



**PRECIZIKA**  
METROLOGY

# SELECTION GUIDE

Rotary/linear encoders



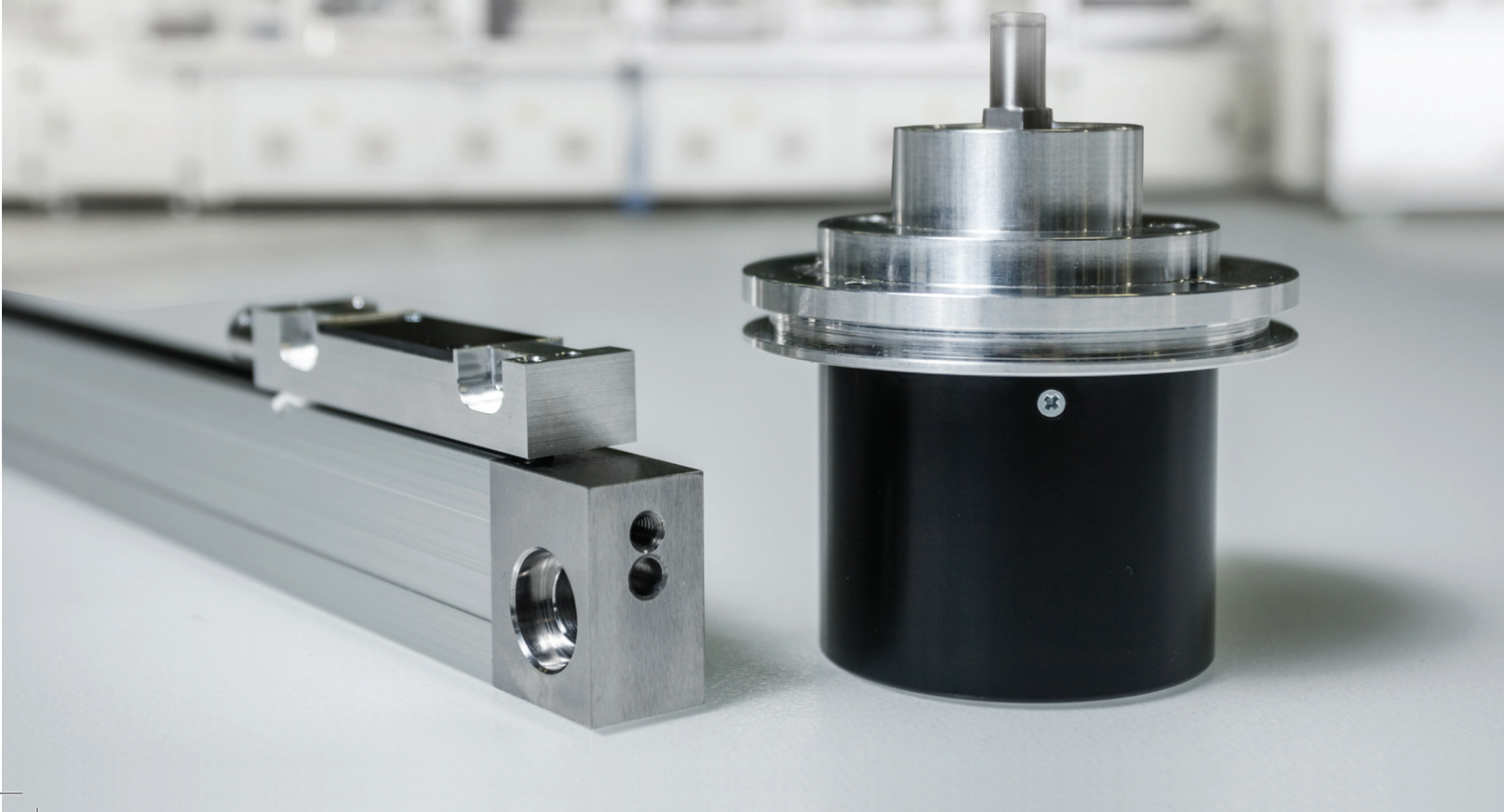
## ABOUT COMPANY

*“Precizika Metrology” is the new name of former Lithuanian-American Joint Venture “Brown & Sharpe - Precizika”. The company has proud history of old traditions in the leadership of design and production of metrological equipment. Its workforce has been involved for over fifty years in the supply of measuring technology and systems to automate factories as well as in the development of optical scale manufacturing technology.*

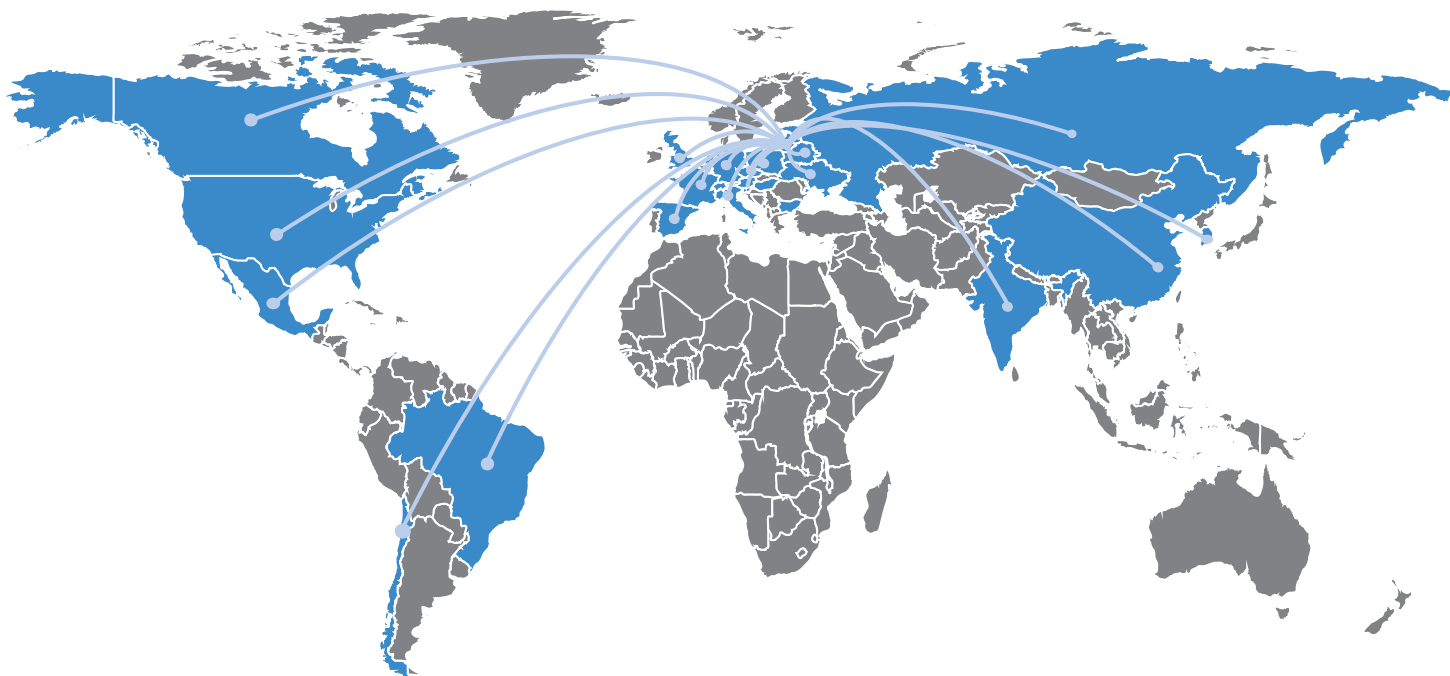
*In 2000 the production process was certified to fully meet the requirements of ISO 9002, in 2003 - ISO 9001.*

*The company’s goal is to consistently supply high quality products and services to meet customer demands on a timely basis. The main company’s products are the linear and angular glass scale gratings, the linear and rotary displacement measuring systems, the mechanical parts and components.*

*We are attentive to every Your inquiry and we are sure of that timely and right attitude along with sincere human attention leads us to long-lasting cooperation.*

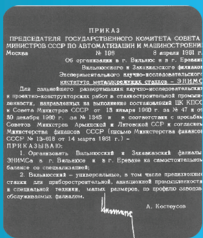


# MAIN EXPORT COUNTRIES 2012 - 2013



# SHORT HISTORY OF COMPANY

1961



COMPANY WAS  
FOUNDED

1991



ESTABLISHED  
A JOINT VENTURE WITH  
BROWN & SHARPE USA

2007



**PRECIZIKA**  
METROLOGY

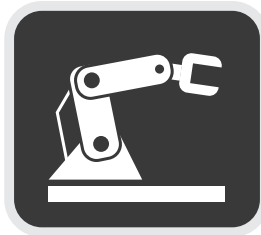
100% OWNERSHIP  
AND NAME CHANGED TO  
PRECIZIKA METROLOGY

# APPLICATIONS



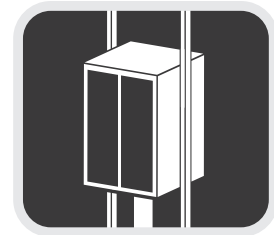
## RADARS / TELESCOPES

Radar and telescope industries demand high precision for satellite and star tracking, therefore incremental and absolute encoders, as well as single-turn and multi-turn type are used. Environmental conditions require high levels of protection.



## ROBOTICS

Robotics industry has a very wide range of different encoders demand, depending on particular cases. High precision is usually not required, but non-magnetic encoders with higher rotation speed are more frequently used.



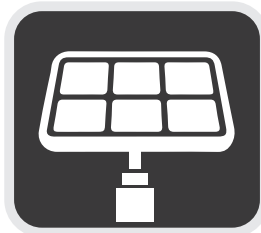
## ELEVATORS

Elevator industry requires vibration and shock resistant encoders to ensure smoothness and safety. High precision is usually not required and photoelectric encoders with higher safety requirements are more frequently used.



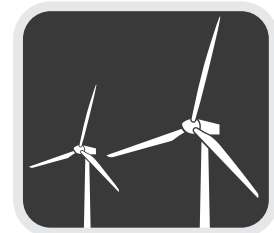
## CRANES

Rotary encoders used in crane industries are able to operate in harsh environmental conditions like dust, moisture and withstand extreme temperatures and mechanical stress.



## SOLAR SYSTEMS

Solar systems are equipped with rotary encoders that are able to deal with different environmental conditions. Magnetic or other more resistant encoders without high accuracy are most frequently found in the industry.



## WIND SYSTEMS

Wind systems use lower accuracy rotary encoders that can operate in harsh environmental conditions, withstand shock and vibration.



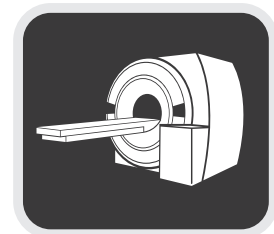
## PACKAGING

Packaging industry requires many different types of encoders, both absolute and incremental. Small sizes of encoders are often needed, as well as easy installation, wide temperature range and high IP protection level.



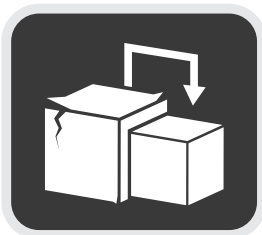
## MINING DRILLS

Mining drills usually use rotary encoders with a magnetic sensing head. They operate in hazardous environment, so high IP class is of major importance, as well as a wide range of operating temperatures.



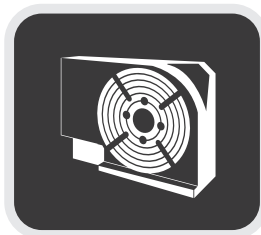
## MEDICAL EQUIPMENT

The industry of medical equipment uses all sorts of different encoders. As hygiene is essential, high IP and safety class encoders are preferred. Generally, magnetic encoders are not recommended.



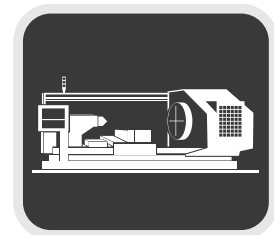
## RETROFITTING

Retrofitting industry uses many different kinds of encoders depending on the individual cases, where usually simple and easy-to-install encoders are used.



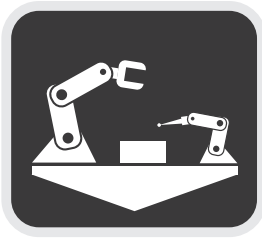
## ROTARY TABLES

Rotary table industry relies heavily on precision, so high accuracy rotary encoders are mainly used with high number of output pulses in many cases.



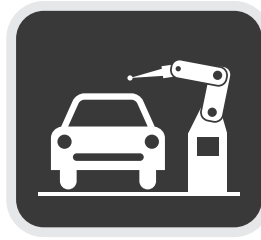
## TURNING MACHINES & CENTERS

Manual and less automated turning machines and centers, usually without CNC, require linear encoders mostly. As generally only two coordinates are in use.



### FACTORY AUTOMATION

Factory automation uses encoders of different diameters and mechanical characteristics, so the exact parameters of the encoder depend strictly on the process. However, normally the industry does not need high precision, so very accurate encoders are rarely used.



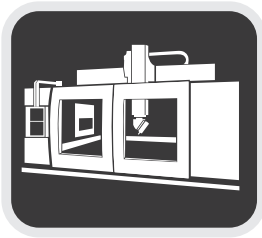
### AUTOMOTIVE

Automotive industry usually demands high accuracy encoders that can be easily installed, have a wide temperature range, are resistant to magnetic fields and hold a high IP class.



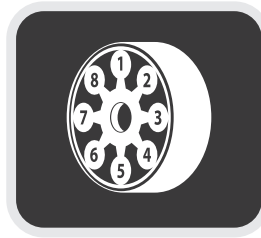
### CNC CUTTING MACHINES

The industry mostly uses linear encoders for axial movement. Depending on particular cases, high IP class and need of shock resistance could be applicable.



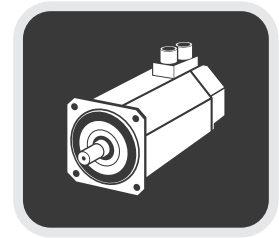
### MILLING / BORING / DRILLING CNC MACHINES

The industry consumes wide range of rotary and linear encoders and in many cases meets harsh environmental conditions. A lot of cases have accurate angle measurement processes that usually require high precision encoders.



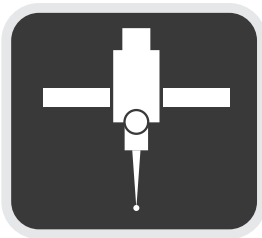
### TOOL REVOLVER

The industry needs different sorts of photoelectric and magnetic encoders. However, higher accuracy encoders are not demanded, because tool revolver industry usually does not have a need for very precise measurements.



### SERVO MOTORS

Servo motor industry can use modular, magnetic encoders, as well as photoelectric absolute or incremental, depending on the resolution and accuracy required. Small sizes and high rotation speed are often required.



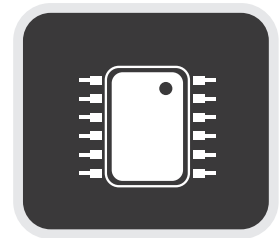
### COORDINATE MEASURING MASHINES

Precision is the most important feature of this industry, so linear encoders with high accuracy are mostly used.



### HIGH-PRECISION MACHINE TOOLS

The industry of high-precision machine tools focuses on precise processes, so high accuracy encoders are demanded.



### ELECTRONICS

This particular industry demands encoders both linear and rotary with higher precision. Long distance encoders are not typical for electronic industry.



### AUTOMATED GONIOMETERS

In the automated goniometer industry photoelectric modular rotary encoders that are without housings fit. Mechanical rotation speed is of no significant importance.



### MAINTENANCE

Encoders that can be directly replaced with major encoder producer brands one to one are required in the maintenance sector.

# ROTARY ENCODERS



	A28	A36	A42M	A75M	AK50	A58M	A58B
<b>Encoder technology</b>							
Photoelectric	+	+	+	+	+	+	+
Magnetic							
<b>Output signal type</b>							
Incremental	+	+	+	+		+	+
Absolute					+		
<b>Number of output pulses per revolution</b>							
≤ 3.600.000 ppr							
≤ 1.800.000 ppr							
≤ 108.000 ppr						+	+
≤ 36.000 ppr		+				+	+
≤ 25.000 ppr	+	+	+			+	+
≤ 20.480 ppr	+	+	+	+		+	+
≤ 20 bit							
≤ 12 bit							
≤ 8 bit					+		
<b>Accuracy (highest on range)</b>							
± 2.0 arc. sec							
± 2.5 arc. sec							
± 5.0 arc. sec							
± 7.5 arc. sec							
± 12.0 arc. sec	+	+	+	+		+	+
± 25.0 arc. sec							
± 120 arc. sec					+		
± 1800 arc. Sec							
<b>Output signals</b>							
Serial Interface							
Parallel					+		
Analog		+	+	+		+	+
Digital	+	+	+	+		+	+
<b>Cable connection</b>							
Axial outlet	+	+				+	+
Radial outlet						+	+
Universal outlet	+	+			+	+	+
Axial connector on housing						+	+
Radial connector on housing						+	+
<b>Applications</b>							
Radars / Telescopes							
Robotics	+	+	+	+	+	+	+
Elevators	+	+				+	+
Cranes	+	+				+	+
Solar systems	+	+				+	+
Wind systems	+	+				+	+
Packaging	+	+				+	+
Tool revolver					+		
Mining drills							
Medical equipment	+	+	+	+		+	+
Retrofitting	+	+			+	+	+
Rotary tables							
Servo motors	+	+	+	+			
Factory automation	+	+				+	+
Milling / Boring / Drilling CNC machines	+	+			+	+	+
CNC cutting mashines						+	+
Electronic industry							
Automotive industry	+	+	+	+		+	+
High-precision machine tools							
Automated goniometers			+	+			
Maintenance	+	+	+	+	+	+	+



# ROTARY ENCODERS



	AK58D	A58H	A58H1	A58HE	A58HM	A90H	A110
<b>Encoder technology</b>							
Photoelectric	+	+	+	+	+	+	+
Magnetic							
<b>Output signal type</b>							
Incremental		+	+	+	+	+	+
Absolute	+						
<b>Number of output pulses per revolution</b>							
≤ 3.600.000 ppr			+				
≤ 1.800.000 ppr			+			+	+
≤ 108.000 ppr		+	+	+	+	+	+
≤ 36.000 ppr		+	+	+	+	+	+
≤ 25.000 ppr		+	+	+	+	+	+
≤ 20.480 ppr		+	+	+	+	+	+
≤ 20 bit	+						
≤ 12 bit	+						
≤ 8 bit	+						
<b>Accuracy (highest on range)</b>							
± 2.0 arc. sec							
± 2.5 arc. sec							
± 5.0 arc. sec						+	+
± 7.5 arc. sec						+	+
± 12.0 arc. sec		+	+	+	+		
± 25.0 arc. sec	+						
± 120 arc. sec							
± 1800 arc. Sec							
<b>Output signals</b>							
Serial Interface	+						
Parallel							
Analog		+	+	+	+	+	+
Digital		+	+	+	+	+	+
<b>Cable connection</b>							
Axial outlet	+						
Radial outlet	+						
Universal outlet	+	+	+	+		+	+
Axial connector on housing	+						
Radial connector on housing	+				+		
<b>Applications</b>							
Radars / Telescopes						+	+
Robotics	+	+	+	+	+		
Elevators		+	+	+	+		
Cranes		+	+	+	+		
Solar systems	+	+	+	+	+		
Wind systems	+	+	+	+	+		
Packaging	+	+	+	+	+		
Tool revolver	+						
Mining drills							
Medical equipment	+	+	+	+	+	+	+
Retrofitting	+	+	+	+	+	+	+
Rotary tables						+	+
Servo motors		+	+	+	+		
Factory automation	+	+	+	+	+		
Milling / Boring / Drilling CNC machines	+	+	+	+	+	+	+
CNC cutting mashines		+	+	+	+		
Electronic industry	+	+	+	+	+		
Automotive industry	+	+		+	+	+	+
High-precision machine tools						+	+
Automated goniometers							
Maintenance	+	+	+	+	+	+	+





# LINEAR ENCODERS

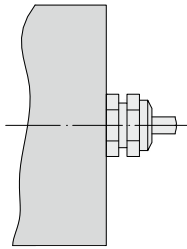


	L18	L18B	L18C	L18T	L23	LK24
<b>Encoder technology</b>						
Photoelectric	+	+	+	+	+	+
Magnetic						
<b>Output signal type</b>						
Incremental	+	+	+	+	+	+
Absolute						+
<b>Measuring lengths (ML)</b>						
≥ 50.000 mm						
≥ 30.040 mm						
≥ 30.000 mm					+	
≥ 20.000 mm					+	
≥ 3.240 mm		+	+		+	+
≥ 1.240 mm	+	+	+	+	+	+
<b>Resolution</b>						
0.1 µm	+	+	+	+		+
0.2 µm	+	+	+	+		
0.5 µm	+	+	+	+	+	
1.0 µm	+	+	+	+	+	+
2.0 µm						
2.5 µm	+	+	+	+		
5.0 µm	+	+	+	+	+	
10.0 µm					+	
25.0 µm						
50.0 µm					+	
100.0 µm					+	
500.0 µm						
1000.0 µm						
<b>Max. accuracy grades</b>						
± 1 µm						+
± 3 µm	+			+	+	
± 5 µm		+	+			
± 10 µm						
± 15 µm						
± 20 µm						
<b>Grating period (highest on range)</b>						
20 µm	+	+	+	+	+	+
40 µm	+	+	+	+	+	+
400 µm					+	
2000 µm (1+1 mm pole pitch)						
4000 µm (2+2 mm pole pitch)						
10000 µm (5+5 mm pole pitch)						
<b>Output signals</b>						
Serial Interface						
Analog	+	+	+	+	+	+
Digital	+	+	+	+	+	+
<b>Applications</b>						
Robotics	+	+	+	+	+	
Packaging					+	
Medical equipment	+	+	+	+		+
Retrofitting	+	+	+	+	+	
Coordinate measuring machines	+	+	+	+		+
Factory automation					+	
Milling / Boring / Drilling CNC machines	+	+	+	+	+	
Turning machines & centers	+	+	+	+	+	
CNC cutting machines	+	+	+	+	+	+
Electronic industry	+	+	+	+		+
Automotive industry					+	
High-precision machine tools	+	+	+	+		+
Maintenance	+	+	+	+	+	



# CABLE CONNECTIONS

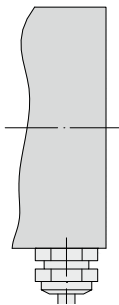
## Axial Outlet



Axial outlet cable connection is present in the majority of photoelectric and magnetic encoders, with notable exceptions being the modular iterations without housings, AK50, A58H through A58HM series and higher accuracy models.

**Compatible with:** A28, A36, A58M, A58B, A58C, A58C2, A58C3, A58D, AK58M, AK58B, AK58C, AK58C2, AK58C3, AK58D, AM36, AM58M, AM58B, AM58C, AM58C2, AM58C3, AM58D.

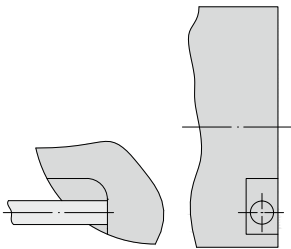
## Radial Outlet



Radial outlet cable connection is not supported by higher accuracy models, modular editions without housings, as well as smaller diameter series like A28 or A36.

**Compatible with:** A58M, A58B, A58C, A58C2, A58C3, A58D, AK58M, AK58B, AK58C, AK58C2, AK58C3, AK58D, AM36, AM58M, AM58B, AM58C, AM58C2, AM58C3, AM58D.

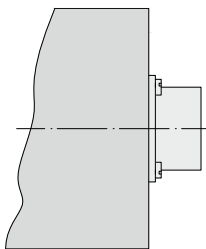
## Universal Outlet



Universal outlet is the most widely used cable connection in our product range. It is not possessed only by encoders without housings and A58HM series.

**Compatible with:** A28, A36, AK50, A58M, A58B, A58C, A58C2, A58C3, A58D, AK58M, AK58B, AK58C, AK58C2, AK58C3, AK58D, A58H, A58H1, A58HE, A90H, A110, A170, A170H, AM36, AM58M, AM58B, AM58C, AM58C2, AM58C3, AM58D.

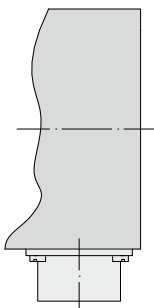
## Axial Connector on Housing



Axial Connector on Housing type of cable connection is present in photoelectric encoders like series A58M through series A58D, as well as the vast majority of magnetic encoders only excluding AM36.

**Compatible with:** A58M, A58B, A58C, A58C2, A58C3, A58D, AK58M, AK58B, AK58C, AK58C2, AK58C3, AK58D, AM58M, AM58B, AM58C, AM58C2, AM58C3, AM58D.

## Radial Connector on Housing



Radial Connector on Housing is the only available connection type for series A58HM. This type is not supported by smaller diameter series, AM36 magnetic encoder, also higher accuracy models.

**Compatible with:** A58M, A58B, A58C, A58C2, A58C3, A58D, AK58M, AK58B, AK58C, AK58C2, AK58C3, AK58D, A58HM, AM58M, AM58B, AM58C, AM58C2, AM58C3, AM58D.

# ACCESSORIES

## NK Interpolator



The NK is external interpolator with up to 10-fold that converts sinusoidal scanning signals from photoelectric encoders to square-wave pulses with TTL levels. Possible interpolation factor: 1, 2, 3, 4, 5, 8, 10. Under the cover the unit has commutation switch that allows users manually change interpolation factor.

**Compatible with:** A28, A36, A42M, A75M, A58M, A58B, A58C, A58C2, A58C3, A58D, A58H, A58H1, A58HE, A58HM, A90H, A110, A170, A170H, AM36, AM58M, AM58B, AM58C, AM58C2, AM58C3, AM58D, L18, L18B, L18C, L18T, L23, L35, L35T, L50, MT, CMT, PCMT.

## SC30 Coupling



The most lightweight coupling for operations demanding lower kinematic accuracy and permissible torque.

**Compatible with:** A28, A36, AM36 AK50, A58M, A58B, A58C, A58C2, A58C3, A58D, AK58M, AK58B, AK58C, AK58C2, AK58C3, AK58D, AM58M, AM58B, AM58C, AM58C2, AM58C3, AM58D.

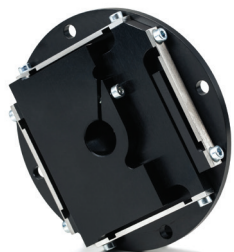
## SC70 Coupling



The mid-range coupling with highest permissible shaft speed.

**Compatible with:** A110.

## SC98 - 1 Coupling



The highest kinematic accuracy and torsional rigidity coupling available.

**Compatible with:** A170.

## SC98 - 2 Coupling

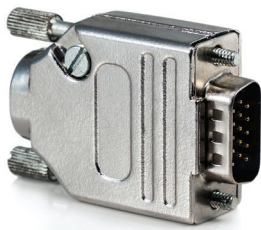


Lighter, less accurate edition of its first iteration SC98-1, offering lower torsional rigidity.

**Compatible with:** A170.

# ENCODER ELECTRICAL CONNECTION

## 9/15-PINS FLAT CONNECTOR D9/D15, MALE



**D9 compatible with:** A28, A36, A42M, A75M, AK50, A58M, A58B, A58C, A58C2, A58C3, A58D, AK58M, AK58B, AK58C, AK58C2, AK58C3, AK58D, A58H, A58H1, A58HE, A90H, A110, A170, A170H, AM36, AM58M, AM58B, AM58C, AM58C2, AM58C3, AM58D, L18, L18B, L18C, L18T, L23, LK24, L35, L35T, L50, MT, CMT, PCMT, MK.

**D15 compatible with:** A28, A36, A42M, A75M, AK50, A58M, A58B, A58C, A58C2, A58C3, A58D, AK58M, AK58B, AK58C, AK58C2, AK58C3, AK58D, A58H, A58H1, A58HE, A90H, A110, A170, A170H, AM36, AM58M, AM58B, AM58C, AM58C2, AM58C3, AM58D, L18, L18B, L18C, L18T, L23, LK24, L35, L35T, L50, MT, CMT, PCMT, MK.

## 9/15-PINS ROUND CONNECTOR D9/D15, MALE



**C9 compatible with:** A36, A42M, AK50, A58M, A58B, A58C, A58C2, A58C3, A58D, AK58M, AK58B, AK58C, AK58C2, AK58C3, AK58D, A58H, A58H1, A58HE, A58HM, A90H, A110, A170, A170H, AM36, AM58M, AM58B, AM58C, AM58C2, AM58C3, AM58D, L18, L18B, L18C, L18T, L23, LK24, L35, L35T.

**C12 compatible with:** A28, A36, A42M, A75M, AK50, A58M, A58B, A58C, A58C2, A58C3, A58D, AK58M, AK58B, AK58C, AK58C2, AK58C3, AK58D, A58H, A58H1, A58HE, A58HM, A90H, A110, A170, A170H, AM36, AM58M, AM58B, AM58C, AM58C2, AM58C3, AM58D, L18, L18B, L18C, L18T, L23, LK24, L35, L35T, L50, MT, CMT, PCMT, MK.

## 12-PINS ROUND CONNECTOR B12, MALE



**Compatible with:** A28, A36, A42M, A75M, AK50, A58M, A58B, A58C, A58C2, A58C3, A58D, AK58M, AK58B, AK58C, AK58C2, AK58C3, AK58D, A58H, A58H1, A58HE, A58HM, A90H, A110, A170, A170H, AM36, AM58M, AM58B, AM58C, AM58C2, AM58C3, AM58D, L18, L18B, L18C, L18T, L23, LK24, L35, L35T, L50, MT, CMT, PCMT, MK.

## 10-PINS ROUND CONNECTOR ONC, MALE



**Compatible with:** A28, A36, A42M, A75M, AK50, A58M, A58B, A58C, A58C2, A58C3, A58D, AK58M, AK58B, AK58C, AK58C2, AK58C3, AK58D, A58H, A58H1, A58HE, A58HM, A90H, A110, A170, A170H, AM36, AM58M, AM58B, AM58C, AM58C2, AM58C3, AM58D, L18, L18B, L18C, L18T, L23, L35, L35T, L50, MT, CMT, PCMT.

## 10-PINS ROUND CONNECTOR RS10, MALE



**Compatible with:** A28, A36, A42M, A75M, AK50, A58M, A58B, A58C, A58C2, A58C3, A58D, AK58M, AK58B, AK58C, AK58C2, AK58C3, AK58D, A58H, A58H1, A58HE, A58HM, A90H, A110, A170, A170H, AM36, AM58M, AM58B, AM58C, AM58C2, AM58C3, AM58D, L18, L18B, L18C, L18T, L23, L35, L35T, L50, MT, CMT, PCMT.

# DIGITAL READOUT DEVICES

## CS 3000 TWO AND THREE AXIS READOUT DEVICE



**Compatible with:** A28, A36, A42M, A75M, A58M, A58B, A58C, A58C2, A58C3, A58D, A58H, A58H1, A58HE, A58HM, A90H, A110, A170, A170H, AM36, AM58M, AM58B, AM58C, AM58C2, AM58C3, AM58D, L18, L18B, L18C, L18T, L23, LK24, L35, L35T, L50, MT, CMT, PCMT, MK.

### Technical data:

INPUT STANDARD	RS 422
POWER SUPPLY FOR ENCODERS	+5 V DC
RESOLUTION OF LINEAR ENCODERS	0.5; 1; 2; 5; 10; 20; 50 $\mu$ m; 0.1; 0.2; 0.5; 1; 5; 10 mm
RESOLUTION OF ROTARY ENCODER	1° - 0,0001°
LED GREEN DISPLAY, 7 DIGIT AND SIGN	14 mm height
MAXIMUM INPUT SIGNALS FREQUENCY	100 MHz
POWER SUPPLY	DC 8-30 V/0.8A Power supply adapter: - input: AC 100V ~ 240V, 50Hz/60Hz - output: DC 8-30 V; 0.8A
POWER CONSUMPTION	5 W
OVERALL DIMENSIONS	214 x 139 x 29.5 mm
WEIGHT	0.9 kg
OPERATION TEMPERATURE RANGE	0 °C - +50 °C

## CS 5500 ADVANCED TWO AND THREE AXIS READOUT DEVICE



**Compatible with:** A28, A36, A42M, A75M, A58M, A58B, A58C, A58C2, A58C3, A58D, A58H, A58H1, A58HE, A58HM, A90H, A110, A170, A170H, AM36, AM58M, AM58B, AM58C, AM58C2, AM58C3, AM58D, L18, L18B, L18C, L18T, L23, LK24, L35, L35T, L50, MT, CMT, PCMT, MK.

### Technical data:

INPUT STANDARD	RS 422
POWER SUPPLY FOR ENCODERS	+5 V DC
RESOLUTION OF LINEAR ENCODERS	0.1; 0.2; 0.5; 1; 2; 5; 10; 20; 50 $\mu$ m;
RESOLUTION OF ROTARY ENCODER	1° - 0,0001°
LED GREEN DISPLAY, 7 DIGIT AND SIGN	14 mm height
MAXIMUM INPUT SIGNALS FREQUENCY	500 MHz
POWER SUPPLY	AC 85V ~ 230V
POWER CONSUMPTION	5 W
OVERALL DIMENSIONS	295 x 182 x 30.5 mm
WEIGHT	2.6 kg
OPERATION TEMPERATURE RANGE	0 °C - +50 °C



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