Danfoss MBS 3000

Danfoss MBS 3000 Pressure Transmitter User Manual

Model: MBS 3000 | Brand: Danfoss

1. Introduction

The Danfoss MBS 3000 is a compact, heavy-duty pressure transmitter designed for reliable pressure measurement in demanding industrial and hydraulic environments. It offers high accuracy and stability, even under harsh conditions, making it suitable for a wide range of applications including pumps, compressors, pneumatic systems, water treatment, and HVAC. This manual provides essential information for the safe and effective installation, operation, and maintenance of your MBS 3000 pressure transmitter.

Figure 1: Overview of the Danfoss MBS 3000 Pressure Transmitter.

2. Safety Information

Read this manual carefully before installing or operating the device. Failure to follow these instructions may result in equipment damage, personal injury, or death.

- Installation and maintenance must be performed by qualified personnel only.
- Ensure the power supply is disconnected before making any electrical connections.
- Verify that the pressure range of the transmitter matches the application requirements to prevent overpressure damage.
- Do not exceed the specified operating temperature limits.
- The device is designed for use in zone 2 explosive atmospheres; however, ensure all local regulations and safety standards for such environments are strictly adhered to.

3. Product Features

The Danfoss MBS 3000 pressure transmitter incorporates several key features for robust and accurate performance:

- Designed for severe industrial and hydraulic environments.
- Resistant to cavitation, liquid hammer, and pressure peaks.
- Enclosure and wetted parts constructed from acid-resistant stainless steel.
- Temperature-compensated and laser calibrated for high accuracy.
- Suitable for use in zone 2 explosive atmospheres.
- Wide range of pressure and electrical connections available.
- Standard output signals include 4-20 mA, 0-5 V, 1-5 V, 1-6 V, 0-10 V, and 1-10 V.

Figure 2: Key features of the MBS 3000 transmitter.

4. Setup and Installation

Proper installation is crucial for the accurate and reliable operation of the MBS 3000 pressure transmitter.

4.1. Mechanical Installation (Pressure Connection)

The MBS 3000 features a G 1/4" pressure connection.

1. Ensure the pressure port and mating connection are clean and free from debris.
2. Apply appropriate thread sealant if necessary, according to system requirements.
3. Carefully screw the transmitter into the pressure port. Do not overtighten. Refer to the system's torque specifications.
4. Ensure the transmitter is securely mounted to prevent vibration-induced damage.

Figure 3: Detail of the G 1/4" pressure connection.

4.2. Electrical Installation (DIN Plug)

The electrical connection is made via a standard DIN plug.

1. Disconnect power to the circuit before making any electrical connections.
2. Wire the DIN plug according to the wiring diagram provided with your specific model or system documentation. The standard output signal is 4-20 mA.
3. Ensure correct polarity for power supply and signal lines.
4. Securely attach the DIN plug to the transmitter's electrical connector.

5. Verify all connections are tight and properly insulated to maintain the IP65 enclosure rating.

Figure 4: Electrical connection via DIN plug.

5. Operating Instructions

Once properly installed and powered, the MBS 3000 pressure transmitter will begin to measure pressure and output a corresponding signal.

- **Power-up:** The transmitter has a power-up time of less than 50 ms.
- **Signal Output:** The standard output is 4-20 mA, linearly proportional to the measured pressure range (e.g., 4 mA for 0 bar, 20 mA for 16 bar). Other output signals (0-5 V, 1-5 V, 1-6 V, 0-10 V, 1-10 V) may be configured depending on the specific model.
- **Monitoring:** Connect the output signal to a compatible control system, PLC, or display unit to monitor the pressure readings.
- **Response Time:** The device has a fast response time of less than 4 ms, ensuring quick and accurate pressure updates.

6. Maintenance

The Danfoss MBS 3000 is designed for minimal maintenance. However, periodic checks can help ensure long-term reliability.

- **Visual Inspection:** Regularly inspect the transmitter for any signs of physical damage, corrosion, or loose connections.
- **Connection Integrity:** Ensure the electrical and pressure connections remain tight and free from leaks.
- **Cleaning:** If necessary, clean the exterior of the transmitter with a soft, damp cloth. Do not use abrasive cleaners or solvents.
- **Recalibration:** While the MBS 3000 is factory calibrated, periodic recalibration may be required depending on application demands and regulatory requirements. Consult a qualified technician for recalibration services.

7. Troubleshooting

This section provides general guidance for common issues. For complex problems, contact Danfoss technical support.

Problem	Possible Cause	Solution
No output signal	No power supply; incorrect wiring; damaged cable; faulty transmitter.	Check power supply voltage; verify wiring against diagram; inspect cable for damage; replace transmitter if faulty.
Inaccurate readings	Incorrect calibration; sensor contamination; pressure fluctuations; electrical interference.	Check calibration; ensure media compatibility; stabilize pressure source; check for proper grounding and shielding.
Intermittent signal	Loose electrical connection; intermittent power supply; excessive vibration.	Secure all electrical connections; check power supply stability; reduce vibration or isolate transmitter.

8. Technical Specifications

Parameter	Value
Brand	Danfoss
Model	MBS 3000
Measuring Range	0 to 16 bar
Standard Output Signal	4-20 mA (Other options: 0-5 V, 1-5 V, 1-6 V, 0-10 V, 1-10 V)
Pressure Connection	G 1/4"
Electrical Connection	DIN plug
Operating Temperature	Normal: -40 °C to +85 °C; ATEX Zone 2: -10 °C to +85 °C
Accuracy (typ./max.)	≤ ± 0.5% FS (typ.) / ≤ ± 1% FS (max.)
Hysteresis and Repeatability	≤ ± 0.1% FS

Thermal Zero Point Shift (typ./max.)	≤ ± 0.1% FS / 10K (typ.) / ≤ ± 0.2% FS / 10K (max.)
Response Time	< 4 ms
Overload Pressure (static)	6 × FS (max. 1500 bar)
Burst Pressure	6 × FS (max. 2000 bar)
Power-up Time	< 50 ms
Durability (P: 10 – 90% FS)	> 10 × 10^6 cycles
Insulation Resistance	> 100 MΩ at 500 V DC
Enclosure Rating	IP65
Net Weight	0.2 – 0.3 kg
Country of Origin	Denmark

9. Applications

The Danfoss MBS 3000 pressure transmitter is versatile and suitable for a broad range of industrial and hydraulic applications, including:

- Pumps
- Compressors
- Pneumatic systems
- Water treatment facilities
- Automotive industry
- Heavy industries
- HVAC (Heating, Ventilation, and Air Conditioning) systems

Figure 5: Typical applications for the MBS 3000.

10. Warranty and Support

For information regarding product warranty, technical support, or service, please contact your authorized Danfoss distributor or visit the official Danfoss website. Ensure you have your product model number (MBS 3000) and any relevant purchase details available when seeking support.