DUC-MF2 *Quickstart*

A
User Interface

DUC-MF2 will be switched on automatically after supply voltage has been plugged on.

Activates / deactivates the background lighting

To navigate through the different menus please use the keys located on the left and right beside the display.

▲ ▼ ◀ ▶ Move cursor in specific direction

ENTER Confirm your settings

NEXT Confirm your settings and moves to next menu

BACK Back to previous menu

\+ Increase of values

− Decrease of values

XYZ Activates a certain function (depending on chosen menu)

No function

B
Set-up your flow measurement in 5 steps

1. **Choose suited mounting position for your transducers**
2. **Parameterize your flow transmitter**
3. **Mounting of ultrasonic transducers on your pipe**
4. **Set zero point (if possible)**
5. **Start your flow measurement**

Pipe need to be filled completely for clamp-on measurement

C
Parameterization and mounting

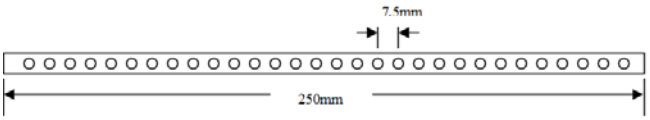
1. Switch on flow transmitter (automatically when plugging on supply voltage, see below)
2. QUICK SETUP Choose menu „quick setup“
3. Select measurment channel 1 or 2
4. Select diameter or circumference (depending on what figure you have) of your pipe
5. Put in value for diameter or circumference
6. Put in value for wall thickness of your pipe
7. Select pipe material
8. Select lining (if there is a lining)
9. Select type of ultrasonic transducer
   → Nr. 1 = DUC-WF40 DN10…..DN100
   → Nr. 3 = DUC-WF10 DN32…..DN400
   → Nr. 4 = DUC-WF05 DN200…DN6000
10. Select method of mounting. Standard is V-mounting.

11. Mount ultrasonic transducers on a pipe

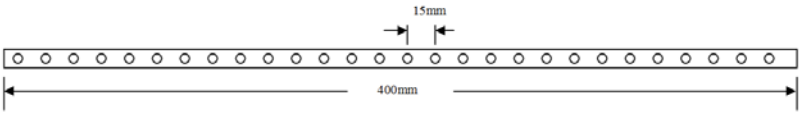
After parameterization the display is showing the required distance between the two transducers in mm and also as Index-No. Index-No. means the number of holes to be used for mounting with the spacer bar. The first hole after the first transducers is hole No. 1, the last hole is the hole where second transducer is put into the spacer bar (threaded bar). Picture 3 shows an example for an index-No. 4.

Together with DUC-MF2 unit itself you will get one pair US- transducers and a spacer bar with matches together with the delivered US- transducers.
If you have ordered more DUC-MF2 units and US- transducers for different pipe diameters it could be that you got spacer bars with different length (short or long). Pls. see in the chart below which spacer bar could be operated together with the corresponding transducer model.

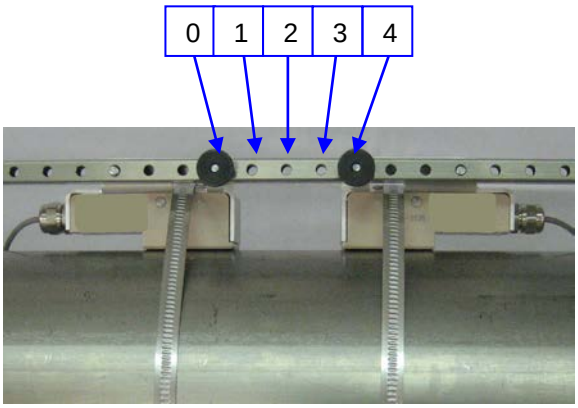
Spacer bar	**DUC-WF10**	**DUC-WF40**
Short (25 cm)		X
Long (40 cm)	X	



Picture 1 spacer bar short (length 250mm, grid hole distance 7,5mm)



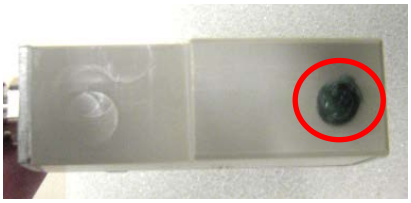
Picture 2 spacer bar„long“ (length 400mm, grid hole distance 15mm)



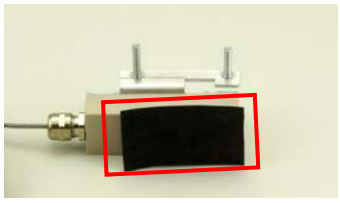
Picture 3 Example distance for bar index four using spacer bar for mounting

Picture 4 example for distance in mm without using spacer bar(V or W mode) face to face

Some acoustic coupling gel (app. size of a peanut, picture 5) or acoustic coupling foil has to be put at the part which touches the pipe wall after installation (picture 6).

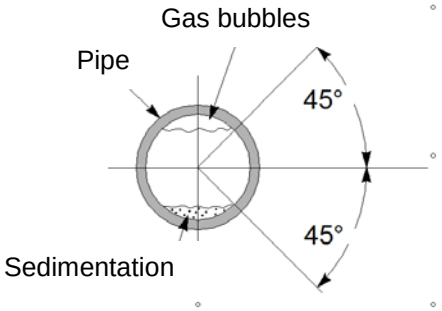


Picture 5 Using acoustic coupling gel (Magnalube)

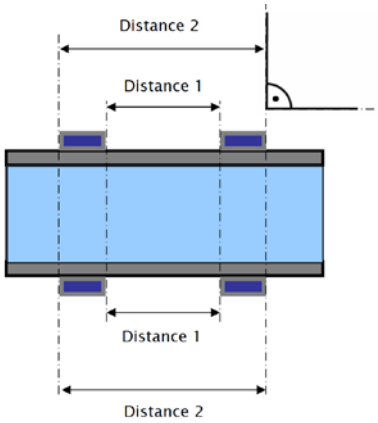


Picture 6 Using acoustic coupling foil

12. Chose best location for US- transducer installation.
    If you install one pair of transducers on each pipe straight run should be 10x diameter (inlet) and 3x diameter (outlet) in order to achieve best accuracy. If you install 2 pairs of transducers on the same pipe it could be used to; increase accuracy, for redundant operation or to reduce effects of flow inclination (see pictures 8 and 9). It is mandatory that both transducers are installed exactly shifted about 180°.
    When using horizontal pipe, we recommend mounting the transducers at 10 o'clock or 2 o'clock position to avoid any influence of gas bubbles / sedimentation might accumulated on top / on bottom of pipe.

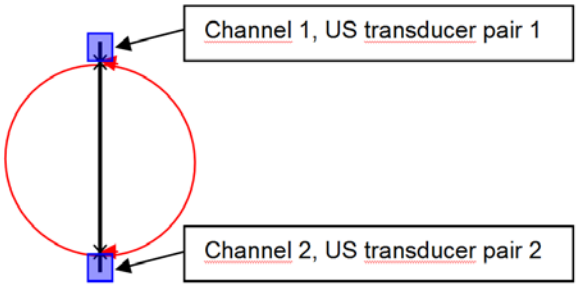


Picture 7 Example Mounted Transducers with spacer bar and mounted at app. 9 o`clock



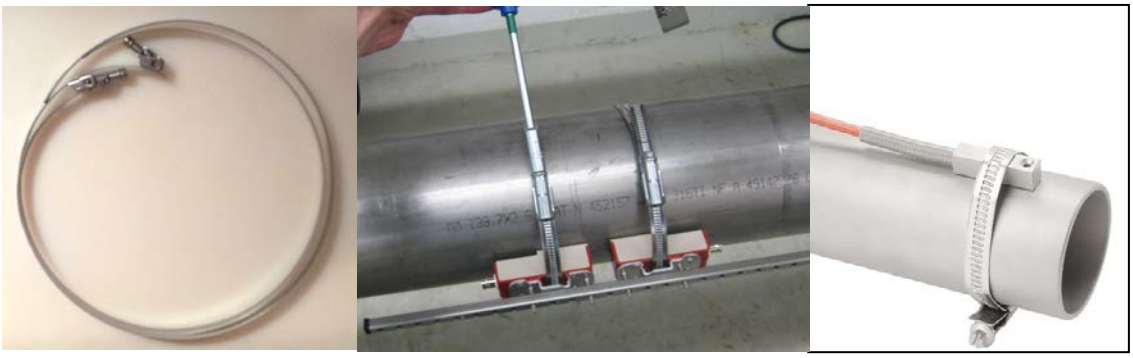
Picture 8 Example two transducer pairs on the same pipe to increase accuracy or to reduce effects of flow inclination or for redundant operation.

$$U_{1/2} = \frac{2 \cdot \pi \cdot r}{2}$$



Picture 9 Example two transducer one line. Second transducer pair lies exactly 180° shifted to the first transducer pair

13. The transducers are fixed to the pipe by using metal belts. The metal belts are tightened by using tightener (picture in the middle). The length of the belts is designed for the biggest pipe size your transducer can cover. Please feed the belt into the tightener as shown in picture on the left. Proceed in the same way for PT100. **PT 100 Nr. 2 must be installed on the hotter pipe. PT Nr. 1 on the colder pipe. Put between PT100 and surface of the pipe also acoustic coupling gel in between. PT100 should after installation insulated tom minimize the influence from ambience air temperature.**



Pictures 10 Mounting US- Transducers, PT100 with stainless steel belts on a pipe

11 Set Zero Point (if possible)

→ If there is the chance to create „zero flow“ please select „Zero Setup“ and set zero point.

12. Go back to main menu and select button „MEAS“

. You then entering the measuring menu where you see the calculated flow, velocity,….

Change units:
->Go to main menu and select SETUP - > COMPL SETUP. Then select „UNITS SETUP“ to change units.

13. Activate Outputs
->Go to main menu and select SETUP - > COMPL SETUP. Then select “I/O-SETUP” and set digital and/or analog outputs.

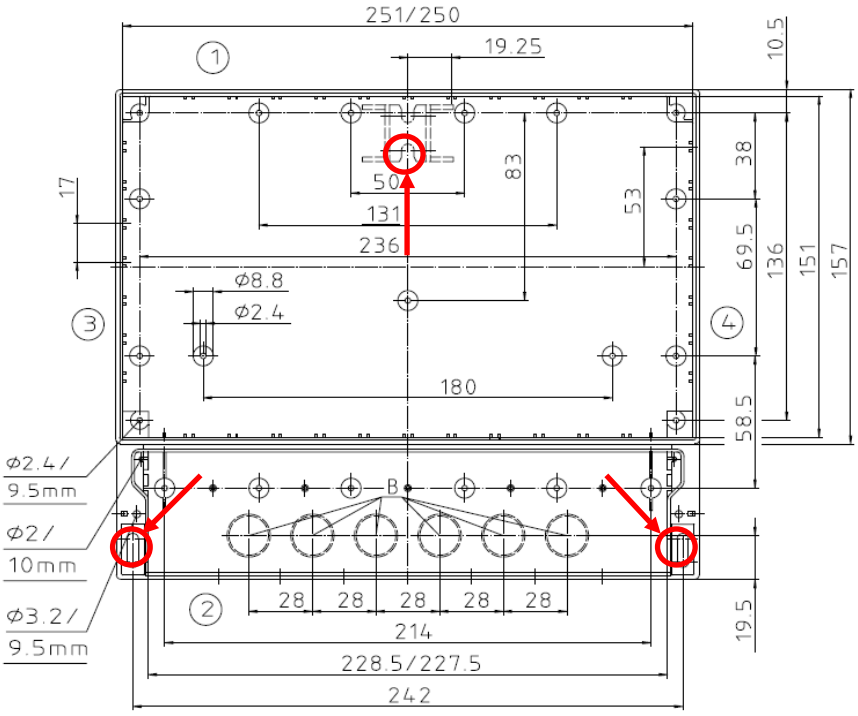
Please check DUC-MF2 user manual for further information. The user manual can be found as pdf-document on the CD which is included in the delivery.

Important Notice!

Heat transfer measurement:	Works only in operation mode (CH1+CH2)/2

Two transducers on the same pipe:	
Increasing accuracy:	Works only in operation mode (CH1+CH2)/2
Reducing flow inclination	Works only in operation mode (CH1+CH2)/2

Wall mount of DUC-MF2

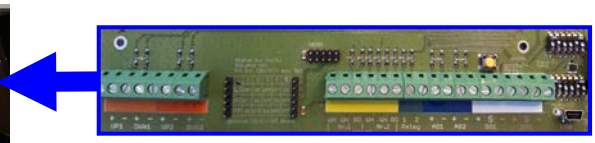


To mount DUC-MF2 on a wall please create three boreholes corresponding to the red marked points on the drawing (all length specifications are metric).

Wiring

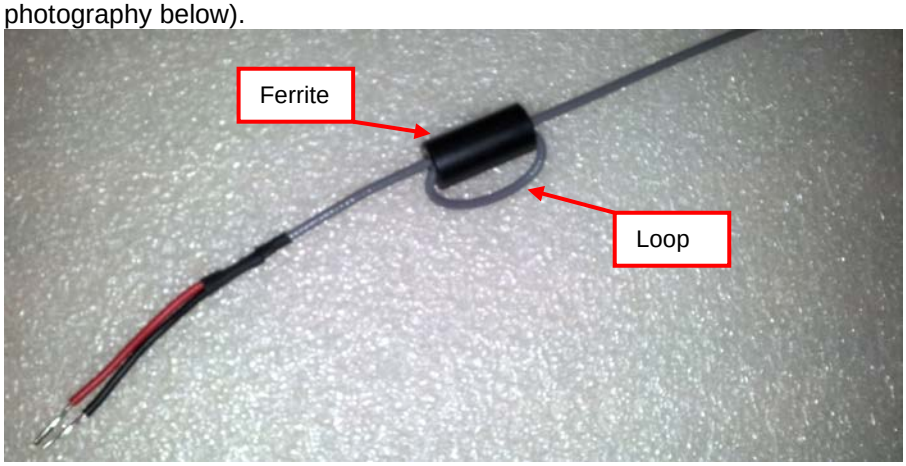
To perform the wiring it is necessary to remove the cable cover from DUC-MF2 by removing the two screws (marked with red arrows, picture 11)

Picture 11 Removing cover plate from cable terminal



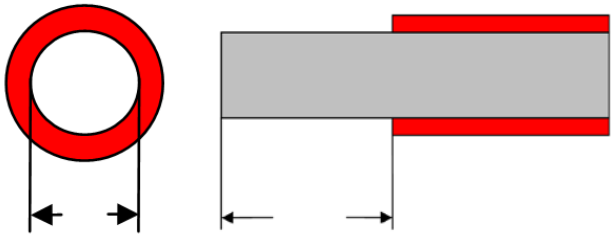
Picture 12 screw terminals

Before you install the ultrasonic sensor cables to the measurement transducer we highly recommend pulling the sensor cable endings through the delivered ferrites.
Loop the cable once as shown in the photo below (The delivered ferrite could differ from the ferrite on the photography below).



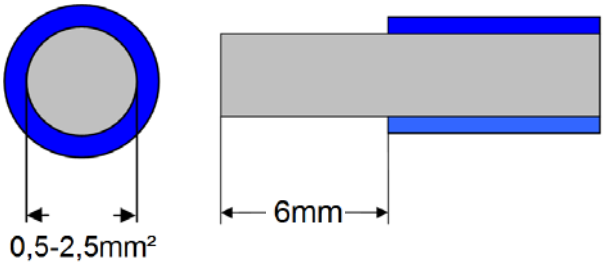
Picture 13 Ferrite mounted on cable with one loop

Power Supply (AC or DC ➔ pls. see type plate)



For power supply please use cables with a cross section of ca. 0.5…4 mm². Solid cables should be dismantled about 8 mm to allow proper contact to terminals.

I/O Terminal



For I/O terminals please use cables with a cross section of ca. 0.5…2.5 mm². Solid cables should be dismantled about 6mm to allow proper contact to terminals.

Terminalname	Colour	Description
UP1	ORANGE	Connection for upstream transducer (red cable = + / black cable = -), Channel 1
DWN1		Connection for downstream transducer (red cable = + / black cable = -), Channel 1
UP2	RED	Connection for upstream transducer (red cable = + / black cable = -), Channel 2
DWN2		Connection for downstream transducer (red cable = + / black cable = -), Channel 2

PT100 No. 1	YELLOW	Input for temperature sensor. Left terminal is for the „colder“ temperature (return pipe)
PT100 No. 2		Input for temperature sensor. Right terminal is for the „hotter“ temperature (feed pipe)
Relay	GREEN	Relay, potential-free
AO1 4-20 mA	BLUE	Analog output 1 (4…20 mA), active, 24 VDC
AO1 4-20 mA		Analog output 2 (4…20 mA), active, 24 VDC
Digital out DO1	WHITE	Universal digital output 1 (transistor), **for configuration of the digital outputs pls. read the user main manual.**
Digital out DO2		Universal Digital output 2 (transistor), **for configuration of the digital outputs pls. read the user main manual.**
Power Supply		Please provide either 90-240 VAC or 8-36 VDC (depending on chosen model). Please make sure that you use the correct voltage. **Flow transmitter might be damaged when using wrong supply.**

Note: All in- and outputs (except relay) have defined potential on the internal devices ground. For potential free operation of the in- and outputs is additional hardware needed (with galvanic isolation). With the normal in- and output it is not possible.

The instruction manuals on our website www.kobold.com are always for currently manufactured version of our products. Due to technical changes, the instruction manuals available online may not always correspond to the product version you have purchased. If you need an instruction manual that corresponds to the purchased product version, you can request it from us free of charge by email (info.de@kobold.com) in PDF format, specifying the relevant invoice number and serial number. If you wish, the operating instructions can also be sent to you by post in paper form against an applicable postage fee.

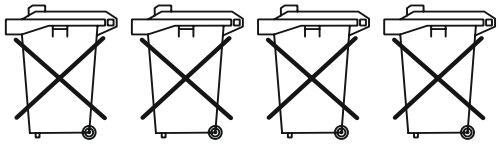
Disposal

Note!

- Avoid environmental damage caused by media-contaminated parts
- Dispose of the device and packaging in an environmentally friendly manner
- Comply with applicable national and international disposal regulations and environmental regulations.

Batteries

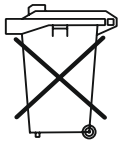
Batteries containing pollutants are marked with a sign consisting of a crossed-out garbage can and the chemical symbol (Cd, Hg, Li or Pb) of the heavy metal that is decisive for the classification as containing pollutants:



Cd[1] Hg[2] Pb[3] Li[4]

1. „Cd" stands for cadmium
2. „Hg" stands for mercury
3. „Pb" stands for lead
4. „Li" stands for lithium

Electrical and electronic equipment



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