GALVANIC

APPLIED SCIENCES

MANUAL

MoniTurb Turbidity Sensors

MoniTurb-F	**12° Forward Scattered Light**
MoniTurb-S	**90° Side Scattered Light**
MoniTurb-FS	**12° / 90° Forward/Side Scattered Light**

Version 1.8a

June 11, 2019

Galvanic Applied Sciences USA, Inc.
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Content

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Before installation and start-up

Installation guidelines

- The sensor is manufactured according to the customer's application (variable line size, flange type, cleaning jets, gasket material etc.).
- It is recommended to run the calibration of the system before installation of the sensor.
- The location / installation of the sensor should be in a vertical standpipe.
- The process pressure should never exceed the specification of the delivered sensor.
- The process temperature should never exceed the specification of the delivered sensor.
- Avoid air and gas bubbles inside the sensor, they cause disturbances. Air and gas bubbles will cause noise and drift of the measurement signal. (The air bubbles are not expected at pressures upwards of 2 bar in aqueous solutions).
- In case the process temperature should fall under the dew point or rise above 85 °C purge the sensor optic housings with dry instrument air (approx. 10 l/h). Condensed water and excessive temperatures can damage the sensor and cause inaccurate measurements.
- Due to potential noise problems it is recommended not to extend the sensor cables.
- Due to potential noise problems use original Monitek sensor cables only.
- In case the optional cleaning jets are being used, make sure the pressure of the cleaning fluid is at least 50% higher than the process pressure.

Danger:
Exceeding the specified maximum pressure and /or the specified maximum temperature will cause a very high safety risk.

Please read the additional safety instructions before installation and start-up.
Page 5 and page 6 !

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Safety instructions

Pay attention to the following general safety instructions during use and operation of the system. Ignoring these instructions or special warnings inside of this manual can damage the sensor, cause inaccurate measurements, and possibly result in unsafe installations. Galvanic Applied Sciences will not take any responsibility for consequences arising from ignoring the safety instructions and warnings.

Electrical installation
Qualified technical personnel must install the electrical installation of the system.

Hazardous area
DO NOT INSTALL the system in hazardous area without the optional Ex-proof equipment.

Operation of non Ex- proof systems in hazardous area will cause a high risk.
Using the system in hazardous areas (Ex Zone I / Ex Zone II) will only be safe with the installation of the optional special Ex-proof designs including all required certifications.

Maintenance
Always disconnect the instrument from power during maintenance, replacement of components, installation of additional components or any other operations at the open instrument.
Only qualified technical personnel must perform this work.

Operating the instrument with open enclosure
Only qualified technical personnel should operate the instrument when the enclosure is open (e.g. during calibration procedure). Be careful that no moisture enters the enclosure.

Some components inside the instrument are energized with voltages, which can cause lethal shocks in case of contact. Be careful during installation, handling and operation of the instrument.

Improper installation / operation of the system
Warranty is void if the system is installed improperly, handled improperly, used outside of the technical specifications (of the instrument), or damaged by gross negligence.

Storage

Please inspect the instrument immediately after receiving for potential shipping damages.
If the instrument has already been unpacked for inspection or testing, or if the instrument has been removed from the process and it is not to be installed or reinstalled for more than 1 day, the following procedure should be observed:

1. If the instrument has been in service, the wetted portion should be thoroughly cleaned (typically with clean water) and than thoroughly dried.
2. The instrument should be placed in the original packing material.
   In case the original packing material is not available place the instrument in a sealed heavy plastic bag with a desiccant added to assure clean dry storage.
3. The instrument should then be stored in a protected area until time of installation.

Transport damage
Please inspect the instrument immediately after receiving for potential shipping damages.
For any claims to the transportation insurance or warranty repair, it is absolutely required to notify transportation damages immediately after receiving the instrument. In case of obvious damages of the outer packaging, the carrier must give a receipt for this damage to make demands for the insurance.
In case of a delayed announcement the insurance will not pay for damages and Galvanic Applied Sciences will not assume liability for these damages.

Shipment of the instrument
Please clean the instrument carefully before shipment (e.g. for revision / repair). Please use fixed packaging to protect the instrument against any shipping damages.
If at all possible the original packaging should be used.

General

What does turbidity mean?

Turbidity is an “appearance” parameter, which describes the characteristic of a transparent product, to scatter light. Turbidity is a measure of the amount of suspended “particles” in a solution (e.g. water). Turbidity is the optical property that causes light to be scattered and absorbed rather than transmitted in straight lines through the sample. A focused light beam will be attenuated and scattered in hazy products.

What causes turbidity?

Turbidity is caused by “particles” in transparent solutions. A particle is defined as something with a different refractive index as the carrier product. As “particle” concentration increases in a solution, there is greater the light scattering; this results in a greater turbidity measurement. Some examples of “particles” are: minerals, clay, yeast cells, metals, oil drops in water, gas bubbles, aerosols, and milk in water.

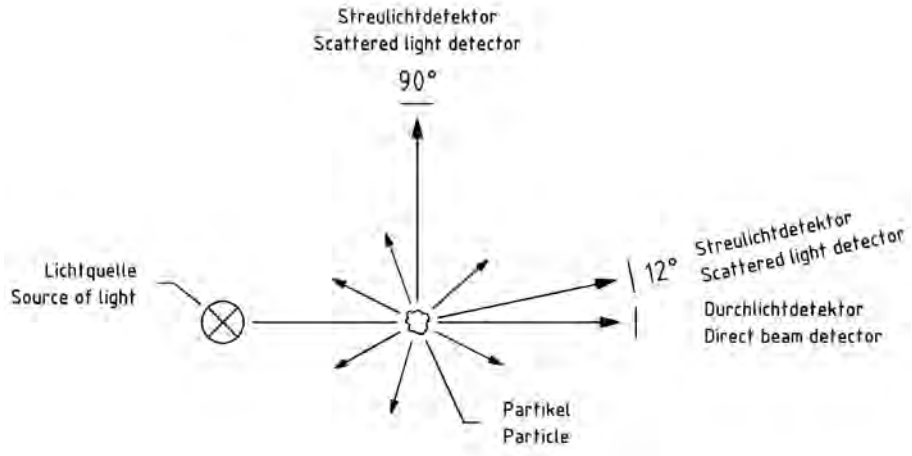
Measurement of turbidity?

Turbidity is not an absolute measurement parameter such as temperature or pressure.
For this reason turbidity measurement systems will typically be calibrated by using a reference suspension standard such as formazin and diatomaceous earth.

Measurement methods

The typical scattered light turbidity measurement methods are:

- Side scattering (90°) The detector is positioned in a right angle (90°) to the light beam.
- Forward scattering (12°) The position of the detector is 12° shifted to the axis of the light. beam



As shown in the figure above, an intense collimated beam of light is projected through a sample contained within the sensor. The intensity of this light beam is measured by the direct beam detector, which is positioned opposite the light source.
A scatter light detector measures the light scattered by the particles in the sample.
Depending on sensor specification, this detector can be located 12° or 90°, displaced from the direct light axis.

The signals caused by scattered and direct light will be amplified, divided and then processed by the electronics. The result displayed is the turbidity value.

$$\frac{\textbf{Scatterd light signal}}{\textbf{Direct light signal}} = \textbf{Turbidity}$$

The particles inside the flowing liquid decrease the intensity of direct light beam while increasing the intensity of the scattered light (i.e. the turbidity rises).
Color decreases the intensity of direct and scattered light in the same ratio, therefore the turbidity value is constant.
Lamp ageing and window coatings are compensated as well by this ratio.

Comparing the different measurement methods

The two different measurement methods (12° forward scattering / 90° side scattering) are not comparable. Even when you use the same calibration standard to calibrate the systems, different samples will have different measurement results.
The deviations of the results are caused by the different particle size distributions within different samples. The measurement methods will respond differently, depending on the current particle distribution of the actual sample.

Important note:
When comparing measurement results. The same methods must be compared to one another. For example, 90 vs. 90, 12 vs. 12. Never 90 vs. 12.

Context between particle size, measurement method and results

The most common Calibration standard for turbidity is based on formazin liquid.
When using formazin as calibration standard, defined formazin suspensions should display identical measurement results with both methods: 12° and 90°.
During observation of a real sample, such as filtered beer, the different methods will have different measurement results. The measurement results of the 90° side scatter method are typically a factor of 3 to 10 times greater than the measurement results of the 12° forward scatter method.
There are typically a lot of small particles left inside the filtered beer, such as proteins, etc. This colloidal turbidity will be overvalued with the 90° method, due to the fact that this method is affected more by the quantity of the particles rather than the particle size. The 12° forward scatter method is affected more by particle size.

90° method: small particles and large particles will cause comparable scatter light intensities.
12° method: small particles / low scatter light intensity, large particles / high scatter light intensity.

At a particle size of approx. 0.3 µm (formazin) both methods will have approximately equal scatter light intensities.
The combination of both measurement results informs about the tendency of the particle size distribution.
Measurement value 90°, greater than the measurement value 12°, average particle size smaller as 0.3 µm
Measurement value 90°, less than the measurement value 12°, average particle size larger as 0.3 µm

Particle size	Result 90° scatter light	Result 12° scatter
Larger 0.3 µm	Lower value	Higher value
Smaller 0.3 µm	Higher value	Lower value

Example filtration control:
90° side scatter:
Small particles (e.g. proteins, colloids, etc.) within the filtered beer will be monitored perfectly by the using the 90° instrument. Using 90° scatter technology, there will be a delay in detecting a filter breakthrough, since there will be small number of large particles within the filtrate during the initial stages of filter breakthrough. The total amount of particles will be raised slightly; therefore the measurement value will be raised slightly as well.

12° forward scatter:
Small particles (e.g. proteins, colloids, etc.) within the filtered beer can be monitored well by the using the 12° instrument. The beginning of a filter breakthrough will be monitored immediately due to the large particles (e.g. DE, yeast cells, etc.) within the filtrate. The few large particles will be monitored immediately and the measurement value will rise sharply. This is also a mass related measurement principle, which will allow calibration in mg/l if necessary.

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Typical Measurement units

ppm:	**P**arts **p**er **m**illion	FNU[1]:	**F**ormazin **n**ephelometric **u**nit
FTU:	**F**ormazin **T**urbidity **U**nit	mg/l:	Milligram per liter
TEF:	**T**rübungs**e**inheiten **F**ormazin (German for FTU)	gr/l:	Gram per liter
EBC:	**E**uropean **b**rewery **c**onvention	% TS:	Percent total solids
NTU[1]:	**N**ephelometric **t**urbidity **u**nit		

The dependencies on the different measurement units

1 FTU = 1 TEF = 1 NTU[1] = 1 FNU[1] = 0,25 EBC

[1] Nephelometry describes the method of side scatter turbidity measurement; these units are used at 90° side scatter turbidimeters only.

Based on correlation studies, using a 12° forward measurement system we have found the following dependencies:

1 FTU = 1 TEF = 0.25 EBC = 2.25ppm = 2.05 mg/l = 0.00205 g/l = 0.00000205 % TS

* At a specific particle weight of 1 kg/dm, 1mg/l particles in 1 kg of water will correspond to 1 ppm.

Typical ranges

The original design of scatter light turbidimeters was used for the detection of low turbidities. The resolution of these kinds of instruments is suited easily in ranges lower as 0.1 ppm (approx. 0.05 TEF / FTU / FNU / NTU or approx. 0.01 EBC) and better. The maximum range is 200 ppm (500 ppm for some applications; there are some systems available with a range of more than 8000 ppm.

Which measurement method to use

The 12° forward scatter method:

The forward scatter method is typically used at low turbidities and produces nearly mass related measurement results. Main applications are quality control, filtration control, oil in water, etc.

The 90° side scatter method:

The side scatter method is also used at low turbidities. This principle of measurement will produce measurement results related to the number of particles in the product.

The main application is the observation of small, well-distributed particles e.g. beyond a filter. The second typical application is the monitoring of potable water as well as wastewater according ISO7027 or according to the US- FDA requirements.

The measurement results of a 90° scatter light system has to be interpreted carefully, since turbidity caused by many large particles can show a similar measurement result as a turbidity caused by the same quantity of small particles.

The combined 12°/ 90° forward- / side- scatter method:

The 12° measurement method has greater sensitivity with large particles. The 90° measurement method has greater sensitivity with small particles. The most common application for the combined systems is filtration control. A filter break through is recognized early, with the 12° forward scattered instrument. A small quantity of big particles inside the filtrate will raise the 12° measurement value significant.

The 90° side scattered method exhibits only a small increase of the turbidity measurement values when some large particles pass the filter. Detection of a filter breakthrough would be delayed, since the number of particles will not increase significantly when the filter starts to break.

Please note:

The combination of forward- and side- scatter turbidity measurement does not replace a particle size analysis, but it can provide a tendency of the particle size distribution.

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Maintenance

Replacement of measurement lamp

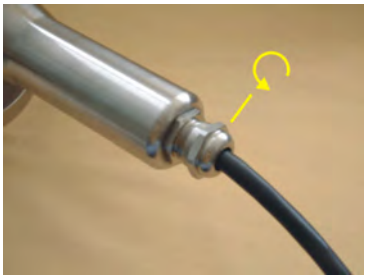
Introduction

Ignoring of the following hints will cause a loss of warranty

- Qualified technical personnel must perform repair and maintenance.
- Before beginning any work the sensor must be cleaned and flushed thoroughly. Depending on customers' application product residues can be very dangerous (aggressive, poisonous). Please handle the system very careful due to possible leakage etc.
- Avoid pulling and twisting of the lamp cable.
- Avoid applying excessive force during assembling and disassembling of the sensor.
- Screw in all bolts and cable glands stalwart only.
- Please work carefully during the replacement of the measurement lamp.
- The lamp replacement should be done in a dry and clean location, to protect the optical components from dirt.
- Please be sure that no dust or other particles penetrates into the optical assembly.
- Do not touch the lenses.
- In case of dirty component please clean carefully by using fresh water and a cloth (lint-free), dry all components by using instrument air.
- Use suitable tools only.

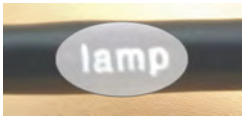
Required tools:

- Special Monitek lamp spanner wrench
- 2 x open end wrench - 22 mm
- Flat blade screwdriver - 2 mm
- Phillips screwdriver – medium size
- Hexagonal spanner – 1.5 mm
- Hexagonal spanner – 2.5 mm
- Needle nose pliers – small
- Small bowl to drop components



Picture 1

The lamp cable is marked with "lamp"



1. Please loose the upper hexagonal nut of the cable gland by using a 22 mm open-end wrench. Use the second 22 mm open-end wrench to hold the lower hexagonal nut of the cable gland in position.
   This will assure that you do not twist the lamp cable.

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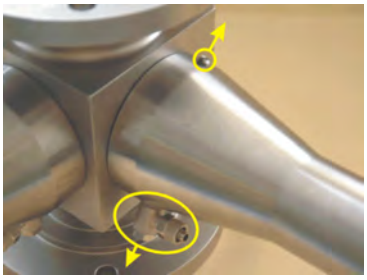
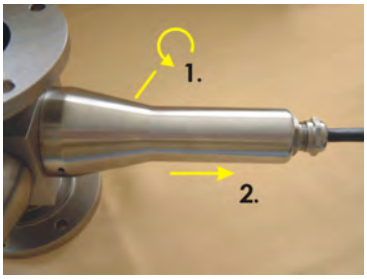
2. Remove Allen screws and / or air purge connectors.

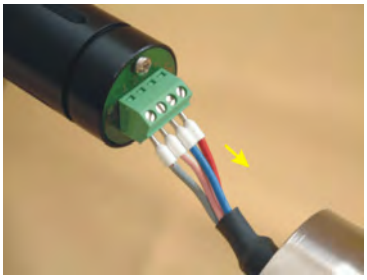


Picture 2



Picture 3

3. Screw off lamp arm.
4. Shift the lamp arm until you have access to the electrical/cable connections.

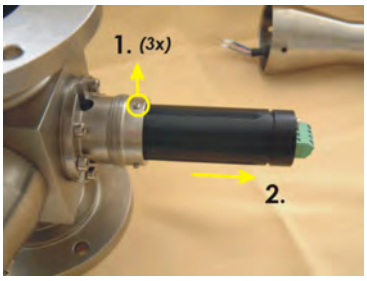


Picture 4

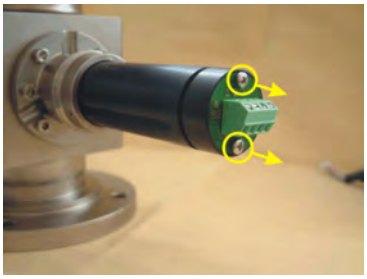
5. Loosen all wires of the lamp cable by using the 2 mm flat blade screwdriver.
   Remove lamp arm and cable carefully.

6. Loosen Allen screws (3x) by using the 1.5 mm hexagonal spanner.
7. Remove lamp assembly carefully.

Important: See Pictures 3, 4 and 5. We recommend removing the lamp assembly and performing the lamp replacement procedure in a dry and clean location.



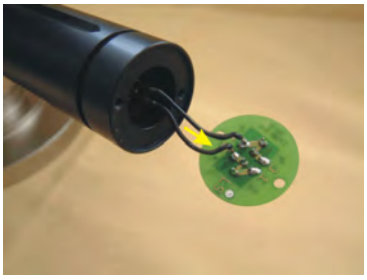
Picture 5



Picture 6

8. Remove screws by using the medium size Phillips screwdriver.

9. Carefully remove the printed circuit board including cable and socket from the measurement lamp.



Picture 7

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Picture 8

10. Remove screw joint carefully by using the special Monitek lamp spanner wrench..

11. Pull out the measurement lamp carefully by using the small needle nose pliers.

Important: Avoid extreme force in pulling out the lamp.

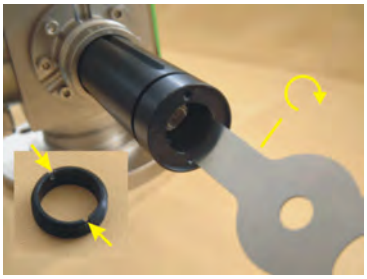
Picture 9

Picture 10

12. Adjust the pins of the new lamp before installation of the new measurement lamp by using the lamp socket. This will allow an easy final assembly of the components

13. Remove plug from the measurement lamp and push the lamp into the barrel.

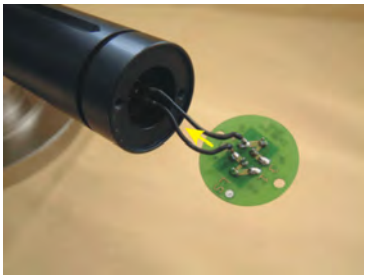
Picture 11



Picture 12

14. Screw in the screw joint and tighten it by using special Monitek lamp spanner wrench.

15. Push the plug carefully onto the contact pins of the lamp.



Picture 13

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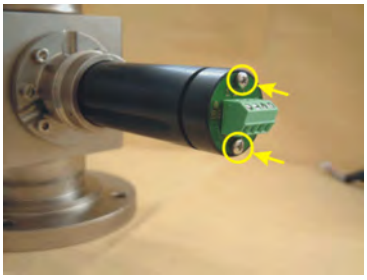
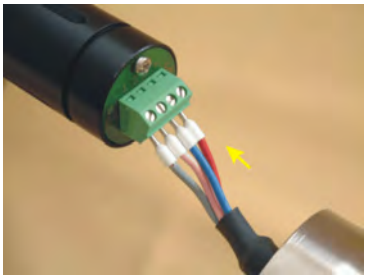


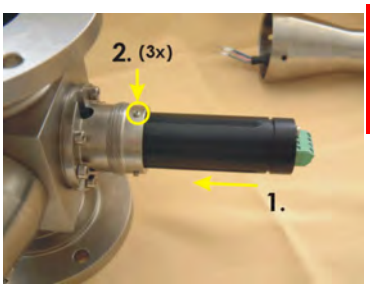
Picture 14

16. Put the printed circuit board to the barrel and screw on by using the medium sized Phillips screwdriver.

17. Reconnect the wires of the lamp cable and perform a lamp test.



Picture 15

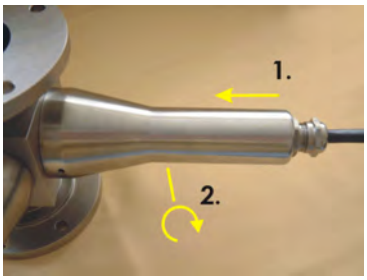


Picture 16

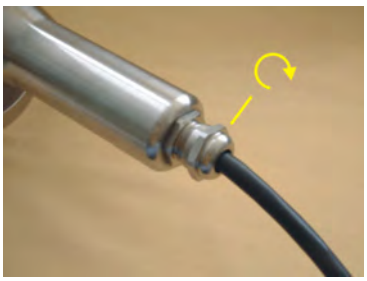
Important: Please pay attention to the position of the optical assembly. The three grooves on the outside of the barrel must be in line with the three Allen screws.

18. Push the optical assembly into the holder.
19. Tighten Allen screws (3x)

20. Push lamp arm to the thread.
21. Tighten lamp arm.



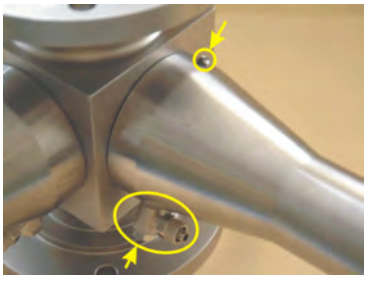
Picture 17



Picture 18

22. Tighten cable gland

23. Screw in Allen screws and / or air purge connectors
24. Functional test and eventual calibration.



Picture 19

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Replacement of gaskets

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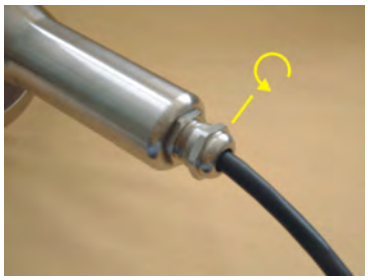
- Before beginning any work the sensor must be cleaned and flushed thoroughly. Depending on customers' application product residues can be very dangerous (aggressive, poisonous). Please handle the system very carefully due to possible leakage etc.
- Avoid pulling and twisting of the lamp cable.
- Avoid applying excessive force during assembling and disassembling of the sensor.
- Screw in all bolts and cable glands stalwart only.
- Please work carefully during the replacement of the measurement gaskets.
- The lamp replacement should be done in a dry and clean location, to protect the optical components from dirt.
- Please be sure that no dust or other particles penetrates into the optical assembly.
- Do not touch the lenses.
- In case of any dirty component please clean carefully by using fresh water and a cloth (lint-free), dry all components by using instrument air.
- Use suitable tools only.

Required tools:

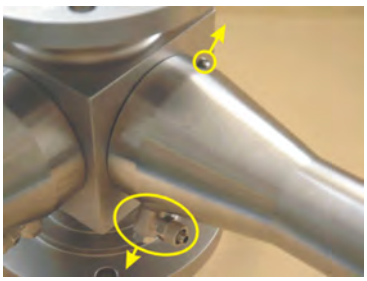
- 2 x open end wrench - 22 mm
- Flat blade screwdriver - 2 mm
- Hexagonal spanner – 1.5 mm
- Hexagonal spanner – 2.5 mm
- Hexagonal spanner – 3.0 mm
- Small bowl to drop components



Picture 1

1. Please loose the upper hexagonal nut of the cable gland by using a 22 mm open-end wrench. Use the second 22 mm open-end wrench to hold the lower hexagonal nut of the cable gland in position. This will assure that you do not twist the lamp cable.

2. Remove Allen screws and / or air purge connectors.



Picture 2

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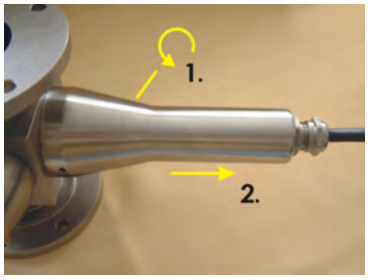
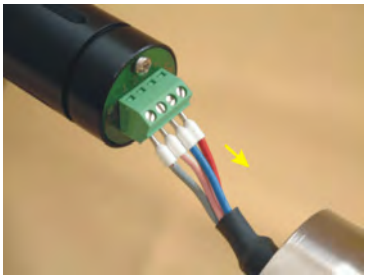
Picture 3



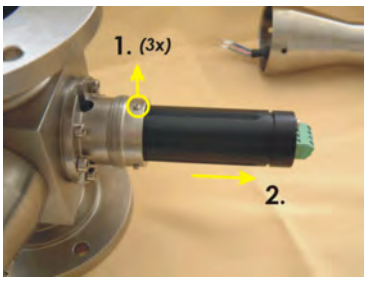
3. Screw off lamp / detector arm.
4. Shift the lamp / detector arm until you have access to the electrical/cable connections.



Picture 4

5. Loosen all wires of the lamp cable by using the 2 mm flat blade screwdriver.
6. Remove lamp arm and cable carefully.

Picture 5



7. Loosen Allen screws (3x) by using the 1,5 mm hexagonal spanner.
8. Remove lamp assembly carefully.

Picture 6

9. Loosen Allen screws (6pc. M4 x 16 [DIN 912]) by using the 3 mm hexagonal spanner.

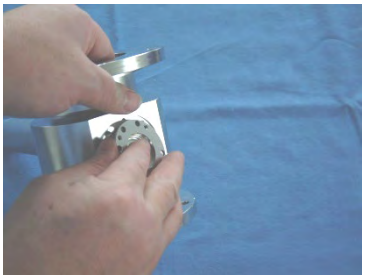
Picture 7

10. Carefully remove sapphire window out of the window holder.

Important note:
If the window sticks in the holder, remove the holder first (Step No. 11) after that carefully push the window out of it's sealing.

11. Remove the window holder carefully out of the flow cell.

Important note:
If the holder sticks inside the flow cell, please use the mounting screws to push the holder out of its sealing. Please make sure that the holder does not tilt during this procedure.
Do not apply excessive force during this procedure; be careful not to damage the sealing surfaces for the holder or flow cell.



Picture 8

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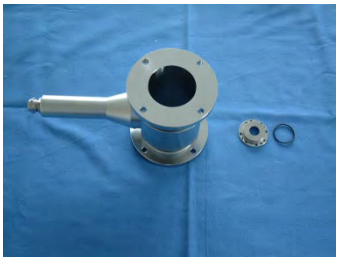
Picture 9



12. Replace the outer O- ring of the holder.

13. Insert the window holder including the new O- ring into the flow cell.
14. Adjust the holder so that the mounting holes of the plate match the mounting threads of the flow cell.

    Important note:
    Please clean the sealing surfaces carefully before reassembling the unit. If necessary use lubrication grease to guarantee proper sealing.
    Do not damage or sheer the O- rings.

Picture 10

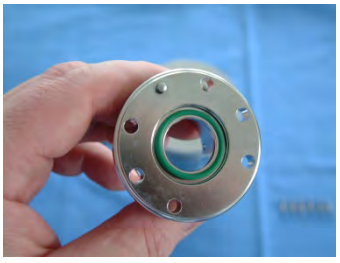
Picture 11

15. Put the new O- ring into the groove of the window holder.

16. Put the window into the holder.

Picture 12

Picture 13



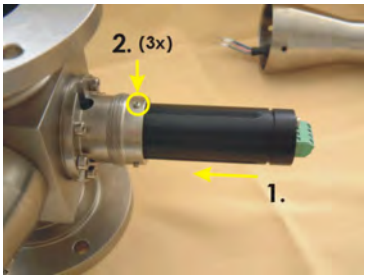
17. Put a new O- ring into the optic holder.

    Important note:
    This O- ring does not have a sealing function; it protects the window against damages.

18. Put the optic holder over the window and screw it by using the mounting screws.

Important note:
Please make sure that the O- rings stay inside their grooves during this procedure. We strictly recommend a 30-minute pressure test under process conditions (without the optical components) to guarantee proper sealing. This procedure will avoid possible damages in case of leakage.

Picture 14

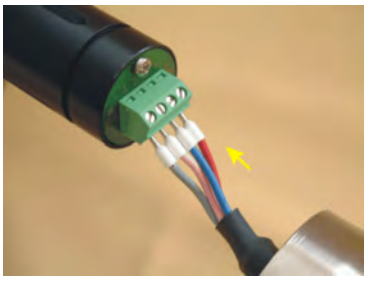


Picture 15

19. Push the optical assembly into the holder.
20. Tighten Allen screws (3x)

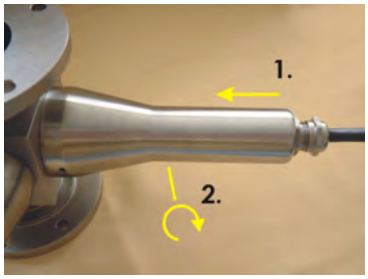
Important note:

Please pay attention to the position of the optical assembly. The three grooves on the outside of the barrel must be in line with the three Allen screws.



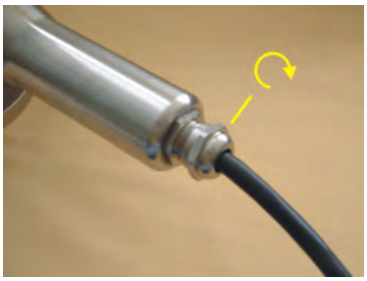
Picture 16

21. Reconnect the wires of lamp / detector cable and perform a lamp test.



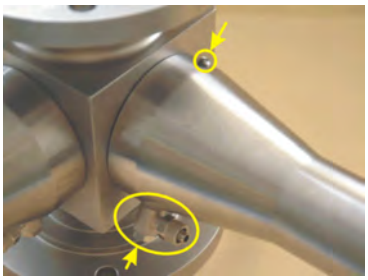
Picture 17

22. Push lamp / detector arm to the thread.
23. Tighten lamp / detector arm



Picture 18

24. Tighten cable gland



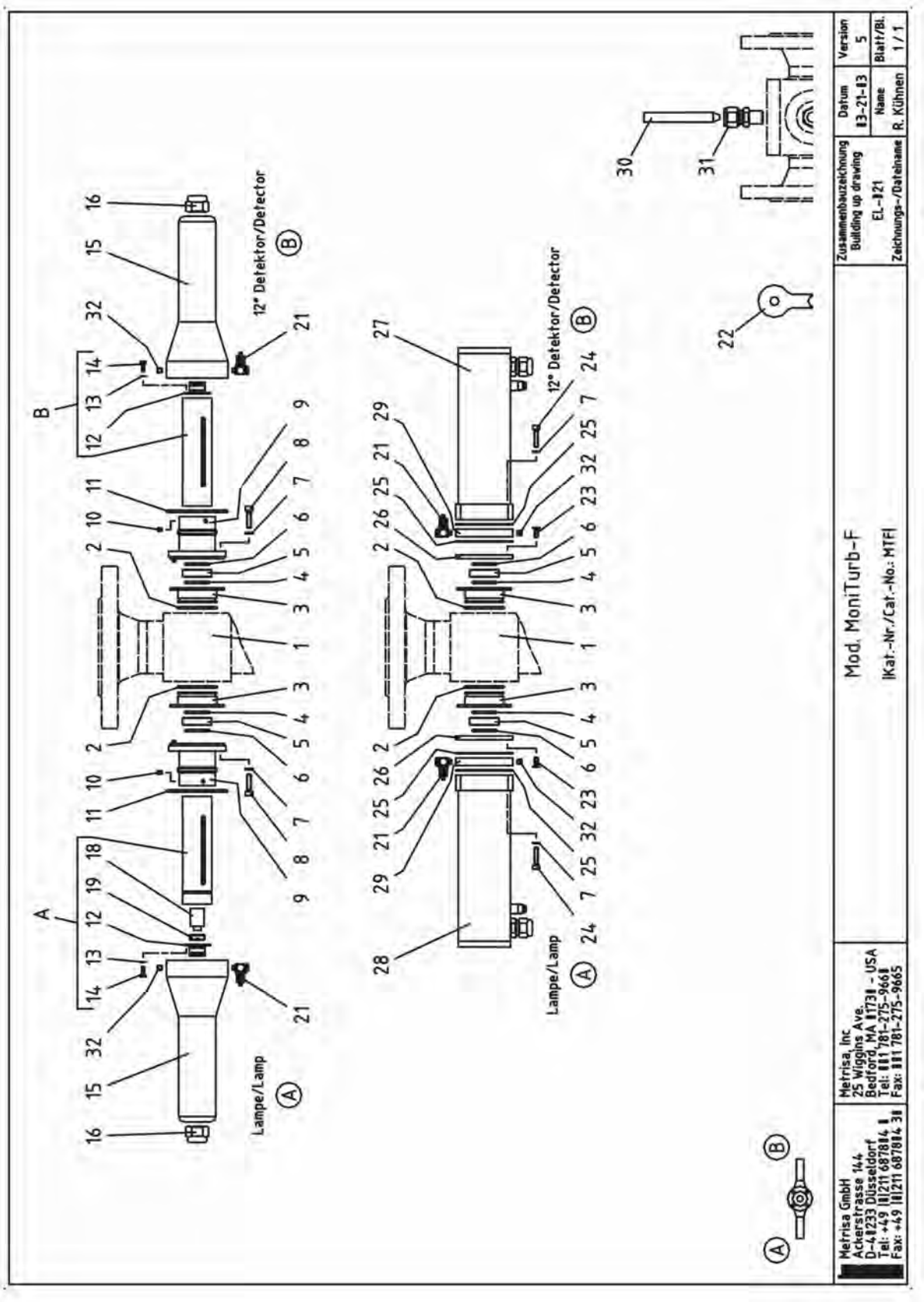
Picture 19

25. Screw in Allen screws and / or air purge connectors
26. Functional test and eventual calibration.

Replacement interval

The interval to replace the gaskets depends on the specific application.
The replacement cycle depends on process pressure, process temperature, sealing material and product characteristics. In worst case (high temperature, high pressure, aggressive medium) the gaskets must be replaced every month. Under normal conditions the gaskets should be replaced every year. The maximum lifetime in easy applications can go up to 2 years.
We strictly recommend that the customer establishes a maintenance interval based on local conditions. If you have any questions or if you require more information contact Metrisa.

Components model MoniTurb- F (12° scattered light)



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Spare part list model MoniTurb- F (12° scattered light)

Pos. Item	Bezeichnung Description	Anz./Sys. Qty./Sys.	Teile Nr. Part No.
1	**Durchflußarmatur / Body**	1	
2	**Adapterdichtung / Adaptor seal**		
	• O-Ring / O-ring - [Viton, DIN3771 - 33 x 2]	2	C208-3007-F01
	• O-Ring / O-ring - [EPDM, DIN3771 - 33 x 2]	2	C208-3007-F00
	• O-Ring / O-ring - [Kalrez, DIN3771 - 33 x 2]	2	C208-3007-F02
3	**Fenstereinsatz / Window, Adaptor**	2	2001-0925-01-1
4	**Innere Fensterdichtung / Inner window seal**		
	• O-Ring / O-ring - [Viton, DIN3771 - 20 x 2]	2	C208-3006-F01
	• O-Ring / O-ring - [EPDM, DIN3771 - 20 x 2]	2	C208-3006-F00
	• O-Ring / O-ring - [Kalrez, DIN3771 - 20 x 2]	2	C208-3006-F02
5	**Messfenster, flach (Saphir) / Measuring window, flat (Sapphire)**	2	2001-1221-01
6	**Äußere Fensterdichtung / Back-up window seal**		
	• O-Ring / O-ring - [Viton, DIN3771 - 20 x 2]	2	C208-3006-F01
7	**Federring / Split washer [DIN128-B4]**	12 / 8	C104-1002-00
8	**Zylinderschr. m. Innensechsk. / Screw, hex, socket head - [DIN912-M4x14]**	12	C100-1011-00
9	**Lampen- und Optikhalterung / Lamp and optic holder**		
	• mit Luftspülung / with Air Purge	2	2001-0911-19-1
	• ohne Luftspülung / without Air Purge	2	2001-0911-19-2
10	**Gewindestift m. Innensechskant / Screw, hex, headless - [DIN 913-M3x3]**	6	C100-1001-00
11	**Messarmdichtung / Housing seal**		
	• O-Ring / O-ring - [Viton, DIN3771-50 x 2]	2	C208-3009-01
	• O-Ring / O-ring - [EPDM, DIN3771-50 x 2]	2	C208-3009-00
12	**Kabelanschluss mit Grundplatte / Connector, cable, with base plate**		
	• Detektor / Detector	1	2001-1301-01
	• Lampe / Lamp	1	2001-1302-01
13	**Federring / Washer, coil spring - [DIN128-B2,5]**	4	C104-1002-00
14	**Linsenkopfschr. m. Kreuzs. / Cross recessed raised pan head screw - [DIN7985-M2,5x7]**	4	C100-1009-00
15	**Messarmgehäuse (Standard) / Housing, Arm (Standard)**	2	2001-1004-01
16	**PG-Verschraubung VA / Strain relief, cable**	2	C305-1003-00

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18	**Messlampe / Measuring lamp**	**1**	**C402-1001-00**
19	**Verschraubung für Messlampe / Ring, screw head #2**	**1**	**2001-1026-03**
21	**Luftanschluß / Connector, air purge**	**2**	**C306-1000-10**
22	**Spezialwerkzeug (Messlampe) / Special tool (measuring lamp)**	**1**	**2001-1030-03**
23	**Senkschraube m. Kreuzs. / Cross recess countersunk (flat) - [DIN965-M4x10]**	**12**	
24	**Zylinderschrauben m. Innensechskant / Hexagon socked head cap screw**		
	• ohne Luftspülung / without air purge - [DIN912-M4x21]	**8**	
	• bei vorhandener Luftspülung / with existing air purge - [DIN912-M4x30]	**8**	
25	**Flachdichtung / Gasket, flat**	**2 / 4**	**2001-1017-01**
26	**Adapterplatte für Gehäuse (Ex) / Adjustment for enclosure (Ex)**	**2**	**2001-1009-01**
27	**12° Detektorgehäuse mit Optik (Ex) / Detector enclosure, 12 deg., with optic (Ex)**	**1**	
28	**Lampengehäuse mit Optik (Ex) / Lamp enclosure with optic (Ex)**	**1**	
29	**Platte für Luftanschluß / Plate for air purge (inkl./incl. Pos. 21)**	**2**	**2001-1018-01**
30	**Reinigungsdüse / Cleaning jet**		
	• lange Version / Long version [120 mm]	**1**	**2001-1033-00**
	• kurze Version / short version [80 mm]	**1**	**2001-1035-00**
31	**Verschraubung Reinigungsdüse / Connector, cleaning jet**		
	• 1/4" NPT-Gewinde / 1/4" MNPT-Thread	**1**	**2001-1000-01**
	• 1/4" ISO-Außengewinde, konisch / 1/4" Male ISO Tapered Thread	**1**	**2001-1000-02**
32	**Gewindestift m. Innensechskant / Screw, hex, headless - [DIN 913-M5x5]**		
	• ohne Luftspülung = ohne Loch / without air purge = without borehole	**2**	
	• bei vorhandener Luftspülung = mit Loch / with existing air purge = with borehole	**2**	
A	**Baugruppe Messlampe / Kit, lamp assembly (inkl./incl. Pos. 12, 13, 14, 18, 19)**	**1**	
B	**Baugr. Detektor / Kit, 12 deg. detector assembly (inkl./incl. Pos. 12, 13, 14)**	**1**	
	Lampenkabel / Cable, lamp	**1 m**	**C604-1002-00**
	Detektorkabel / Cable, detector	**1 m**	**C604-1001-00**

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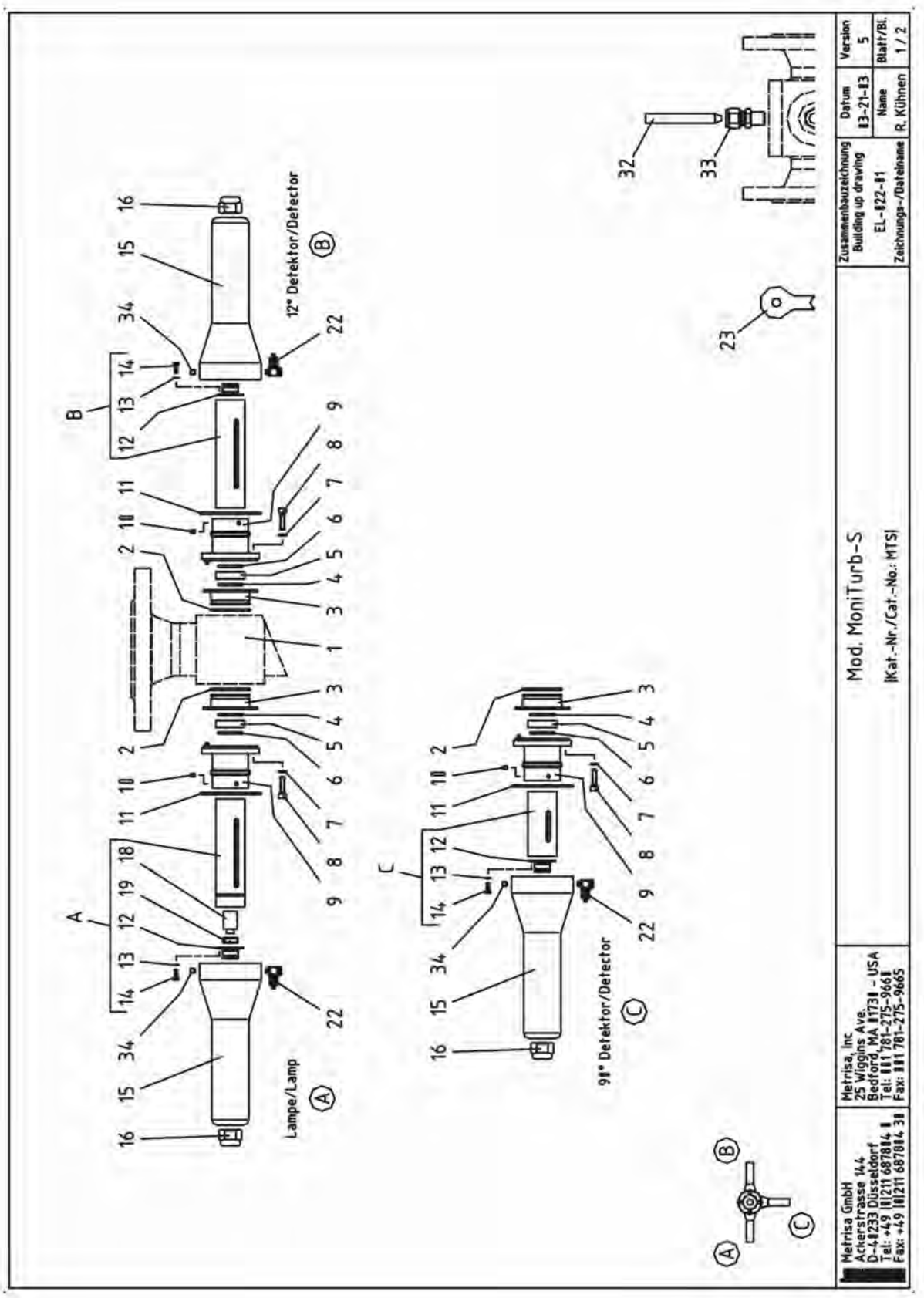
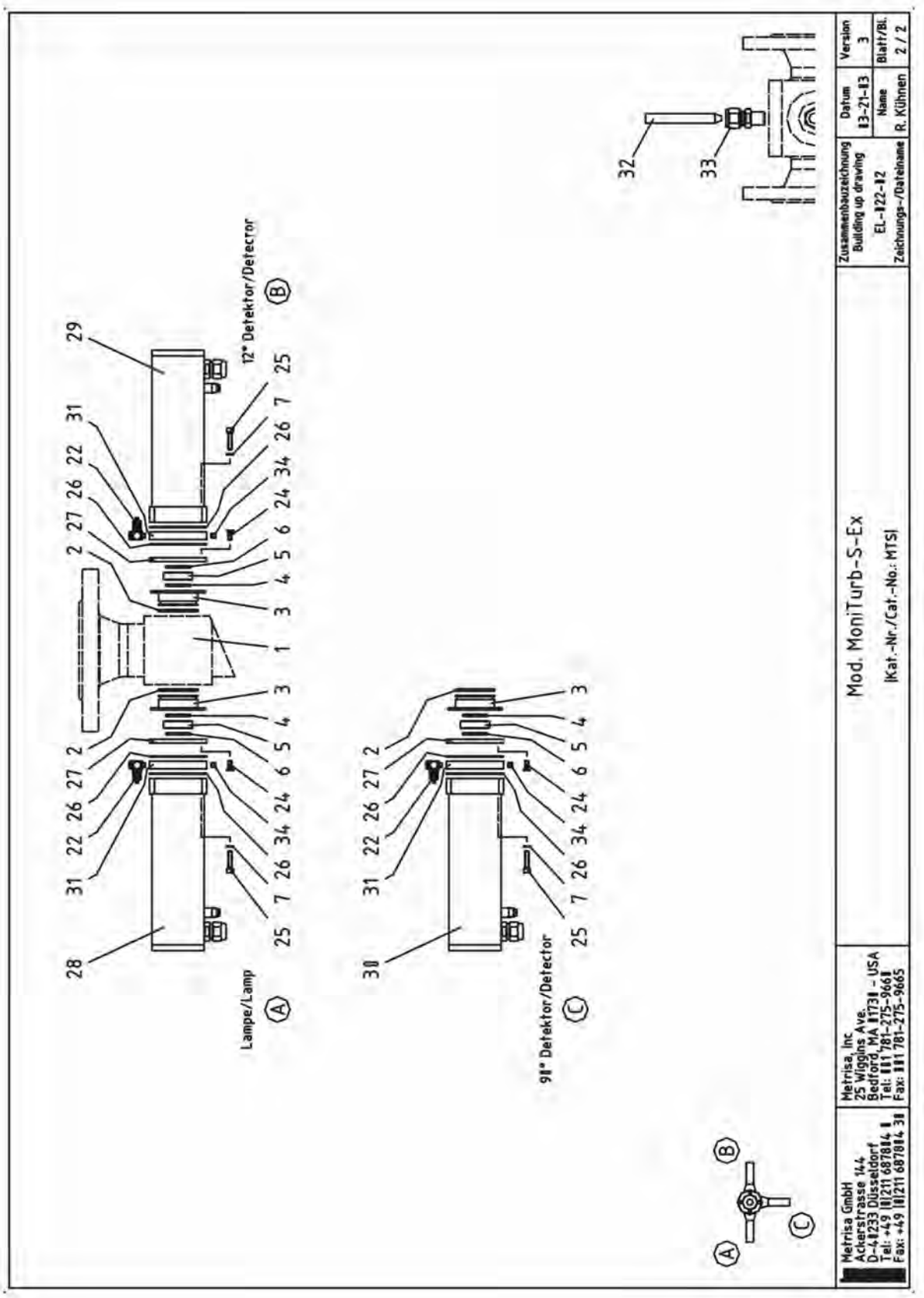
Components model MoniTurb- S (90° scattered light)



Components model MoniTurb- S (90° scattered light) Ex- version



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Spare part list model MoniTurb- S (90° scattered light)

Pos. Item	Bezeichnung Description	Anz./Sys. Qty./Sys.	Teile Nr. Part No.
1	**Durchflußarmatur / Body**	1	
2	**Adapterdichtung / Adaptor seal**		
	• O-Ring / O-ring - [Viton, DIN3771 - 33 x 2]	3	C208-3007-F01
	• O-Ring / O-ring - [EPDM, DIN3771 - 33 x 2]	3	C208-3007-F00
	• O-Ring / O-ring - [Kalrez, DIN3771 - 33 x 2]	3	C208-3007-F02
3	**Fenstereinsatz / Window, Adaptor**	3	2001-0925-01-1
4	**Innere Fensterdichtung / Inner window seal**		
	• O-Ring / O-ring - [Viton, DIN3771 - 20 x 2]	3	C208-3006-F01
	• O-Ring / O-ring - [EPDM, DIN3771 - 20 x 2]	3	C208-3006-F00
	• O-Ring / O-ring - [Kalrez, DIN3771 - 20 x 2]	3	C208-3006-F02
5	**Messfenster, flach (Saphir) / Measuring window, flat (Sapphire)**	3	2001-1221-01
6	**Äußere Fensterdichtung / Back-up window seal**		
	• O-Ring / O-ring - [Viton, DIN3771 - 20 x 2]	3	C208-3006-F01
7	**Federring / Split washer [DIN128-B4]**	18	C104-1002-00
8	**Zylinderschr. m. Innensechsk. / Screw, hex, socket head - [DIN912-M4x14]**	18	C100-1011-00
9	**Lampen- und Optikhalterung / Lamp and optic holder**		
	• mit Luftspülung / with Air Purge	3	2001-0911-19-1
	• ohne Luftspülung / without Air Purge	3	2001-0911-19-2
10	**Gewindestift m. Innensechskant / Screw, hex, headless - [DIN 913-M3x3]**	9	C100-1001-00
11	**Messarmdichtung / Housing seal**		
	• O-Ring / O-ring - [Viton, DIN3771-50 x 2]	3	C208-3009-01
	• O-Ring / O-ring - [EPDM, DIN3771-50 x 2]	3	C208-3009-00
12	**Kabelanschluss mit Grundplatte / Connector, cable, with base plate**		
	• Detektor / Detector	2	2001-1301-01
	• Lampe / Lamp	1	2001-1302-01
13	**Federring / Washer, coil spring - [DIN128-B2,5]**	6	C104-1002-00
14	**Linsenkopfschr. m. Kreuzs. / Cross recessed raised pan head screw - [DIN7985-M2,5x7]**	6	C100-1009-00
15	**Messarmgehäuse (Standard) / Housing, Arm (Standard)**	3	2001-1004-01
16	**PG-Verschraubung VA / Strain relief, cable**	3	C305-1003-00
18	**Messlampe / Measuring lamp**	1	C402-1001-00
19	**Verschraubung für Messlampe / Ring, screw head #2**	1	2001-1026-03

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22	**Luftanschluß / Connector, air purge**	**3**	**C306-1000-10**
23	**Spezialwerkzeug (Messlampe) / Special tool (measuring lamp)**		**2001-1030-03**
24	**Senkschraube m. Kreuzs. / Cross recess countersunk (flat) - [DIN965-M4x10]**	**18**	
25	**Zylinderschrauben m. Innensechskant / Hexagon socked head cap screw**		
	• ohne Luftspülung / without air purge - [DIN912-M4x21]	**12**	
	• bei vorhandener Luftspülung / with existing air purge - [DIN912-M4x30]	**12**	
26	**Flachdichtung / Gasket, flat**	**6**	**2001-1017-01**
27	**Adapterplatte für Gehäuse (Ex) / Adjustment for enclosure (Ex)**	**3**	**2001-1009-01**
28	**Lampengehäuse mit Optik (Ex) / Lamp enclosure with optic (Ex)**	**1**	
29	**12° Detektorgehäuse mit Optik (Ex) / Detector enclosure, 12 deg., with optic (Ex)**	**1**	
30	**90° Detektorgehäuse mit Optik (Ex) / Detector enclosure, 90 deg., with optic (Ex)**	**1**	
31	**Platte für Luftanschluß / Plate for air purge**	**3**	**2001-1018-01**
32	**Reinigungsdüse / Cleaning jet**		
	• lange Version / Long version [120 mm]	**1**	**2001-1032-00**
	• kurze Version / short version [80 mm]	**1**	**2001-1034-00**
33	**Verschraubung Reinigungsdüse / Connector, cleaning jet**		
	• 1/4" NPT-Gewinde / 1/4" MNPT-Thread	**1**	**2001-1000-01**
	• 1/4" ISO-Außengewinde, konisch / 1/4" Male ISO Tapered Thread	**1**	**2001-1000-02**
34	**Gewindestift m. Innensechskant / Screw, hex, headless - [DIN 913-M5x5]**		
	• ohne Luftspülung = ohne Loch / without air purge = without borehole	**2**	
	• bei vorhandener Luftspülung = mit Loch / with existing air purge = with borehole	**2**	
A	**Baugruppe Messlampe / Kit, lamp assembly (inkl./incl. Pos. 12, 13, 14, 18, 19)**	**1**	
B	**Baugr. 12° Detektor / Kit, 12 deg. detector assembly (inkl./incl. Pos. 12, 13, 14)**	**1**	
C	**Baugruppe 90° Detektor / Kit, 90 deg. detector assembly (inkl./incl. Pos. 12, 13, 14)**	**1**	
	Lampenkabel / Cable, lamp	**1 m**	**C604-1002-00**
	Detektorkabel / Cable, detector	**1 m**	**C604-1001-00**

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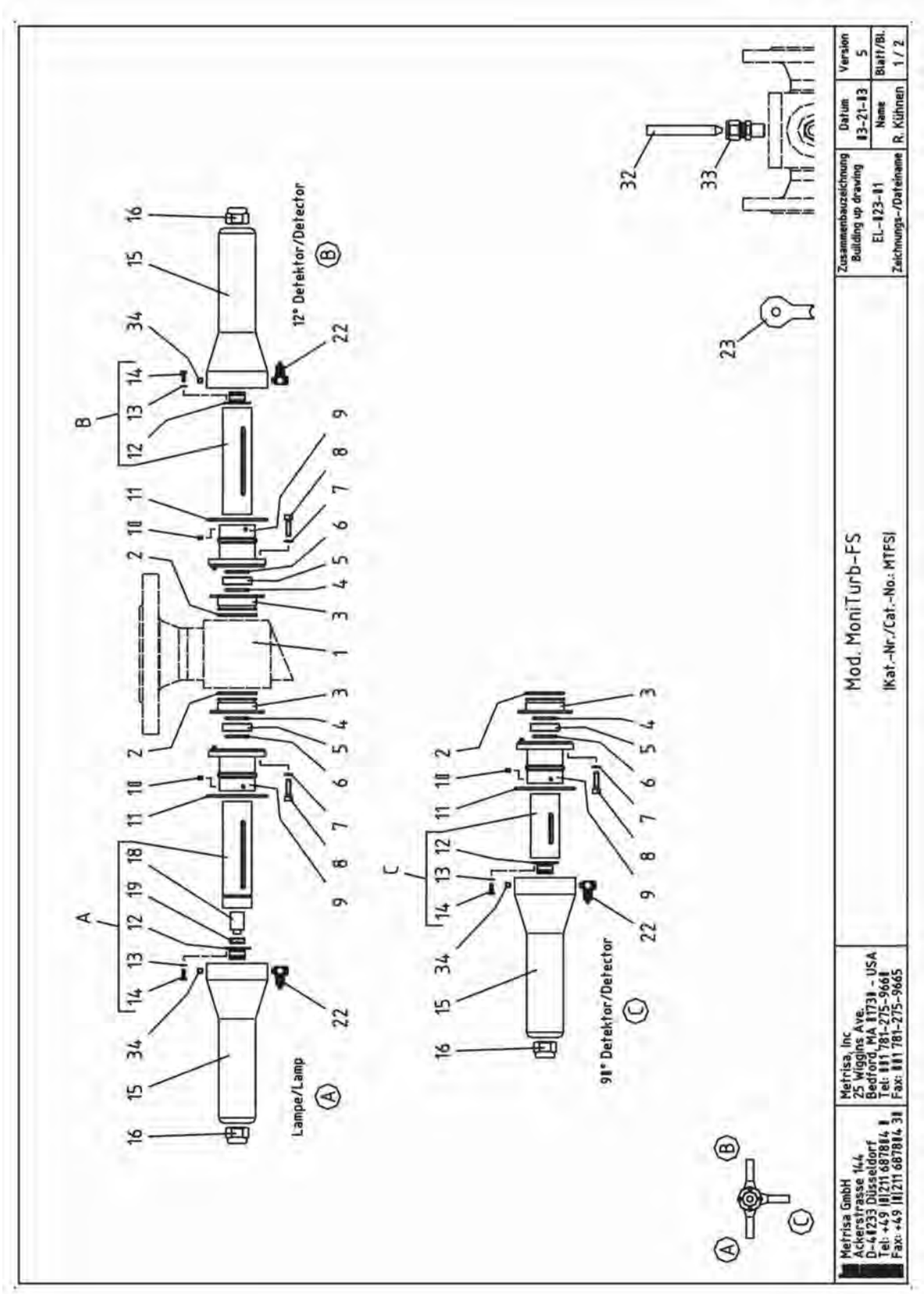
Components model MoniTurb- FS (12° / 90° scattered light)



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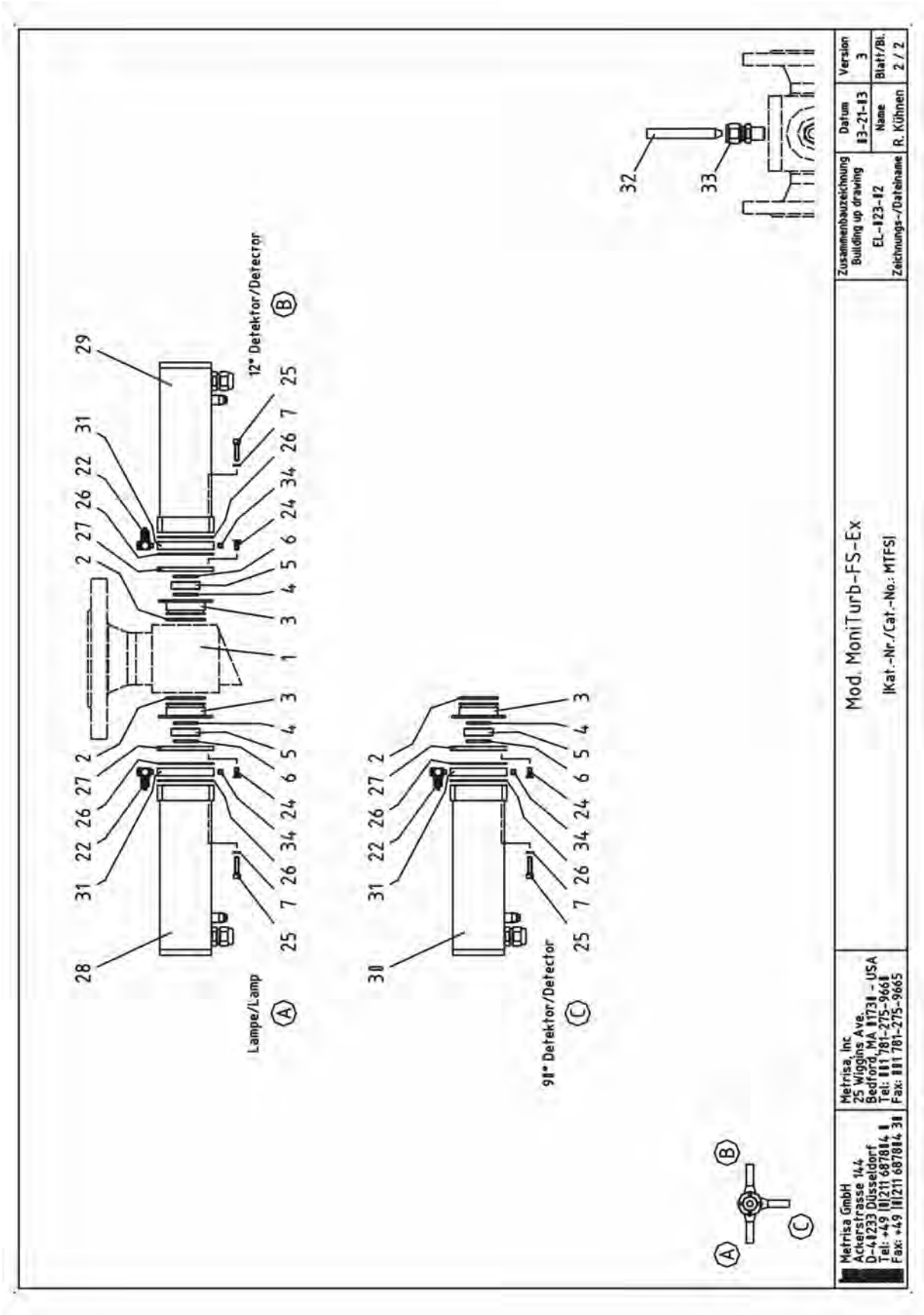
Components model MoniTurb- FS (12° / 90° scattered light) Ex- version



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Spare part list model MoniTurb- FS (12° / 90° scattered light)

Pos. Item	Bezeichnung Description	Anz./Sys. Qty./Sys.	Teile Nr. Part No.
1	**Durchflußarmatur / Body**	1	
2	**Adapterdichtung / Adaptor seal**		
	• O-Ring / O-ring - [Viton, DIN3771 - 33 x 2]	3	C208-3007-F01
	• O-Ring / O-ring - [EPDM, DIN3771 - 33 x 2]	3	C208-3007-F00
	• O-Ring / O-ring - [Kalrez, DIN3771 - 33 x 2]	3	C208-3007-F02
3	**Fenstereinsatz / Window, Adaptor**	3	2001-0925-01-1
4	**Innere Fensterdichtung / Inner window seal**		
	• O-Ring / O-ring - [Viton, DIN3771 - 20 x 2]	3	C208-3006-F01
	• O-Ring / O-ring - [EPDM, DIN3771 - 20 x 2]	3	C208-3006-F00
	• O-Ring / O-ring - [Kalrez, DIN3771 - 20 x 2]	3	C208-3006-F02
5	**Messfenster, flach (Saphir) / Measuring window, flat (Sapphire)**	3	2001-1221-01
6	**Äußere Fensterdichtung / Back-up window seal**		
	• O-Ring / O-ring - [Viton, DIN3771 - 20 x 2]	3	C208-3006-F01
7	**Federring / Split washer [DIN128-B4]**	18	C104-1002-00
8	**Zylinderschr. m. Innensechsk. / Screw, hex, socket head - [DIN912-M4x14]**	18	C100-1011-00
9	**Lampen- und Optikhalterung / Lamp and optic holder**		
	• mit Luftspülung / with Air Purge	3	2001-0911-19-1
	• ohne Luftspülung / without Air Purge	3	2001-0911-19-2
10	**Gewindestift m. Innensechskant / Screw, hex, headless - [DIN 913-M3x3]**	9	C100-1001-00
11	**Messarmdichtung / Housing seal**		
	• O-Ring / O-ring - [Viton, DIN3771-50 x 2]	3	C208-3009-01
	• O-Ring / O-ring - [EPDM, DIN3771-50 x 2]	3	C208-3009-00
12	**Kabelanschluss mit Grundplatte / Connector, cable, with base plate**		
	• Detektor / Detector	2	2001-1301-01
	• Lampe / Lamp	1	2001-1302-01
13	**Federring / Washer, coil spring - [DIN128-B2,5]**	6	C104-1002-00
14	**Linsenkopfschr. m. Kreuzs. / Cross recessed raised pan head screw - [DIN7985-M2,5x7]**	6	C100-1009-00
15	**Messarmgehäuse (Standard) / Housing, Arm (Standard)**	3	2001-1004-01
16	**PG-Verschraubung VA / Strain relief, cable**	3	C305-1003-00
18	**Messlampe / Measuring lamp**	1	C402-1001-00
19	**Verschraubung für Messlampe / Ring, screw head #2**	1	2001-1026-03

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22	Luftanschluß / Connector, air purge	3	C306-1000-10
23	Spezialwerkzeug (Messlampe) / Special tool (measuring lamp)		2001-1030-03
24	Senkschraube m. Kreuzs. / Cross recess countersunk (flat) - [DIN965-M4x10]	18	
25	Zylinderschrauben m. Innensechskant / Hexagon socked head cap screw		
	• ohne Luftspülung / without air purge - [DIN912-M4x21]	12	
	• bei vorhandener Luftspülung / with existing air purge - [DIN912-M4x30]	12	
26	Flachdichtung / Gasket, flat	6	2001-1017-01
27	Adapterplatte für Gehäuse (Ex) / Adjustment for enclosure (Ex)	3	2001-1009-01
28	Lampengehäuse mit Optik (Ex) / Lamp enclosure with optic (Ex)	1	
29	12° Detektorgehäuse mit Optik (Ex) / Detector enclosure, 12 deg., with optic (Ex)	1	
30	90° Detektorgehäuse mit Optik (Ex) / Detector enclosure, 90 deg., with optic (Ex)	1	
31	Platte für Luftanschluß / Plate for air purge	3	2001-1018-01
32	Reinigungsdüse / Cleaning jet		
	• lange Version / Long version [120 mm]	1	2001-1032-00
	• kurze Version / short version [80 mm]	1	2001-1034-00
33	Verschraubung Reinigungsdüse / Connector, cleaning jet		
	• 1/4" NPT-Gewinde / 1/4" MNPT-Thread	1	2001-1000-01
	• 1/4" ISO-Außengewinde, konisch / 1/4" Male ISO Tapered Thread	1	2001-1000-02
34	Gewindestift m. Innensechskant / Screw, hex, headless - [DIN 913-M5x5]		
	• ohne Luftspülung = ohne Loch / without air purge = without borehole	2	
	• bei vorhandener Luftspülung = mit Loch / with existing air purge = with borehole	2	
A	Baugruppe Messlampe / Kit, lamp assembly (inkl./incl. Pos. 12, 13, 14, 18, 19)	1	
B	Baugr. 12° Detektor / Kit, 12 deg. detector assembly (inkl./incl. Pos. 12, 13, 14)	1	
C	Baugruppe 90° Detektor / Kit, 90 deg. detector assembly (inkl./incl. Pos. 12, 13, 14)	1	
	Lampenkabel / Cable, lamp	1 m	C604-1002-00
	Detektorkabel / Cable, detector	1 m	C604-1001-00

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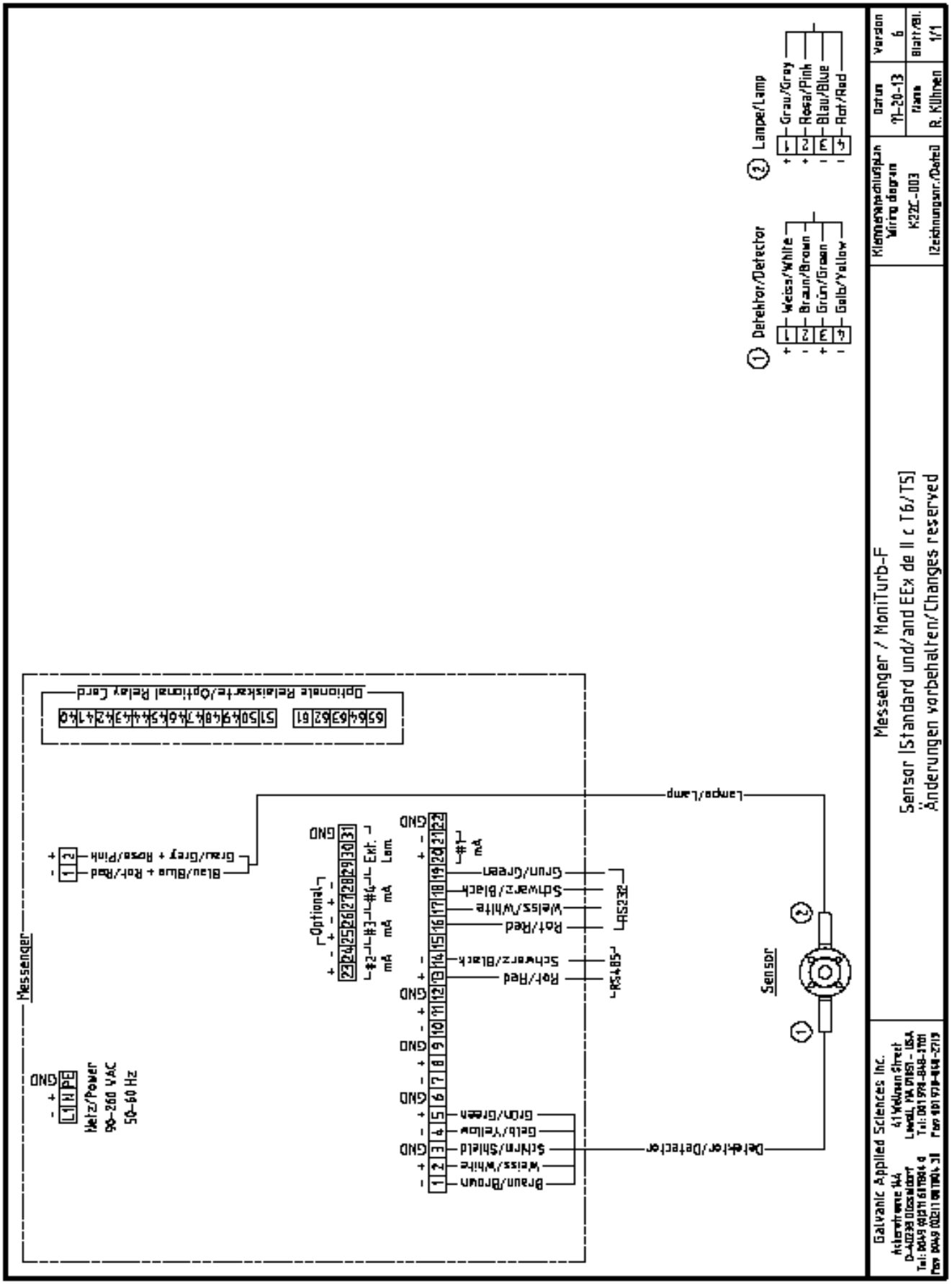
Connection model MoniTurb-F (12° scattered light)



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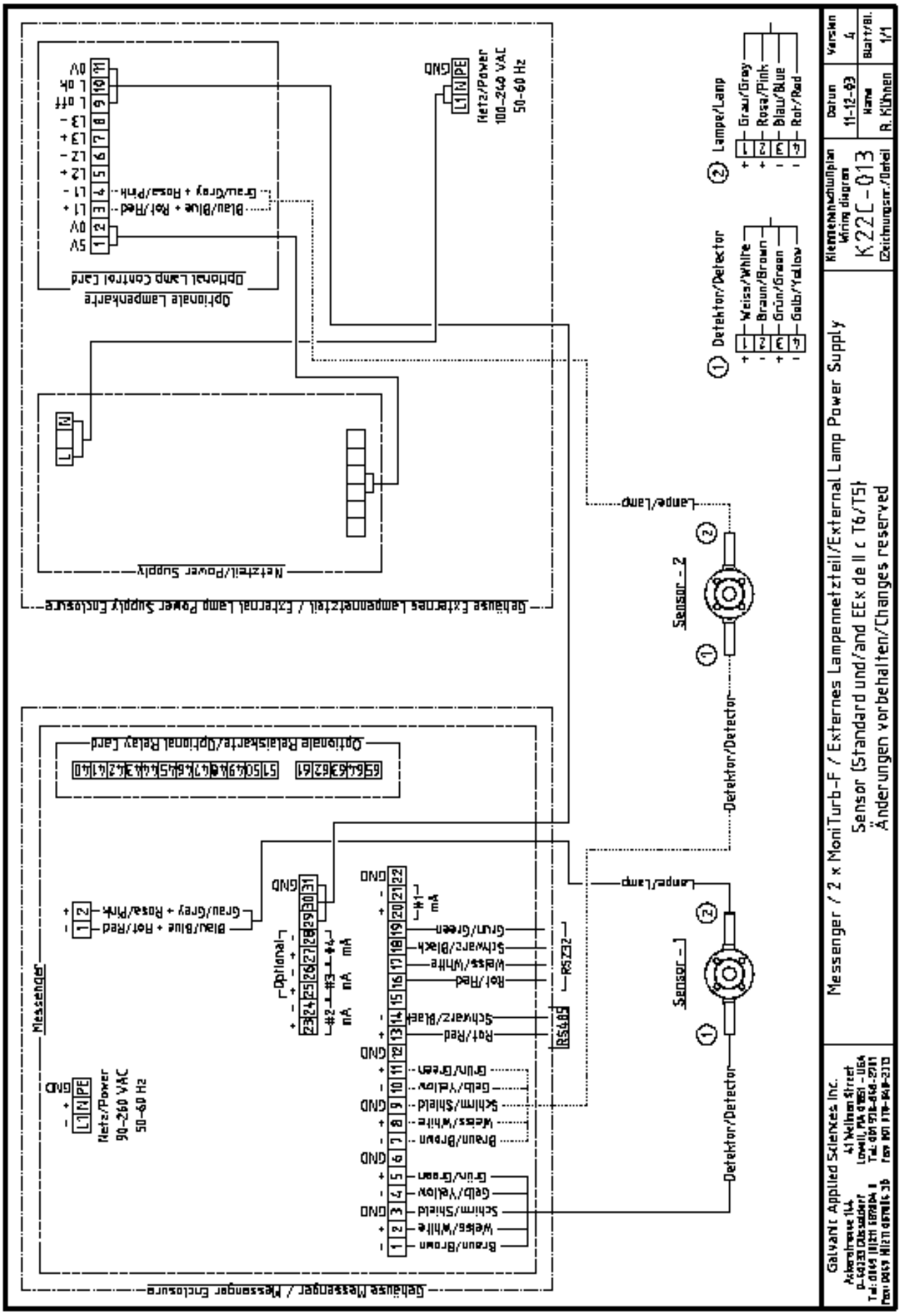

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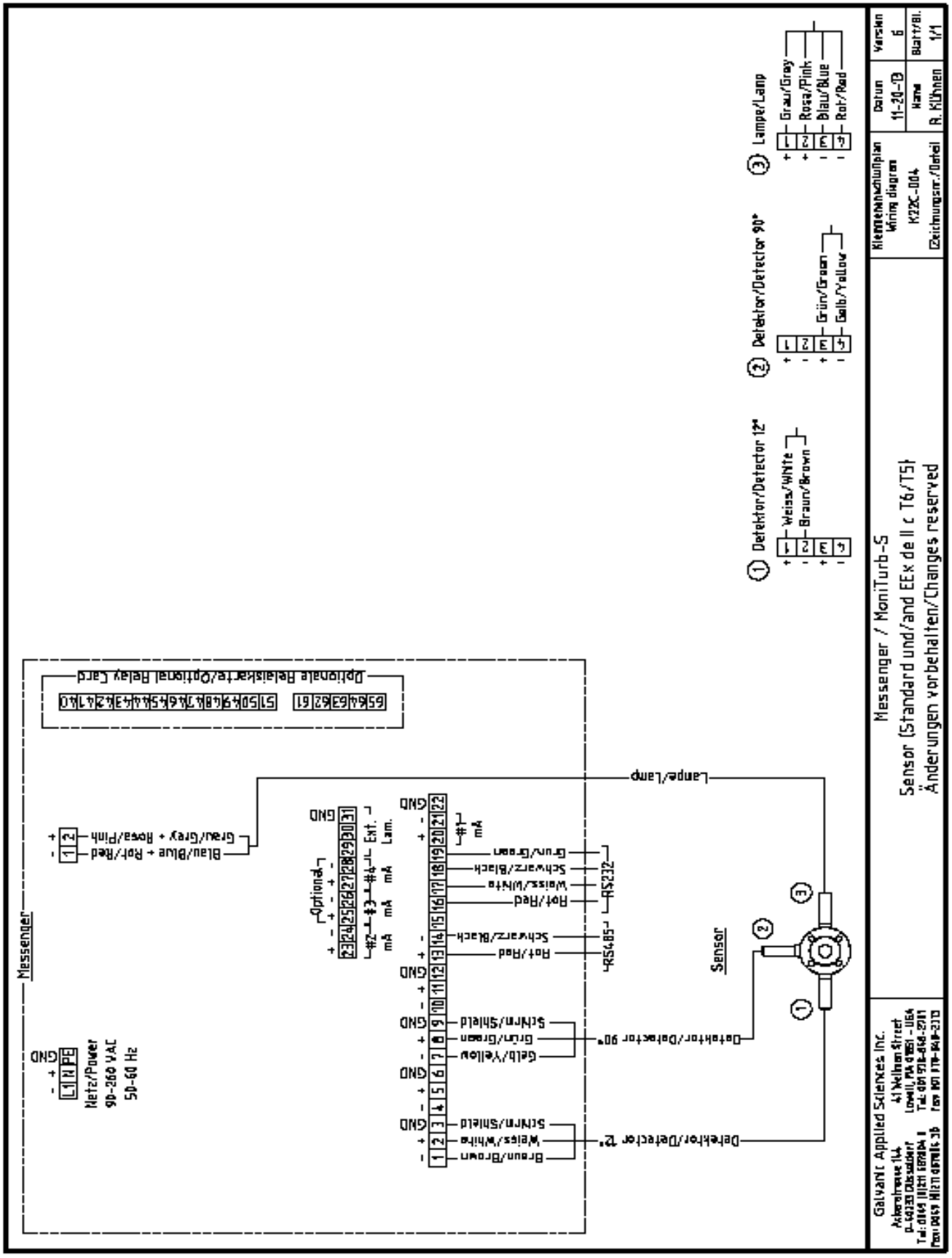
Connection model MoniTurb-S (90° scattered light)



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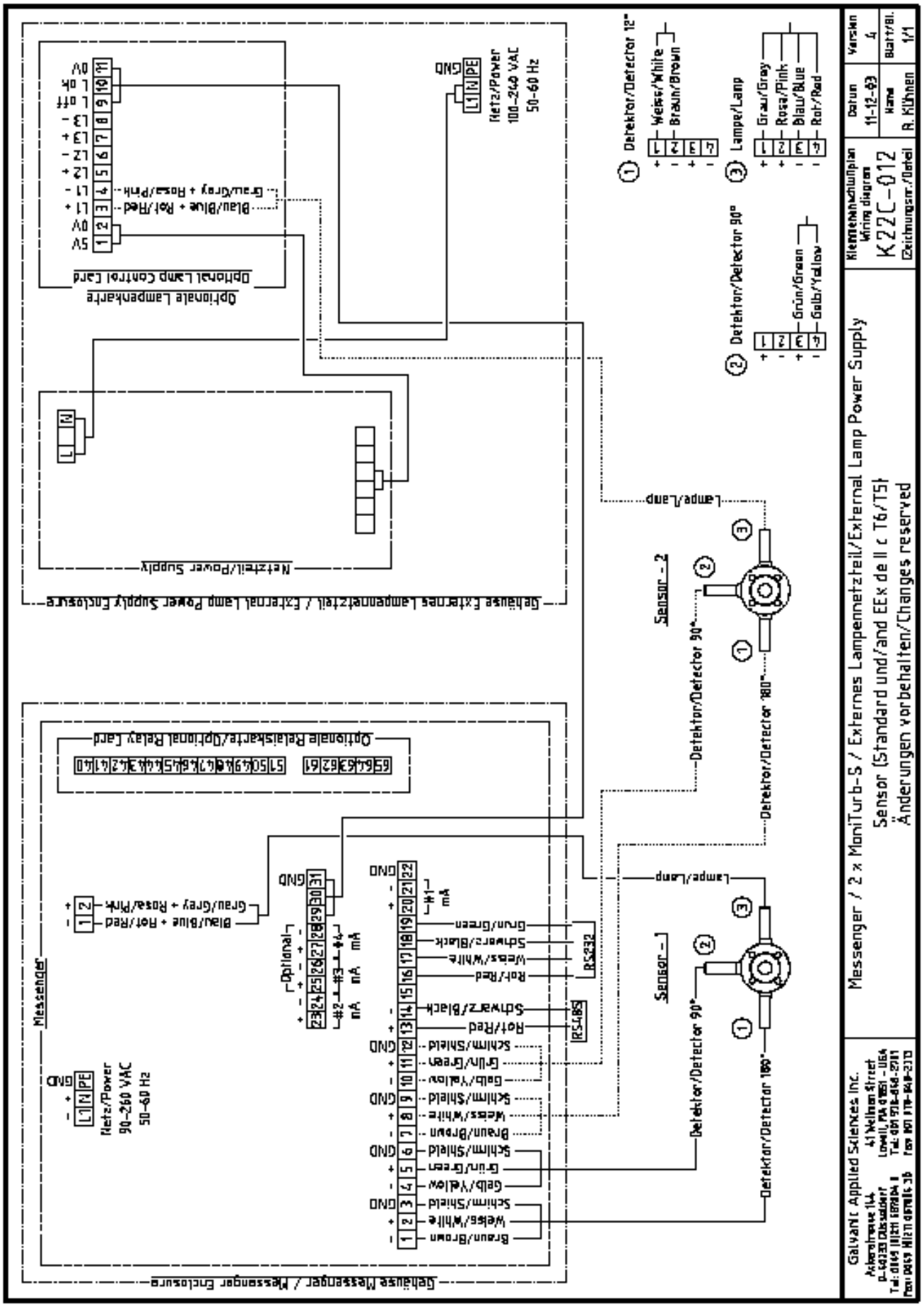

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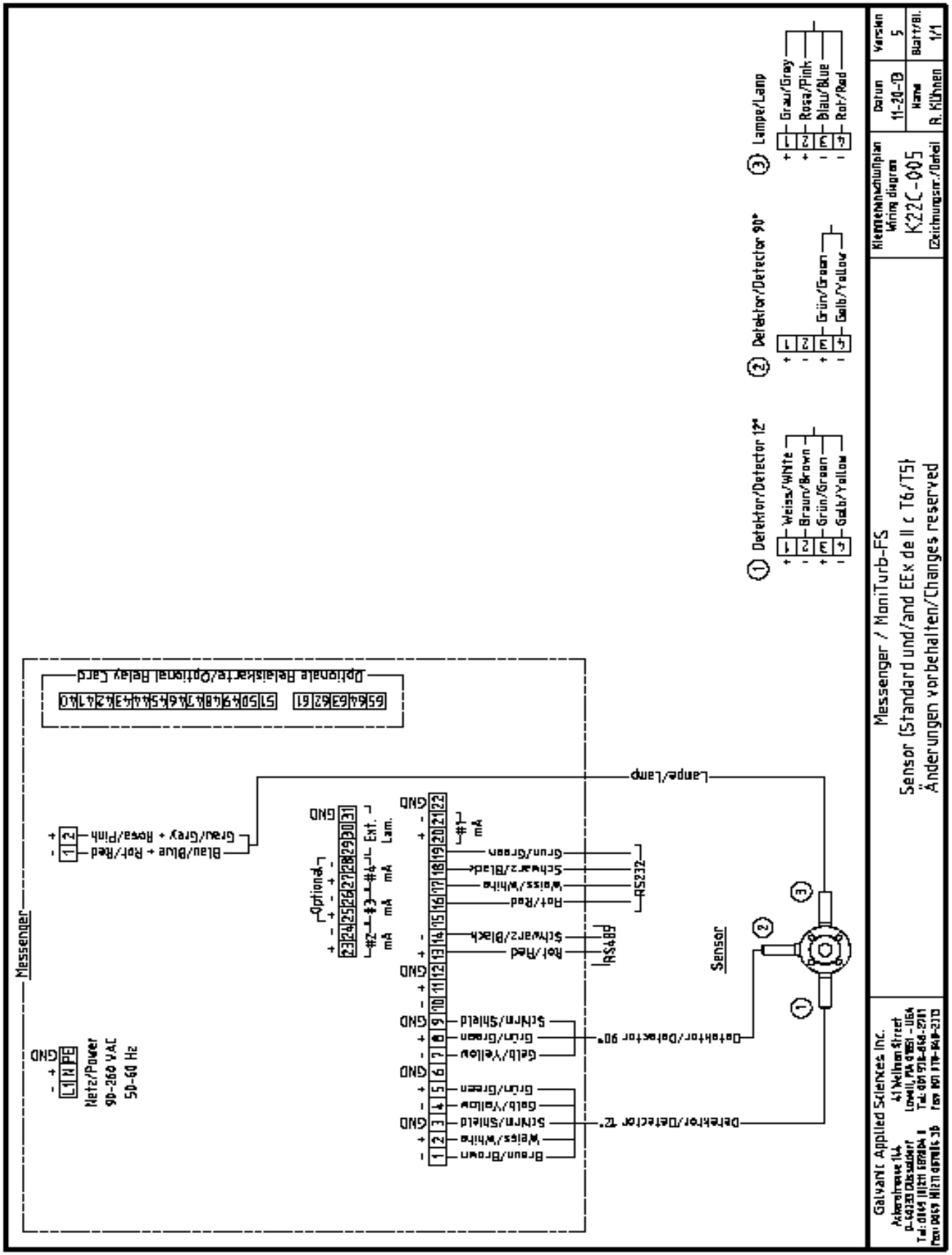
Connection model MoniTurb-FS (12° / 90° scattered light)



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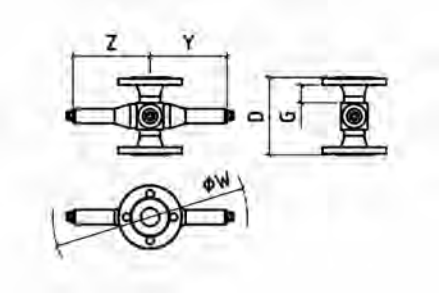
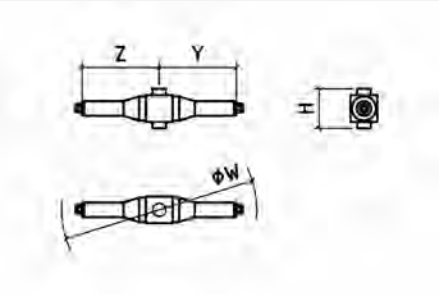
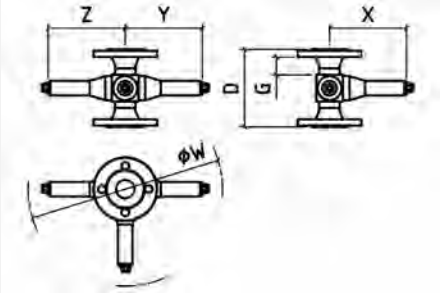
Dimensional drawings

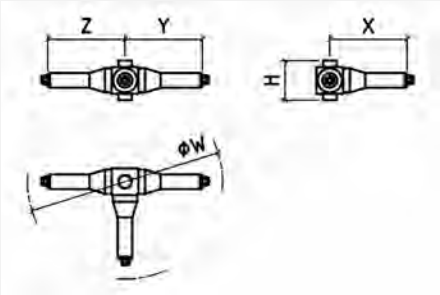
MoniTurb-F





MoniTurb-S und/and MoniTurb-FS





alle Angaben in mm/all dimensions in mm • Änderungen vorbehalten/Changes reserved

Flansch/Flange:

DIN 2632/PN 10 und/and **DIN 2633/PN 16**

± 1 mm	Z	Y	X	D	G	W
DN 25	184	184	184	169	34,5	800
DN 32				173	36,5	
DN 40				177	38,5	
DN 50				183	39,5	
DN 65	193	193	193	180	42,0	
DN 80	199	199	199	190	45,0	
DN 100	212	212	212	194	47,0	900
DN 125	223	223	223	200	48,0	
DN 150	238	238	238	200	48,0	1000

Flansch/Flange:

ANSI B 16.5 / 150 lb in²

± 1 mm	Z	Y	X	D	G	W
1“	184	184	184	204,2	53,9	800
1 ¼“				207,4	54,0	
1 ½“				217,0	57,0	
2“				220,0	56,9	
2 ½“	191	191	191	229,8	62,5	
3“	199	199	199	229,8	61,0	
4“	212	212	212	242,4	67,3	900
5“	223	223	223	267,8	80,0	
6“	238	238	238	267,8	78,5	1000

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Flansch/Flange:

DIN 2634/PN 25 und/and **DIN 2635/PN 40**

± 1 mm	Z	Y	X	D	G	W
DN 25	184	184	184	173	34,5	800
DN 32				177	36,5	
DN 40				183	39,5	
DN 50				189	40,5	
DN 65	193	193	193	194	45,0	
DN 80	199	199	199	206	49,0	
DN 100	212	212	212	220	56,0	900
DN 125	223	223	223	226	57,0	
DN 150	238	238	238	240	62,0	1000

Flansch/Flange:

ANSI B 16.5 / 300 lb in²

± 1 mm	Z	Y	X	D	G	W
1“	184	184	184	217,0	57,0	800
1 ¼“				223,0	58,4	
1 ½“				229,6	60,2	
2“				232,8	60,0	
2 ½“	191	191	191	242,4	65,8	
3“	199	199	199	248,4	65,8	
4“	212	212	212	261,8	69,1	900
5“	223	223	223	287,2	78,5	
6“	238	238	238	287,2	77,0	1000

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Flansch/Flange:

ANSI B 16.5 / 400 lb in²

± 1 mm	Z	Y	X	D	G	W
1“	184	184	184	229,8	57,0	800
1 ¼“				238,8	58,4	
1 ½“				245,6	60,0	
2“				252,2	60,3	
2 ½“	191	191	191	261,2	65,8	
3“	199	199	199	268,0	65,8	
4“	212	212	212	280,6	68,8	900
5“	223	223	223	306,0	78,5	
6“	238	238	238	309,0	77,0	1000

Milchgewinde/Milk fitting:

DIN 11851

± 1 mm	Z	Y	X	D	W
DN 25	184	184	184	151	800
DN 32				157	
DN 40				159	
DN 50				163	
DN 65	193	193	193	170	
DN 80	199	199	199	180	
DN 100	212	212	212	198	900
DN 125	232	232	232	182	
DN 150	238	238	238	190	1000

APV:

± 1 mm	Z	Y	X	D	G	W
DN 25	184	184	184	141	26,5	800
DN 32	nicht auswählbar / not available					
DN 40	184	184	184	141	26,5	800
DN 50				141	26,5	
DN 65	193	193	193	138	29,0	
DN 80	199	199	199	138	29,0	
DN 100	212	212	212	138	29,0	900
DN 125	232	232	232	144	27,0	
DN 150	238	238	238	144	27,0	1000

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Flansch/Flange:

ANSI B 16.5 / 600 lb in²

± 1 mm	Z	Y	X	D	G	W
1“	184	184	184	229,8	57,0	800
1 ¼“				238,8	58,4	
1 ½“				245,6	60,0	
2“				252,2	60,3	
2 ½“	191	191	191	261,2	65,8	
3“	199	199	199	268,0	65,8	
4“	212	212	212	306,0	78,5	900
5“	223	223	223	331,4	84,8	
6“	238	238	238	337,4	84,5	1000

Milchgewinde/Milk fitting:

± 1 mm	Z	Y	X	D	W
1“	184	184	184	151	800
1 ¼“				157	
1 ½“				159	
2“				163	
2 ½“	191	191	191	170	
3“	199	199	199	170	
4“	212	212	212	198	900
5“	nicht auswählbar / not available				
6“					

NPT:

± 1 mm	Z	Y	X	H	W
1“	184	184	184	93	800

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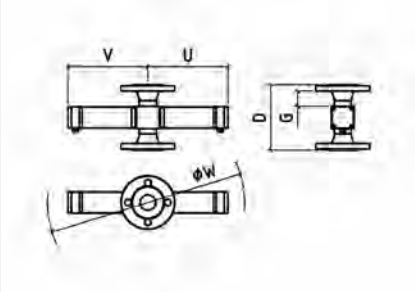
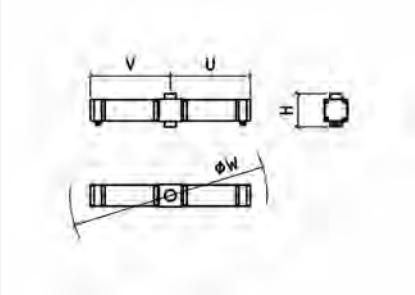
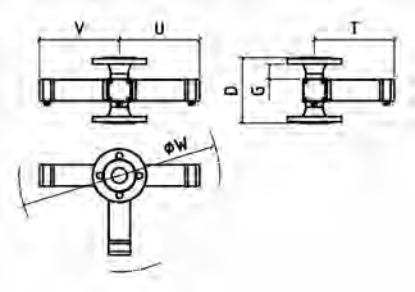
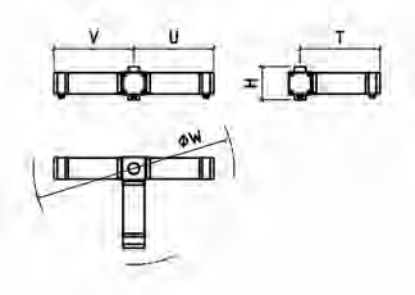
MoniTurb-F (Ex-Version)





MoniTurb-S und/and -FS (Ex-Version)





alle Angaben in mm/all dimensions in mm • Änderungen vorbehalten/Changes reserved

Flansch/Flange:

DIN 2632/PN 10 und/and **DIN 2633/PN 16**

± 1 mm	V	U	T	D	G	W
DN 25	226	226	226	169	34,5	800
DN 32				173	36,5	
DN 40				177	38,5	
DN 50				183	39,5	
DN 65	235	235	235	180	42,0	
DN 80	241	241	241	190	45,0	
DN 100	254	254	254	194	47,0	900
DN 125	265	265	265	200	48,0	
DN 150	280	280	280	200	48,0	1000

Flansch/Flange:

ANSI B 16.5 / 150 lb in²

± 1 mm	V	U	T	D	G	W
1“	226	226	226	204,2	53,9	800
1 ¼“				207,4	54,0	
1 ½“				217,0	57,0	
2“				220,0	56,9	
2 ½“	233	233	233	229,8	62,5	
3“	241	241	241	229,8	61,0	
4“	254	254	254	242,4	67,3	900
5“	265	265	265	267,8	80,0	
6“	280	280	280	267,8	78,5	1000

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Flansch/Flange:

DIN 2634/PN 25 und/and **DIN 2635/PN 40**

± 1 mm	V	U	T	D	G	W
DN 25	226	226	226	173	34,5	800
DN 32				177	36,5	
DN 40				183	39,5	
DN 50				189	40,5	
DN 65	235	235	235	194	45,0	
DN 80	241	241	241	206	49,0	
DN 100	254	254	254	220	56,0	900
DN 125	265	265	265	226	57,0	
DN 150	280	280	280	240	62,0	1000

Flansch/Flange:

ANSI B 16.5 / 300 lb in²

± 1 mm	V	U	T	D	G	W
1“	226	226	226	217,0	57,0	800
1 ¼“				223,0	58,4	
1 ½“				229,6	60,2	
2“				232,8	60,0	
2 ½“	233	233	233	242,4	65,8	
3“	241	241	241	248,4	65,8	
4“	254	254	254	261,8	69,1	900
5“	265	265	265	287,2	78,5	
6“	280	280	280	287,2	77,0	1000

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Flansch/Flange:

ANSI B 16.5 / 400 lb in²

± 1 mm	V	U	T	D	G	W
1“	226	226	226	229,8	57,0	800
1 ¼“				238,8	58,4	
1 ½“				245,6	60,0	
2“				252,2	60,3	
2 ½“	233	233	233	261,2	65,8	
3“	241	241	241	268,0	65,8	
4“	254	254	254	280,6	68,8	900
5“	265	265	265	306,0	78,5	
6“	280	280	280	309,0	77,0	1000

Milchgewinde/Milk fitting:

DIN 11851

± 1 mm	V	U	T	D	W
DN 25	226	226	226	151	800
DN 32				157	
DN 40				159	
DN 50				163	
DN 65	235	235	235	170	
DN 80	241	241	241	180	
DN 100	254	254	254	198	900
DN 125	265	265	265	182	
DN 150	280	280	280	190	1000

APV:

± 1 mm	V	U	T	D	G	W
DN 25	226	226	226	141	26,5	800
DN 32	nicht auswählbar / not available					
DN 40	226	226	226	141	26,5	800
DN 50				141	26,5	
DN 65	235	235	235	138	29,0	
DN 80	241	241	241	138	29,0	
DN 100	254	254	254	138	29,0	900
DN 125	265	265	265	144	27,0	
DN 150	280	280	280	144	27,0	1000

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Flansch/Flange:

ANSI B 16.5 / 600 lb in²

± 1 mm	V	U	T	D	G	W
1“	226	226	226	229,8	57,0	800
1 ¼“				238,8	58,4	
1 ½“				245,6	60,0	
2“				252,2	60,3	
2 ½“	233	233	233	261,2	65,8	
3“	241	241	241	268,0	65,8	
4“	254	254	254	306,0	78,5	900
5“	265	265	265	331,4	84,8	
6“	280	280	280	337,4	84,5	1000

Milchgewinde/Milk fitting:

± 1 mm	V	U	T	D	W
1“	226	226	226	151	800
1 ¼“				157	
1 ½“				159	
2“				163	
2 ½“	233	233	233	170	
3“	241	241	241	170	
4“	254	254	254	198	900
5“	nicht auswählbar / not available				
6“					

NPT:

± 1 mm	Z	Y	X	H	W
1“	226	226	226	93	800

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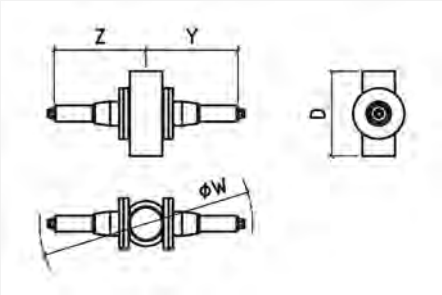
MoniTurb-F (Bio Control®)



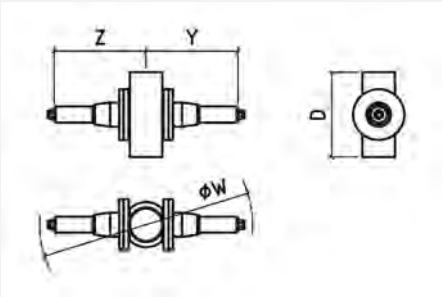
Achtung!
Abmessungen ohne Prozessanschlüsse

Please pay attention!
Dimension without process connection

± 1 mm	Z	Y	D	W
DN 25	nicht auswählbar / not available			
DN 32				
DN 40	202	202	180	800
DN 50	208	208		
DN 65	216	216	200	
DN 80	222	222		
DN 100	235	235		
DN 125	nicht auswählbar / not available			
DN 150				

alle Angaben in mm/all dimensions in mm
Änderungen vorbehalten/Changes reserved

MoniTurb-F (Varivent®-In-Line)



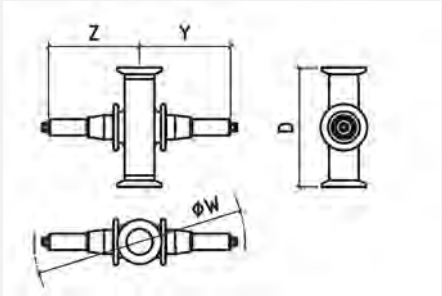
Achtung!
Abmessungen ohne Prozessanschlüsse

Please pay attention!
Dimension without process connection

± 1 mm	Z	Y	D	W
DN 25	nicht auswählbar / not available			
DN 32				
DN 40	190	190	180	800
DN 50	197	197		
DN 65	205	205	250	
DN 80	213	213		
DN 100	222	222		
DN 125	nicht auswählbar / not available			
DN 150				

alle Angaben in mm/all dimensions in mm
Änderungen vorbehalten/Changes reserved

MoniTurb-F (TriClover)



± 1 mm	Z	Y	D	W
½"	nicht auswählbar / not available			
¾"	185	185	152,4	800
1"	191	191		
1 ½"	194	194	165,1	
2"	200	200		
3"	213	213	228,6	
4"	226	226		900
5"	nicht auswählbar / not available			
6"				

alle Angaben in mm/all dimensions in mm
Änderungen vorbehalten/Changes reserved

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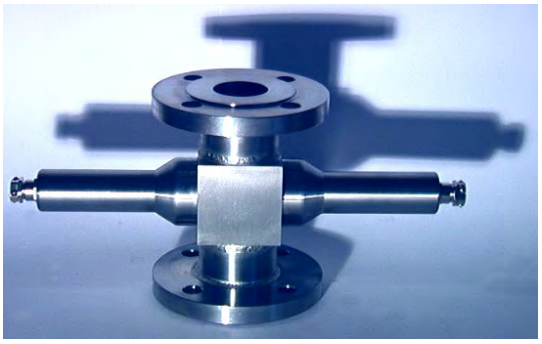
Technical data model MoniTurb-F (12° scattered light



(Illustration similar)

- **Principle of measurement: 12° forward scattered light**
- **Calibration interval 24 months**
- **Colour compensation**
- **Cleaning in place**
- **Flow cell material: 316SS / 1.4404 (other materials on request)**
- **Protection: NEMA 4X / IP65**
- **Process connections: DIN, ANSI, SMS, NPT, APV, TH,...**
- **Line sizes DN 25 to DN 125 (1/2“ up to 4“)**
- **Process pressure: PN16 / ANSI class 150**
- **Process temperature: max. 140° C**
- **Cable length: max. 100 m (approx. 300 feet)**
- **Optional cleaning jets**
- **Optional hazardous area Ex-zone I and Ex-zone II**
- **Compatible to converter type: Messenger**

Applications

The Monitek sensor Model MoniTurb-F, in connection with a Monitek converter type Messenger, measures turbidity in liquids. The system can be used for inspection, control and optimisation of industrial processes:

• **Drinking water** • **Waste water** • **Chemical industry** • **Paper industry** • **Biotechnology** • **Beverages** •

• **Ultra filtrate** • **Filtrate** • **Un-filtrate** • **Condensate** • **Process water** • **Water in oil / oil in water** •

Description

The turbidity sensor Model MoniTurb-F uses the principle of 12° forward scattered light to detect suspended particles in liquids. The ratio of scattered light/direct light assures highly reliable and repeatable measurement results. The 12° scattered light measuring result is nearly independent of particle size and can be correlated (linearly) to concentration. The sensor can be installed into almost any type of pipe. Process connection, pressure, temperature, gasket material, etc will be application specific.
The optional feature for hazardous area, zone I or zone II, allows for wide range of applications. A maximum cable length of 100 m (approx. 300 feet) allows the converter to be located outside the hazardous area.

Specifications

Line sizes:	DN 25 to DN 125 / 1/2“ to 4“	Optical path length:	Application specific
Process pressure:	PN 16 / ANSI Class 150	Measurement range:	0 – 500 ppm appl.dep.
Process temperature:	Max. 140° C	Detector system:	Silicone diodes
Sensor material:	316 SS / 1.4404 (other materials on request)	Hazardous area (optional):	Ex-zone I and Ex-zone II
Gasket material:	Application specific	Cleaning jets:	Optional

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Technical data model MoniTurb-S (90° scattered light)

(Illustration similar)

- **Principle of measurement: 90° side scattered light**
- **Calibration interval 24 months**
- **Colour compensation**
- **Cleaning in place**
- **Flow cell material: 316SS/ 1.4404 (other materials on request)**
- **Protection: NEMA 4X / IP65**
- **Process connections: DIN, ANSI, SMS, NPT, APV, TH, ...**
- **Line sizes DN 25 to DN 125 (1/2" to 4")**
- **Process pressure: PN16 / ANSI class 150**
- **Process temperature: max. 140° C**
- **Cable length: max. 100 m (approx. 300 feet)**
- **Optional cleaning jets**
- **Optional hazardous area Ex-zone I and Ex-zone II**
- **Compatible to converter type: Messenger**

Applications

The Monitek sensor Model MoniTurb-S, in connection with a Monitek converter type Messenger, measures turbidity in liquids. The system can be used for inspection, control and optimisation of industrial processes:

• **Drinking water** • **Waste water** • **Chemical industry** • **Paper industry** • **Biotechnology** • **Beverages** •

• **Ultra filtrate** • **Filtrate** • **Unfiltrate** • **Condensate** • **Process water** • **Water in oil / oil in water** •

Description

The turbidity sensor Model MoniTurb-S uses the principle of 90° side scattered light to detect suspended particles in liquids. The ratio of scattered light/direct light assures highly reliable and repeatable measurement results. The sensor is specially designed to detect small particle sizes (high sensitivity for particles < 0,3 µm). The sensor can be installed into almost any type of pipe. Process connection, pressure, temperature, gasket material, etc will be application specific.
The optional feature for hazardous area, zone I or zone II, allows for a wide range of applications. A maximum cable length of 100 m (approx. 300 feet) allows the converter to be located, outside the hazardous area.

Specifications

Line sizes:	DN 25 to DN 125 mm / 1/2" to 4"	Optical path length:	Application specific
Process pressure:	PN 16 / ANSI class 150	Measurement range:	0 – 500 ppm
Process temperature:	Max. 140° C	Detector system:	Silicone diodes
Sensor material:	316SS / 1.4404 (other materials on request)	Hazardous area (optional):	Ex-zone I and Ex-zone II
Gasket material:	Application specific	Cleaning jets:	Optional

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Technical data model MoniTurb-FS (12° / 90° scattered light)

(Illustration similar)

- **Principle of measurement: 12° forward / 90° side scatter**
- **Calibration interval 24 months**
- **Colour compensation**
- **Cleaning in place (optional)**
- **Flow cell material: 316SS / 1.4404 (other materials on request)**
- **Protection: NEMA 4X / IP65**
- **Process connections: DIN, ANSI, SMS, NPT, APV, TH,...**
- **Line sizes DN 25 to DN 125 (1/2" to 4")**
- **Process pressure: PN16 / ANSI class 150**
- **Process temperature: max. 140° C**
- **Cable length: max. 100 m (approx. 300 feet)**
- **Optional cleaning jets**
- **Optional hazardous area Ex-zone I and Ex-zone II**
- **Compatible to converter type: Messenger**

Applications

The Monitek sensor Model MoniTurb-FS, in connection with a Monitek converter type Messenger, measures turbidity in liquids. The system can be used for inspection, control and optimisation of industrial processes:

- **Drinking water** • **Waste water** • **Chemical industry** • **Paper industry** • **Biotechnology** • **Beverages** •
- **Ultra filtrate** • **Filtrate** • **Un-filtrate** • **Condensate** • **Process water** • **Water in oil / oil in water** •

Description

The turbidity sensor Model MoniTurb-FS uses the principles of 12° forward scattered light and 90° side scattered light to detect suspended particles in liquids. The ratio of scattered light/direct light assures highly reliable and repeatable measurement results. The 12° scattered light measuring result is nearly independent of particle size and can be correlated (linearly) to concentration. The 90° scattered light optics have been specially designed for detecting small particle sizes (high sensitivity for particles < 0,3 µm). The sensors can be installed into almost any type of pipe. Process connection, pressure, temperature, gasket material, etc. will be application specific.
The optional feature for hazardous area, zone I or zone II, allows for wide range of application. A maximum cable length of 100 m (approx. 300 feet) allows the converter to be located outside the hazardous area.

Specifications

Line sizes:	DN 25 to DN 125 / 1/2" to 4"	Optical path length:	Application specific
Process pressure:	PN16 / ANSI Class 150	Measurement range:	0 – 500 ppm appl. spec.
Process temperature:	Max. 140° C	Detector system:	Silicone diodes
Sensor material:	316SS / 1.4404 (other materials on request)	Hazardous area (optional):	Ex-zone I and Ex-zone II
Gasket material:	Application specific	Cleaning jets:	Optional

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Manufacturer's Warranty Statement

Galvanic Applied Sciences Inc. ("Seller") warrants that its products will be free from defects in materials and workmanship under normal use and service in general process conditions for 12 months from the date of Product start-up or 18 months from the date of shipping from Seller's production facility, whichever comes first (the "Warranty Period"). Products purchased by Seller from a third party for resale to Buyer ("Resale Products") shall carry only the warranty extended by the original manufacturer. Buyer agrees that Seller has no liability for Resale Products beyond making a reasonable commercial effort to arrange for procurement and shipping of the Resale Products. Buyer must give Seller notice of any warranty claim prior to the end of the Warranty Period. Seller shall not be responsible for any defects (including latent defects) which are reported to Seller after the end of the Warranty Period.

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Limitations

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- Analyzer components which may be damaged by exposure to contamination or fouling from the process fluid due to a process upset, improper sample extraction techniques or improper sample preparation, fluid pressures in excess of the analyzer's maximum rated pressure or fluid temperatures in excess of the analyzer's maximum rated temperature. These include but are not limited to sample filters, pressure regulators, transfer tubing, sample cells, optical components, pumps, measuring electrodes, switching solenoids, pressure sensors or any other sample wetted components.

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