mA, 3 wire, programmable
U2/PMZ	= Voltage 0.5 ... 10 V, tare function
U6/PMZ	= Voltage 0.5 ... 4.5 V, tare function
U8/PMZ	= Voltage 0.5 ... 4.5 V, tare function
I1/PMZ	= Current 4 ... 20 mA, 3 wire, tare function

4 Signal characteristics

CW	= Signal increasing CW
CCW	= Signal increasing CCW

5 Connection

M12A5	= Connector M12 axial, 5 pin

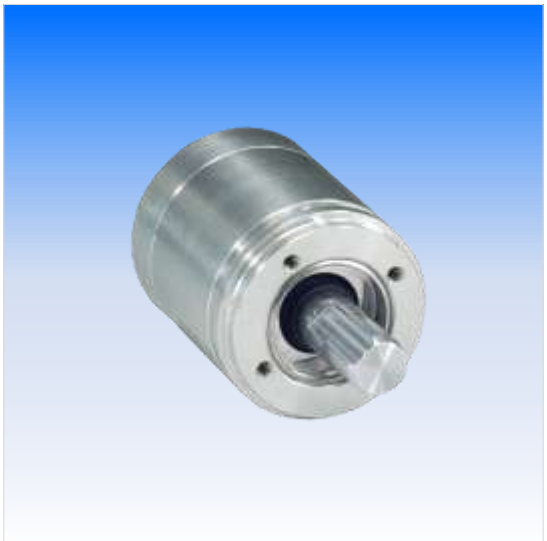
Order example

PH36	–	V01	–	31T	–	U2/PMU	–	CW	–	M12A5

Accessories:

Connector cable (see page 48)

Digital output SSI



Sensor features

- **Magnetic Multiturn Angle Sensor in a housing of 36 mm ∅**
- **31 revolutions**
- **With 6 mm or 10 mm shaft**
- **Protection class IP67/IP69**
- **Digital output SSI**

Specifications

Output	Synchronous serial SSI
Measurement range	31 x 360° (31 revolutions)
Resolution	Up to 16 bit
Repeatability	0.1°
Linearity	±(2°+ 0.015% f.s.)
Protection class	IP67 shaft IP67/69 housing (with IP69 compatible connector)
Housing material	Aluminum (housing), stainless steel (shaft)
Mounting	Clamps, mounting plate
Connection	Connector M12 axial, 8 pin
Revolutions	10,000 r.p.m. max.
Allowable shaft load	20 N radial, 10 N axial
Bearing life expectancy	1.5 x 10^{10} rev. (4500 h per 6000 r.p.m)
Temperature range	-40 ... +85°C
Shock	DIN EN 60068-2-27:2010, 100 g/11 ms, 100 shocks
Vibration	DIN EN 60068-2-6:2008, 20 g 10 Hz-2 kHz, 10 cycles
Weight	approx. 120 g
EMC	DIN EN 61326-1:2013

Order code

PH36	–	1	–	2	–	3	–	4	–	5

1 Shaft

V01	= shaft 6 mm
V02	= shaft 10 mm

2 Measurement range (in revolutions)

31T	= 31 revolutions

3 Output

MSSI/G/24	= synchronous serial, Gray-Code, 24 bit

4 Code characteristics

CW	= Signal increasing CW
CCW	= Signal increasing CCW

5 Connection

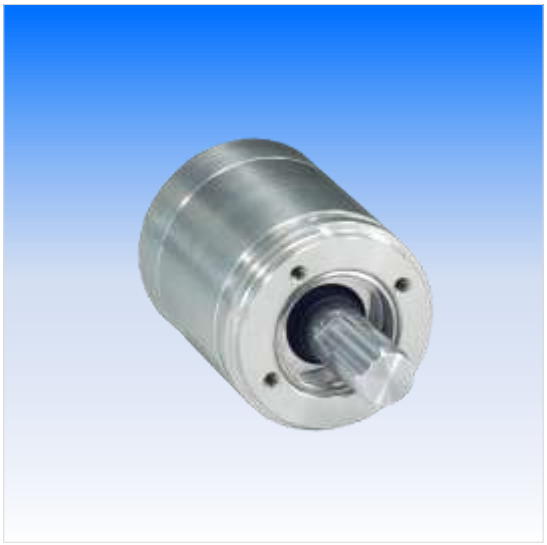
M12A8	= Connector M12 axial, 8 pin

Order example

PH36	–	V01	–	31T	–	MSSI/G/24	–	CW	–	M12A8>

Accessories:
Connector cable (see page 49)

Digital output CANopen



Sensor features

- **Magnetic Multiturn Angle Sensor in a housing of 36 mm ∅**
- **31 revolutions**
- **With 6 mm or 10 mm shaft**
- **Protection class IP67/IP69**
- **CANopen or CAN SAE J1939**

Specifications

Output	CANopen (CiA 301-V4.02/406-V3.2) CAN SAE J1939
Measurement range	31 x 360° (31 revolutions)
Resolution	Up to 16 bit
Repeatability	0.1°
Linearity	±1°
Protection class	IP67 shaft IP67/69 housing (with IP69 compatible connector)
Housing material	Aluminum (housing), stainless steel (shaft)
Mounting	Clamps, mounting plate
Connection	Connector M12 axial, 5 pin
Revolutions	10,000 r.p.m. max.
Allowable shaft load	20 N radial, 10 N axial
Bearing life expectancy	1.5 x 10^{10} rev. (4500 h per 6000 r.p.m)
Temperature range	-40 ... +85°C
Shock	DIN EN 60068-2-27:2010, 100 g/11 ms, 100 shocks
Vibration	DIN EN 60068-2-6:2008, 20 g 10 Hz-2 kHz, 10 cycles
Weight	approx. 120 g
EMC	DIN EN 61326-1:2013

Order code

PH36	–	1	–	2	–	3	–	4

1 Shaft

V01	= shaft 6 mm
V02	= shaft 10 mm

2 Measurement range (in revolutions)

31T	= 31 revolutions

3 Output

MCANOP	= CANopen
MCANJ1939	= CAN SAE J1939

4 Connection

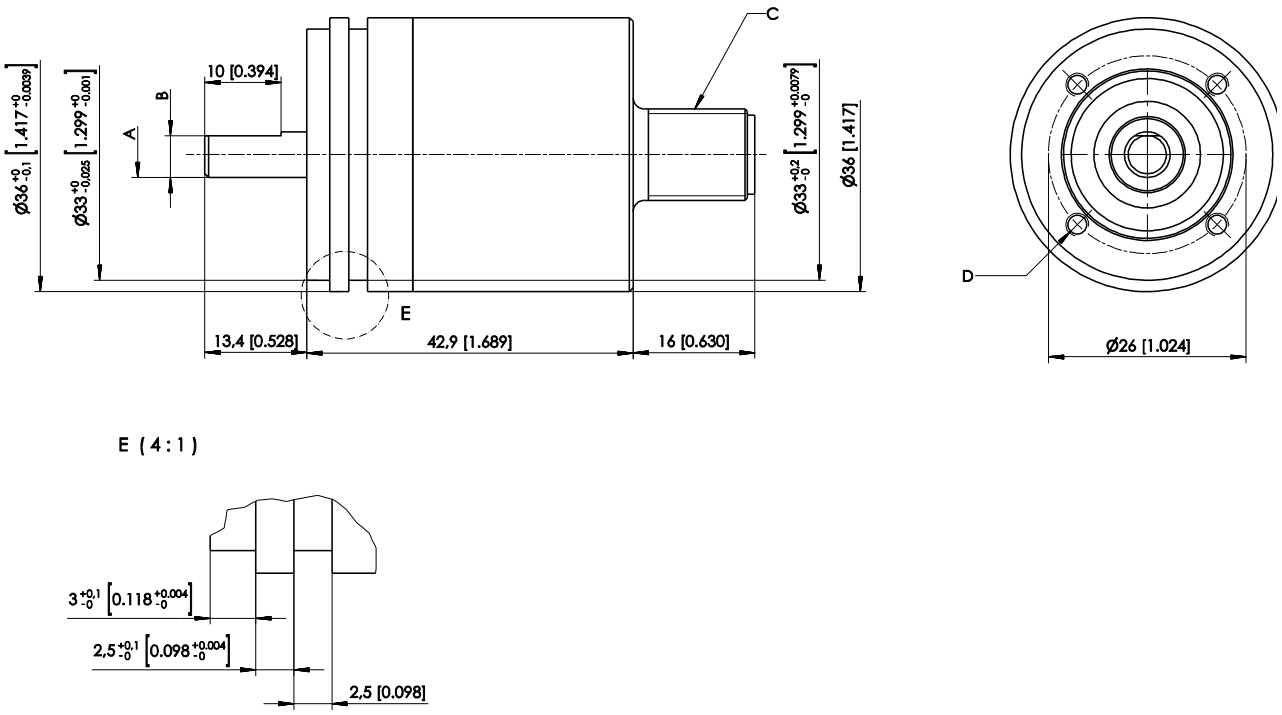
M12A5/CAN	= Connector M12 axial, 5 pin

Order example

PH36 – V01 – 31T – MCANOP – M12A5/CAN

Accessories:
Connector cable (see page 50)

Dimensions



C – Connector M12
D – 4 x M3 – 5 [0.197] deep

Dimensions in mm [inch].
Dimensions informative only.
For guaranteed dimensions consult factory.

Dimensions shaft

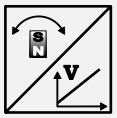
	V01	V02
Dim. A	Ø6f6 -0.01 -0.018 [0.236 -0.0004 -0.0007]	Ø10f6 -0.013 -0.022 [0.394 -0.0005 -0.0009]
Dim. B	5.5 [0.217]	9 [0.354]

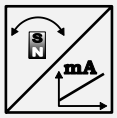
PH58

Analog output

Sensor features

- **Magnetic Multiturn Angle Sensor in a housing of 58 mm ∅**
- **Up to 255 revolutions**
- **Shaft diameter 6 mm, 10 mm or 12 mm**
- **Protection class IP67/IP69**
- **Analog output**





Specifications

Output	Voltage 0.5 ... 4.5 V Voltage 0.5 ... 10 V Current 4 ... 20 mA, 3 wire
Measurement range	Up to 255 x 360° (255 revolutions)
Resolution	Up to 16 bit
Repeatability	0.1°
Linearity	±(2°+ 0.015% f.s.)
Protection class	IP67 shaft IP67/69 housing (with IP69 compatible connector)
Housing material	Aluminum (housing), stainless steel (shaft)
Mounting	Clamps or screws
Connection	Connector M12 axial, 5 pin
Revolutions	10,000 r.p.m. max.
Allowable shaft load	80 N radial, 50 N axial
Bearing life expectancy	1 x 10^{10} rev. (2800 h per 6000 r.p.m)
Temperature range	-40 ... +85°C
Shock	DIN EN 60068-2-27:2010, 100 g/11 ms, 100 shocks
Vibration	DIN EN 60068-2-6:2008, 20 g 10 Hz-2 kHz, 10 cycles
Weight	approx. 400 g
EMC	DIN EN 61326-1:2013

Order code

PH58	–	1	–	2	–	3	–	4	–	5

1 Shaft

Shaft for clamping flange:

V20	= shaft 6 mm
V21	= shaft 10 mm
V22	= shaft 12 mm

Shaft for synchro flange:

V23	= shaft 6 mm
V24	= shaft 10 mm
V25	= shaft 12 mm

2 Measurement range (in revolutions)

1T	= 1 revolution
2T	= 2 revolutions
	up to
255T	= 255 revolutions

3 Output

U2	= Voltage 0.5 ... 10 V
U6	= Voltage 0.5 ... 4.5 V
U8	= Voltage 0.5 ... 4.5 V
I1	= Current 4 ... 20 mA, 3 wire

4 Signal characteristics

CW	= Signal increasing CW
CCW	= Signal increasing CCW

5 Connection

M12A5	= Connector M12 axial, 5 pin

Order example

PH58	–	V20	–	255T	–	I1	–	CW	–	M12A5

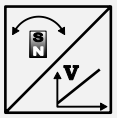
Accessories:

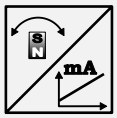
Connector cable (see page 48)

Analog output, programmable / tare function

Sensor features

- **Magnetic Multiturn Angle Sensor in a housing of 58 mm ∅**
- **Up to 255 revolutions**
- **Shaft diameter 6 mm, 10 mm or 12 mm**
- **Protection class IP67/IP69**
- **Analog output, programmable / tare function**





Specifications

Output	Voltage 0.5 ... 4.5 V, programmable / tare function Voltage 0.5 ... 10 V, programmable / tare function Current 4 ... 20 mA, 3 wire, programmable / tare function
Measurement range	Up to 255 x 360° (255 revolutions)
Resolution	Up to 16 bit
Repeatability	0.1°
Linearity	±(2°+ 0.015% f.s.)
Protection class	IP67 shaft IP67/69 housing (with IP69 compatible connector)
Housing material	Aluminum (housing), stainless steel (shaft)
Mounting	Clamps or screws
Connection	Connector M12 axial, 5 pin
Revolutions per minute	10,000 r.p.m. max.
Allowable shaft load	80 N radial, 50 N axial
Bearing life expectancy	1 x 10^{10} rev. (2800 h per 6000 r.p.m)
Temperature range	-40 ... +85°C
Shock	DIN EN 60068-2-27:2010, 100 g/11 ms, 100 shocks
Vibration	DIN EN 60068-2-6:2008, 20 g 10 Hz-2 kHz, 10 cycles
Weight	approx. 400 g
EMC	DIN EN 61326-1:2013

Order code

PH58	–	1	–	2	–	3	–	4	–	5

1 Shaft

Shaft for clamping flange:

V20	= shaft 6 mm
V21	= shaft 10 mm
V22	= shaft 12 mm

Shaft for synchro flange:

V23	= shaft 6 mm
V24	= shaft 10 mm
V25	= shaft 12 mm

2 Measurement range (in revolutions)

1T	= 1 revolution
2T	= 2 revolutions
	up to
255T	= 255 revolutions

3 Output

U2/PMU	= Voltage 0.5 ... 10 V, programmable
U6/PMU	= Voltage 0.5 ... 4.5 V, programmable
U8/PMU	= Voltage 0.5 ... 4.5 V, programmable
I1/PMU	= Current 4 ... 20 mA, 3 wire, programmable
U2/PMZ	= Voltage 0.5 ... 10 V, tare function
U6/PMZ	= Voltage 0.5 ... 4.5 V, tare function
U8/PMZ	= Voltage 0.5 ... 4.5 V, tare function
I1/PMZ	= Current 4 ... 20 mA, 3 wire, tare function

4 Signal characteristics

CW	= Signal increasing CW
CCW	= Signal increasing CCW

5 Connection

M12A5	= Connector M12 axial, 5 pin

Order example

PH58	–	V20	–	255T	–	U2/PMU	–	CW	–	M12A5

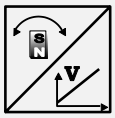
Accessories:

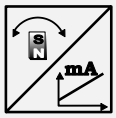
Connector cable (see page 48)

Analog output, redundant

Sensor features

- **Magnetic Multiturn Angle Sensor in a housing of 58 mm ∅**
- **Up to 255 revolutions**
- **Shaft diameter 6 mm, 10 mm or 12 mm**
- **Protection class IP67/IP69**
- **Analog output, redundant**





Specifications

Output	Voltage 0.5 ... 10 V, two channels, redundant Voltage 0.5 ... 4.5 V two channels, redundant Current 4 ... 20 mA, 3 wire, redundant
Measurement range	Up to 255 x 360° (255 revolutions)
Resolution	Up to 16 bit
Repeatability	0.1°
Linearity	±(2°+ 0.015% f.s.)
Protection class	IP67 shaft IP67/69 housing (with IP69 compatible connector)
Housing material	Aluminum (housing), stainless steel (shaft)
Mounting	Clamps or screws
Connection	Connector M12 axial, 8 pin
Revolutions per minute	10,000 r.p.m. max.
Allowable shaft load	80 N radial, 50 N axial
Bearing life expectancy	1 x 10^{10} rev. (2800 h per 6000 r.p.m)
Temperature range	-40 ... +85°C
Shock	DIN EN 60068-2-27:2010, 100 g/11 ms, 100 shocks
Vibration	DIN EN 60068-2-6:2008, 20 g 10 Hz-2 kHz, 10 cycles
Weight	approx. 400 g
EMC	DIN EN 61326-1:2013

Order code

PH58	–	1	–	2	–	3	–	4	–	5

1 Shaft

Shaft for clamping flange:

V20	= shaft 6 mm
V21	= shaft 10 mm
V22	= shaft 12 mm

Shaft for synchro flange:

V23	= shaft 6 mm
V24	= shaft 10 mm
V25	= shaft 12 mm

2 Measurement range (in revolutions)

1T	= 1 revolution
2T	= 2 revolutions
	up to
255T	= 255 revolutions

3 Output

U2R	= Voltage 0.5 ... 10 V, two channels, redundant
U6R	= Voltage 0.5 ... 4.5 V two channels, redundant
U8R	= Voltage 0.5 ... 4.5 V two channels, redundant
I1R	= Current 4 ... 20 mA, 3 wire, two channels, redundant

4 Signal characteristics

CW/CW	= Signal 1 increasing CW / signal 2 increasing CW
CW/CCW	= Signal 1 increasing CCW/ / signal 2 increasing CCW
CCW/CCW	= Signal 1 increasing CCW / signal 2 increasing CCW

5 Connection

M12A8	= Connector M12 axial, 8 pin

Order example

PH58	–	V20	–	255T	–	I1R	–	M12A8

Accessories:

Connector cable (see page 49)

Digital output CANopen

Sensor features

- **Magnetic Multiturn Angle Sensor in a housing of 58 mm Ør**
- **255 revolutions**
- **Shaft diameter 6 mm, 10 mm or 12 mm**
- **Protection class IP67/IP69**
- **CANopen or CAN SAE J1939**
- **Redundant version with 1 connector**

Specifications

Output	CANopen (CiA 301-V4.02/406-V3.2) CAN SAE J1939
Measurement range	255 x 360° (255 revolutions)
Resolution	Up to 16 bit
Repeatability	0.1°
Linearity	±1°
Protection class	IP67 shaft IP67/69 housing (with IP69 compatible connector)
Housing material	Aluminum (housing), stainless steel (shaft)
Mounting	Clamps or screws
Connection	Connector M12 axial, 5 pin
Revolutions	10,000 r.p.m. max.
Allowable shaft load	80 N radial, 50 N axial
Bearing life expectancy	1 x 10^{10} rev. (2800 h per 6000 r.p.m)
Temperature range	-40 ... +85°C
Shock	DIN EN 60068-2-27:2010, 100 g/11 ms, 100 shocks
Vibration	DIN EN 60068-2-6:2008, 20 g 10 Hz-2 kHz, 10 cycles
Weight	approx. 400 g
EMC	DIN EN 61326-1:2013

Order code

PH58	–	1	–	2	–	3	–	4

1 Shaft

Shaft for clamping flange:

V20	= shaft 6 mm
V21	= shaft 10 mm
V22	= shaft 12 mm

Shaft for synchro flange:

V23	= shaft 6 mm
V24	= shaft 10 mm
V25	= shaft 12 mm

2 Measurement range (in revolutions)

255T	= 255 revolutions

3 Output

MCANOP	= CANopen
MCANOPR	= CANopen, redundant
MCANJ1939	= CAN SAE J1939
MCANJ1939R	= CAN SAE J1939, redundant

4 Connection

M12A5/CAN	= 5-pin socket M12 axial

Order example

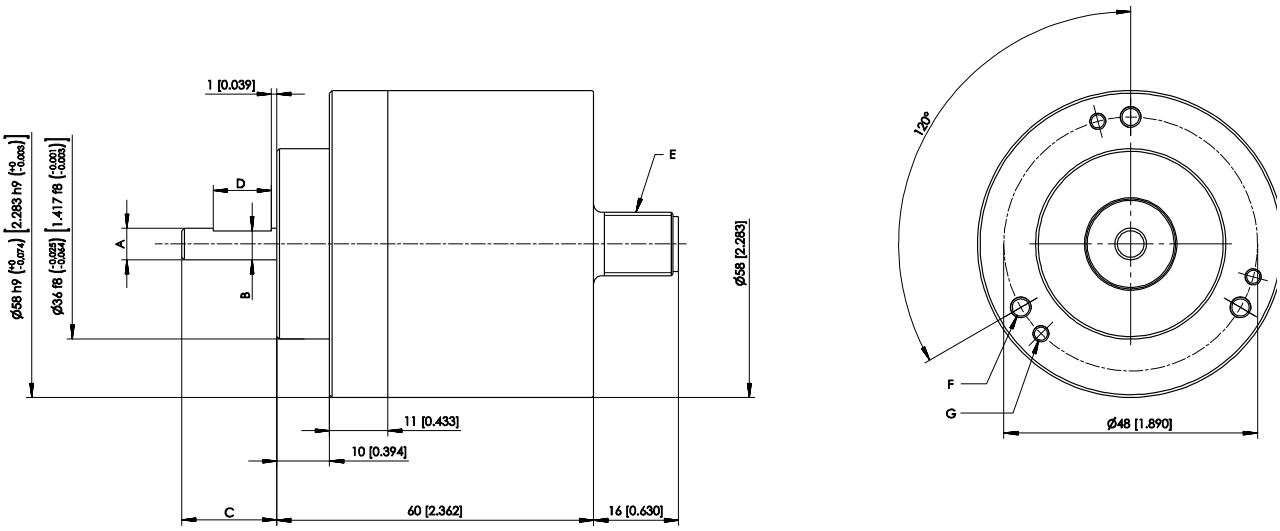
PH58 – V20 – 255T – MCANOP – M12A5/CAN

Accessories:

Connector cable (see page 50)

Dimensions

Clamping flange



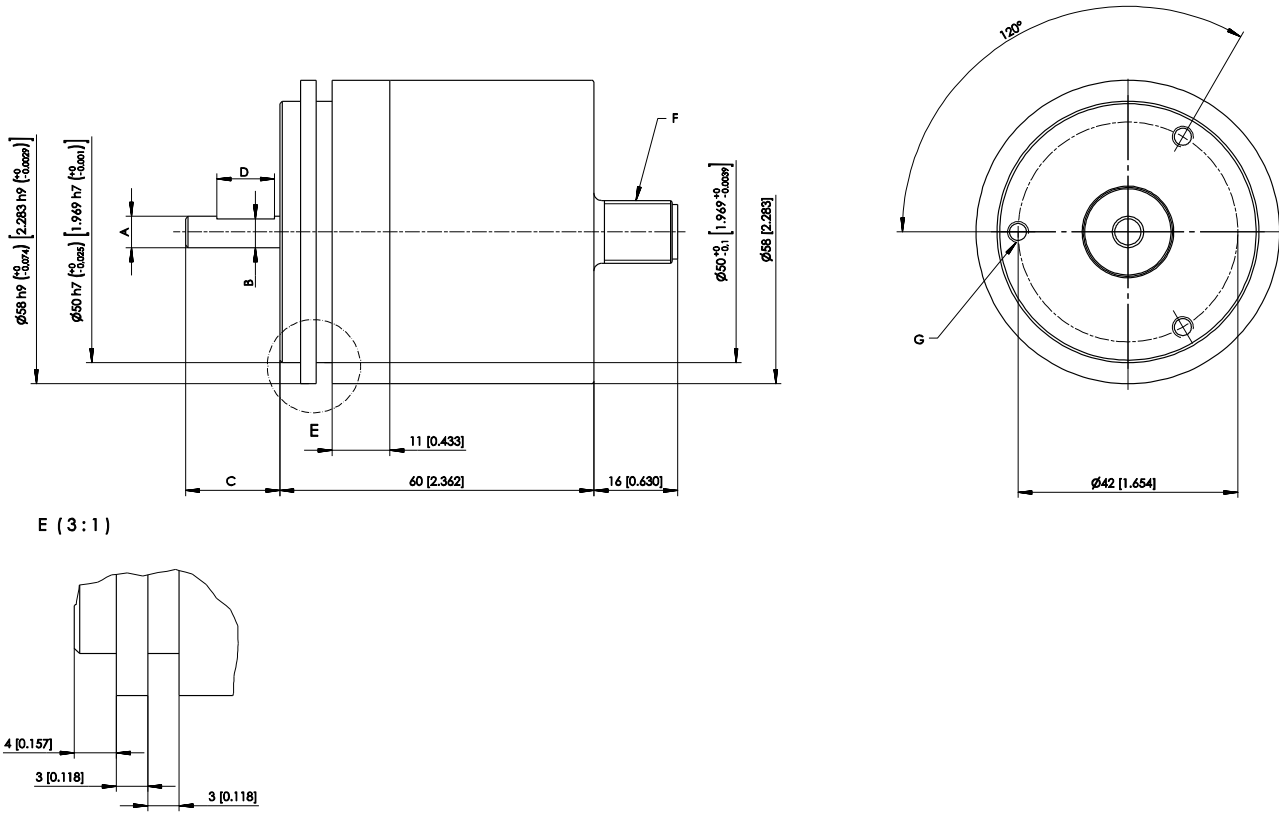
E – Connector M12
F – 3 x M4 – 6 [0.236] deep
G – 3 x M3 – 6 [0.236] deep

Dimensions in mm [inch].
Dimensions informative only.
For guaranteed dimensions consult factory.

Shaft dimensions for clamping flange

Dim.	V20	V21	V22
A	Ø6g7 -0.004 -0.016 [0.236 -0.0002 -0.0006]	Ø10g7 -0.005 -0.02 [0.394 -0.0002] -0.0008]]	Ø12g7 -0.006 -0.024 [0.472 -0.0002 -0.0009]
B	5.5 [0.217]	9 [0.354]	11 [0.433]
C	18 [0.709]	20 [0.787]	20 [0.787]
D	11 [0.433]	15 [0.591]	15 [0.591]

Synchro flange



F – Connector M12
G – 3 x M4 – 6 [0.236] deep

Dimensions in mm [inch].
Dimensions informative only.
For guaranteed dimensions consult factory.

Shaft dimensions for synchro flange

Dim.	V23	V24	V25
A	Ø6g7 -0.004 -0.016 [0.236 -0.0002 -0.0006]	Ø10g7 -0.005 -0.02 [0.394 -0.0002] -0.0008]]	Ø12g7 -0.006 -0.024 [0.472 -0.0002 -0.0009]
B	5.5 [0.217]	9 [0.354]	11 [0.433]
C	18 [0.709]	20 [0.787]	20 [0.787]
D	11 [0.433]	15 [0.591]	15 [0.591]

PH68

Analog output

Sensor features

- **Magnetic Multiturn Angle Sensor in a housing of 68 mm ∅**
- **Up to 255 revolutions**
- **Shaft diameter 10 mm**
- **Protection class IP67/IP69**
- **Analog output**

Specifications

Output	Voltage 0.5 ... 4.5 V Voltage 0.5 ... 10 V Current 4 ... 20 mA, 3 wire
Measurement range	Up to 255 x 360° (255 revolutions)
Resolution	Up to 16 bit
Repeatability	0.1°
Linearity	±(2°+ 0.015% f.s.)
Protection class	IP67 shaft IP67/69 housing (with IP69 compatible connector)
Housing material	Aluminum (housing), stainless steel (shaft)
Mounting	Clamps or screws
Connection	Connector M12 axial, 5 pin
Revolutions	10,000 r.p.m.
Allowable shaft load	70 N radial, 50 N axial
Bearing life expectancy	1.1 x 10^{10} rev. (3000 h per 6000 r.p.m)
Temperature range	-40 ... +85°C
Shock	DIN EN 60068-2-27:2010, 100 g/11 ms, 100 shocks
Vibration	EN 60068-2-6:2008, 20 g 10 Hz-2 kHz, 10 cycles
Weight	approx. 450 g
EMC	DIN EN 61326-1:2013

Order code

PH68	–	1	–	2	–	3	–	4	–	5

1 Shaft

V61	= shaft 10 mm

2 Measurement range (in revolutions)

1T	= 1 revolution
2T	= 2 revolutions
	up to
255T	= 255 revolutions

3 Output

U2	= Voltage 0.5 ... 10 V
U6	= Voltage 0.5 ... 4.5 V
U8	= Voltage 0.5 ... 4.5 V
I1	= Current 4 ... 20 mA, 3 wire

4 Signal characteristics

CW	= Signal increasing CW
CCW	= Signal increasing CCW

5 Connection

M12A5	= Connector M12 axial, 5 pin

Order example

PH68	–	V61	–	255T	–	I1	–	CW	–	M12A5

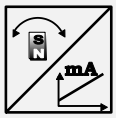
Accessories:

Connector cable (see page 48)

Analog output, programmable / tare function

Sensor features

- **Magnetic Multiturn Angle Sensor in a housing of 68 mm ∅**
- **Up to 255 revolutions**
- **Shaft diameter 10 mm**
- **Protection class IP67/IP69**
- **Analog output, programmable / tare function**



Specifications

Output	Voltage 0.5 ... 4.5 V, programmable / tare function Voltage 0.5 ... 10 V, programmable / tare function Current 4 ... 20 mA, 3 wire, programmable / tare function
Measurement range	Up to 255 x 360° (255 revolutions)
Resolution	Up to 16 bit
Repeatability	0.1°
Linearity	±(2°+ 0.015% f.s.)
Protection class	IP67 shaft IP67/69 housing (with IP69 compatible connector)
Housing material	Aluminum (housing), stainless steel (shaft)
Mounting	Clamps or screws
Connection	Connector M12 axial, 5 pin
Revolutions per minute	10,000 r.p.m.
Allowable shaft load	70 N radial, 50 N axial
Bearing life expectancy	1.1 x 10^{10} rev. (3000 h per 6000 r.p.m)
Temperature range	-40 ... +85°C
Shock	DIN EN 60068-2-27:2010, 100 g/11 ms, 100 shocks
Vibration	EN 60068-2-6:2008, 20 g 10 Hz-2 kHz, 10 cycles
Weight	approx. 450 g
EMC	DIN EN 61326-1:2013

Order code

PH68	–	1	–	2	–	3	–	4	–	5

1 Shaft

V61	= shaft 10 mm

2 Measurement range (in revolutions)

1T	= 1 revolution
2T	= 2 revolutions
	up to
255T	= 255 revolutions

3 Output

U2/PMU	= Voltage 0.5 ... 10 V, programmable
U6/PMU	= Voltage 0.5 ... 4.5 V, programmable
U8/PMU	= Voltage 0.5 ... 4.5 V, programmable
I1/PMU	= Current 4 ... 20 mA, 3 wire, programmable
U2/PMZ	= Voltage 0.5 ... 10 V, tare function
U6/PMZ	= Voltage 0.5 ... 4.5 V, tare function
U8/PMZ	= Voltage 0.5 ... 4.5 V, tare function
I1/PMZ	= Current 4 ... 20 mA, 3 wire, tare function

4 Signal characteristics

CW	= Signal increasing CW
CCW	= Signal increasing CCW

5 Connection

M12A5	= Connector M12 axial, 5 pin

Order example

PH68	–	V61	–	255T	–	U2/PMU	–	CW	–	M12A5

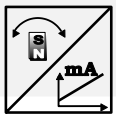
Accessories:

Connector cable (see page 48)

Analog output, redundant

Sensor features

- **Magnetic Multiturn Angle Sensor in a housing of 68 mm ∅**
- **Up to 255 revolutions**
- **Shaft diameter 10 mm**
- **Protection class IP67/IP69**
- **Analog output, redundant**
- **Two independent channels with two connectors**



Specifications

Output	Voltage 0.5 ... 10 V, two channels, redundant Voltage 0.5 ... 4.5 V two channels, redundant Current 4 ... 20 mA, 3 wire, redundant
Measurement range	Up to 255 x 360° (255 revolutions)
Resolution	Up to 16 bit
Repeatability	0.1°
Linearity	±(2°+ 0.015% f.s.)
Protection class	IP67 shaft IP67/69 housing (with IP69 compatible connector)
Housing material	Aluminum (housing), stainless steel (shaft)
Mounting	Clamps or screws
Connection	2 x connector M12 axial, 5 pin
Revolutions per minute	10,000 r.p.m.
Allowable shaft load	70 N radial, 50 N axial
Bearing life expectancy	1.1 x 10^{10} rev. (3000 h per 6000 r.p.m)
Temperature range	-40 ... +85°C
Shock	DIN EN 60068-2-27:2010, 100 g/11 ms, 100 shocks
Vibration	EN 60068-2-6:2008, 20 g 10 Hz-2 kHz, 10 cycles
Weight	approx. 450 g
EMC	DIN EN 61326-1:2013

Order code

PH68R	–	1	–	2	–	3	–	4	–	5

1 Shaft

V61	= shaft 10 mm

2 Measurement range (in revolutions)

1T	= 1 revolution
2T	= 2 revolutions
	up to
255T	= 255 revolutions

3 Output

U2R	= Voltage 0.5 ... 10 V, redundant
U6R	= Voltage 0.5 ... 4.5 V, redundant
U8R	= Voltage 0.5 ... 4.5 V, redundant
I1R	= Current 4 ... 20 mA, 3 wire, redundant

4 Signal characteristics

CW/CW	= Signal 1 increasing CW / signal 2 increasing CW
CW/CCW	= Signal 1 increasing CCW/ / signal 2 increasing CCW
CCW/CCW	= Signal 1 increasing CCW / signal 2 increasing CCW

5 Connection

2M12A5	= 2x connector M12 axial, 5 pin

Order example

PH68R	–	V61	–	255T	–	I1R	–	CW/CCW	–	2M12A5

Accessories:

Connector cable (see page 48)

Digital output CANopen

Sensor features

- **Magnetic Multiturn Angle Sensor in a housing of 68 mm ∅**
- **255 revolutions**
- **Shaft diameter 10 mm**
- **Protection class IP67/IP69**
- **CANopen or CAN SAE J1939**

Specifications

Output	CANopen (CiA 301-V4.02/406-V3.2) CAN SAE J1939
Measurement range	255 x 360° (255 revolutions)
Resolution	Up to 16 bit
Repeatability	0.1°
Linearity	±1°
Protection class	IP67 shaft IP67/69 housing (with IP69 compatible connector)
Housing material	Aluminum (housing), stainless steel (shaft)
Mounting	Clamps or screws
Connection	Connector M12 axial, 5 pin
Revolutions	10,000 r.p.m.
Allowable shaft load	70 N radial, 50 N axial
Bearing life expectancy	1.1 x 10^{10} rev. (3000 h per 6000 r.p.m)
Temperature range	-40 ... +85°C
Shock	DIN EN 60068-2-27:2010, 100 g/11 ms, 100 shocks
Vibration	EN 60068-2-6:2008, 20 g 10 Hz-2 kHz, 10 cycles
Weight	approx. 450 g
EMC	DIN EN 61326-1:2013

Order code

PH68	–	1	–	2	–	3	–	4

1 Shaft

V61	= shaft 10 mm

2 Measurement range (in revolutions)

255T	= 255 revolutions

3 Output

MCANOP	= CANopen
MCANOPR	= CANopen, redundant
MCANJ1939	= CAN SAE J1939
MCANJ1939R	= CAN SAE J1939, redundant

4 Connection

M12A5/CAN	= Connector M12 axial, 5 pin

Order example

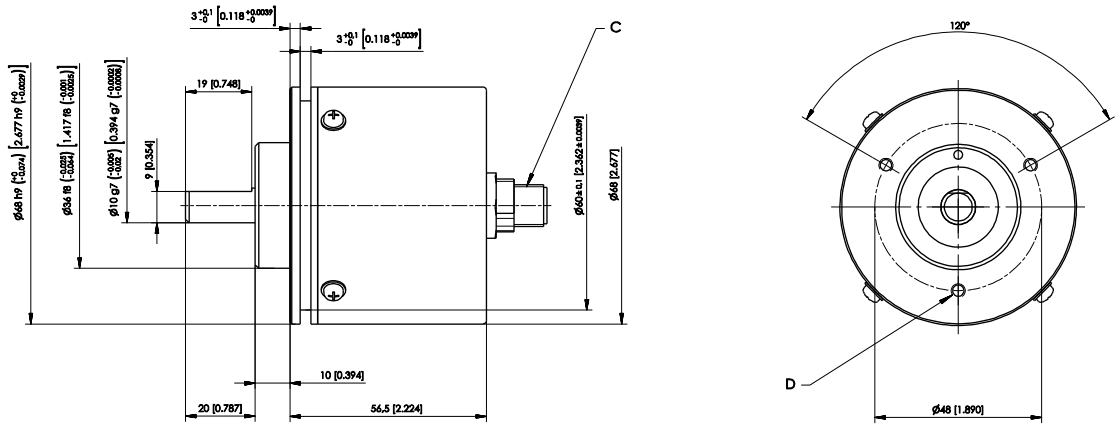
PH68 – V61 – 255T – MCANOP – M12A5/CAN

Accessories:

Connector cable (see page 50)

Dimensions

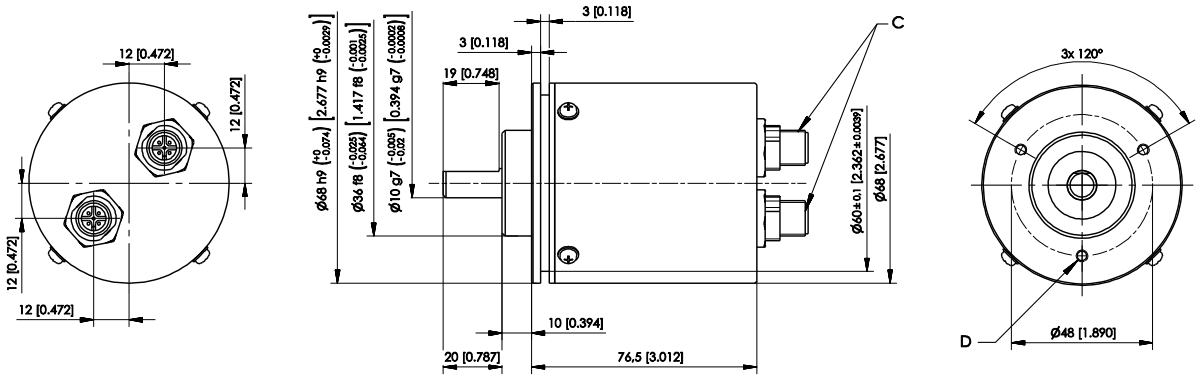
PH68, connector M12 axial



C – Connector M12
D – M4 – 7 [0.276] deep

Dimensions in mm [inch].
Dimensions informative only.
For guaranteed dimensions consult factory.

PH68R, connector M12 axial (2x)

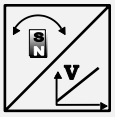
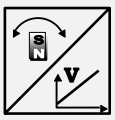
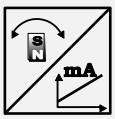


C – Connector M12
D – M4 – 7 [0.276] deep

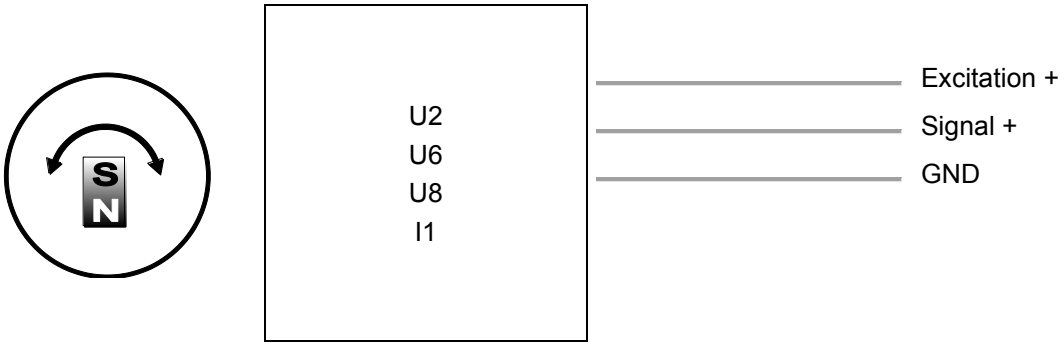
Dimensions in mm [inch].
Dimensions informative only.
For guaranteed dimensions consult factory.

Output specification

Analog output

U2 Voltage output 0.5 ... 10 V 	Excitation voltage	8 … 36 V DC
	Excitation current	20 mA typical at 24 V DC 38 mA typical at 12 V DC max. 50 mA
	Output voltage	0.5 ... 10 V DC
	Output current	2 mA max.
	Measuring rate	1 kHz standard
	Stability (temperature)	±50 x 10^{-6} / °C f.s. (typical)
	Protection	Reverse polarity, short circuit
	Operating temperature	See specification of the respective sensor
	EMC	DIN EN 61326-1:2013
U6 Voltage output 0.5 … 4.5 V 	Excitation voltage	5 V DC ±5%
	Excitation current	typical 140 mA max.
	Output voltage	0.5 … 4.5 V DC
	Output current	2 mA max.
	Measuring rate	1 kHz standard
	Stability (temperature)	±50 x 10^{-6} / °C f.s. (typical)
	Protection	Reverse polarity, short circuit
	Operating temperature	See specification of the respective sensor
	EMC	DIN EN 61326-1:2013
U8 Voltage output 0.5 … 4.5 V 	Excitation voltage	8 … 36 V DC
	Excitation current	17 mA typical at 24 V DC 32 mA typical at 12 V DC 50 mA max.
	Output voltage	0.5 … 4.5 V DC
	Output current	2 mA max.
	Measuring rate	1 kHz standard
	Stability (temperature)	±50 x 10^{-6} / °C f.s. (typical)
	Protection	Reverse polarity, short circuit
	Operating temperature	See specification of the respective sensor
	EMC	DIN EN 61326-1:2013
I1 Current output 4 … 20 mA, 3 wires 	Excitation voltage	8 … 36 V DC
	Excitation current	typical 36 mA at 24 V DC typical 70 mA at 12 V DC 120 mA max.
	Load R_L	500 Ω max.
	Output current	4 … 20 mA
	Measuring rate	1 kHz standard
	Stability (temperature)	±50 x 10^{-6} / °C f.s. (typical)
	Protection	Reverse polarity, short circuit
	Operating temperature	See specification of the respective sensor
	EMC	DIN EN 61326-1:2013

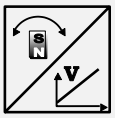
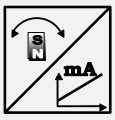
Signal diagram



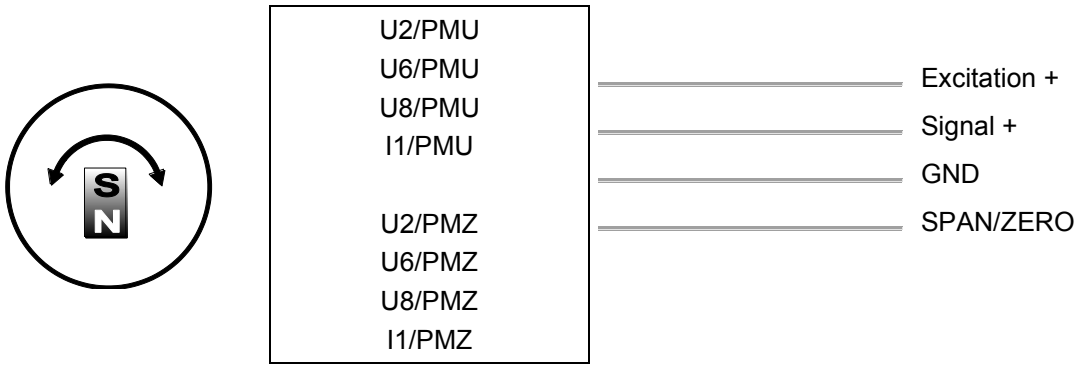
Signal wiring

Signal	Connector pin no.	Cable connection	View to the sensor connector
Excitation +	1	brown	
Signal	2	white	
GND	3	blue	
Do not connect!	4	black	
Do not connect!	5	(grey)	

Analog output, programmable / tare function

U2/PMU programmable **U2/PMZ tare function** Voltage output 0.5 ... 10 V 	Excitation voltage	8 … 36 V DC
	Excitation current	20 mA typical at 24 V DC 38 mA typical at 12 V DC max. 50 mA
	Output voltage	0,5 ... 10 V DC
	Output current	2 mA max.
	Measuring rate	1 kHz standard
	Stability (temperature)	±50 x 10^{-6} / °C f.s. (typical)
	Protection	Reverse polarity, short circuit
	Operating temperature	See specification of the respective sensor
	EMC	DIN EN 61326-1:2013
U6/PMU programmable **U6/PMZ tare function** Voltage output 0.5 … 4.5 V 	Excitation voltage	5 V DC ±5%
	Excitation current	typical 140 mA
	Output voltage	0.5 … 4.5 V DC
	Output current	2 mA max.
	Measuring rate	1 kHz standard
	Stability (temperature)	±50 x 10^{-6} / °C f.s. (typical)
	Protection	Reverse polarity, short circuit
	Operating temperature	See specification of the respective sensor
	EMC	DIN EN 61326-1:2013
U8/PMU programmable **U8/PMZ tare function** Voltage output 0.5 … 4.5 V 	Excitation voltage	8 … 36 V DC
	Excitation current	17 mA typical at 24 V DC 32 mA typical at 12 V DC max. 50 mA
	Output voltage	0.5 … 4.5 V DC
	Output current	2 mA max.
	Measuring rate	1 kHz standard
	Stabilität (Temperatur)	±50 x 10^{-6} / °C f.s. (typical)
	Protection	Reverse polarity, short circuit
	Operating temperature	See specification of the respective sensor
	EMC	DIN EN 61326-1:2013
I1/PMU programmable **I1/PMZ tare function** Current output 4 … 20 mA, 3 wire 	Excitation voltage	8 … 36 V DC
	Excitation current	typical 36 mA at 24 V DC typical 70 mA at 12 V DC max. 120 mA
	Load R_L	500 Ω max.
	Output current	4 … 20 mA
	Measuring rate	1 kHz standard
	Stability (temperature)	±50 x 10^{-6} / °C f.s. (typical)
	Protection	Reverse polarity, short circuit
	Operating temperature	See specification of the respective sensor
	EMC	DIN EN 61326-1:2013

Signal diagram



Signal wiring

Signal	Connector pin no.	Cable color	View to sensor connector
Excitation +	1	brown	
Signal	2	white	
GND	3	blue	
Do not connect!	4	black	
SPAN/ZERO	5	grey	

Option -PMU

Programming of the start and end value by the customer (programmable)

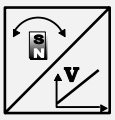
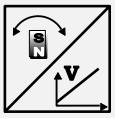
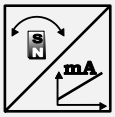
Teach-In of start and end value for the options U2/PMU, I1/PMU, U8/PMU is provided by a binary signal SPAN/ZERO. At the start position connect signal SPAN/ZERO for a period of 2 … 3 seconds to GND via push button. At the end position connect signal SPAN/ZERO for a period of 5 … 6 seconds to GND via a push button. The scaling teached will be stored non-volatile.
To reset the sensor to factory default ZERO/END must be connected to ground while powering up the sensor for 2 … 3 seconds.

Option -PMZ

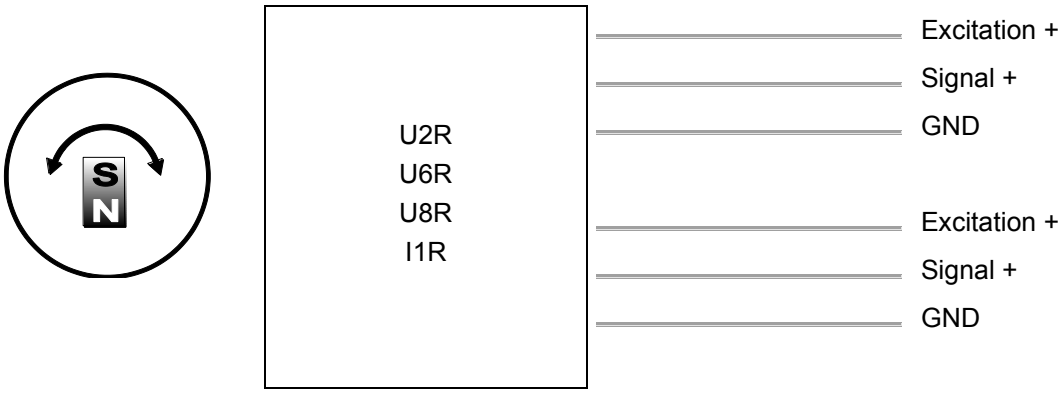
Programming of the start value by the customer (tare function)

Programming of the start value for the outputs U2/U8 and I1 is provided by a programming signal ZERO available at the connector. Connect the signal ZERO with GND via a push button. Pushing the button between 1 and 4 seconds sets the current position as start position. To reset the sensor to the factory values the button must be pushed when the sensor is switched on.

Analog output, redundant

U2R Voltage output 0.5 ... 10 V 	Excitation voltage	8 … 36 V DC
	Excitation current	20 mA typical at 24 V DC 38 mA typical at 12 V DC max. 50 mA per channel
	Output voltage	0.5 ... 10 V DC
	Output current	2 mA max.
	Measuring rate	1 kHz standard
	Stability (temperature)	±50 x 10^{-6} / °C f.s. (typical)
	Protection	Reverse polarity, short circuit
	Operating temperature	See specification of the respective sensor
	EMC	DIN EN 61326-1:2013
U6R Voltage output 0.5 … 4.5 V 	Excitation voltage	5 V DC ±5%
	Excitation current	typical 140 mA per channel
	Output voltage	0.5 … 4.5 V DC
	Output current	2 mA max.
	Measuring rate	1 kHz standard
	Stability (temperature)	±50 x 10^{-6} / °C f.s. (typical)
	Protection	Reverse polarity, short circuit
	Operating temperature	See specification of the respective sensor
	EMC	DIN EN 61326-1:2013
U8R Voltage output 0.5 … 4.5 V 	Excitation voltage	8 … 36 V DC
	Excitation current	17 mA typical at 24 V DC 32 mA typical at 12 V DC max. 50 mA per channel
	Output voltage	0.5 … 4.5 V DC
	Output current	2 mA max.
	Measuring rate	1 kHz standard
	Stability (temperature)	±50 x 10^{-6} / °C f.s. (typical)
	Protection	Reverse polarity, short circuit
	Operating temperature	See specification of the respective sensor
	EMC	DIN EN 61326-1:2013
I1R Current output 4 … 20 mA, 3 wires 	Excitation voltage	8 … 36 V DC
	Excitation current	36 mA typical at 24 V DC 76 mA typical at 12 V DC max. 120 mA per channel
	Load R_L	500 Ω max.
	Output current	4 … 20 mA
	Measuring rate	1 kHz standard
	Stability (temperature)	±50 x 10^{-6} / °C f.s. (typical)
	Protection	Reverse polarity, short circuit
	Operating temperature	See specification of the respective sensor
	EMC	DIN EN 61326-1:2013

Signal diagram



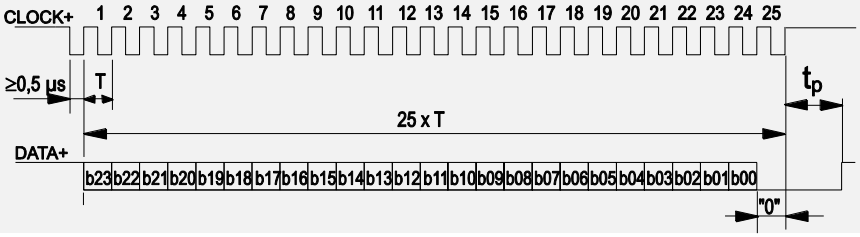
Signal wiring

Channel	Signal	Connector pin no.	Cable color	View to the sensor connector
1	Excitation +	1	white	
1	Signal	2	brown	
1	GND	3	green	
1	Do not connect!	4	yellow	
2	Excitation +	5	grey	
2	Signal	6	pink	
2	GND	7	blue	
2	Do not connect!	8	red	

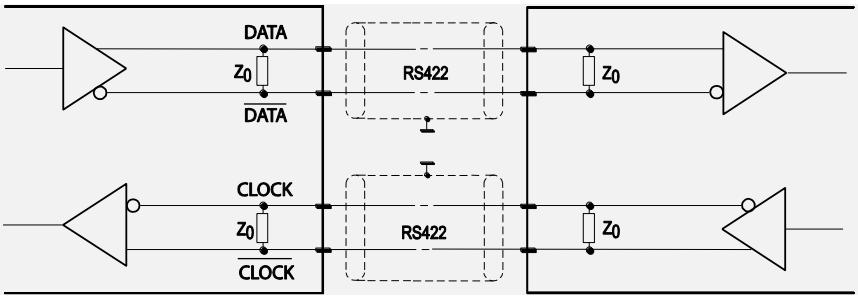
Digital output SSI

MSSI Synchronous serial SSI	Interface	EIA RS-422
	Excitation voltage	8 ... 36 V DC
	Excitation current	19 mA typical at 24 V DC 35 mA typical at 12 V DC max. 80 mA
	Clock frequency	100 kHz ... 500 kHz
	Code	Gray-Code, continuous progression
	Delay between pulse trains (t_p)	30 µs min.
	Stability (temperature)	±50 x 10^{-6} / °C f.s. (typical)
	Operating temperature	See specification of the respective sensor
	Protection	Reverse polarity, short circuit
	EMC	DIN EN 61326-1:2013

Data format
(Train of 26 pulses)



Recommended processing circuit



Transmission rate	Cable length	Baud rate
	50 m	100-400 kHz
	100 m	100-300 kHz

Note:
Extension of the cable length will reduce the maximum transmission rate.

Signal wiring

Signal	Connector pin no.	Cable color	View to sensor connector
Excitation +	1	white	
Excitation GND	2	brown	
CLOCK	3	green	
$\overline{\text{CLOCK}}$	4	yellow	
DATA	5	grey	
$\overline{\text{DATA}}$	6	pink	
-	7	blue	
-	8	red	

Digital output CANopen

CANOP CANopen	CAN Specification	ISO 11898, Basic and Full CAN 2.0 B
	Communication profile	CANopen CiA 301 V 4.02, Slave
	Device profile	Encoder CiA 406 V 3.2
	Configuration services	Layer Setting Service (LSS), CiA Draft Standard 305 (transmission rate, node id)
	Error Control	Node Guarding, Heartbeat, Emergency Message
	Node ID	Default: 127; programmable via LSS or SDO
	PDO	3 TxPDO, 0 RxPDO, static mapping
	PDO Modes	Event-/Time triggered, Remote-request, Sync cyclic/acyclic
	SDO	1 server, 0 Client
	CAM	8 cams
	Certified	Yes
	Transmission rates	50 kBaud to 1 MBaud, default: 125 kBaud; programmable via LSS or SDO
	Bus connection	M12 connector, 5 pin
	Integrated bus terminating resistor	Adjustable by the customer
	Bus, galvanic isolated	No

Specifications	Excitation voltage	8 ... 36 V DC
	Excitation current	20 mA typical at 24 V DC 40 mA typical at 12 V DC, 80 mA max.
	Resolution	0.05° max.
	Linearity	±1°
	Measuring rate	1 kHz (asynchronous)
	Stability (temperature)	±50 x 10^{-6}/°C f.s. (typical)
	Repeatability	1 LSB
	Operating temperature	See specification of the respective sensor
	Protection	Reverse polarity, short circuit
	Dielectric strength	1 kV (V AC, 50 Hz, 1 min.)
	EMC	DIN EN 61326-1:2013

Signal wiring	**Signal**	**Connector pin no.**	**Cable color**	**View to the sensor connector**
	Shield	1	brown	
	Excitation +	2	white	
	GND	3	blue	
	CAN-H	4	black	
	CAN-L	5	grey	

Digital output CAN SAE J1939

MCANJ1939/R CAN SAE J1939	CAN Specification	ISO 11898, Basic and Full CAN 2.0 B
	Transceiver	24V-compliant, not isolated
	Communication profile	SAE J1939
	Baud Rate	250 kbit/s
	Internal termination resistor	120 Ω adjustable by the customer
	Address	Default 247d, configurable

NAME Fields	Arbitrary address capable	1	Yes
	Industry group	0	Global
	Vehicle system	7Fh (127d)	Non specific
	Vehicle system instance	0	
	Function	FFh (255d)	Non specific
	Function instance	0	
	ECU instance	0	
	Manufacturer	145h (325d)	Manufacturer ID
	Identity number	0nnn	Serial number 21 bit

Parameter Group Numbers (PGN)	Configuration data	PGN EF00h	Proprietary-A (PDU1 peer-to-peer)
	Process data	PGN FFnnh	Proprietary-B (PDU2 broadcast); nn Group Extension (PS) configurable

Specifications	Excitation voltage	8 ... 36 V DC
	Excitation current	20 mA typical at 24 V DC 40 mA typical at 12 V DC, max. 80 mA
	Measuring rate	1 kHz (asynchronous)
	Stability (temperature)	±50 x 10^{-6}/°C f.s. (typical)
	Repeatability	1 LSB
	Operating temperature	See specification of the respective sensor
	Protection	Reverse polarity, short circuit
	Dielectric strength	1 kV (V AC, 50 Hz, 1 min.)
	EMV	EN 61326-1:2013

Signal wiring

Signal	Connector pin no.	View to the sensor connector
Shield	1	
Excitiation +	2	
GND	3	
CAN-H	4	
CAN-L	5	

Connector cables

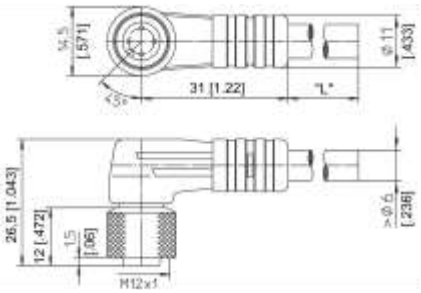
Connector cable M12, 4 pin

(angular coupling)

shielded connector

Suitable for 5-pin sensor connectors

The 4-core screened cable is supplied with a mating 4-pin 90° M12 connector at one end and 4 wires at the other end.
Available lengths are 2 m, 5 m and 10 m.
Wire: cross sectional area 0.34 mm²
Cable diameter: 5.6 ±0.2 mm



Order code

	KAB - xM - M12/4F/W - LITZE
IP69:	**KAB - xM - M12/4F/W/69K - LITZE**

xM = length in m

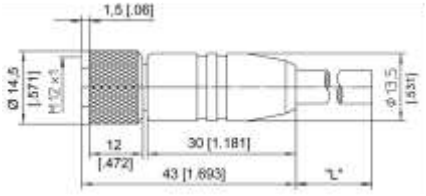
Connector cable M12, 4 pin

(straight coupling)

shielded connector

Suitable for 5-pin sensor connectors

The 4-core screened cable is supplied with a mating 4-pin M12 connector at one end and 4 wires at the other end.
Available lengths are 2 m, 5 m and 10 m.
Wire: cross sectional area 0.34 mm²
Cable diameter: 5.6 ±0.2 mm



Order code

	KAB - xM - M12/4F/G - LITZE
IP69:	**KAB - xM - M12/4F/G/69K - LITZE**

xM = length in m

Signal wiring M12, 4 pin	**Plug connection / cable color**			
	1	2	3	4
	brown	white	blue	black

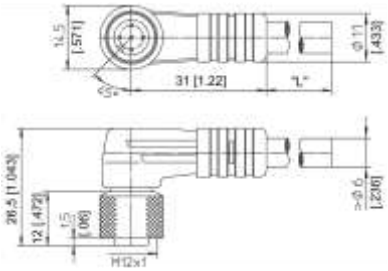
Applicable for cable carriers

Maximum movement speed	3 m/s
Maximum acceleration	5 m/s²
Minimum bending radius	10 x cable diameter

Connector cable M12, 5 pin
(angular coupling)

shielded connector

The 5-core screened cable is supplied with a mating 5-pin 90° M12 connector at one end and 4 wires at the other end. Available lengths are 2 m, 5 m and 10 m.
Wire: cross sectional area 0.34 mm²
Cable diameter: 5.6 ±0.2 mm



Order code

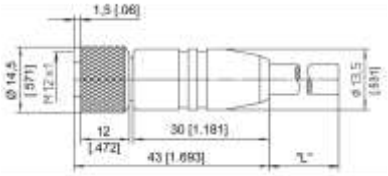
	KAB - xM - M12/5F/W - LITZE
IP69:	**KAB - xM - M12/5F/W/69K - LITZE**

xM = length in m

Connector cable M12, 5 pin
(straight coupling)

shielded connector

The 5-core screened cable is supplied with a mating 5-pin M12 connector at one end and 4 wires at the other end. Available lengths are 2 m, 5 m and 10 m.
Wire: cross sectional area 0.34 mm²
Cable diameter: 5.6 ±0.2 mm



Order code

	KAB - xM - M12/5F/G - LITZE
IP69:	**KAB - xM - M12/5F/G/69K - LITZE**

xM = length in m

Signal wiring M12, 5 pin	**Plug connection / Cable color**				
	1	2	3	4	5
	brown	white	blue	black	grey

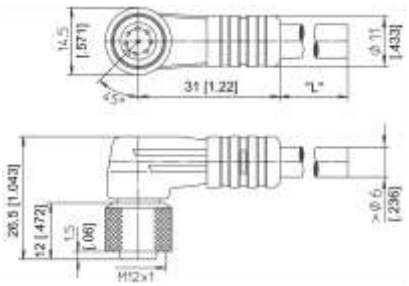
Applicable for cable carriers

Maximum movement speed	3 m/s
Maximum acceleration	5 m/s²
Minimum bending radius	10 x cable diameter

Connector cable M12, 8 pin
(angular coupling)

shielded connector

The 8-lead shielded cable is supplied with a mating 8-pin 90° M12 connector at one end and 8 wires at the other end.
Available lengths are 2 m, 5 m and 10 m.
Wire: cross sectional area 0.25 mm²
Cable diameter: 6.3 ±0.2 mm



Order code

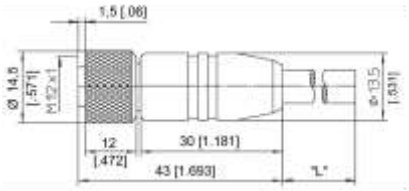
	KAB - xM - M12/8F/W - LITZE
IP69:	**KAB - xM - M12/8F/W/69K - LITZE**

xM = length in m

Connector cable M12, 8 pin
(straight coupling)

shielded connector

The 8-lead shielded cable is supplied with a mating 8-pin M12 connector at one end and 8 wires at the other end.
Available lengths are 2 m, 5 m and 10 m.
Wire: cross sectional area 0.25 mm²
Cable diameter: 6.3 ±0.2 mm



Order code

	KAB - xM - M12/8F/G - LITZE
IP69:	**KAB - xM - M12/8F/G/69K - LITZE**

xM = length in m

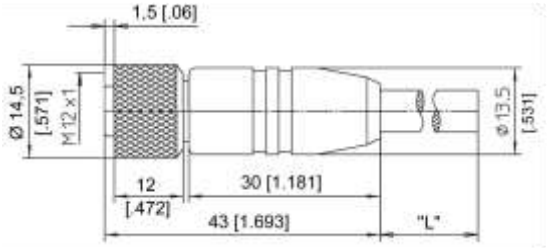
Signal wiring M12, 8 pin	**Plug connection / cable color**							
	1	2	3	4	5	6	7	8
	white	brown	green	yellow	grey	pink	blue	red

Applicable for cable carriers

Maximum movement speed	3 m/s
Maximum acceleration	5 m/s²
Minimum bending radius	10 x cable diameter

Connector/bus cable M12, 5 pin CAN-Bus

The 5-lead shielded cable is supplied with a female 5 pin M12 connector at one end and a male 5 pin M12 connector at the other end.
Available lengths are 0.3 m, 2 m, 5 and 10 m.
Cable diameter: 6.7 ±0.2 mm



Order code:

	KAB - xM - M12/5F/G - M12/5M/G - CAN
IP69:	**KAB - xM - M12/5F/G/69K - M12/5M/G/69K - CAN**

xM = length in m

T-connector for bus cable M12, 5 pin CAN-Bus

Order code:

KAB - TCONN - M12/5M - 2M12/5F - CAN

Terminating resistor M12, 5 pin CAN-Bus

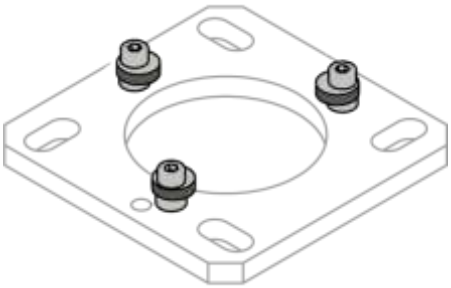
Order code:

KAB - RTERM - M12/5M/G - CAN

Applicable for cable carriers

Maximum movement speed	3 m/s
Maximum acceleration	5 m/s^2
Minimum bending radius	10 x cable diameter

Accessories



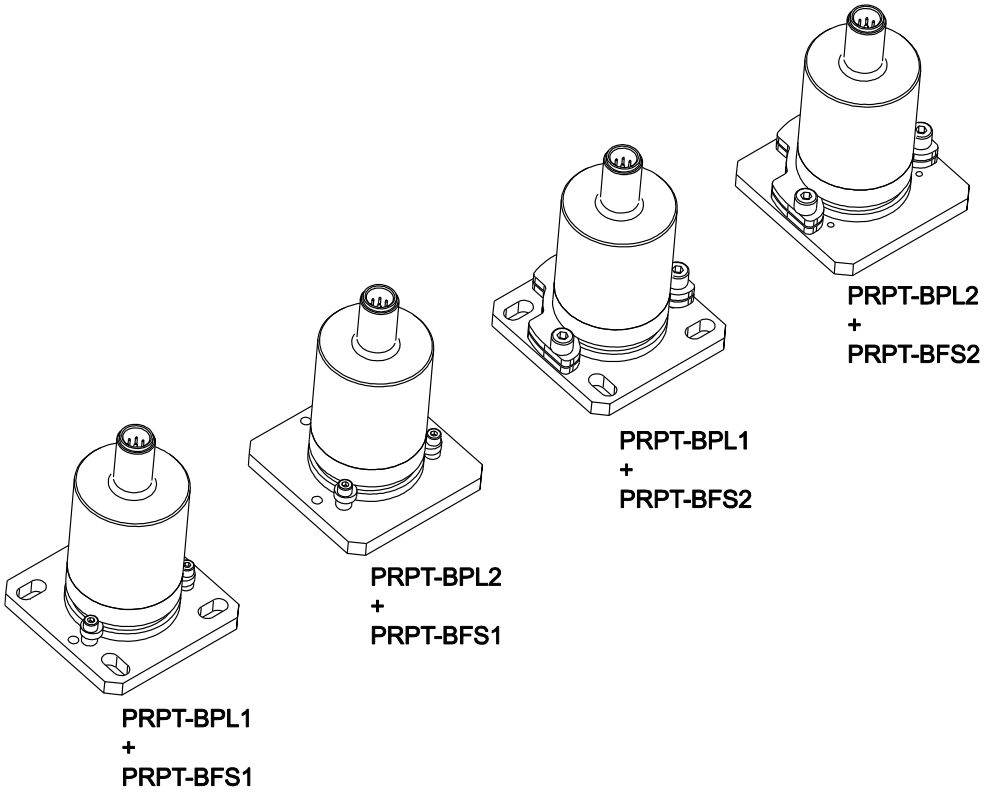
Mounting clamp BFS1
Order code:

PRPT- BFS1

Mounting clamp BFS2
Order code:

PRPT- BFS2

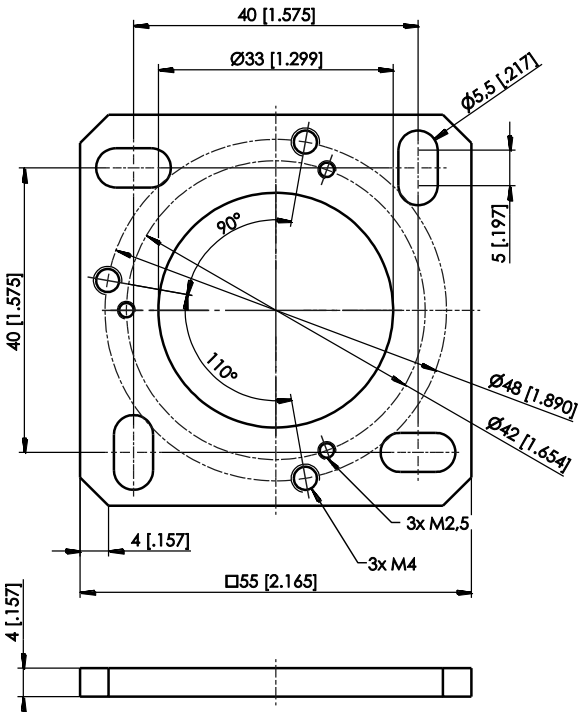
Mounting possibilities (PH36)



PRPT-BPL1

(Screw mounting)

In combination with the mounting clamps PRPT-BFS1 (3 x M2.5) or in combination with the mounting bracket PRPT-BFS2 (3 x M4).

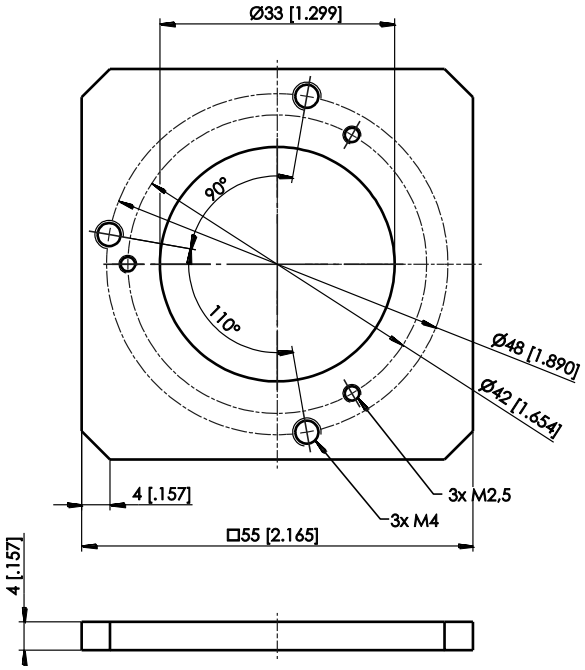


Dimensions in mm [inch]. Weight 30 g approx.
Dimensions informative only.
For guaranteed dimensions please consult factory.

PRPT-BPL2

(Welding assembly)

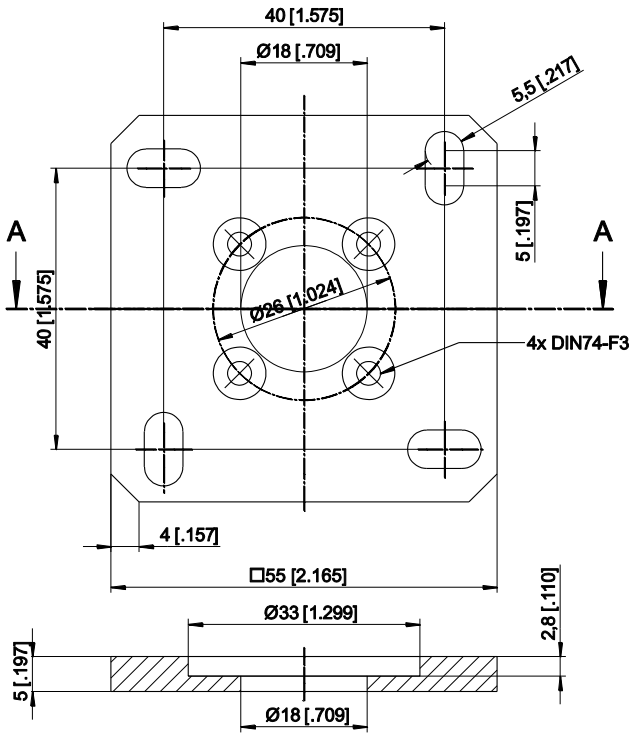
In combination with the mounting clamps PRPT-BFS1 (3 x M2.5) or in combination with the mounting bracket PRPT-BFS2 (3 x M4).



Dimensions in mm [inch]. Weight 30 g approx.
Dimensions informative only.
For guaranteed dimensions please consult factory.

PRPT-BPL3

In combination with PH36
and frontal mounting.



Dimensions in mm [inch]. Weight 30 g approx.
Dimensions informative only.
For guaranteed dimensions please consult factory.

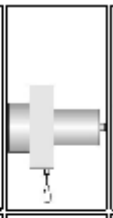
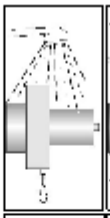
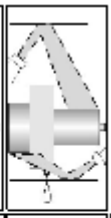
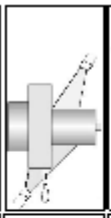
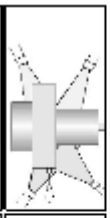
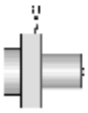
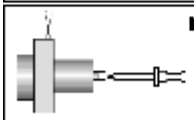
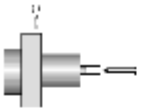
Reliability Characteristics

Models	PH36, PH58, PH68, PH68R	
Outputs	**single-channel**	
	U2, U2/PMU, U2/PMZ	Voltage output 0.5 ... 10 V
	U6, U6/PMU, U6/PMZ	Voltage output 0.5 ... 4.5 V
	U8, U8/PMU, U8/PMZ	Voltage output 0.5 ... 4.5 V
	I1, I1/PMU, I1/PMZ	Current output 4 ... 20 mA
	MSSI	Synchronous serial interface SSI
	MCANOP, MCANJ1939	CAN-interface (CANopen, CAN SAEJ1939)
	dual-channel	
	U2R	Voltage output 0.5 ... 10 V, redundant
	U6R	Voltage output 0.5 ... 4.5 V, redundant
	U8R	Voltage output 0.5 ... 4.5 V, redundant
	I1R	Current output 4 ... 20 mA, redundant
	MCANOPR, MCANJ1939R	CAN.interface redundant (CANopen, CAN SAEJ1939)
Characteristics	Device type	B
	Life period (electronics) $MTTF_d$	320 years / channel*)
	Probability of failure PFH (λ_{DU})	350 Fit / channel
	Working life	10 years
	Life period (mechanics) B_{10}	1.2* 10^9 revolutions
	Probability of failure (mechanics) (λ_{MECH})	0.1* Ch / B100,1 * Ch / B_{10} Ch = cycles per hour
	Allowable shaft load	PH36: 20N radial, 10N axial
		PH58: 80N radial, 50 N axial
		PH68: 70N radial, 50N axial
Standards	Failure rate of electronic components (Siemens)	SN 29500

*) = Reference Conditions: Reference Supply Voltage UBREF= 24 V, Reference Temperature ϑREF= 60 °C

General Information

Protection Classes according to DIN EN 60529

2nd char. numeral: Protection against ingress of water / 1nd char. numeral: Protection against solid foreign objects								 *	 *
Protection against...	Not protected	Falling water drops vertical / 15°		Spraying water	Splashing water	Water jets	Powerful water jets	Temporary immersion	Continuous immersion
DIN EN 60529	IP .. 0	IP .. 1	IP .. 2	IP .. 3	IP .. 4	IP .. 5	IP .. 6	IP .. 7	IP .. 8
IP 0 ..  Not protected	IP 00								
IP 1 ..  Solid foreign objects diameter ≥ 50 mm	IP 10	IP 11	IP 12						
IP 2 ..  Solid foreign objects diameter ≥ 12,5 mm	IP 20	IP 21	IP 22	IP 23					
IP 3 ..  Solid foreign objects diameter ≥ 2,5 mm	IP 30	IP 31	IP 32	IP 33	IP 34				
IP 4 ..  Solid foreign objects diameter ≥ 1 mm	IP 40	IP 41	IP 42	IP 43	IP 44				
IP 5 ..  Dust-protected	IP 50		IP 52	IP 53	IP 54	IP 55	IP 56		
IP 6 ..  Dust-tight	IP 60				IP 64	IP 65	IP 66	IP 67	IP 68*

* Depth and duration of immersion must be specified!

ASM Product Catalogs

POSIWIRE® – Cable Extension Position Sensors

POSITAPE® – Tape Extension Position Sensors

POSICHRON® – Magnetostrictive Position Sensors

POSIMAG® – Magnetic Scale Position Sensors

POSIROT® – Magnetic Angle Sensors and Encoders
POSIHALL® – Magnetic Multiturn Angle Sensors

POSITILT® – Inclination Sensors

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(for contact information see back cover).

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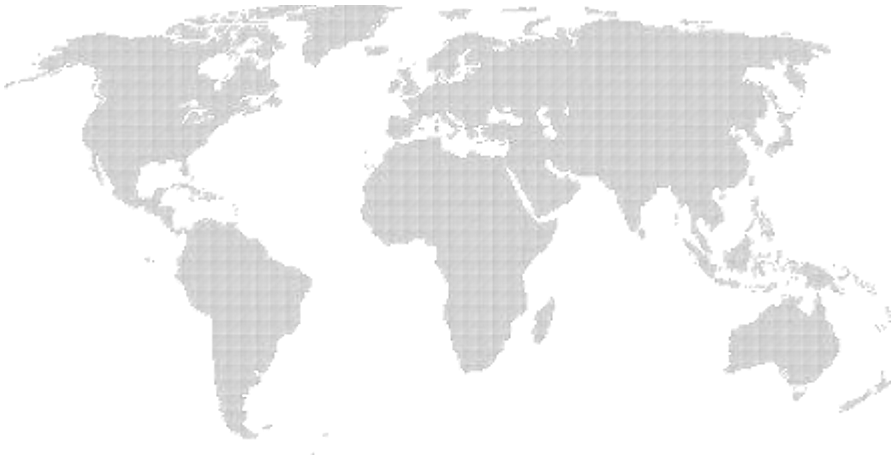
USA: www.asmsensors.com



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www.asm-sensor.com
USA: www.asmsensors.com

Headquarters:
ASM Automation Sensorik Messtechnik GmbH
Am Bleichbach 18 - 24
85452 Moosinning
Germany
Tel. +49 8123 986-0
Fax +49 8123 986-500
info@asm-sensor.de

ASM Sensors, Inc.
650 W. Grand Ave., Unit 205
Elmhurst, IL 60126
USA
Tel. +1 (630) 832-3202
Fax +1 (630) 832-3204
info@asmsensors.com

ASM Sales Office UK
Tanyard House, High Street
Measham, Derbs DE12 7HR
United Kingdom
Tel. +44 845 1222-123
Fax +44 845 1222-124
info@asm-sensor.com

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