



M12 A-Coded 12-Pin Female Field Wirable Connector with IP67 Protection and 90° Angled Design

Our Product Introduction

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Basic Information

- Place of Origin: Guangdong, China
- Brand Name: KRONZ
- Certification: CE
- Model Number: H1212MA-9
- Minimum Order Quantity: 10 pieces
- Price: Negotiable
- Packaging Details: Paper box packing
- Delivery Time: 5-8 working days
- Payment Terms: T/T, Western Union
- Supply Ability: 100000 pieces per month



Product Specification

- Contact Resistance: $\leq 5\text{m}\Omega$
- Contact Carrier Material: Plastic, PA, Black
- Isolation Voltage: 500V
- Output Current: Max. 500mA
- Connector Nut: Brass, Nickle-plated
- Input Voltage: 24VDC ($\pm 25\%$)
- Color: Black
- Pin Option: 12 Pin
- Ingress Protection: IP67 Or IP68
- Voltage: 60V
- Gender: Male And Female
- Contact Surface Material: Brass, Gold-plated
- Cable Outlet: Straight
- Highlight: **M12 A-Coded female connector IP67, 12-pin field wirable connector 90° angled, IP67 female connector with IP67 protection**

Product Description

M12 A-Coded 12-Pin Female Field Wirable Connector with IP67 Protection and 90° Angled Design

The M12 A-Coded 12-Pin Male Field Wirable Assembly, Angled (90°) is a right-angle industrial circular connector designed for applications where cable exit direction must be perpendicular to the mating axis — enabling installation in tight spaces, behind panels, and in dense wiring environments. Manufactured to IEC 61076-2-101, this connector delivers IP67 environmental protection with high-density 12-pin capacity in a compact elbow form factor.

The connector nut is constructed from alloy/brass with nickel plating for corrosion-resistant mating. The clamp base housing uses PBT/PA (polybutylene terephthalate / polyamide) plastic in black, providing excellent chemical resistance, dimensional stability, and lightweight construction. Contacts are gold-plated brass for low contact resistance ($\leq 5\text{m}\Omega$) and reliable signal transmission over 100+ mating cycles. Screw-type termination accepts cables of 4–6mm (PG7) or 6–8mm (PG9) diameter — no crimping tools required. FPM/FKM (fluoroelastomer) seals maintain IP67 protection across the full operating range of -25°C to +85°C.

With overall dimensions of approximately 40mm * 41mm and an outer diameter of $\varnothing 20.2\text{mm}$, the angled design redirects the cable 90° from the mating face, making it ideal for back-of-panel wiring, confined enclosures, and installations where straight connectors would cause cable bending stress.

Key Features

IP67 Environmental Protection: Fully dust-tight and waterproof. Withstands immersion in 1 meter of water for 30 minutes. FPM/FKM elastomer seals resist oil, coolant, and chemical exposure for long-term sealing integrity.

90° Angled Cable Exit: Right-angle design redirects cable perpendicular to the connector axis. Eliminates cable bending stress in tight spaces, behind panels, and in dense installation environments.

12-Pin High-Density Configuration: Twelve independent circuits in a single M12 connector footprint. Supports multi-sensor arrays, signal distribution, and complex I/O wiring while reducing connector count and panel space.

Gold-Plated Brass Contacts: Brass contacts with gold plating deliver $\leq 5\text{m}\Omega$ contact resistance and $\geq 100\text{M}\Omega$ insulation resistance, ensuring stable signal integrity in noise-sensitive industrial environments.

PBT/PA Plastic Housing: Lightweight clamp base made of PBT/PA black plastic with excellent chemical resistance and dimensional stability. Reduces overall weight compared to metal housings while maintaining mechanical durability.

Field-Wirable — No Crimping Tools: Screw termination accepts 4–6mm (PG7) or 6–8mm (PG9) cable diameter. Strip, insert, tighten — complete wiring on-site in under 10 minutes.

Technical Specifications

Parameter	Specification
Applicable Standard	IEC 61076-2-101
Connector Type	M12 A-Coded Male, Field Wirable, Angled (90°)
Pin Count	12
Thread Size	M21*1
Overall Width	~40 mm
Overall Height	~41 mm
Outer Diameter	$\varnothing 20.2\text{ mm}$
Connector Nut Material	Alloy / Brass, Nickel-Plated
Contact Material	Gold-Plated Brass
Contact Carrier Material	PA (Polyamide), Black
Clamp Base Housing Material	PBT / PA (Polybutylene Terephthalate / Polyamide), Black
Sealing Material	FPM / FKM (Fluoroelastomer)
Rated Current	1.5A
Rated Voltage	30V
Insulation Resistance	$\geq 100\text{ M}\Omega$
Contact Resistance	$\leq 5\text{ m}\Omega$
Pollution Degree	3

Operating Temperature	-25°C to +85°C
Mechanical Life	> 100 Mating Cycles
IP Rating	IP67
Coding	A-Coded
Termination Type	Screw Connection
Cable Exit Diameter	4–6mm (PG7) / 6–8mm (PG9)

Dimensions

- Thread Standard: M21*1
- Overall Width: ~40 mm
- Overall Height: ~41 mm
- Outer Diameter: Ø 20.2 mm
- Cable Exit: 4–6mm (PG7) / 6–8mm (PG9)
- Orientation: Angled (90°)
- Mating Compatibility: All M12 A-Coded 12-Pin Female Connectors

Pin Layout (12-Pin A-Coded Male)

The 12-pin configuration arranges contacts in a single circle inside the M12 male housing, following IEC 61076-2-101 A-Coded standard:

- 12 pins evenly distributed in a circular pattern
- Standard A-Coded keyway positioning (male)
- Fully compatible with any M12 A-Coded 12-pin female connector from all major manufacturers

Applications

The 12-pin M12 angled male connector is specifically designed for applications where space constraints require a 90° cable exit:

- Tight-Space Sensor Wiring: Back-of-panel connections where straight connectors would cause cable bending or exceed bend radius limits
- Dense Control Cabinets: High-density I/O panels where perpendicular cable routing maximizes space efficiency and airflow
- Multi-Sensor Junction Boxes: Aggregating signals from 12 sensors at a single junction point in confined enclosures
- Robotics & Motion Systems: Feedback wiring for multi-axis motor controllers and encoder clusters in tight mechanical assemblies
- Process Automation: Sensor arrays for temperature, pressure, proximity, and level monitoring where cable management is critical
- Conveyor Systems: Centralized sensor wiring along conveyor lines where cables must exit perpendicular to avoid interference with moving parts
- HVAC & Building Automation: Multi-zone thermostat and damper control connections inside compact control panels
- Agricultural Machinery: Sensor arrays for soil moisture, temperature, and GPS guidance where cables must route along machinery frames
- Water & Wastewater Treatment: IP67-rated multi-channel connections for level sensors, pH probes, and flow meters in wet environments with limited cable routing space
- Food & Beverage Processing: Washdown-rated installations where angled cable exit prevents water pooling at the connector interface

Angled vs. Straight: When to Choose the 90° Version

Factor	Angled (90°)	Straight (0°)
Cable exit direction	Perpendicular to mating axis	In-line with mating axis
Space behind panel	Requires less depth	Requires more depth
Cable bend stress	Eliminates sharp bends	May require external bend relief
Dense panel installations	Ideal for side-by-side connectors	May cause cable interference
Washdown environments	Cable routes downward, reducing water ingress risk	Cable may pool water at connector
Weight	Lighter (PBT/PA plastic housing)	Varies by material
Aesthetic routing	Cleaner cable management along surfaces	Cables extend straight out

Choose the angled version when space is limited behind the panel, when cables need to route along a surface rather than protruding, or when multiple connectors are installed side by side and cable interference is a concern.

Installation Guide

Prepare the cable: Strip the outer jacket to expose 12 individual conductors. Ensure total cable diameter matches the gland size — 4–6mm for PG7 or 6–8mm for PG9.

Thread the components: Pass the cable through the coupling nut, cable gland insert (PA), and FPM sealing ring in the correct order.

Terminate the wires: Insert each of the 12 conductors into its designated male pin terminal. Tighten each screw — avoid overtightening to prevent contact damage.

Assemble the housing: Slide the male connector housing over the terminated contacts, aligning the A-Coded keyway notch.

Seal and tighten: Thread the coupling nut onto the M21*1 housing thread. Tighten by hand until the FPM seal compresses uniformly around the cable.

Verify: Check all 12 pins are seated, housing is fully threaded, and cable cannot be pulled out. Test continuity on all 12 circuits before commissioning.

Orient the connector: The 90° angled body allows you to rotate the connector to the desired cable exit direction before final tightening.

Complete Product Range — M12 A-Coded Male Field Wirable, Angled (90°)

Pin Layout	Pins	Connection	Coding	Current	Voltage	Angle	Cable Ø	Part Number
○○○	3	Screw	A-CODE	4A	250V	Angled	4–6mm (PG7)	H1203MA-7
○○○	3	Screw	A-CODE	4A	250V	Angled	6–8mm (PG9)	H1203MA-9
○○○○	4	Screw	A-CODE	4A	250V	Angled	4–6mm (PG7)	H1204MA-7
○○○○	4	Screw	A-CODE	4A	250V	Angled	6–8mm (PG9)	H1204MA-9
○○○○○	5	Screw	A-CODE	4A	60V	Angled	4–6mm (PG7)	H1205MA-7
○○○○○	5	Screw	A-CODE	4A	60V	Angled	6–8mm (PG9)	H1205MA-9
○○○○○○○○	8	Screw	A-CODE	2A	30V	Angled	4–6mm (PG7)	H1208MA-7
○○○○○○○○	8	Screw	A-CODE	2A	30V	Angled	6–8mm (PG9)	H1208MA-9
○○○○○○○○○○○○	12	Screw	A-CODE	1.5A	30V	Angled	4–6mm (PG7)	H1212MA-7
○○○○○○○○○○○○	12	Screw	A-CODE	1.5A	30V	Angled	6–8mm (PG9)	H1212MA-9

FAQ

Q1: What is the rated current and voltage for the 12-pin M12 angled male connector?

The 12-pin M12 A-Coded angled male connector is rated at 1.5A per pin at 30V AC/DC. The reduced current and voltage ratings compared to lower pin counts (e.g., 3/4-pin at 4A/250V) are due to the smaller contact size and tighter pin spacing required to fit 12 pins within the M12 housing. It is designed for signal-level and low-power applications, not for power distribution.

Q2: What does "angled" or "90°" mean for this connector?

The angled (90°) version redirects the cable exit perpendicular to the connector's mating axis. Instead of the cable extending straight back from the connector, it exits at a right angle. This is ideal for installations behind panels, in tight enclosures, or where cables need to route along a surface rather than protruding outward. The angled design also reduces cable bending stress and can help prevent water pooling at the connector interface in washdown environments.

Q3: What is the difference between PG7 and PG9 cable glands?

PG7 and PG9 refer to the cable gland size standard. PG7 accepts cables with an outer diameter of 4–6mm, while PG9 accepts cables with an outer diameter of 6–8mm. Choose the gland size that matches your cable's outer diameter for proper sealing and strain relief. Using the wrong gland size will compromise the IP67 rating — a PG7 gland with an 8mm cable will not seal, and a PG9 gland with a 4mm cable will not grip properly.

Q4: Is the 12-pin M12 angled male connector compatible with 8-pin or 5-pin female connectors?

No. The 12-pin M12 A-Coded male connector only mates with 12-pin A-Coded female connectors. M12 connectors with different pin counts have different keyway positions and pin arrangements — they are physically incompatible by design. This prevents incorrect connections that could damage equipment or create safety hazards. The angled or straight orientation does not affect mating compatibility.

Q5: Can this 12-pin connector carry digital signals like IO-Link?

Yes. The 12-pin M12 A-Coded angled male connector supports digital signal transmission including IO-Link, PROFINET, and other industrial communication protocols at signal level. However, for high-speed data protocols like Ethernet (100 Mbps+), consider using D-Coded or X-Coded M12 connectors which are optimized for data transmission. The 12-pin A-Coded connector is best suited for standard sensor-level signals, DC power, and low-speed digital I/O.

Q6: What is the difference between 12-pin A-Coded and 12-pin X-Coded?

Both support 12 pins, but they serve different purposes. A-Coded connectors are designed for sensor/actuator signal wiring at low voltage (30V, 1.5A). X-Coded connectors are designed for high-speed data transmission (up to 10 Gbps) and are not interchangeable with A-Coded. They

have different keyways and cannot be mated with each other.

Q7: How do I verify IP67 sealing after field installation?

After wiring, ensure: (1) the FPM/FKM sealing ring is seated evenly around the cable with no gaps; (2) the coupling nut is hand-tightened until the cable cannot move; (3) the housing thread is fully engaged with no cross-threading. For angled connectors, also verify that the 90° body orientation is correct for your cable routing direction before final tightening. IP67 rating is only guaranteed when the connector is properly assembled and mated with a compatible female connector.

Q8: What materials are used in this connector?

The connector nut is made of alloy/brass with nickel plating. Contacts are gold-plated brass. The contact carrier is black PA (polyamide) plastic. The clamp base housing is PBT/PA (polybutylene terephthalate/polyamide) black plastic — lightweight yet chemically resistant and dimensionally stable. Sealing uses FPM/FKM (fluoroelastomer) rings that resist oils, chemicals, and UV from -25°C to +85°C.

Q9: What is the difference between the male and female angled versions?

The male version has protruding pins and uses a PBT/PA plastic clamp base housing — lighter weight, good chemical resistance. The female version has socket contacts and uses a zinc alloy clamp base housing — higher mechanical strength and impact resistance. Both share the same 90° angled form factor, IP67 rating, M21*1 thread, and mating compatibility. Choose male for connecting to female panel receptacles or female cable connectors; choose female for connecting to male panel plugs or male cable connectors.

Q10: When should I choose angled over straight?

Choose the angled version when: space is limited behind the panel or enclosure; cables need to route along a surface rather than protruding straight out; multiple connectors are installed side by side and straight cables would interfere with each other; you want to reduce cable bending stress at the exit point; or in washdown environments where a downward cable exit prevents water from pooling at the connector interface.

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