|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **طرح نگهداشت و افزایش تولید 27 مخزن** | | | | | | |
| **Motor Data Sheets Including Curves and Drawing**  **نگهداشت و افزایش تولید میدان نفتی بینک** | | | | | | |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
| V01 | APR. 2025 | IFA | AAC | M.FAKHARIAN | S.FARAMARZPOUR |  |
| V00 | DEC. 2024 | IFA | AAC | M.FAKHARIAN | M.SADEGHIAN |  |
| **Rev.** | **Date** | **Purpose of Issue/Status** | **Prepared by:** | **Checked by:** | **Approved by:** | **CLIENT Approval** |
|  | | | | | | |
| **Status:** | **IFA: Issued For Approval**  **IFI: Issued For Information**  **AFC: Approved For Construction** | | | | | |

**REVISION RECORD SHEET**

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **PAGE** | **V00** | **V01** | **V02** | **V03** | **V04** |  | **PAGE** | **V00** | **V01** | **V02** | **V03** | **V04** |
| **1** | X | X |  |  |  | **66** |  |  |  |  |  |
| **2** | X | X |  |  |  | **67** |  |  |  |  |  |
| **3** | X | X |  |  |  | **68** |  |  |  |  |  |
| **4** | X | X |  |  |  | **69** |  |  |  |  |  |
| **5** | X | X |  |  |  | **70** |  |  |  |  |  |
| **6** | X | X |  |  |  | **71** |  |  |  |  |  |
| **7** | X | X |  |  |  | **72** |  |  |  |  |  |
| **8** | X | X |  |  |  | **73** |  |  |  |  |  |
| **9** | X | X |  |  |  | **74** |  |  |  |  |  |
| **10** | X | X |  |  |  | **75** |  |  |  |  |  |
| **11** | X | X |  |  |  | **76** |  |  |  |  |  |
| **12** | X | X |  |  |  | **77** |  |  |  |  |  |
| **13** | X | X |  |  |  | **78** |  |  |  |  |  |
| **14** | X | X |  |  |  | **79** |  |  |  |  |  |
| **15** | X | X |  |  |  | **80** |  |  |  |  |  |
| **16** | X | X |  |  |  | **81** |  |  |  |  |  |
| **17** | X | X |  |  |  | **82** |  |  |  |  |  |
| **18** | X | X |  |  |  | **83** |  |  |  |  |  |
| **19** | X | X |  |  |  | **84** |  |  |  |  |  |
| **20** | X | X |  |  |  | **85** |  |  |  |  |  |
| **21** | X | X |  |  |  | **86** |  |  |  |  |  |
| **22** | X | X |  |  |  | **87** |  |  |  |  |  |
| **23** | X | X |  |  |  | **88** |  |  |  |  |  |
| **24** | X | X |  |  |  | **89** |  |  |  |  |  |
| **25** | X | X |  |  |  | **90** |  |  |  |  |  |
| **26** | X | X |  |  |  | **91** |  |  |  |  |  |
| **27** | X | X |  |  |  | **92** |  |  |  |  |  |
| **28** | X | X |  |  |  | **93** |  |  |  |  |  |
| **29** | X | X |  |  |  | **94** |  |  |  |  |  |
| **30** | X | X |  |  |  | **95** |  |  |  |  |  |
| **31** | X | X |  |  |  | **96** |  |  |  |  |  |
| **32** | X | X |  |  |  | **97** |  |  |  |  |  |
| **33** | X | X |  |  |  | **98** |  |  |  |  |  |
| **34** | X | X |  |  |  | **99** |  |  |  |  |  |
| **35** | X | X |  |  |  | **100** |  |  |  |  |  |
| **36** | X | X |  |  |  | **101** |  |  |  |  |  |
| **37** | X | X |  |  |  | **102** |  |  |  |  |  |
| **38** | X | X |  |  |  | **103** |  |  |  |  |  |
| **39** | X | X |  |  |  | **104** |  |  |  |  |  |
| **40** | X | X |  |  |  | **105** |  |  |  |  |  |
| **41** | X | X |  |  |  | **106** |  |  |  |  |  |
| **42** | X | X |  |  |  | **107** |  |  |  |  |  |
| **43** | X | X |  |  |  | **108** |  |  |  |  |  |
| **44** | X | X |  |  |  | **109** |  |  |  |  |  |
| **45** | X | X |  |  |  | **110** |  |  |  |  |  |
| **46** | X | X |  |  |  | **111** |  |  |  |  |  |
| **47** | X | X |  |  |  | **112** |  |  |  |  |  |
| **48** | X | X |  |  |  | **113** |  |  |  |  |  |
| **49** |  | X |  |  |  | **114** |  |  |  |  |  |
| **50** |  | X |  |  |  | **115** |  |  |  |  |  |
| **51** |  |  |  |  |  | **116** |  |  |  |  |  |
| **52** |  |  |  |  |  | **117** |  |  |  |  |  |
| **53** |  |  |  |  |  | **118** |  |  |  |  |  |
| **54** |  |  |  |  |  | **119** |  |  |  |  |  |
| **55** |  |  |  |  |  | **120** |  |  |  |  |  |
| **56** |  |  |  |  |  | **121** |  |  |  |  |  |
| **57** |  |  |  |  |  | **122** |  |  |  |  |  |
| **58** |  |  |  |  |  | **123** |  |  |  |  |  |
| **59** |  |  |  |  |  | **124** |  |  |  |  |  |
| **60** |  |  |  |  |  | **125** |  |  |  |  |  |
| **61** |  |  |  |  |  | **126** |  |  |  |  |  |
| **62** |  |  |  |  |  | **127** |  |  |  |  |  |
| **63** |  |  |  |  |  | **128** |  |  |  |  |  |
| **64** |  |  |  |  |  | **129** |  |  |  |  |  |
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**CONTENTS**

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[2.0 Motor data sheets , curves and drawing 5](#_Toc151560802)

1. **INTRODUCTION**

Binak oilfield in Bushehr province is a part of the southern oilfields of Iran, is located 20 km northwest of Genaveh city.

With the aim of increasing production of oil from Binak oilfield, an EPC/EPD Project has been defined by NIOC/NISOC and awarded to Petro Iran Development Company (PEDCO). Also PEDCO (as General Contractor) has assigned the EPC-packages of the Project to "Hirgan Energy - Design and Inspection" JV.

**GENERAL DEFINITION**

The following terms shall be used in this document.

|  |  |
| --- | --- |
| CLIENT: | National Iranian South Oilfields Company (NISOC) |
| PROJECT: | Binak Oilfield Development – Manufacturing (w/Engineering & Material Supply) of Air Coolers |
| EPD/EPC CONTRACTOR (GC): | Petro Iran Development Company (PEDCO) |
| OWNER: | OWNER is collectively refer to National Iranian South Oil Company (NISOC) and Petro Iran Development Company (PEDCO) |
| EPC CONTRACTOR: | Joint Venture of : Hirgan Energy – Design & Inspection(D&I) Companies |
| VENDOR: | Aban Air Cooler (AAC) |
| EXECUTOR: | Executor is the party which carries out all or part of construction and/or commissioning for the project. |
| THIRD PARTY INSPECTOR (TPI): | Third Party Inspector |
| SHALL: | Is used where a provision is mandatory. |
| SHOULD: | Is used where a provision is advisory only. |
| WILL: | Is normally used in connection with the action by CLIENT rather than by an EPC/EPD CONTRACTOR, supplier or VENDOR. |
| MAY: | Is used where a provision is completely discretionary. |
|  |  |
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| --- | --- | --- | --- | --- | --- | --- | --- |
| **Data Sheets for LV Induction Motors** | | | | | | | |
| **Item** | | **Category** | | **Required Specification** | | **Vendor Data** | |
| 1 | | Driven Machine | | Electrical Motor | | Electrical Motor | |
| 2 | | Driven Machine Tag No. | | - | | AEM-2101 | |
| 3 | | Manufacturer | | By Vendor | | VEM | |
| 4 | | Manufacturer's Number / Type/IE Level | | By Vendor | | K8KR 132 S4 / IE1 | |
| 5 | | Manufacturing Standard | | IEC 60034 & IPS-M-EL-131(2)  01 | | IEC 60034 | |
| 6 | | Location | | [X] Outdoor (Under Shelter)  [ ] Indoor | | Outdoor | |
| 7 | | Area Classification | | EExd IIB T3 | | EExd IIC T3 | |
| 8 | | Ambient Temperature | | 5 to +55°C | | 5 to +55°C | |
| 9 | | Relative Humidity | | 100 % | |  | |
| 10 | | Dust | | [X] Yes [ ] No | | Yes | |
| 11 | | Corrosion | | [X] Yes  [ ] No | | Yes | |
| 12 | | Elevation | | 12.5m Above Sea Level | | 12.5m Above Sea Level | |
| 13 | | Quantity | | Acc. To Load List  (BK-GCS-PEDCO-120-EL-LI-0001) | | 6 | |
| 14 | | Tag Number | | Acc. To Load List  (BK-GCS-PEDCO-120-EL-LI-0001) | | AEM-2101-1~6 | |
| 15 | | Motor Type | | Asynchronous, Squirrel Cage | | Asynchronous, Squirrel Cage | |
| 16 | | Mounting | | [ ] Horizontal [ ] Vertical | | Vertical, IMV3 | |
| 17 | | Rotor Construction | | [ ] Brazed Copper Bars  [ ] Aluminum Die Cast | | Die Cast Aluminum | |
| 18 | | Frame Material | | Steel Sheet or Cast Iron | | Cast Iron | |
| 19 | | Rotor Cage Material | | By Vendor | | Die Cast Aluminum | |
| 20 | | Cooling Method | | IC411 According to IPS-M-EL-131(2) | | IC 411 | |
| 21 | | Ingress Protection Degree for Motor | | IP 54 | | IP55 | |
| 22 | | Ingress Protection Degree for Terminal  Box | | IP 55 | | IP55 | |
| 23 | | Explosion Protection of Motor | | N/A for Safe Area  Zone 2, IIB, T3 | | EExd IIC T3 | |
| 24 | | Explosion Protection of Terminal Box | | N/A for Safe Area  Zone 2, IIB, T3 | | EExd IIC T3 | |
| 25 | | Ex. Certificate Authority/Certificate No. | | By Vendor | | CESI15ATEX017X | |
| 26 | | Driven Machine Shaft Power Requirement  (Pmp) | | As Per Related Mechanical Data sheet  (to be Specified by Vendor) | | 3.15 Kw | |
| 27 | | De-Rating Factor due to Ambient  Temperature (Kt) | | Vendor Shall Advise | | 0.86  01 | |
| 28 | | De-Rating Factor Due to Altitude (Ka) | | 1 | | 1 | |
| 29 | | Design margin (Km) | | Acc. to IPS Standard (Note 1) | | API661 | |
| **Data Sheets for LV Induction Motors** | | | | | | | |
| **Item** | | **Category** | | **Required Specification** | | **Vendor Data** | |
| 30 | | Motor Shaft Power Requirement @ Site  condition (=Km X Pmp) | | By Vendor | | 3.15\*1.1 =3.4 Kw | |
| 31 | | Standard Rated Motor Output  =Km X Pmp/ (Ka Kt) | | By Vendor | | 5.5 Kw @ +40C | |
| 32 | | Frame Size | | By Vendor  01 | | 132S | |
| 33 | | Frame Earth Boss | | External | | External | |
| 34 | | Rated Voltage | | 400 V ±10% | | 400 V ±10% | |
| 35 | | Rated Frequency | | 50 Hz ±5% | | 50 Hz ±5% | |
| 36 | | Protection Devices | | Switch-Fuse | | Switch-Fuse | |
| 37 | | Neutral Earthing System | | TNS | | TNS | |
| 38 | | Voltage During Motor Start | | 80% Un | | 80% Un | |
| 39 | | Synchronous Speed | | By Vendor | | 1500 | |
| 40 | | Full Load Speed [RPM] | | By Vendor | | 1435 | |
| 41 | | Over Speed Capability | | By Vendor | | 120 % | |
| 42 | | Number of Poles | | By Vendor | | 4 | |
| 43 | | Starting Method | | Direct on Line | | DOL | |
| 44 | | Direction of Rotation (Viewed from coupling end) | | Shall be Proposed by MFR Based on Driven Load Rotation of Direction | | [ ] CW  [ ] CCW  [ ] Unidirectional  [X] Bidirectional | |
| 45 | | Stator Winding Connection | | Delta | | Delta | |
| 46 | | Location of Terminal Box (Viewed from DE) | | [ ] Right [ ] Left | | Top | |
| 47 | | Insulation Class | | Class F | | F | |
| 48 | | Class of Temperature Rise | | Class B | | B | |
| 49 | | Max. Permissible Starting Time [s] | | By Vendor | |  | |
| 50 | | Accelerating Time  DOL starting, at 100% Un [s] | | By Vendor | | 3 | |
| 51 | | Accelerating Time  DOL starting, at 80% Un [s] | | By Vendor | | 5.16 | |
| 52 | | Starting Torque at 100% Un [N.m] | | By Vendor | | 87.84 | |
| 53 | | Starting Torque at 80% Un [N.m] | | By Vendor | | 56.22 | |
| 54 | | Maximum Torque [N.m] | | By Vendor | | 109 | |
| 55 | | Pull-Up Torque | | By Vendor | | 80.52 | |
| 56 | | Locked Rotor Torque | | By Vendor | | 84 | |
| 57 | | Rated Torque [N.m] | | By Vendor | | 36.6 | |
| 58 | | Rated Current [A] | | By Vendor | | 11 | |
| **Data Sheets for LV Induction Motors** | | | | | | | |
| **Item** | | **Category** | | **Required Specification** | | **Vendor Data** | |
| 59 | | Max Starting Current | | By Vendor | | ≤700 In | |
| 60 | | No Load Current [A] | | By Vendor | | 6.1 A | |
| 61 | | Locked Rotor Current [A] | | <7In | | 6.1 In | |
| 62 | | Locked Rotor Power Factor [A] | | By Vendor  01 | | 0.49 | |
| 63 | | Torque-Speed Class | | Shall be Selected Based on Driven  Load Torque Requirement | | [ ] A [ ] B  [ X ] N [ ] D | |
| 64 | | Duty Cycle | | S1 | | S1 | |
| 65 | | Current at ½ Rated Load | | By Vendor | | 6.35 A | |
| 66 | | Current at ¾ Rated load | | By Vendor | | 8.46 A | |
| 67 | | Current at Rated Load | | By Vendor | | 11 A | |
| 68 | | Starting Power Factor | | By Vendor  01 | | 0.49 | |
| 69 | | Power Factor at ½ Rated Load | | By Vendor | | 0.71 | |
| 70 | | Power Factor at ¾ Rated load | | By Vendor | | 0.8 | |
| 71 | | Power Factor at Rated Load | | By Vendor | | 0.85 | |
| 72 | | Efficiency at ½ Rated Load | | By Vendor | | 83.2 | |
| 73 | | Efficiency at ¾ Rated Load | | By Vendor | | 85 | |
| 74 | | Efficiency at Rated Load | | By Vendor | | 84.7 | |
| 75 | | No Load Losses | | By Vendor | | 0.35 | |
| 76 | | Stall Time (Hot/Cold) (Sec) | | By Vendor | | 10/15 | |
| 77 | | Transient Reactance (X'd) | | By Vendor | | - | |
| 78 | | Sub - Transient Reactance (X"d) | | By Vendor | | - | |
| 79 | | Acceleration Time At 80% Un (Sec) | | By Vendor | | 5.16 | |
| 80 | | Bearing (DE) | | | | | |
| Type (Detail Description by Vendor) | | Anti-Friction (Ball Bearing) | | 6208-2Z C3 | |
| Manufacturer | | By Vendor | | SKF Or NSK | |
| Minimum Life Without Load | | Minimum 40000 Hours | | 40000 | |
| Minimum Life With Load | | Minimum 32000 Hours | | 32000 | |
| Lubrication | | Grease | | Grease | |
| Cooling Water/ Oil Capacity | | N/A | | N/A | |
| Permissible Trust Force [N] | | By Vendor | | - | |
| 81 | | Bearing (NDE) | | | | | |
| Type (Detail Description by Vendor) | | Anti friction (ball bearing) | | 6208-2Z C3 | |
| Manufacturer | | By Vendor | | SKF Or NSK | |
| **Data Sheets for LV Induction Motors** | | | | | | | |
| **Item** | | **Category** | | **Required Specification** | | **Vendor Data** | |
|  | | Minimum Life Without Load | | Minimum 40000 Hours | | 40000 | |
| Minimum Life With Load | | Minimum 32000 Hours | | 32000 | |
| Lubrication | | Grease | | Grease | |
| Cooling Water/ Oil Capacity | | N/A | | N/A | |
| Permissible Trust Force [N] | | By Vendor | | - | |
|  | | Space Heater | | Not Required | | N/A | |
| Space Heater Voltage [V] | | 230VAC, 50Hz, 1Ph | | N/A | |
| Space Heater Power [W] | | By Vendor | | N/A | |
| 82 | | Temp. Detector (Winding/Bearing) | | By Vendor | | N/A | |
| 83 | | Terminal Boxes | | [X] Power Terminal Box  [X] Space heater (if required) | | Power TB | |
| 84 | | Main Power Cable Specification & Size &  Orientation | | According to  (BK-GCS-PEDCO-120-EL-CN-0003) | | - | |
| 85 | | Motor Weight (Net/Shipped) | | By Vendor | | 79 | |
| 86 | | Rotor Moment of Inertia | | By Vendor | | 0.02 | |
| 87 | | Method of Cable Entry | | [X] Cable Gland  [ ] Sealing Gasket | | Gland | |
| 88 | | Cable Gland Hub of Main Terminal Box | | By Vendor | | 2 x M32 x1.5 | |
| 89 | | Cable Gland Entry for aux. Terminal Box  (if applicable) | | 1 X M25 (if Required) | | N/A | |
| 90 | | Short Circuit Capability of Terminal Box | | 30 kA for 0.2 S | | 10KA for 1Sec | |
| 91 | | Sound Level at 1 distance meter From  Motor | | Max. 85 dB(A) | | Below 85 dB | |
| 92 | | Finish Color | | Manufacturer Standard | | 7031 | |
| 93 | | Load Torque/Slip, Current/Slip Curves | | By Vendor | | After fan finalization | |
| 94 | | Motor Torque/Slip, Current/Slip Curves | | By Vendor | | Attached | |
| 95 | | Time - Current Heating (Thermal Limit)  Curve | | By Vendor | | Attached | |
| 96 | | Motor Thermal Capacity Data | | By Vendor | | Attached | |
| 97 | | Installation, Operation & Maintenance  Instruction | | By Vendor | | Attached | |
| 98 | | Spare Parts List for Two Years Operation | | By Vendor | | Please refer to relevant document | |
| 99 | | Commissioning Spare Part List | | By Vendor | | N/A | |
| 100 | | Dimensional Outline Drawing | | By Vendor | | As per attached DWG | |
| 101 | | Certified Type Test Report & Written  Statement | | By Vendor | | After Manufacturing test report would be provided. | |
| 102 | | Certified Conformity for EX Type Motors | | By Vendor | | Attached | |
| 103 | | Deviation List (if Any) | | By Vendor | | There is no deviation between the standard by considering the TCL. | |
| **Data Sheets for LV Induction Motors**  01 | | | | | | | |
| **Item** | | **Category** | | **Required Specification** | | **Vendor Data** | |
| 104 | | Test & Inspection | | Factory Routine Test Report Shall be  Submitted | | After Manufacturing test report would be provided | |

DE: Drive End

NDE: Non Drive End CW: Clockwise

CCW: Counter Clockwise

Note 1: IPS design margin is defined in accordance with standard output power rating of motor:

|  |  |  |
| --- | --- | --- |
|  | Standard Output Power Rating | Design margin |
| 1 | Up to 22kW | 1.25 |
| 2 | from 22kW to 55kW | 1.15 |
| 3 | Above 55kW | 1.10 |

Note 2: The following values are default unless otherwise specified during finalization of motors:

|  |  |  |  |
| --- | --- | --- | --- |
|  | Standard Output Power Rating | Cable Size | Gland Size |
| 1 | 5.5kW | 3x6 | M25 |
| 2 | 7.5kW | 3x6 | M25 |
| 3 | 15kW | 3x16 | M32 |
| 4 | 18.5kW | 3x16 | M32 |
| 5 | 30kW | 3x50 | M40 |
| 6 | 37kW | 3x50 | M40 |
| 7 | 45kW |  | M50 |
| 8 | 55kW | 3x95 | M50 |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Data Sheets for LV Induction Motors** | | | | | | | |
| **Item** | | **Category** | | **Required Specification** | | **Vendor Data** | |
| 1 | | Driven Machine | | Electrical Motor | | Electrical Motor | |
| 2 | | Drive Machine Tag No. | | - | | AEM-2102 | |
| 3 | | Manufacturer | | By Vendor | | VEM | |
| 4 | | Manufacturer's Number / Type/Efficiency Level | | By Vendor | | K8KR 132 M4 / IE1 | |
| 5 | | Manufacturing Standard | | IEC 60034 & IPS-M-EL-131(2)  01 | | IEC 60034 | |
| 6 | | Location | | [X] Outdoor (Under Shelter)  [ ] Indoor | | Outdoor | |
| 7 | | Area Classification | | EExd IIB T3 | | EExd IIC T3 | |
| 8 | | Ambient Temperature | | 5 to +55°C | | 5 to +55°C | |
| 9 | | Relative Humidity | | 100 % | |  | |
| 10 | | Dust | | [X] Yes [ ] No | | Yes | |
| 11 | | Corrosion | | [X] Yes  [ ] No | | Yes | |
| 12 | | Elevation | | 12.5m Above Sea Level | | 12.5m Above Sea Level | |
| 13 | | Quantity | | Acc. To Load List  (BK-GCS-PEDCO-120-EL-LI-0001) | | 6 | |
| 14 | | Tag Number | | Acc. To Load List  (BK-GCS-PEDCO-120-EL-LI-0001) | | AEM-2102-1~6 | |
| 15 | | Motor Type | | Asynchronous, Squirrel Cage | | Asynchronous, Squirrel Cage | |
| 16 | | Mounting | | [ ] Horizontal [ ] Vertical | | Vertical, IMV3 | |
| 17 | | Rotor Construction | | [ ] Brazed Copper Bars  [ ] Aluminum Die Cast | | Die Cast Aluminum | |
| 18 | | Frame Material | | Steel Sheet or Cast Iron | | Cast Iron | |
| 19 | | Rotor Cage Material | | By Vendor | | Die Cast Aluminum | |
| 20 | | Cooling Method | | IC411 According to IPS-M-EL-131(2) | | IC 411 | |
| 21 | | Ingress Protection Degree for Motor | | IP 54 | | IP55 | |
| 22 | | Ingress Protection Degree for Terminal  Box | | IP 55 | | IP55 | |
| 23 | | Explosion Protection of Motor | | N/A for Safe Area  Zone 2, IIB, T3 | | EExd IIC T3 | |
| 24 | | Explosion Protection of Terminal Box | | N/A for Safe Area  Zone 2, IIB, T3 | | EExd IIC T3 | |
| 25 | | Ex. Certificate Authority/Certificate No. | | By Vendor | | CESI15ATEX017X | |
| 26 | | Driven Machine Shaft Power Requirement  (Pmp) | | As Per Related Mechanical Data sheet  (to be Specified by Vendor) | | 4.83 Kw | |
| 27 | | De-Rating Factor due to Ambient  Temperature (Kt) | | Vendor Shall Advise | | 0.86  01 | |
| 28 | | De-Rating Factor Due to Altitude (Ka) | | 1 | | 1 | |
| 29 | | Design margin (Km) | | Acc. to IPS Standard (Note 1) | | API661 | |
| **Data Sheets for LV Induction Motors** | | | | | | | |
| **Item** | | **Category** | | **Required Specification** | | **Vendor Data** | |
| 30 | | Motor Shaft Power Requirement @ Site  condition (=Km X Pmp) | | By Vendor | | 4.83\*1.1 =5.3 Kw | |
| 31 | | Standard Rated Motor Output  =Km X Pmp/ (Ka Kt) | | By Vendor | | 7.5 Kw @+40C  01 | |
| 32 | | Frame Size | | By Vendor  01 | | 132M | |
| 33 | | Frame Earth Boss | | External | | External | |
| 34 | | Rated Voltage | | 400 V ±10% | | 400 V ±10% | |
| 35 | | Rated Frequency | | 50 Hz ±5% | | 50 Hz ±5% | |
| 36 | | Protection Devices | | Switch-Fuse | | Switch-Fuse | |
| 37 | | Neutral Earthing System | | TNS | | TNS | |
| 38 | | Voltage During Motor Start | | 80% Un | | 80% Un | |
| 39 | | Synchronous Speed | | By Vendor | | 1500 | |
| 40 | | Full Load Speed [RPM] | | By Vendor | | 1440 | |
| 41 | | Over Speed Capability | | By Vendor | | 120 % | |
| 42 | | Number of Poles | | By Vendor | | 4 | |
| 43 | | Starting Method | | Direct on Line | | DOL | |
| 44 | | Direction of Rotation (Viewed from coupling end) | | Shall be Proposed by MFR Based on Driven Load Rotation of Direction | | [ ] CW  [ ] CCW  [ ] Unidirectional  [X] Bidirectional | |
| 45 | | Stator Winding Connection | | Delta | | Delta | |
| 46 | | Location of Terminal Box (Viewed from DE) | | [ ] Right [ ] Left | | Top | |
| 47 | | Insulation Class | | Class F | | F | |
| 48 | | Class of Temperature Rise | | Class B | | B | |
| 49 | | Max. Permissible Starting Time [s] | | By Vendor | | - | |
| 50 | | Accelerating Time  DOL starting, at 100% Un [s] | | By Vendor | | 2.18 | |
| 51 | | Accelerating Time  DOL starting, at 80% Un [s] | | By Vendor | | 3.66 | |
| 52 | | Starting Torque at 100% Un [N.m] | | By Vendor | | 154.18 | |
| 53 | | Starting Torque at 80% Un [N.m] | | By Vendor | | 98.67 | |
| 54 | | Maximum Torque [N.m] | | By Vendor | | 174 | |
| 55 | | Pull-Up Torque | | By Vendor | | 144.23 | |
| 56 | | Locked Rotor Torque | | By Vendor | | 154 | |
| 57 | | Rated Torque [N.m] | | By Vendor | | 49.73 | |
| 58 | | Rated Current [A] | | By Vendor | | 16.5 | |
| **Data Sheets for LV Induction Motors** | | | | | | | |
| **Item** | | **Category** | | **Required Specification** | | **Vendor Data** | |
| 59 | | Max Starting Current | | By Vendor | | ≤700 In | |
| 60 | | No Load Current [A] | | By Vendor | | 7.6 A | |
| 61 | | Locked Rotor Current [A] | | <7In | | 6.6 In | |
| 62 | | Locked Rotor Power Factor [A] | | By Vendor | | 0.44  01 | |
| 63 | | Torque-Speed Class | | Shall be Selected Based on Driven  Load Torque Requirement | | [ ] A [ ] B  [ X ] N [ ] D | |
| 64 | | Duty Cycle | | S1 | | S1  01 | |
| 65 | | Current at ½ Rated Load | | By Vendor | | 10.27 A | |
| 66 | | Current at ¾ Rated load | | By Vendor | | 13.25 A | |
| 67 | | Current at Rated Load | | By Vendor | | 16.5 A  01 | |
| 68 | | Starting Power Factor | | By Vendor | | 0.44 | |
| 69 | | Power Factor at ½ Rated Load | | By Vendor | | 0.62 | |
| 70 | | Power Factor at ¾ Rated load | | By Vendor | | 0.71 | |
| 71 | | Power Factor at Rated Load | | By Vendor | | 0.76 | |
| 72 | | Efficiency at ½ Rated Load | | By Vendor | | 85 | |
| 73 | | Efficiency at ¾ Rated Load | | By Vendor | | 86.3 | |
| 74 | | Efficiency at Rated Load | | By Vendor | | 86 | |
| 75 | | No Load Losses | | By Vendor | | 0.52 | |
| 76 | | Stall Time (Hot/Cold) (Sec) | | By Vendor | | 7/11 | |
| 77 | | Transient Reactance (X'd) | | By Vendor | | - | |
| 78 | | Sub - Transient Reactance (X"d) | | By Vendor | | - | |
| 79 | | Acceleration Time At 80% Un (Sec) | | By Vendor | | 3.66 | |
| 80 | | Bearing (DE) | | | | | |
| Type (Detail Description by Vendor) | | Anti Friction (Ball Bearing) | | 6208-2Z C3 | |
| Manufacturer | | By Vendor | | SKF Or NSK | |
| Minimum Life Without Load | | Minimum 40000 Hours | | 40000 | |
| Minimum Life With Load | | Minimum 32000 Hours | | 32000 | |
| Lubrication | | Grease | | Grease | |
| Cooling Water/ Oil Capacity | | N/A | | - | |
| Permissible Trust Force [N] | | By Vendor | | - | |
| 81 | | Bearing (NDE) | | | | | |
| Type (Detail Description by Vendor) | | Anti friction (ball bearing) | | 6208-2Z C3 | |
| Manufacturer | | By Vendor | |  | |
| **Data Sheets for LV Induction Motors** | | | | | | | |
| **Item** | | **Category** | | **Required Specification** | | **Vendor Data** | |
|  | | Minimum Life Without Load | | Minimum 40000 Hours | | 40000 | |
| Minimum Life With Load | | Minimum 32000 Hours | | 32000 | |
| Lubrication | | Grease | | Grease | |
| Cooling Water/ Oil Capacity | | N/A | | -- | |
| Permissible Trust Force [N] | | By Vendor | | - | |
|  | | Space Heater | | Not Required | | N/A | |
| Space Heater Voltage [V] | | 230VAC, 50Hz, 1Ph | | N/A | |
| Space Heater Power [W] | | By Vendor | | N/A | |
| 82 | | Temp. Detector (Winding/Bearing) | | By Vendor | | N/A | |
| 83 | | Terminal Boxes | | [X] Power Terminal Box  [X] Space heater (if required) | | Power TB | |
| 84 | | Main Power Cable Specification & Size &  Orientation | | According to  (BK-GCS-PEDCO-120-EL-CN-0003) | | - | |
| 85 | | Motor Weight (Net/Shipped) | | By Vendor | | 87 | |
| 86 | | Rotor Moment of Inertia | | By Vendor | | 0.167 | |
| 87 | | Method of Cable Entry | | [X] Cable Gland  [ ] Sealing Gasket | | Gland | |
| 88 | | Cable Gland Hub of Main Terminal Box | | By Vendor | | 2 x M32 x1.5 | |
| 89 | | Cable Gland Entry for aux. Terminal Box  (if applicable) | | 1 X M25 (if Required) | | N/A | |
| 90 | | Short Circuit Capability of Terminal Box | | 30 kA for 0.2 S | | 10KA for 1Sec | |
| 91 | | Sound Level at 1 distance meter From  Motor | | Max. 85 dB(A) | | Below 85 dB | |
| 92 | | Finish Color | | Manufacturer Standard | | 7031 | |
| 93 | | Load Torque/Slip, Current/Slip Curves | | By Vendor | | After fan finalization | |
| 94 | | Motor Torque/Slip, Current/Slip Curves | | By Vendor | | Attached | |
| 95 | | Time - Current Heating (Thermal Limit)  Curve | | By Vendor | | Attached | |
| 96 | | Motor Thermal Capacity Data | | By Vendor | | Attached | |
| 97 | | Installation, Operation & Maintenance  Instruction | | By Vendor | | Attached | |
| 98 | | Spare Parts List for Two Years Operation | | By Vendor | | Please refer to relevant document | |
| 99 | | Commissioning Spare Part List | | By Vendor | | N/A | |
| 100 | | Dimensional Outline Drawing | | By Vendor | | As per attached DWG | |
| 101 | | Certified Type Test Report & Written  Statement | | By Vendor | | After Manufacturing test report would be provided. | |
| 102 | | Certified Conformity for EX Type Motors | | By Vendor | | Attached | |
| 103 | | Deviation List (if Any) | | By Vendor | | There is no deviation between the standard by considering the TCL. | |
| **Data Sheets for LV Induction Motors**  01 | | | | | | | |
| **Item** | | **Category** | | **Required Specification** | | **Vendor Data** | |
| 104 | | Test & Inspection | | Factory Routine Test Report Shall be  Submitted | | After Manufacturing test report would be provided | |

DE: Drive End

NDE: Non Drive End CW: Clockwise

CCW: Counter Clockwise

Note 1: IPS design margin is defined in accordance with standard output power rating of motor:

|  |  |  |
| --- | --- | --- |
|  | Standard Output Power Rating | Design margin |
| 1 | Up to 22kW | 1.25 |
| 2 | from 22kW to 55kW | 1.15 |
| 3 | Above 55kW | 1.10 |

Note 2: The following values are default unless otherwise specified during finalization of motors:

|  |  |  |  |
| --- | --- | --- | --- |
|  | Standard Output Power Rating | Cable Size | Gland Size |
| 1 | 5.5kW | 3x6 | M25 |
| 2 | 7.5kW | 3x6 | M25 |
| 3 | 15kW | 3x16 | M32 |
| 4 | 18.5kW | 3x16 | M32 |
| 5 | 30kW | 3x50 | M40 |
| 6 | 37kW | 3x50 | M40 |
| 7 | 45kW |  | M50 |
| 8 | 55kW | 3x95 | M50 |