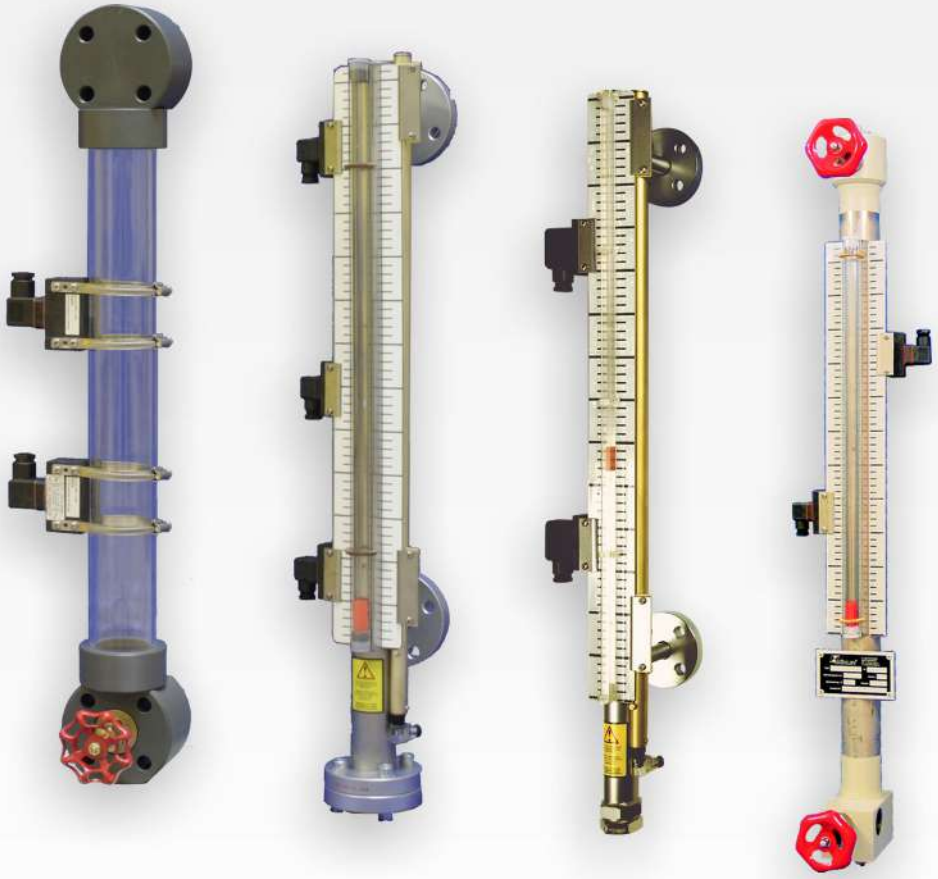

BÜHLER TECHNOLOGIES

Fluidcontrol

IO-Link

External level switches

NS xx/xx-AM, HD-NS xx-AM

Installation and Operation Instructions

Original instructions

BE200001
01/2025

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E-Mail: fluidcontrol@buehler-technologies.com

Read this instruction carefully prior to installation and/or use. Pay attention particularly to all advises and safety instructions to prevent injuries. Bühler Technologies can not be held responsible for misusing the product or unreliable function due to unauthorised modifications.

Document information
Document No.....BE200001
Version..... 01/2025

Contents

1 Introduction

1.1 Intended Use

The level switches are used to monitor the liquid level in fluid systems. They mount to the outside of the tank and have a visual display and electric liquid level monitor. Depending on the model the operating pressure can be between 3 and 360 bar.

The level switches can optionally be equipped with a transducer tube to allow for continuous electronic liquid level monitoring. Different versions also allow for use in aggressive mediums.

Please refer to the technical data in the appendix for the specific intended use and available material combinations.

WARNING

All models are solely intended for industrial applications. They are **not safety components**. The devices must not be used if failure or malfunction thereof jeopardises the safety and health of persons.
Use in explosive areas is **prohibited**.
The level switches are not designed for cycling!

Any use outside the technical data and outside the areas of application specified in these instructions is considered improper use.

1.2 Functionality

1.2.1 Liquid level monitoring

In a number of applications it's beneficial to combine visual and electrical liquid level monitoring. The display outside the tank is often most visible. This is where the NS-AM level switch is used.

1.3 Model key NS 10

NS 10/-XX-XX-SK166/-XX

Length
L1 = mm

Float

No optional continuous liquid level measurement BLT-AM (max. 4650 mm)
LD5 IO-Link 5 mm resolution
LD10 IO-Link 10 mm resolution
LA5 Analog 4...20 mA 5 mm resolution
LA10 Analog 4...20 mA 10 mm resolution
if not required

Type designation

Version
0-AM with pipe socket
15-AM DN 15 flange
25-AM DN 25 flange

1.4 Model key NS 25

NS 25/-XX-XX-XX/-XX

Length
L1 = mm

Float type
SK661 spec. min. fluid weight 0.85 kg/dm³
SK662 spec. min. fluid weight 0.70 kg/dm³

No optional continuous liquid level measurement BLT-AM (max. 4650 mm)
LD5 IO-Link 5 mm resolution
LD10 IO-Link 10 mm resolution
LA5 Analog 4...20 mA 5 mm resolution
LA10 Analog 4...20 mA 10 mm resolution
if not required

Type designation

Version
15-AM DN 15 flange
25-AM DN 25 flange

1.5 Model key NS 64

NS 64/25AM-XX-SK596/-XX

Type designation/tank top installation

No optional continuous liquid level measurement BLT-AM (max. 4650 mm)
LD5 IO-Link 5 mm resolution
LD10 IO-Link 10 mm resolution
LA5 Analog 4...20 mA 5 mm resolution
LA10 Analog 4...20 mA 10 mm resolution
if not required

Length
L1 = mm

Float

1.6 Model key NS 100

NS100/25AM-XX-SK596/-XX

Type designation/tank top installation

No optional continuous liquid level measurement BLT-AM (max. 4650 mm)
LD5 IO-Link 5 mm resolution
LD10 IO-Link 10 mm resolution
LA5 Analog 4...20 mA 5 mm resolution
LA10 Analog 4...20 mA 10 mm resolution
if not required

Length
L1 = mm

Float

1.7 Model key HD NS 250

HD NS250-AM-G1-V-XX-SK597/-XX

Model designation, high pressure level switch

Tank top installation

Connection
G1

Valve

Length
L1 = mm

Float

No optional continuous liquid level measurement BLT-AM (max. 4650 mm)
LD5 IO-Link 5 mm resolution
LD10 IO-Link 10 mm resolution
LA5 Analog 4...20 mA 5 mm resolution
LA10 Analog 4...20 mA 10 mm resolution
if not required

1.8 Model key HD NS 360

HD NS360-AM-G1-V-XX-SK597/-XX

Model designation, high pressure level switch

Tank top installation

Connection
G1

Valve

Length
L1 = mm

Float

No optional continuous liquid level measurement BLT-AM (max. 4650 mm)
LD5 IO-Link 5 mm resolution
LD10 IO-Link 10 mm resolution
LA5 Analog 4...20 mA 5 mm resolution
LA10 Analog 4...20 mA 10 mm resolution
if not required

1.9 Pressure Equipment Directive information

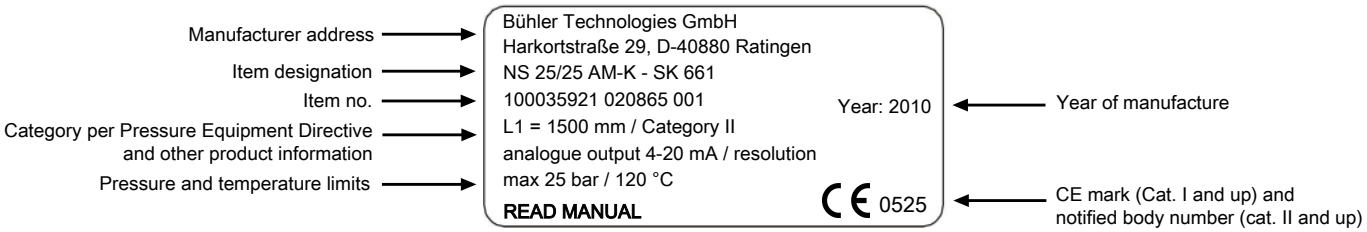
The level switches are designed, manufactured and tested to Pressure Equipment Directive 2014/68/EU according to AD-2000 code.

The actual category of the level switch achieved is printed on the type plate. Comprehensive quality assurance is performed according to module H.

HD-NS series level switches include TÜV-approval. Tested to Pressure Equipment Directive 2014/68/EU (Module G).

Level switches which fall under article 4, section 3 of the Pressure Equipment Directive 2014/68/EU do not bear a CE mark.

The type plate contains the following information:



The operator must always check the resistance of the level switch materials against the mediums used (materials see Technical Data).

Based on the resistance to the medium used, HD-NS series level switches are only approved for fluid group 2 per Pressure Equipment Directive 2014/68/EU.

The level switches are not designed for cycling.

During pressure testing the level switches are pressurised with the following test pressure:

Type:	NS 10	NS 25	NS 64	NS 100	NS 250	NS 360
Test pressure:	15 bar	38 bar	96 bar	150 bar	375 bar	540 bar

1.10 Scope of Delivery

- Level switch
- Product documentation
- Connection/mounting accessories (optional)

2 Safety instructions

2.1 Important advice

Operation of the device is only permitted if:

- the product is used under the conditions described in the installation- and operation instruction, the intended application according to the type plate and the intended use. In case of unauthorized modifications done by the user Bühler Technologies GmbH can not be held responsible for any damage,
- when complying with the specifications and markings on the nameplates.
- the performance limits given in the datasheets and in the installation- and operation instruction are obeyed,
- monitoring devices and safety devices are installed properly,
- service and repair is carried out by Bühler Technologies GmbH,
- only original spare parts are used.

This manual is part of the equipment. The manufacturer keeps the right to modify specifications without advanced notice. Keep this manual for later use.

Signal words for warnings

DANGER	Signal word for an imminent danger with high risk, resulting in severe injuries or death if not avoided.
WARNING	Signal word for a hazardous situation with medium risk, possibly resulting in severe injuries or death if not avoided.
CAUTION	Signal word for a hazardous situation with low risk, resulting in damaged to the device or the property or minor or medium injuries if not avoided.
NOTICE	Signal word for important information to the product.

Warning signs

These instructions include the following warnings:

	General warning sign		General mandatory sign
	Voltage warning		Wear respiratory equipment
	Warning not to inhale toxic gases		Wear a safety mask
	Warning of corrosive substances		Wear gloves
	High pressure warning		

2.2 General hazard warnings

The equipment must be installed by a professional familiar with the safety requirements and risks.

Be sure to observe the safety regulations and generally applicable rules of technology relevant for the installation site. Prevent malfunctions and avoid personal injuries and property damage.

The operator of the system must ensure:

- Safety notices and operating instructions are available and observed,
- The respective national accident prevention regulations are observed,
- The permissible data and operational conditions are maintained,
- Safety guards are used and mandatory maintenance is performed,
- Legal regulations are observed during disposal,
- compliance with national installation regulations.

Maintenance, Repair

Please note during maintenance and repairs:

- Repairs to the unit must be performed by Bühler authorised personnel.
- Only perform conversion-, maintenance or installation work described in these operating and installation instructions.
- Always use genuine spare parts.
- Do not install damaged or defective spare part. If necessary, visually inspect prior to installation to determine any obvious damage to the spare parts.

Always observe the applicable safety and operating regulations in the respective country of use when performing any type of maintenance.

The method for cleaning the devices must be adapted to the IP protection class of the devices. Do not use cleaners which could damage the device materials.

DANGER **Toxic, corrosive gases or liquids**

Gasses or liquids can be harmful to the health.

a) If necessary, ensure a safe gas/liquid discharge.

b) Always disconnect the gas supply when performing maintenance or repairs.

c) Protect yourself from toxic/corrosive gasses/liquids when performing maintenance. Wear suitable protective equipment.

3 Transport and storage

Only transport the product inside the original packaging or a suitable alternative.

The equipment must be protected from moisture and heat when not in use. It must be stored in a covered, dry, dust-free room at room temperature.

4 Setup and connection

DANGER **Electric voltage**

Risk of electric shock

a) Always disconnect the unit from the mains before performing work.

b) Secure the equipment from accidental restarting.

c) The equipment may only be installed, maintained and put into operation by instructed, competent personnel.

d) Always observe the applicable safety regulations for the operating site.

WARNING **Fluids or gasses discharged at high pressure harmful to the environment or health**

a) Depressurise the system/component prior to installation.

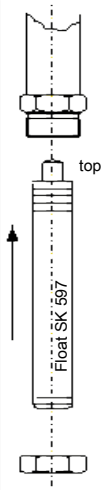
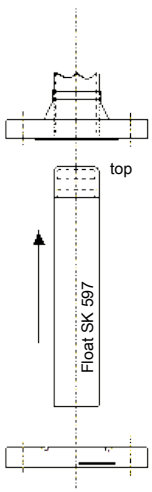
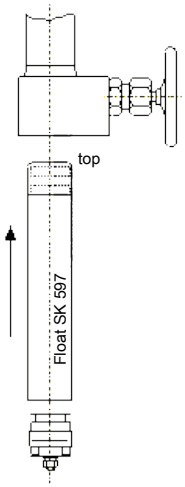
b) Drain the system/component in accordance with environmental regulations. Wear suitable protective clothing.

4.1 Installation

The float is included in the package (not model NS 25/...AM) and must be installed prior to installation.

Proceed as follows:

Note: After installing or removing the float, be sure the magnet inside the float is above the fluid level. This can easily be verified with a piece of iron to determine the magnet position inside the float.

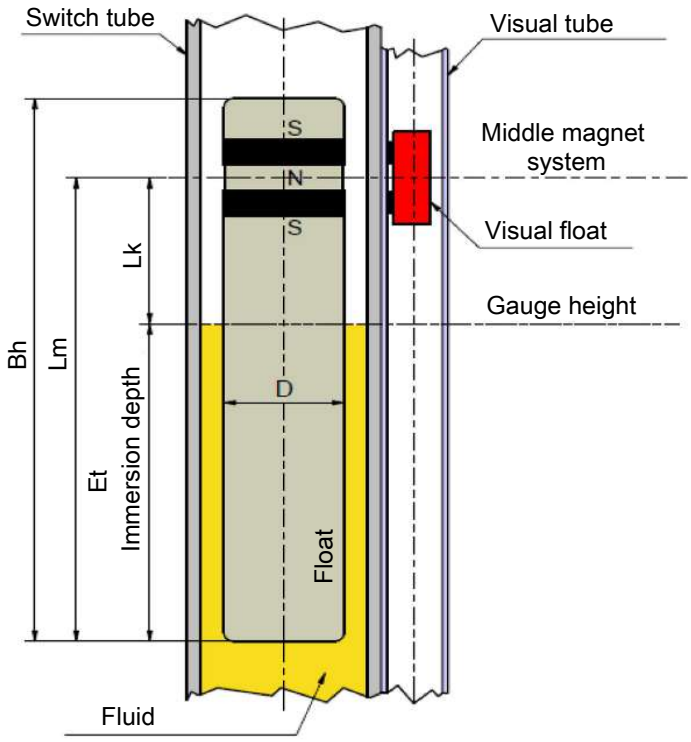
NS 10/... AM		NS 64/25 and NS 100/25 AM		HD-NS ...	
	Unscrew the hexagon cap at the bottom of the riser and insert the float (SK166), top end first. Reattach the cap with the seal attached.		Screw the dummy flange onto the bottom end of the steel tube and insert the float (SK596), top end first. Reattach the dummy flange with seal		Unscrew the plug from the bottom of the riser and insert the float, top end first. After checking the O-ring and back-up ring, screw the plug all the way in again.

Now attach the side fittings of the level switch to the tank fitting. The holes in all seals must be large enough to prevent cross-section constriction in the connection fitting. Mounting to the connections must be tension-free. Therefore tighten all screws to the same torque.

Every switch has a display. The sight glass is made from polycarbonate and mounted to the indicator scale. The indicator has a scale and, as the unit, is made from stainless steel.

The solenoid switches (type MKS) are flush mounted to the indicator scale and are variable.

Display height and fluid density



Float type	SK166	SK661	SK662	SK596	SK597
Item no.	1801166	2801661	2802662	2805596	2806597
Material	NBR	1.4571	1.4571	LD4000	LD7000 / PP
D [mm]	Ø32	Ø44	Ø44	Ø44	Ø45
Bh [mm]	215	235	400	269	362
Lm [mm]	183	207	372	251	341
max. pressure [bar]	10	25	25	100	360
Density [kg/dm³]	0.6	0.74	0.61	0.63	0.71

Theoretically calculated adjustment length Lk [mm] by float type

Fluid density [kg/dm³]	Et [mm]	Lk [mm]	Et [mm]	Lk [mm]	Et [mm]	Lk [mm]	Et [mm]	Lk [mm]	Et [mm]	Lk [mm]
0.7	-	-	-	-	348	24	-	-	-	-
0.75	172	11	-	-	325	47	-	-	-	-
0.8	161	22	-	-	305	67	-	-	321	20
0.85	152	31	205	2	287	85	199	52	302	39
0.9	143	40	193	14	271	101	188	63	286	55
0.95	163	20	183	24	257	115	178	73	271	70
1	129	54	174	33	244	128	170	81	257	84
1.05	123	60	166	41	232	140	161	90	245	96
1.1	117	66	158	49	222	150	154	97	238	103

4.2 Electrical connections

DANGER **Electric voltage**

Risk of electric shock
When connecting devices, please note the maximum voltages and currents currents (see technical data) and use the correct wire cross-sections and circuit breakers.
When selecting the connection lines, also note the maximum operating temperatures of the devices.
Installation in special areas of application:
If the device will be installed outdoors or in wet areas, the maximum operating voltage is max. 16 V DC effective or 35 V DC.

The solenoid switches are available as change-over contact, single NC contact/NO contact, or as double NC contact/NO contact. Please refer to the appendix for the terminal configuration and technical data of the contacts.

4.3 Information on the correct operation of reed contacts in Bühler level switches

Based on their construction, reed contacts are very long lasting and reliable components. Yet the following should be considered when using them:

Life of reed switches

The life of reed switches can be up to 10^9 cycles. This is reduces by high stress and / or incorrect or the absence of protective circuits when switching inductive, capacitive or lamp loads.

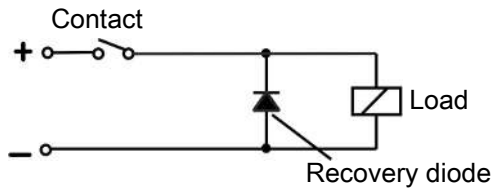
It's therefore important to ensure NEVER to exceed one or several of the maximum approved limits, even temporarily, and to install a contact protective circuit for loads which are not purely ohmic. Using test lamps when installing the devices is also prohibited, as these can temporarily allow too much current to flow, which can damage the reed contacts. In this case non-volatile testing equipment should always be used.

Contact protective circuits for reed switches

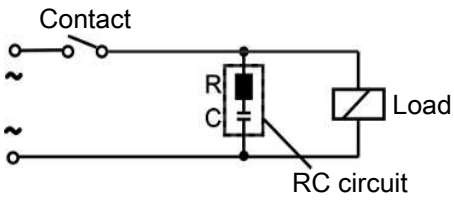
For direct current voltage a recovery diode per figure A must be connected parallel to the contact.

For alternating current voltage an RC circuit per Figure B and Table 1 must be connected parallel to the contact.

A



B



Load in VA	10		25		50	
Voltage at contact V	R/Ohm	C/µF	R/Ohm	C/µF	R/Ohm	C/µF
24	22	0.022	1	0.1	1	0.47
60	120	0.0047	22	0.022	1	0.1
110	470	0.001	120	0.0047	22	0.022
230	470	0.001	470	0.001	120	0.0047

Please note the max. voltage/load ratings of the respective level contacts!

Voltages and currents

All Bühler level contacts with reed switch can switch minimal Switching voltages of 10 µV and minimal switching currents of 1 µA.

The maximum values specified for the respective contact types apply.

Level contact with reed switches can therefore be used for SPS applications as well as for high loads (within the maximum limits) without hesitation.

Contact material

All reed switches in Bühler level contacts use rhodium as the contact material for the actual contact areas.

Magnetic fields

Avoid external magnetic fields, including from electric motors. These can interfere with the function of the reed switches.

Mechanical loads

Do not expose the level switch to strong blows or bending.

4.4 Level Switch With Transducer Tube (4 – 20 mA Output or IO-Link)

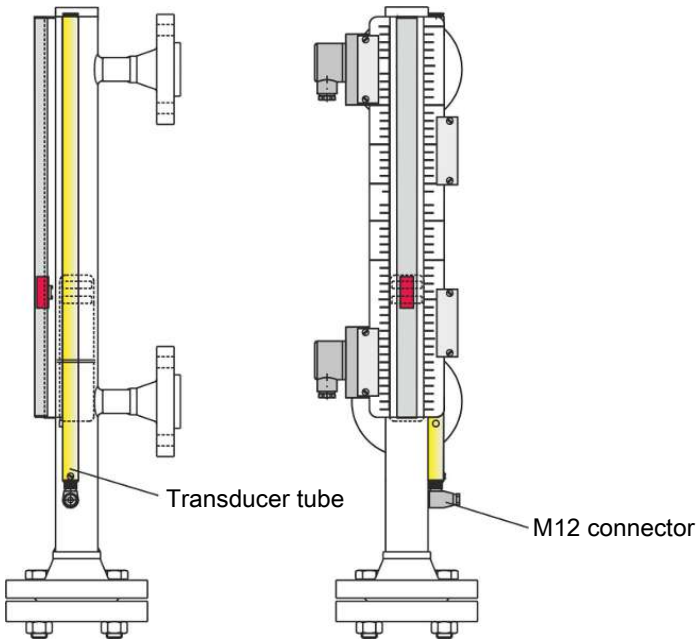
If the level switch is equipped with BLT transducer tube for continuous liquid level monitoring, the solenoid switches can only be installed on the left side of the indicator scale. The transducer is factory set (4 mA = tank empty; 20 mA = tank full) and must not be changed.

4.5 Retrofitting the transducer tube

The BLT transducer tube can be retrofit. In this case the solenoid contacts must be installed left of the indicator scale.

The transducer tube contains a reed chain with 5 or 10 mm resolution and clips to the right side of the indicator. The connector must be at the bottom. The transducer tube must touch the level switch along the entire length.

Please refer to the appendix for the connector wiring diagram.



5 Operation and control

NOTICE

The device must not be operated beyond its specifications.

5.1 Initial operation

For initial operation level switch operation on a pressurised tank:

– **ALWAYS FIRST SLOWLY** open the top valve.
– Wait for the pressure to equalise.
– Now open the bottom valve.

This will prevent the float from shooting up to the top of the tube at a high speed and under high pressure and from being damaged.

5.2 Bleeding

If the level switch has a bleeder valve, proceed as follows to bleed:

– Loosen the bleeder screw approx. 1 turn.

NOTICE

Never unscrew the bleeder screw all the way. Forcing the bleeder screw to turn can damage it and pieces from it may render the level switch inoperable.

– Allow air to bleed until liquid comes out. Collect the liquid and dispose according to local regulations.
– Tighten the screw.

6 Cleaning and Maintenance

DANGER **Toxic, corrosive gases or liquids**

Gasses or liquids can be harmful to the health.

a) If necessary, ensure a safe gas/liquid discharge.

b) Always disconnect the gas supply when performing maintenance or repairs.

c) Protect yourself from toxic/corrosive gasses/liquids when performing maintenance. Wear suitable protective equipment.

During maintenance, remember:

- The equipment must be maintained by a professional familiar with the safety requirements and risks.
- Only perform maintenance work described in these operating and installation instructions.
- Observe the respective safety regulations and operating specifications when performing any type of maintenance.
- Always use genuine spare parts.
- The method for cleaning the devices must be adapted to the IP protection class of the devices. Do not use cleaners which could damage the device materials.

Inadequate filtration may cause sludge deposit in the system. In this case the level switch must be inspected. Proceed as follows:

- Shut down and depressurise the system/component.
- Drain the liquid according to environmental regulations.
- On level switches with shut-off, close the shut-off. In this case you will not need to drain all of the liquid.
- Open the bleed valve on the level switch and open the lower flange or hexagon cap. Collect the liquid (place a drain tray under it!).
- Clean the float and the float chamber.
- Reinstall the float the in the correct direction (check with a piece of iron: magnet above the liquid level) and close the level switch with the flange or the caps.
- Open the check valves as described in chapter Initial operation [> page 12] and put the level switch into operation.
- Dispose of the collected liquid according to local regulations.

7 Service and repair

This chapter contains information on troubleshooting and correction should an error occur during operation.

Repairs to the unit must be performed by Bühler authorised personnel.

Please contact our Service Department with any questions:

Tel.: +49-(0)2102-498955 or your agent

For further information about our services and customised maintenance visit http://www.buehler-technologies.com/service.

If the equipment is not functioning properly after correcting any malfunctions and switching on the power, it must be inspected by the manufacturer. Please send the equipment inside suitable packaging to:

Bühler Technologies GmbH

- Reparatur/Service -

Harkortstraße 29

40880 Ratingen

Germany

Please also attach the completed and signed RMA decontamination statement to the packaging. We will otherwise be unable to process your repair order.

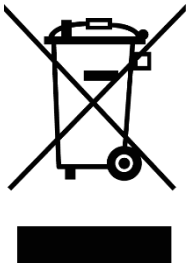
You will find the form in the appendix of these instructions, or simply request it by e-mail:

service@buehler-technologies.com.

8 Disposal

The applicable national laws must be observed when disposing of the products. Disposal must not result in a danger to health and environment.

The crossed out wheelie bin symbol on Bühler Technologies GmbH electrical and electronic products indicates special disposal notices within the European Union (EU).



The crossed out wheelie bin symbol indicates the electric and electronic products bearing the symbol must be disposed of separate from household waste. They must be properly disposed of as waste electrical and electronic equipment.

Bühler Technologies GmbH will gladly dispose of your device bearing this mark. Please send your device to the address below for this purpose.

We are obligated by law to protect our employees from hazards posed by contaminated devices. Therefore please understand that we can only dispose of your waste equipment if the device is free from any aggressive, corrosive or other operating fluids dangerous to health or environment. **Please complete the "RMA Form and Decontamination Statement", available on our website, for every waste electrical and electronic equipment. The form must be applied to the packaging so it is visible from the outside.**

Please return waste electrical and electronic equipment to the following address:

Bühler Technologies GmbH
WEEE
Harkortstr. 29
40880 Ratingen
Germany

Please also observe data protection regulations and remember you are personally responsible for the returned waste equipment not bearing any personal data. Therefore please be sure to delete your personal data before returning your waste equipment.

9 Appendices

9.1 Technical Data NS 10 ..-AM

Basic unit			
Max. operating pressure	10 bar		
Max. operating temperature	100 °C		
spec. min. fluid weight	0.75 kg/dm³		
Material			
Float SK166	NBR		
Riser	1.4571		
Flange	Galvanised steel		
Sight glass	PC		
Sealing cap	1.4571		
Version	**0-AM**	**15-AM**	**25-AM**
Connection	Tube	Flange	Flange
DIN 2656 flange		DN15	DN25
ØD	20	95	115
Øk		65	85
Ød		14	14
b		16	18
ØA		45	68
h		12	14
Weight at L1=500 mm	approx. 7.5 kg	approx. 8.0 kg	approx. 8.75 kg
Weight L1+100 mm	approx. 0.2 kg	approx. 0.2 kg	approx. 0.2 kg

Other versions available upon request

Options

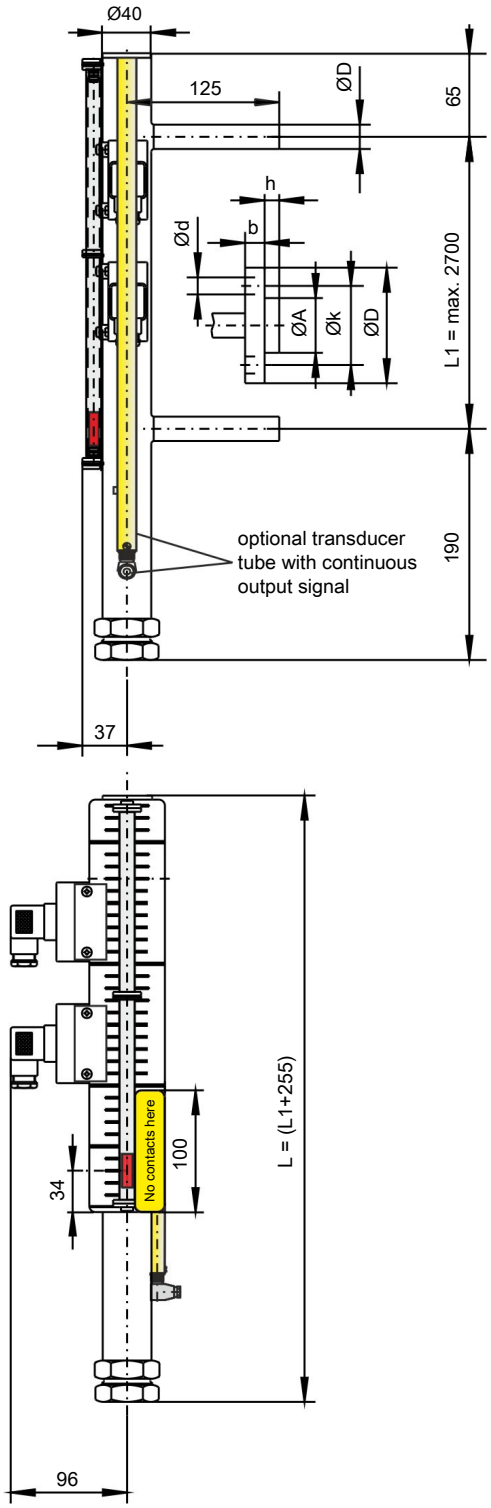
Continuous liquid level measurement BLT-AM or switching contacts, see below

Accessories

Item no.:	**Description:**
2251000	Flange seal 45/22x2 mm (DN15)
2252000	Flange seal 68/27x2 mm (DN25)
2271999	Mounting bolts 8 x M12x65
9008070	Ball valve, steel DN15 PN16/40
9008002	Ball valve, steel DN25 PN16/40
9008071	Ball valve, stainless steel DN15 PN16/40
9008004	Ball valve, stainless steel DN25 PN16/40

Pressure Equipment Directive information:

The level switches are designed, manufactured and tested to Pressure Equipment Directive 2014/68/EU according to AD-2000 code.
The actual category of the level switch achieved is printed on the type plate.
Comprehensive quality assurance is performed according to module H.



9.2 Technical Data NS 25 ..-AM

Basic unit		
Operating pressure	max. 25 bar	
Operating temperature	max. 120 °C	
spec. min. fluid weight	SK661 0.85 kg/dm³	SK662 0.70 kg/dm³
Material		
Float	1.4571	
Riser	1.4571	
Flange	Galvanised steel	
Sight glass	PC	
Version	**15-AM**	**25-AM**
Connection	Flange	Flange
DIN 2656 flange	DN15	DN25
ØD	95	115
Øk	65	85
Ød	14	14
b	16	18
ØA	45	68
h	12	14
S for float SK661	205	205
S for float SK662	390	390
Weight at L1=500 mm	approx. 9.5 kg	approx. 10.5 kg
Weight L1+100 mm	approx. 0.4 kg	approx. 0.4 kg
Other versions available upon request		

Options

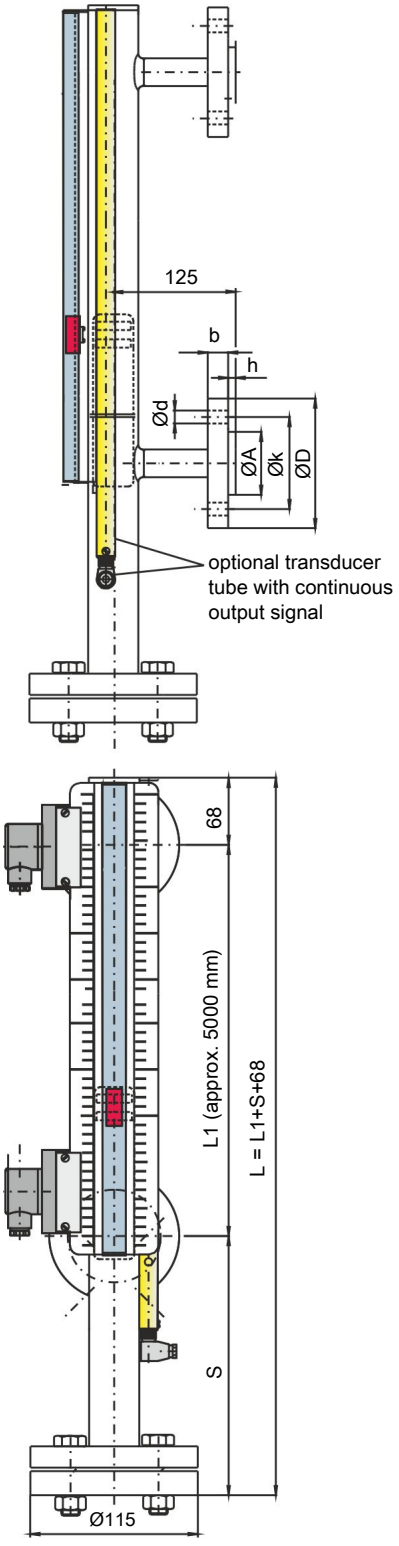
Continuous liquid level measurement BLT-AM or switching contacts, see below

Accessories

Item no.:	**Description:**
2251000	Flange seal 45/22x2 mm (DN15)
2252000	Flange seal 68/27x2 mm (DN25)
2271999	Mounting bolts 8 x M12x65
9008070	Ball valve, steel DN15 PN16/40
9008002	Ball valve, steel DN25 PN16/40
9008071	Ball valve, stainless steel DN15 PN16/40
9008004	Ball valve, stainless steel DN25 PN16/40

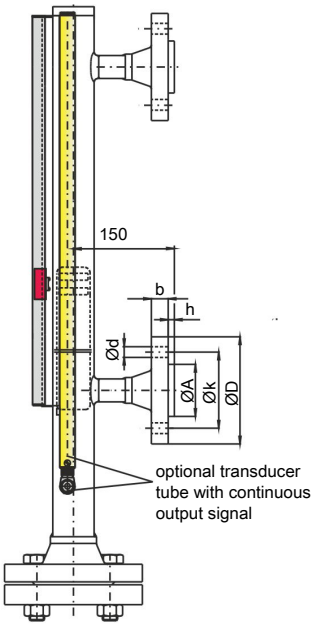
Pressure Equipment Directive information:

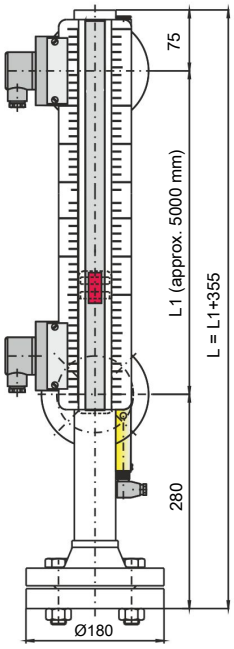
The level switches are designed, manufactured and tested to Pressure Equipment Directive 2014/68/EU according to AD-2000 code.
The actual category of the level switch achieved is printed on the type plate. Comprehensive quality assurance is performed according to module H.



9.3 Technical Data NS 64 ..-AM

Basic unit	
Max. operating pressure	64 bar
Max. operating temperature	50 °C
spec. min. fluid weight	0.85 kg/dm³
Material	
Float SK596	Plastic
Riser	1.4571
Flange	1.4541
Sight glass	PC
Connection	
DIN 2637 flange	**DN 25**
ØD	140
Øk	100
Ød	18
b	22
ØA	68
h	2
Weight at L1=500 mm	approx. 22 kg
Weight L1+100 mm	approx. 0.5 kg
Other versions available upon request	





Options
Continuous liquid level measurement BLT-AM or switching contacts, see below

Accessories

Item no.:	**Description:**
2254000	Flange seal 65/25x2 mm (DN25)
2273999	Mounting bolts 8 x M16x70
9008073	Ball valve, steel DN25 PN64
9008078	Ball valve, stainless steel DN25 PN64

Pressure Equipment Directive information:
The level switches are designed, manufactured and tested to Pressure Equipment Directive 2014/68/EU according to AD-2000 code.
The actual category of the level switch achieved is printed on the type plate. Comprehensive quality assurance is performed according to module H.

9.4 Technical Data NS 100 ..-AM

Basic unit	
Max. operating pressure	100 bar
Max. operating temperature	50 °C
spec. min. fluid weight	0.85 kg/dm³
Material	
Float SK596	Plastic
Riser	1.4571
Flange	1.4541
Sight glass	PC
Connection	
DIN 2637 flange	**DN 25**
ØD	140
Øk	100
Ød	18
b	22
ØA	68
h	2
Weight at L1=500 mm	approx. 25 kg
Weight L1+100 mm	approx. 0.5 kg
Other versions available upon request	

Options

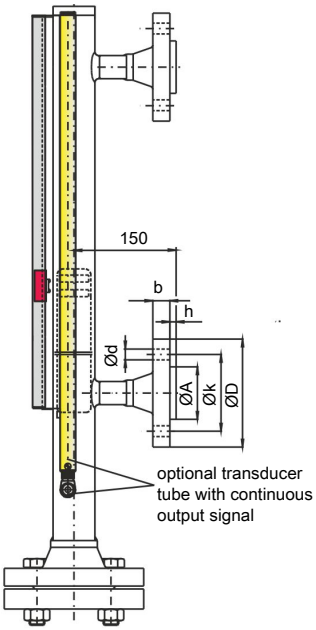
Continuous liquid level measurement BLT-AM or switching contacts, see below

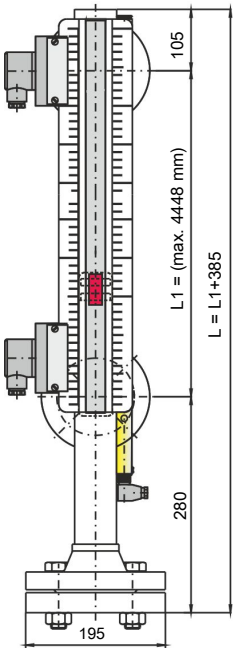
Accessories

Item no.:	**Description:**
2254000	Flange seal 65/25x2 mm (DN25)
2273999	Mounting bolts 8 x M16x70
9008077	Ball valve, steel DN25 PN100
9008079	Ball valve, stainless steel DN25 PN100

Pressure Equipment Directive information:

The level switches are designed, manufactured and tested to Pressure Equipment Directive 2014/68/EU according to AD-2000 code.
The actual category of the level switch achieved is printed on the type plate. Comprehensive quality assurance is performed according to module H.





9.5 Technical Data HD NS 250 ..-AM

Basic unit	
Max. operating pressure	250 bar
Max. operating temperature	50 °C
spec. min. fluid weight	0.80 kg/dm³
L1 max.	4780 mm
Weight at L1=500 mm	approx. 15 kg
Weight L1+100 mm	approx. 0.65 kg
Longer version available upon request	
Material	
Float SK597	Solid plastic
Riser	1.4571
Upper end piece	Steel
Bottom end piece	Steel
Check valve	1.4571
Bleeder valve	1.4571
Sight glass	PC
Connection	
Air end	G1
Water end	G1

Options

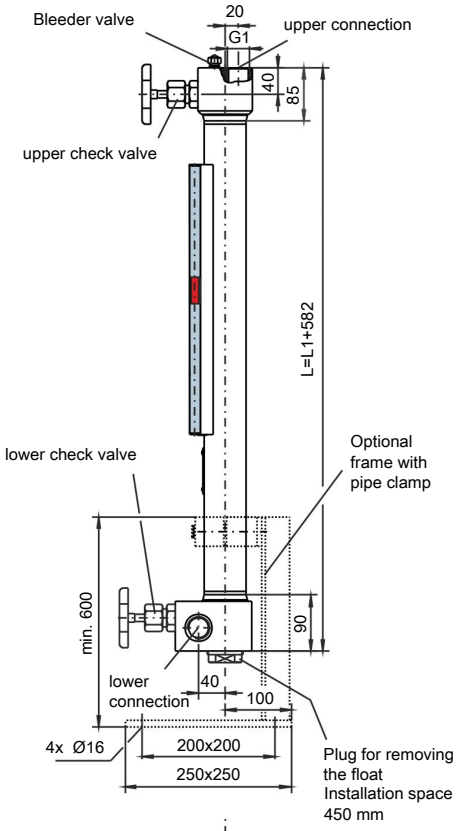
Continuous liquid level measurement BLT-AM or switching contacts, see below

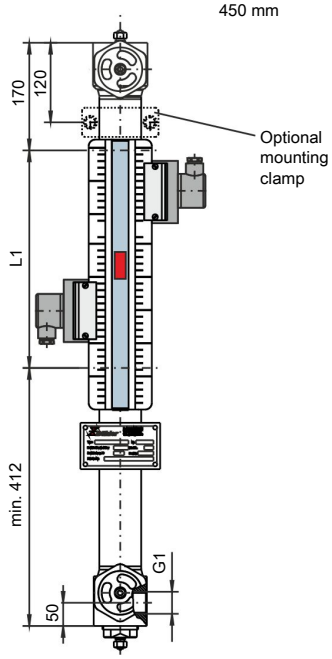
Accessories

Item no.:	**Description:**
2051002	Mounting clamp heavy series SPAL 6060
2254999	Frame for ground anchoring the level switch
2274999	with SPAL 6060 pipe clamp
	Masonry screws 4x DIN529-M12x300 with nuts

Note!

These level switches include TÜV-approval.
Tested to Pressure Equipment Directive 2014/68/EU (Module G).





9.6 Technical Data HD NS 360 ..-AM

Basic unit	
Max. operating pressure	360 bar
Max. operating temperature	50 °C
spec. min. fluid weight	0.80 kg/dm³
L1 max.	4780 mm
Weight at L1=500 mm	approx. 20 kg
Weight L1+100 mm	approx. 1.0 kg
Longer version available upon request	
Material	
Float SK597	Solid plastic
Riser	1.4571
Upper end piece	Steel
Bottom end piece	Steel
Check valve	1.4571
Bleeder valve	1.4571
Sight glass	PC
Connection	
Air end	G1
Water end	G1

Options

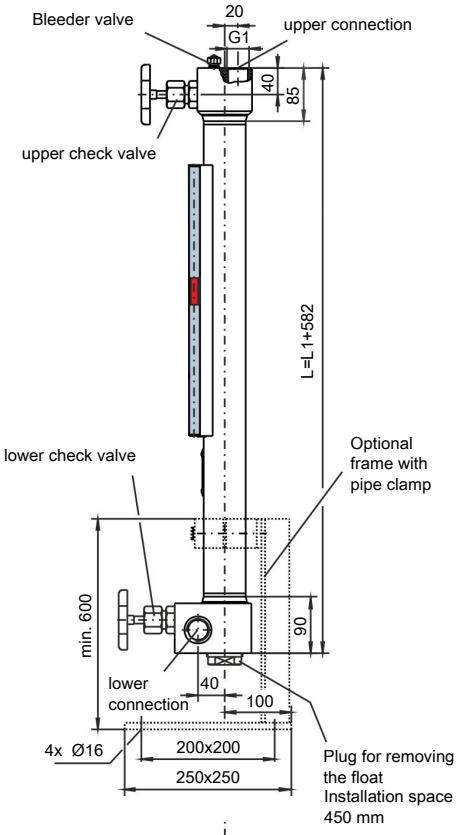
Continuous liquid level measurement BLT-AM or switching contacts, see below

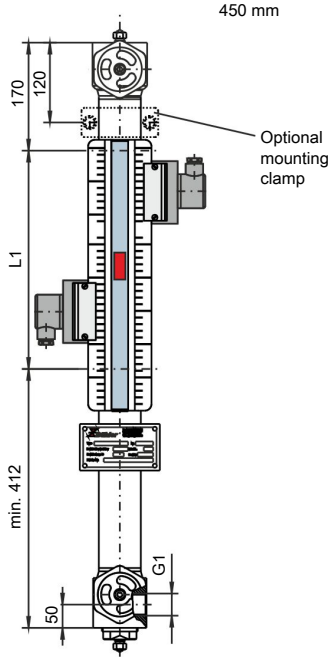
Accessories

Item no.:	**Description:**
2051003	Mounting clamp heavy series SPAL 6063.5
2055999	Frame for level switch ground anchoring with
2274999	pipe clamp SPAL 6063.5
	Masonry screws 4x DIN529-M12x300 with nuts

Note!

These level switches include TÜV-approval.
Tested to Pressure Equipment Directive 2014/68/EU (Module G).

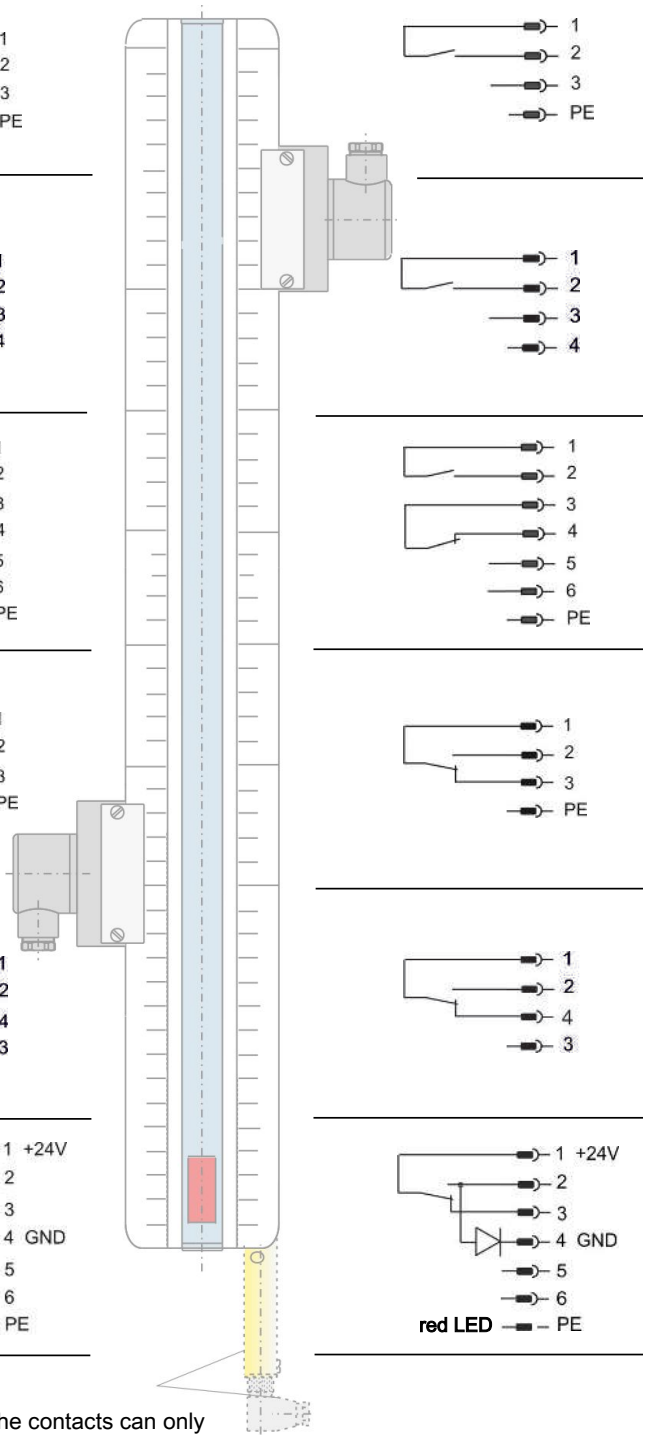




9.7 Contacts for NS ..-AM

Pin assignment (Contact position empty tank)

		Mounted left	Mounted right
Type	**MKS-1/K-M3 (-60)**		
Function	NC contact/NO contact		
Max. voltage	230 VAC/DC		
Max. switching current	1 A		
Max. contact load	50 VA		
Connector	M3 (DIN EN 175301-803) 3-pin + PE	1, 2, 3, PE	1, 2, 3, PE
IP class	IP 65		
Item no.	2888999		
Type	**MKS-1/K-M12**		
Function	NCC/NOC		
Max. voltage	24 V DC		
Max. switching current	1 A		
Max. contact load	50 VA		
Connector	M12 (DIN EN 61076-2-101) 4 pol.	1, 2, 3, 4	1, 2, 3, 4
IP class	IP65*		
Item no.	2893999		
Type	**MKS-2/K-S6**		
Function	2 x NC contact/NO contact		
Max. voltage	230 VAC/DC		
Max. switching current	1 A		
Max. contact load	50 VA		
Connector	S6 6-pin + PE	1, 2, 3, 4, 5, 6, PE	1, 2, 3, 4, 5, 6, PE
IP class	IP 65		
Item no.	2891999		
Type	**MKS-1/W-M3 (-60)**		
Function	Changeover switch		
Max. voltage	230 V AC/DC		
Max. switching current	1 A		
Max. contact load	50 VA		
Connector	M3 (DIN EN 175301-803) 3 pol. + PE	1, 2, 3, PE	1, 2, 3, PE
IP class	IP65		
Item no.	2889999		
Type	**MKS-1/W-M12**		
Function	Changeover switch		
Max. voltage	24 V DC		
Max. switching current	1 A		
Max. contact load	50 VA		
Connector	M12 (DIN EN 61076-2-101) 4 pol.	1, 2, 4, 3	1, 2, 4, 3
IP class	IP65*		
Item no.	2889899		
Type	**MKS-1/W-L 24V-S6 (-60)**		
Function	Changeover switch with LED		
Max. voltage	24 V DC		
Max. switching current	1 A		
Max. contact load	25 VA		
Connector	S6 6 pol. + PE	1 +24V, 2, 3, 4 GND, 5, 6, red LED, PE	1 +24V, 2, 3, 4 GND, 5, 6, red LED, PE
IP class	IP65		
Item no.	2890999		



*IP65 with cable box attached.

When installing a BLT transducer tube with continuous output signal, the contacts can only be mounted on the left.

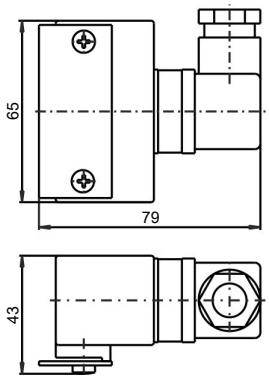
Other contacts available upon request

For applications in high shock and vibration environments we recommend using the contacts MKS-1/K-M3, MKS-1/K-M12 or MKS-2/K-S6.

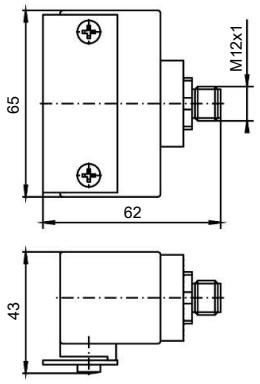
Versions ending in -60 are for switch type NS 3/20 AM and have a pipe clamp for mounting to the level switch tube.

9.8 Dimensions for contacts for NS ..-AM

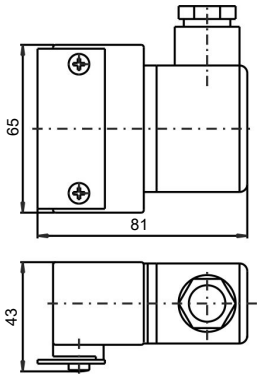
MKS-1/K-M3, MKS-1/W-M3



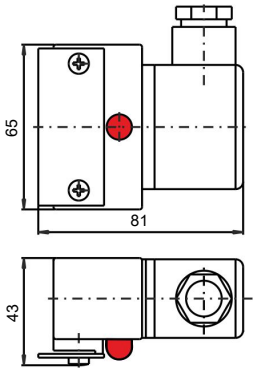
MKS-1/K-M12, MKS-1/W-M12



MKS-2/K-S6



MKS-1/W-L24V-S6



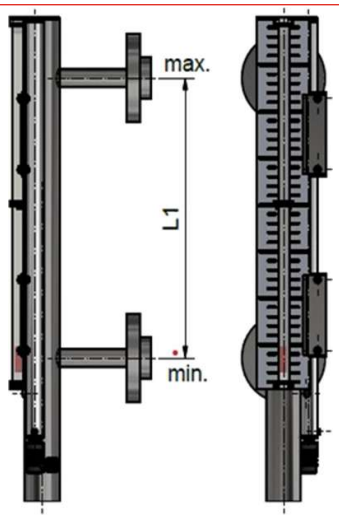
9.9 Technical Data BLT-AM

BLT-AM1(2)-LD-5(10)-1D1S-/VAR with IO-Link interface

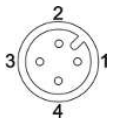
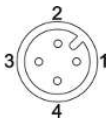
BLT-AM1(2)-LA-5(10)-1A-/VAR with 4-20 mA output

	1D1S	1A
Transducer tube material:	Nickel-plated brass	
Ambient temperature:	-20 °C to +70 °C	
Lengths:	L1 variable to max. 4650 mm	
Input value		
Sensor element:	Reed chain 5 or 10 mm resolution	
Tolerance:	±1% FS	
Operating voltage (UB):	18 - 30 VDC	10 - 30 VDC
Measuring range:	0 to 100 %	4-20 mA > 0-100 %
Output:	IO-Link	4-20 mA
IO-Link	**Rev. 1.1**	-
Baudrate:	COM3 (230.4k)	-
SIO Mode:	Yes	-
Min. Time Period	10 ms	-
Max. Load:	-	(UB-8V)/0.02 A

Dimensions



9.10 Standard Pin Assignment BLT-AM

Connector	**M12 (base)**	**M12 (base)**
Number of pins	4-pin	4-pin
DIN EN 61076-2-101	30 VDC	30 VDC
IP rating with IP67 cable box attached	IP67	IP67
Version	1D1S	1A
Connection schematic		
	1D1S (IO-Link)	**1A (4-20 mA)**
1	+24 VDC	+24 VDC
2	S2 (PNP max. 200 mA)	OUT 4-20 mA
3	GND	GND
4	C/Q (IO-Link)	NC

10 Attached documents

- Declaration of conformity: KX200020, KX100036
- RMA - Decontamination Statement

EU-Konformitätserklärung
EU-declaration of conformity

Hiermit erklärt Bühler Technologies GmbH, dass die nachfolgenden Produkte den Anforderungen der Richtlinie

Herewith declares Bühler Technologies GmbH that the following products correspond to the essential requirements of Directive

2014/68/EU
(Druckgeräterichtlinie / *pressure equipment)*

in ihrer aktuellen Fassung entsprechen.

in its actual version.

Folgende Richtlinien wurden berücksichtigt:

The following directives were regarded:

2014/30/EU (EMV/EMC)
2014/35/EU (NSR/LVD)

Produkt / *products*: Niveauschalter und –geber / *Level switches and gauges*
Typ / *type*: NS-xx/yy-AM-zz mit Anbaukontakten Typ MKS
xx = Druckstufe / *pressure range*
yy = Nennweite des Stutzens / *nominal diameter flange*
zz = Geberrohr (optional) / *transducer tube (option)*

Die Betriebsmittel dienen zur Überwachung des Füllstandes in Fluidsystemen.
The equipment is suitable for monitoring level in fluid systems.

Die tatsächlich erreichte Kategorie ist auf dem Typenschild aufgedruckt.
The category achieved is printed onto the type plate.

Angewandtes Verfahren: Modul H - umfassende Qualitätssicherung
Applied procedure: module H - integrated quality assurance

Das Qualitätsmanagementsystem wird durch folgende notifizierte Stelle überwacht
The quality management system is monitored by the following notified body:

CE *0525; LRQA Deutschland GmbH; Überseeallee 10; 20457 Hamburg*

Folgende harmonisierte Normen wurden angewendet:
The following harmonized standards have been applied:

EN 1092-1:2018 **EN 10204:2005**

Zusätzlich angewendetes Auslegungsregelwerk und angewandte Normen:
Additionally applied design regulations and applied standards:

AD 2000:2015 **EN 61010-1:2010/A1:2019/AC:2019-04** **EN 61326-1:2013**

Die alleinige Verantwortung für die Ausstellung dieser Konformitätserklärung trägt der Hersteller.
This declaration of conformity is issued under the sole responsibility of the manufacturer.

Dokumentationsverantwortlicher für diese Konformitätserklärung ist Herr Stefan Eschweiler mit Anschrift am Firmensitz.
The person authorised to compile the technical file is Mr. Stefan Eschweiler located at the company's address.

Ratingen, den 01.03.2023

Stefan Eschweiler
Geschäftsführer – *Managing Director*

Frank Pospiech
Geschäftsführer – *Managing Director*

KX 20 0020

Bühler Technologies GmbH, Harkortstr. 29, D-40880 Ratingen,
Tel. +49 (0) 21 02 / 49 89-0, Fax. +49 (0) 21 02 / 49 89-20
Internet: www.buehler-technologies.com

EU-Konformitätserklärung
EU-declaration of conformity

Hiermit erklärt Bühler Technologies GmbH, dass die nachfolgenden Produkte den wesentlichen Anforderungen der Richtlinie

Herewith declares Bühler Technologies GmbH that the following products correspond to the essential requirements of Directive

2014/30/EU
(Elektromagnetische Verträglichkeit / *electromagnetic compatibility)*

in ihrer aktuellen Fassung entsprechen.

in its actual version.

Produkt / products: Geberrohr / *Transducer tube*
Typ / type: BLT-AM
BLT-OM

Die Betriebsmittel dienen zur kontinuierlichen Niveaumessung an Niveauschaltern.
The equipment is designed for continuous level measurement on level switches.

Das oben beschriebene Produkt der Erklärung erfüllt die einschlägigen Harmonisierungsrechtsvorschriften der Union:
The object of the declaration described above is in conformity with the relevant Union harmonisation legislation:

EN IEC 61326-1:2021

Die alleinige Verantwortung für die Ausstellung dieser Konformitätserklärung trägt der Hersteller.
This declaration of conformity is issued under the sole responsibility of the manufacturer.

Dokumentationsverantwortlicher für diese Konformitätserklärung ist Herr Stefan Eschweiler mit Anschrift am Firmensitz.
The person authorised to compile the technical file is Mr. Stefan Eschweiler located at the company's address.

Ratingen, den 27.01.2025

Stefan Eschweiler
Geschäftsführer – *Managing Director*

Frank Pospiech
Geschäftsführer – *Managing Director*

Bühler Technologies GmbH, Harkortstr. 29, D-40880 Ratingen,
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RMA-Formular und Erklärung über Dekontaminierung
RMA-Form and explanation for decontamination

RMA-Nr./ RMA-No.

Die RMA-Nr. bekommen Sie von Ihrem Ansprechpartner im Vertrieb oder Service. Bei Rücksendung eines Altgeräts zur Entsorgung tragen Sie bitte in das Feld der RMA-Nr. "WEEE" ein./ You may obtain the RMA number from your sales or service representative. When returning an old appliance for disposal, please enter "WEEE" in the RMA number box.

Zu diesem Rücksendeschein gehört eine Dekontaminierungserklärung. Die gesetzlichen Vorschriften schreiben vor, dass Sie uns diese Dekontaminierungserklärung ausgefüllt und unterschrieben zurücksenden müssen. Bitte füllen Sie auch diese im Sinne der Gesundheit unserer Mitarbeiter vollständig aus./ This return form includes a decontamination statement. The law requires you to submit this completed and signed decontamination statement to us. Please complete the entire form, also in the interest of our employee health.

Firma/ Company

Firma/ Company	
Straße/ Street	
PLZ, Ort/ Zip, City	
Land/ Country	

Ansprechpartner/ Person in charge

Name/ Name	
Abt./ Dept.	
Tel./ Phone	
E-Mail	

Gerät/ Device	
Anzahl/ Quantity	
Auftragsnr./ Order No.	

Serien-Nr./ Serial No.	
Artikel-Nr./ Item No.	

Grund der Rücksendung/ Reason for return

- ☐ Kalibrierung/ Calibration
- ☐ Modifikation/ Modification
- ☐ Reklamation/ Claim
- ☐ Reparatur/ Repair
- ☐ Elektroaltgerät/ Waste Electrical & Electronic Equipment (WEEE)
- ☐ andere/ other

bitte spezifizieren/ please specify

Ist das Gerät möglicherweise kontaminiert?/ Could the equipment be contaminated?

☐ Nein, da das Gerät nicht mit gesundheitsgefährdenden Stoffen betrieben wurde./ No, because the device was not operated with hazardous substances.

☐ Nein, da das Gerät ordnungsgemäß gereinigt und dekontaminiert wurde./ No, because the device has been properly cleaned and decontaminated.

☐ Ja, kontaminiert mit:/ Yes, contaminated with:

☐ explosiv/ explosive	☐ entzündlich/ flammable	☐ brandfördernd/ oxidizing	☐ komprimierte Gase/ compressed gases	☐ ätzend/ caustic	☐ giftig, Lebensgefahr/ poisonous, risk of death	☐ gesundheitsgefährdend/ harmful to health	☐ gesundheitsschädlich/ health hazard	☐ umweltgefährdend/ environmental hazard

Bitte Sicherheitsdatenblatt beilegen!/ Please enclose safety data sheet!

Das Gerät wurde gespült mit:/ The equipment was purged with:

Diese Erklärung wurde korrekt und vollständig ausgefüllt und von einer dazu befugten Person unterschrieben. Der Versand der (dekontaminierten) Geräte und Komponenten erfolgt gemäß den gesetzlichen Bestimmungen.

This declaration has been filled out correctly and completely, and signed by an authorized person. The dispatch of the (decontaminated) devices and components takes place according to the legal regulations.

Falls die Ware nicht gereinigt, also kontaminiert bei uns eintrifft, muss die Firma Bühler sich vorbehalten, diese durch einen externen Dienstleister reinigen zu lassen und Ihnen dies in Rechnung zu stellen.

Should the goods not arrive clean, but contaminated, Bühler reserves the right, to comission an external service provider to clean the goods and invoice it to your account.

Firmenstempel/ Company Sign

Datum/ Date

rechtsverbindliche Unterschrift/ Legally binding signature

Bühler Technologies GmbH, Harkortstr. 29, D-40880 Ratingen
Tel. +49 (0) 21 02 / 49 89-0, Fax: +49 (0) 21 02 / 49 89-20
E-Mail: service@buehler-technologies.com
Internet: www.buehler-technologies.com

Vermeiden von Veränderung und Beschädigung der einzusendenden Baugruppe

Die Analyse defekter Baugruppen ist ein wesentlicher Bestandteil der Qualitätssicherung der Firma Bühler Technologies GmbH. Um eine aussagekräftige Analyse zu gewährleisten muss die Ware möglichst unverändert untersucht werden. Es dürfen keine Veränderungen oder weitere Beschädigungen auftreten, die Ursachen verdecken oder eine Analyse unmöglich machen.

Umgang mit elektrostatisch sensiblen Baugruppen

Bei elektronischen Baugruppen kann es sich um elektrostatisch sensible Baugruppen handeln. Es ist darauf zu achten, diese Baugruppen ESD-gerecht zu behandeln. Nach Möglichkeit sollten die Baugruppen an einem ESD-gerechten Arbeitsplatz getauscht werden. Ist dies nicht möglich sollten ESD-gerechte Maßnahmen beim Austausch getroffen werden. Der Transport darf nur in ESD-gerechten Behältnissen durchgeführt werden. Die Verpackung der Baugruppen muss ESD-konform sein. Verwenden Sie nach Möglichkeit die Verpackung des Ersatzteils oder wählen Sie selber eine ESD-gerechte Verpackung.

Einbau von Ersatzteilen

Beachten Sie beim Einbau des Ersatzteils die gleichen Vorgaben wie oben beschrieben. Achten Sie auf die ordnungsgemäße Montage des Bauteils und aller Komponenten. Versetzen Sie vor der Inbetriebnahme die Verkabelung wieder in den ursprünglichen Zustand. Fragen Sie im Zweifel beim Hersteller nach weiteren Informationen.

Einsenden von Elektroaltgeräten zur Entsorgung

Wollen Sie ein von Bühler Technologies GmbH stammendes Elektroprodukt zur fachgerechten Entsorgung einsenden, dann tragen Sie bitte in das Feld der RMA-Nr. „WEEE“ ein. Legen Sie dem Altgerät die vollständig ausgefüllte Dekontaminierungserklärung für den Transport von außen sichtbar bei. Weitere Informationen zur Entsorgung von Elektroaltgeräten finden Sie auf der Webseite unseres Unternehmens.

Avoiding alterations and damage to the components to be returned

Analysing defective assemblies is an essential part of quality assurance at Bühler Technologies GmbH. To ensure conclusive analysis the goods must be inspected unaltered, if possible. Modifications or other damages which may hide the cause or render it impossible to analyse are prohibited.

Handling electrostatically conductive components

Electronic assemblies may be sensitive to static electricity. Be sure to handle these assemblies in an ESD-safe manner. Where possible, the assembles should be replaced in an ESD-safe location. If unable to do so, take ESD-safe precautions when replacing these. Must be transported in ESD-safe containers. The packaging of the assemblies must be ESD-safe. If possible, use the packaging of the spare part or use ESD-safe packaging.

Fitting of spare parts

Observe the above specifications when installing the spare part. Ensure the part and all components are properly installed. Return the cables to the original state before putting into service. When in doubt, contact the manufacturer for additional information.

Returning old electrical appliances for disposal

If you wish to return an electrical product from Bühler Technologies GmbH for proper disposal, please enter "WEEE" in the RMA number box. Please attach the fully completed decontamination declaration form for transport to the old appliance so that it is visible from the outside. You can find more information on the disposal of old electrical appliances on our company’s website.

Bühler Technologies GmbH, Harkortstr. 29, D-40880 Ratingen
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