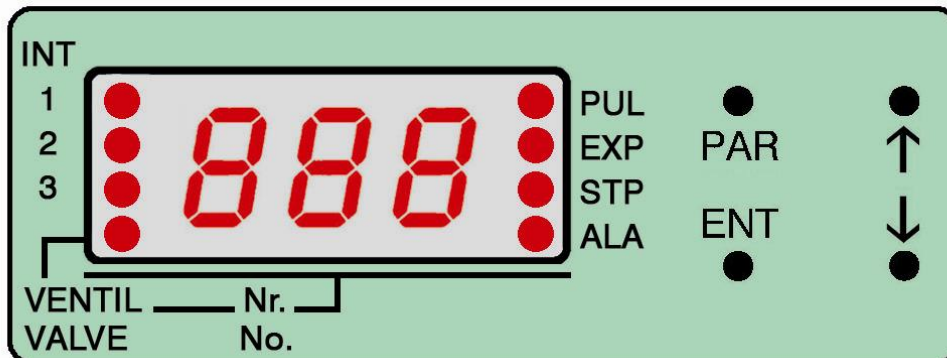


TRANS - FILTER - SCANNER TFS-32*

Operating instructions



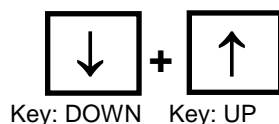
Digital display, operation:

Display:	<ul style="list-style-type: none"> - shows the abbreviation of the parameters. - shows the values of the set parameters. - shows the current valve number. - shows valve failures.
Light-emitting Diodes (LED):	<p>INT 1: Lights up when dedusting with PULSE 1 and INTERVAL 1. INT 2: Lights up when dedusting with PULSE 2 and INTERVAL 2. INT 3: Lights up when dedusting with PULSE 3 and INTERVAL 3. VALVE: Lights up when the current valve number is displayed. PUL: Lights up when the dedusting impulse is active. EXP: Lights up when an expander unit is activated. STP Lights up when dedusting has stopped. ALA: Lights up when alarm.</p>
Keyboard:	<p>PAR = access to the parameters or exiting the parameter mode and back to normal operation.</p> <p>ENT = Exit the parameter setting.</p> <p>↑ = Increases the value of the selected parameter.</p> <p>↓ = Decreases the value of the selected parameter.</p>

1. General:

After switching on the power supply, the LEDs light up and the display shows 8.8.8. for ca. 3s. After this short self-test, the device functions in normal operation with the set parameters.

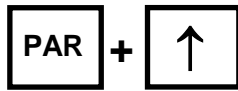
Keyboard:



Whilst setting the parameters, the values change by one number if the UP or DOWN key is pressed for longer that >200ms. If the key is pressed for longer than >1s, the values change faster and by more than one number.

2. Parameter mode: Access, selection and setting:

2.1 Access to the parameter mode by entering the password



Press simultaneously for ca. 3s:

If a password has been set, the digital display flashes three times and then shows: **PAS** (password) and then 000. **No password** is set in the **factory settings**.

The display then immediately switches to the select parameters option and the first parameter is displayed.

Continue with:



Press until the digital display shows the right password for access to the parameter mode. The factory settings are password = **000** = no password and can be changed via parameter **PSt** further on in this chapter.

Continue with:

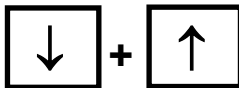


Press the ENT= enter key to confirm the correct password.

The device switches to parameter mode.

If the password is wrong, the digital display shows "no" for ca. 3s and the device then switches into normal operation.

2.2 Parameter selection:



Press the ↓ or ↑ key until the required parameter appears:

		<u>Factory setting</u>
Display	2.3. PU1 = PULSE 1, 20 ms – 5 s,	100 ms
Name of the parameter	2.4. In1 = INTERVAL 1, 5 – 999 s,	15 s
Access with:	2.5. Cy1 = Number of dedusting cycles with Pulse 1 and Interval 1,	0
	2.6. F15 = Function of Terminal 15 for Pulse 1 and Interval 1,	1
	2.7. PU2 = PULSE 2, 20 ms – 5 s,	100 ms
	2.8. In2 = INTERVAL 2, 5 – 999 s,	30 minutes
	2.9. I2E = INTERVAL 2 activated: deactivated = 0, activated = 1,	1
	2.10. PU3 = PULSE 3, 20 ms – 5 s,	100 ms
	2.11. In3 = INTERVAL 3, 5 – 999 s,	10 s
	2.12. Cy3 = Number of dedusting cycles with Pulse 3 and Interval 3,	0
	2.13. F16 = Function of Terminal 16 for Pulse 3 and Interval 3,	1
	2.14. Out = Number of connected valve outputs, number of assembled outlets, e.g. 12	
	2.15. rEL = Function of the relay	1
	2.16. dEL = Deletes the failure memory for valve failures	
	2.17. PSt = Change password	
	2.18. FAd = Factory settings, resets all parameters to factory settings	



Press the ↓ or ↑ key until the required parameter appears.



By pressing the PAR key for ca. 2s, the device switches back to normal operations with the set parameters.

2.3 Pulse 1, Parameter PU1:

Parameter **PU1** defines the PULSEtime, if PULSE 1 and INTERVAL 1 are activated by a signal on Terminal 15 (see Item 2.6). Parameter **PU1** can be altered in the range of 20 ms – 5 s. The factory setting is 100 ms. Please note: The digital display shows the value in ms without a decimal point if the value is in the range of 20 – 990 ms. The value is shown with a decimal point if the value is ≥ 1.0 s. The LED PUL and INT 1 lights up during setting. The value is adopted and saved by pressing the ENT key.

Dedusting with Pulse 1 and Interval 1 can be started as follows:

- with a Signal 24 VDC, 10mA at Terminal 15 (+) and Terminal 33 (-), e.g. from an SPS.
- with a potential-free contact from Terminal 15 to Terminal 32, e.g. from a differential pressure controller, a pressure switch or a manual switch/push-button etc.

Note: Dedusting with Pulse 3 and Interval 3 takes precedence over dedusting with Pulse 1 and Interval 1.

Example: If dedusting is requested with Pulse 1 and Interval 1 via Terminal 15 and with Pulse 3 and Interval 3 via Terminal 16 at the same time, then Pulse 3 and Interval 3 take precedence and dedusting is run with Pulse 3 and Interval 3.

2.4 Interval 1, Parameter In1:

Parameter **In1** defines the INTERVALtime, if PULSE 1 and INTERVAL 1 are activated. Parameter **In1** can be altered in the range of 5 – 999. The factory setting is 15 s. During the setting, the LED INT 1 lights up. The value is adopted and saved by pressing the ENT key.

2.5 Number of dedusting cycles with Pulse 1 and Interval 1, Parameter Cy1:

Parameter **Cy1** defines the number of dedusting cycles, if PULSE 1 and INTERVAL 1 are activated by a signal on Terminal 15 (see Item 2.6). Parameter **Cy1** can be altered in the range of 0 – 250 cycles. The factory setting is 0 cycles. During the setting, the LED INT 1 lights up. The value is adopted and saved by pressing the ENT key.

Examples:

Cy1 = 0: The dedusting stops immediately after the signal on Terminal 15 had been removed.

Cy1 = 5: The dedusting goes through another 5 full cycles, e.g. from valve 1 to 12, after the signal on Terminal 15 has been removed.

With this parameter, with a simple and cost-efficient differential pressure switch without hysteresis for example, a differential pressure-dependent dedusting can be realised. After the pressure switch point, e.g. 10 mbar, of the differential pressure switch has been exceeded, it switches on the dedusting via Terminal 15. After dedusting the first filter, the differential pressure switch usually switches back again because the filter differential pressure is already decreasing. Parameter Cy1 now ensures that dedusting is continued, for example, for another 5 full cycles, thus meaning each filter is dedusted another 5 times.

With this parameter, secondary cleaning can also be realised. The signal can, for example, come from a differential pressure switch, which sensors the deactivated process air, for example, during the shortfall of 2 mbar, and then starts the secondary cleaning via Terminal 15. In this case, set Parameter **F15 = 2** (see Item 2.6).

If secondary cleaning is to be started manually, e.g. by way of a short impulse or using a manual push-button, set Parameter **F15 = 1**.

2.6 Function of Terminal 15 for Pulse 1 and Interval 1, Parameter F15:

Parameter **F15** defines the functionality of Terminal 15. Via Terminal 15, dedusting with PULSE 1 and INTERVAL 1 can be activated with an appropriate signal. Parameter **F15** can be altered in the range of 1 – 2. The factory setting is 1. LED INT 1 lights up during setting. The value is adopted and saved by pressing the ENT key.

Examples:

F15 = 1: Dedusting is started with a **24 VDC permanent signal** or via a **24 VDC impulse >300 ms** at Terminal 15.

Starting with a **24 VDC permanent signal** and the setting of Parameter **Cy1 = 0**:
Dedusting starts when the 24 VDC signal is at Terminal 15 and stops immediately when the signal is removed.

Starting with **24 VDC permanent signal** and the setting of Parameter **Cy1 > 0**:
Dedusting starts when the 24 VDC signal is at Terminal 15. If the signal is removed, dedusting continues for the number of cycles set with Parameter **Cy1** and stops after that.

Starting with **impulse > 300 ms**:
Dedusting starts when the 24 VDC signal is at Terminal 15. If the signal is removed, dedusting continues for the number of cycles set with Parameter **Cy1** and stops after that.

F15 = 2: Dedusting is started via a **24 VDC permanent signal** on Terminal 15.

Only select this setting if secondary cleaning is to be realised. The 24 VDC permanent signal can, for example, come from a differential pressure switch, which sensors the switched off process air, e.g. with a shortfall of 2 mbar, and then starts the secondary cleaning via Terminal 15. In this case, set the secondary cleaning cycles via Parameter **Cy1 > 0** (see Item 2.5).

Starting with a **24 VDC permanent signal** and setting Parameter **Cy1 = 0**:
Dedusting starts when the 24 VDC signal is at Terminal 15 and stops immediately when the signal is removed.

Starting with a **24 VDC permanent signal** and setting Parameter **Cy1 > 0**:

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Dedusting starts when the 24 VDC signal is at Terminal 15 and stops when the number of secondary cleaning cycles set with Parameter **Cy1** has come to an end.

2.7 Pulse 2, Parameter PU2:

Parameter **PU2** defines the PULSEtime if PULSE 2 and INTERVAL 2 are activated. Parameter **PU2** can be altered in the range of 20 ms – 5 s. The factory setting is 100 ms. Please note: The digital display shows the value in ms without a decimal point if the value is in the range of 20 – 990 ms. The value is shown with a decimal point if the value is ≥ 1.0 s. The LED PUL and INT 1 lights up during setting. The value is adopted and saved by pressing the ENT key.

2.8 Interval 2, Parameter In2:

Parameter **In2** defines the PULSEtime if PULSE 2 and INTERVAL 2 are activated. Parameter **In2** can be altered in the range of 5 s – 60 minutes. The factory setting is 30 minutes. Please note: The digital display shows the value in ms without a decimal point if the value is in the range of 5 s – 59 s. The value is shown with a decimal point if the value is in the range of 1.0 – 60 minutes. The LED INT 2 lights up during setting. The value is adopted and saved by pressing the ENT key.

2.9 Interval 2 activated, Parameter I2E:

Parameter **I2E** defines whether INTERVAL 2 should be activated or not. Parameter **I2E** can be altered in the range of 0 - 1. The factory setting is 0. 0 = deactivated, 1 = activated. The LED INT 2 lights up during setting. The value is adopted and saved by pressing the ENT key.

Examples:

I2E = 0: Dedusting with Pulse 2 and Interval 2 is deactivated.

I2E = 1: Dedusting is running with Pulse 2 and Interval 2, if Pulse 1 and Interval 1 as well as Pulse 3 and Interval 3 are not running.

2.10 Pulse 3, Parameter PU3:

Parameter **PU3** defines the PULSEtime if PULSE 3 and INTERVAL 3 are activated by a signal at Terminal 16 (see Item 2.13). Parameter **PU3** can be altered in the range of 20 ms – 5 s. The factory setting is 100 ms. Please note: The digital display shows the value in ms without a decimal point if the value is in the range of 20 – 990 ms. The value is shown with a decimal point if the value is ≥ 1.0 s. The LED PUL and INT 3 lights up during setting. The value is adopted and saved by pressing the ENT key.

Dedusting with Pulse 3 and Interval 3 can be started as follows:

- with a Signal 24 VDC, 10mA on terminal 16 (+) and terminal 33 (-), e.g. from an SPS.
- with a potential-free contact from terminal 16 to terminal 32, e.g. from a differential pressure controller, a pressure switch or a manual switch/push-button etc.

Note: Dedusting with Pulse 3 and Interval 3 takes precedence over dedusting with Pulse 1 and Interval 1.

Example: If dedusting is requested with Pulse 1 and Interval 1 via Terminal 15 and with Pulse 3 and Interval 3 via Terminal 16 at the same time, then Pulse 3 and Interval 3 take precedence and dedusting is run with Pulse 3 and Interval 3.

2.11 Interval 3, Parameter In3:

Parameter **In3** defines the INTERVALtime, if PULSE 3 and INTERVAL 3 are activated. Parameter **In3** can be altered in the range of 5 – 999. The factory setting is 10 s. During the setting, the LED INT 3 lights up. The value is adopted and saved by pressing the ENT key.

2.12 The number of dedusting cycles with Pulse 3 and Interval 3, Parameter Cy3:

Parameter **Cy3** defines the number of dedusting cycles, if PULSE 3 and INTERVAL 3 are activated by a signal on Terminal 16 (see Item 2.13). Parameter **Cy3** can be altered in the range of 0 – 250 cycles. The factory setting is 0 cycles. During the setting, the LED INT 3 lights up. The value is adopted and saved by pressing the ENT key.

Examples:

Cy3 = 0: The dedusting stops immediately after the signal on Terminal 16 had been removed.

Cy3 = 5: The dedusting goes through another 5 full cycles, e.g. from valve 1 to 12, after the signal on Terminal 16 has been removed.

With this parameter, with a simple and cost-efficient differential pressure switch without hysteresis for example, a differential pressure-dependent dedusting can be realised. After the pressure switch point, e.g. 10 mbar, of the differential pressure switch has been exceeded, it switches on the dedusting via Terminal 16. After dedusting the first filter, the differential pressure switch usually switches back again because the filter differential pressure is already decreasing. Parameter Cy3 now ensures that dedusting is continued, for example, for another 5 full cycles, thus meaning each filter is dedusted another 5 times.

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With this parameter, secondary cleaning can also be realised. The signal can, for example, come from a differential pressure switch, which sensors the deactivated process air, for example, during the shortfall of 2 mbar, and then starts the secondary cleaning via Terminal 15. In this case, set Parameter **F16 = 2** (see Item 2.13).

If secondary cleaning is to be started manually, e.g. by way of a short impulse or using a manual push-button, set Parameter **F16 = 1**.

2.13 Function of Terminal 16 for Pulse 3 and Interval 3, Parameter F16:

Parameter **F16** defines the functionality of Terminal 16. Via Terminal 16, dedusting with PULSE 3 and INTERVAL 3 can be activated with an appropriate signal. Parameter **F16** can be altered in the range of 1 – 2. The factory setting is 1. LED INT 3 lights up during setting. The value is adopted and saved by pressing the ENT key.

Examples:

F16 = 1: Dedusting is started with a **24 VDC permanent signal** or via a **24 VDC impulse >300 ms** at Terminal 16.

Starting with a **24 VDC permanent signal** and the setting of Parameter **Cy3 = 0**:
Dedusting starts when the 24 VDC signal is at Terminal 16 and stops immediately when the signal is removed.

Starting with **24 VDC permanent signal** and the setting of Parameter **Cy3 > 0**:
Dedusting starts when the 24 VDC signal is at Terminal 16. If the signal is removed, dedusting continues for the number of cycles set with Parameter **Cy3** and stops after that.

Starting with **impulse > 300 ms**:
Dedusting starts when the 24 VDC signal is at Terminal 16. If the signal is removed, dedusting continues for the number of cycles set with Parameter **Cy3** and stops after that.

F16 = 2: Dedusting is started via a **24 VDC permanent signal** on Terminal 16.

Only select this setting if secondary cleaning is to be realised. The 24 VDC permanent signal can, for example, come from a differential pressure switch, which sensors the switched off process air, e.g. with a shortfall of 2 mbar, and then starts the secondary cleaning via Terminal 16. In this case, set the secondary cleaning cycles via Parameter **Cy3 > 0** (see Item 2.12).

Starting with a **24 VDC permanent signal** and setting Parameter **Cy3 = 0**:
Dedusting starts when the 24 VDC signal is at Terminal 16 and stops immediately when the signal is removed.

Starting with a **24 VDC permanent signal** and setting Parameter **Cy3 > 0**:
Dedusting starts when the 24 VDC signal is at Terminal 16 and stops when the number of secondary cleaning cycles set with Parameter **Cy3** has come to an end.

2.14 Number of valve outlets, parameter Out:

Parameter **Out** defines how many of the valve outlets assembled in the TRANS-FILTER-SCANNER need to be controlled. Example: Assuming the TRANS-FILTER-SCANNER has 24 built-in valve outlets, but valves are only connected to 20 valve outlets, then Parameter **Out** needs to be set at 20. The factory setting is the same as the number of valve outlets built in to the device. The value is adopted and saved by pressing the ENT key.

2.15 Function of the relay, Parameter rEL:

Parameter **rEL** defines the function of the relay at Terminals 7, 8 and 9.

rEL = 1: The relay reports and alarm (relay has fallen, the opener is closed), if the supply voltage to the control unit has been switched off or if the internal supply voltage is no longer available, e.g. due to a fault in the device (voltage monitoring).

rEL = 2: Function as with **rEL = 1** and additional alarm report with valve defects (relay is not energized, the N.C. contact is closed).

rEL = 3: The relay reports (relay energized, N.O. contact closed) if dedusting is running with Pulse 1 and Interval 1.

rEL = 4: The relay reports (relay energized, N.O. contact closed) if dedusting is running with Pulse 2 and Interval 2.

rEL = 5: The relay reports (relay energized, N.O. contact closed) if dedusting is running with Pulse 1 and Interval 1 or with Pulse 2 and Interval 2.

rEL = 6: The relay reports (relay energized, N.O. contact closed) if dedusting is running with Pulse 3 and Interval 3

rEL = 7: The relay reports (relay energized, N.O. contact closed) if dedusting is running with Pulse 1 and Interval 1 or with Pulse 3 and Interval 3.

rEL = 8: The relay reports (relay energized, N.O. contact closed) if dedusting is running with Pulse 2 and Interval 2 or with Pulse 3 and Interval 3.

rEL = 9: The relay reports (relay energized, N.O. contact closed) if dedusting is running with Pulse 1 and Interval 1 or

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with Pulse 2 and Interval 2 or with Pulse 3 and Interval 3.
 rEL = 10: The relay serves as the control of an expansion unit in expander operation.

Parameter rEL	Voltage monitoring	Valve defect	Pulse 1 Interval 1	Pulse 2 Interval 2	Pulse 3 Interval 3	Expander operation	ALARM relay
1	X						not energized
2	X	X					not energized
3			X				energized
4				X			energized
5			X	X			energized
6					X		energized
7			X		X		energized
8				X	X		energized
9			X	X	X		energized
10						X	energized

Table 1: Function of the relay at Terminals 7, 8 and 9

The factory setting is 1. The value is adopted and saved by pressing the ENT key.

2.16 Deleting the error memory for valve failures, Parameter dEL:

Parameter **dEL** deletes the error memory for expired valve failures. The process of deleting is started by pressing the ENT key and it is shown in %. After successful deletion, the displays shows a short "yES" and the device switches back to the parameter level.

2.17 Password, Parameter PSt:

Parameter **PSt** allows the user to set up a password for access to the parameters or change a previously set password. In order to access Parameter **PSt**, please first enter the current password. If you enter a wrong password, the digital display shows "no" for ca. 2s and the device returns to the list of parameters. If you enter the correct password, the digital display shows "SUC" (successful) for ca. 2s – and then displays the correct password. If no password has been set (factory setting = no password), the password is not requested and the digital display shows "SUC" (successful) for ca. 2s – and then the current password. The password can be changed in the range of 000 – 999. The password is adopted and saved by pressing the ENT key.

If a previously set password is reset at 000, this means that "no password is set".

If you have forgotten your password, please send an e-mail to info@mikro-mess.de and tell us the device number. The device number is an 8-digit number with a barcode and is located on the outside of the device by the label.

2.18 Factory settings, Parameter FAd:

Parameter **FAd** allows the user to reset all parameters to the factory settings. . In order to access Parameter **FAd**, please first enter the current password (factory setting = no password). If you enter a wrong password, the digital display shows "no" for ca. 2s and the device returns to the list of parameters. If you enter the correct password, the digital display shows "SUC" (successful) for ca. 2s. If no password has been set (factory setting = no password), the password is not requested and the digital display shows "SUC" (successful) for ca. 2s. Afterwards, you are asked for security reasons "Do you really want to reset all parameters to the factory settings?" the display shows "y n" for yes/no. After pressing the "PAR" key for "yes", all parameters are reset to the factory settings. This takes ca. 5s and the progress of the process is shown on the digital display in %. Please note: Even the password for access to the parameters is set to the factory settings = no password set and needs to be changed afterwards if necessary.

After pressing the ↑ key for "no", the process is stopped and the device returns back to the list of parameters and digital display shows "FAd" again.

Please note: During the reset to factory settings process, the supply voltage to the device must not be switched off. If the supply voltage to the device is switched off during the rest to factory settings process, the process will be automatically repeated after switching the supply voltage back on and the device will then switch to normal operation.

2.19 Exiting the parameters and return to normal operation:



After pressing the PAR key for ca. 2s, the parameter mode is exited and the device returns to normal operation.

If you do not press a key for ca. 2 minutes, the device automatically returns to normal operation. The digital display shows "tio"

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(timeout) for ca. 2s. If parameters are set and not confirmed by pressing the ENT key, they will not be adopted or saved. The device will then function with the previously set settings.

3. Alarm function:

With every impulse, the device monitors the valve flow and reports an alarm if it is too high, caused for example by a valve short circuit. The alarm is reported by the LED ALA by an error code on the display (see Item 5.2) and, if Parameter **rEL = 2** (see Item 2.15) is set accordingly, also by the alarm relay at Terminals 7, 8 and 9. The alarm is deleted automatically if the valve flow, e.g. by replacing the faulty valve, has returned to normal operation.

4. Expander operation:

In expander operation, more than one TFS-32 devices can be operated after each other (master/slave) to increase the number of valves. This operating mode is selected via Parameter **rEL = 10**, see Item 2.15. At the end of the valve control of the master device, the relay draws on Terminals 7, 8 and 9 and switches the voltage supply of the slave device on. See the Z1516233 connection plan for this purpose.

5. Special information on the digital display:

5.1. In normal operation, the display shows the valve number of the last activated valve.

5.2. In the event of a fault, the display shows alternately "E" and then the number of the valve where the fault occurred.

The display is shown in the sequence "E" > valve number > "E" > valve number > „E" > valve number etc.

6. Declaration of conformity:

CE conformity as defined by the EC Directive Machines 2006/42/EC for parts to be built into machines and EC Directive 2004/108/EC.

Type: **TRANS-FILTER-SCANNER TFS-32***

was developed, designed and manufactured in accordance with the EC Directives 2006/42/EC and 2004/108/EC under the sole responsibility of the company:

MIKRO-MESS-GMBH, Am Südende 15, D-31275 Lehrte.

The following harmonised standards were applied:

DIN EN 60204-1	Electrical equipment for industrial machinery
DIN EN 61010	Safety regulations for electrical MSR technology
DIN EN 61000	Electromagnetic tolerance (EMT)

The following national standards, directives and specifications were applied: BGV A3.

A full technical documentation is available. There are instructions for use available in German for the machine parts to be built in listed under Type. The operation of this machine part is not permitted until it has been ascertained that the equipment the machine part has been built into is in accordance with the provisions of the EC Directive Machines, the harmonised standards, European standards or the corresponding national standards.

Lehrte 01.10.2015 Nils Varchmin

7. Declaration of conformity:

CE conformity as defined by the EC Directive Machines 2006/42/EC for parts to be built into machines and the EC Directives 2004/108/EC and 94/9/EC.

Type: **TRANS-FILTER-SCANNER TFS-32* (für ATEX-Zone 22)**

was developed, designed and manufactured in accordance with the EC Directives 2006/42/EC and 2004/108/EC and 94/9/EC under the sole responsibility of the company :

MIKRO-MESS-GMBH, Am Südende 15, D-31275 Lehrte.

The following harmonised standards were applied:

DIN EN 60204-1	Electrical equipment for industrial machinery
DIN EN 61010	Safety regulations for electrical MSR technology

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DIN EN 61000 Electromagnetic tolerance (EMT)
DIN EN 60079-15 Equipment Dust Explosion Protection by way of a casing "t"

The following national standards, directives and specifications were applied: BGV A3.

A full technical documentation is available. There are instructions for use available in German for the machine parts to be built in listed under Type. The operation of this machine part is not permitted until it has been ascertained that the equipment the machine part has been built into is in accordance with the provisions of the EC Directive Machines, the harmonised standards, European standards or the corresponding national standards.

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