

# Assembly Instructions M8100-EN

## Spare part flow rate measuring board DFM-51 (O/ID T25605)

### Purpose

Replacement of flow rate measuring board DFM-51 (A 9)

### Precondition



**WARNING!**

**Danger for unauthorized persons!**

Conversion work may only be carried out by specialist staff who have been trained accordingly.

Therefore:

- Keep unauthorized persons away from the work area.



**NOTE!**

*Knowledge of the Instruction Manual is a precondition for carrying out conversion work on the unit.*

### Procedure



**DANGER!**

**Danger to life caused by electric current!**

Touching conductive parts causes a direct danger to life.

Therefore:

- For all work on the electrical system, for maintenance, cleaning or repair work, disconnect from the mains or disconnect all phases of the external power supply and secure them against being switched on again. Check unit is isolated from power supply.



**WARNING!**

**Danger of crushing due to rolling away or tipping**

With an uneven floor or when the castors are not locked, there is a danger that the unit tips over or rolls away causing crushing.

Therefore:

- Only install the unit on an even floor.
- Ensure that the castors are locked.

1. Proceed as follows in order to cool down the unit and empty the mould (mould evacuation)
  - Display menu page **Functions**.
  - Select the function **Cooling** and activate with the **OK** key.
  - Select the function **Mould evacuation** and activate with the **OK** key.

→ The activated function is indicated with the **✓** symbol.

2. Main switch off, remove the plug from the mains and empty the unit.

3. Remove control cable to ext. flow rate meter Flow-5.

4. Proceed as follows in order to remove the cover of the evaluation unit:
  - Remove screws (Label 1 → Fig. 1).
  - Detach screws (Label 2 → Fig. 2).
  - Lift the cover with the keyboard and pull out the ribbon cable.
  - Remove the cover with the keyboard.

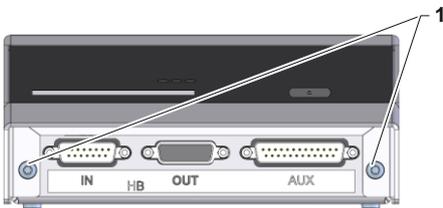


Fig. 1: Front side of the evaluation unit

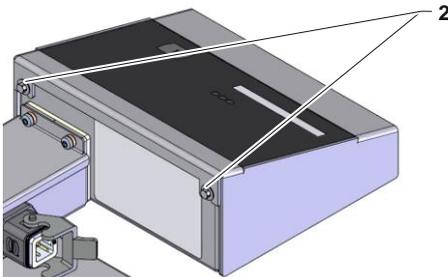


Fig. 2: Rear side of the evaluation unit

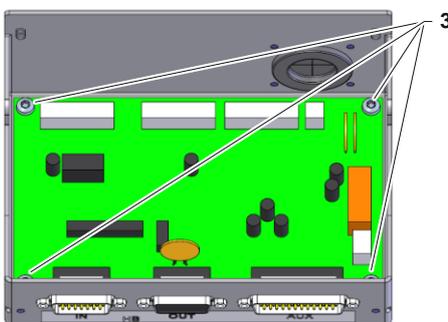


Fig. 3: DFM-51 evaluation unit

5. Proceed as follows in order to replace the printed circuit board DFM-51 (A 9):
  - Pull out plug connections of printed circuit board DFM-51.
  - Remove screws (Label 3 → Fig. 3).
  - Remove printed circuit board DFM-51 and insert new one in the evaluation unit.
  - Attach screws (Label 3 → Fig. 3).
  - Connect plug connections to the printed circuit board.

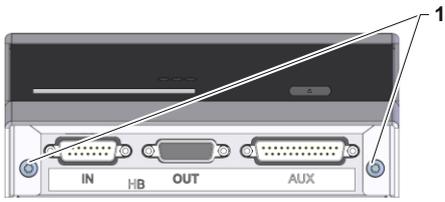


Fig. 4: Front side of the evaluation unit

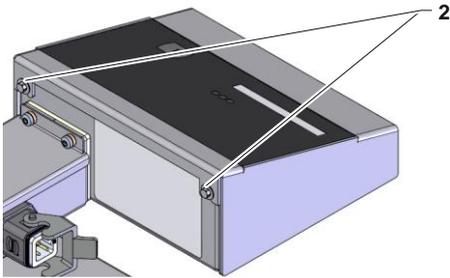


Fig. 5: Rear side of the evaluation unit

6. Proceed as follows in order to attach the cover of the evaluation unit:
  - Connect the ribbon cable to the keyboard and attach the cover.
  - Attach screws (Label 1 → Fig. 4).
  - Tighten screws (Label 2 → Fig. 5).

7. Connect control cable to ext. flow rate meter Flow-5.
8. Reconnect mains plug and switch on main switch.
9. Switch the unit on with the  key.



### NOTICE!

Software version SW51-1\_1335 or higher is required for the printed circuit board DFM-51 (acceptance date 1253 and later). If necessary perform a software-update (→ Thermo-5 operating instructions)



## NOTICE!

If a new printed circuit board DFM-51 (A 9) is recognised, the configuration is requested automatically via the input window.

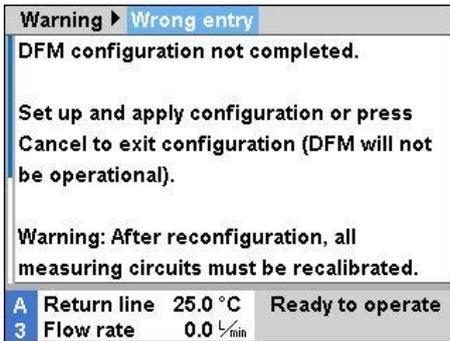


Fig. 6: Warning configuration notice

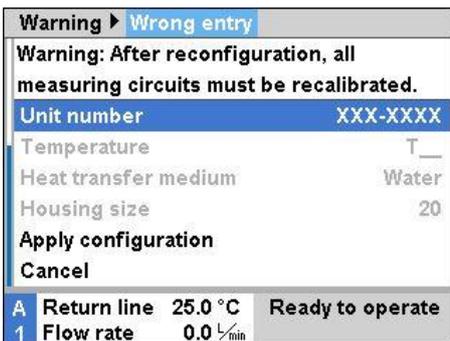


Fig. 7: Entry of configuration

10. Proceed as follows to assemble the new printed circuit board DFM-51 (A 9):

- Change to the next screen page with the key.
- Configure ext. flow rate meter (→ information on the rating plate)
- Select the **Apply configuration** function and activate with the key.

→ The activated function is indicated with the symbol.

11. Assigning the ext. flow rate meter address (→ Operating instructions Flow-5, registering of new external Flow rate meter)

12. Proceed as follows to calibrate the flow rate metre:

- When setting parameters set **DFM recognition** to the "integrated" value (in [Settings / Miscellaneous](#)), continue with Step 13.
- When setting parameters set **DFM recognition** to the "modular" value (in [Settings / Miscellaneous](#)), continue with Step 14.

### Integrated operation

13. Proceed as follows to calibrate the corresponding flow rate metre:

(from software version SW51-1 0849B)

- In normal operation operate the device at 40 °C for at least 10 minutes.
  - **Only in the case of water units:**  
If present set the parameter **Pressure relief with unit OFF** at [Setting / Miscellaneous](#) to "OFF".
  - Switch the unit off using button  and wait at least 10 seconds.
  - Set corresponding parameter **Flow rate ext. 1..8 Calibration** at [Service / Calibration / Flow rate external 1 to 4](#) or [Service / Calibration / Flow rate external 5 to 8](#) to "ON".
- The flow rate is calibrated automatically.
- **Only in the case of water devices:**  
If present set the parameter **Pressure relief with unit OFF** at [Setting / Miscellaneous](#) to "ON".
  - Switch the unit on with the  key.

(up to software version SW51-1 0849B)

- In normal operation operate the device at 40 °C for at least 10 minutes.
- Set corresponding parameter **Flow rate ext. ... offset** at [Service / Calibration / Flow rate external 1 to 4](#) or [Service / Calibration / Flow rate external 1 to 4](#) to "5 L/min".
- Close the corresponding shut-off valve between the feed and return line and wait for 1 minute.
- Read current **Flow rate**.
- Set the parameter **Flow rate ext. ... offset** according to the following calculation:  
→ **Flow rate ext. ... offset** new = 5 – **flow rate** as it currently stands
- Opening the shut-off valve

| ... ▶ Calibrating ▶ Flow rate external 1 to 4 |                                 |                    |                  |
|---|---------------------------------|--------------------|------------------|
|   | Flow rate ext. filter           |                    | 10 s             |
|   | Flow rate ext. 1..4 Calibration |                    | ON               |
|   | Flow rate ext. 1 offset         | 0.0                | l/min            |
|   | Flow rate ext. 1 ascent corr.   | 0.0 %              |                  |
|   | Flow rate ext. 1 Calibration    |                    | OFF              |
|   | Flow rate ext. 2 offset         | 0.0                | l/min            |
|   | Flow rate ext. 2 ascent corr.   | 0.0 %              |                  |
|   | Flow rate ext. 2 Calibration    |                    | OFF              |
| 1   | Main line Pressure              | 40.0 °C<br>0.8 bar | Ready to operate |

Fig. 8: Calibrate flow rate during integrated operation

| ... ▶ Calibrating ▶ Flow rate external 1 to 4 |                                 |                      |                  |
|---|---------------------------------|----------------------|------------------|
|   | Flow rate ext. filter           |                      | 10 s             |
|   | Flow rate ext. 1..4 Calibration |                      | OFF              |
|   | Flow rate ext. 1 offset         | 0.0                  | l/min            |
|   | Flow rate ext. 1 ascent corr.   | 0.0 %                |                  |
|   | Flow rate ext. 1 Calibration    |                      | OFF              |
|   | Flow rate ext. 2 offset         | 0.0                  | l/min            |
|   | Flow rate ext. 2 ascent corr.   | 0.0 %                |                  |
|   | Flow rate ext. 2 Calibration    |                      | OFF              |
| 1   | Main line Flow rate             | 40.0 °C<br>5.0 l/min | Normal operation |

Fig. 9: Calibrate flow rate during integrated operation (<SW51-1 0849B)

| Service ▶ Calibrating ▶ Flow rate |             |                     |                      |
|-----------------------------------|-------------|---------------------|----------------------|
| No.                               | 1           | A..Z                | A A1 A2 A3 A4 A5 ... |
| Flow rate filter                  |             |                     | 10 s                 |
| Durchfluss Offset                 |             |                     | 0.0 $\frac{L}{min}$  |
| Flow rate ascent corr.            |             |                     | 0.0 %                |
| Flow rate calibration             |             |                     | ON                   |
| <hr/>                             |             |                     |                      |
| A                                 | Return line | 33.6 °C             | Ready to operate     |
| 1                                 | Flow rate   | 2.9 $\frac{L}{min}$ |                      |

Fig. 10: Calibrate flow rate during modular operation

## Operation Modular

14. Proceed as follows to calibrate the corresponding flow rate metre:

- In normal operation operate the device at 40 °C for at least 10 minutes.
  - **Only in the case of water devices:**  
If present set the parameter **Pressure relief with unit OFF** at **Setting / Miscellaneous** to "OFF".
  - Switch the unit off using button  and wait at least 10 seconds.
  - Select the module affected e.g. "A1" with the  or  buttons.
  - Set parameter **Flow rate calibration** at **Service / Calibration / Flow rate** to "ON".
- The flow rate is calibrated automatically.
- **Only in the case of water devices:**  
If present set the parameter **Pressure relief at unit OFF** at **Setting / Miscellaneous** to "ON".
  - Switch the unit on with the  key.

15. Inspection of calibration of Flow rate meter

- In normal operation operate the unit at 40 °C for at least 5 minutes following calibration.
- Close the corresponding shut-off valve between main and return lines.
- Flow rate returns to 0 L/min.
- If this is not the case repeat the Flow rate meter point.
- Repeat the Flow rate meter calibration item for each measuring circuit.

16. Proceed as follows in order to calibrate the temperature sensor:

- When setting parameters set **DFM recognition** to the "integrated" value (in **Settings / Various**), continue with Step 17.
- When setting parameters set **DFM recognition** to the "modular" value (in **Settings / Various**), continue with Step 18.

### Integrated operation

17. Temperature sensor main line ext 1..8 and temperature sensor return line ext. Proceed as follows in order to calibrate 1..8 , if necessary, the temperature sensor:

- With a constant deviation set parameter **Sensor... offset** under **Service / Calibration / Temperature**.
- With a linear deviation, set parameter **Sensor... asc.cor.** under **Service / Calibration / Temperature**.

| Service ▶ Calibrating ▶ Temperature |           |           |
|-------------------------------------|-----------|-----------|
| Sensor external offset              |           | 0.0 K     |
| Sensor external ascent corr.        |           | 0.0 %     |
| Sensor external filter              |           | 15 s      |
| Sensor main l. ext.1 offset         |           | 0.0 K     |
| Sensor return l. ext.1 offset       |           | 0.0 K     |
| Sensor return l. ext.1 asc.cor.     |           | 0.0 %     |
| Sensor return l. ext.2 offset       |           | 0.0 K     |
| Sensor return l. ext.2 asc.cor.     |           | 0.0 %     |
| 1                                   | Main line | 40.2 °C   |
|                                     | Flow rate | 5.0 l/min |
| Normal operation                    |           |           |

Fig. 11: Sensor calibration during integrated operation

### Operation Modular

18. Proceed as follows, if necessary calibrate the temperature sensor for the main line and temperature sensor of the return line:

- Select the module affected e.g. "A1" with the  or  buttons.
- With a constant deviation set parameter **Sensor... offset** under **Service / Calibration / Temperature**.
- With a linear deviation, set parameter **Sensor... asc.cor.** under **Service / Calibration / Temperature**.

| Service ▶ Calibrating ▶ Temperature |             |  |
|-------------------------------------|-------------|--|
| No.                                 | A..Z        | A1 A2 A3 A4 A5 ...   |
| Sensor main line offset             |             | 0.0 K  |
| Sensor main line ascent corr.       |             | 0 %  |
| Sensor main line filter             |             | 20 s   |
| Sensor return line offset           |             | 0.0 K  |
| Sensor return line ascent corr.     |             | 0 %  |
| Sensor return line filter           |             | 20 s   |
| A                                   | Return line | 26.9 °C  |
| 7                                   | Flow rate   | 0.6 l/min  |
| Normal operation                    |             |  |

Fig. 12: Sensor calibration during modular operation

19. Check unit functions.

20. Switch the unit off by press the  key.

21. Main switch off.

### Parts list

| Pos | Description                      | O/ID     | Pcs |
|-----|----------------------------------|----------|-----|
| 01  | Flow rate measuring board DFM-51 | T24693   | 1   |
| 02  | Assembly instructions German     | M8100-DE | 1   |
| 03  | Assembly instructions English    | M8100-EN | 1   |
| 04  | Assembly instructions French     | M8100-FR | 1   |