Baumer
Passion for Sensors

Sine encoders

HS35S - Sine

Insulated through hollow shaft ø0.375...1 inch
1024...2048 sinewave cycles per turn

Overview

- Rugged design up to IP 67 protection
- Shock resistant up to 200 g's
- Insulating insert to prevent high shaft currents from damaging bearings
- Wide range voltage supply 4.75...30 VDC
- Precision ≤60 arc-seconds for perfect process control
- Patented LowHarmonics® technology
- Outstanding signal quality for superior speed control



Technical data

Technical data - electrical ratings	
Voltage supply	4.75...30 VDC
Reverse polarity protection	Yes
Consumption w/o load	≤90 mA
Sinewave cycles per revolution	1024 … 5000
Accuracy	≤60 arc-seconds
Sensing method	Optical
Output frequency	≤180 kHz (-3 dB)
Output signals	A+, A-, B+, B-, Z+, Z-
Output stages	SinCos 1 Vpp
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)
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

Technical data - mechanical design	
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, 10-pin Cable (AWG26 wire)
Weight approx.	23 oz. 660 g

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2020-03-24

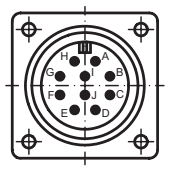
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Terminal assignment

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 –
Pin I	Track B –
Pin J	Track Z –

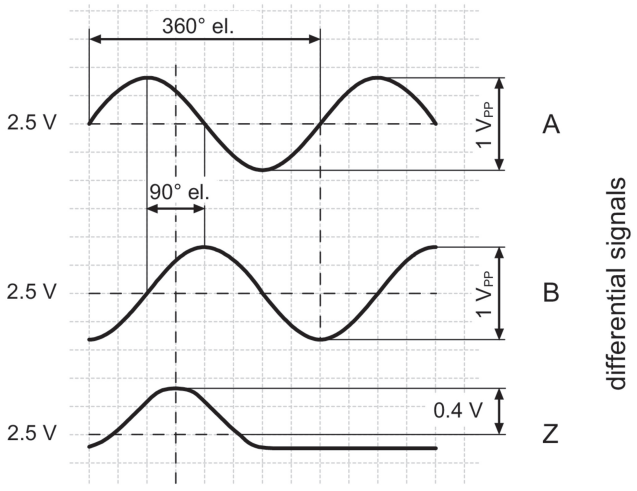


Cable gland (AWG26 wire)

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

Output signals

Clockwise rotation when looking at the mounting side.



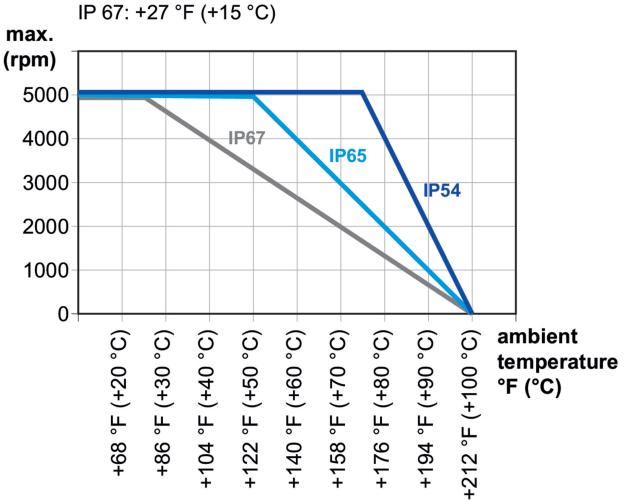
Output signal level

Outputs	Sine
Output amplitude A + B	1 V_{PP} at Z_0 = 120 Ω
Output amplitude N	approx. 0,4 V (useable part) at Z_0 = 120 Ω

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)



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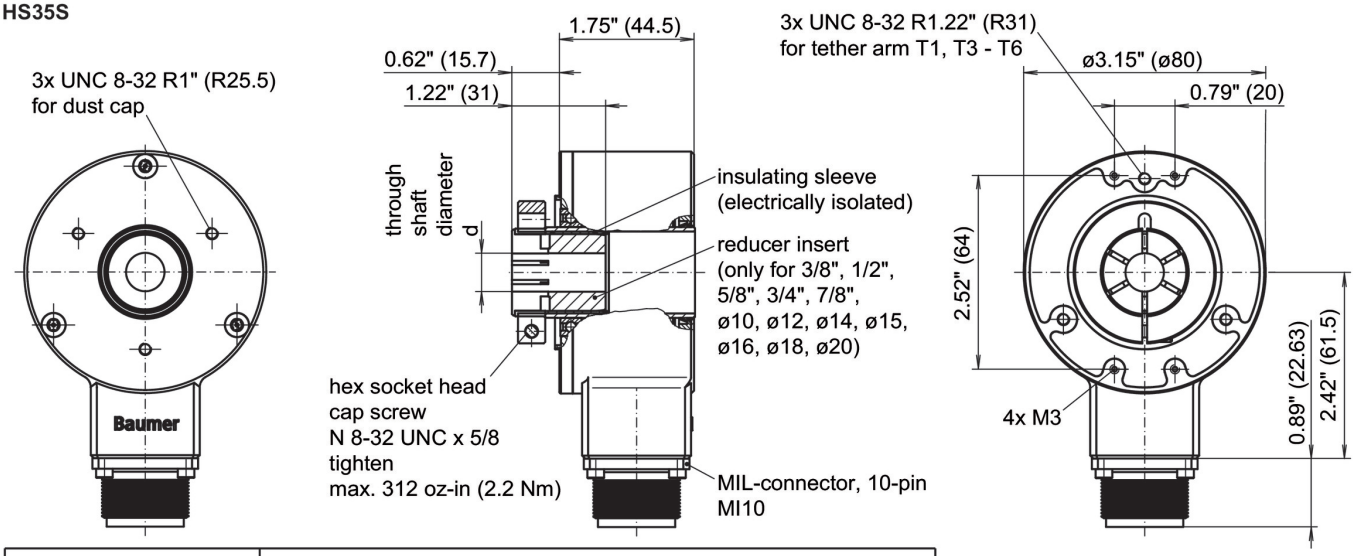
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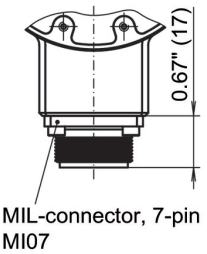
1024...2048 sinewave cycles per turn

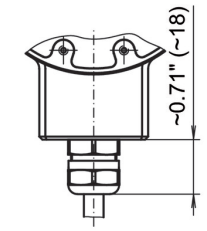
Dimensions

HS35S



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





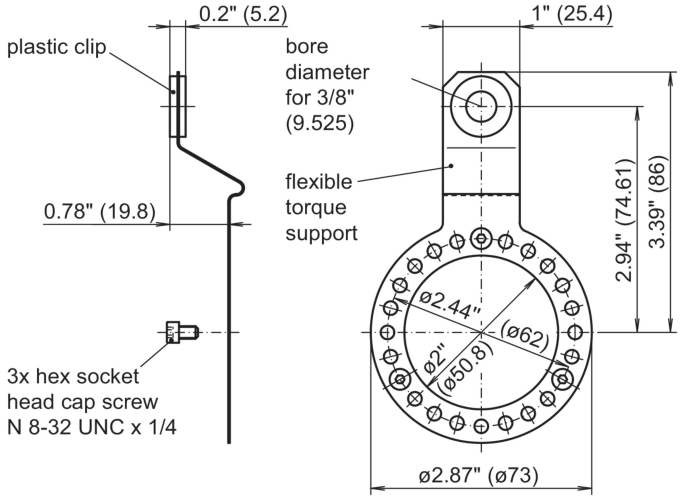
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HS35S - Sine

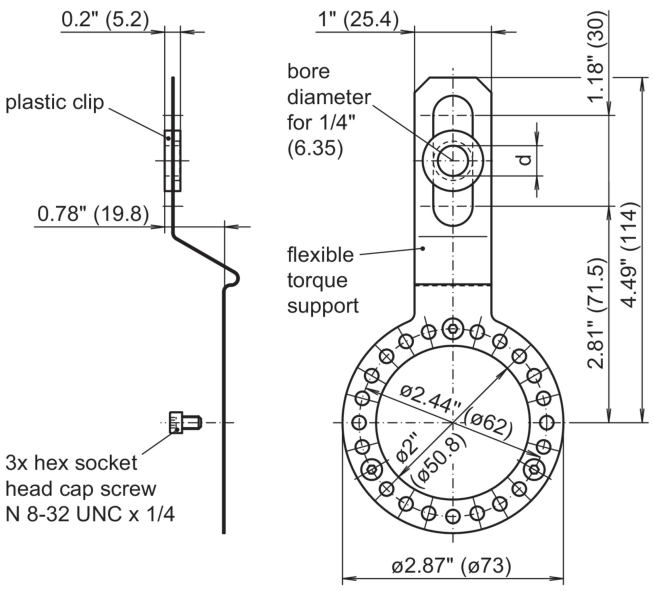
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1024...2048 sinewave cycles per turn

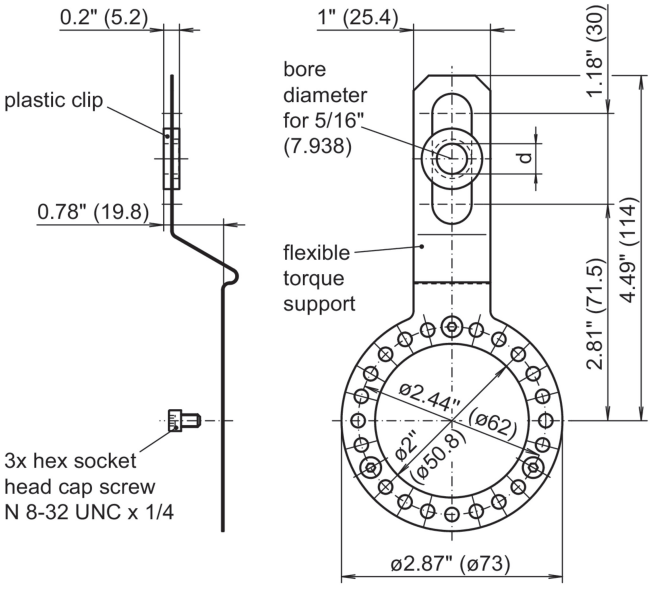
Dimensions



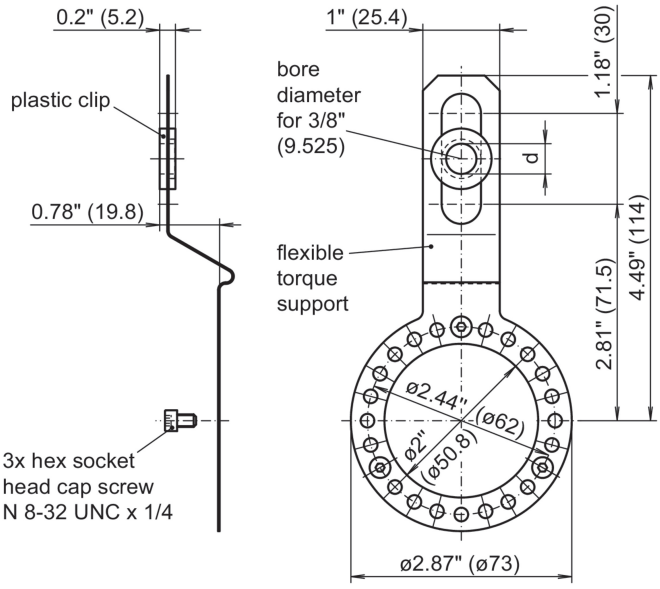
Tether arm T1



Tether arm T3



Tether arm T4



Tether arm T5

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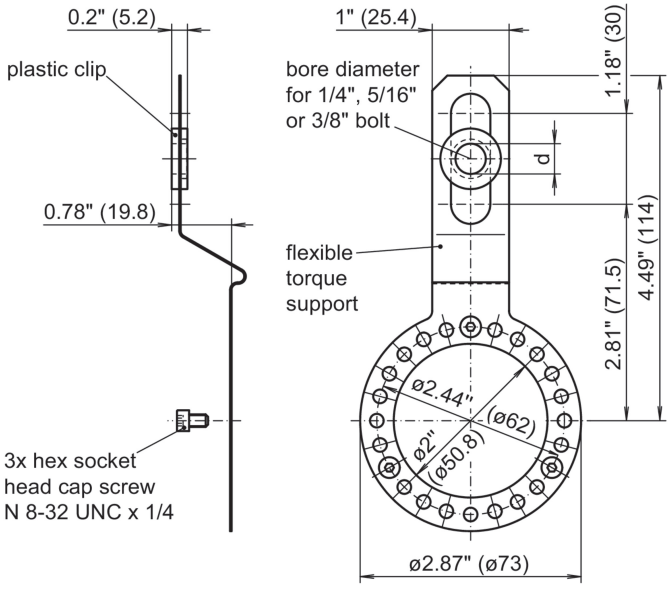
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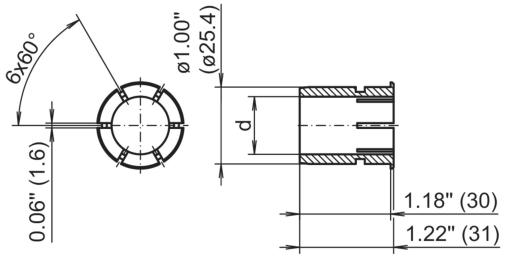
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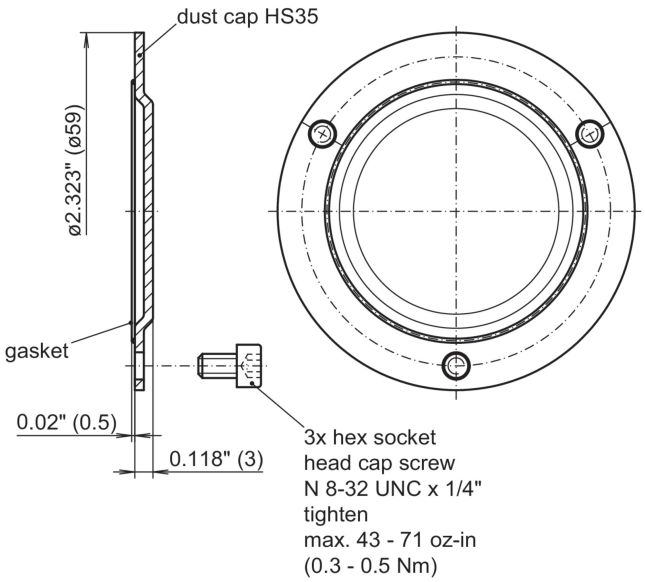


Tether arm T6

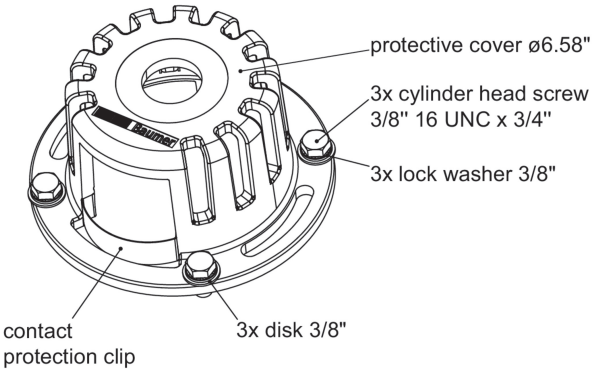


ø nominal dimension		tolerance		
inch (in ")	metric (in mm)		inch (in 1/1000")	metric (in µm)
0.875"	22.225	G7	+1.10 +0.28	+28 +7
0.750"	19.050	G7	+1.10 +0.28	+28 +7
0.625"	15.875	G7	+0.94 +0.24	+24 +6
0.500"	12.700	G7	+0.94 +0.24	+24 +6
0.375"	9.525	G7	+0.79 +0.20	+20 +5
0.787"	20	H8	+1.30 0	+33 0
0.709"	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



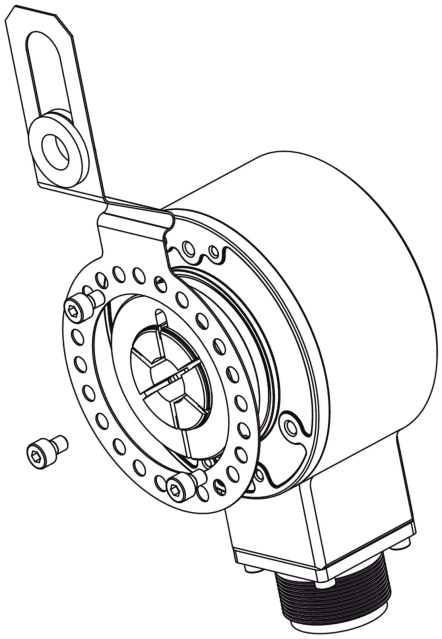
Protective cage HS35

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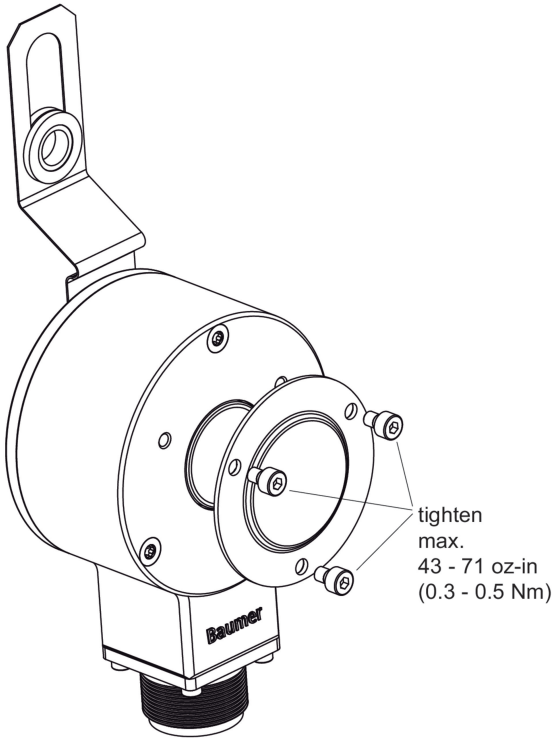
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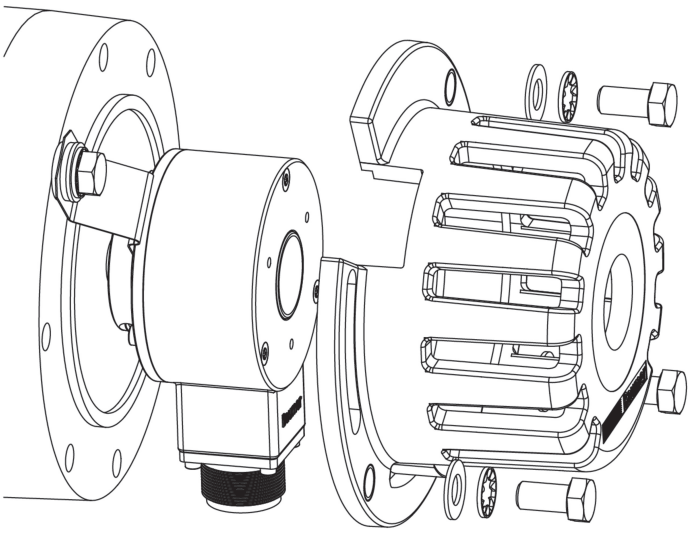
Dimensions



Example fitting tether arm



Example fitting dust cap



Example fitting protective cover

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Ordering reference

	HS35S	######	W	ABZC	#######	E	###	#	###
Product									
	HS35S								
Sinewave cycles/turn									
1024		1024							
2048		2048							
5000		5000							
Voltage supply									
UB= 4.75...30 VDC, SinCos 1 Vpp			W						
Output signal sine									
A+, A-, B+, B-, Z+, Z-				ABZC					
Connection(1)									
MIL-connector, 10-pin					MI10				
Cable radial, 12 (305 mm)					C012				
Cable radial, 18 (457 mm)					C018				
Cable radial, 24 (610 mm)					C024				
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

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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

Connectors and cables

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)

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