

### MAIN FEATURES

Industry standard singleturn absolute encoder for factory automation applications.

- Optical sensor technology (proprietary OptoASIC)
- Resolution up to 25 bit
- Power supply up to +30 VDC with Bit Parallel or SSI as electrical interface
- Cable or connector output
- Blind hollow shaft up to 15 mm
- Mounting by stator coupling, torque stop slot or torque pin

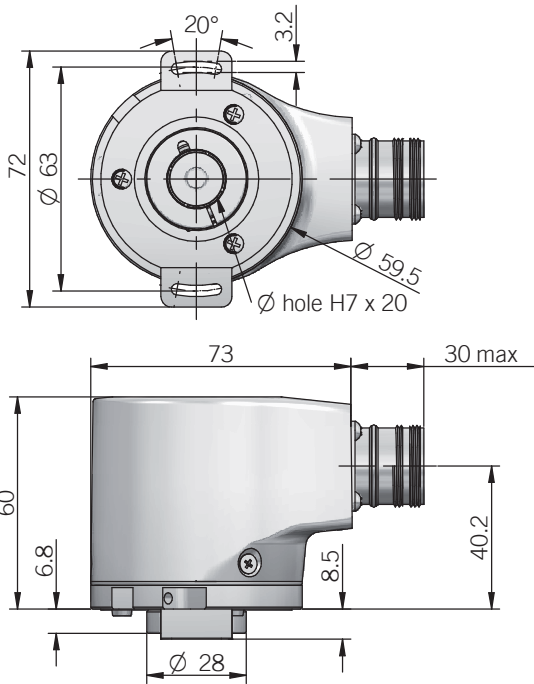


ORDERING CODE BIT PARALLEL	EAR	58F	12	G	8/30	P	P	X	15	X	PD	R	.XXX
<b>SERIES</b> singleturn absolute encoder <b>EAR</b>													
<b>MODEL</b> blind hollow shaft with stator coupling <b>58F</b> blind hollow shaft with torque stop slot <b>63F</b> blind hollow shaft with torque pin <b>63G</b>													
<b>RESOLUTION</b> bit from <b>1</b> to <b>13</b> (multiples and submultiples of 360) ppr from <b>90</b> to <b>3600</b>													
<b>CODE TYPE</b> binary <b>B</b> gray <b>G</b> (no powers of 2) binary offset code (0-XXX) <b>BC</b> (no powers of 2) gray offset code (0-XXX) <b>GC</b>													
<b>POWER SUPPLY</b> 8 ... 30 V DC <b>8/30</b>													
<b>ELECTRICAL INTERFACE</b> push-pull <b>P</b>													
<b>LOGIC</b> negative <b>N</b> positive <b>P</b>													
<b>OPTIONS</b> to be reported if not used <b>X</b> latch <b>L</b> (with binary code) strobe <b>S</b> reset <b>ZE</b> latch / reset <b>LZE</b> (with binary code) strobe / reset <b>SZE</b>													
<b>BORE DIAMETER</b> mm <b>14</b> mm <b>15</b> other diameters with optional shaft adapter													
<b>ENCLOSURE RATING</b> IP 65 shaft side / IP67 cover side <b>X</b> IP 67 <b>S</b>													
<b>OUTPUT TYPE</b> (without options) cable (standard length 1,5 m) <b>PD</b> cable (standard length 1,5 m) <b>PE</b> (without reset option) 19 pin MIL connector <b>MA</b> female connector included, without female please add 162 as variant code													
<b>DIRECTION TYPE</b> radial <b>R</b>													
<b>VARIANT</b> custom version <b>XXX</b>													

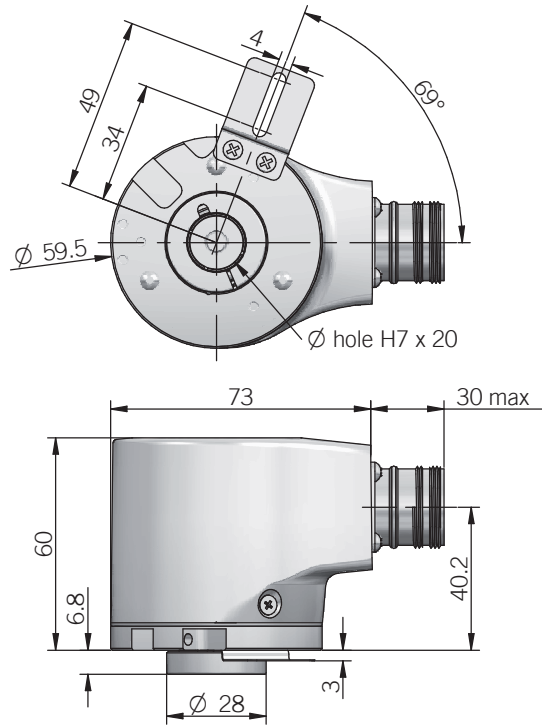
ORDERING CODE SSI	EAR	58F	13	G	8/30	S	X	2048	RS	15	X	HA	R	.XXX
<b>SERIES</b> singleturn absolute encoder <b>EAR</b>														
<b>MODEL</b> blind hollow shaft with stator coupling <b>58F</b> blind hollow shaft with torque stop slot <b>63F</b> blind hollow shaft with torque pin <b>63G</b>														
<b>RESOLUTION</b> bit <b>13 / 16 / 17 / 18 / 21 / 25</b> ppr <b>360 / 720 / 1440 / 2880 / 3600</b>														
<b>CODE TYPE</b> binary <b>B</b> gray <b>G</b> (no powers of 2) binary offset code (0-XXX) <b>BC</b> (no powers of 2) gray offset code (0-XXX) <b>GC</b>														
<b>POWER SUPPLY</b> 8 ... 30 V DC <b>8/30</b>														
<b>ELECTRICAL INTERFACE</b> Serial Synchronous Interface - SSI <b>S</b>														
<b>OPTION</b> to be reported if not used <b>X</b> reset <b>ZE</b>														
<b>INCREMENTAL RESOLUTION</b> (powers of 2) ppr from <b>128</b> to <b>8192</b>														
<b>INCREMENTAL ELECTRICAL INTERFACE</b> available with PC or HA output type line driver HTL <b>L</b> push pull <b>P</b> line driver RS-422 <b>RS</b>														
<b>BORE DIAMETER</b> mm <b>14</b> mm <b>15</b> other diameters with optional shaft adapter														
<b>ENCLOSURE RATING</b> IP 65 shaft side / IP67 cover side <b>X</b> IP 67 <b>S</b>														
<b>OUTPUT TYPE</b> cable (standard length 1,5 m) <b>PC</b> (without reset option) 7 pin MIL connector <b>MC</b> (with reset option) 10 pin MIL connector <b>MD</b> 12 pin M23 connector <b>HA</b> 8 pin M12 connector <b>M12</b> female connector included, without female please add 162 as variant code														
<b>DIRECTION TYPE</b> radial <b>R</b>														
<b>VARIANT</b> custom version <b>XXX</b>														

  only with additional incremental output

58 F

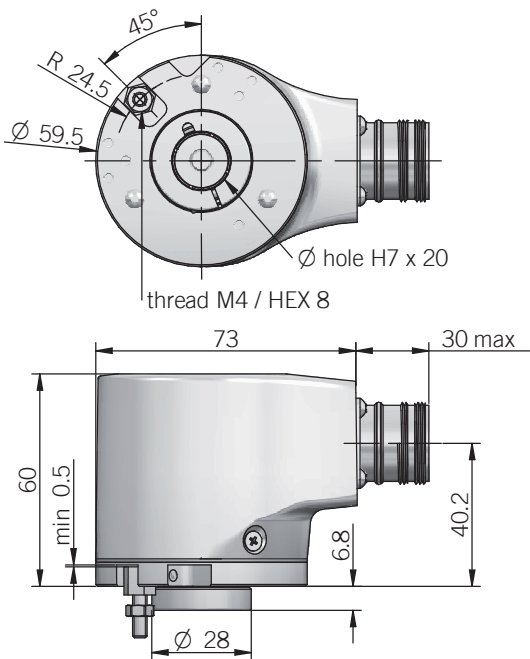


63 F



for torque pin please refer to Accessories

63 G



torque pin is included  
dimensions in mm

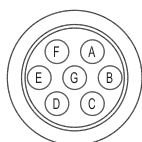
**BIT PARALLEL CONNECTIONS**

Function	Binary / Gray	Cable PD	Cable PE	19 pin MA
bit 1 (LSB)	B <sup>0</sup> / G <sup>0</sup>	green	green	A
bit 2	B <sup>1</sup> / G <sup>1</sup>	yellow	yellow	B
bit 3	B <sup>2</sup> / G <sup>2</sup>	blue	blue	C
bit 4	B <sup>3</sup> / G <sup>3</sup>	brown	brown	D
bit 5	B <sup>4</sup> / G <sup>4</sup>	orange or pink	orange or pink	E
bit 6	B <sup>5</sup> / G <sup>5</sup>	white	white	F
bit 7	B <sup>6</sup> / G <sup>6</sup>	grey	grey	G
bit 8	B <sup>7</sup> / G <sup>7</sup>	purple	purple	H
bit 9	B <sup>8</sup> / G <sup>8</sup>	grey / pink	grey / pink	J
bit 10	B <sup>9</sup> / G <sup>9</sup>	white / green	white / green	K
bit 11	B <sup>10</sup> / G <sup>10</sup>	brown / green	brown / green	L
bit 12	B <sup>11</sup> / G <sup>11</sup>	white / yellow	white / yellow	M
bit 13	B <sup>12</sup> / G <sup>12</sup>	yellow / brown	yellow / brown	N
STROBE	/	/	green / blue	P
LATCH	/	/	yellow / grey	R
0 V	/	black	black	T
U / D	/	red / blue	red / blue	U
RESET	/	/	pink / green	/
+ V DC	/	red	red	V
≡	/	shield	shield	S

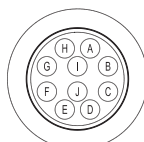
**SSI CONNECTIONS**

Function	Cable PC	7 pin MC	10 pin MD	12 pin HA	12 pin HA	8 pin M12
+ V DC	red	G	G	8	8	8
0 V	black	F	F	1	1	5
DATA +	green	C	C	2	2	3
DATA -	brown	D	D	10	10	2
CLOCK +	yellow	A	A	3	3	4
CLOCK -	orange or pink	B	B	11	11	6
A+	grey	/	/	/	6	/
A-	blue	/	/	/	7	/
B+	purple	/	/	/	9	/
B-	white / green	/	/	/	12	/
U / D	red / blue	E	E	5	5	7
RESET	white	/	H	4	4	1
≡	shield	housing	housing	9	housing	housing

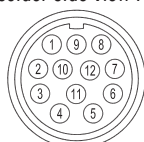
MC connector (7 pin)  
Amphenol MS3102-E-16-S  
solder side view FV



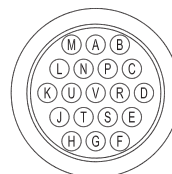
MD connector (10 pin)  
Amphenol MS3102-E-18-1P  
solder side view FV



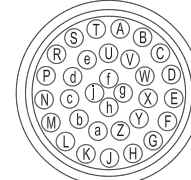
HA connector (12 pin)  
M23 CCW Hummel  
7.410.000000 - 7.002.912.603  
solder side view FV



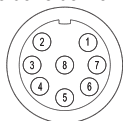
MA connector (19 pin)  
Amphenol 62IN 12E 14-19 P  
solder side view FV



ME connector (32 pin)  
Glenair IPT 02 A 18-32 P F6  
solder side view FV



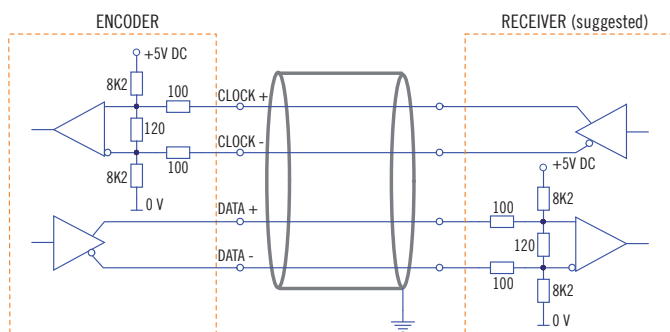
M12 connector (8 pin)  
M12 A coded  
solder side view FV



**ELECTRICAL SPECIFICATIONS**

<b>Resolution</b>	P = from 90 ppr to 13 bit S = from 360 ppr to 25 bit
<b>Power supply<sup>1</sup></b>	7,6 ... 30 V DC (reverse polarity protection)
<b>Power draw without load</b>	< 1 W
<b>Max load current</b>	20 mA / channel
<b>Absolute electrical interface<sup>2</sup></b>	P = push pull (iC-DL) S = RS-422 (SN65LBC179Q or equivalent)
<b>Incremental electrical interface<sup>2</sup></b>	L = HTL diff. (AEIC-7272, active short circuit protection) P = Push-Pull (AEIC-7272, active short circuit protection) RS = RS-422 (AELT-5000 or equivalent)
<b>Max incremental output frequency</b>	128 kHz
<b>Auxiliary inputs (U/D - RESET - LATCH)</b>	active high (+V DC) connect to 0 V if not used / RESET - LATCH t <sub>min</sub> 150 ms
<b>Max frequency</b>	50 kHz LSB (Bit Parallel) clock input: 100 kHz ... 1 MHz (SSI)
<b>Code type</b>	binary or gray
<b>Logic</b>	SSI = positive Bit parallel = positive or negative
<b>SSI monostable time (T<sub>m</sub>)</b>	20 μs
<b>SSI pause time (T<sub>p</sub>)</b>	> 35 μs
<b>SSI frame</b>	left aligned format (MSB ... LSB) up to 13 bit = length 13 bit from 14 to 21 bit = length 21 bit from 22 to 25 bit = length 25 bit
<b>SSI status and parity bit</b>	on request
<b>Counting direction</b>	decreasing clockwise (shaft view)
<b>Start-up time</b>	700 ms
<b>Accuracy</b>	± 250 arc-sec
<b>Electromagnetic compatibility</b>	according to 2014/30/EU directive
<b>RoHS</b>	according to 2015/863/EU directive
<b>UL / CSA</b>	certificate n. E212495

**SSI SCHEMATICS**



**MECHANICAL SPECIFICATIONS**

<b>Bore diameter</b>	∅ 8* / 9,52 (3/8")* / 10* / 12* / 14 / 15 mm * with optional shaft adapter, please refer to Accessories
<b>Enclosure rating IEC 60529</b>	X = IP 65 shaft side / IP67 cover side S = IP 67
<b>Max rotation speed</b>	see table
<b>Max shaft load<sup>3</sup></b>	200 N axial / 60 N radial
<b>Shock</b>	50 G, 11 ms (IEC 60068-2-27)
<b>Vibration</b>	10 G, 10 ... 2000 Hz (IEC 60068-2-6)
<b>Moment of inertia</b>	5 x 10 <sup>-6</sup> kgm <sup>2</sup> (119 x 10 <sup>-6</sup> lbf <sup>2</sup> )
<b>Starting torque (at +20°C / +68°F)</b>	< 0,03 Nm (4,25 Ozin)
<b>Bearing stage material</b>	EN-AW 2011 aluminum
<b>Shaft material</b>	1.4305 / AISI 303 stainless steel
<b>Housing material</b>	painted aluminium
<b>Bearings</b>	n.2 ball bearings
<b>Bearings life</b>	10 <sup>9</sup> revolutions
<b>Operating temperature Bit parallel<sup>4, 5</sup></b>	-20° ... +85°C (-4 ... +185°F)
<b>Operating temperature SSI<sup>4, 5</sup></b>	-40° ... +85°C (-40° ... +185°F) -20° ... +85°C (-4° ... +185°F) with cable output -25° ... +85°C (-13° ... +185°F) with M12 connector
<b>Storage temperature<sup>5</sup></b>	-20° ... +85°C (-4° ... +185°F)
<b>Weight</b>	approx 300 g (10,58 oz)

<sup>1</sup> as measured at the transducer without cable influences

<sup>2</sup> for further details refer to OUTPUT LEVELS on TECHNICAL BASICS section

<sup>3</sup> maximum load for static usage

<sup>4</sup> measured on the transducer flange

<sup>5</sup> condensation not allowed

**ROTATION SPEED DERATING TABLE**

	Temperature °C (°F)	Max speed (rpm)	Max continuous speed (rpm)
<b>IP65</b>	up to +70 (+158)	9000	6000
	+70 ... 85 (+158 ... 185)	6000	3000
<b>IP67</b>	up to +70 (+158)	8000	6000
	+70 ... 85 (+158 ... 185)	4000	2000