

# WATER DOSING COMPUTER FL-MIKRO-TURBO WITH TOUCH PANEL



Wasserdosiercomputer FL-MIKRO-TURBO mit Touch Panel

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## TECHNICAL DATA FL-MIKRO-TURBO

The **FL-Mikro-Turbo** is made of a computer, one or two electronic evaluation boards, a display unit and a microwave probe for installation in the mixer as well as an optional microwave probe for aggregate material measurement. The measurement is performed by high microwave signals, from which the average value is created. The dosing takes place through a contact water counter ( the water quantity is displayed in litres or pounds ).

### Applications

Concrete, Foundry, Ceramic and Lime Stone Industries

### Connections

Mouse (PS2) and keyboard, mouse or storage medium (USB).

### Model

Optionally as slide in 19" rack or dust free and spray water protected slide in cover

<b>Dimension (in rack)</b>	H: 177 mm W: 445 mm D: 285 mm
<b>Weight</b>	approx. 5 kg
<b>Power Supply</b>	110-230 VAC ± 10% 50/60 Hz
<b>Power Consumption</b>	approx. 38 VA
<b>Temperature Range</b>	0°C to 70°C
<b>Control Outputs</b>	24VDC / max. 1,5 A
<b>Measure Channels</b>	4 x 0-20 mA / 2 x 4-20 mA / 2 x 0-10 V
<b>Accuracy</b>	± 0,5 l / 1 m <sup>3</sup>
<b>Control Inputs</b>	24VDC
<b>Recipe Controlling</b>	Decimal (39), BCD (165), Binary (250), via RS 232 or 0-10V (40)
<b>Dosing</b>	Contact Water Counter
<b>Error Message</b>	Display, Contacts 24VDC

## TECHNICAL DATA MICROWAVE PROBE

<b>Diameter</b>	75 mm
<b>Length</b>	90 mm / 170 mm (with lengthening)
<b>Power Supply</b>	24 VDC (± 25 %)
<b>Power Consumption</b>	3 VA
<b>Temperature Range</b>	0°C to 80°C
<b>Measured Value Outputs</b>	2 x analogue / 0-20 mA
<b>Accuracy</b>	approx. ± 0,3 % (depending to measure medium)
<b>Cover</b>	Stainless Steel / IP 68
<b>Connection Cable</b>	5 x 0,25 mm <sup>2</sup> (shielded) / Length: 2 m (7 m)
<b>Weight</b>	1,4 kg (without lengthening) / 2,4 kg (with lengthening)

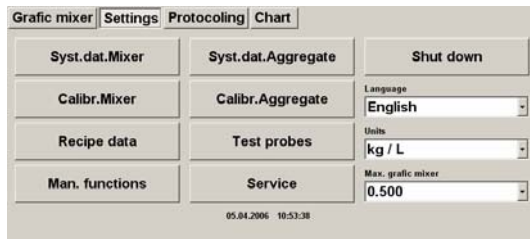
## 1. POWER-UP FL-MIKRO-TURBO



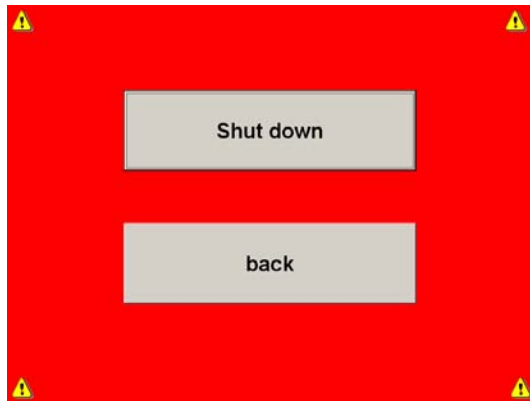
The visualisation of the software on the following pages is depending on the equipment of the FL-MIKRO-TURBO.

Operate the main switch. Wait until the start page appears. Please choose your menu point now.

## 2. SHUT DOWN FL-MIKRO-TURBO



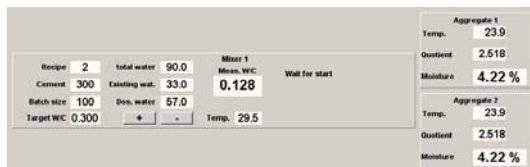
Choose menu page „SETTINGS“. Press button „SHUT DOWN“. The security message appears „SHUT DOWN“ and „BACK“.



Press button „SHUT DOWN“ to switch off the FL-MIKRO-TURBO duly. You should wait until the display is dark before operating the main switch („POWER“).

## 3. SCREEN PROPORTION

1 Mixer 2 Aggregate



2 Mixer 2 Aggregate



If the recipe selection is „Manual“, the program is chosen by touching the recipe number of the corresponding mixer. With „+“ or „-“ the total water is raised / lowered up to 0,5 litres (only with contact or manual recipe selection). The temperature display is only visible with activated temperature compensation.

## 4. MAIN MENU

### 4.1 GRAFIC MIXER



**EXISTING W/C-Value Graph's Course 2 x Mixer**  
 This displaying option is only available when operating 2 mixers.

**EXISTING W/C-Value Speedometer**  
 Here the current Existing W/C Value is shown in ratio to the Target W/C Value. The green range concerns from -10% until +20% from the Target W/C.

### 4.2 SETTINGS

#### 4.2.1 PROBE CHECK

-Here are all values of the connected probes and additionally the analogue inputs of the water and cement balances displayed.

	Channel 0	Channel 1	Value
Mixer 1	2038	1019	2.000
Mixer 2	2038	1019	2.000
Aggregate 1	2038	1019	2.000
Aggregate 2	2038	1019	2.000
Water scale 1	Cem. scale 1	Water scale 2	Agg. scale 2
0	0	0	0

back

Probe check:  
 Clean the probe and note down the values of channel 0 and 1.  
 Cover the probe's surface with a wet cloth or the palm of your hand and repeat this procedure.

Typical probe values:  
 Probe free: Channel 0 = 1800 – 2200 Channel 1 = 3200 – 4095  
 Probe covered: Channel 0 = 1800 – 2200 Channel 1 = 300 – 600

If you should receive other values, please contact one of our technicians.

#### 4.2.2 RECIPE DATA

##### RECIPE

Choose the requested recipe number.

##### CEMENT

Cement weight of the corresponding mixing.

##### TARGET W/C

Shows the requested TOTAL moisture as W/C ratio.

##### TOTAL WATER

Contains the requested total water quantity (liters) of the demanded concrete consistency.

##### CALIBRATION CURVE

Store here the recipe's calibrated calibration curve.

##### DRY MIX TIME

If dry / wet mix time is set recipe-depending, please pay attention that you are entering the time the mixer needs to mix all materials homogeneous.

##### WET MIX TIME

If dry / wet mix time is set recipe-depending, please pay attention that you are entering the time the mixer needs to mix the dosed water quantity homogeneous.

##### CORRECTION WATER

This correction valve is added to the water to dose.

##### FIX WATER

You can set a fix water quantity. If this parameter is higher 0 the entered water quantity is dosed without a pre measurement.

### 4.2.3 CALIBRATION MIXER

Grafic mixer   Settings   Protocolling   Chart		
Calibr. Curve	Dry mixing time	Calibration Mixer 1
1	5	
Additional water	Wet mixing time	
10.0	5	
<div style="display: flex; justify-content: space-around;"> <span>Man. Start</span> <span>Man. Changes</span> <span>back</span> </div>		

#### CALIBRATION CURVE:

Choose the calibration graph which should be used for calibration or manual changes.

#### ADDITIONAL WATER:

„Additional Water“ is the water quantity to dose at the calibration.

#### DRY MIX TIME:

Set the calibration's dry mix time.

#### WET MIX TIME:

Set the calibration's wet mix time.

#### CALIBRATION SEQUENCE:

After entering all values, the device is waiting for the start of the next batch. After the batch sequence is finished the calibration is done. For the reason of enlarged mixing times, please pay attention that no time topping error is occurring at the control. If the FL-MIKRO-TURBO is not dosing water itself, the button „DOSING FINISHED?“ appears after transmittance of the water quantity to the control. When the control has dosed the requested water quantity, this button has to be operated. Wet mix time and the second measurement are following. Pay absolute attention that the mixing remains in the mixer until the calibration ended.

Proceed a program with the calibrated calibration curve. Change now to the manual functions and choose point 'CHECK CURVE'. When mixing this program the second time after the calibration, add a fix defined water quantity (e.g. 20 Liters) to the additional goods and enter this value at the additional water into the program. Preferably the water should be dosed onto the dosing belt or into the skip. After the program course the recognized moisture alteration in comparison with the former mixing is displayed. If the difference to the added water quantity should be too big, the curve can be adapted automatically.

#### START MANUALLY

The calibration can be started manually, please see 4.2.6..

Grafic mixer   Settings   Protocolling   Chart		
Recipe/Calibr.curve	Cement	Target W/C
2	300	0.300
Batch size	Water balance	
100	0.0	
Start mixer 1	Start mixer 2	back
Tel. A mixer 1	Tel. A mixer 2	

#### MANUALLY CHANGES

Here you can adapt the calibration curve manually:

Grafic mixer   Settings   Protocolling   Chart		
	Mixer 1 Calibration curve 1	
	Offset	Steep
	0.000	1.000
	Parallel mov.	corr. steep
	save	back
Angle: 45.0°		

- Entering of calibration curve via „**OFFSET**“ and „**STEEP**“.

Grafic mixer   Settings   Protocolling   Chart		
	Mixer 1 Calibration curve 1	
	Display	Drying
	0.000	0.000
	OK    Cancel	

- Adaptation of the curve through „**PARALLEL MOVEMENT**“

- DISPLAY: displayed EXISTING W/C-value (incorrect)
- DRYING: evaluated EXISTING W/C-value

Grafic mixer   Settings   Protocolling   Chart		
	Mixer 1 Calibration curve 1	
	W/C false	W/C corrected
	0.000	0.000
	W/C ok	
	OK    Cancel	

- Adaptation of the curve through „**CORRECTION STEEP**“

- W/C FALSE: displayed EXISTING W/C-value (incorrect)
- W/C CORRECTED: evaluated EXISTING W/C-value (replaces W/C false)
- W/C OK: displayed EXISTING W/C-value (correct; Centre of curve rotation)

**!!! ALL MANUAL CHANGINGS HAVE TO BE SAVED SEPARATELY !!!**

#### 4.2.4 CALIBRATION AGGREGATE MATERIAL

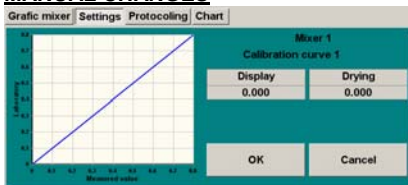
Calibr. Curve		Calibration Aggregate 1	
1			
Measure ->	Quotient 1 0.000	Moisture 1 0.0	Man. changes
Measure ->	Quotient 2 4.000	Moisture 2 4.0	save
Calculate ->	Quotient 3 8.000	Moisture 3 8.0	back

,QUOTIENT 3' or push the ,MEASURE' button beside the third pair of values. Enter the corresponding moisture value (7%) to ,MOISTURE 3'. Evaluate the second pair of values when operating the ,CALCULATE' button. In certain cases it could be useful to separate the material sample into 3 parts and to determine the middle value through a measurement as well. Save the curve with ,SAVE'.

#### CALIBRATION PROCESS

Take a sample of the material to be measured from the measure process. Dry the total material sample and separate it in 2 parts. Moist both parts with different moisture again (e.g. 2% and 7%). Choose the calibration curve to calibrate. Stick the probe into the first sample and enter the quotient at ,QUOTIENT 1' or push the , MEASURE' button beside the first pair of values. Enter the corresponding moisture value (2%) to ,MOISTURE 1'. Stick the probe into the sample with the higher moisture and enter the quotient at

#### MANUAL CHANGES



The curve can be adapted through a parallel movement.

- DISPLAY :Displayed EXISTING moisture (incorrect)
- DRYING: Evaluated EXISTING moisture

#### 4.2.5 MANUALLY FUNKTION

Man. start	Man. dosing
Man. end	Set clock
Check curve	
back	

#### MANUALLY START

Enter the requested mixing data in the upper fields. Pay attention to enter real values to all fields.

Recipe/Calibr. curve 2	Cement 300	Target W/C 0.300
Batch size 100	Water balance 0.0	
Start mixer 1	Start mixer 2	back
Tel. A mixer 1	Tel. A mixer 2	

#### START MIXER

When operating this button the FL-MIKRO-TURBO is started with the set data. The remaining mixing sequence depends to the chosen processing variation.

#### TELEGRAM A

With a serial operation the last sent control's A-Telegram is displayed in the lower right after operating this button.

Existing water 33.0	Dos. water 57.0
Tel. B mixer 1	Tel. B mixer 2
End mixer 1	End mixer 2
back	

#### MANUALLY END

Enter the water values to be send to the control at the upper fields.

#### TELEGRAM B MIXER

When operating this button, the entered values are sent to the control as Telegram B.

#### END MIXER

When operating this button the hardware end signal is set for about 2 sec.

water to dose 0.0	
Dos. Mixer 1	Dos. Mixer 2
back	

#### MANUALLY DOSING

- Enter the requested number of liters to be dosed manually at ,WATER QUANTITY TO DOSE'.
- Choose the mixer to be dosed to.

#### SET CLOCK

Set the current date and time and confirm with „OK“.

#### 4.2.6 SERVICE

This tab is only for technicians of the Franz Ludwig Company and for control manufacturers. Its password is „55124“. We are not responsible for any failure settings from your side.

##### 4.2.6.1 EXPORT DATA TO USB – STICK

- Fit the USB-Stick into the connection on the front plate and pay attention that the USB-LED is lightning and the connection is indicated.
- Choose the tab SETTINGS and click the SERVICE button.
- Enter the password „55124“ and confirm with ENTER.
- Tip the button EXPORT ALL SETTINGS TO USB-STICK.
- In case any other remark than **action in processing** is shown, a failure occurred.

#### 4.2.7 LANGUAGE

Set the requested country language.

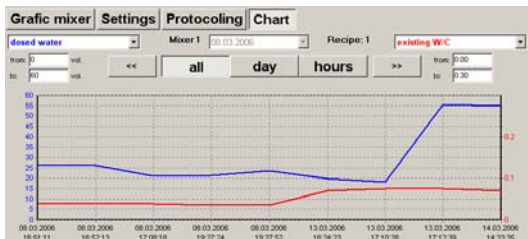
### 4.3 LOGGING

No.	Date	Time	W/C	total vol	res. W/C	res. W/C	res. W/C	res. W/C	res. W/C	res. W/C	res. W/C	res. W/C	res. W/C	res. W/C	res. W/C	res. W/C	res. W/C	res. W/C	res. W/C
10	06.03.2006	16:51:11	0.3	30	0.038	3.8	26.2	100	100	0	0								
11	08.03.2006	18:52:13	0.3	30	0.038	3.8	26.2	100	100	0	0								
12	08.03.2006	17:08:18	0.25	25	0.038	3.8	21.2	100	100	0	0								
13	08.03.2006	19:27:24	0.25	25	0.038	3.5	21.5	100	100	0	0								
14	08.03.2006	19:27:52	0.27	27	0.035	3.5	23.5	100	100	0	0								
1	13.03.2006	16:24:23	0.27	27	0.071	7.1	19.9	100	100	0	0								
2	13.03.2006	17:10:28	0.3	24.3	0.0753	6.1	18.2	81	16	0	0								
3	13.03.2006	17:12:38	0.3	73.8	0.0752	10.5	55.4	240	48	0	0								
1	14.03.2006	14:32:35	0.3	72	0.0708	17	55	240	48	0	0								

Choose the logging data of a certain recipe in the requested time frame. For editing the data press the button 'CHOOSE ALL'. The data will all be marked. These data can be exported to a memory stick (to be inserted in front panel) with 'EXPORT TO CSV' or deleted with 'DELETE'. (Memory stick with min. 10 MB free space). The file name is generated automatically. (Mixer number / Recipe number / Date from / Date to). For import to EXCEL :

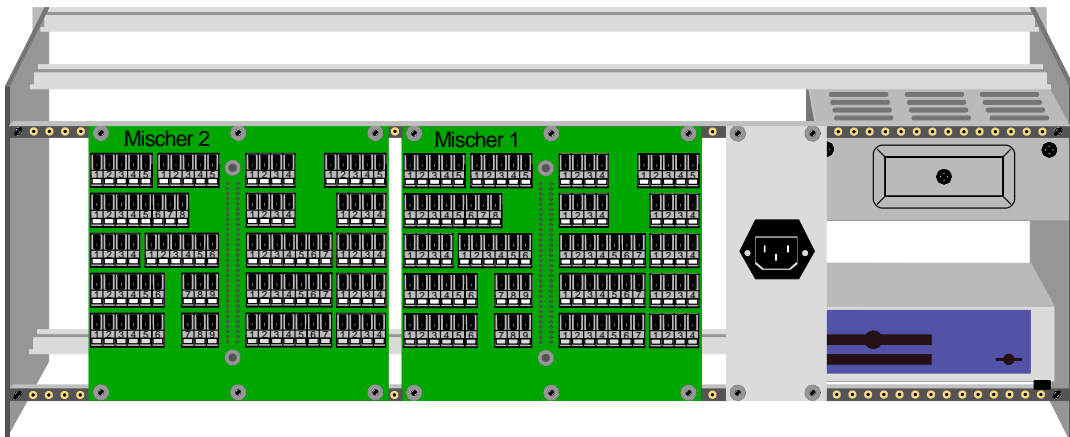
- Decimal separator = „.“ (point)
- Column separator = „;“ (semicolon)

### 4.4 DIAGRAM

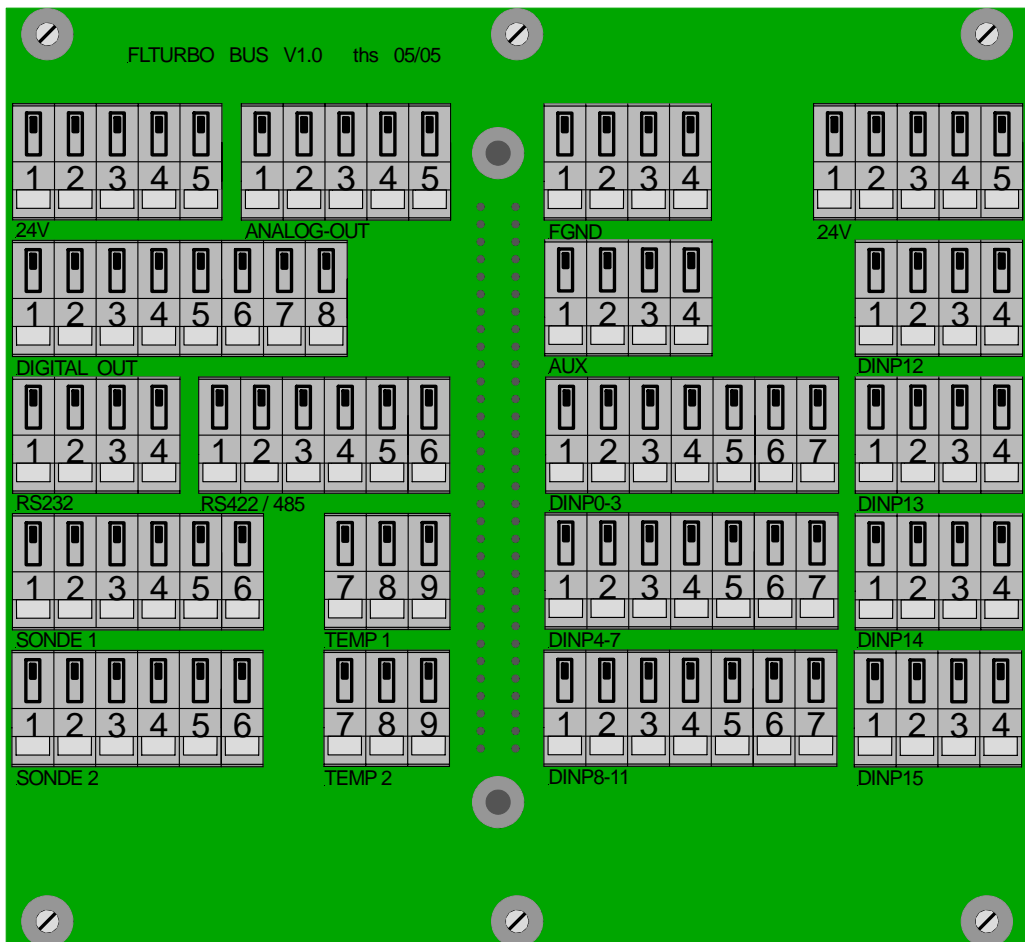


The chosen mixing data are graphically displayed. Two values in separate curves can be displayed. Min. and Max. value of the graphic are free to choose. The displaying can be selected per day or zoomed in blocks of 3 hours.

**5. FL-MIKRO-TURBO DEVICE'S BACK SIDE**



**5.1. FL-MIKRO-TURBO BUS BOARD**

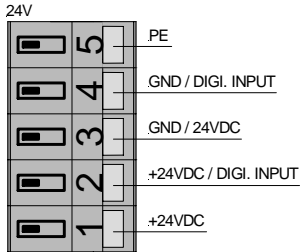


## 6. INSTALLATION PLAN & FL-MIKRO-TURBO CLAMP CONNECTION

### GENERALS

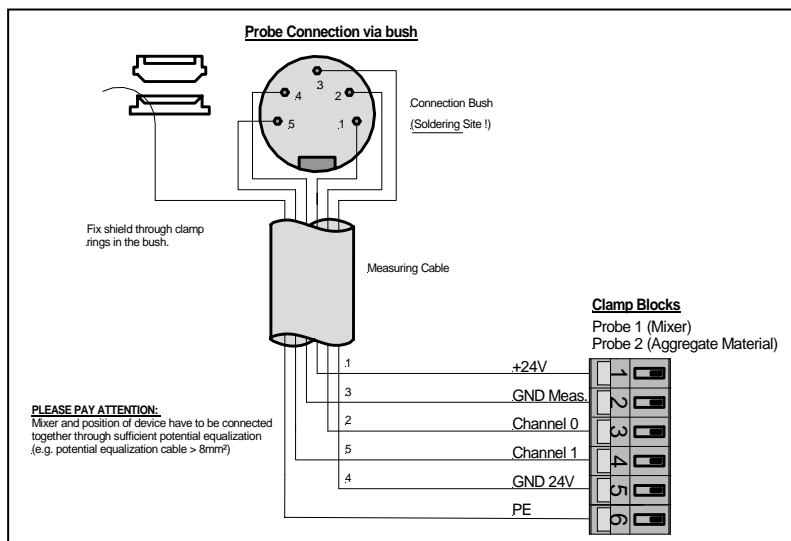
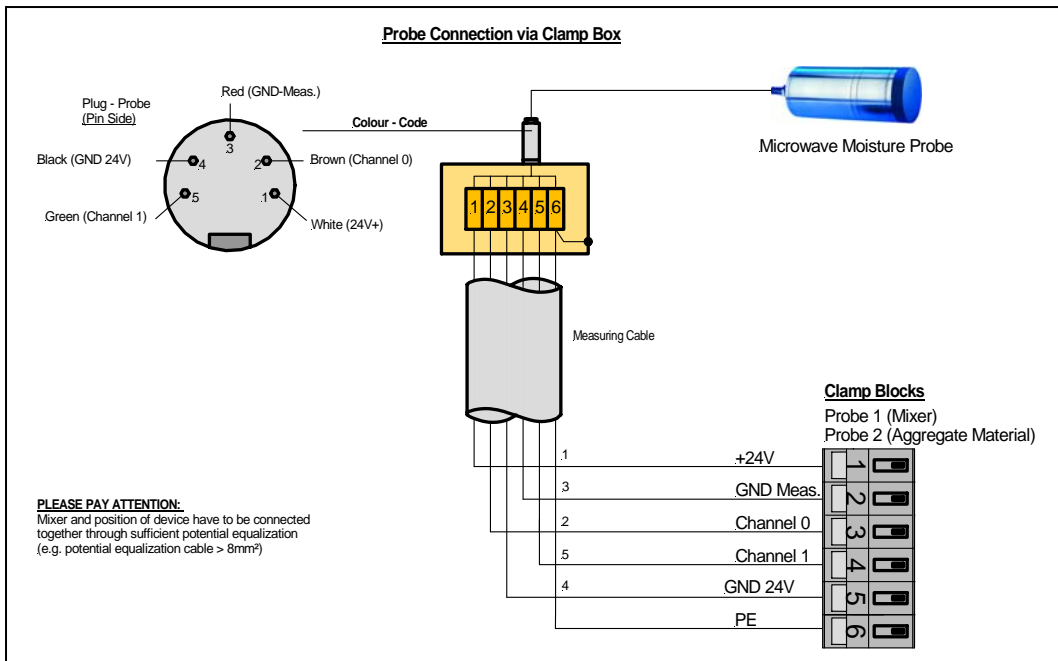
The probe's cable and the signal cables for water counter, cement weight, temperature probe and remote correction have to be shielded. Connect the shield to the FL-Mikro Turbo. The probe's cable and the signal cables should not be laid together with load carrying cables.

### 6.1 24V CLAMP BLOCKS

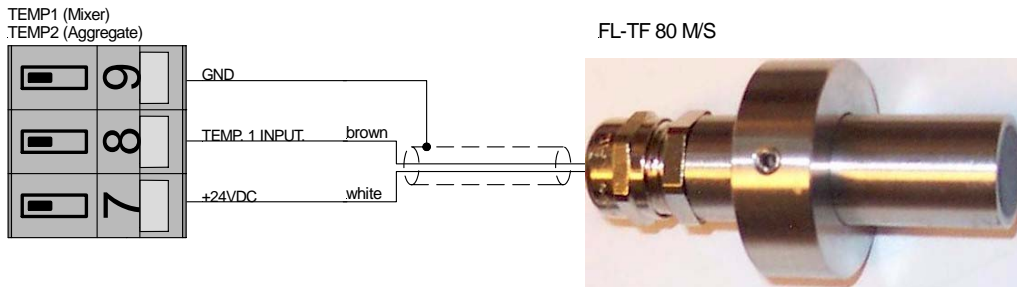


- This 24V clamp block is existing 2 times on the BUS board.
- Power supply for the FL-MIKRO-TURBO board.
- A separate 24 V power supply for digital inputs can be connected. If his is not available, the internal power supply can be bridged.

### 6.2 PROBE CONNECTION CLAMP BLOCKS



### 6.3 TEMPERATURE PROBE CLAMP BLOCKS



### 6.4 DIGITAL INPUT CLAMP BLOCKS

#### RECIPE CONNECTION

DECIMAL		BCD		BINARY	
CLAMP	VALENCE	CLAMP	VALENCE	CLAMP	VALENCE
DIGI.INPUT 0	1	DIGI.INPUT 0	1	DIGI.INPUT 0	1
DIGI.INPUT 1	2	DIGI.INPUT 1	2	DIGI.INPUT 1	2
DIGI.INPUT 2	3	DIGI.INPUT 2	4	DIGI.INPUT 2	4
DIGI.INPUT 3	4	DIGI.INPUT 3	8	DIGI.INPUT 3	8
DIGI.INPUT 4	5	DIGI.INPUT 4	10	DIGI.INPUT 4	16
DIGI.INPUT 5	6	DIGI.INPUT 5	20	DIGI.INPUT 5	32
DIGI.INPUT 6	7	DIGI.INPUT 6	40	DIGI.INPUT 6	64
DIGI.INPUT 7	8	DIGI.INPUT 7	80	DIGI.INPUT 7	128
DIGI.INPUT 8	9				
DIGI.INPUT 9	+ 10				
DIGI.INPUT 10	+ 20				

0-10V (OPTIONALLY)							
Rec.	V	Rec.	V	Rec.	V	Rec.	V
1	0,25	12	3,00	23	5,75	34	8,50
2	0,50	13	3,25	24	6,00	35	8,75
3	0,75	14	3,50	25	6,25	36	9,00
4	1,00	15	3,75	26	6,50	37	9,25
5	1,25	16	4,00	27	6,75	38	9,50
6	1,50	17	4,25	28	7,00	39	9,75
7	1,75	18	4,50	29	7,25	40	10,00
8	2,00	19	4,75	30	7,50		
9	2,25	20	5,00	31	7,75		
10	2,50	21	5,25	32	8,00		
11	2,75	22	5,50	33	8,25		

Digital Input 10: Temperature Reading Impulse (Attention: If temperature compensation and decimal actuation is activated, the valency „+20“ is inapplicable at clamp 10. Availability recipes: 19)  
 Digital Input 11: Cement weight reading impulse

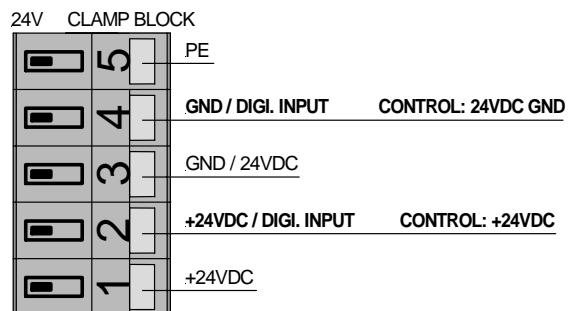
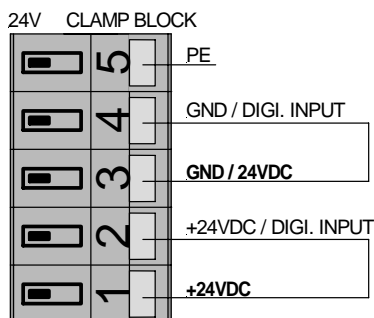
All inputs have to be wired **24V** under the following possibilities:

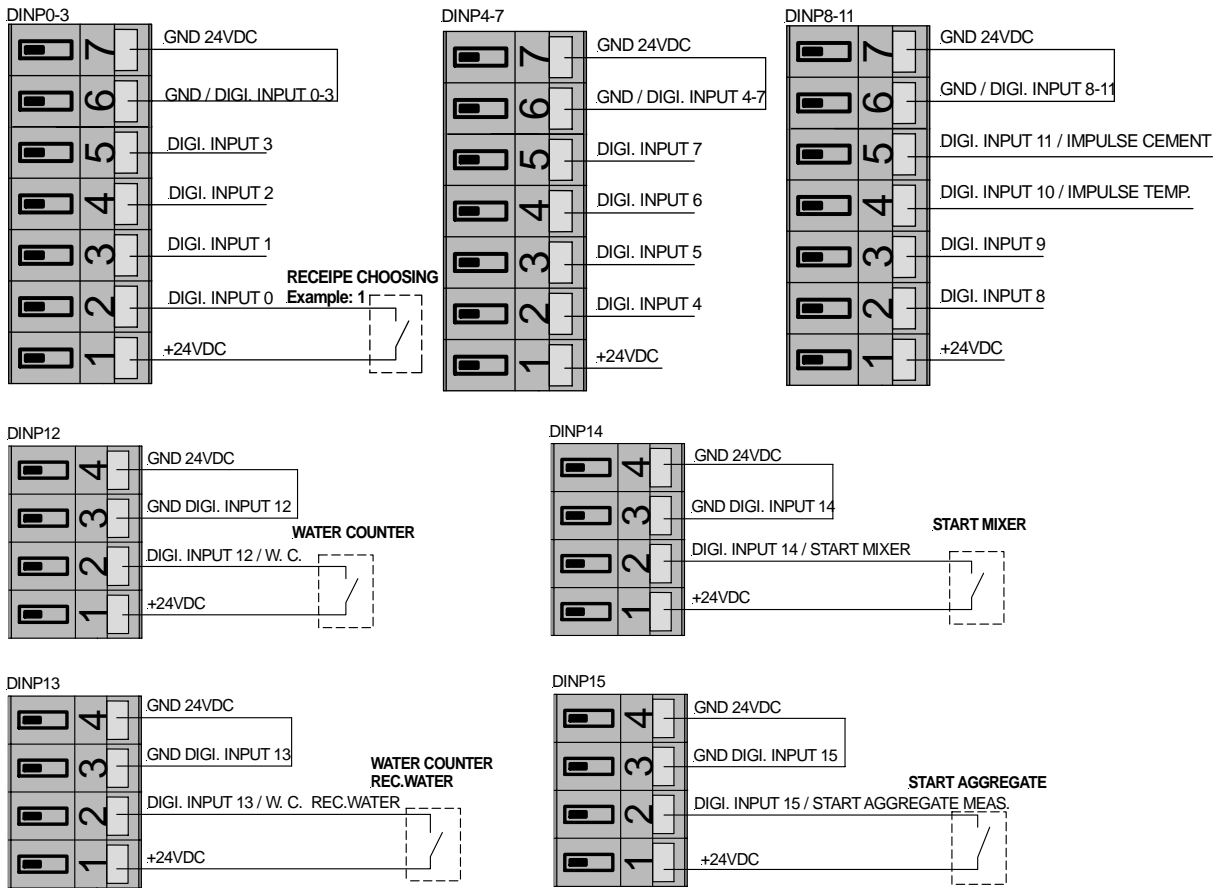
Option 1:

Connect the internal control voltage via clamps on the 24 V clamp block.

Option 2:

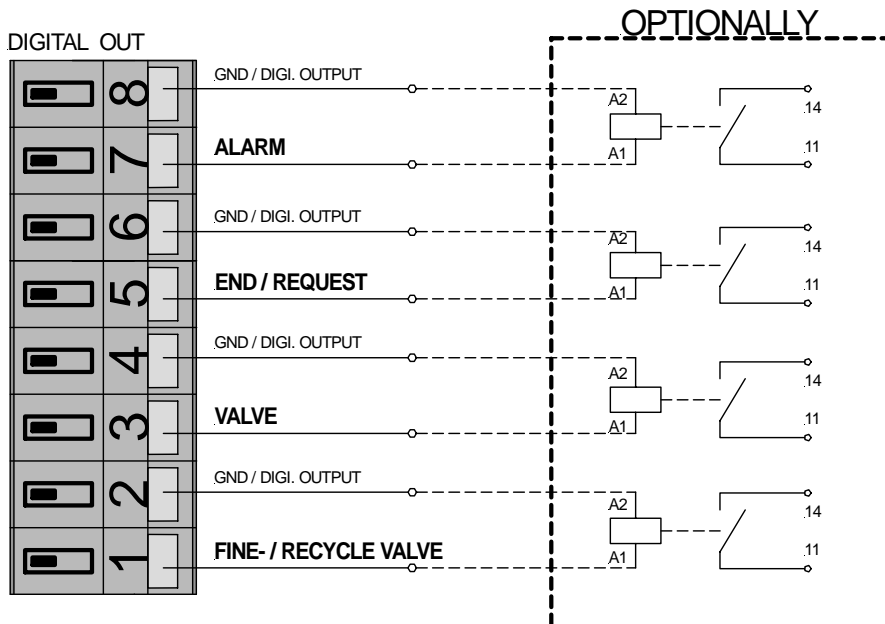
Connect the external control voltage via clamps on the 24V clamp block.





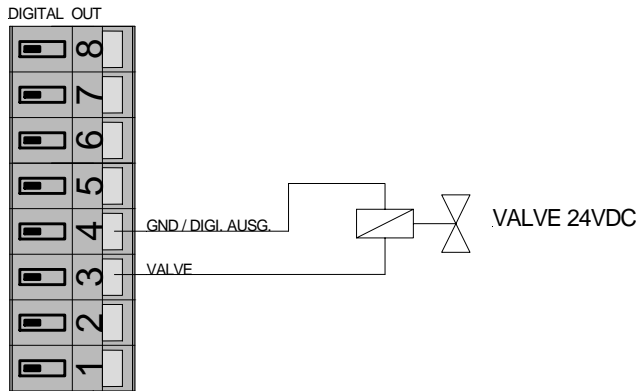
## 6.5 DIGITAL OUTPUT CLAMP BLOCK

Digital Outputs 24VDC max. 1,5A

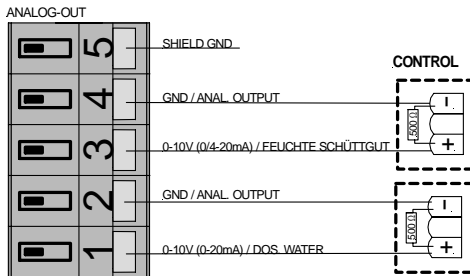


### 6.5.1 USE EXAMPLE (LAWFULL FOR THE ALL DIGITAL OUTPUT)

Output 24VDC (max. 1,5A), active output signal (Example: VALVE).



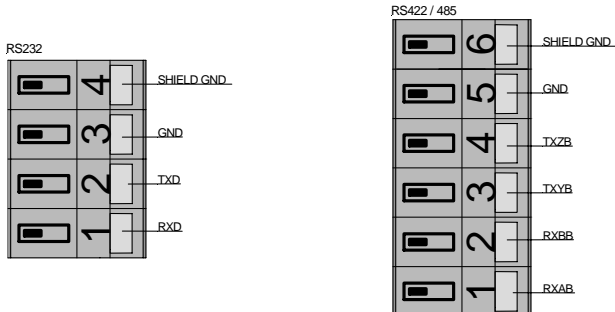
### 6.6 ANALOG OUTPUT CLAMP BLOCK



#### OUTPUT

1. Currently: analog voltage output
2. Analog output 0-10V:
  - Cable length between Turbo & control less than 2m, connect a 500Ω resistor parallelly to Turbo ANALOG OUT (3/4).
  - Cable length between Turbo & control over 2m, connect a 500Ω resistor (0,6W / Metal layer 1%) parallelly to the control's input.
3. Two 500Ω resistors are present at the FL-MIKRO-TURBO cover's side.

### 6.7 INTERFACE CLAMP BLOCKS



## 7. DISTURBANCYS WITH ISM-FREQUENCIES

Radio frequency devices use particular ISM-Frequencies (Industrial Scientific and Medical), which are international prescribed. Our Microwave Moisture Probe, which counts as this type of device, is operated inside the frequency range from 433,05 to 434,79 MHz. Radio frequency ranges are utilized in many commonly known devices. An example of these devices as follows.

- Radio Alarm Systems
- Vehicle Opener
- Mobile Transmitters
- Garage door Opener
- Remote Controls
- Wireless Movement Detectors

On account of the huge number of ISM-Devices it can lead to mutual influences or interferences, if they are operated in direct environment. The radio signals might be received from other as the expected receiver. To avoid each kind of interferences, we recommend, that your other operating ISM-devices, which use the range from 433,05 – 434,79 MHz as well, not be used in immediate vicinity of our Microwave Moisture Probes or should be laid out for other ISM-Frequencies. This goes especially for possible danger zones as for example cranes, roll-doors, buckle conveyor belts, e.g. In researches and tests, which had been done by us and outside institutes, have been found out, that the from us used frequency range from 433,05 to 434,79 MHz is the most advantageous to get reliable and accurate Moisture Measurement with our Microwave Moisture Probes. Please feel free to contact us. We look forward to answering any questions you may have.

## 8. SELECTION OF INSTALLATION PLACE WITH CERTAIN MIXER TYPES

Only one microwave moisture probe is needed, independent from mixer type and size. To guarantee optimal measure results the probe has to be free of built-up material and the material has to be homogenized sufficiently.

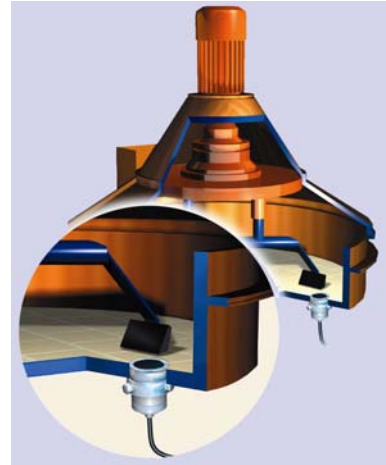
### INSTALLATION IN THE MIXER BOTTOM OF PLANETARY / ANNULAR PAN MIXERS

- Choose an installation place which is cleaned sufficiently every times (e.g. on the highest point of uneven mixer bottoms.).



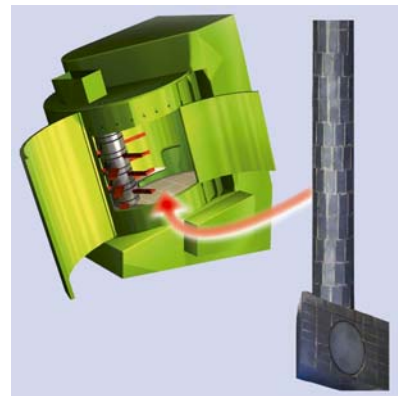
*Specific: Annual Pan Mixers*

- If the mixer arms are giving during the dry mix process a non-sufficient homogenizing is according on the mixer bottom zone which results in error measurements.
- Remedy: Reduce the mixing size or re-adjusting the feathers.



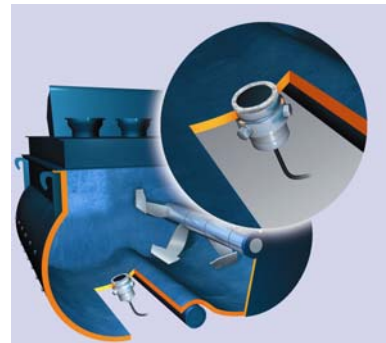
### INSTALLATION IN INTENSIVE MIXERS

- The probe is installed in the bottom/wall-scraper with integrated holder.
- The probe's measure surface has to be installed at the same level as the scraper's.
- When producing very fine material it probably will be necessary to clean the probe through spraying after mixer emptying.
- The probe can even be installed in a separate holder arm.



### INSTALLATION IN A S (SINGLE / DOUBLE) SHAFT -MIXERS

- We recommend the installation of our wear tile round.
- The probe should be installed in a middle distance between both side walls of the mixer pan.  
(approx. 1m distance to the side wall)  
*Best place: near the opening clap*
- The probe should be installed at 05:00 approx.  
(The mixer shares should transport the material upwards on the probe.)
- The above mentioned recommends are even to be considered with single shaft mixers.



### USEFUL TIPS

- The **probe** has to be installed in min. 1 meter distance to **electric motors (p.e. mixer drive)**.
- The **probe** should be installed near an inspection clap.
- If the mixer bottom is **unevenly** used, the probe should be installed on the **highest** place of the bottom.
- The **holder surface and the probe's surface** have to be installed the same level as the **mixer bottom**.
- The distance of the probe's measure surface (centre) should take 15 cm from the inner side of the outer mixer wall minimum.
- The **probe cable** has not to be layed together with load carrying cables.
- **Before** installing in the holder, the **probe** should be lubricated with high-performance grease.
- Only **de-installing** without using massive **force**. Pull out the **probe** of the holder only from bottom to top.
- **Welding working** in the probe's environment only with uninstalled probe.



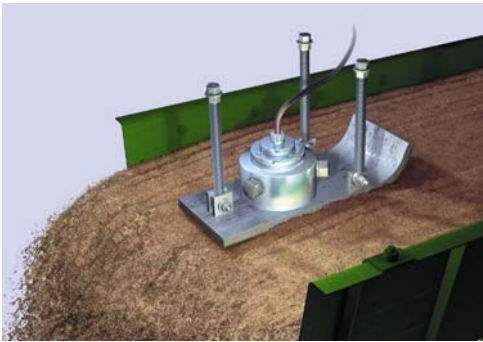
## 9. SELECTION OF INSTALLATION PLACE FOR AGGREGATE MATERIAL PROBES

To guarantee optimal measure results the probe has to be free of material storage anytime.



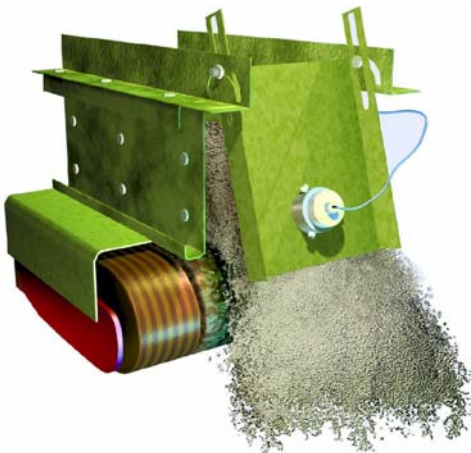
### INSTALLATION WITH WEAR PROTECTION TUBE AT THE SILO OUTLET

- The probe's measure surface has to be situated in the current material flow.
- Do not assign the probe's measure surface too high above the silo outlet.
- Do not assign the probe's measure surface directly to bracings or steam jets.
- Pay attention when filling the silo that no material falls from high above onto the probe (do not empty the silo totally).



### INSTALLATION AT A SLIDE ONTO CONVEYER BELT

- Fix the installation set absolutely stable and vibration-free.
- Press the slide as deep in the material as the measure surface is covered with the material even when material height variations occur.
- Relief: The material flow's height can be optimized to approx. 8-10 cm when affixing deflector or dust plates on the dosing belt.
- The angle should be 10° (visual effect „skiing“).
- Hold a constant conveying speed of the measure medium.
- Do not assign the probe directly over a guide roller.



### INSTALLATION WITH A WEAR PROTECTION TILE ON A MATERIAL DISCHARGE LOCATION

- The probe's measure surface has to be situated in the middle of the conveyer belt in the current material flow. Measured value variations result, if the material height is varying on the belt and the probe's measure surface is not covered enough.
- Relief: The material flow's height can be optimized to approx. 8-10 cm when affixing deflector or dust plates on the dosing belt.

### USEFUL TIPS

- The **probe** has to be installed in min. 1 meter distance to **electric motors (p.E. mixer drive)**.
- The **holder surface and the probe's surface** have to be installed the same level.
- The **probe cable** has not to be layed together with load carrying cables.
- **Before** installing in the holder, the **probe** should be lubricated with high-performance grease.
- **Welding working** in the probe's environment only with uninstalled probe.

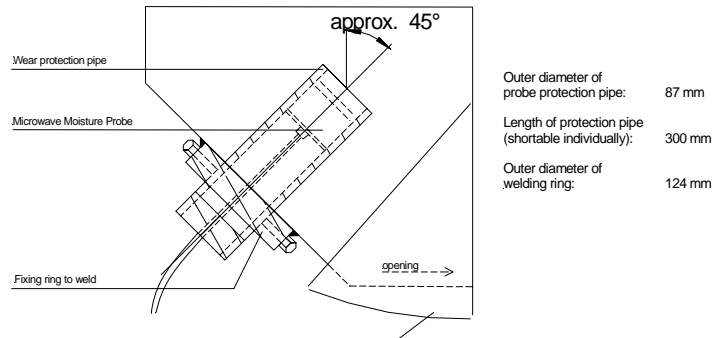
**9.1. HOLDER SYSTEMS FOR AGGREGATE MATERIAL PROBES**

To protect the probe optimally against wear and interference effects, one of the following holder systems should be installed:

**Wear Protection Tube**



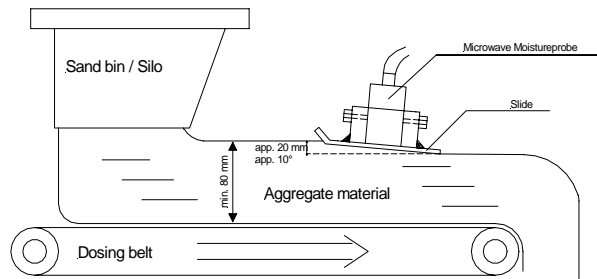
Installation Microwave Moisture Probe with Wear Protection Tube at the silo outlet



**Slide**



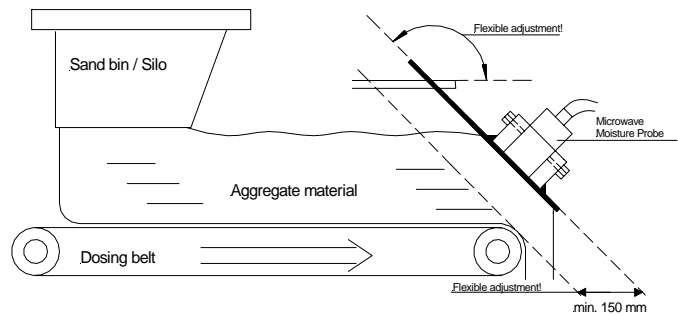
Installation Microwave Moisture Probe at a slide



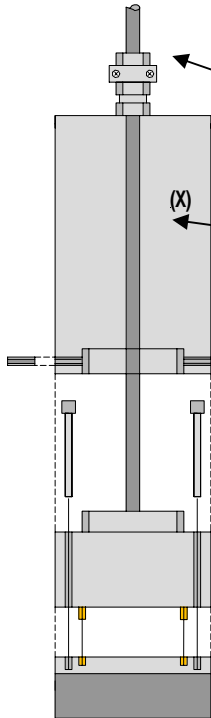
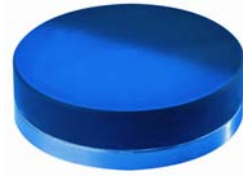
**Wear Protection Tile**



Installation Microwave Moisture Probe with wear protection tile at a material discharge location



## 10. EXCHANGE OF MEASURE HEAD



Probe extension (X) only optionally.

1. \_\_\_\_\_ Device has to be switched off. !!!
2. Remove probe plug or disconnect the probe from the clamp connection box.
3. Unscrew tension.
4. Loose internal hexagon screws.
5. Unscrew extension from the probe  
**(Attention:** turn only the extension to avoid cable damage
6. Loose non-sealed cylinder screws (4 pc.).
7. Remove wear and tear head.

Fix the new wear and tear head carefully without tilting.

Please pay attention to pass the fixing pins exactly into the existing holes.

When fixing please use new cylinder screws and fix them tightly to avoid water flow into the probe.

**IMPORTANT:**

Always exchange the wear and tear head in a proper place because dirt particles can cause probe's error performance.