

HS35S - Sine

Insulated through hollow shaft $\varnothing 0.375 \dots 1$ inch
1024...5000 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	EN 61000-6-2
Emitted interference	EN 61000-6-3
Approval	UL approval / file no. E240061 RoHS compliant EU guideline 2011/65/EC CE

Technical data - mechanical design

Size (flange)	$\varnothing 3.15$ " ($\varnothing 80$ mm)
Shaft type	$\varnothing 0.375 \dots 1$ " ($\varnothing 9.525 \dots 25.4$ 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 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) $\leq 0,02$ Nm (+25 °C, IP 65)
Rotor moment of inertia	2,3 oz-in ² (420 gcm ²)
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

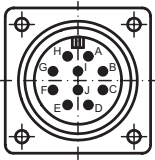
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Terminal assignment

MI10: MIL-conector, 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 –

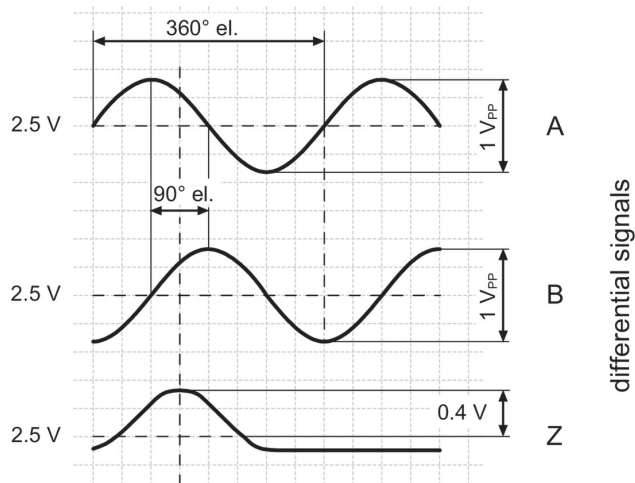


Cable gland (AWG26 wire)

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

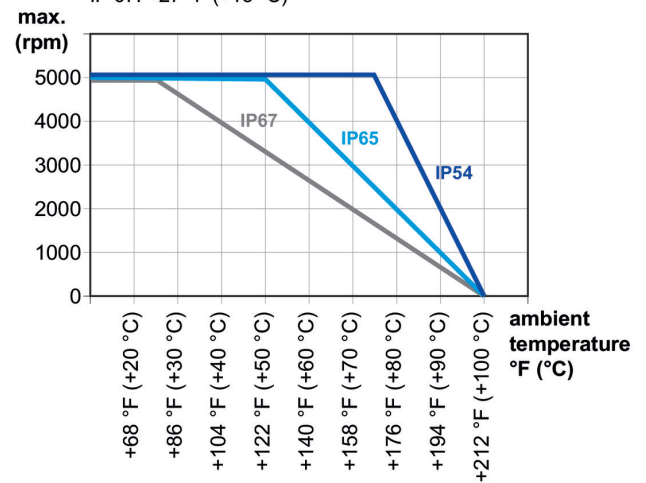
Outputs	Sine
Output amplitude A + B	1 V _{PP} at Z ₀ = 120 Ω
Output amplitude N	approx. 0,4 V (useable part) at Z ₀ = 120 Ω

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)

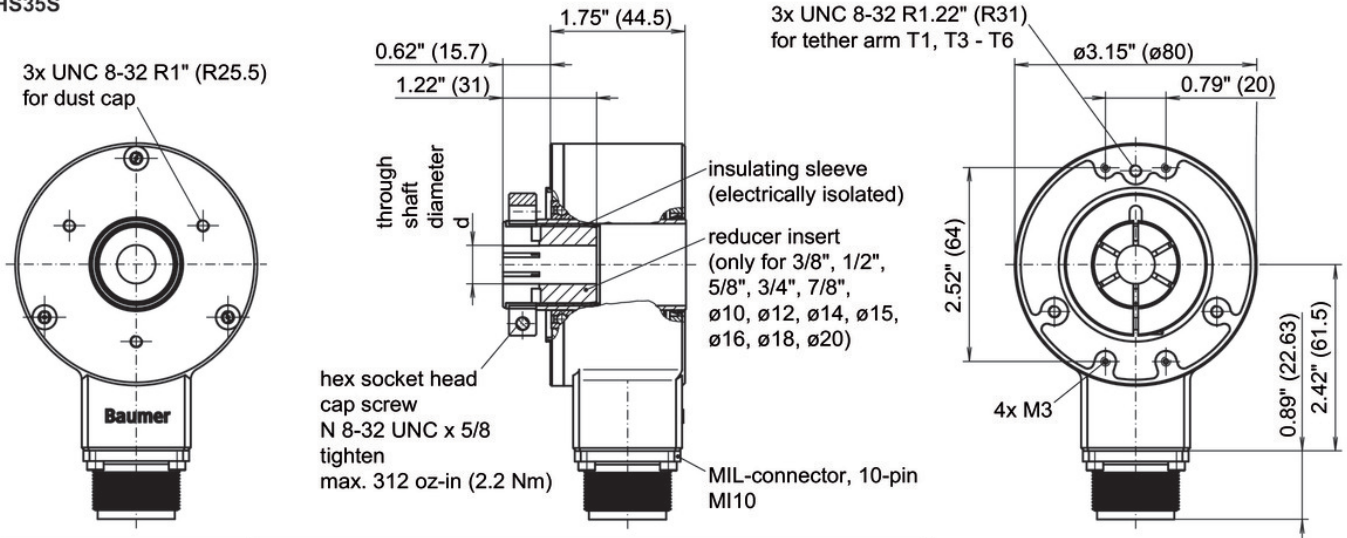


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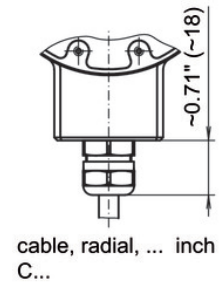
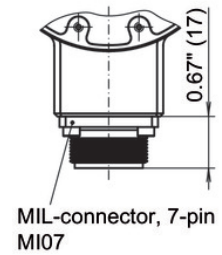
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Dimensions

HS35S



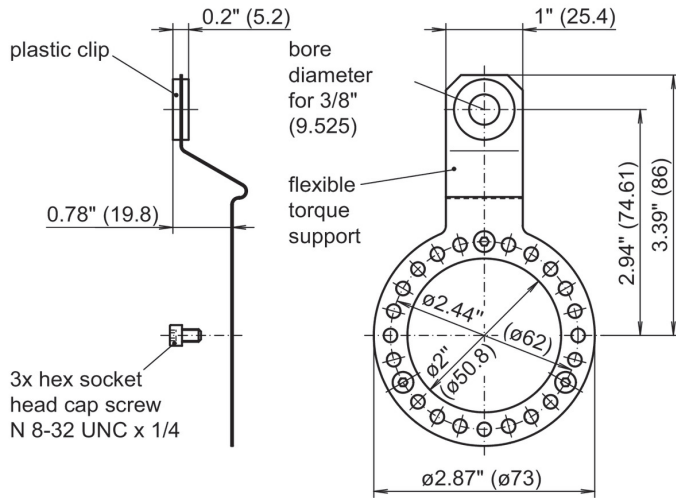
$\varnothing$ nominal dimension		tolerance					
		hollow shaft encoder			recommended customer shaft		
inch (in ")	metric (in mm)		inch (in 1/1000")	metric (in μ m)		inch (in 1/1000")	metric (in μ m)
1.000"	25.400	G7	+1.10 +0.28	+28 +7	h6	0 -0.51	0 -13
0.875"	22.225	G7	+1.10 +0.28	+28 +7	h6	0 -0.51	0 -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



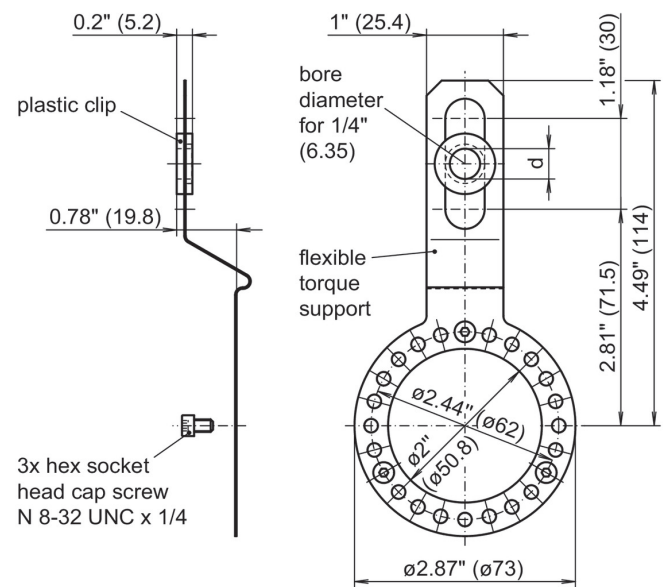
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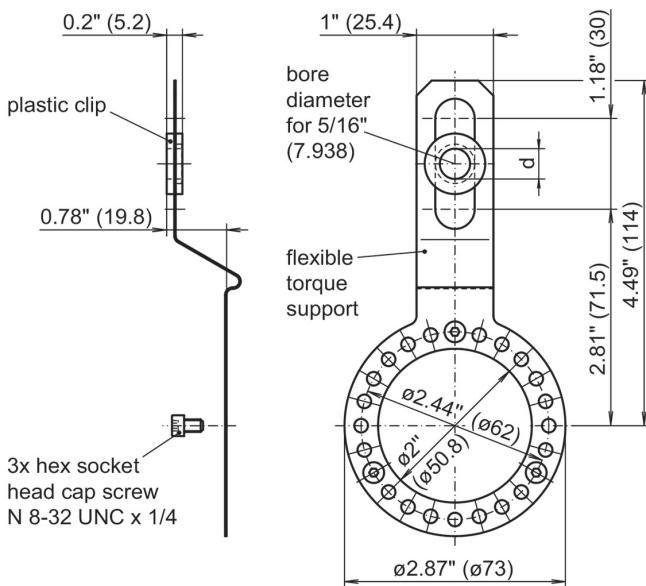
Dimensions



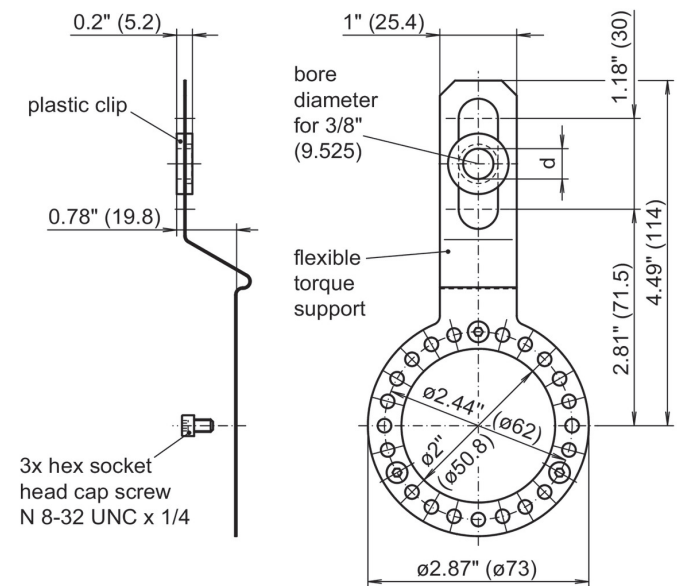
Tether arm T1



Tether arm T3



Tether arm T4

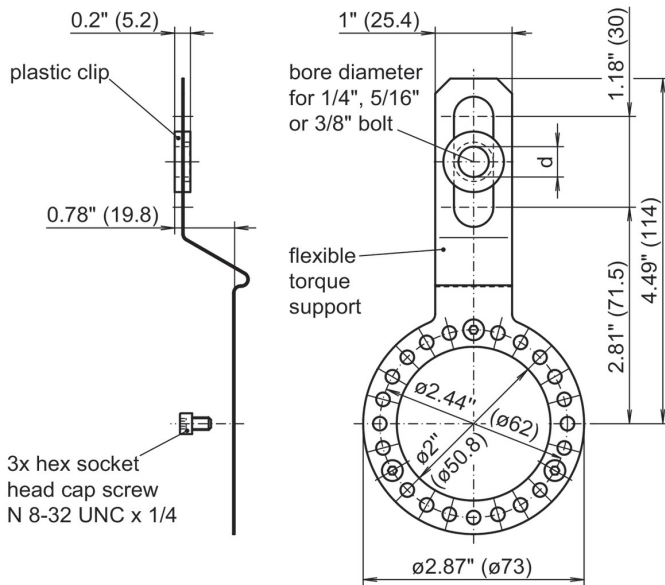


Tether arm T5

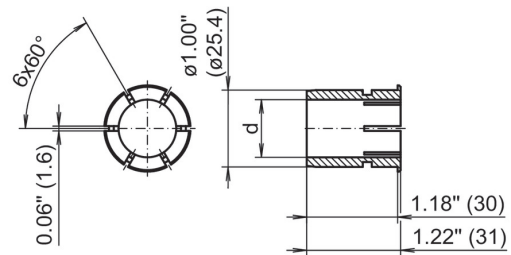
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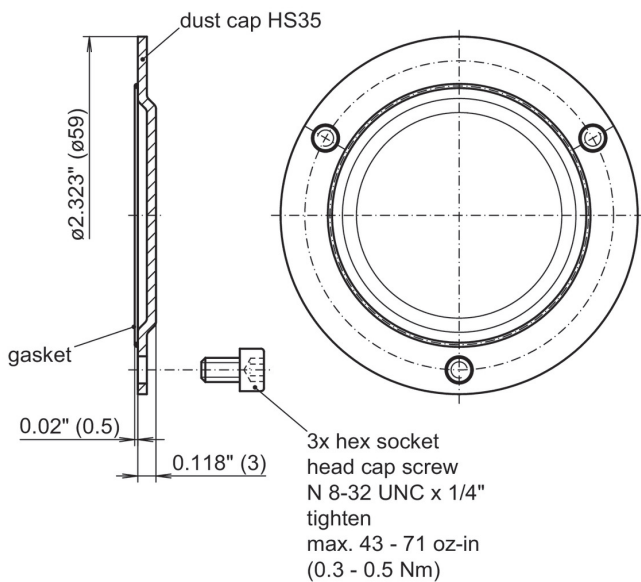


Tether arm T6

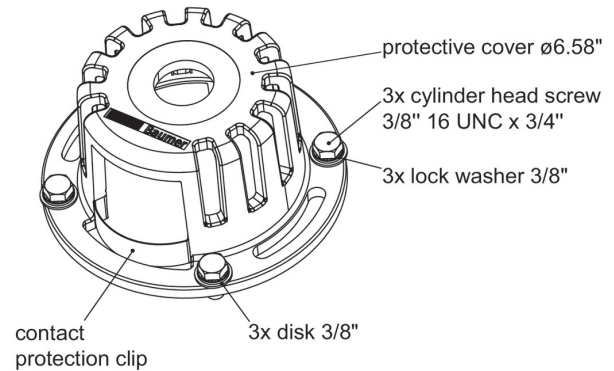


$\varnothing$ nominal dimension		tolerance		
inch (in ")	metric (in mm)		inch (in 1/1000")	metric (in μ m)
0.875"	22.225	G7	+1.10 +0.28	+28 +7
0.750"	19.050	G7	+1.10 +0.28	+28 +7
0.625"	15.875	G7	+0.94 +0.24	+24 +6
0.500"	12.700	G7	+0.94 +0.24	+24 +6
0.375"	9.525	G7	+0.79 +0.20	+20 +5
0.787"	20	H8	+1.30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

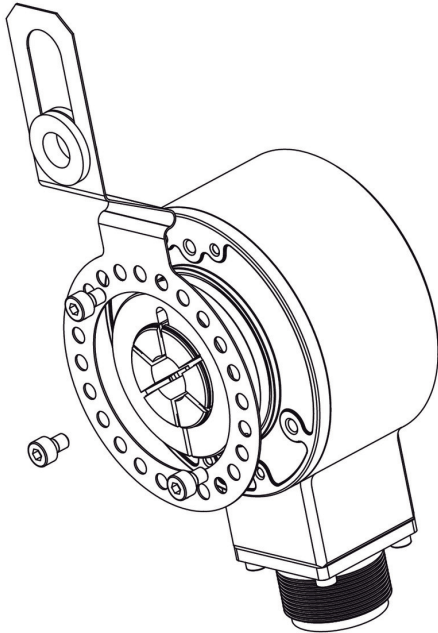


Protective cage HS35

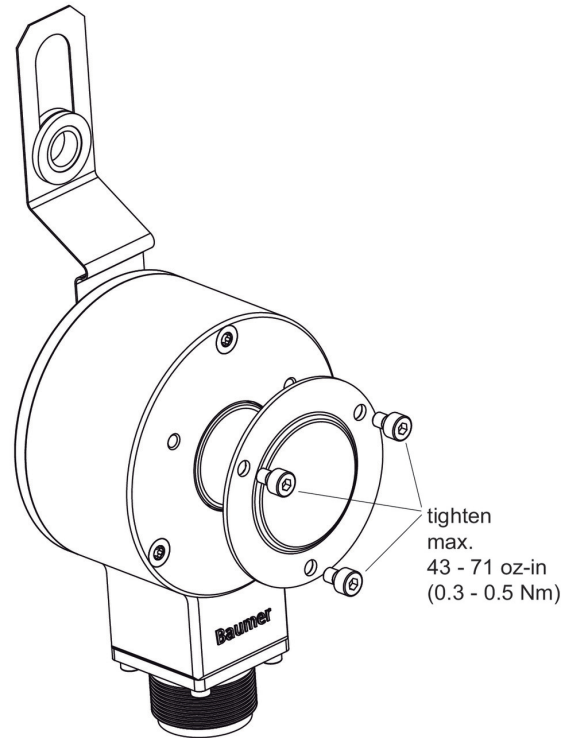
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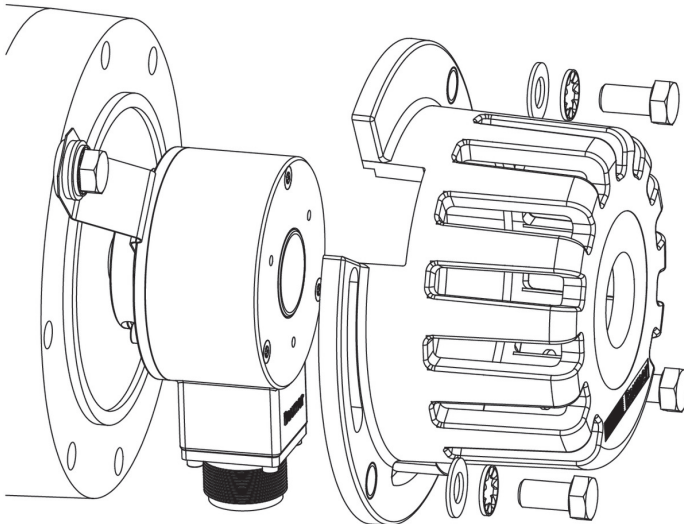
Dimensions



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									
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									
$\varnothing 0.375$ ($\varnothing 9.525$ mm) isolated, clamping ring A-side							037		
$\varnothing 0.500$ ($\varnothing 12.7$ mm) isolated, clamping ring A-side							050		
$\varnothing 0.625$ ($\varnothing 15.88$ mm) isolated, clamping ring A-side							062		
$\varnothing 0.750$ ($\varnothing 19.05$ mm) isolated, clamping ring A-side							075		
$\varnothing 0.875$ ($\varnothing 22.23$ mm) isolated, clamping ring A-side							087		
$\varnothing 1.000$ ($\varnothing 25.4$ mm) isolated, clamping ring A-side							100		
$\varnothing 10$ mm isolated, clamping ring A-side							M10		
$\varnothing 12$ mm isolated, clamping ring A-side							M12		
$\varnothing 14$ mm isolated, clamping ring A-side							M14		
$\varnothing 15$ mm isolated, clamping ring A-side							M15		
$\varnothing 16$ mm isolated, clamping ring A-side							M16		
$\varnothing 18$ mm isolated, clamping ring A-side							M18		
$\varnothing 20$ 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

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 $\varnothing 0.375$ " ($\varnothing 9.525$ mm)

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Accessories

Mounting accessories

11078636	Reducer insert HS35 $\varnothing 0.50''$ ($\varnothing 12.7$ mm)
11080114	Reducer insert HS35 $\varnothing 0.625''$ ($\varnothing 15.875$ mm)
11078639	Reducer insert HS35 $\varnothing 0.75''$ ($\varnothing 19.05$ mm)
11078654	Reducer insert HS35 $\varnothing 0.87''$ ($\varnothing 22.225$ mm)
11087744	Reducer insert HS35 $\varnothing 10$ mm
11087745	Reducer insert HS35 $\varnothing 12$ mm
11087746	Reducer insert HS35 $\varnothing 14$ mm
11148651	Reducer insert HS35 $\varnothing 15$ mm
11087747	Reducer insert HS35 $\varnothing 16$ mm
11087748	Reducer insert HS35 $\varnothing 18$ mm
11087750	Reducer insert HS35 $\varnothing 20$ 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 ft (3.05 m)
11078427	CNAC 29H 10-pin Mil Spec Mating Connector + cable L=20 ft (6.10 m)
11078428	CNAC 29H 10-pin Mil Spec Mating Connector + cable L=30 ft (9.15 m)