Baumer
Passion for Sensors

Incremental encoders

HS35P - Programmable

Insulated through hollow shaft ø0.375...1 inch

1...8192 pulses per revolution programmable (interpolated system)

Overview

- Robust industrial encoder up to IP 67 protection
- Highly versatile fully programmable encoder
- Interchangeable bore size(s) using metal inserts
- Insulating sleeve to prevent high shaft currents from damaging bearings
- Programmable resolution from 1...8192 ppr
- User programmable index pulse width and location
- Programmable from PC or standalone Baumer Programming Tools
- Wide range voltage supply 4.75...30 VDC
- Shock resistant up to 200 g's



Technical data

Technical data - electrical ratings

Voltage supply	4.75...30 VDC
Reverse polarity protection	Yes
Consumption w/o load	≤50 mA (24 VDC) ≤180 mA (5 VDC) + output load, max. 250 mA
Pulses per revolution	1 … 8192
Sensing method	Optical
Output frequency	≤300 kHz (TTL) ≤160 kHz (HTL)
Output signals	A, B, Z A, B, Z + complement, ½ cycle index gated with negative B channel
Output stages	Linedriver (TTL, 7272) Vout = 5 V, short-circuit proof Push-pull (HTL, 7272) Vout = Vin, short-circuit proof
Programmable parameters	Output resolution in increments of one (can be different for A and B) Output level TTL/HTL Zero pulse width and position Rotational direction CW/CCW
Interference immunity	DIN EN 61000-6-2
Emitted interference	DIN EN 61000-6-3
Approval	UL approval / file no. E240061 RoHS compliant EU guideline 2011/65/EC CE

Technical data - mechanical design

Size (flange)	ø3.15" (ø80 mm)

Technical data - mechanical design

Shaft type	ø0.375...1" (ø9.525...25.4 mm) (through hollow shaft isolated)
Bore runout	0.0016" (0.04 mm) TIR max.
Admitted misalignment	0.004" (0.1016 mm) radial TIR (end of shaft) 0.01" (0.254 mm) axial
Protection DIN EN 60529	IP 54 IP 65 IP 67
Operating speed	≤5000 rpm (see temperature diagram)
Bearing	52100 SAE high carbon steel (ABEC 5)
Starting torque	≤3 in-oz (77 °F, IP 65) ≤0,02 Nm (+25 °C, IP 65)
Rotor moment of inertia	2,3 oz-in² (420 gcm²)
Service life	Bearing: typ. 13 billion rev. (89000 h/2500 rpm)
Material	Housing: aluminium, powder-coated Shaft: stainless steel
Operating temperature	-40...+212 °F (-40...+100 °C), (fixed cable): see temperature diagram
Relative humidity	98 % non-condensing
Resistance	DIN EN 60068-2-6 Vibration 20 g, 60-2000 Hz DIN EN 60068-2-27 Shock 200 g, 6 ms
Connection	MIL-connector, 7-pin MIL-connector, 10-pin Cable (AWG26 wire)
Weight approx.	23 oz. 660 g

2020-03-24 The product features and technical data specified do not express or imply any warranty. Technical modifications subject to change.

HS35P - Programmable

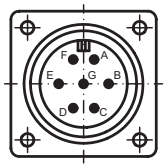
Insulated through hollow shaft ø0.375...1 inch

1...8192 pulses per revolution programmable (interpolated system)

Terminal assignment

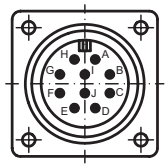
MI07: MIL-connector, 7-pin

Connector	Assignment
Pin A	Track A
Pin B	Track B
Pin C	Track Z
Pin D	+Vs
Pin E	–
Pin F	0 V
Pin G	Housing



MI10: MIL-connector, 10-pin

Connector	Assignment
Pin A	Track A
Pin B	Track B
Pin C	Track Z
Pin D	+Vs
Pin E	–
Pin F	0 V
Pin G	Housing
Pin H	Track A complement
Pin I	Track B complement
Pin J	Track Z complement



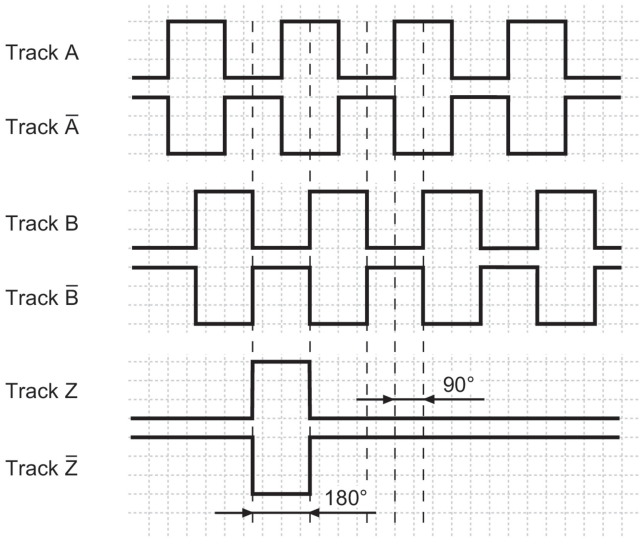
Cable gland (AWG26 wire)

Core colour	Assignment
green	Track A
grey	Track B
pink	Track Z
red	+Vs
blue	0 V
transparent	Shield/Housing
brown	Track A complement
black	Track B complement
white	Track Z complement

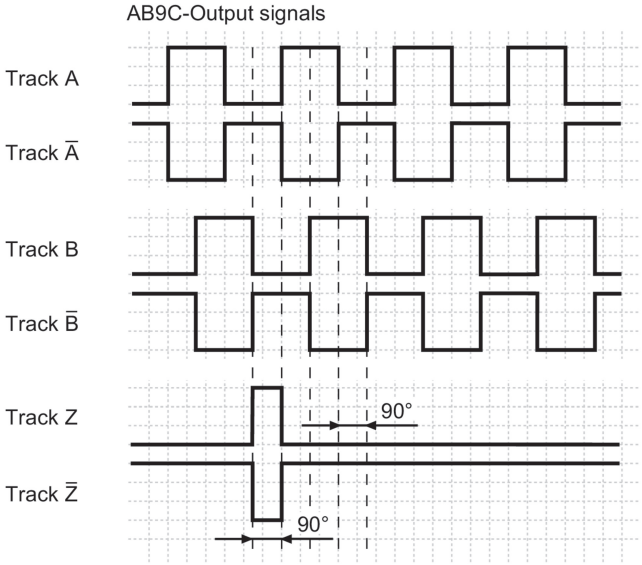
Output signals

Phasing = B: Counterclockwise rotation (standard) from clamping end.
Phasing = D: Clockwise rotation (option) from clamping end.

ABZC-Output signals



AB9C-Output signals



The product features and technical data specified do not express or imply any warranty. Technical modifications subject to change.
2020-03-24

HS35P - Programmable

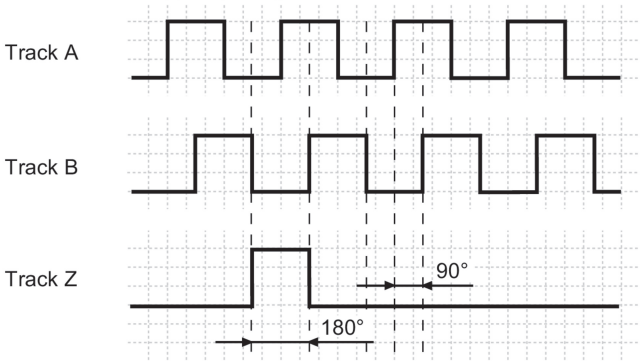
Insulated through hollow shaft ø0.375...1 inch

1...8192 pulses per revolution programmable (interpolated system)

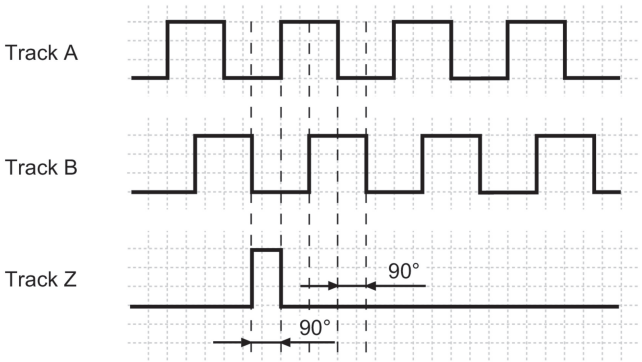
Output signals

Phasing = B: Counterclockwise rotation (standard) from clamping end.
Phasing = D: Clockwise rotation (option) from clamping end.

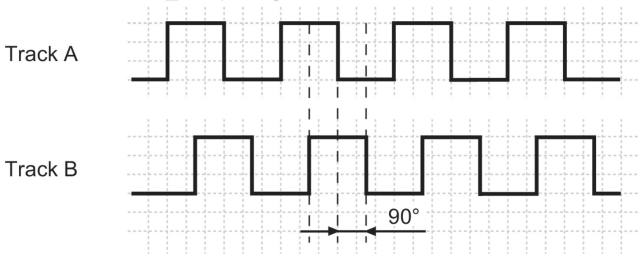
ABZ_-Output signals



AB9_-Output signals



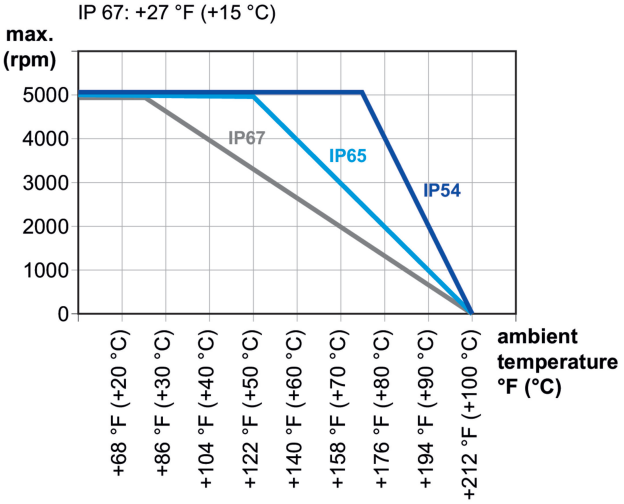
AB0_-Output signals



Temperature diagram

ambient temperature + self heating
≤ max. operating temperature +212 °F (+100 °C)

self-heating per 1000 rpm:
IP 54: +9 °F (+5 °C)
IP 65: +18 °F (+10 °C)
IP 67: +27 °F (+15 °C)



Trigger level

Outputs	**Linedriver** (TTL, ET7272)
Output level High	≥2.4 V
Output level Low	≤0.5 V
Load	≤40 mA

Outputs	**Push pull** (HTL, ET7272)
Output level High	≥UB -3 V
Output level Low	≤1.5 V
Load	≤40 mA

2020-03-24 The product features and technical data specified do not express or imply any warranty. Technical modifications subject to change.

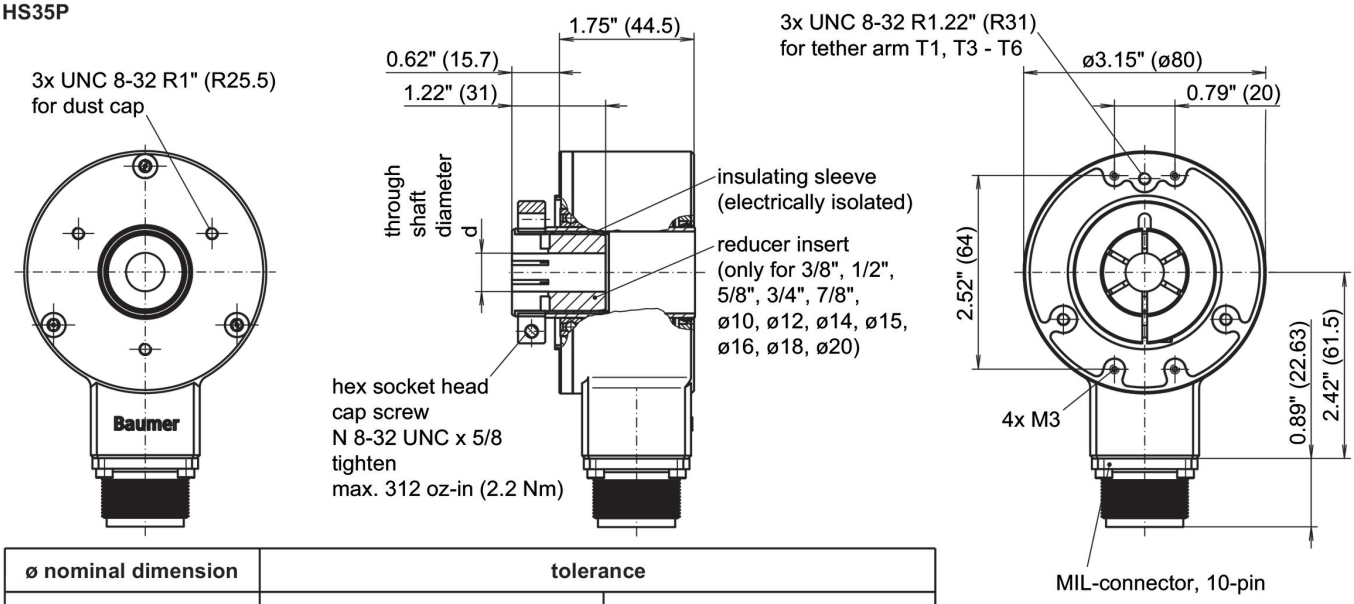
HS35P - Programmable

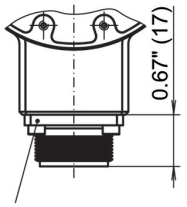
Insulated through hollow shaft ø0.375...1 inch

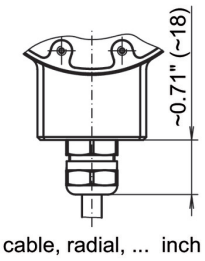
1...8192 pulses per revolution programmable (interpolated system)

Dimensions

HS35P







ø nominal dimension		tolerance					
		hollow shaft encoder			recommended customer shaft		
inch (in ")	metric (in mm)		inch (in 1/1000")	metric (in µm)		inch (in 1/1000")	metric (in µm)
1.000"	25.400	G7	+1.10 +0.28	+28 +7	h6	0 -0.51	0 -13
0.875"	22.225	G7	+1.10 +0.28	+28 +7	h6	0 -0.51	0 -13
0.750"	19.050	G7	+1.10 +0.28	+28 +7	h6	0 -0.51	0 -13
0.625"	15.875	G7	+0.94 +0.24	+24 +6	h6	0 -0.43	0 -11
0.500"	12.700	G7	+0.94 +0.24	+24 +6	h6	0 -0.43	0 -11
0.375"	9.525	G7	+0.79 +0.20	+20 +5	h6	0 -0.35	0 -9
0.787"	20	H8	+1.30 0	+33 0	g6	-0.28 -0.79	-7 -20
0.709"	18	H8	+1.06 0	+27 0	g6	-0.24 -0.67	-6 -17
0.630"	16	H8	+1.06 0	+27 0	g6	-0.24 -0.67	-6 -17
0.591"	15	H8	+1.06 0	+27 0	g6	-0.24 -0.67	-6 -17
0.551"	14	H8	+1.06 0	+27 0	g6	-0.24 -0.67	-6 -17
0.472"	12	H8	+1.06 0	+27 0	g6	-0.24 -0.67	-6 -17
0.394"	10	H8	+1.06 0	+27 0	g6	-0.20 -0.55	-5 -14

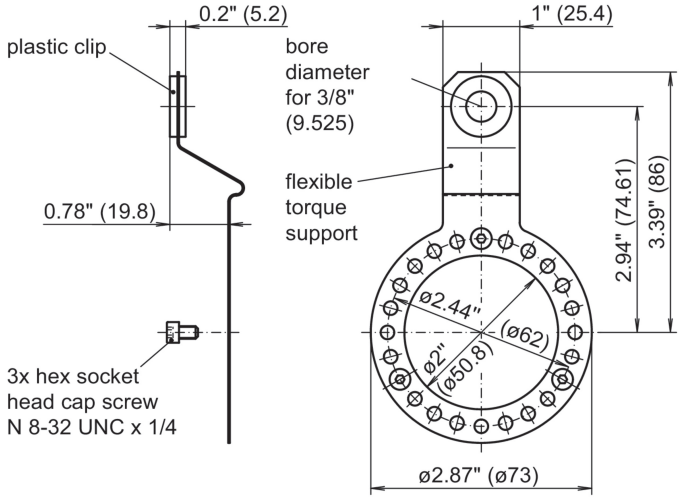
2020-03-24 The product features and technical data specified do not express or imply any warranty. Technical modifications subject to change.

HS35P - Programmable

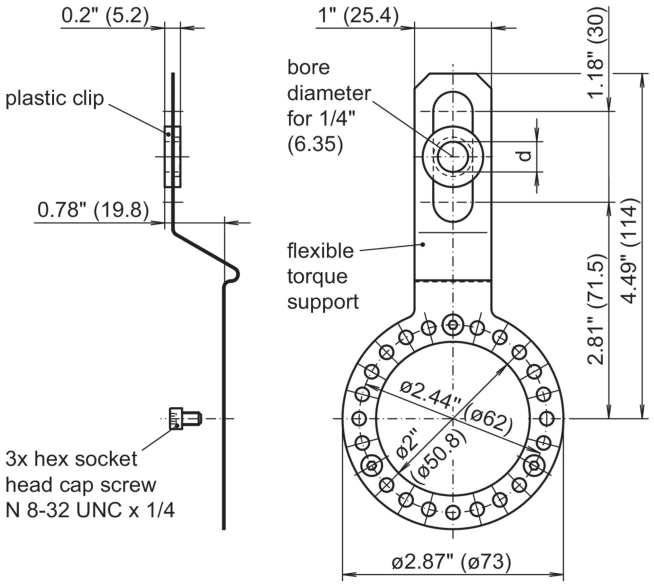
Insulated through hollow shaft ø0.375...1 inch

1...8192 pulses per revolution programmable (interpolated system)

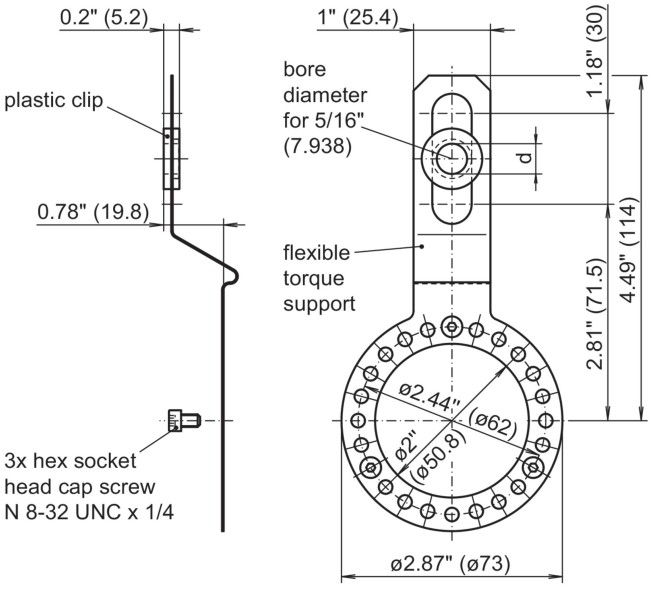
Dimensions



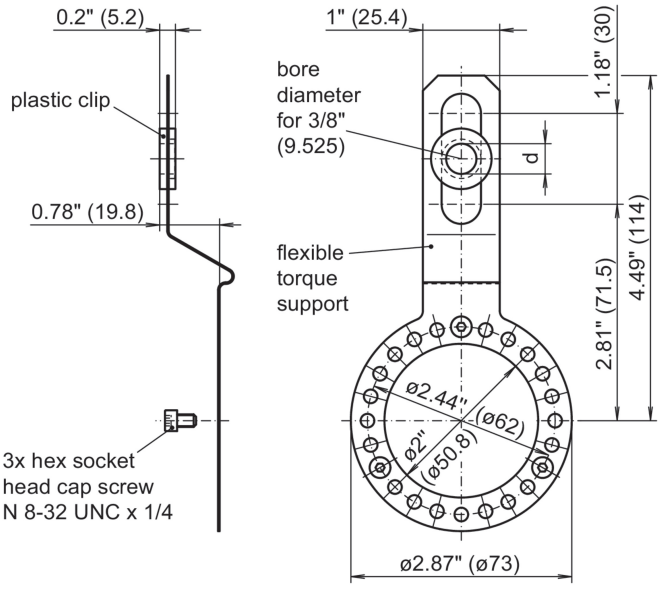
Tether arm T1



Tether arm T3



Tether arm T4



Tether arm T5

The product features and technical data specified do not express or imply any warranty. Technical modifications subject to change.

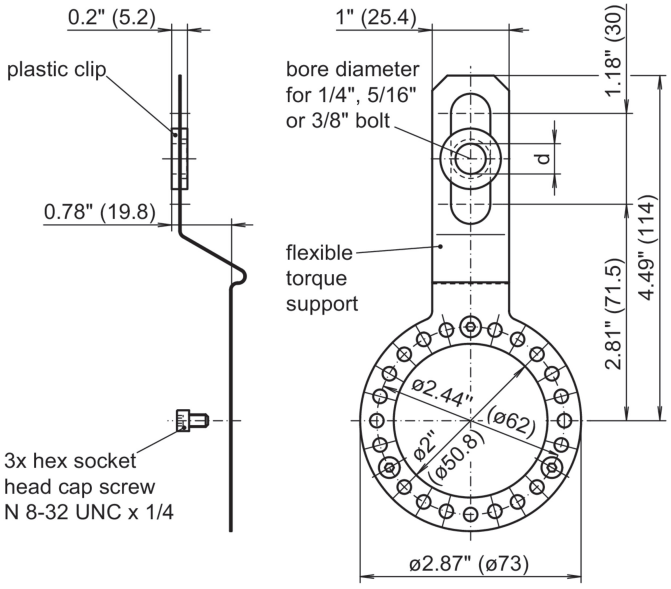
2020-03-24

HS35P - Programmable

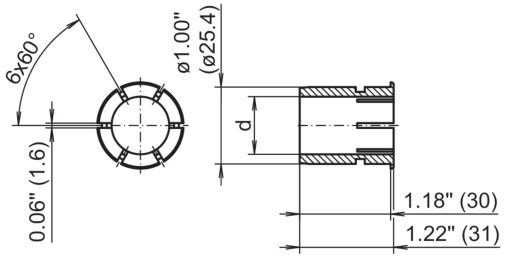
Insulated through hollow shaft ø0.375...1 inch

1...8192 pulses per revolution programmable (interpolated system)

Dimensions

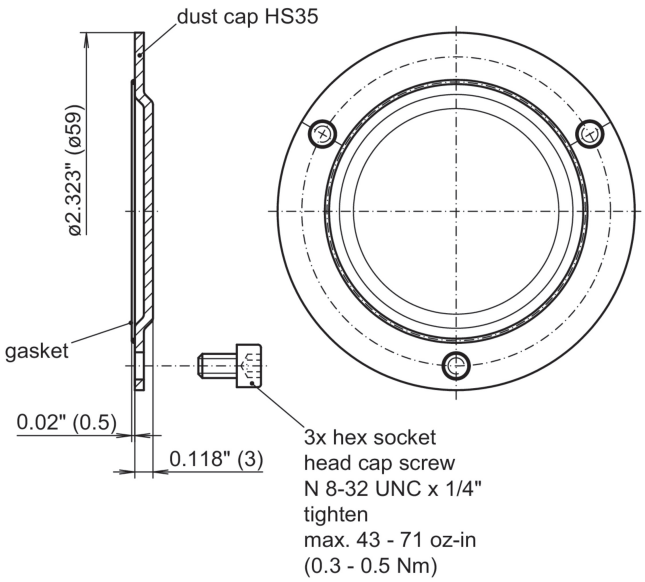


Tether arm T6

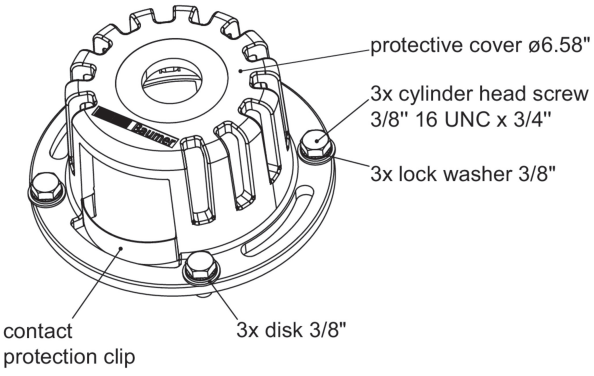


ø nominal dimension		tolerance		
inch (in ")	metric (in mm)		inch (in 1/1000")	metric (in µm)
0.875"	22.225	G7	+1.10 +0.28	+28 +7
0.750"	19.050	G7	+1.10 +0.28	+28 +7
0.625"	15.875	G7	+0.94 +0.24	+24 +6
0.500"	12.700	G7	+0.94 +0.24	+24 +6
0.375"	9.525	G7	+0.79 +0.20	+20 +5
0.787"	20	H8	+1.30 0	+33 0
0.709"	18	H8	+1.06 0	+27 0
0.630"	16	H8	+1.06 0	+27 0
0.551"	15	H8	+1.06 0	+27 0
0.551"	14	H8	+1.06 0	+27 0
0.472"	12	H8	+1.06 0	+27 0
0.394"	10	H8	+1.06 0	+27 0

Reducer inserts



Dust cap HS35



Protective cage HS35

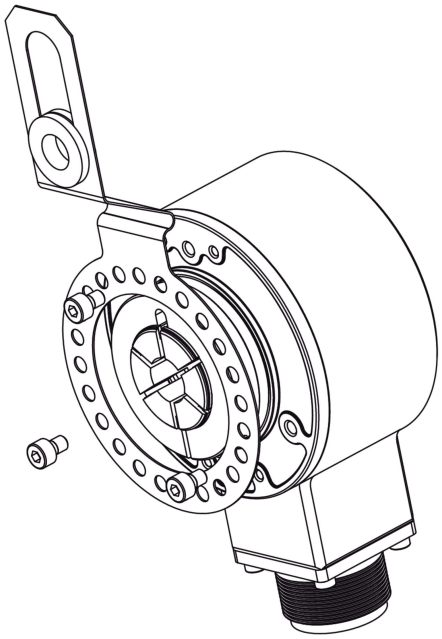
2020-03-24 The product features and technical data specified do not express or imply any warranty. Technical modifications subject to change.

HS35P - Programmable

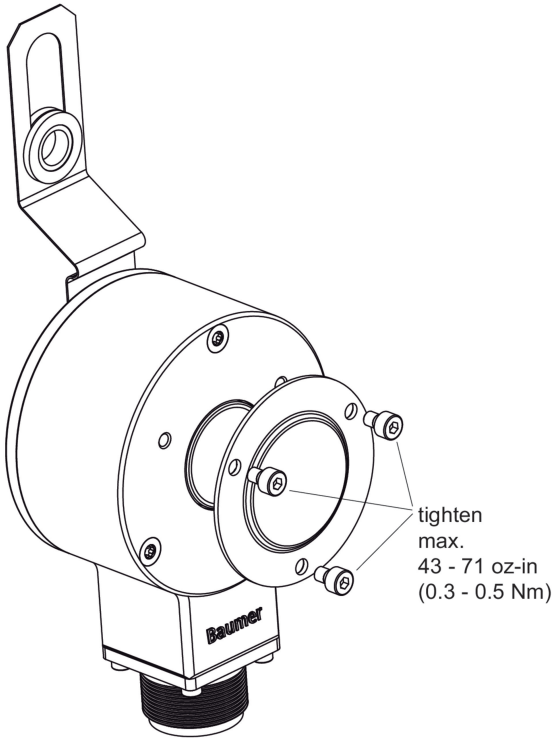
Insulated through hollow shaft ø0.375...1 inch

1...8192 pulses per revolution programmable (interpolated system)

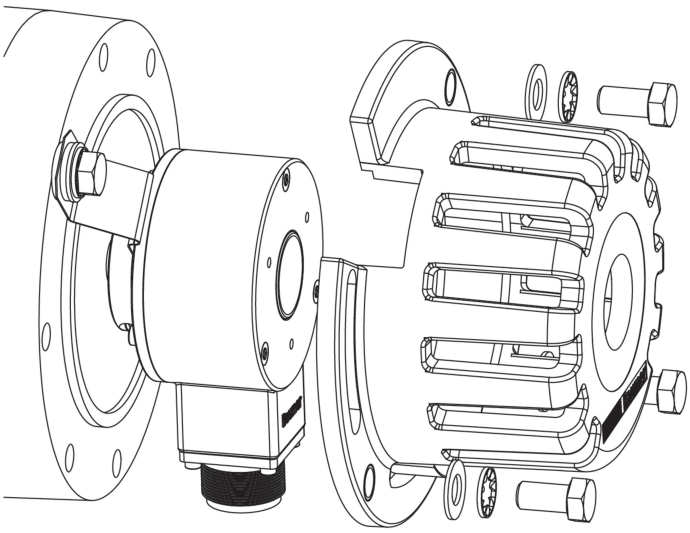
Dimensions



Example fitting tether arm



Example fitting dust cap



Example fitting protective cover

2020-03-24 The product features and technical data specified do not express or imply any warranty. Technical modifications subject to change.

HS35P - Programmable

Insulated through hollow shaft ø0.375...1 inch

1...8192 pulses per revolution programmable (interpolated system)

Ordering reference

	HS35P	01024	T	####	#######	B	E	###	#	###
Product information										
Incremental encoder HS35P	HS35P									
Pulses programmable										
00001...08192 ppr programmable (1024 ppr factory setting)		01024								
Voltage supply										
Linedriver (TTL): UB= 4.75...30 VDC, Vout = 5 VDC (7272), programmable (factory setting)			T							
Output signal										
A, B, Z				ABZ_						
A, B, Z + complements				ABZC						
Connection										
MIL-connector, 7-pin					MI07					
MIL-connector, 10-pin					MI10					
Cable radial, 12 (305 mm)					C012					
Cable radial, 18 (457 mm)					C018					
Cable radial, 24 (610 mm)(1)					C024					
Phasing										
Standard phasing, CCW rotation, A leads B						B				
Operating temperature										
-40...+212 °F (-40...+100 °C)							E			
Through hollow shaft										
Ø0.375 (Ø9.525 mm) isolated, clamping ring A-side								037		
Ø0.500 (Ø12.7 mm) isolated, clamping ring A-side								050		
Ø0.625 (Ø15.88 mm) isolated, clamping ring A-side								062		
Ø0.750 (Ø19.05 mm) isolated, clamping ring A-side								075		
Ø0.875 (Ø22.23 mm) isolated, clamping ring A-side								087		
Ø1.000 (Ø25.4 mm) isolated, clamping ring A-side								100		
Ø10 mm isolated, clamping ring A-side								M10		
Ø12 mm isolated, clamping ring A-side								M12		
Ø14 mm isolated, clamping ring A-side								M14		
Ø15 mm isolated, clamping ring A-side								M15		
Ø16 mm isolated, clamping ring A-side								M16		
Ø18 mm isolated, clamping ring A-side								M18		
Ø20 mm isolated, clamping ring A-side								M20		
Protection class										
IP 54									4	
IP 65									5	
IP 67(2)									7	
Mounting kit										
Tether arm T1, fixed length, for bolt 3/8										T1
Tether arm T3, adjustable length, for bolt 1/4										T3
Tether arm T4, adjustable length, for bolt 5/16										T4
Tether arm T5, adjustable length, for bolt 3/8										T5
Tether arm T6, adjustable, kit, bolts 1/4, 5/16, 3/8										T6

(1) Other cable lengths on request.
(2) Dust cap included

2020-03-24 The product features and technical data specified do not express or imply any warranty. Technical modifications subject to change.

HS35P - Programmable

Insulated through hollow shaft ø0.375...1 inch

1...8192 pulses per revolution programmable (interpolated system)

Accessories

Mounting accessories

11076339	Torque arm T1, fixed length, for bolt 3/8" with plastic clip and screws
11075692	Torque arm T3, adjustable length, for bolt 1/4" with plastic clip and screws
11075690	Torque arm T4, adjustable length, for bolt 5/16" with plastic clip and screws
11071506	Torque arm T5, adjustable length, for bolt 3/8" with plastic clip and screws
11167978	Torque arm T6, adjustable length, kit for bolts 1/4", 5/16" and 3/8" with plastic clip and screws
11084462	Reducer insert HS35 ø0.375" (ø9.525 mm)
11078636	Reducer insert HS35 ø0.50" (ø12.7 mm)
11080114	Reducer insert HS35 ø0.625" (ø15.875 mm)
11078639	Reducer insert HS35 ø0.75" (ø19.05 mm)
11078654	Reducer insert HS35 ø0.87" (ø22.225 mm)
11087744	Reducer insert HS35 ø10 mm
11087745	Reducer insert HS35 ø12 mm
11087746	Reducer insert HS35 ø14 mm
11148651	Reducer insert HS35 ø15 mm
11087747	Reducer insert HS35 ø16 mm
11087748	Reducer insert HS35 ø18 mm
11087750	Reducer insert HS35 ø20 mm
11075459	Dust cap HS35
11080884	Protective cage HS35

Accessories

Connectors and cables

11150977	NAC 25E 7-pin Mil Spec Mating Connector (Stock in US)
11150863	CNAC 25E0500 7-pin Mil Spec Mating Connector + cable L = 5 m (Stock in US)
11150865	CNAC 25E1000 7-pin Mil Spec Mating Connector + cable L = 10 m (Stock in US)
11150978	NAC 29H 10-pin Mil Spec Mating Connector (Stock in US)
11151376	CNAC 29H0200 10-pin Mil Spec Mating Connector + cable L = 2 m (Stock in US)
11150869	CNAC 29H0500 10-pin Mil Spec Mating Connector + cable L = 5 m (Stock in US)
11150871	CNAC 29H1000 10-pin Mil Spec Mating Connector + cable L = 10 m (Stock in US)
11151328	CNAC 29H1500 10-pin Mil Spec Mating Connector + cable L = 15 m (Stock in US)
11150872	CNAC 29H2500 10-pin Mil Spec Mating Connector + cable L = 25 m (Stock in US)
11128642	NAC 25E 7-pin Mil Spec Mating Connector
11078440	CNAC 25E 7-pin Mil Spec Mating Connector + cable L = 10 feet (3.05 m)
11078442	CNAC 25E 7-pin Mil Spec Mating Connector + cable L = 20 feet (6.10 m)
11078446	CNAC 25E 7-pin Mil Spec Mating Connector + cable L = 30 feet (9.15 m)
11126235	NAC 29H 10-pin Mil Spec Mating Connector
11078307	CNAC 29H 10-pin Mil Spec Mating Connector + cable L = 10 feet (3.05 m)
11078427	CNAC 29H 10-pin Mil Spec Mating Connector + cable L = 20 feet (6.10 m)
11078428	CNAC 29H 10-pin Mil Spec Mating Connector + cable L = 30 feet (9.15 m)

Programming accessories

11120547	PC Programming Tool Z-PA-EI-P
11120657	Handheld Programming Tool Z-PA-EI-H

The product features and technical data specified do not express or imply any warranty. Technical modifications subject to change.
2020-03-24