

Manual

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Single Beam Dual Wavelength Absorption Photometer Model MoniSpec-AD

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Transportation Damages!



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 Chemtronic Waltemode GmbH will not assume liability for these damages.



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Copyright

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There are no further reaching warranty claims to take because of the content of existing document.

Non-warranty

Chemtronic Waltemode GmbH takes no responsibility or warranty for technical or editorial mistakes or omissions in this document. The information in this publication will be provided without warranty for their correctness. Chemtronic Waltemode GmbH reserves all rights to make changes to this document without announcement. Chemtronic Waltemode GmbH is by no means liable for any consequential damages or miscellaneous damages, which occur during the use or storage of the system. Some countries do not allow the limitation of liability, so that this exclusion is possibly not valid for you.

Warranty conditions

The warranty for this product takes place according to the legal provisions. As place of warranty we explicitly name Chemtronic Waltemode GmbH, Niederstr. 14, 40789 Monheim am Rhein, Germany or Galvanic Applied Sciences Inc., Lowell, MA, USA. In case of warranty service at the customer site, we will charge additional expenses e.g. travel expenses, overnight cost, etc. Consumable parts as well as wearing parts e.g. lamps, gaskets, etc. are not covered by warranty. Improper use, gross negligence, use of the system outside of the technical specifications, missing or improper maintenance will cause a loss of the warranty claim.

Please pay attention to our general terms of contract.

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. Chemtronic Waltemode GmbH will not take any responsibility for consequences arising from ignoring the safety instructions and warnings.

For ALL chemical liquids

The reagents or standards may be toxic or otherwise harmful to human health. Observe appropriate precautions when handling and disposing the chemicals. Review the appropriate published material safety data sheets regarding the safe handling and disposal of all reagents or standards.

Electrical installation

Qualified technical personnel must perform the 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



Electrical safety

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 then thoroughly dried.
2. 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.

Shipment of the instrument

Please clean the instrument carefully before shipment (e.g. for revision / repair). Please use fixed packaging material to protect the instrument against any shipping damages.

Installation Guidelines

Transmitter

- Take notice to the separate manual of your transmitter.
 - We recommend installing the transmitter in a dry and dust-free area.
 - The ambient temperature should not exceed or fall below a range of -10°C up to +50°C (avoid direct sunshine).
 - Use dry and dust-free instrument air to purge transmitter at temperatures above 35°C.
- Follow the wiring diagram carefully during installation of the system.
- The supply voltage should come from a disturbance free circuit. Machines such as large motors, pumps, etc., should be connected to a separate supply circuit.

Sensor



Exceeding the specified maximum pressure and / or the specified maximum temperature of the sensor flow cell represents a high security risk.



Please read the following safety information before installation.

- Make sure that the distance between measuring cable and any power cables is at least 0.5 meters, to protect the measuring results from radiated disturbances.
- The length of the measuring cable between transmitter and sensor should be as short as possible.
- We strictly recommend adding 2m of cable at the sensor's end, so that the sensor can stand on the ground, during maintenance and calibration.
- The sensor will be calibrated by liquid standards within the measuring cell; therefore we recommend, not installing the sensor, to the piping before calibration.
- The flow cell is manufactured according to the application requirements (line size, flange type, pressure & temperature rating, cleaning jets and gasket materials) please double check before installation.
- The sensor should be installed in a standpipe with upright flow direction.
- Process pressure and temperature has to be in the specification ratings of the flow cell.
- Avoid air and gas bubbles inside the flow cell, they cause disturbances as noisy and unstable measurement results. Please take notice: air bubbles are not expected at a pressure above 2Bar in aqueous liquids.
- Purge the sensor with dry instrument air (approx. 10 l/h) in case the process temperature falls under the dew point.
- Condense water or excessive temperatures can damage the sensor.
- Check the voltage of the lamp inside the LD- Unit (max. 5V DC) in case the length of the measuring cable has been changed (to high voltage will damage the lamp or reduce its life time).
- Use original parts only!
- Do not extend the sensor cables.
- In case the optional cleaning jets are being used, make sure the pressure of the cleaning fluid /gas is at least 50% higher than the process pressure. We strictly recommend installing an additional one-direction valve to make sure that the process fluid can not flow backwards.

Principle of Operation

The single beam, dual wavelength photometer model MoniSpec-AD / Messenger is used to measure the colour of liquid products. The light absorption is measured at two different wavelengths. The difference between these both absorbance values is used to calculate the colour concentration.

What does Colour mean?

Colour is defined as a light released sense impression mediated by eye.

The physical science considers light as electromagnetic waves. Colour is not a clear defined magnitude like e.g. temperature or pressure, colour is a subjective impression.

How arises a Colour Impression?

A colour impression will be caused, in case electromagnetic waves of the visible spectrum (wavelengths of about 380nm up to 750nm) will fall on the eye.

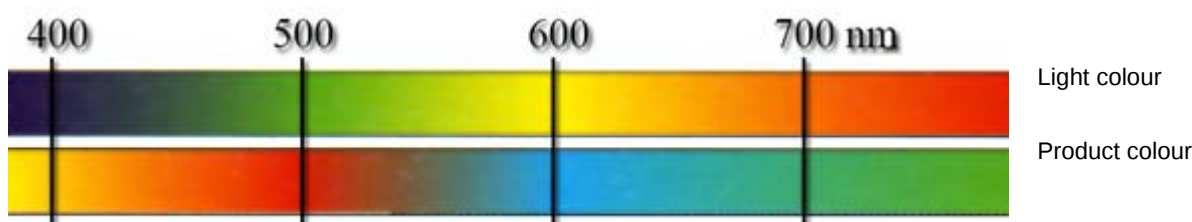
How accrues Colour?

White light (colourless) consists from the summation of all colours of the visible spectrum. A colour impression accrues for the eye, in case a specific range of wavelengths within the visible spectrum will be absorbed.

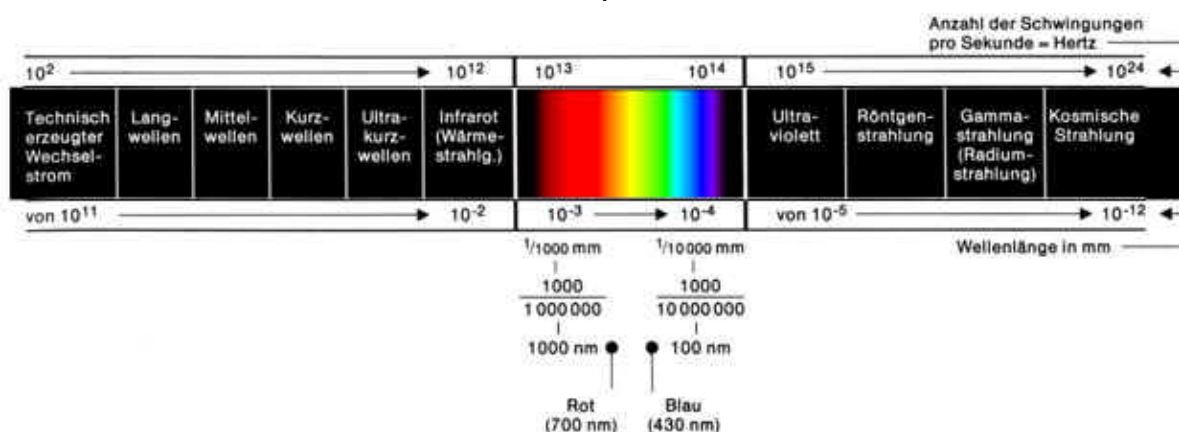
Context between Wavelength and Colour

Absorbed Wavelength λ [nm]	Colour of absorbed Light	Visual impression human eye
380 – 435	violet	yellow-green
435 – 480	blue	yellow
480 – 490	greenish-blue	orange
490 – 500	bluish-green	red
500 – 560	green	magenta
560 – 580	yellow-green	violet
580 – 595	yellow	blue
595 – 650	orange	greenish-blue
650 – 780	red	bluish-green

Comparison absorbed light colour / product colour



Total Spectrum



Measurement of Colour

The following methods are used for the measurement of a "colour concentration" in a liquid; both methods are based on the principle of light absorption at specific wavelengths.

Example single wavelength absorption:

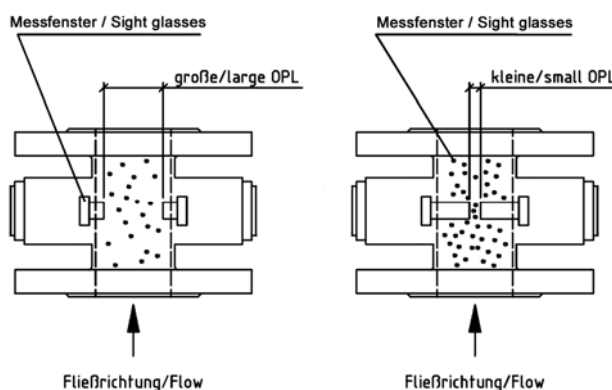
Measurement of blue colour in a liquid.

The light absorption in a spectral range of approximately 600nm will be detected and evaluated; this is the range of wavelengths where the blue colour generates light absorption.

Mainly two parameters will affect the sensitivity of the measurement.

1. The initial intensity of the white light source, which is a constant value of the respective sensor.
2. The optical path length (OPL) which is a variable magnitude of the sensor.

The sensor requires a large optical path length (OPL) to generate enough light attenuation at low colour concentration. The sensor requires a small optical path length (OPL), to ensure enough light intensity penetrates the product at high colour concentration.



Large optical path length/OPL = measurement of low concentrations/high sensitivity

Small optical path length/OPL = measurement of high concentrations/low sensitivity

Single Beam dual Wavelength Measurement

Single Beam dual Wavelength Measurement

The previously described method of single wavelength absorption operates with filtrated liquids with low particle content only, because the particles in the liquid absorb the light as well as colour. Therefore particles affect the measurement results. Particles absorb the light at the complete spectral range and not at specific wavelengths only. Colour absorbs the light at specific wavelengths in the visible spectrum. Therefore colour is typically measured at two different wavelengths ranges. The measurement channel detects in a spectral range where colour and particles absorb. The reference channel detects in a spectral range where only colour absorbs. This method is called, single beam dual wavelength measurement.

The measurement channel detects the absorption caused by colour and particles.

The reference channel detects the absorption caused by particles only.

The difference of both signals will result the absorption caused by colour only.

The difference measurement compensates for cross interference's caused by particles, window coatings and lamp ageing

Example dual wavelength absorption:

Measurement of blue colour in liquid.

The measurement channel detects the light absorption in a range of approx. 600nm (colour and particles).

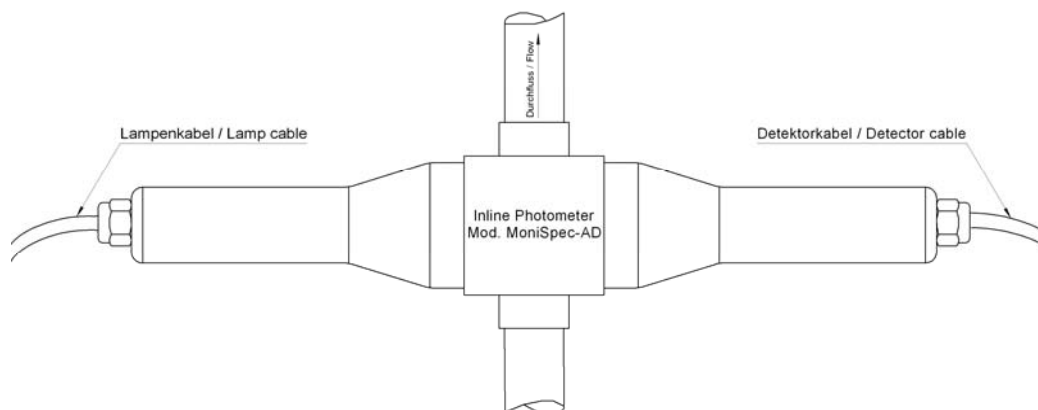
The reference channel detects the particle absorption at 850 nm (invisible NIR light, unaffected by colour).

$$\text{Measurement Ch. (blue colour + particles)} - \text{Reference Ch. (particles only)} = \text{Colour Concentration}$$

Technical Design of the Measuring System

The system consists of three main components:

1. Measuring- / Flow- Cell



The measuring cell is specified according to your application. Material, pressure rating, temperature class, process connection (e.g. NPT fitting, DIN flanges, ANSI flanges, hygienic designed Bio Connect fittings, etc.), sight glass material and gasket material are selected according to application requirements, please double check your specification!

Ideally the measurement cell is installed in a vertical stand pipe. Make sure that degassing in the flow cell is avoided because bubbles will affect the measuring results.

2. Transmitter Model Messenger



The transmitter model Messenger is available in different designs depending on customer's specification.

The instrument is suitable for industrial field applications. A sensor cable (max. length 100m / 300ft) connects transmitter and Sensor of the system. Therefore, we recommend choosing a dry and protected location for the transmitter. This allows a comfortable configuration and calibration.

Depending on specification up to two sensors model MoniSpec-AD can get connected to one transmitter.

Please take notice to the separate manual of the transmitter.

Maintenance

Replacement of measurement lamp



Ignoring of the following hints will cause a loss of warranty



Notice:

- 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



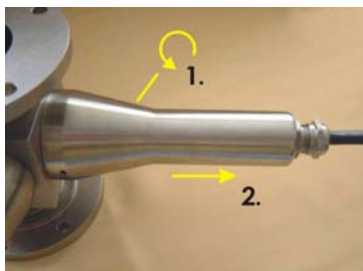
- Please loosen the upper hexagonal nut of the cable gland by using a 22 mm open-end wrench. Use the second 22 mm open-end wrench to hold the lower hexagonal nut of the cable gland in position. This will assure that you do not twist the lamp cable.

Attention!

The lamp cable is marked with "lamp"

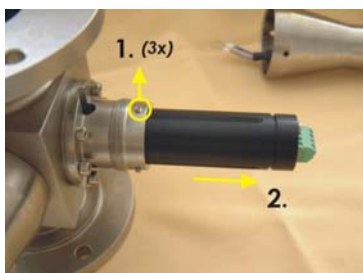


- Remove Allen screws and / or air purge connectors.



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

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

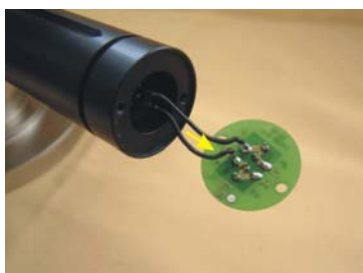


- Loosen Allen screws (3x) by using the 1.5 mm hexagonal spanner.
- Remove lamp assembly carefully.

Attention!

We recommend removing the lamp assembly and performing the lamp replacement procedure in a dry and clean location.

- Remove screws by using the medium size Phillips screwdriver.



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

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



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

Attention!

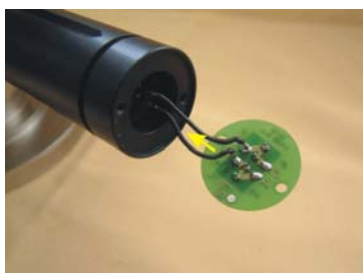
Avoid extreme force in pulling out the lamp.

- 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.



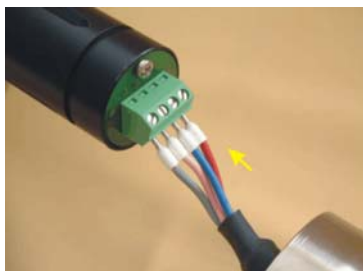
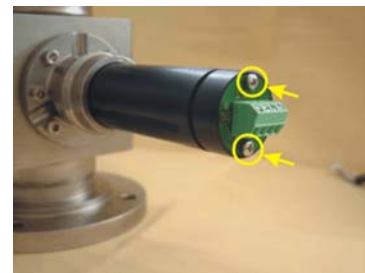
- Remove plug from the measurement lamp and push the lamp into the barrel.

- Tighten the packing nut by using special Monitek lamp spanner wrench.



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

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

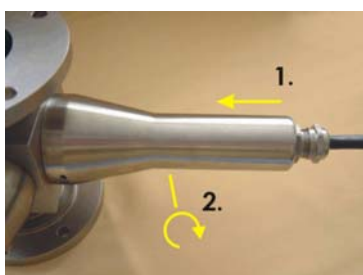
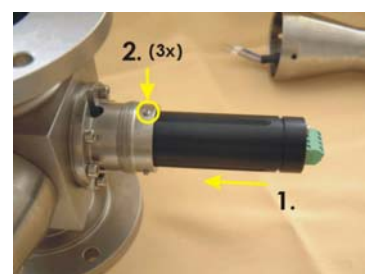


- Reconnect the wires of the lamp cable and perform a lamp test.

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

Attention!

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.



- Push lamp arm to the thread.
- Tighten lamp arm.

- Tighten cable gland



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

Replacement of measurement lamp (EEx d IIC Version)

Please take notice to the introduction of this chapter (page 7)!

- Loosen cable gland by using a spanner wrench.



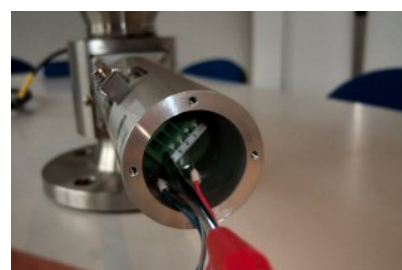
- Loosen the cable gland completely.

- Remove the four screws of the back plate by using a hexagonal spanner.



- Open the back plate.

- Disconnect wires by using a screw driver.

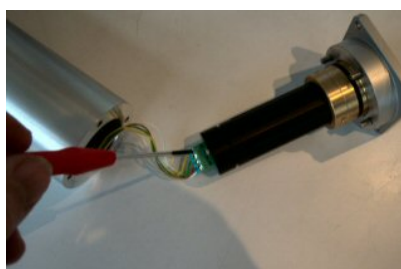


- Remove the four screws of the mounting flange by using a hexagonal spanner.

- Remove lamp enclosure from the flow cell.



- Remove the four screws located at the surface of the mounting flange by using a hexagonal spanner.

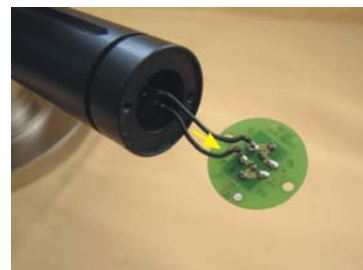


- Open the lamp enclosure and disconnect the wires by using a small screw driver.



- Loosen the two screws located at the connection plate of the lamp optic.

- Remove cable and plate.



- Loosen the pressing nut by using the Monitek lamp tool.

Remove measurement lamp carefully by using a needle nose plier.

Take notice!

Do not take excessive force to optical components!



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

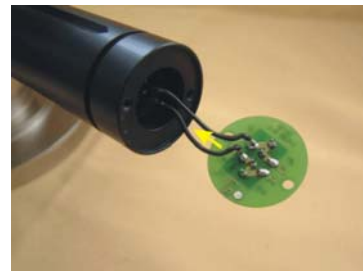
- Disconnect the lamp socket and insert the lamp into the optical assembly.





- Tighten the packing nut by using special Monitek lamp spanner wrench.

- Push the lamp connection plug carefully onto the contact pins of the lamp.



- Reassemble the connection plate of the lamp optic.

Reassemble the sensor.

Replacement of gaskets



Ignoring of the following hints will cause a loss of warranty



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 Galvanic Applied Sciences USA.

Notice:

- 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 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.

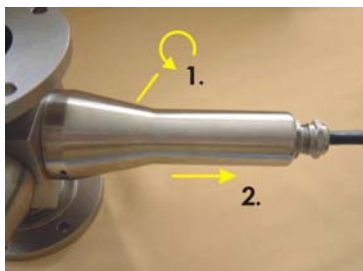
Required tools:

- 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



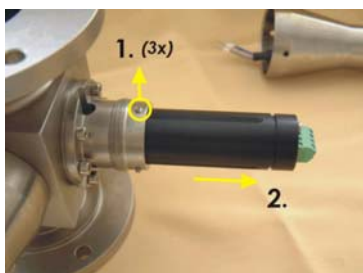
- Please loosen the upper hexagonal nut of the cable gland by using a 22 mm open-end wrench. Use the second 22 mm open-end wrench to hold the lower hexagonal nut of the cable gland in position. This will assure that you do not twist the lamp cable.

- Remove Allen screws and / or air purge connectors.



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

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



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

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



- Carefully remove sapphire window out of the window holder.

Attention!

If the window sticks in the holder, remove the holder first after that carefully push the window out of it's sealing.

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

Attention!

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.



- Replace the outer O- ring of the holder.

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

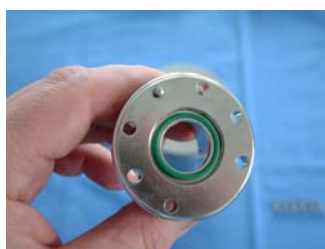
Attention!

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



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

- Put the window into the holder.



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

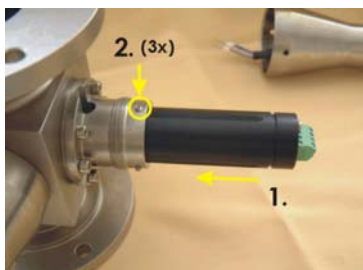
Attention!

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

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

Attention!

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.

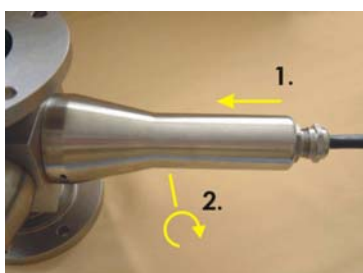


- Push the optical assembly into the holder.
- Tighten Allen screws (3x)

Attention!

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.

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



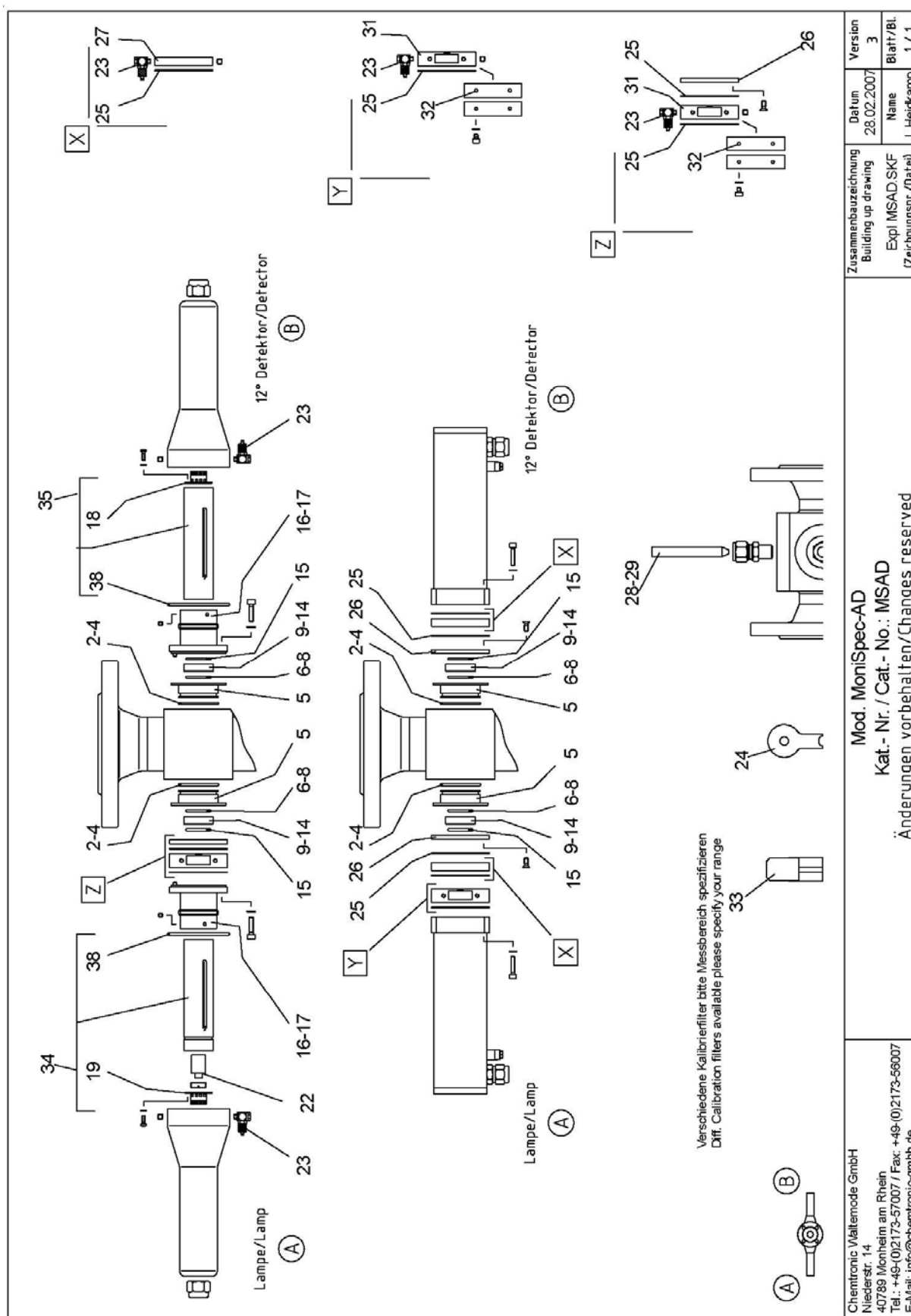
- Push lamp / detector arm to the thread.
- Tighten lamp / detector arm

- Tighten cable gland



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

Exploded Drawing Model MoniSpec-AD

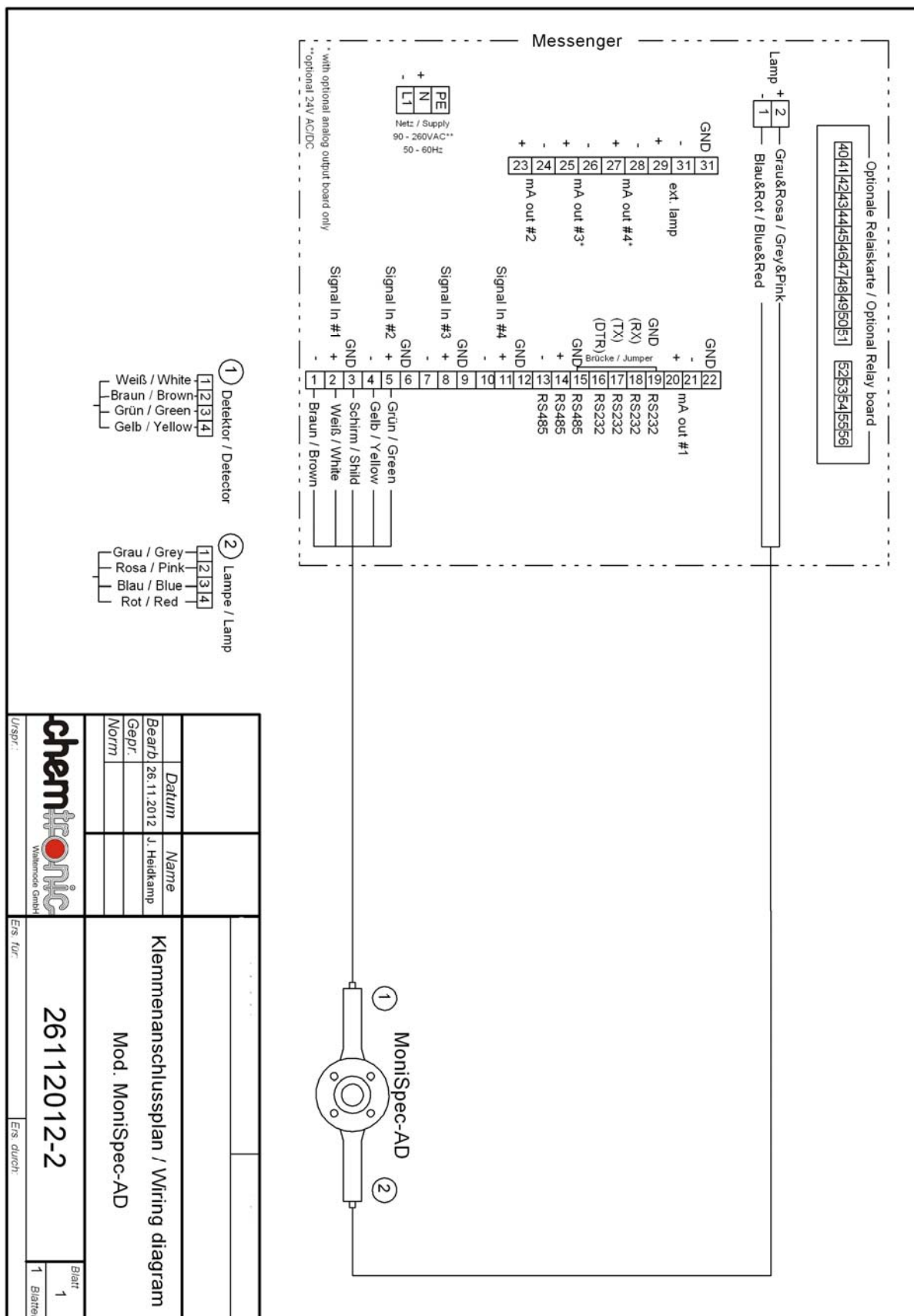


Chemtronic Waltemode GmbH Niederstr. 14 40789 Monheim am Rhein Tel.: +49-(0)2173-57007 / Fax: +49-(0)2173-56007 E-Mail: info@chemtronic-gmbh.de	Mod. MoniSpec-AD				Zusammenbauzeichnung Building up drawing		Datum 28.02.2007		Version 3	
	Kat.- Nr. / Cat.- No.: MSAD				Expl MSAD.SKF		Name J. Heickamp		Blatt/Bl. 1 / 1	
	.. Änderungen vorbehalten/Changes reserved									

Spare Parts List

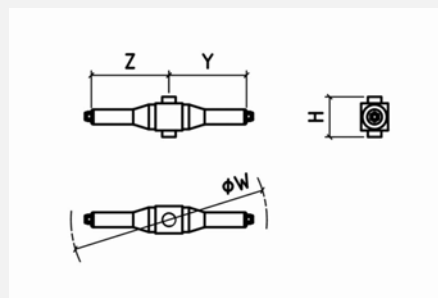
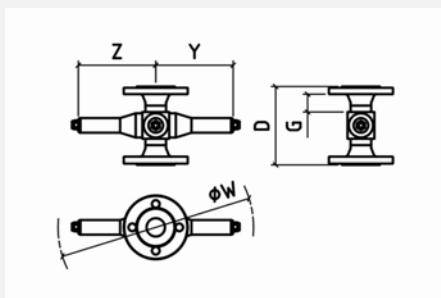
Pos.	Qty required	Article-No.	Article-Description
001	1	S-0000-0006-00	Stückliste MoniSpec-AD
002	2	C208-3007-00	O-Ring (MT, MS • EPDM • 33x2)
003	2	C208-3007-01	O-Ring (MT, MS • VITON • 33x2)
004	2	C208-3007-02	O-Ring (MT, MS • KALREZ • 33x2)
005	2	2001-0925-01-1	Fenstereinsatz - Standard (MT, MS)
006	2	C208-3006-00	O-Ring (MT, MS • EPDM • 20x2)
007	2	C208-3006-01	O-Ring (MT, MS • VITON • 20x2)
008	2	C208-3006-02	O-Ring (MT, MS • KALREZ • 20x2)
009	2	2001-1221-01	Messfenster / measuring window (Saphir 7,0mm) - (MT, MS)
010	2	2001-1221-20	Messfenster / measuring window (Saphir 20,0mm) - (MT, MS)
011	2	2001-1221-25	Messfenster / measuring window (Saphir 25,0mm) - (MT, MS)
012	2	2001-1221-30	Messfenster / measuring window (Saphir 30,0mm) - (MT, MS)
013	2	2001-1221-33	Messfenster / measuring window (Saphir 32,5mm) - (MT, MS)
014	2	2001-1221-34	Messfenster / measuring window (Saphir 34,0mm) - (MT, MS)
015	2	C208-3008-01	O-Ring - GRÜN (MT, MS • VITON-G • 20x2)
016	2	2001-0911-19-1	Optikhalterung m. Luftanschl./Optic bracket w. air purge
017	2	2001-0911-19-2	Optikhalterung o. Luftanschl./Optic bracket w/o air purge
018	1	2001-1301-01	Klemmenanschlussplatine (Defektor)/Connection board (detector)
019	1	2001-1301-02	Klemmenanschlussplatine (Lampe)/Connection board (lamp)
020	2	2001-1004-01	Messarmgehäuse - Sensor housing Standard (MT, MS)
021	2	C305-1034-00	Kabelverschraubung VA/Cable gland 316SS (PG11)
022	1	C402-1001-00	Messlampe / measuring lamp - (MT, MS)
023	2	C305-1002-00	Luftanschluss 90°/Connector air purge 90°
024	1	2001-1030-02	Lampenschlüssel / lamp tool (MT, MS)
025	2	2001-1017-01	Flachdichtung Ex / Flat gasket Ex (MT, MS)
026	2	2001-1009-01	Adapterplatte(Ex) / Adapter plate (Ex) - (MS, MT)
027	2	2001-1018-01	Platte für Luftanschluß Ex / plate for air purge conn. Ex (MT, MS)
028	1	C608-1002-00	Reinigungs-sonde, 120mm lang / Cleanig probe 120mm length (MT, MS)
029	1	C608-1003-00	Reinigungs-sonde, 80mm lang / Cleanig probe 80mm length (MT, MS)
030	1	2001-1000-01	Verschraubung Reinigungsdüse (1/4" MNPT • MT, MS)
031	1	2001-1016-01	Kalibrierfilterkassette / Calibration filter adapter (MS)
032	2	2001-1016-03	Flachdichtung Kalibrierfilterkassette/flat gasket calibr. adapter (MS)
033	2	2001-1019-01	Kalibrierfilter / Calibration filter (MS)
034	1	2001-0508-00	Baugruppe Messlampe - Kit lamp assy / VIS (MSA, MSAD)
035	1	2001-0506-00	Baugruppe Defektor MSAD - Kit detector assy MSAD
036	1	C604-1001-00	Defektorkabel / detector cable - (MT, MS)
037	1	C604-1002-00	Lampenkabel / lamp cable - (MT, MS)
038	2	C208-3009-01	O-Ring - GRÜN (MT, MS • VITON-G • 50x2)

Wiring Diagram Model MoniSpec-AD / Messenger (single Sensor)



Dimensions

MoniSpec-A - MoniSpec-AD



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	D	W
DN 25	184	184	169	800
DN 32			173	
DN 40			177	
DN 50			183	
DN 65	193	193	180	900
DN 80	199	199	190	
DN 100	212	212	194	
DN 125	223	223	200	
DN 150	238	238	200	1000

Flansch/Flange:

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

± 1 mm	Z	Y	D	W
DN 25	184	184	173	800
DN 32			177	
DN 40			183	
DN 50			189	
DN 65	193	193	194	900
DN 80	199	199	206	
DN 100	212	212	220	
DN 125	223	223	226	
DN 150	238	238	240	1000

Flansch/Flange:

ANSI B 16.5 / 150 lb in²

± 1 mm	Z	Y	D	W
1"	184	184	204,2	800
1 ¼"			207,4	
1 ½"			217,0	
2"			220,0	
2 ½"	191	191	229,8	900
3"	199	199	229,8	
4"	212	212	242,4	
5"	223	223	267,8	
6"	238	238	267,8	1000

Flansch/Flange:

ANSI B 16.5 / 300 lb in²

± 1 mm	Z	Y	D	W
1"	184	184	217,0	800
1 ¼"			223,0	
1 ½"			229,6	
2"			232,8	
2 ½"	191	191	242,4	900
3"	199	199	248,4	
4"	212	212	261,8	
5"	223	223	287,2	
6"	238	238	287,2	1000

Flansch/Flange:

ANSI B 16.5 / 400 lb in²

± 1 mm	Z	Y	D	W
1"	184	184	229,8	800
1 ¼"			238,8	
1 ½"			245,6	
2"			252,2	
2 ½"	191	191	261,2	900
3"	199	199	268,0	
4"	212	212	280,6	
5"	223	223	306,0	
6"	238	238	309,0	1000

Flansch/Flange:

ANSI B 16.5 / 600 lb in²

± 1 mm	Z	Y	D	W
1"	184	184	229,8	800
1 ¼"			238,8	
1 ½"			245,6	
2"			252,2	
2 ½"	191	191	261,2	900
3"	199	199	268,0	
4"	212	212	306,0	
5"	223	223	331,4	
6"	238	238	337,4	1000

Milchgewinde/Milk fitting:

DIN 11851

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

Milchgewinde/Milk fitting:

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

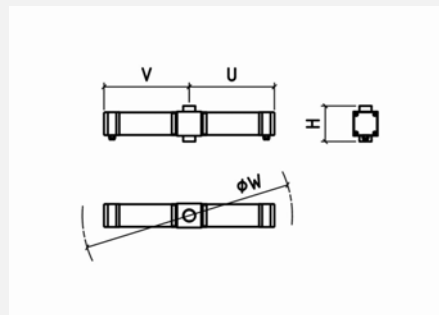
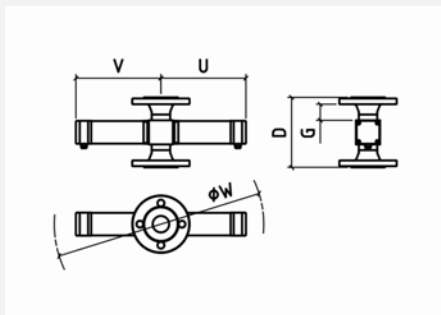
APV:

± 1 mm	Z	Y	D	W
DN 25	184	184	141	800
DN 32	nicht auswählbar / not available			
DN 40	184	184	141	800
DN 50			141	
DN 65	193	193	138	
DN 80	199	199	138	900
DN 100	212	212	138	
DN 125	232	232	144	
DN 150	238	238	144	

NPT:

± 1 mm	Z	Y	H	W
1"	184	184	93	800

MoniSpec-A (Ex-Version) - MoniSpec-AD (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	D	W
DN 25	226	226	169	800
DN 32			173	
DN 40			177	
DN 50			183	
DN 65	235	235	180	900
DN 80	241	241	190	
DN 100	254	254	194	
DN 125	265	265	200	
DN 150	280	280	200	1000

Flansch/Flange:

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

± 1 mm	V	U	D	W
DN 25	226	226	173	800
DN 32			177	
DN 40			183	
DN 50			189	
DN 65	235	235	194	900
DN 80	241	241	206	
DN 100	254	254	220	
DN 125	265	265	226	
DN 150	280	280	240	1000

Flansch/Flange:

ANSI B 16.5 / 150 lb in²

± 1 mm	V	U	D	W
1"	226	226	204,2	800
1 ¼"			207,4	
1 ½"			217,0	
2"			220,0	
2 ½"	233	233	229,8	900
3"	241	241	229,8	
4"	254	254	242,4	
5"	265	265	267,8	
6"	280	280	267,8	1000

Flansch/Flange:

ANSI B 16.5 / 300 lb in²

± 1 mm	V	U	D	W
1"	226	226	217,0	800
1 ¼"			223,0	
1 ½"			229,6	
2"			232,8	
2 ½"	233	233	242,4	900
3"	241	241	248,4	
4"	254	254	261,8	
5"	265	265	287,2	
6"	280	280	287,2	1000

Flansch/Flange:

ANSI B 16.5 / 400 lb in²

± 1 mm	V	U	D	W
1"	226	226	229,8	800
1 ¼"			238,8	
1 ½"			245,6	
2"			252,2	
2 ½"	233	233	261,2	900
3"	241	241	268,0	
4"	254	254	280,6	
5"	265	265	306,0	
6"	280	280	309,0	1000

Flansch/Flange:

ANSI B 16.5 / 600 lb in²

± 1 mm	V	U	D	W
1"	226	226	229,8	800
1 ¼"			238,8	
1 ½"			245,6	
2"			252,2	
2 ½"	233	233	261,2	900
3"	241	241	268,0	
4"	254	254	306,0	
5"	265	265	331,4	
6"	280	280	337,4	1000

Milchgewinde/Milk fitting:

DIN 11851

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

Milchgewinde/Milk fitting:

± 1 mm	V	U	T	D	W
1"	226	226	226	151	800
1 ¾"				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 wählbar / not available				
6"					

APV:

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

NPT:

± 1 mm	Z	Y	H	W
1"	226	226	93	800

Technical Data / Data Sheet

Model MoniSpec-AD (MSAD)



- Low maintenance
- Extended calibration interval: Typical 12 month
- Sight glass material: Sapphire
- Sight glass cleaning: Via cleaning jet probe
- Cleaning in place (CIP)
- Process connection: DIN, ANSI, SMS, NPT, APV, TH, ...
- Optional air purge connection: 4mm

Description:

The sensor model MoniSpec-AD uses the principle of dual channel light absorption to detect colour in liquids. The transmitter model Messenger is required to use this sensor. The system has been designed for continuous operation with long life time. The difference between measurement and reference channel ($[\text{colour} + \text{turbidity}] - \text{turbidity} = \text{colour}$) provides the colour signal. The sensor can be installed into almost any type of pipe. Process connection, gasket material, etc. will be selected application specific. Optional cleaning jets will allow a cleaning of the sapphire windows in determined intervals. Calibration can be done in multiple ranges and measurement units like Hazen, APHA, ASTM, ppm, etc.. Due to the availability of multiple optical path lengths (2mm up to 500mm) the sensor allows measurement ranges of approximately 0-20Hazen up to 0-50000Hazen.

Applications:

- Product colour
- Hazen colour according APHA
- ASTM 1500 colour & Saybolt Colour
- Lovibond colour & EBC colour

Operational areas:

- Chemical industry
- Petrochemical industry
- Water & vegetable oil
- Brew & Beverage

Technical Data:

Line size: DN 25 – DN 125 / 1/2" - 5"
 Process pressure: PN16 / ANSI class 150
 Process temperature: maximum 140°C
 Sensor material: 1.4404 / 316L
 Sight glass material: Sapphire
 Gasket material: application specific
 Protection class: IP65 / NEMA 4X

Measurement range: typical 0–20Hazen, 0–50000Hazen
 Reproducibility: $\pm 1\%$
 Detector: Silica diode
 Measurement wavelength: 390 - 900nm
 Cleaning: optional cleaning jet probe
 Sterilization: CIP (cleaning in place)
 optional hazardous area: ATEX Zone I or Zone II