

# Absolute encoders ENA58IL-R\*\*\*-J1939

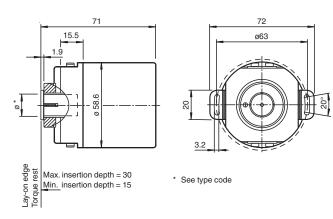
- Recessed hollow shaft
- Up to 31 bit overall resolution
- CAN bus with SAE J1939 protocol
- Free of wear magnetic samplingHigh resolution and accuracy

# 

## **Function**

This absolute rotary encoder provides a position value corresponding to the shaft position on its integrated J1939 interface. The rugged miniature encoders are based on magnetic sampling.

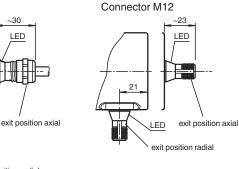
# Dimensions



#### Recessed hollow shaft







exit position radial

LED

21

Refer to "General Notes Relating to Pepperl+Fuchs Product Information".

Pepperl+Fuchs Group www.pepperl-fuchs.com USA: +1 330 486 0001 fa-info@us.pepperl-fuchs.com

Germany: +49 621 776 1111 fa-info@de.pepperl-fuchs.com Singapore: +65 6779 9091 fa-info@sg.pepperl-fuchs.com

**<sup>5</sup>**PEPPERL+FUCHS

1

# **Technical Data**

Detiction type         magnetic sampling           Device type         Absolute encoders           Linearly error         5 ± 0.1 °           UL File Number         E223170 'For use in NFPA 79 Applications only', if UL marking is marked on the product.           MTTFd         480 at 40 °C           Mission Time (Ta)         20 a           Lip         0 %           Diagnostic Coverage (DC)         0 %           Diagnostic Coverage (DC)         0 %           Dignostic Coverage (DC)         0 %           Dignostic Coverage (DC)         0 %           Dorating mode         UP           LED green         Operating mode           Electrical specifications         0 %	General specifications		
Linearity error         < < 1.1 °	·		magnetic sampling
Linearity error         < < 1.1 °	Device type		
UL File Number     E23178 'For use in NFPA 79 Applications only', if UL marking is marked on the product.       Functional safely related parameters     480 a at 40 °C       MTTFc,     08 a       Unission Time (Tu)     20 a       Lo,     5 E+8 revolutions at 24/188 N axial/radial shaft load       Diagnostic Coverage (DC)     0% %       Diadcors/operating means     Uwong baud rate       ELD ord     0% mong baud rate       Elderload specifications     0% a 1.2 W       Power consumption     Pq       Single turn     Uwong baud rate       Output code     binany code       Code course (counting direction)     Que ally asbible       Output code     jinany code       Code course (counting direction)     Que to 16 Bit       Multitum     up to 16 Bit       Multitum     up to 18 Bit       Overall resolution     Que to 11898       Connector     M12 connector, 5 pin       Cable     Que Notos-22, 200, 6 ms       Standard conformity     UN NE Nocos-22, 200, 6 ms       Standard conformity     EN 51000-6-22, 200, 7 ms       Connector     M12 connector, 5 pin       Cable     Que Notos-22, 200, 6 ms       Standard conformity     UN NE Nocos-22, 200, 6 ms       Unitarie resolution     EN 51000-6-22, 200, 7 ms       Noise im			≤±0.1 °
MTTFa400 at 40°CMission Time (Tup)20 aMission Time (Tup)5 E-8 revolutions at 24/198 N axial/radial shaft loadDiagnostic Coverage (DC)0%Indicators/operating measOperating modeLED orden0%Departing votage0%Steffer for Steffer St			
Mission Time (T <sub>n</sub> )20 aLeG 5 E4 revolutions at 24/198 N axia/radial shaft loadDiagnotic Coverage (CC)0 %Operating modeVorrage modeLED greenOperating modeED trict aspecificationsWrong Boad ratePower consumptionPos 12.00 NcOutput codebinary codeOutput codebinary codeCode course (counting direction)d adjustableInterfaceUa djustableInterface typeJ 1939Resolutionu p to 16 BitMultitumup to 15 BitOveral modeJ 1000Cole course (conting three)J 1000Voreal resolutiona 1000 NcMultitumup to 15 BitTransfer ratemin. 20 kBi/s, max. 1 MBit/sConnectorJ 20 mcConnectorJ 20 mcConnectorMultitumDagree of protectionM 20 connector, 5 pinConnectorJ 1000 Ad-22007Standard conformityEN 1000-64-22007Dagree of protectificateEN 1000-64-22007Standard conformityEN 1000-64-22007Standard conformityEN 1000-64-22007Urbarion resistanceEN 1000-64-22007Noise immunityEN 1000-64-22007Storage temperatureCable (Luc Licking, General Purpose, Class 2 Power Source, if UL marking is marked on the product.Noise immunityEN 1000-64-22007Storage temperatureCable, Being: S., 70 °C (22, 158 °F), Cable, Being: S., 70 °C (22, 158 °F), Cable, Being: S., 70 °C (22, 158 °F), Cable	Functional safety related parameters		
Lo         5 E+8 revolutions at 24/198 N axial/adial shaft load           Diagnostic Coverage (DC)         0%           Diagnostic Coverage (DC)         0%           Depending consenting means         Use wrong baud rate           EED green         0           Departing voltage         Up           Operating voltage         Up           Power consumption         Pp           Power consumption         Pp           Power consumption         1/2           Power consumption         Pp           Single balce availability         4           Code course (counting direction)         adjustable           Single turn         up to 16 Bit           Multurn         up to 16 Bit           Overall resolution         up to 18 Bit           Connector         min. 20 kBit/s, max. 1 MBit/s           Connector         11989           Connector         Mit 2 connector, 5 pin           Connector         Mit 2 connector, 5 pin           Cable         26 mm, 4 × 2 x 0.14 mm²           Barger of protection         UP to 80529, P65 or 1P67           Connector         Mit 2 connector, 5 pin           Cable         Din EN 60682-30, no moisture condenasation           Emited interference <td>MTTF<sub>d</sub></td> <td></td> <td>480 a at 40 °C</td>	MTTF <sub>d</sub>		480 a at 40 °C
Degnosic Coverage (DC)0 %Indicators/operating meansOperating modeLED red0LED redwrong baud rateDeperating voltageUaOperating voltageUaPower consumptionPoPower consumptionPoStatistic Statistic S	Mission Time (T <sub>M</sub> )		20 a
Note and the set of the se	L <sub>10</sub>		5 E+8 revolutions at 24/198 N axial/radial shaft load
LED green         Operating mode           LED red         Coperating mode           LED red         Worng baud rate           Depreating voltage         Ua         930 V DC (with galvanic isolation)           Power consumption         Po         < 250 ms	Diagnostic Coverage (DC)		0 %
LED redivwrong baud rateElectrical specifications930 V DC (with galvanic isolation)Power consumptionPoPower consumptionPoStandard Config direction)1Output code1Code course (counting direction)1Single turn1Besolution1Single turn1Multiturn1Overall resolution1Overall resolution1Transfer rate1Overall resolution1Single turn1Single turn1Overall resolution1Up to 15 BitTransfer rate1Overall resolution1Sindard conformity150 1898Connector11898Connector100 NEN 60529, 1P65 or 1P67Colland conformity1Degree of protection100 NEN 60529, 1P65 or 1P67Colland conformity1Di NEN 60568-23, no moisture condensationSindard conformity1Di NEN 60568-242, 020, 9, 6 msVibration resistance101 NEN 60568-242, 020, 9, 6 msVibration resistance101 NEN 60568-242, 020, 9, 6 msVibration resistance101 NEN 60568-242, 020, 9, 6 msStorage temperaturecable, flexing: 570 °C (23158 °F), connectionColland coefficiens2Storage temperaturecable, flexing: 570 °C (23158 °F), connection rubes: 400 Nei	Indicators/operating means		
Electrical specifications         Image: Contraction of the second	LED green		Operating mode
Operating voltageUg9 30 V DC (with galvanic isolation)Power consumptionPo< 12 W	LED red		wrong baud rate
Power consumption $P_0$ $\leq 1.2$ WTime delay before availability $t_{\star}$ $< 250$ msOutput codebinary codeCode course (counting direction)adjustableInterfaceImage: Code Course (counting direction)BesolutionImage: Code Course (counting direction)BesolutionImage: Code Course (counting direction)Single turnImage: Code Course (counting direction)MultiumImp to 16 BitMultiumImp to 15 BitOverall resolutionImage: Code Course (counting direction)Transfer rateImage: Code Course (counting direction)Coyle timeImage: Code Course (counting direction)ConnectorM12 connector, 5 pinConnectorM12 connector, 5 pinCableImage: Code Course (counting direction)Degree of protectionIDIN EN 60529, IP65 or IP67Climatic testingIDIN EN 60529, IP65 or IP67Climatic testingIDIN EN 60068-2-3, no moisture condensationEmitted interferenceImage: Course CourseVibraton resistanceIDIN EN 60068-2-27, 200 g, 6 msVibraton resistance	Electrical specifications		
Time delay before availability         t,         < <250 ms           Output code         binary code           Code course (counting direction)         adjustable           Interface         J1939           Resolution         jup to 16 Bit           Multitum         up to 15 Bit           Overall resolution         jup to 15 Bit           Overall resolution         jup to 31 Bit           Transfer rate         min. 20 kBit/s, max. 1 MBit/s           Cycle time         is 1 ms           Standard conformity         JS0 11988           Connector         ge (m, 4 x 2 x 0.14 mm²)           Cable         Obm (m, 4 x 2 x 0.14 mm²)           Bardard conformity         DIN EN 60088-2.3 no moisture condensation           Climatic testing         DIN EN 60088-2.3 no moisture condensation           Emitted interferece         EN 61000-64-2.007           Noise immunity         EN 61000-64-2.007, gins           Vibration resistance         DIN EN 60088-2.3, no moisture condensation           Approval and cortificats         clus Listed, General Purpose, Class 2 Power Source, if UL marking is marked on the product.           Noise immunity         EN 61000-64-2.007, Gi (23	Operating voltage	U <sub>B</sub>	9 30 V DC (with galvanic isolation)
Output code         binary code           Code course (counting direction)         adjustable           Interface (counting direction)         adjustable           Interface type         J1339           Resolution         up to 16 Bit           Multitum         up to 16 Bit           Overall resolution         up to 31 Bit           Transfer rate         min. 20 kBit/s, max. 1 MBit/s           Cycle time         a 1 ms           Standard conformity         ISO 11898           Connection         M12 connector, 5 pin           Cable         60 mm, 4 x 2 x 0.14 mm <sup>2</sup> Standard conformity         IDI NEN 60529, IP65 or IP67           Climatic testing         DIN EN 60529, IP65 or IP67           Climatic testing         DIN EN 60068-23, no molisture condensation           Emitted interference         EN 61000-64:2007           Noise immunity         EN 61000-64:2005           Shock resistance         DIN EN 60688-24, p.0 g, 6 ms           Vibration resistance         DIN EN 60688-24, p.0 g, 6 ms           Vibration resistance         DIN EN 60688-24, p.0 g, 10 1000 Hz           Approval         cdLus Listed, General Purpose, Class 2 Power Source , if UL marking is marked on the product.           Approval         cdLus Listed, General Purpose, Class 2	Power consumption	P <sub>0</sub>	≤ 1.2 W
Code course (counting direction)adjustableInterfaceJ1939Resolutionup to 16 BitMultitumup to 15 BitOverall resolutionup to 15 BitOverall resolutionup to 31 BitTransfer ratemin. 20 kBit/s, max. 1 MBit/sCycle time≤ 1 msStandard conformityKD 11898ConnectorM12 connector, 5 pinCableØf om, 4 x 2 x 0.14 mm²ConnectorM12 connector, 5 pinCableØf om, 4 x 2 x 0.14 mm²ConnectorM12 connector, 5 pinCableØf om, 4 x 2 x 0.14 mm²ConnectorM12 connector, 5 pinCableØf om, 4 x 2 x 0.14 mm²ConnectorM12 connector, 5 pinCableØf om, 6 x 2 x 0.04 mm²ConnectorM12 connector, 5 pinCableØf NE N 60068-23, no moisture condensationEmitted interferenceØi NE N 60068-24, no moisture condensationEmitted interferenceDIN EN 60068-27, 200 g, 6 msVibration resistanceDIN EN 60068-27, 200 g, 6 msVibration resistanceDIN EN 60068-27, 200 g, 0 mVibration resistanceULus Listed, General Purpose, Class 2 Power Source, if UL marking is marked on the product.Approval-20 connector models: 40 85 °C (-40 185 °F), connector models: 40 85 °C (-40 185	Time delay before availability	t <sub>v</sub>	< 250 ms
Interface         Interface type         Interface type           Interface type         J1939           Resolution         up to 16 Bit           Multitum         up to 15 Bit           Multitum         up to 15 Bit           Coreal resolution         up to 15 Bit           Transfer rate         min. 20 kBit/s, max. 1 MBit/s           Cycle time         2 1 ms           Standard conformity         ISO 11898           Connector         M12 connector, 5 pin           Cable         Ø 6 mm, 4 x 2 x 0.14 mm <sup>3</sup> Standard conformity         DIN EN 60529, IP65 or IP67           Climatic testing         DIN EN 60068-2-3, no moisture condensation           Emitted interference         EN 61000-6-2:2005           Standerd configue         DIN EN 60068-2-27, 200 g, 6 ms           Vibration resistance         DIN EN 60068-2-27, 200 g, 10 1000 Hz           Approval         cuble, flexing: -5 70 °C (23 158 °F), connector she product.           Approval         cable, flexing: -5 70 °C (23 158 °F), connector rodels: 40 85 °C (-40 185 °F)           Storage temperature         -40 85 °C (-40 185 °F), connector models: 40 85 °C (-40 185 °F), connector models: 40 85 °C (-40 185 °F), connector models: 40 85 °C (-40 185 °F)           Storage temperature         -40	Output code		binary code
Interface type         J1939           Resolution         up to 16 Bit           Multitum         up to 15 Bit           Overall resolution         up to 31 Bit           Transfer rate         min. 20 kBit/s, max. 1 MBit/s           Cycle time         a 1 ms           Standard conformity         10898           Connector         M12 connector, 5 pin           Connector         M12 connector, 5 pin           Cable         26 mm, 4 x 2 x 0.14 mm <sup>2</sup> Bandard conformity         DIN EN 60529, IP65 or IP67           Climatic testing         DIN EN 60582-3, no moisture condensation           Climatic testing         DIN EN 60068-2-37, no moisture condensation           Emitted interference         EN 61000-64:2007           Noise immunity         EN 61000-64:2007           Shock resistance         DIN EN 6068-2-7, 200 g, 10 1000 Hz           Vibration resistance         DIN EN 6068-2-7, 200 g, 10 1000 Hz           Approval         cable, flexing: -570 °C (23 158 °F), cable, fixed: -50 70 °	Code course (counting direction)		adjustable
Resolution       up to 16 Bit         Multium       up to 16 Bit         Multium       up to 16 Bit         Overall resolution       up to 31 Bit         Transfer rate       min.20 kBit/s, max. 1 MBit/s         Cycle time       ≥ 1 ms         Standard conformity       ISO 11898         Connector       M12 connector, 5 pin         Cable       26 mm, 4 x 2 x 0.14 mm²         Standard conformity       DIN EN 60529, IP65 or IP67         Clinatic testing       DIN EN 60529, IP65 or IP67         Clinatic testing       DIN EN 6068-2-3, no moisture condensation         Emitted interference       EN 6100-6-4:2007         Noise immunity       EN 6100-6-4:2007         Shock resistance       DIN EN 6068-2-7, 200 g, 6 ms         Vibration resistance       DIN EN 60068-2-7, 200 g, 6 ms         Vibration resistance       DIN EN 60068-2-7, 200 g, 6 ms         Vibration resistance       DIN EN 60068-2-6, 20 g, 10 1000 Hz         Approval       cable, flexing: -5 70 °C (23 158 °F), connector models: -40 85 °C (-40 158 °F)         Storage temperature       cable, flexing: -5 70 °C (23 158 °F), connector models: -40 85 °C (-40 158 °F)         Storage temperature       cable, flexing: -5 70 °C (23 158 °F), connector models: -40 85 °C (-40 158 °F)	Interface		
Single turn         up to 16 Bit           Multitum         up to 15 Bit           Overall resolution         up to 31 Bit           Transfer rate         min. 20 kBit/s max. 1 MBit/s           Cycle time         ≤ 1 ms           Standard conformity         ISO 11898           Connection         M12 connector, 5 pin           Cable         Øf mm, 4 x 2 x 0.14 mm²           Bandard conformity         DIN EN 60529, IP65 or IP67           Climatic testing         DIN EN 60529, IP65 or IP67           Climatic testing         DIN EN 60529, IP65 or IP67           Climatic testing         DIN EN 6058-2-3, no moisture condensation           Emitted interference         EN 61000-64:2005           Shock resistance         DIN EN 60068-2-27, 200 g, 6 ms           Vibration resistance         DIN EN 60068-2-27, 200 g, 6 ms           Vibration resistance         DIN EN 60068-2-6, 20 g, 10 1000 Hz           Approval         cable, fixedr, -5 70 °C (22 158 °F), cable, fixed - 50 70 °C (22 158 °F), cable, fixed - 30 70 °C (22 158 °F), cable, fixed - 30 85 °C (40 185 °F)           Vibration resistance         UL up roval         cable, fixed - 50 70 °C (24 185 °F), cable, fixed - 50 70 °C (24 185 °F), cable, fixed - 30 70 °C (22 158 °F), cable, fixed - 30 70 °C (22 158 °F), cable, fixed - 30 85 °C (40 185 °F)      <	Interface type		J1939
Multitum         up to 15 Bit           Overall resolution         up to 31 Bit           Transfer rate         min. 20 KBit/s, max. 1 MBit/s           Cycle time         ≥ 1 ms           Standard conformity         ISO 11898           Connection         Ø6 mm, 4 x 2 x 0.14 mm²           Cable         Ø6 mm, 4 x 2 x 0.14 mm²           Standard conformity         Ø1 IN EN 60529, IP65 or IP67           Climatic testing         DIN EN 60529, IP65 or IP67           Climatic testing         DIN EN 60529, IP65 or IP67           Climatic testing         DIN EN 6068-2-3, no moisture condensation           Emitted interference         EN 61000-6-4:2007           Noise immunity         EN 61000-6-2:2005           Shork resistance         DIN EN 6068-2-27, 200 g, 6 ms           Vibration resistance         DIN EN 6068-2-27, 200 g, 10 1000 Hz           Approval         cutLus Listed, General Purpose, Class 2 Power Source, if UL marking is marked on the roduct.           Approval         cutLus Listed, General Purpose, Class 2 Power Source, if UL marking is marked on the roduct.           Approval         cutLus Listed, General Purpose, Class 2 Power Source, if UL marking is marked on the roduct.           Approval         cutLus Listed, General Purpose, Class 2 Power Source, if UL marking is marked on the roduct.           Approval	Resolution		
Overall resolution         up to 31 Bit           Transfer rate         min. 20 kBit/s, max. 1 MBit/s           Cycle time         ≥ 1 ms           Standard conformity         JSO 11898           Connection         M12 connector, 5 pin           Cable         Ø 6 mm, 4 x 2 x 0.14 mm²           Standard conformity         Ø 6 mm, 4 x 2 x 0.14 mm²           Standard conformity         Ø 6 mm, 4 x 2 x 0.14 mm²           Standard conformity         Ø 10 N EN 60529, IP65 or IP67           Climatic testing         DIN EN 60068-2-3, no moisture condensation           Emitted interference         EN 61000-64:2007           Noise immunity         EN 61000-62:2005           Shock resistance         DIN EN 60068-2-7, 200 g, 6 ms           Vibration resistance         DIN EN 60068-2-7, 200 g, 6 ms           Vibration resistance         DIN EN 60068-2-7, 200 g, 6 ms           Vibration resistance         DIN EN 60068-2-7, 200 g, 6 ms           Vibration resistance         DIN EN 60068-2-7, 200 g, 6 ms           Vibration resistance         DIN EN 60068-2-7, 200 g, 6 ms           Vibration resistance         DIN EN 60068-2-7, 200 g, 6 ms           Operating temperature         cable, fixed; -3070 °C (23158 °F).           Storage temperature         cable, fixed; -3070 °C (23158 °F).	Single turn		up to 16 Bit
Transfer ratemin. 20 kBit/s, max. 1 MBit/sCycle time $\geq$ 1 msStandard conformityISO 11898ConnectorM12 connector, 5 pinCableØ 6 mm, 4 x 2 x 0.14 mm²Standard conformityID N EN 60529, IP65 or IP67Climatic testingDIN EN 60529, IP65 or IP67Climatic testingDIN EN 60068-2-3, no moisture condensationEmitted interferenceEN 61000-64:2007Noise immunityEN 61000-62:2005Shock resistanceDIN EN 60068-2-7, 200 g, 6 msVibration resistanceCuble Listed, General Purpose, Class 2 Power Source , if UL marking is marked on the product.Approvalcable, filterig: -570 °C (23158 °F), cable, filterig: -570 °C (23158 °F)Storage temperaturecable, filterig: -570 °C (23158 °F)Storage temperaturee3 %, no moisture condensationMaterialHousingHausing9 %, no moisture condensationMaterialHousing<	Multiturn		up to 15 Bit
Cycle time       ≥ 1 ms         Standard conformity       ISO 11898         Connection       ISO 11898         Connector       M12 connector, 5 pin         Cable       Ø fmm, 4 x 2 x 0.14 mm²         Standard conformity       Øfm, 4 x 2 x 0.14 mm²         Standard conformity       DIN EN 60529, IP65 or IP67         Climatic testing       DIN EN 6058-2-3, no moisture condensation         Emitted interference       EN 61000-6-4:2007         Noise immunity       EN 61000-6-2:2005         Shock resistance       DIN EN 6058-2-27, 200 g, 6 ms         Vibration resistance       DIN EN 60068-2-27, 200 g, 10 1000 Hz         Approvals and certificates       UL us bisted, General Purpose, Class 2 Power Source , if UL marking is marked on the product.         Ambient conditions       cable, flexing: -5 70 °C (23 158 °F), connector models: -40 85 °C (-40 185 °F)         Storage temperature       -40 85 °C (-40 185 °F)         Relative humidity       9% , no moisture condensation         Mechanical specifications       Material         Material       nickel-plated steel , painted         Housing       nickel-plated steel , painted         Flange       Aluminum	Overall resolution		up to 31 Bit
Standard conformity       ISO 11898         Connection       M12 connector, 5 pin         Cable       Ø 6 mm, 4 x 2 x 0.14 mm²         Standard conformity       Ø 6 mm, 4 x 2 x 0.14 mm²         Standard conformity       Degree of protection         Degree of protection       DIN EN 60529, IP65 or IP67         Climatic testing       DIN EN 6068-2-3, no moisture condensation         Emitted interference       EN 61000-6-4:2007         Noise immunity       EN 61000-6-2:2005         Shock resistance       DIN EN 60068-2-27, 200 g, 6 ms         Vibration resistance       DIN EN 60068-2-6, 20 g, 10 1000 Hz         Approvals and certificates       UL approval         UL approval       Cubus Listed, General Purpose, Class 2 Power Source , if UL marking is marked on the product.         Ambient conditions       Cable, flexing: -5 70 °C (23 158 °F), cable, flexing: -5 70 °C (42 158 °F), cable, flexing: -5 70 °C (40 185 °F)         Storage temperature       -40 85 °C (-40 185 °F)         Relative humidity       98 %, no moisture condensation         Wechanical specifications       Material         Housing       nickel-plated steel , painted         Alarge       Aluminum         Shaft       Stainless steel	Transfer rate		min. 20 kBit/s , max. 1 MBit/s
Connection       M12 connector, 5 pin         Cable       Ø 6 mm, 4 x 2 x 0.14 mm²         Cable       Ø 6 mm, 4 x 2 x 0.14 mm²         Standard conformity       Degree of protection         Degree of protection       DIN EN 60529, IP65 or IP67         Clinatic testing       DIN EN 60068-2-3, no moisture condensation         Emitted interference       EN 61000-6-2:2005         Noise immunity       EN 61000-6-2:2005, 6 ms         Shock resistance       DIN EN 60068-2-27, 200 g, 6 ms         Vibration resistance       DIN EN 60068-2-27, 200 g, 6 ms         Vibration resistance       DIN EN 60068-2-27, 200 g, 10 1000 Hz         Approvals and certificates       UL us bisted, General Purpose, Class 2 Power Source , if UL marking is marked on the product.         Vul approval       cultus Listed, General Purpose, Class 2 Power Source , if UL marking is marked on the product.         Approvals       cable, fixeri: -30 70 °C (23 158 °F). cable, fixed: -30 70 °C (40 185 °F).         Storage temperature       cable, fixeri: -30 70 °C (40 185 °F).         Relative humidity       98 %, no moisture condensation         Material       Material         Material       nickel-plated steel , painted         Housing       nickel-plated steel , painted         Flange       Aluminum	Cycle time		≥ 1 ms
Connector       M12 connector, 5 pin         Cable       Ø6 mm, 4 x 2 x 0.14 mm²         Standard conformity       DIN EN 60529, IP65 or IP67         Degree of protection       Image: DIN EN 60068-2-3, no moisture condensation         Climatic testing       DIN EN 60068-2-3, no moisture condensation         Emitted interference       Image: EN 61000-6-4:2007         Noise immunity       EN 61000-6-4:2007         Shock resistance       DIN EN 60068-2-27, 200 g, 6 ms         Vibration resistance       DIN EN 60068-2-27, 200 g, 6 ms         Approvals and certificates       DIN EN 60068-2-6, 20 g, 10 1000 Hz         Approvals and certificates       CULus Listed, General Purpose, Class 2 Power Source , if UL marking is marked on the product.         Ambient conditions       Cable, flexing: -5 70 °C (23 158 °F).         Operating temperature       Cable, flexing: -5 70 °C (23 158 °F).         Storage temperature       28 %, no moisture condensation         Belative humidity       98 %, no moisture condensation         Metrial       moisture condensation         Housing       nickel-plated steel , painted         Flange       Aluminum         Shaft       Gi Stainless steel	Standard conformity		ISO 11898
Cable       Ø6 mm, 4 x 2 x 0.14 mm²         Standard conformity       DIN EN 60529, IP65 or IP67         Degree of protection       DIN EN 60068-2-3, no moisture condensation         Climatic testing       DIN EN 60068-2-3, no moisture condensation         Emitted interference       EN 61000-6-4:2007         Noise immunity       EN 61000-6-2:2005         Shock resistance       DIN EN 60068-2-27, 200 g, 6 ms         Vibration resistance       DIN EN 60068-2-27, 200 g, 10 1000 Hz         Approvals and certificates       UL us Listed, General Purpose, Class 2 Power Source , if UL marking is marked on the product.         Approval       culLus Listed, General Purpose, Class 2 Power Source , if UL marking is marked on the product.         Approval       cuble, fixed: -30 70 °C (23 158 °F), cable, fixed: -30 85 °C (-22 158 °F), cable, fixed: -30 85 °C (-40 185 °F)         Storage temperature       -40 85 °C (-40 185 °F)         Relative humidity       98 %, no moisture condensation         Material       mickel-plated steel , painted         Housing       nickel-plated steel , painted         Flange       Aluminum         Shaft       Gilless steel	Connection		
Standard conformity       DIN EN 60529, IP65 or IP67         Degree of protection       DIN EN 60068-2-3, no moisture condensation         Emitted interference       EN 61000-6-4:2007         Noise immunity       EN 61000-6-2:2005         Shock resistance       DIN EN 60068-2-27, 200 g, 6 ms         Vibration resistance       DIN EN 60068-2-27, 200 g, 6 ms         Vibration resistance       DIN EN 60068-2-27, 200 g, 6 ms         Vibration resistance       DIN EN 60068-2-6, 20 g, 10 1000 Hz         Approvals and certificates       UL us Listed, General Purpose, Class 2 Power Source , if UL marking is marked on the product.         Ambient conditions       cULus Listed, General Purpose, Class 2 Power Source , if UL marking is marked on chaber and certificates         Operating temperature       cable, flexing: -5 70 °C (23 158 °F), cable, fixed: -30 70 °C (-22 158 °F), cable, fixed: -30	Connector		M12 connector, 5 pin
Degree of protectionImage: ConstructionDegree of protectionDIN EN 60529, IP65 or IP67Climatic testingDIN EN 60068-2-3, no moisture condensationEmitted interferenceEN 61000-64:2007Noise immunityEN 61000-62:2005Shock resistanceDIN EN 60068-2-27, 200 g, 6 msVibration resistanceDIN EN 60068-2-6, 20 g, 10 1000 HzApprovals and certificatesDIN EN 60068-2-6, 20 g, 10 1000 HzUL approvalcULus Listed, General Purpose, Class 2 Power Source , if UL marking is marked on the product.Ambient conditionscullus Listed, General Purpose, Class 2 Power Source , if UL marking is marked on the product.Operating temperaturecable, fixing: -5 70 °C (23 158 °F), cable, fixed: -30 70 °C (-22 158 °F)Storage temperature-40 85 °C (-40 185 °F)Relative humidity98 %, no moisture condensationMeterialImage: Sundow CondensationHousingnickel-plated steel , paintedFlangeAluminumShaftGiainess steel	Cable		Ø6 mm, 4 x 2 x 0.14 mm <sup>2</sup>
Climatic testingDIN EN 60068-2-3, no moisture condensationEmitted interferenceEN 61000-6-4:2007Noise immunityEN 61000-6-2:2005Shock resistanceDIN EN 60068-2-27, 200 g, 6 msVibration resistanceDIN EN 60068-2-6, 20 g, 10 1000 HzApprovals and certificatesUL us Listed, General Purpose, Class 2 Power Source , if UL marking is marked on the product.Ambient conditionscULus Listed, General Purpose, Class 2 Power Source , if UL marking is marked on the product.Operating temperaturecable, flexing: -5 70 °C (23 158 °F), cable, fixed: -30 70 °C (-22 158 °F)Storage temperaturecable, flexing: -5 70 °C (-22 158 °F)Relative humidity98 %, no moisture condensationWechanical specifications-40 85 °C (-40 185 °F)MaterialImage: Additional ConditionsMaterialImage: Additional Conditional ConditionsMaterialAluminumFlangeAluminumShaftStainless steel	Standard conformity		
Emitted interferenceEN 61000-6-4:2007Noise immunityEN 61000-6-2:2005Shock resistanceDIN EN 60068-2-27, 200 g, 6 msVibration resistanceDIN EN 60068-2-6, 20 g, 10 1000 HzApprovals and certificatesUL us Listed, General Purpose, Class 2 Power Source , if UL marking is marked on the product.Ambient conditionsCULus Listed, General Purpose, Class 2 Power Source , if UL marking is marked on the product.Operating temperaturecable, flexing: -5 70 °C (23 158 °F), cable, fixed: -30 70 °C (-22 158 °F)Storage temperaturecable, fixed: -30 70 °C (-24 185 °F)Relative humidity98 %, no moisture condensationMaterial-40 85 °C (-40 185 °F)Materialinckel-plated steel , paintedHousingnickel-plated steel , paintedFlangeAluminumShaftStainless steel	Degree of protection		DIN EN 60529, IP65 or IP67
Noise immunityEN 61000-6-2:2005Shock resistanceDIN EN 60068-2-27, 200 g, 6 msVibration resistanceDIN EN 60068-2-6, 20 g, 10 1000 HzApprovals and certificatesUL approvalUL approvalCULus Listed, General Purpose, Class 2 Power Source , if UL marking is marked on the product.Ambient conditionscable, flexing: -5 70 °C (23 158 °F), cable, fixed: -30 70 °C (-22 158 °F), connector models: -40 85 °C (-40 185 °F)Storage temperature-40 85 °C (-40 185 °F)Relative humidity98 %, no moisture condensationMaterialnickel-plated steel , paintedHousingnickel-plated steel , paintedFlangeAluminumShaftStainless steel	Climatic testing		DIN EN 60068-2-3, no moisture condensation
Shock resistance       DIN EN 60068-2-27, 200 g, 6 ms         Vibration resistance       DIN EN 60068-2-6, 20 g, 10 1000 Hz         Approvals and certificates       cULus Listed, General Purpose, Class 2 Power Source , if UL marking is marked on the product.         Ambient conditions       cULus Listed, General Purpose, Class 2 Power Source , if UL marking is marked on the product.         Ambient conditions       cable, flexing: -5 70 °C (23 158 °F), cable, fixed: -30 70 °C (-22 158 °F)         Operating temperature       cable, fixed: -30 70 °C (-40 185 °F)         Storage temperature       -40 85 °C (-40 185 °F)         Relative humidity       98 % , no moisture condensation         Meterial       nickel-plated steel , painted         Housing       nickel-plated steel , painted         Flange       Aluminum         Shaft       Stainless steel	Emitted interference		EN 61000-6-4:2007
Vibration resistance       DIN EN 60068-2-6, 20 g, 10 1000 Hz         Approvals and certificates       UL approval         UL approval       cULus Listed, General Purpose, Class 2 Power Source , if UL marking is marked on the product.         Ambient conditions       cable, flexing: -5 70 °C (23 158 °F), cable, fixed: -30 70 °C (-22 158 °F)         Operating temperature       cable, fixed: -30 70 °C (-22 158 °F)         Storage temperature       -40 85 °C (-40 185 °F)         Relative humidity       98 %, no moisture condensation         Meterial       nickel-plated steel , painted         Housing       nickel-plated steel , painted         Flange       Aluminum         Shaft       Stainless steel	Noise immunity		EN 61000-6-2:2005
Vibration resistance       DIN EN 60068-2-6, 20 g, 10 1000 Hz         Approvals and certificates       UL approval         UL approval       cULus Listed, General Purpose, Class 2 Power Source , if UL marking is marked on the product.         Ambient conditions       cable, flexing: -5 70 °C (23 158 °F), cable, fixed: -30 70 °C (-22 158 °F)         Operating temperature       cable, fixed: -30 70 °C (-22 158 °F)         Storage temperature       -40 85 °C (-40 185 °F)         Relative humidity       98 %, no moisture condensation         Meterial       nickel-plated steel , painted         Housing       nickel-plated steel , painted         Flange       Aluminum         Shaft       Stainless steel	Shock resistance		DIN EN 60068-2-27, 200 g, 6 ms
UL approval       cULus Listed, General Purpose, Class 2 Power Source , if UL marking is marked on the product.         Ambient conditions       cable, flexing: -5 70 °C (23 158 °F), cable, fixed: -30 70 °C (-22 158 °F) connector models: -40 85 °C (-40 185 °F)         Storage temperature       -40 85 °C (-40 185 °F)         Relative humidity       98 % , no moisture condensation         Material       -40 85 °C (-40 185 °F)         Material       -40 85 °C (-40 185 °F)         Flange       nickel-plated steel , painted         Aluminum       Stainless steel	Vibration resistance		-
UL approval       cULus Listed, General Purpose, Class 2 Power Source , if UL marking is marked on the product.         Ambient conditions       cable, flexing: -5 70 °C (23 158 °F), cable, fixed: -30 70 °C (-22 158 °F) connector models: -40 85 °C (-40 185 °F)         Storage temperature       -40 85 °C (-40 185 °F)         Relative humidity       98 % , no moisture condensation         Material       -40 85 °C (-40 185 °F)         Material       -40 85 °C (-40 185 °F)         Flange       nickel-plated steel , painted         Aluminum       Stainless steel	Approvals and certificates		-
Operating temperaturecable, flexing: -5 70 °C (23 158 °F), cable, fixed: -30 70 °C (-22 158 °F) connector models: -40 85 °C (-40 185 °F)Storage temperature-40 85 °C (-40 185 °F)Relative humidity98 %, no moisture condensationMechanical specificationsMaterial			cULus Listed, General Purpose, Class 2 Power Source , if UL marking is marked on the product.
cable, fixed: -30 70 °C (-22 158 °F) connector models: -40 85 °C (-40 185 °F)Storage temperature-40 85 °C (-40 185 °F)Relative humidity98 %, no moisture condensationMechanical specifications98 %, no moisture condensationMaterialinickel-plated steel, paintedHousingnickel-plated steel, paintedFlangeAluminumShaftStainless steel	Ambient conditions		
Relative humidity     98 %, no moisture condensation       Mechanical specifications       Material       Housing     nickel-plated steel, painted       Flange     Aluminum       Shaft     Stainless steel	Operating temperature		cable, fixed: -30 70 °C (-22 158 °F)
Relative humidity     98 %, no moisture condensation       Mechanical specifications       Material       Housing     nickel-plated steel, painted       Flange     Aluminum       Shaft     Stainless steel	Storage temperature		
Material       Housing     nickel-plated steel, painted       Flange     Aluminum       Shaft     Stainless steel	Relative humidity		
Material       Housing     nickel-plated steel, painted       Flange     Aluminum       Shaft     Stainless steel	Mechanical specifications		
Flange     Aluminum       Shaft     Stainless steel			
Flange     Aluminum       Shaft     Stainless steel	Housing		nickel-plated steel, painted
Shaft Stainless steel			
	•		Stainless steel
			approx. 300 g

Release date: 2022-12-12 Date of issue: 2022-12-12 Filename: t185557\_eng.pdf

Refer to "General Notes Relating to Pepperl+Fuchs Product Information"

Germany: +49 621 776 1111 fa-info@de.pepperl-fuchs.com Singapore: +65 6779 9091 fa-info@sg.pepperl-fuchs.com

## Absolute encoders

# ENA58IL-R\*\*\*-J1939

#### **Technical Data**

Rotational speed	max. 12000 min <sup>-1</sup>
Moment of inertia	50 gcm <sup>2</sup>
Starting torque	< 5 Ncm
Shaft load	
Axial	24 N
Radial	198 N
Angle offset	± 0.9 °
Axial offset	± 0.3 mm static
Radial offset	± 0.5 mm static

## Accessories

Z	V15-G-BK2M-PUR- O2/CAN	DeviceNet/CANOpen bus cable female cordset single-ended M12 straight A-coded 5-pin, PUR cable 4-core twisted pairs black, shielded, UL approved, drag chain suitable, outdoor
Š	V15-G-BK5M-PUR- O2/CAN	DeviceNet/CANOpen bus cable female cordset single-ended M12 straight A-coded 5-pin, PUR cable 4-core twisted pairs black, shielded, UL approved, drag chain suitable, outdoor
Z	V15-G-BK10M-PUR- O2/CAN	DeviceNet/CANOpen bus cable female cordset single-ended M12 straight A-coded 5-pin, PUR cable 4-core twisted pairs black, shielded, UL approved, drag chain suitable, outdoor
°.	ACC-PACK-ABSS_58 ø15	Accessories set for Ø58 absolut rotary encoder with recessed hollow shaft 15 mm
°,Q	ACC-PACK-ABSS_58 ø14	Accessories set for Ø58 absolut rotary encoder with recessed hollow shaft 14 mm
°,Q	ACC-PACK-ABSS_58 ø12	Accessories set for Ø58 absolut rotary encoder with recessed hollow shaft 12 mm
°,Q	ACC-PACK-ABSS_58 ø10	Accessories set for Ø58 absolut rotary encoder with recessed hollow shaft 10 mm

 Refer to "General Notes Relating to Pepperl+Fuchs Product Information".

 Pepperl+Fuchs Group
 USA: +1 330 486 0001
 Get

 www.pepperl-fuchs.com
 fa-info@us.pepperl-fuchs.com
 fa-info@us.pepperl-fuchs.com

3

# Connection

Signal	Wire end	5-pin, M12 x 1 connector
CAN GND	green	1
+V <sub>S</sub>	red	2
GND	yellow	3
CAN-High	white	4
CAN-Low	brown	5
Shielding	Shielding	Housing
Pinout		2

# Interface

#### Example of the transmit commands

Command	Identifier	Data	Comments
Read request Direction	18EA2000	01 EF 00 00 00 00 00 00	
Read request Node	18EA2000	08 EF 00 00 00 00 00 00 00	
Write Direction	00EF2000	01 01 00 00 00 FF FF FF (CCW increase position)	When you change direction it will give you a different positional value. You will then need to set your preset value.
Write PRESET	00EF2000	04 A8 61 00 00 FF FF FF (value 25.000)	The preset value should be received at positional value 18FFAA20.
Write Save	00EF2000	FA 73 61 76 65 FF FF FF	The settings saved in non-volatile memory

If you change the node number, you will need to cycle power (after you save your settings) for the node number to change. Once you cycle power, you will need to enter the new node number in your identifier. You can confirm everything is saved in non-volatile memory by cycling power.

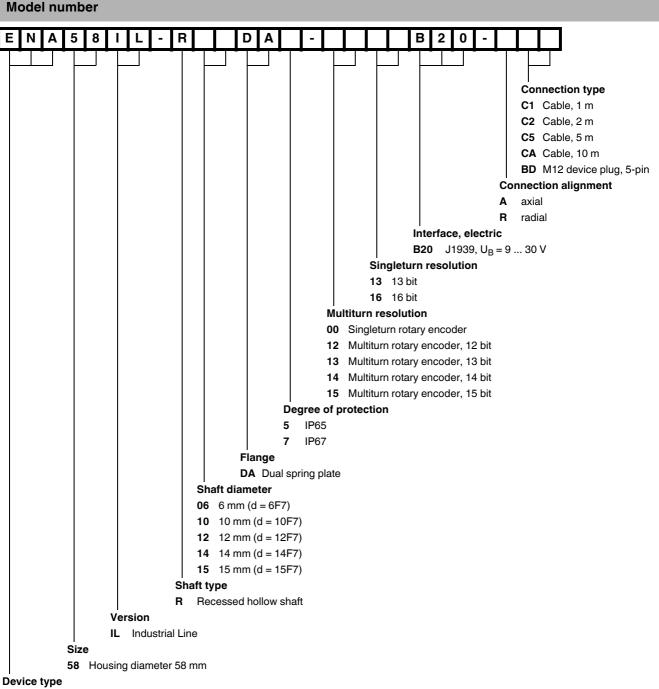
Receive:

18FFAA20: Positional and speed data

18EA2000: Read response

# **Type Code**

4



Release date: 2022-12-12 Date of issue: 2022-12-12 Filename: t185557\_eng.pdf

ENA Absolute rotary encoder

## Installation

#### Anti-interference measures

The use of highly sophisticated microelectronics requires a consistently implemented anti-interference and wiring concept. This becomes all the more important the more compact the constructions are and the higher the demands are on the performance of modern machines.

The following installation instructions and proposals apply for "normal industrial environments". There is no ideal solution for all interfering environments.

When the following measures are applied, the encoder should be in perfect working order:

- Termination of the serial line with a 120 Ω resistor (between Receive/Transmit and Receive/Transmit) at the beginning and end of the serial line (e.g. the control and the last encoder).
- The wiring of the encoder should be laid at a large distance to energy lines which could cause interferences.
- Cable cross-section of the screen at least 4 mm<sup>2</sup>. .
- Cable cross-section at least 0,14 mm<sup>2</sup>. .

Refer to "General Notes Relating to Pepperl+Fuchs Product Information

Singapore: +65 6779 9091 fa-info@sg.pepperl-fuchs.com



#### Absolute encoders

- Do not kink or jam the cables.
- Adhere to the minimum bending radius as given in the data sheet and avoid tensile as well as shearing load.

# **Operating instructions**

Every encoder manufactured by Pepperl+Fuchs leaves the factory in a perfect condition. In order to ensure this quality as well as a faultless operation, the following specifications have to be taken into consideration:

- Avoid any impact on the housing and in particular on the encoder shaft as well as the axial and radial overload of the encoder shaft.
- The accuracy and service life of the encoder is guaranteed only, if a suitable coupling is used.
- The operating voltage for the encoder and the follow-up device (e.g. control) has to be switched on and off simultaneously.
- Any wiring work has to be carried out with the system in a dead condition.
- The maximum operating voltages must not be exceeded. The devices have to be operated at extra-low safety voltage.

#### Notes on connecting the electric screening

The immunity to interference of a plant depends on the correct screening. In this field installation faults occur frequently. Often the screen is applied to one side only, and is then soldered to the earthing terminal with a wire, which is a valid procedure in LF engineering. However, in case of EMC the rules of HF engineering apply.

One basic goal in HF engineering is to pass the HF energy to earth at an impedance as low as possible as otherwise energy would discharge into the cable. A low impedance is achieved by a large-surface connection to metal surfaces.

The following instructions have to be observed:

- Apply the screen on both sides to a "common earth" in a large surface, if there is no risk of equipotential currents.
- The screen has to be passed behind the insulation and has to be clamped on a large surface below the tension relief.
- In case of cable connections to screw-type terminals, the tension relief has to be connected to an earthed surface.
- If plugs are used, metallised plugs only should be fitted (such as sub D plugs with metallised housing). Please observe the direct connection of the tension relief to the housing.

Advantage: shield	metalised connector,	
relief	clamped with the strain	
	clamp	
Disadvantage:	soldering shield on	

# Safety instructions

Please observe the national safety and accident prevention regulations as well as the subsequent safety instructions in these operating instructions when working on encoders.

If failures cannot be remedied, the device has to be shut down and has to be secured against accidental operation. Repairs may be carried out only by the manufacturer. Entry into and modifications of the device are not permissible.

Tighten the clamping ring only, if a shaft has been fitted in the area of the clamping ring (hollow shaft encoders). Tighten all screws and plug connectors prior to operating the encoder.



Do not stand on the encoder!



Do not remachine the drive shaft!

Avoid impact!



Do not remachine the housing!

Refer to "General Notes Relating to Pepperl+Fuchs Product Information

Pepperl+Fuchs Group www.pepperl-fuchs.com

USA: +1 330 486 0001 fa-info@us.pepperl-fuchs.com



Refer to "General Notes Relating to Pepperl+Fuchs Product Information".

