JORAL
INNOVATIVE SENSING SOLUTIONS

Hockey Puck™
Non-contact rotary position sensor
HP38 General Specifications
Non-contact ; HP38 / 1 of 3   *Joral REF S2; I4 / 1*

NON-CONTACT POSITION SENSORS

HP38 Hockey Puck™ *non-contact rotary position sensor*

- 🔴 OEM driven solution with minimum order quantities
- Compact bare bones non-contact rotary encoder
  - Body only 0.69" *(17.5mm)* tall
- Patented true non-contact position sensing
  - 0.5" (12mm) gap between sensor and application
  - 0.10" (2.5mm) center alignment
  - 30° planar tilt
- Totally sealed IP69K *(connector dependent)*
- LED indicators for power and output feedback
- Outputs: Quadrature, SSI, Analog, & J1939 Can Bus

STANDARD OPERATING CHARACTERISTICS

ELECTRICAL			
Outputs	**B - [PPR] - SEPP**	Incremental 10 bit Quadrature w/ Single Ended Output | A B Z	
	B - 1939	J1939 10 bit @ 512 positions	
	B - PWM	PWM absolute position	
	B - SSI1	SSI absolute position @ 512 positions	
	V1	Voltage Out / 5 VDC IN, 0-5 VDC OUT	
	V2	Voltage Out / 6-36 VDC IN, 0-5 VDC OUT	
Input Power		6 to 30 VDC at approx 60 mA max, *not including output loads*	
Electrical Protection		Over-voltage, reserve-voltage, output short-circuit protected	
LED Indicators		Power and output channels	
Connections		M8, M12 Pigtail, Terminal Block, Flying Lead Cable, or Deutsch (4 or 6 pin)	
Resolution		0.3°	
Repeatability		0.30%	
Nonlinearity		<1%	

MECHANICAL		
Housing Diameter	38mm	
Housing Material	Black Delrin™ *(standard)*	
Housing Height	0.69" *(17.5mm)* body	
Mounting	32mm (.884) spacing w/ 4mm diameter screws	
Weight	1.3 oz	
Magnet / sensor gap*	Standard 0.5" (12mm) (Max w/ custom mag assembly up to 1" [30mm])	
Rated planer tilt / axial gap*	Planar 30° *(Max 45°)* / Axial 0.1" *(2.5mm) (Max 0.16" [4mm])*	
Speed	3000 RPM max	

* Non-contact tolerances rated using MAGH-RING 1/4x20 magnet accessory.

ENVIRONMENTAL		
Operating Temperature	-30° to +80° C	
Storage Temperature	-40° to +90° C	
Humidity	100%	
Shock	400g/6ms *(MIL STD 202)*	
Vibration	5 to 3000 Hz, 20g *(MIL STD 202)*	
Protection Class	IP69K *(connection dependent)*	

General ordering guide found on next page (S2; I4 / 2)

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HP38 General Ordering Guide
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NON-CONTACT POSITION SENSORS

HP38 GENERAL ORDERING GUIDE

Build part number first by selecting **Housing Style** (code 1), **MagElec** (code 2), and **Connection** (code 3). Add **Special Codes** (code 4) to the end of the Joral part number. Refer to **'Special Part Number Information'** for explanation of modifiers.

Examples: **HP38-B-0256-SEPP-M12P** - Black Delrin™ (HP38), M12 pigtail (M12P), 10 bit incremental quadrature @ 256 ppr

HP38-B-1939-SC72 - Black Delrin™ (HP38), 72" Shielded cable, 10 bit J1939 @ 512 positions

HP38-V1-0-360-5-4.5-CW-C72 - Black Delrin™ (HP38), 72" Cable (SC72), 0-5v Voltage Out (V1) @ 0-360°, 0.5-4.5v out, clockwise signal

Code 1: Housing Style	Code 2: MagElec (Sensor Output)		Code 3: Connection		Code 4: Special Codes	
HP38 HP38 material black Delrin™, connector orientation SIDE EXIT. For REAR EXIT connector on HP38 add code 33 to end of P/N.	**B - _ _ _ _ - SEPP**	10 bit single ended quadrature - A B Z	**TRM**	Pluggable Terminal block	**31**	Side Exit (housing wall)
	B - 1939	10 bit J1939 @ 512 positions	**M8**	M8 male	**33**	Back Exit (epoxy side)
			M12P	M12 male on 18' pigtail	**71**	Roller
	B - SSI1	Absolute position SSI @ 512 positions	**CXX**	Flying lead cable (enter XX as inches)	**72**	Spindle
	B - PWM	PWM absolute position	**SCXX**	Shielded cable (enter XX as inches)		
* More outputs and connection options available, contact Joral if desired configuration is not listed	**V1**	5 VDC IN, 0-5 VDC OUT	**DE4**	DT04 - 4 pin male Deutsch		
	V2	6-36 VDC IN, 0-5 VDC OUT	**DE6**	DT04 - 6 pin male Deutsch		

Special Part Number Information   *Review below code sections for important P/N build information*

Code 1: Housing Style
- **Modifier 33** - For BACK EXIT connector orientation on HP38 add 33 to end of Joral P/N
- **HP38** - Handles ALL back exit and CABLE ONLY side exit connections

Code 2: MagElec

(B - _ _ _ _ - SEPP)
- Enter Quadrature PPR in place of _ _ _ _
- B = 10 bit PPR
- **Available 10 bit PPR:** 0032, 0064, 0128, 0256

B - 1939
- 10 bit J1939 output is 512 positions
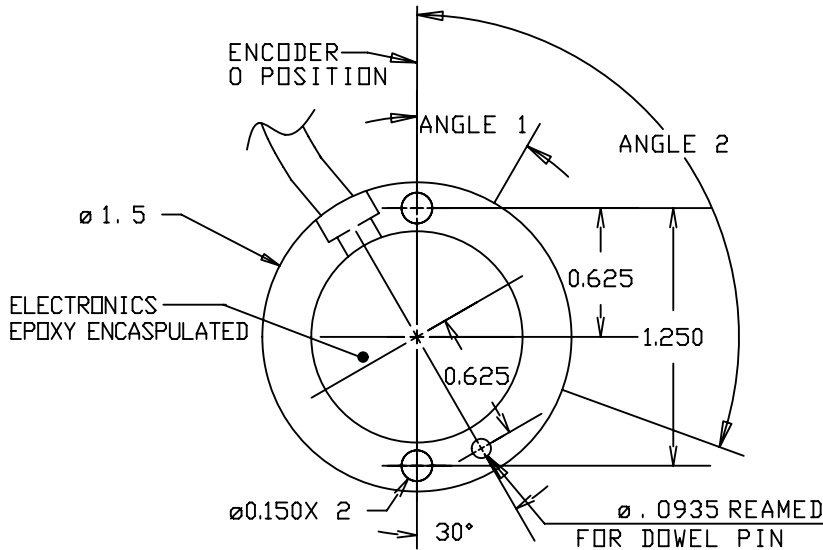- B = 10 bit

V1, V2, and I1 (Analog MagElec P/N Guide)
- First select MagElec code (**V1, V2 or I1**) then Angle Range (**A1-A2**), Voltage Range (**VR1-VR2**) and Signal Direction (**Clockwise [CW] or Counter [CCW]**)
- **PART NUMBER FORMULA** (MagElec)-(A1-A2)-(VR1-VR2)-(CW or CCW)
- **EXACT V1, V2, and I1 EXAMPLES**
  HP38 - **V1 - 0-360 - 0.5-4.5 - CW** - C72
  HP38 - **V2 - 0-180 - 0-5 - CCW** - C72
  HP38 - **I1 - 180-270 - 4-20 - CW** - C72

Code 3: Connections
- **All Outputs, All Connections** - Standard connection orientation SIDE EXIT. For BACK EXIT connector on HP38 add 33 to end of Joral HP38 P/N
- **J1939 Output** - Addressing via varying value resistor in connection requires at least five conductors *(M12, DE6 and Cables addressing compatible)*
- **All Outputs w/ Deutsch** - DE4 and DE6 connection Deutsch connectors add $20 to HP38 list

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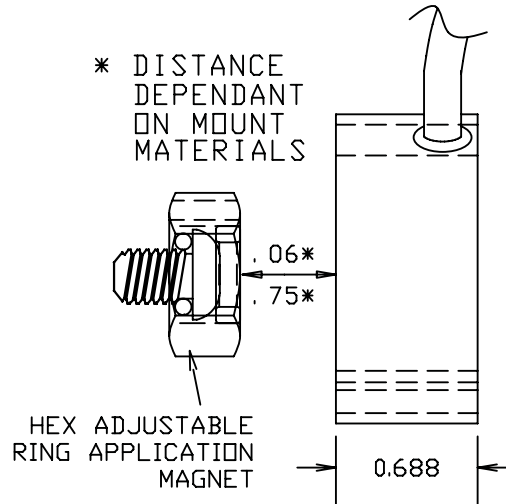
Hockey Puck™
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HP38 Dimensions & General Pin-outs
Non-contact ; HP38 / 3 of 3   *Joral REF S2; I4 / 3*

NON-CONTACT POSITION SENSORS

HP38 DIMENSIONS & GENERAL PIN OUTS

ENCODER
0 POSITION

ANGLE 1   ANGLE 2

ø 1.5

0.625

ELECTRONICS
EPOXY ENCASPULATED

1.250

0.625

ø0.150X 2   30°   ø .0935 REAMED
FOR DOWEL PIN

STANDARD MAGNET
MAG-H-RING-ASSM.
1/4-20 X .47
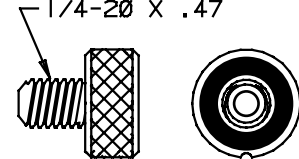
MAGNET NOTE:
STANDARD MAGNET INCLUDED AS ACCESSORY WITH PURCHASE OF NON-CONTACT SENSOR

HOUSING/INSTALL NOTES:
MAGNET MOUNT MATERIALS MUST HAVE Ø1.0 [25.4] HOLE CENTERED ON SENSOR CENTERLINE

NON-MAGNETIC MOUNT MATERIAL, MAY BE SOLID

MOUNT WITH 316 STAINLESS STEEL 4-40 SCREWS

* DISTANCE
DEPENDANT
ON MOUNT
MATERIALS

.06*
.75*

HEX ADJUSTABLE
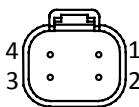RING APPLICATION
MAGNET

0.688

V1,V2,I1
HEX ADJUSTABLE
MAGNET DETAIL
(FACE VIEW)

0.688
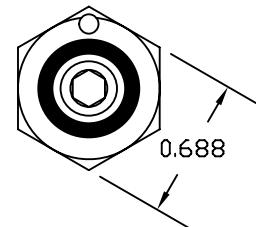
HEX ADJUSTABLE MAGNET NOTE:
ADJUSTABLE RING MAGNET INCLUDED AS ACCESSORY WITH PURCHASE OF ANALOG/VOLTAGE NON-CONTACT SENSOR (OUPUTS V1, V2, I1)

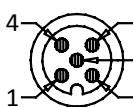FOR ZERO/HOME POSITION CAPABILITY WITH ALL ANALOG ABSOLUTE NON-CONTACT POSITION SENSORS

DT04-4P MALE FACE VIEW

4			1
3			2

DT04-4P J1939 OUTPUT
1 = YEL = CAN HIGH
2 = GRN = CAN LOW
3 = RED = +VDC (VIN)
4 = BLK = COMMON/GROUND

DT04-6P MALE FACE VIEW

6		1
5		2
4		3

DT04-6P J1939 OUTPUT
1 = YEL = CAN HIGH
2 = GRN = CAN LOW
3 = RED = +VDC (VIN)
4 = BLK = ADDRESS GROUND
5 = WHT = ADDRESS PROG. RESISTOR
6 = BLK = COMMON/GROUND

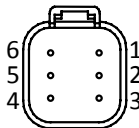**M12-5P MALE FACE VIEW**

4 — 3
5
1 — 2

M12-5P/CABLE/FLYING LEAD QUADRATURE OUTPUT
1 = BRN = +VDC (VIN)
2 = WHT = CHANNEL B
3 = BLUE = COMMON/GROUND
4 = BLK = CHANNEL A
5 = GRY = CHANNEL Z

M12-5P AND 5 CONDUCTOR CABLE J1939 OUTPUT
1 = BRN = +VDC (VIN)
2 = WHT = CAN HIGH
3 = BLUE = COMMON/GROUND
4 = BLK = CAN LOW
5 = GRY = OPTIONAL ADDRESS PROGRAMMING RESISTOR

M12-5P/CABLE/FLYING LEAD PROPORTIONAL (ANALOG) OUTPUT
1 = BRN = +VDC (VIN)
2 = WHT = DIG. LIMIT OUT*
3 = BLUE = COMMON/GROUND
4 = BLK = PROP. VDC OUTPUT
5 = GRY = NOT USED
*OPTION CONSULT FACTORY

Dimensions informative only
For most recent dimensions please consult factory