**48 V DC powered BLDC Motor based fans with feature for remote operation**

 **Technical Specifications**

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| **Parameter** |  **Specifications** |
| Type of fan | External rotor  |
| Type of motor | PM BLDC |
| Fan size (Sweep) | 1200 ±5 mm |
| Nominal Operating Voltage | 48 V DC |
| Operating Voltage Range | 45-52 V DC  |
| Power input | 30 W Max |
| Max Speed |  300 – 320 RPM |
| Air delivery at max speed |  200-210 m3/min |
| Motor controller | Sensor less control strategy |
|  ON/OFF and speed control operation  | With built-in remote (IR) Sensor for external remote control  |
| Multiple speed settings | From 180 RPM to max speed in near equal steps from remote |
| Starting | Fan shall start and run at 45 V to 52 V DC |
| Start up at all speeds  | Smooth starting with a maximum of 180 degree (mechanical) reverse rotation, if any.  |
| Memorising last set speed | Fan controller shall be capable of running at the last set speed, at the time of Power ON |
| Insulation resistance | 5 M Ohm @ 600 V DC |
| Winding Temperature rise | 70 ◦ C |
| Type of blades | Aluminium sheet |
| Protection features | Blocked Blade, Reverse polarity, Over voltage and Over Current |
| Operating noise at at full speed | 65 dBA |
| No load operating noise | 52 dBA |
| Motor construction | Totally enclosed type |
| Corrosion resistance  | Motor body and blades shall be corrosion resistant |
| Safe operation temperature | 50 ◦ C |
| Max humidity | 90 % Rh |
| Other fan accessories | Standard down rod, canopy and shackle clip  |
| Safety features | Compliance to mechanical safety of fan suspension system (clamp and down rod) |
| **Remote control signals, commands and codes** |
| Communication Protocol | NEC derived custom protocol |
| Carrier Frequency | 38 ± 1 kHz |
| Operating distance (line of sight)  | 5 m  |
| Feedback signal to user | Light signals to user for 2s whenever remote is operated |
| Control signals | Command | Hex Codes |
| Fan ON or OFF | F\_ON\_OFF | 0x00FF42BB  |
| Fan speed increase  | F\_UP | 0x00FF52AA |
| Fan speed decrease | F\_DN | 0x00FF7888 |
|  **Code description** |

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| **Command** | **Hex Code** | **Binary Codes (32 bits)** | **Reversal of binary digits in** **Hex Code** | **Decimal****notation of the Code** |
| F\_ON\_OFF | 0x00FF42BB | 0b 0000 0000 1111 1111 0100 0010 1011 1011 | DD42FF00 | 3712155392 |
| F\_UP | 0x00FF52AA | 0b 0000 0000 1111 1111 0101 0010 1010 1010 | 554AFF00 | 1430978304 |
| F\_DN | 0x00FF7888 | 0b 0000 0000 1111 1111 0111 1000 1000 1000 | 111EFF00 | 287244032 |
| **Data reception** | As per NEC protocol for communication |
| 1. **(i) Total length of the data reception in one cycle in 32 bits.**
* Logical '0' – a 562.5µs high signal followed by a 562.5µs low signal, with a total

 time of 1.125ms * Logical '1' – a 562.5µs high signal followed by a 1.6875ms low signal, with a total time of 2.25ms.

**(ii) Start sequence:** A high signal of 9ms followed by a low signal of 4.5ms and thus making a total time of 13.5ms; bit sequence is modulating signal.  |