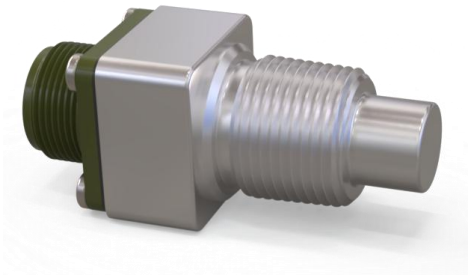
1030 Magnetic Debris Detector (MDD)

KasperAero Technical Data Sheet
Powered by NZMS Technology

About the 1030 Product Family

The KasperAero 1030 Series is our ruggedized line of ferrous debris detection sensors, designed for demanding industrial, aerospace-adjacent, marine, and rail environments. Powered by our proprietary NZMS technology, the 1030 Series delivers industry-leading debris monitoring performance in a durable high-temperature platform.



Entire Sensor
(no separate electronics)

Key Features

- Real-time, continuous condition monitoring
- Detects both coarse and fine ferrous debris
- Proven to reduce unplanned downtime and maintenance costs
- Compatible with PLC and SCADA systems for seamless integration
- Standard industrial output options
- Rugged one-piece aluminum sensor body construction
- Rear mounted MIL-spec connector interface
- Compact form factor for easy installation in existing systems
- Suitable for fuels, oils, coolants, and hydraulics
- Broad range of fittings available

Applications:

- Oil Reservoirs (Tank)
- Oil Return Lines
- Fuel Return Lines
- Hydraulic Reservoirs (Tanks)
- Gearboxes / Final Drives
- Filter housings (Pre or Post)
- Industrial Process Piping
- Pump Discharge Line

Advantages

- Low power consumption for battery-driven or embedded systems
- High temperature capable architecture
- No external electronics box
- No calibration required

Industries:

- High Uptime Industrial Machinery
- Power Generation
- Railways
- Wind Turbines
- Gear Motors
- Mining
- Transportation
- Machine Tools
- Compressor Sumps & Scavenge

Kasper Aero
Focused on the Fundamentals

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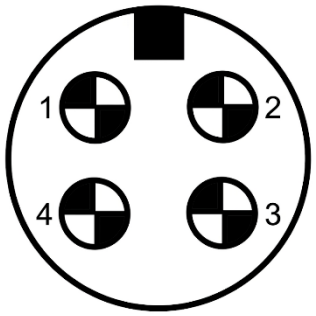
Electrical Characteristics

Electrical characteristics vary by output type. For detailed performance specifications, and exact pinouts, please refer to the individual data sheets for each product variant.

Electrical Data	
Pin 1, Power	Varies by output style
Pin 2, Analog Output	Varies by output style
Pin 3, Digital Output (< 0.050 grams of debris)	Varies by output style
Pin 3, Digital Output (> 0.050 grams of debris)	Varies by output style
Pin 4, Ground	
Max Report Rate [Hz]	10 Hz Max
Circuit Protection	
Reverse Polarity Protection	YES
Over Voltage Protection	YES
Short Circuit Protection	YES
Type of Short Circuit Protection	PULSED
Overload Protection	YES

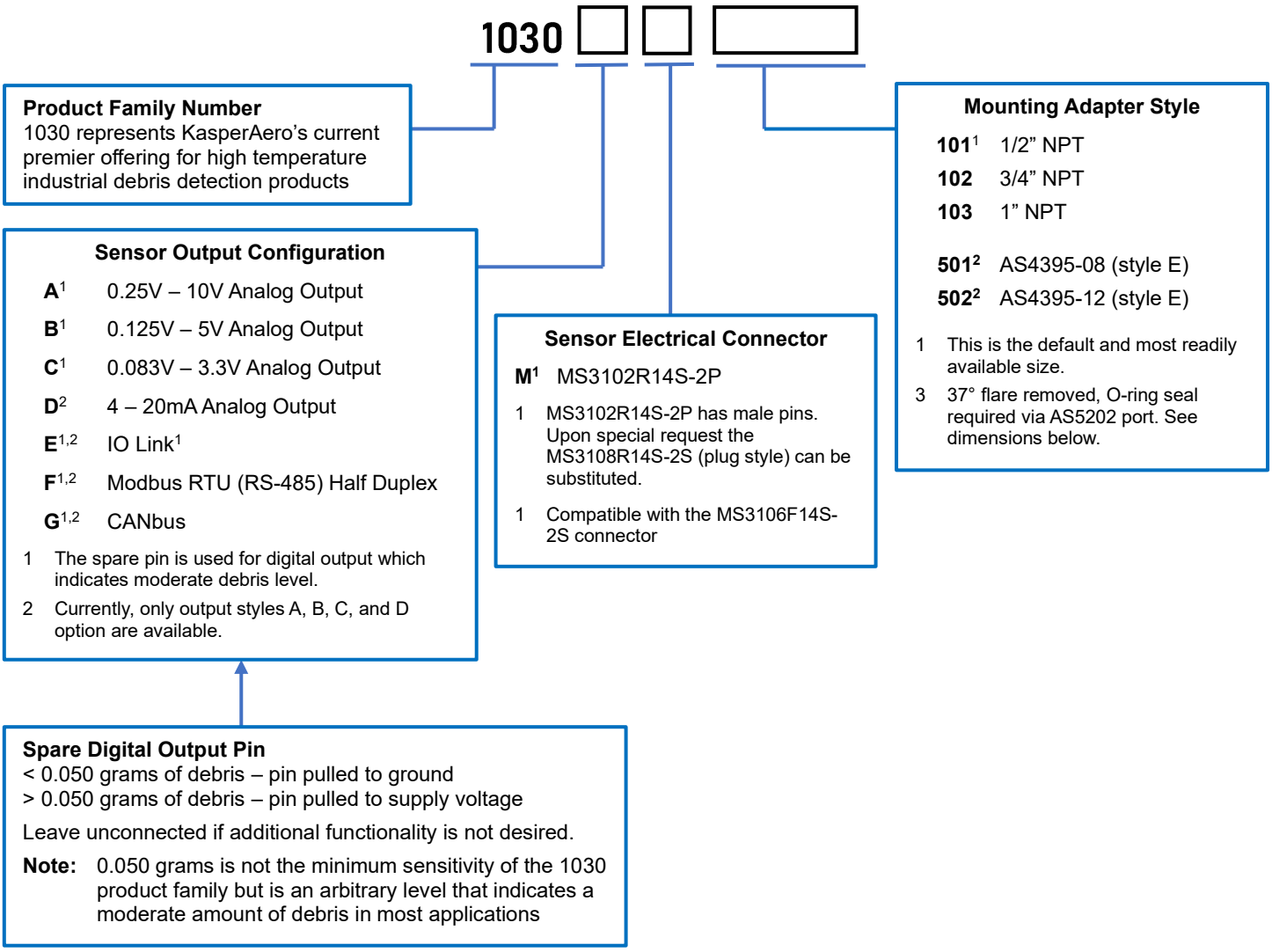
Sensor Electrical Connector	
Part Number Code:	**M**
Description:	MS3102R14S-2P
Pinout:	1. Power (24V) 2. Analog Output 3. Digital Output (0V or 10V) 4. Ground



Physical Characteristics

Mechanical	
Minimum Detectabe Debris	0.010 grams of 10-micron Ferrous Debris (0.053 inch ball)
Maximum Detectable Debris	9.50 grams of 10-micron Ferrous Debris (0.520 inch ball)
Detectable Debris Media	Ferrous Only Aluminum and Ceramic Debris Immune
Sensor Body Material	6061-T6 Aluminum
Sensor Size	See CAD models and dimensions on page 6.
Weight (lbs)	0.250 LBS Max
Note on Pressure Rating	Pressure rating varies depending on attachment method and interface materials.
Environmental	
Sensor Protection	IP66 / IP68
Differential Pressure	400 psi (27.5 bar)
Maximum Operating Temperature	257°F (125°C)
Humidity	95% RH @ +135°F
ATEX	Product not designed for ATEX environments. ATEX debris sensors must be custom solution.
Liquids	
Fuels	Gasoline, Diesel, Kerosene, Jet-A, JP-8, Avgas
Oils / Grease	Petroleum Oil, Grease, Mineral Oil, Synthetic Ester, Gear Oil, PAO based Oils, Automatic Transmission Fluid (ATF), Aeroshell Grease, Aero Lubriplate, Bunker Oil, Polyalkylene Glycol, Vegetable Oil
Hydraulics	Hydraulic Oils (HVI and ISO VG), Mineral Oil Based, Water-Gylcol
Coolants	Ethylene Glycol, Propylene Glycol, Organic Acid Technology (OAT)
Other	Water, Salt Water, Methanol, Isopropyl Alcohol

Part Numbering Breakdown



Currently, only output styles A, B, C, and D have been developed and are available for sale. Please contact our team (Info@KasperAero.com) if these do not meet your needs.

Example Part Numbers

Example 1: 1030AM101

1030 The KasperAero high temperature industrial debris sensor product family.
A 0.25V – 10V Output (and spare digital output pin)
M 4 Pin MS3102R14S-2P Connector
101 1/2" NPT Thread Connection

Example 2: 1030BM102

1030 The KasperAero high temperature industrial debris sensor product family.
B 0.125V – 5V Output (and spare digital output pin)
M 4 Pin MS3102R14S-2P Connector
102 3/4" NPT Thread Connection

Example 3: 1030CM103

1030 The KasperAero high temperature industrial debris sensor product family.
C 0.083V – 3.3V Output (and spare digital output pin)
M 4 Pin MS3102R14S-2P Connector
103 1.00" NPT Thread Connection

Example 4: 1020DM501

1020 A KasperAero industrial debris sensor product family.
D 4mA – 20mAV Output (no spare digital output pin)
M 4 Pin MS3102R14S-2P Connector
501 AS4395-08 (style E) connection. Shipped with a -912 fluorocarbon O-ring that is required if sealing on a boss port.

Example 4: 1030E

IO Link Output not currently available, development in progress. KasperAero recommends using an inline adapter such as the *Banner Engineering S15C Analog Voltage to IO-Link Device Converter* to convert to IO link.

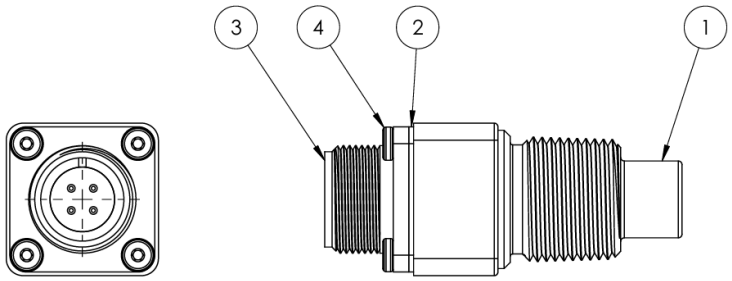
Example 5: 1030F

Modbus Output not currently available, development in progress. KasperAero recommends using an interface adapter such as the *DatExel Voltage to Modbus converter RTU DAT3015V* or the *Banner Engineering S15C-U-MQ Analog Voltage to Modbus Converter.*

Example 6: 1030G

CANbus Output not currently available, development in progress. KasperAero recommends either the *CSS Electronics CANmod.input: 8 x Analog/Digital/Pulse to CAN Bus Converter* or converting to IO Link then converting to CAN Bus.

Assembly



External Bill of Materials (BOM)				
Item Number	**Part Number**	**Description**	**Materials**	**QTY**
1	1030____	Housing, Sensor	6061-T6 Aluminum	1
2	KA-1221-0001	Gasket, Connector	Neoprene	1
3	MS3102R14S-2P	Connector, Electrical	6061-T6 Aluminum	1
4	KA-4122-2001	Screw, Socket HD Cap, LP	18-8 Stainless Steel	4

Dimensions

Adapter Dimensions			
Adapter Style	**Thread Type**	**Overall Length** (inches)	**Wrench Size** (inches)
101[1]	1/2” NPT	2.912	1.250
102	3/4” NPT	2.912	1.250
103	1” NPT	2.912	1.250
501[3]	AS4395-08 (style E) .7500-16-UNJF	2.787	1.250
502[4]	AS4395-12 (style E) 1.0625-12-UNJ	2.787	1.375
NOTES:	1 This is the default and most readily available size. 2 Requires face seal. Unit shipped aluminum crush washer. See dimensions below. Upgrade to dowty washer for more demanding applications. 3 37° flare removed, O-ring seal required via AS5202-08 and AS5202-12 port. See dimensions below.		

See CAD models on KasperAero.com