



Operation Manual Flow Transmitter DW-D

1. MOUNTING

1.1 Position of mounting

It is advantageous to install the unit in a straight piece of pipe and to choose a place of mounting which has the biggest possible distance from elbows, valves etc.

It is especially important to have the biggest possible distance from magnet valves and ball valves. Please make sure that they are opened as slow as possible, especially if the pipe after the valve is empty. These measures prevent the measuring system from flow shocks which can cause damages. We recommend a straight length of $10 \times d$ at input side and $5 \times d$ at the output side (d = diameter of pipe).

The apparatus provides a stable signal when installed at closer distances, but depending on flow conditions it may be less accurate

1.2 Mounting position on electronic view

Please take in consideration that the mounting has to be done EMI conform in order to avoid interruptions of operations.

Especially the following points have to be attended:

- The provided ferrites have to be mounted as described.
- Signal and supply cable of the DW-D may not directly taken close to 230V or 380V wirings.
- The device should not be installed close to inductance, switching loads, engines or similar sources of inductive fields.

1.3 Direction of Flow

It is essential that the unit is mounted so that flow is as indicated by the arrow on the body.

The unit will not operate unless installed correctly in this way and the possibility of damage to the unit cannot be excluded.

1.4 Mounting Orientation

If the display has to be changed to a new position, it is possible to turn it relative to the housing. To do this, remove the front and back of the housing and remove the screw retaining the electronic board to the housing. Rotate the electronic board to the new desired position taking care not to damage the cable link, refit and secure the retaining screws. In a similar way, the window on the front of the access cover can also be turned.

2. MOUNTING AT THE TUBE

2.1 Items with THREAD CONNECTION

We recommend sealing all threads with PTFE sealing tape. Ensure no excess of tape is left protruding into the pipe.

When screwing the unit into a pipe, take care to ensure that the housing is not damaged or impacted during the process.

2.2 Items with FLANGE CONNECTION

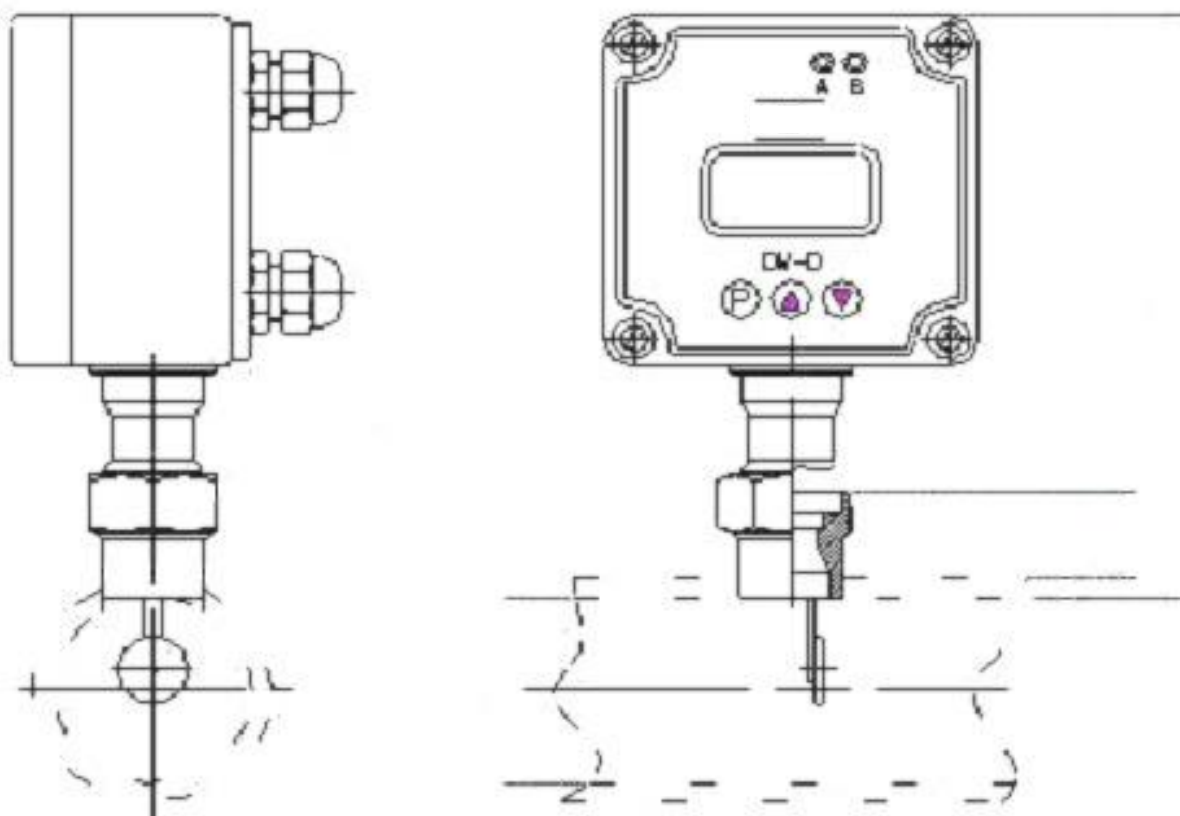
An approved flange seal or gasket must be used. Neither this nor the required fixing bolts are included in the delivery. Ensure the transmitter is not damaged when tightening the flange bolts.



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2.3 Items with WELDED SOCKET

The welding socket is included in the delivery. Remove by loosening union nut (A). The dimensions shown in the drawing (right) must be adhered to strictly. Drill a ridge less hole in the pipe. Weld the socket to the pipe. Mount the flow transmitter to the socket ensuring that the pendulum is not damaged during this procedure. Align the transmitter into the final desired position before tightening the union nut (A). Please do not forget to keep the flow direction in consideration before weld on the socket. (groove)



2.4 Torsional moment of the union nut

If the device shall be divided from the t-piece or the welding socket, the union nut has to be disconnected and the device carefully taken out of the housing.

If both pieces are assembled, please take care that the nut is tightened with a torsional moment of 40Nm.



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3. ELECTRONICAL CONNECTIONS

Remove the rear access cover to gain access the connector blocks.

(see drawing right)

Block KL 2 is for connecting the relays.

Block KL 1 is for connecting power supply and output signals. The sketch shows the relays in position of no flow respectively flow is under the related switch point level.

Feed the cable through the corresponding cable entry.

3.1 Power Supply

The supply-voltage is $24\text{VDC} \pm 10\%$. Connection is to block KL 1 like described at drawing. In order to prevent the electronic from impermissible potential between pipe and device, the power supply device must be connected with earth. The connection is prevented from mixing the poles. At the connection cable a ferrite must be fixed with one coil. The ferrite is included in delivery.

3.2 Analogue output (4-20 mA)

Connection is to block KL 1 according to the drawing. At the connection cable a ferrite must be fixed. The ferrite is included in delivery.

3.3 Voltage output (0-10 V)

Connection is to block KL 1 according to the drawing. (See reference point 4.3) At the connection cable a ferrite must be fixed. The ferrite is included in delivery.

3.4 Frequency output

Connection is to block KL 1 according to the drawing. (See reference point 4.3) At the connection cable a ferrite must be fixed. The ferrite is included in delivery.

3.5 Connecting the relais

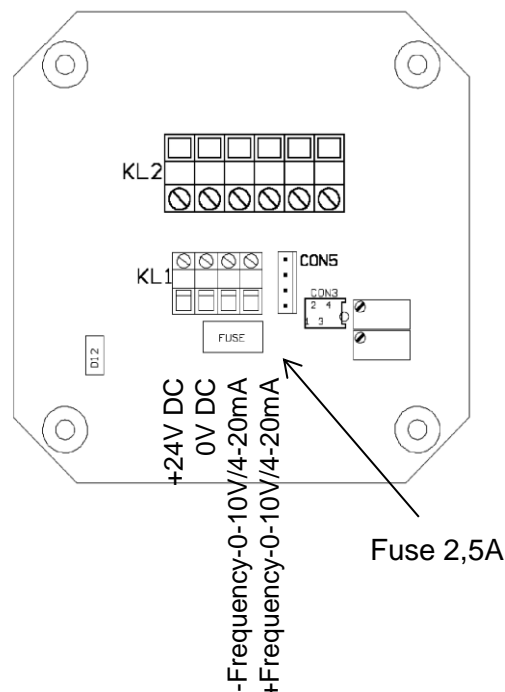
Relays can be connected via block KL 2 as shown on the drawing. At the connection cable a ferrite must be fixed. The ferrite is included in delivery.

3.6 Interface

The DW-D is available to special order with RS232C interface. The special connection cable is just connected with the device. (See reference point 4.7)

4. TUNING THE DW-D

The device is equipped by 3 buttons on the front side of the enclosure. The button P has the function to choose a point of the menu and to take over the wished values. With the buttons \uparrow and \downarrow you can set a value. Button \uparrow increases value. Button \downarrow decreases the value. Pressing this button one time the value changes for one digit. If you keep the buttons on hold the value is changing continuously. After some time velocity is increasing. At some points of the menu the DW-D informs you which buttons have to be pressed as next step. For example *PIN* [+/-],





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whereby + corresponds to button \uparrow and – to button \downarrow . The device returns back automatically after some time to the modus set under *DWD MODE* (point 4.2) if no button is pressed. The actual point of the menu is always shown in the first line, the chosen value in the second line.

4.1 Function **BATT CHECK**

The BATT CHECK function is used for giving the user information that the device was not in use for a certain time due to power interruption and therefore the amounts of flow could not get accumulated during that time by the totalizer. Therefore the device should always be on (ON) when using the totalizer function. Please find further information under point 4.6.

If the totalizer is not used, we would advise to switch-off this function (OFF), as otherwise the device will only work after restart in case of power loss.

The menu can be operated with P and the functions with \uparrow or \downarrow . To take over the requested adjustment please push P again.

4.2 Adjusting the relais

Press button P until *RELAIS 1* appears. Line 2 shows the actual switch point.

Pressing \uparrow or \downarrow the wished switch point can be adjusted. For setting the switch point P has to be actuated * is appearing. After some time the sigh is disappearing. Adjusting the switch point of *RELAIS 1* is now completed. Actuate P button once more causes changing to *RELAIS 2*. Adjustment is like described under *RELAIS 1*.

When the adjusted value is reached, a lamp glows for control. The green one (A) is assigned to *RELAIS 1* the red one to *RELAIS 2* (B)

4.3 Adjusting of output occupancy

DW-D comes with current, voltage and frequency output. The different output types only can be used alternatively. It is only one pair of connector existing for all functions. Connection is to block KL1 (see point 3.2 , 3.3 and 3.4 respectively drawing of the board). At menu *OUTPUT* analogue, voltage or frequency output can be activated. With the buttons \uparrow and \downarrow you can set the wished function. Button P takes over the adjustment.

At the option frequency output the max. frequency can be adjusted between 125-32000 Hz. Therefore utton P must be pressed after entering the frequency function. Then the max. frequency can be adjusted with the buttons \uparrow and \downarrow . Now the adjusted max. frequency corresponds to the upper range value.

4.4 Adjusting of standard indication mode

It is possible to choose between 2 different indication modes.

At the point in the menu *DWD MODE* you can select the modes. In the second line the valid mode is shown. *FLOW* means indication of momentous flow. *TOTAL* means that the value of totalizer is shown. You can choose the required indication by using button \uparrow or \downarrow . Button P takes over the adjustment.

Only the selected standard indication is permanent visible. All other points of the menu turn back to the standard indication after some time automatically.



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4.5 Adjusting of integration time

The DW-D Flow transmitter makes 18870 measurements pro minute. If the result of each measurement would be shown on the display, the indication would change it's worth continuously and it would be very difficult to read off the indication. Therefore it is possible to program a integration time between 0 and 3,4s. Then the average value of the values measured within the programmed time is shown. A long integration time causes a slowly changing indication which is easy to read. We recommend to maintain the standard adjustment of 1s. For changing the integration time you can choose the wished time with help of the buttons \uparrow and \downarrow in menu *INT.[s]* Button *P* takes over the adjustment.

4.6 The totalizer

The device is equipped by a totalizer, which adds the flow quantity. (Menu point *TOT: X.*) *X* corresponds to the respective quantity. The unity results from flow unity. (for example l/min corresponds to l). Actuating button \uparrow push down the memory to zero.

PRESS <+> to reset appears (+ = \uparrow). Now actuate \uparrow as long as the appearing counter is executed (20s).

In case of power failure or too low current the actual amount will be ensured. If necessary voltage is back again the device notifies *POWER LOW / PRESS P* & \uparrow respectively *PRESS P* & \uparrow . Pressing *P* and \uparrow (at same time) DW-D changes back to standard modus. After that the device starts counting from the amount has been present at the time of power failure. This guarantees that the operator is aware of that power supply was interrupted and so the amount indicated perhaps not corresponds to the real quantity.

Attention: The power failure supervising function only works if at menu point *BATT CHECK* (see 4.1) the function is activated (*ON*)

The device has a 8 digit display so a big capacity is available. Nevertheless depending on unity, flow quantity and time of flow the capacity may be quite different. If the max. indication value is reached, DW-D starts with zero again. At the totalizer menu you see the actual value in the moment of switch over to the totalizer function. That means always when the totalizer menu is actuated the indication is updated.

The actual value only is indicated if the totalizer is defined as standard indication

4.7 Restriction of access by code number

In order to restrict of access of not authorizes persons to the programmed dates it is possible to activate a code number. In the point of menu *PIN [+/-]* it is possible to adjust any code number between 1 and 999 by help of the buttons \uparrow and \downarrow . By pressing *P* and \uparrow at the same time the programmed code number is activated. *ENABLE* is appearing. If an adjustment in any menu now should be changed the operator is asked for the code number. The number can be entered liked described above. After that *PIN OK!* is appearing. Now the adjustment can be changed. If *PIN NOT OK!* is appearing input was wrong. You now can repeat entering the code number.

Attention: Should the number be forgotten the adjustments can not be changed any more. At point of menu *PIN [+/-]* restriction of access can be switched off. Therefore code number has to be entered as described above. *PIN OK!* And thereafter *DISABLE* is appearing.



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4.8 Programming the interface

Under point of menu *DWD ADR*: the address of each device can be programmed (selection by ↓, input by P). For more details please see our data sheet for devices with interface. It is only added to devices which are equipped with this option. (Also see point 3.5)

4.9 Mounting the ferrite

The HSW flow transmitter DW-D is EMI certified and comes up to the corresponding norm. The EMI directive will only be achieved, if the provided ferrites are mounted as mentioned under 3.1 3.2 3.33 and 3.4. If not, serious malfunctions can be appeared depending on the mounting position. (q.v. 1.2)

IMPORTANT! Always mount the ferrite

4.10 Protection on data loss

If your device is operated on incorrect EMI conditions, it could come to data loss respectively damages of coded data in extreme cases.

As the item need these data for a correct function there hereby is an anticipate protection. In this case the item is showing *K DATA MISSING*.

So that this information is available for the occupant, even in case of a use of the analogue-voltage or frequency output, impermissible values will normally be transferred. These are 1mA, 20V, respectively 0 Hz.

In order to re-establish the function of the item in such a case, the necessary software is saved additionally for safety reasons. The software can be load again with the menu item *FACTORY RESET*. Therefore push the button ↑ or ↓ in the menu *FACTORY RESET*. You will be asked to start the action (Y) button ↑ or to break up (N) button ↓.

ATTENTION! When starting the application, all adjusted data as switch points, totalizer value etc. will be lost. (Reset to the original factory setting)

Please consider this and keep the data before starting the procedure in mind. After the reestablishment has been started, you will get informed about the status of the procedure. When the flow indication on the display appears, the operation is over. The device is working as usual again. Please consider that e.g. the switch points have to be new installed again. We would like to point out, that the data loss occurs only if the item is used under forbidden conditions. Therefore it is really necessary to open corresponding arrangements in order to avoid a new data loss.

This could be: mounting the provided ferrites, installation of the device at another position, changing the cabling within the installation (no measure or feed lines of the transmitter near high voltage feed cable). Reducing of radiation or magnetic field or even the installation of suitable electrostatic shields.



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5. MAINTENANCE

The DW-D is essentially maintenance-free. However, depending on the degree of pollution in the medium, it is recommended that the sensor system be inspected and cleaned as necessary from time to time.

Under no circumstances attempt to remove the pendulum from the unit as this will destroy the calibration. Clean the pendulum system before re-installing into the pipe.

IMPORTANT! If the DW-D must be separated from the tee loosen nut (A) and cant the unit a little opposed to direction of flow. Then lift the DW-D with pendulum rectangular out of the tee. Please perform all disassembly/reassembly operations with great care. Avoid damage! Especially to the pendulum system.

6. TECHNICAL DATA

Power supply :	24V DC \pm 10%
Current drain:	200 mA max.
Fuse:	2,5 A
Contacts:	2x230V 1A max
Analog output:	4-20 mA
Voltage output:	0-10V
Display:	LCD DOT-Matrix-Module 2x8 digits (illuminated)
Medium – Temperature:	-20 – +100°C (special versions dissonant)
Max. pressure:	25 bar (special versions dissonant)