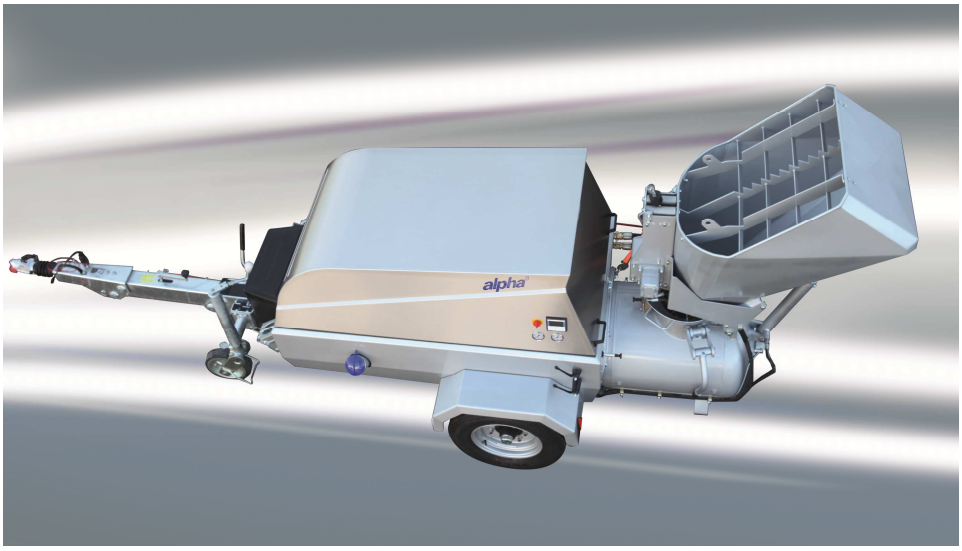
CONGRATULATIONS ON YOUR

alpha



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1. Introduction

This instruction manual was created with utmost care and contains information about the technical equipment, the use and necessary maintenance jobs.

Please give special attention to safety instructions in order to use the machine without risks for you and the machine.

Please read this instruction manual carefully.
This will help to avoid operating errors as well as resulting standstills and costs.

The instruction manual is divided into the main sections

Chassis - driving (chapter 3)

and

Machine – machine operation (chapter 4).

The complete instruction manual must be read before the first use of the machine, especially the safety instructions of each chapter.
In case of subsequent questions, driver and operator may specifically read the necessary respective information on driving or machine operation.

Should any practical questions occur that are not answered in this instruction manual, please consult the client service closest to you or consult **BMS** directly.
The contact details are listed under „Service“.

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The replication of common names, trade names, trademarks, etc., even without special labelling, does not justify the assumption that such names should, in the sense of trademark and brand protection legislation, be regarded as unused and therefore usable by anyone.

This instruction manual documents the current technical state of our machine.
Errors and omissions excepted.

Only the original German version of this instruction manual is valid and binding.

1.1 Service

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Should any practical questions occur that are not answered in this instruction manual, please consult the client service closest to you or consult **BMS** directly.

Service/Workshop: Telefon: +49 5242 96 46 17

E-Mail: werkstatt@bmsbaumaschinen.de

Spare parts inventory: Telefon: +49 5242 96 46 15

E-Mail: versand@bmsbaumaschinen.de

1.2 Identification of the machine

1.2.1 Type plate

Machine designation: **BMS *alpha***
BMS *alpha* B
BMS *alpha* B/S

On the trailer you find a type plate on the right side at the front of the superstructure (in driving direction)

and at the inner surface – at the rear on the left side (in driving direction).

The type plate on the axle

is positioned on the side of the towing bar.

1.2.2 Machine equipment

Machine type	BMS alpha Z3		
	BMS alpha Z4		
	BMS alpha energy		
	BMS alpha energy plus		
Trailer hitch	DIN-towing eye		
	Ball head hitch		
Lighting voltage	12V		13-pin plug
	24V		15-pin plug
License	100 km/h	80 km/h	
Machine model	Standard		
	Feeder		
	Feeder/Scraper		
	Silo		
Scope of delivery	Instruction manual		handed out
	Storage box		
	Grease gun		
Optional equipment	GPS system		
	Filter hood		
	Regulation of mixing time		
	Ball head hitch		

1.2.3 designated purposes

The screed machine “BMS alpha” is made for producing and transporting construction materials. The materials are going to be homogenized in a mixing vessel. By setting the mixing vessel and the transport hose under pressure, the material is going to be transported to the required location.

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1.3 EC-Declaration of conformity

The machines

BMS *alpha*
BMS *alpha* B
BMS *alpha* B/S comply with:

- Machinery Directive 2006/42EG.
- DIN EN ISO 12100, Safety of machinery
- EMV Directive 2014/30/EU
- EN 60204-4 Electrical equipment of industrial machines
- Low Voltage Directive 2014/35/EU
- Simple Pressure Vessels Directive 2014/68/EU

Specific regulations for mortar machines

- DIN EN 12001**,** Conveying, spraying and placing machines for concrete and mortar
- EN 12151, Machinery and plants for the preparation of concrete and mortar Safety requirements
- BGR 183 Safety requirements for conveying and spraying machines for concrete and mortar
- BS EN 12001

1.4 Warranty and liability

Our General terms and conditions generally apply and were agreed on with confirmation of the order.
Warranty and liability claims for personal and material damage are excluded if these were caused by one or several of the following causes:

- Improper use of the machine,
- Improper installation, commissioning, operation and maintenance of the machine,
- Non-compliance with the instructions in this manual regarding transportation, storage, installation, commissioning, operation and maintenance. This applies in particular to the 1. service after 50 operating hours,
- Unauthorized structural changes,
- Insufficient monitoring of machine parts, which are subject to wear,
- Improperly executed repairs. Only original parts or those authorized by the manufacturer may be used.

All repairs of the chassis and the machine that are marked with the symbol  in the instruction manual must be effected by **BMS** or by a specialist workshop authorized by **BMS**.

Observe the utmost cleanliness in all maintenance work.
Storage and sealing surfaces may be considerably damaged by dirt.
The service life and reliability of the machine depend to a large extent on proper operation and maintenance.

The following information is required when ordering spare or wear parts:

- machine type
- vehicle identification number
- designation

You find this information on the type plate in this instruction manual and on the machine.

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2. General information on the instruction manual

2.1 Symbols

The following symbols are used in this instruction manual:

	Safety
	Danger symbols in general Failure to comply with the safety instructions may cause severe personal injuries or even death.
	Danger symbol electricity Failure to comply with the safety instructions may cause severe personal injuries or even death.
	Danger of burns
	Danger of chemical burns
	Danger of crushing
	Danger from rotating parts
	Danger of falling objects
	Danger of explosion
	**Pay special attention**
	Instructions
	Wear protective clothing, including goggles, face protection, working gloves, safety shoes and suitable clothing for work.
	Wear safety goggles (obligation)
	Wear hearing protection (obligation)
	Wear protective clothing – especially safety shoes (obligation)
	Heed environmental requirements
	Maintenance
	Maintenance  Check before start of work for example (as part of maintenance)
	Maintenance by **BMS** or by a specialist workshop authorized by **BMS**
	Questions
	Hotline

As well as other, non-recurring, symbols.
Images of the machine may defer from the original in color or detail, but are functionally identical.

2.2 Safety regulations

In general

The instruction manual must be kept with the machine at all times.
In addition to this instruction manual, general regulations on the prevention of accidents as well as on environmental protection must be adhered to.
The national regulations of the country in which the machine is used are valid and must be adhered to.

The machine **BMS *alpha***
BMS *alpha* B (feeder)
BMS *alpha* B/S (feeder / scraper)
may only be operated by

- carefully instructed personnel authorized by the employer
- in good order and condition
- with accessories authorized by the manufacturer

Incorrect operation of the machine is explicitly prohibited, for it may cause unpredictable danger.

The operator must have read and understood the instruction manual before using the machine!

In case of improper use of the machine, the manufacturer's liability will be excluded.

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3. Chassis

3.1 General

Before using the trailer in public traffic, it is essential to acquaint yourself with the instruction manual for safety reasons. If you have any questions or doubts concerning this manual, please contact **BMS**. (for contact details see chapter 1.1).

The following safety instructions concerning operation, maintenance and cleaning must be strictly observed.

Please check before each drive

The proper condition of the trailer for driving, in particular

- lighting
- tyre equipment
- brake system
- towing hitch

Moreover, please pay attention to the suitability of the towing vehicle, in particular

- to the support load of the towing vehicle's hitch being sufficient
- to the driver disposing of the license category necessary for the vehicle.

3.2 License for public traffic

BMS *alpha*, BMS *alpha* B, BMS *alpha* B/S are non self-propelled work machines and are subject to road traffic and license regulations.

The vehicle has been approved by TÜV and suited for licensing according to the German road traffic act.

In Germany, the registration of the trailer is obligatory. Including the assignment of an individual official license plate and the two-year-valid technical examination by an approved inspection body.

Outside of Germany, the license regulations of the respective countries of the registration must be observed.
The registration in other European countries is effected according to the regulations in force in these countries.

Please consider the license for maximum speed!
With the appropriate equipment, a license for the maximum speed of 100 km/h may be obtained. The authorized maximum speed is listed in chapter 1.2.2 machine equipment.

3.3 Chassis (frame)

3.3.1 General

Do not weld on the chassis frame (thermally galvanized steel).

Alterations on lighting, tire equipment and rims are explicitly prohibited, unless they are listed in the general operating license.

The following safety instructions concerning operation, maintenance and cleaning must be strictly observed.

Failure to comply with the safety instructions may cause severe personal injuries or death, as well as damage to the machine.

Only displace the machine with the DIN-towing eye or the Ball head hitch

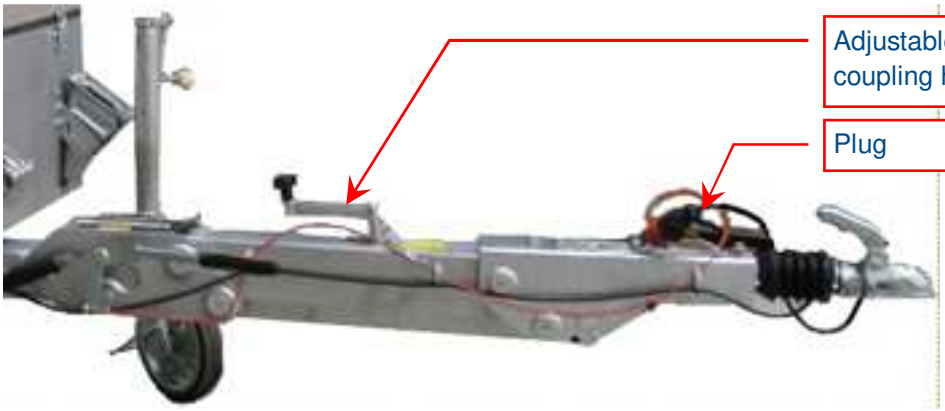
The formation of white rust on the chassis is merely a blemish and does not constitute impairment. You may prevent the formation of white rust by positioning the trailer in places with sufficient airing or air circulation.

After driving in winter, the thermally galvanized parts must be cleansed with clear water.

3.3.2 Elements of the chassis

Model Feeder

Model Scraper



3.4 Towing bar with axle and towing hitch

3.4.1 Axle and towing hitch

Axle

The Euro axle is fixed with rubber bearings and does not need maintenance. Neither do the wheel bearings. The axle must not be greased because this might affect the rubber parts.

Towing hitch – Ball head hitch respectively DIN-towing eye

For transport, the chassis may optionally be equipped with a ball head hitch (mostly for passenger cars) or with a towing eye (mostly for trucks or transporters).
If the trailer is used in public traffic, the respective regulations must be observed.
In addition, the national regulations of the country in which the **BMS** is used, must be observed.

Ball head hitch

DIN-towing eye

Images may differ from the condition upon delivery!

The hitch / DIN towing eye must be adjusted to the coupling height of the towing vehicle.
If the hitch / DIN towing eye is not positioned in a straight line to the towing hitch of the towing vehicle (parallel to the floor), the functioning of the inertia brake cannot be guaranteed.

The handling of the ball head hitch is described in the following paragraph.
The DIN towing eye is operated at the coupling of the towing vehicle. Therefore, please observe the instructions in the manual for the towing hitch of your towing vehicle.
The height adjustment refers to the trailer and is described in detail in the following paragraph.

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3.4.2 Towing hitch – height adjustment

Ball head hitch / DIN-towing eye

The ball head hitch, respectively the DIN towing eye, is fixed to the towing bar via an adjustable intermediate part. Due to this intermediate part the height of the hitch may easily be adjusted at the right level for the towing vehicle. The towing bar must by all means be positioned parallel to the inertia brake in order to guarantee the functioning of the brake system.

The adjustment should be carried out on level ground.

Chock block

➢ First, secure both wheels of the machine with the chock blocks to avoid rolling off.

➢➢ Use the jockey wheel to position the towing bar parallel to the floor.

Jockey wheel

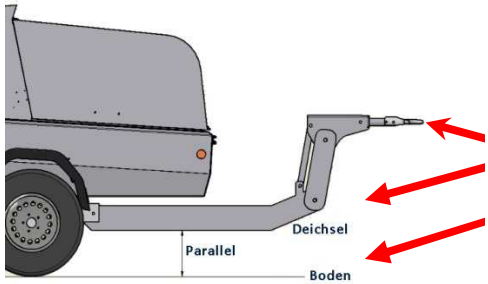
Crank for adjustment of towing bar

➢ Pull out the locking pin.

➢➢ Turn the crank until the correct coupling height is obtained with the towing bar positioned parallel to the ground.

➢➢➢ Insert the locking pin. In order to do so the crank must be positioned above the towing bar.

Locking pin



Parallel to the ground

➢ The coupling height must be adjusted for the towing bar and the hitch / towing eye to be positioned parallel to the ground <u>after the coupling to the towing vehicle</u>.

In case of rough-running height adjustment:
Fretting corrosion may occur in the toothed washer conjunction (the toothed washers corrode and get stuck). Regular cleaning of the toothed washer conjunction prevents corrosion. (See lubrication chart chapter 3.6.3).

3.4.3 Hand brake

Hand brake

The hand brake serves the secure parking of machine.

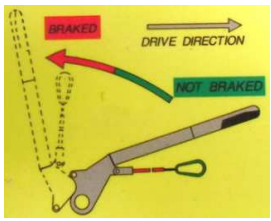
If the hand brake is not fully applied, the machine may roll!

Hand brake lever

If the machine is parked when linked to the towing vehicle, on uneven ground, the trailer must be secured by the chock blocks in addition to the hand brake.

Chock block

Please observe the position of the hand brake lever!
The hand brake lever must not be positioned vertically.
Secure brake action is warranted at a position up to 70° when the brake is applied.
As soon as the hand brake lever takes a position over 70°, the brakes must be checked by BMS or a specialist workshop authorized by BMS.



If the trailer is parked without towing vehicle, it must always be secured with the chock blocks.

3.4.4 Inertia brake

The inertia brake slows down the trailer when the brakes of the towing vehicle are applied or on steep downhill drives.

When the brakes of the towing vehicle are applied or during downhill rides, the towing bar of the overrun hitch slips in, depending on the force of the tow bar. The brake reacts on this.

On reversing, the brake equally reacts initially.
However, the backward rotation almost nullifies the braking effect.

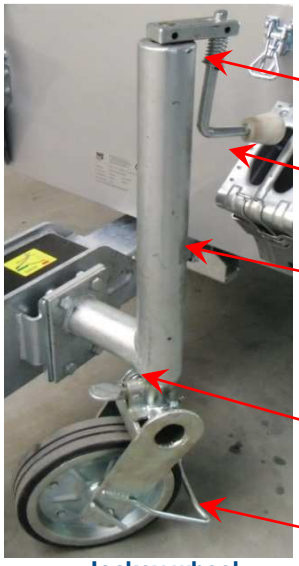
On adjusting the overrun hitch it is essential that the hitch is positioned parallel to the towing bar in order to guarantee the functioning of the brake system (see chapter 3.4.2).
Please check the safety of towing bar, hitch, hand and inertia brake before each drive!

Caution! Use the chock blocks when parking the machine.

Maintenance work and repairs (replacement) may only be executed by specialist workshops authorized by BMS. Use only original spare parts.

3.4.5 Jockey wheel

The jockey wheel is used for parking the trailer.

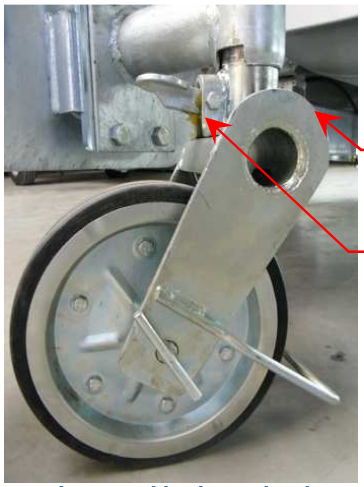


Jockey wheel

The jockey wheel does not need any maintenance work with the exception of the 2 lubricating points (lubricating nipple at the central pipe and at the wheel joint – see image.
Please grease the lubricating points regularly during maintenance work (see lubrication chart chapter 3.6.3).

Please turn the jockey wheel slightly downward and hinge it down by applying pressure on the catch.
In the lowered position, the jockey wheel automatically locks in.
Use the crank to turn the jockey wheel downwards until the trailer is positioned horizontally.

For driving, please use the crank to turn the jockey wheel upwards until it is lifted off the floor.
Apply pressure on the catch and lift the jockey wheel until it locks into the upper position.
Turn the jockey wheel in this position completely up and tilt back the crank.



Lowered jockey wheel

The jockey wheel may only be turned up by manual operation of the catch when the trailer is not loaded.
Always make sure that the jockey wheel is firmly locked into the desired position.

Caution!
It is essential to use the chock blocks when the uncoupled trailer is parked.

Maintenance work and repairs (replacement) may only be executed by specialist workshops authorized by BMS.
Use only original spare parts.

3.4.6 Wheels

Only wheels listed in the vehicle registration certificate may be assembled.

In case of wheel change, hub, end and type must correspond to the specifications in the vehicle registration certificate.

Check before each drive if the tires are in proper condition.

Tread depth
According to regulation
1,6 mm
recommandation =
not less than 4 mm.

Check the tire inflation pressure regularly, for an incorrect tire pressure may influence the handling of the trailer in a negative way. You find the tire pressure for the models **BMS *alpha* (Standard), BMS *alpha* B (feeder) und BMS *alpha* B/S** in chapter 5 technical data.

In the case of new vehicles and after wheel change, after driving 50 km, tighten wheel nuts to the prescribed torque.

Torque
120 N•m

The use of winter tires is not prescribed by law (status 10/2011). However, should the vehicle be subject to an accident or get stuck, tire equipment not adjusted to weather conditions may be found faulty by the authorities. For this reason, in winter, we recommend the use of M&S or all season tires disposing of the qualities specified in the image on the right hand side.
Legal amendments are possible any time! Please keep up to date with respective laws and regulations.

3.4.7 Wheel brake

The wheel brakes satisfy the requirements of the directive on harmful substances as well as the EU Directive.

Should the brake power decline, the wheel brakes must be checked and eventually be adjusted or even replaced by **BMS** or a specialist workshop authorized by **BMS**.

Maintenance work and repairs (replacement) may only be effected by specialist workshops authorized by BMS.
Use only original spare parts.

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3.4.8 Chock blocks

The chock blocks secure the trailer and support the function of the hand brake.

Holding device for the chock blocks

The trailer disposes of 2 chock blocks.
The chock blocks are fixed at special holding devices on both sides at the front of the chassis. (1 piece per side).

3.4.9 Feet of the mixing vessel

When the jockey wheel is set correctly, the feet of the mixing vessel ensure the safe placement of the machine.

The BMS ***alpha*** Standard has a reinforcement plate welded to the centre of its mixing and conveyor vessel. Put a wood plank under the vessel to ensure the safe placement of the machine.

Feet on the rear of the mixing vessel

BMS *alpha* B and **B/S** have 2 feet welded to the vessel to ensure the safe positioning of the trailer during operation.
The jockey wheel (on the towing bar) must be turned downward so far that the vessel respectively the feet are safely placed on the floor, ensuring a safe position of the trailer during operation.
⇦ Feet on the vessel, rear
Jockey wheel at the front ⇨

Jockey wheel at the front

During operation, the machine and the whole of the trailer may vibrate strongly.

When the jockey wheel has not been lowered sufficiently, operating the machine is not permitted!

For the operation of the machine, the vessel (Standard) or the feet (B and BS) and the jockey wheel must be placed on solid ground.

Use appropriate support if needed – a wood plank for example.

If the jockey wheel has not been lowered sufficiently and the vessel or the feet are not placed firmly on the ground, the trailer may tip over or move during operation.

It is not allowed to modificate the vessel !

3.5 Preparation for driving

3.5.1 General

All type information at the chassis must remain clearly legible.

Clean the jockey wheel regularly.

In winter, after driving on salt-thawed streets, the chassis must imperatively be cleaned with clear water.

3.5.2 Check before driving

Before the machine is coupled to a towing vehicle the following check must be effected!

Check if the trailer is in orderly and roadworthy condition:

- Condition of the tire system
- Check tire pressure and wheel nuts
- Rear-light-license plate fitted to the vessel and electrically connected
- Check lighting system on damages
- Trailer voltage and lighting must comply with the voltage of the towing vehicle (12V or 24V)
- Check functioning of the lighting system
- Check the support load of the towing hitch and its compliance with the towing vehicle

For transport of the system, the mixing vessel must be completely emptied and cleaned. Additional load affects the driving stability of the vehicle.

Please observe traffic regulations (StVO § 3, § 18 Abs.5) during transport on the road.
In addition, national regulations of the country in which **BMS *alpha*, BMS *alpha* B, BMS *alpha* B/S** are operated must be observed.

Do not move the machine on your own!
Always ask the help of a second person or have a second person in proximity.

3.5.3 Coupling

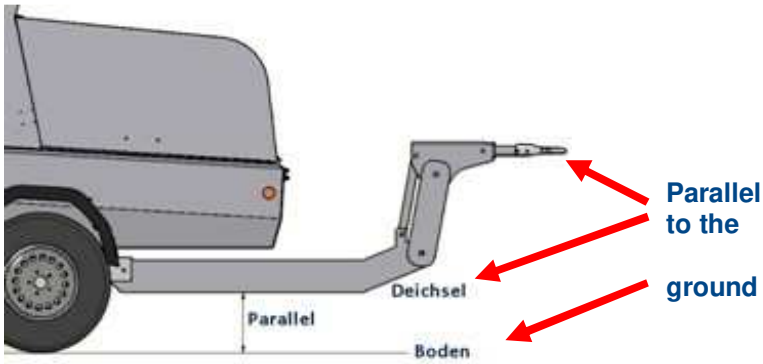
After checking the trailer according to chapter 3.5.2, it may be connected to the suitable towing vehicle. A suitable towing vehicle must dispose of the appropriate loading pressure as well as the same voltage as the trailer (12V or 24V).

Adjustment of the towing hitch to the appropriate coupling height at the towing vehicle (see chapter 3.4.2 Towing hitch-height adjustment).

It is imperative to secure the wheels with the chock blocks against rolling!

The bulbs of the light bars must be suitable to the voltage of the towing vehicle. (12 or 24 Volt - see technical data).

The mixing vessel must be empty.
Empty the vessel if necessary, for additional load affects the driving quality of the trailer immensely to the negative.



Adjust the coupling height as required.
Height adjustment is carried out as described in chapter 3.4.2.
Inertia brake and towing bar must be positioned parallel to the ground when the trailer is connected to the towing vehicle.

Approach the towing vehicle to the machine


Tightened hand brake

- Loosen the hand brake at the trailer
- On the left image, the hand brake is tightened
- Press the brake lever down to loosen the brake.


Loosened hand brake

- Place the hitch above the towing hook
- Connect the trailer
  The lever of the hitch tilts down automatically.
- Check if the lever is locked into place.
- Attach the safety cable!
  If the trailer gets loose on the drive the cable prevents it from rolling off unbraked.
  The cable may either be clipped with a snap hook into the eye at the towing vehicle or it may be put around the towing hook.

Replace defective cable immediately!
The hooking eye should be positioned in direct proximity to the coupling point; otherwise, the hand brake may involuntarily be tightened in curves!

Check the safety of the hitch
- ➢ the hitch is locked into place
- ➢ the safety cable is attached
- ➢ the safety cable is undamaged

Check
When the hitch is properly locked into place, the marker is in the green ╪ field.
If the marker is in one of the red fields, the trailer is not connected properly (red field with X) or damaged (red field with ─).

In both cases (marker in the red field) the trailer must not be used!
The hitch must be checked and eventually replaced by BMS or a specialist workshop authorized by BMS.

➢ Turn the jockey wheel completely up and put it into the upper position. (see chapter 3.4.5)

For models feeder and feeder/ scraper:
Fix the rear light unit with the license plate to the end of the mixing vessel.
Plug the unit onto the two pins at the vessel and secure them with the clamps (image on the right).
The unity need not be fixed for operation with the model “Standard”. Therefore the fixation mentioned above does not apply for “Standard”.

The rear light unit with license plate must be connected to electricity.
Put the plug into the socket on the left of the chassis, at the bottom. Please observe that the plug is secured by the flap of the socket.

Caution: Observe the lighting voltage of 12/24V!

⇦ Establish the electrical connection between trailer and towing vehicle and

Check the function of the electrical facilities of the trailer ⇨

Please observe that TWO electrical connections must be established!
1 x plug of the trailer in the socket at the towing vehicle
1 x plug of the rear light unit in the socket at the trailer

➢ Check the function of the brake system of the trailer (brake test).

Admissible support load

➢ Observe the admissible support load of the towing vehicle.

Tire pressure
Depends on the model!

➢ Check tire pressure, tread depth and wheel nuts. (description see chapter 1.2.2)
The tire pressure of the models standard, feeder and feeder/ scraper differs.
The proper tire pressure is listed in chapter 5 technical data.

⇦ Remove the chock blocks
and
fix and secure them to the supports on both sides of the chassis. ⇨

➢ Check the locking devices and fasteners at the hood and on the machine to prevent pieces from falling off while driving.

➢ Observe proper fixations and safeguarding especially with the models feeder and scraper!

Safety device at the rear light unit (image on the left)
and at the scraper (image on the right)

Safety device scraper

➢ Secure the feeder with a lashing strap

Safety device feeder

Please observe traffic regulations (StVO § 3, § 18 Abs.5) during transport on the road.
In addition, national regulations of the country in which **BMS *alpha*, BMS *alpha* B, BMS *alpha* B/S** are operated must be observed.

3.5.4 Decoupling and parking

For decoupling and parking place the trailer on even ground if possible.

➢ **Secure the towing vehicle**

➢ Secure the trailer

⇦ Hand brake

Chock block ⇨

➢ Lower the jockey wheel

At the worksite, lower the jockey wheel until the mixing vessel (***alpha***), respectively the feet of the vessel are placed on the ground (BMS ***alpha*** B / BMS ***alpha*** B/S)!
Put a wood plank underneath if necessary!

➢ Disconnect electricity

➢ Open the hitch

➢ Unhinge the safety cable ⇨

The unit is fixed to the bolts at the vessel.
For the models “feeder“ and “feeder/ scraper“ the unit must be taken off for operation.

➢ At the worksite, the rear light unit with the license plate must be taken off the vessel and fixed to the hitch.
➢ Remove the plug from the socket at the trailer.
➢ Remove the safety clamps from the fixing bolts.
➢ Take the rear light unit off the bolts.
➢ Fix the safety clamps.

Cover the tires if the machine will be parked for a longer period.
Observe the airing
Clean if parked for a longer period
Eventually anti-theft protection
If the trailer is parked on public spaces with or without towing vehicle, the rear light unit must be fixed according to regulations!

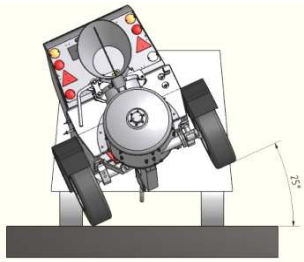
3.5.5 Driving

The following aspects must imperatively be observed when driving:

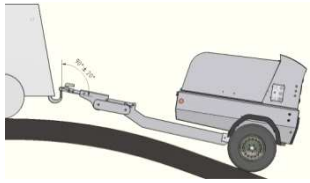
During the coupling of the trailer, all aspects and particularly the aspects that must be checked according to **chapter 3.5.2** must be observed.

The mixing vessel must be empty (empty and clean it eventually), for additional load affects the driving quality of the trailer immensely to the negative.
Concerning the models **BMS *alpha*** B and B/S, feeder and scraper must equally be empty and clean for transport.

Do not tilt the trailer more than 25° in cross direction (tilting danger)!



Do not tilt the trailer more than **+** / — 20° from the horizontal position in longitudinal direction (driving direction)!



The machine has been construed in a way that permits the support load to attain approximately 50% of the admissible support load.
The minimum and maximum support load may not be exceeded or undercut.
The machine disposes of a minimal support load of 25kg and a maximum support load of 100kg.
Additional loading, a non-cleaned vessel and/ or feeder/ scraper may change the support load and influence the handling of the machine in a negative way.

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3.6 Maintenance chassis

3.6.1 Maintenance chassis in general

Regular maintenance is essential for flawless and permanent functioning of the chassis and the machine.

For safety reasons, imperatively keep to the maintenance intervals listed below and effect completely all of the listed maintenance jobs!

3.6.2. Maintenance schedule chassis

Maintenance jobs without specialist workshop 

Executed by	Maintenance job	Tool	Interval
	Check firm seating of wheel nuts	Observe tightening torque, see technical data 5.1.2 Use torque key.	- After the first 50 km - After each wheel change
	Check tire pressure	Manometer tire pressure Pressure see chapter 5 technical data	- After the first 50 km, - each wheel change, - 1x per week.
	Grease all lubrication points of the overrun hitch	Grease gun	Every 1 000 km 1 x per month
	Check firm seating of screws Overrun hitch chassis	Observe tightening torque	Regularly 1 x per month
	Grease chassis frame	All movable parts Grease respectively spray grease	Check weekly
	Spray machine with preserving agent.	Preserving agent	Check weekly
	Check parallel adjustment of the overrun hitch on clearance and easy movement.	Visual check. In case of stiffness, grease or see specialist workshop eventually.	Check before each drive and weekly.
	Check function of hand brake	Break test (start up with tightened hand brake) In case of functional disorder, see specialist workshop.	Check before each drive and weekly.
	Check function of inertia brake.	Break test In case of functional disorder, see specialist workshop.	Check before each drive and weekly.
	Check safety cable guide and function of the safety cable.	Replace safety cable if damaged. In case of functional disorder, see specialist workshop.	Check before each drive and weekly.
	Check function and locking device of the jockey wheel Towing eye, respectively ball head hitch	If the hitch or the ball head are defective, have it replaced by a specialist workshop.	Check before each drive and weekly.

Maintenance jobs that must be effected by BMS or a specialist workshop authorized by BMS.

Executed by	Maintenance job	Tool	Interval
	Adjust brake system	Brake test stand **Specialist workshop**	After the first 200 km by a specialist workshop
	Check function of overrun hitch and check shock absorbers on oil loss.	Brake test stand **Specialist workshop**	Regularly every 3 months. In case of anomaly, have parts adjusted or defective parts replaced.
	Check shock absorbers on function and oil loss	**Specialist workshop**	Regularly every 3 months. In case of anomaly, have parts adjusted or defective parts replaced.
	Check clearance of the towing bar at the overrun hitch.	Max. clearance 1,5 mm **Specialist workshop**	Regularly every 3 months. In case of anomaly, have parts adjusted or defective parts replaced.
	Check parallel adjustment of the overrun hitch on clearance and easy movement.	**Specialist workshop**	Regularly every 3 months. In case of anomaly, have parts adjusted or defective parts replaced.
	Check function of brake system.	Brake test stand **Specialist workshop**	Regularly every 3 months. In case of anomaly, have parts adjusted or defective parts replaced.
	Check function of hand brake.	Brake test stand **Specialist workshop**	Regularly every 3 months. In case of anomaly, have parts adjusted or defective parts replaced.
	Check safety cable guide and function of the safety cable.	Visual check and brake test. Adjustment by **specialist workshop**	**Regular visual check before each drive.** **Regular brake test every 2 months.** In case of anomaly, have parts adjusted or defective parts replaced.
	Check function and locking device of the jockey wheel.	Smooth-running, locking device and condition of wheel and locking device **Specialist workshop**	Regularly every 3 months. In case of anomaly, have parts adjusted or defective parts replaced.
	Wheel bearing clearance	Do not replace wheel bearings individually. Complete brake drum. according to KNOTT-requirements. **Specialist workshop**	Regularly every 3 months. In case of anomaly, have parts adjusted or defective parts replaced.
	Towing eye, respectively ball head hitch	Check firm seating and wear out. **Specialist workshop**	Regularly every 3 months. In case of anomaly, have parts adjusted or defective parts replaced.

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3.6.3 Lubricating chart

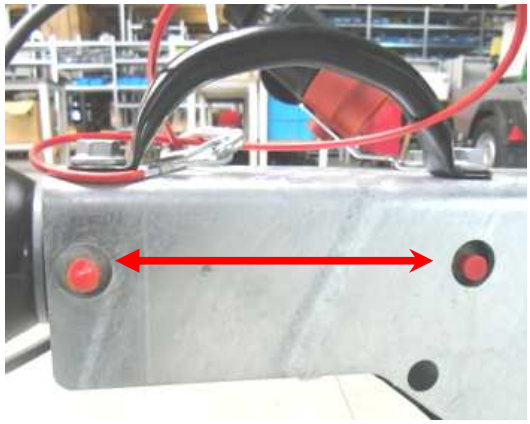
Executed by	Maintenance job	Tool		Interval
	4 lubricating points at the chassis		Grease gun	Monthly, respectively every 1000 km

Lubricating point (2x)
At the top of the main pipe of the jockey wheel and at the bottom at the jockey wheel

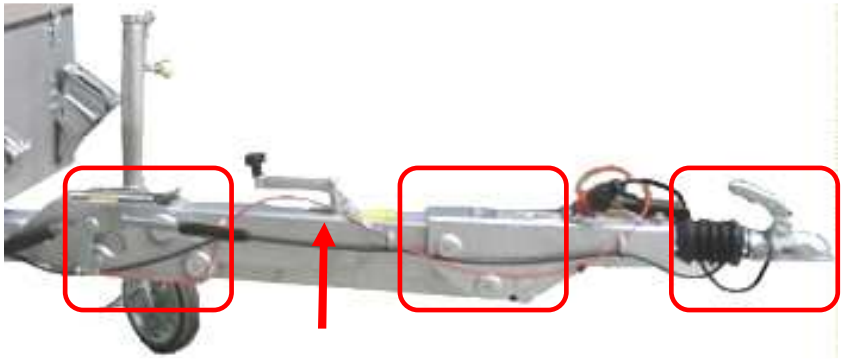
At the main pipe of the jockey wheel

At the jockey wheel

Lubricating point 2
(overrun hitch)



Slightly lubricate all movable parts of the towing bar or inject them with spray grease.



Hand brake Crank towing bar joints Hitch

Lubricate all movable parts of the towing bar

	All movable parts of the chassis	Lubricate, respectively grease slightly or inject with spray grease

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3.6.4 Tire maintenance

During longer times of non-operation

- Cover tires to protect them against sun and over-heating
- Jack up the trailer in order to relieve the tires and to avoid deformation.
- Grease all movable parts at the chassis frame and inject the machine with preserving agent.

3.6.5 Lighting

Check function of the lighting system before each drive.
Replace or repair defective bulbs and cable connections immediately.

Observe the lighting voltage of the machine!
12 V for Standard (car and most vans). 24 V for trucks.
The lighting voltage of this machine is listed on page 10 (machine equipment)

The rear light unit with license plate on the back of the vessel is pinned onto 2 bolts and must be taken off before operation for BMS ***alpha*** B and BMS ***alpha*** B/S (see chapter 3.5.3 Coupling and 3.5.4 Decoupling).

While checking the lighting please observe equally the proper installation (BMS ***alpha*** B - B/S) and fixation with 2 safety pins.
Do not forget the electrical connection via the socket at the trailer!

BMS *alpha*

Rear light unit at the vessel ready for transport.

Safety pins of the rear light unit at the vessel.

Do not forget the plug connection at the chassis in order to be ready for driving!

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3.6.6 Tire change

The trailer does not dispose of a spare tire. One may eventually be carried in the towing vehicle. For the tire change, please see the instruction for the tire change of the towing vehicle.

The support points for the car lifter are placed under the axle as close to the tires as possible.

Secure the trailer against rolling off before lifting it with the car lifter.

- Tighten the hand brake and
- place the chock blocks at the wheel.

If the trailer is lifted up do not go underneath the trailer!

- Only fit tires that are authorized for the trailer.

- Observe tightening torque, see technical data 5.1.2
- use torque key.

- Retighten the wheel nuts after driving approximately 50 km after the tire change, (Use torque key, as mentioned above).

3.6.7 Error detection at the chassis

Correction by	Error	Remedy
	Braking effect is too feeble, too severe or permanent	In any case, check first if the hand brake has been properly tightened, respectively loosened.
	Brake pads drag or make noises.	- Brake pads are not broken in. Effect brake actions. While doing so, pay attention to not hindering road traffic! **Caution!** **If there is no improvement – see specialist workshop**
	Breaking effect is too feeble. Towing bar pushes completely in during brake action.	- Re-adjust the brakes. Have the brakes re-set in a **specialist workshop**.
	Brake pads are damaged.	- Renew brake pads. Have the set of brake shoes replaced in a **specialist workshop**.
	Great friction losses in the mechanics of braking. Corrosion at the towing bar.	Have the mechanics repaired and made smooth-running by a **specialist workshop**.
	Reversing is too hard-running.	- The braking system has been over-tightened. Have the brake system re-set by a **specialist workshop**.
	Brakes are overheating.	- The braking system is not set properly. - Corrosion at the mechanics of braking. - Mechanics of braking are deformed. Have the braking system re-set by a **specialist workshop**.
	Brake linkage is deformed.	Have the brake linkage replaced by a **specialist workshop**.
	The machine applies the brakes already on releasing the accelerator.	- The shock absorbers are damaged - The mechanics of braking are not set properly. Have the braking system checked by a **specialist workshop**.
	Too much clearance in the braking system.	- Have brakes set and defective parts replaced. - The mechanics of braking are worn out. - The mechanics of braking are not properly adjusted. - The mechanics of braking are deformed. Have the brake linkage replaced by a **specialist workshop**.
	The braking effect of the hand brake is not sufficient.	- The hand brake is not properly set. - The mechanics are hard-running. Have the hand brake checked and set by a **specialist workshop**.

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The braking effect of the overrun hitch is too feeble

Fault correction by	Error	Remedy
	Towing bar pushes completely in during braking	- Brake pads are at wear limit. - Brake linkage is deformed. - Brake pads are damaged. - Have brake set and defective parts replaced. Have brake system checked by **BMS** or a **specialist workshop** authorized by **BMS** and have cause of defect removed.
	The mechanics of braking are hard-running.	- Corrosion at the mechanics of braking - Mechanics of braking are deformed - Mechanics of braking are worn out Have braking system checked by **BMS** or a **specialist workshop** authorized by **BMS** and have cause of defect removed. - Have brake set and defective parts replaced.

Sudden jolts, uneasy driving characteristics

Fault correction by	P Possible cause	Remedy
	The machine applies the brakes already on releasing the accelerator.	- The shock absorbers are damaged - The mechanics of braking are not set properly. Have braking system checked by **BMS** or a **specialist workshop** authorized by **BMS** and have cause of defect removed. - Have brake adjusted and defective parts replaced.
	Too much clearance in the braking system.	- The mechanics of braking are worn out. - The mechanics of braking are not set properly. - The mechanics of braking are deformed. Have braking system checked by **BMS** or a **specialist workshop** authorized by **BMS** and have cause of defect removed. - Have brake set and defective parts replaced.

Reversing is not possible or difficult.

Fault correction by	Error	Remedy
	Brake blocks on reversing.	- Hand brake is tightened or not fully loosened. Loosen hand brake
	The braking system has been set too tightly.	- Corrosion at the mechanics of braking. - The mechanics of braking are deformed. Have braking system checked by **BMS** or a **specialist workshop** authorized by **BMS** and have cause of defect removed. - Have brake set and defective parts replaced.
	Towing bar pushes completely in.	- The gas damper of the mechanics of braking is defective. Have braking system checked by **BMS** or a **specialist workshop** authorized by **BMS** and have cause of defect removed. - Have brake set and defective parts replaced.

Ball head hitch

	The ball head hitch does not lock at the towing vehicle.	- The ball head hitch is dirty. - The ball head hitch is hard-running. - The ball head hitch is corroded Clean and lubricate the ball head hitch to get it smooth-running.
	The ball head hitch does not lock at the towing vehicle.	- The ball head hitch is mechanically damaged. Have ball head hitch and ball head checked at a **specialist workshop**.

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4. Operation of the machine

4.1 Machine description

The machine consists of the following main components

Drive motor

Separator with filler neck for compressor oil

Compressor with flap

BMS *alpha* (Standard)

Mixing and conveyor vessel

The mixing and conveyor vessel is a pressure vessel.

BMS *alpha* B (feeder)
Additional equipment for **BMS *alpha*** (Standard)

BMS *alpha* B/S (feeder and scraper) (foto)
Additional equipment for **BMS *alpha*** B (feeder)

Further elements necessary for the operation of the machine:

Conveying hose

Connector

Connector

Discharge stand

The overall structure is fixed to the chassis that has been described in the preceding chapter 3.

4.2 Suitability of the machine

The **BMS *alpha***
BMS *alpha* B
BMS *alpha* B/S
may mix and convey the following material:

Floor screed, concrete and plaster up to a grain size of 16 mm

Other material is only permitted after consultation and with written authorization of the manufacturer.

The material is conveyed by compressed air.
Compressed air may only be withdrawn for cleaning purposes at the designated connection.

Other uses of compressed air are only permitted after consultation and with written authorization of the manufacturer.

Any use of the machine for purposes not designated in this instruction manual is prohibited!
To the designated purposes rank (chapter 1.2.3)

Correct operation of the machine equally includes:

- The observation of all instructions in this manual.
- Strict adherence to all service and maintenance jobs.
- Observance of safety instructions and regulations in particular.
- Observance of all safety regulations of the accident prevention and insurance association.

Non-appropriate use of the machine or use that is not in accordance with regulations may cause dangers for the machine as well as for the health of the operating person.

In case of non-appropriate use of the machine or use that is not in accordance with regulations, the manufacturer's liability is excluded.

Factory settings of pressure range, revolution, temperature, etc. may not be altered.
Alterations may endanger people and cause damage to the machine!

4.3 Machine equipment

The machine is available in 3 versions
BMS *alpha*
(Standard)

With the standard version, the operator fills the material directly into the mixing and conveyor vessel.

BMS *alpha* B
(feeder)

With the feeder, new material may be filled in during the automatic mixing and conveying operation.

The feeder ensures continuous operation.

BMS *alpha* B/S
(feeder and scraper)

The scraper facilitates the filling of the feeder immensely.
It saves time and force during the filling procedure of the feeder.

The images may differ in detail from the delivered machine.

Standard version

BMS *alpha* (Standard)

Optionally equipped with

DIN-towing eye or ball head hitch

12V or 24V lighting system

Instruction manual

Hand book for drive unit DEUTZ

Grease gun

Storage box

The equipment of this machine is listed in chapter 1.2.2 machine equipment.

Models:

BMS *alpha* B (feeder)

Same equipment as standard with additional feeder

BMS *alpha* B/S (feeder and scraper)

Same equipment as BMS ***alpha*** with additional feeder and scraper

Options for all versions

Automatic adjustment of revolution speed
The automatic adjustment of revolution speed adjusts the revolution speed to the necessary performance during operation. The revolution speed may also be adjusted manually.

Filter hoods
The filter hoods protect the cooler from quick and heavy dust pollution.
Moreover, the filters enable quick and easy cleaning of the cooler unit.

Regulation of mixing time
With this option, mixing time may be regulated individually before starting the pumping procedure (after switching on the machine). The regulation of mixing time may be switched on and off.

Ball head hitch with lock
The lock protects the machine against theft.

Additionally, the following equipment is needed for all versions:

Discharge stand
Hoses with connectors (Overall length of choice)

Diameter 50 mm (minimum diameter)
Operating pressure min. 10 Bar

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4.4 Safety instructions and protective devices

4.4.1 Safety instructions

Do not operate the machine in enclosed spaces!
Danger of intoxication by exhaust fumes!

Place the machine on firm and even ground!

When placing the machine, observe that the worksite is protected from falling objects!

Use the hand brake and the chock blocks to secure the machine against rolling off!

See description preparation for operation

Only operate the machine with the necessary safety devices installed!

Lay out the conveying hoses on the shortest way possible. For changes in direction, lay out the hoses in generous bows (approx. 40 cm) to avoid bends!

Use as few hose connectors as possible!

Fix risers carefully with the designated hose clamps to avoid them being torn down by their own weight!

In case of doubt, secure all hose connectors against opening!

Check hoses and connectors regularly on wear and tear (friction and aging, see maintenance list)!

A **discharge stand** must be connected to the end of the conveyor hose. Any operation of the machine without the discharge stand is prohibited!

Without the discharge stand, the pressure in the conveyor hose may cause the material to spurt out uncontrolledly and inflict severe injuries.

Pressure vessel (mixing and conveying vessel)
Pressure vessels are subject to the German regulation on pressurized containers §8 group IV.
The required test of the pressure vessel has been executed by the manufacturer. An approval test of the system is required before the initial operation (§9) and in regular intervals (§10). The tests are executed by an approved inspection body. See also chapter 4.14 extern test intervals.

4.4.2 Safety devices

Before each operation of the machine all safety devices must be properly installed and functional.

Safety guards are fixed safety devices that must not be taken off during operation.

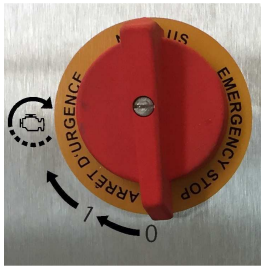
The machine disposes of several safety devices.
All safety devices in direct contact with an operator are listed below.

Dome sieve at the mixing and conveying vessel
The dome sieve is equipped with a safety switch.
For work in the vessel, the dome sieve may be lifted up and swung to the side.

Dome sieve

Safety switch of the sieve

For lifting, pull out the bolt at the switch and tilt the safety lever to the back (see images on the right).
When the lever is unlocked, the dome sieve may be lifted and swung to the side.
The pilot lamp at the control panel is illuminated.



EMERGENCY-STOP

The central switch is equally the emergency stop switch.
When the switch is turned to emergency stop, the machine stops immediately. The drive motor is switched off. The hydraulic system and the compressor stop generating pressure.

Check of the safety switch:
Turn the safety switch when the machine is running.
The machine is turned off.
If the machine does not stop, the safety switch is defective and must be repaired before operating the machine!

Caution!
Even if all aggregates are switched off, there is still pressure in the mixing and conveying vessel as well as in the conveying hoses!
Before working at the mixing and conveying vessel or at the conveying hoses (opening the vessel or taking off the hoses), the pressure must be released (see chapter 4,9 end of work).

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4.4.3 Personal protective equipment

The operator must wear personal protective equipment during the operation of the machine.
The obligation to wearing personal protective equipment results from the regulations of the accident prevention and insurance association as well as from legal requirements.

Protective helmet

Safety shoes

Protective clothing

Safety goggles

Respiratory and face protection

Ear protection

4.4.4 Safety devices during maintenance

Particular care is to be taken, if a safety device is switched off or taken off during maintenance.

During repair and eventually the resulting shutting down of safety devices, the technician must ensure that

- all risks and risk prevention are known.
- no second person, ignoring the repairs and the resulting missing safety devices, may operate the machine and get injured for this reason.

- Disconnect the battery to ensure that the machine may not be started accidentally during maintenance.
- A sign informing about the maintenance work must be placed.

The machine is only fit for operation when all the safety devices are fully functional. For this reason, the completeness and full function of the safety devices must be checked before each operation (see chapter 4.6).

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4.5 Operating the machine

4.5.1 General

This instruction manual must always be kept with the machine.
In addition to this instruction manual, the generally valid regulations on the prevention of accidents as well as environmental regulations must be observed
The national regulations of the country in which the machine is operated are valid and must be adhered to.

The machine

BMS *alpha*
BMS *alpha* B
BMS *alpha* BS

may only be operated

- by carefully instructed staff that has been engaged by the employer.
-
- safety-related in good order and condition

- with accessories authorized by the manufacturer

The use of the machine for purposes non-described in this manual is strictly prohibited, for non-calculable risks may occur in this case.

Constructional changes at the chassis and the machine are strictly prohibited.
These also include welding jobs, extensions or modifications of any kind.

Any eventual extensions or modifications may only be carried out with an explicit written authorization by the manufacturer.

In case of non-compliance to this regulation, the operating license of the machine may expire. This may have legal consequences and impact on insurances.

Before operation, the instruction manual must be read and understood by the operator!

If the machine is used for purposes other than described in this manual, the manufacturers' liability will be excluded.

Any use of the machine for purposes other than described in this manual is prohibited!
The proper use of the machines also comprises:

- adherence to all instructions in this manual.
- strict adherence to all service and maintenance intervals.
- adherence to all safety instructions and regulations in particular.
- adherence to the regulations of the accident prevention and insurance association.

In case of incorrect use or use not in accordance with regulations, damages to the machine as well as dangers to the health of the operators may occur.

The instruction manual must be read and understood by the operator before operating the machine
If there are multiple operators they must all have read and understood the instruction manual before operating the machine.

4.5.2 Elements of the machine

Exterior view

BMS *alpha*
Standard

Superstructure

Towing bar and chassis

Feeder

Mixing and conveyor vessel

BMS *alpha* B
Feeder

Feeder

BMS *alpha* B/S
Feeder/ Scraper

Scraper

Feeder

The images may differ in detail from the delivered machine.

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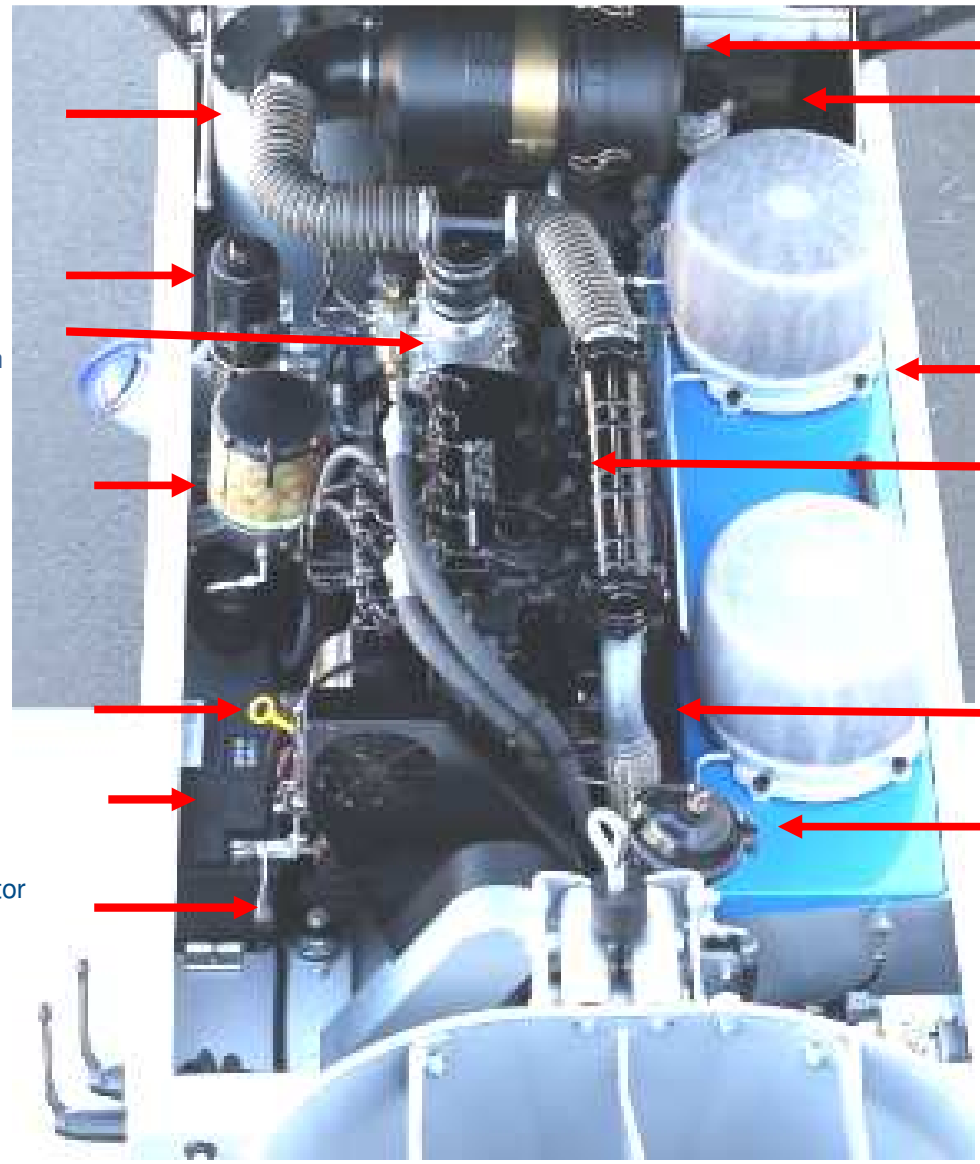
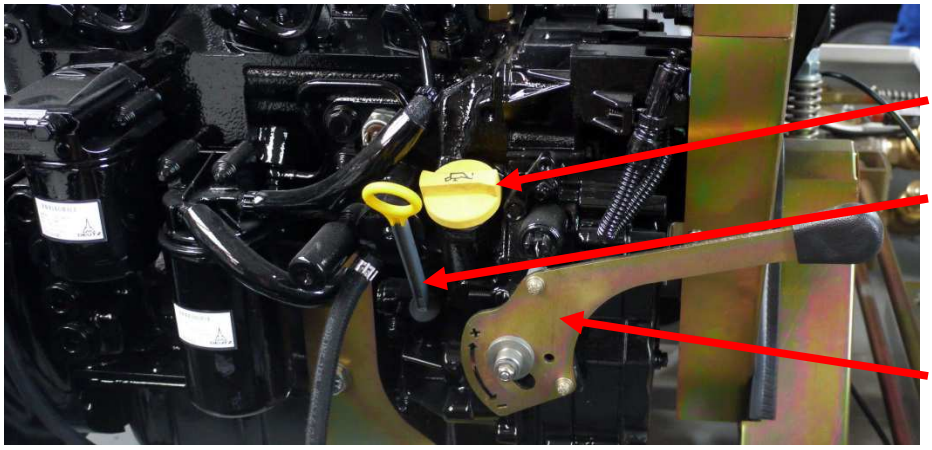
Interior view



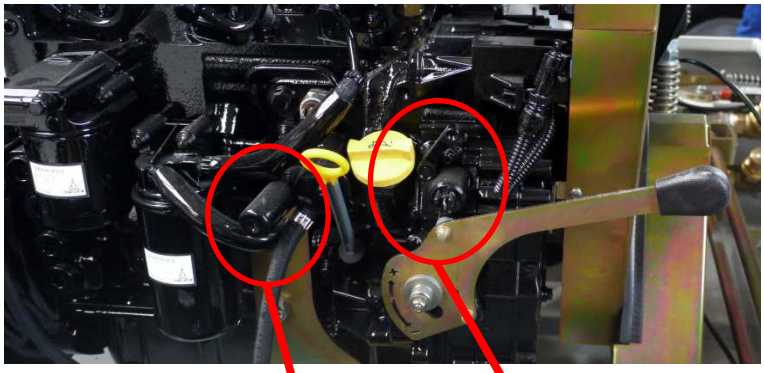
Caution – danger of burns
Certain spots of the engine compartment may heat up extremely!



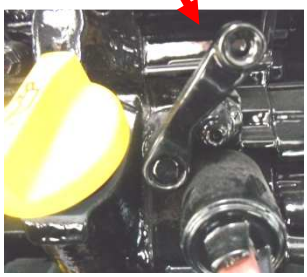
Oil filler neck engine oil

Oil dipstick engine oil

Speed regulator diesel engine



Caution – danger of burns
Certain spots of the engine compartment may heat up extremely!



Diesel pump Engine stop

Separator

Filtering cartridges

Automatic lubricating system

Hydraulic unit with oil dipstick and oil filler neck (black cap)

Black for compressor oil
White for diesel pre filter

Battery

Model Scraper

At the top
Transmitter with battery in loading unit

At the bottom
Handle with battery

Ventilator unit above cooler

Additionally with the option ventilator filter on the right

The ventilator filter consists of a metal support that is fixed to the ground board by a magnet.

May be taken off by just lifting it up.

The coating of the filter should be cleaned regularly.

The engine compartment is hot – in particular the

- exhaust system
- compressor
- hydraulic unit.

4.5.3 Operator controls

The machine is operated via the control unit at the exterior part.
Firstly the control at the main switch in the engine compartment must be switched on.

Light switch
Working lamp

Main switch
Control on

The control panel

Indicator lamps

Operating switch
fan and mixer
OFF (red light) / ON

push button
automatic

Electricity (green)
Battery load control (yellow)
Safety chain (red)
Fuse of the dome sieve (red)

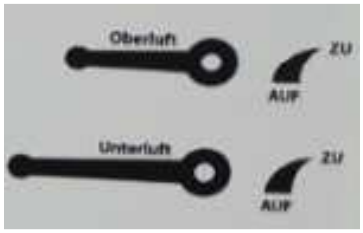
The main switch has 3 positions
up = **Emergency stop**
right = **Ignition**
down = **Engine Start**
(Engine start only as inching function)

Main switch
Also emergency stop

Fuel indicator

Compressor
Stop

Operation upper and lower air supply



The manometer of the vessel indicates the pressure inside the mixing vessel.
On positioning upper and lower air supply on “on”, the conveying process will start.

4.5.4 Accessories

Accessories necessary for the operation of the machine

Conveyor hose

Hose connectors

Suspension eyes for hoses

Discharge stand

Only use authorized conveyor hoses with an operating pressure of 10 bar!

Connect the conveyor hose to the outlet at the mixing and conveyor vessel.
The machine must not be operated without being connected to a hose.
Connect the discharge stand to the end of the conveyor hose.
The machine must not be operated without being connected to a conveyor hose and a discharge stand (no mixing and conveying operation!)

Connection for the conveyor hose at the mixing and conveyor vessel

4.5.5 Operational description

4.5.5.1 Floor screed mixing and conveyor system

Screed pumps are airstream conveyors. The material is conveyed discontinuously.

While the mixing vessel is filled with the components of the material to just below the dome, the material is mixed at the same time. The mixer operates as compulsory mixer.
At the end of the scheduled mixing time, the operator closes the dome lid.
The mixing vessel and the conveyor hose are charged with pressure by the pressurized air produced by the screw compressor.
The upper air streams into the mixing vessel.
The lower air streams into the conveyor hose.
The upper and lower air cocks are set according to draw and conveyor height.
The upper air stream and the blades of the mixer push the material into the conveyor hose.
The lower air stream pushes the material through the conveyor hose to the discharge stand.
This mode of operation produces cushions of pressurized air between the „packages of material“. Material and pressurized air alternately exit the discharge stand.

4.5.5.2 Mixing and conveyor vessel

As a pressure vessel, the mixer is operated as a compulsory mixer.
The openings at the side of the vessel serve to insert the mixing shaft, the mixing shaft bearing and the sealing. The mixing shaft disposes of blades for the mixing of the material that is to be conveyed.
The mixing blades push the mixed material into the conveyor hose (after the vessel is charged with pressure).
The mixing shaft is driven by the diesel engine via a pulley and a transmission.

4.5.5.3 Compressor unit

The compressor unit, consisting of screw compressor, separator and stabilizer with air filter, controls and commands the chosen operation mode of the compressor.
After the motor is started, the screw compressor builds up system pressure.
In the operation mode “conveying” the motor runs with the set number of revolutions.
The screw compressor conveys the maximum air quantity.
When the maximum system pressure is attained (approx. 8-9 Bar) the system automatically regulates down and the screw compressor operates at rest.
On lower pressure the screw compressor starts automatically.
If the pressure goes below 2 Bar (mixing vessel is empty) the screw compressor switches off during automatic operation. During manual operation, the machine may be cleaned with low pressure.
As soon as the motor is switched off or fails, the compressor, respectively the whole unit evacuates air via the purge valve.

Screw compressor with stabilizer unit

Separator

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4.5.5.4 Central lubrication system

The automatic lubrication system ensures the regular lubrication of the front and rear sealing as well as the front and rear suspensions of the mixing shaft.
The central lubrication system is activated each time the push button for „conveying“ is used.
The liquid level and the functioning of the central lubrication system must be checked regularly.
The liquid level may be checked with the markers for minimum and maximum fill level.
The amount of grease at disposal should last for approx. 500 operating hours in normal operating mode.
For functional check use the start switch.
A red indicating bar turns within the glass bulb of the central lubrication system.
After one rotation, the central lubrication turns off automatically.
For functional check, observe during the start process that the bar is moving within the glass bulb.

Vorratsbehälter der Zentralschmierung

4.5.5.5 Operating elements

Left =
Pull switch working light

Right =
Push button control system On/Off

(at the inside under the oil filter cartridge)

Control panel with indicator lights
Operation On/Off
Push button automatic mode On

Central switch (also EMERGENCY STOP)
Fuel gauge
Compressor Off

Adjustment of upper and lower air supply

Upper and lower air supply may only be used once the pressure in the vessel is sufficient.

Inside of the control unit
Pull switch for "manual operation" and operating hour indicator

Only BMS *alpha* B / BS
Feeder lift /lower down

4.5.5.6 Option regulation of mixing time

Purpose of regulation of mixing time

The regulation of mixing time ensures a thorough mixing procedure of the material and hence represents a quality advantage.

If the regulation of mixing time is switched on, the material will be mixed for a time period that has been pre-set before the material is conveyed (before the pumping procedure).
Factory settings (20 seconds) may be changed optionally.

In addition to the quality improvement, the time delay during the conveying of material equally offers the opportunity to get the operator to the worksite in order to spread the material.

If the material should be mixed while the machine works in automatic mode, before pumping, the regulation of mixing time may be switched on additionally.

The regulation of mixing time is activated by tilting the switch (backward).

Switch regulation of mixing time
On / Off

On = switch tilted backward
Off = switch tilted forward

The regulation of mixing time is set to 20 seconds.
It may be set by turning the adjusting knob T on the time scale.

The adjusting knob **xT** (on the top) as multiplicator serves to multiply the adjusted time of **T**.

Factory settings are 20 seconds
= adjusting knob **T** = 5 seconds
X adjusting knob **xT** = 4 x

Example for 15 seconds:
= adjusting knob **T** = 5 seconds
X adjusting knob **xT** = 3.

The lowest adjusting knob **F**
may not be adjusted!

Adjusting knob **xT** (Multiplicator)

Adjusting knob **T** (time)

Adjusting knob **F** (do not alter!)

Activate or deactivate the regulation of mixing time only when the machine is switched off!
Mixing time may only be set when the machine is switched off!
Setting mixing time while the machine is running constitutes the risk of severe injuries!

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Do not activate automatic mode while the regulation of mixing time is switched on and the dome lid is open!
There is danger of material being projected out of the vessel after the mixing time has elapsed!

4.6 Work preparation

4.6.1 General safety instructions

Only approved conveyor hoses and connectors may be used with a minimum diameter of 50 mm, operation pressure 10 Bar!

Hoses and connectors are subject to natural wear through friction and aging.

Check the immaculate condition of hoses and connectors.
The check must be effected by an expert every 3 months (safety checklist).
Check conveyor hoses, hose connectors, connections at the conveyor vessel, respectively at the pump.

Avoid using conveyor hoses with different nominal diameters.
This heightens the danger of blockages.

Do not position the machine in closed rooms!
Danger of poisoning through exhaust gases!

On positioning the machine, please observe that no staff or external persons are constrained or put into danger.
In individual cases, respective warning plates must be positioned.

Remove immediately all disturbances that may endanger safety!
In case of danger activate the central switch (as EMERGENCY STOP)!

Some of the material used may possibly cause health risks.
For this reason, you must always wear the necessary protective clothing corresponding to the information of the manufacturers' data specifications (respiratory protection, gloves, etc.)! See chapter 4.4.3 personal protective equipment.

Observe the regulations of the accident prevention and insurance association, accident prevention regulations in particular!

Process and convey only material that corresponds to the designated use of the machine (see chapter 4.2 suitability of the machine)!

The machine has been designed and constructed according to the generally acknowledged regulations of technology.
Improper use of the machine, respectively non-observance of safety instructions, may lead to dangers for the body and life of the operator, third persons as well as to damage of objects.

.

4.6.2 Positioning the machine

4.6.2.1 Choice of location

The location must meet the following criteria:

- Firm underground, plane and even.
- Sufficient clearance for unimpaired working conditions.
- Keep sufficient distance to walls or other obstacles.
- For maintenance and service jobs the necessary workspace must be at disposal.
- Do not keep explosives or otherwise dangerous material nearby that may be absorbed.
- Mostly dust-free.
- Well ventilated, to avoid the absorption of exhaust-gases.
- Favourable for the operator with sufficient space and free moving space
- Do not place under danger zones (for example danger of falling objects).
- Favourable for hose installation, so that hoses do not cause danger for third persons.
- Favourable for hose installation, so that conveyor hoses may be installed on the shortest possible distance.
- Observe emergency exits for the operator.
- It is not allowed to operate the machine in explosible atmospheres.

4.6.2.2 Positioning

The machine may only be placed on plane and firm underground!
Observe the criteria mentioned above concerning the positioning of the machine!

Use the towing vehicle to position the machine.

- Tighten the hand brake.

- Secure the wheels additionally with the chock blocks.

- Hinge the jockey wheel down and use the crank to lower it until the clutch loosens.
- Uncouple the towing vehicle.
- Lower the jockey wheel and adjust it so that the mixing and conveyor vessel is placed firmly on the ground (or a plank), or in case of **BMS *alpha* B/BS** so that the feet of the conveyor vessel are placed firmly on the ground
- Secure the machine additionally with the chock blocks against rolling!

If the underground is loose or wet, put wood planks underneath the supports!

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- Conveyor hoses **minimum diameter 50 mm (Operating pressure 10 Bar**)
  Install and connect the conveyor hoses carefully.
  Only use approved and flawless conveyor hoses
  Only approved conveyor hoses and connectors may be used.

- Install the discharge stand at the end of the conveyor hose!
  It is prohibited to convey without discharge stand. Risk of injury!

4.6.2.3 Instruction for the installation of conveyor hoses

The conveyor hose is connected to the outlet of the mixing and conveyor vessel.
Lay out the conveyor hoses as straight as possible and use as few connections as possible.
It is essential to connect the discharge stand to the last conveyor hose!

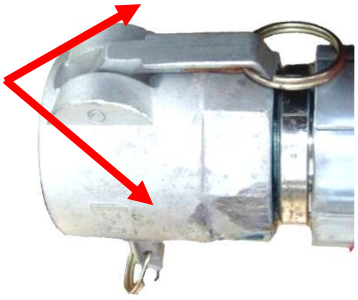
The hose connectors must be cleaned carefully in order to stay impermeable.

- Observe the correct insertion and cleanliness of the rubber seal in the coupling sleeve.

To install the hoses, open (pull out) the two levers, put the plug in the sleeve and close (pull back down) the two levers at the sleeve.
The seal is secure.

Coupling plug

Coupling lever



Coupling sleeve
with rubber seal at the inside

If the hoses are laid out in rooms where people or material move around, the levers should be secured against involuntary opening.
The levers may be secured by slinging a wire around them.

To ensure safe and fast conveying of the material on plane distances, lay the conveyor hoses over a secured support frame directly behind the machine.
On longer hose connections at ground level, place a support frame under the conveyor hose every 20 meters.
Fix the support frame safely to the ground so that it secures the hose at the same time.
Torn off conveyor hoses and couplings or such tearing off may cause severe or even deadly injuries as well as considerable damage to property.
For this reason, it is prohibited to operate the machine without connecting a discharge stand!

4.6.3 Start of operation

Check <u>before start of operation:</u>

- Check the entire machine on proper condition, in particular concerning technical safety. Eliminate immediately all disturbances that may impact safety!

- Check proper condition of conveyor hoses and connectors.

- Control the oil level of the diesel engine.

  Pull out the oil dipstick when the engine is cold and clean it with a dust-free cloth or absorbent paper.

  Insert the oil dipstick and pull it out after approx. 10 seconds.

  The oil level must be between the markers **MIN** and **MAX**.

  If the level is close to **MIN** or underneath **MIN** refill the needed amount of oil and control again.

  The oil level must not exceed the marker **MAX**!

- Check the amount of hydraulic oil.
  The hydraulic oil level must be between the markers **MIN** and **MAX** when the engine is warm.

  The oil level must not exceed the marker **MAX**!

- Control the quantity of fuel (fuel indicator) and refill eventually.

  The tank cover is secured with a lid.
  The lid must be unlocked in the engine compartment.

  The tank is positioned under the chassis.

Please pay attention to not spilling any oil (compressor oil, hydraulic oil) in the engine compartment. Should any oil get into the engine compartment it must <u>immediately</u> be removed carefully!
The engine compartment heats up. Spilled oil vaporizes due to the heat. There is considerable risk of fire! Oil vapour is poisonous!

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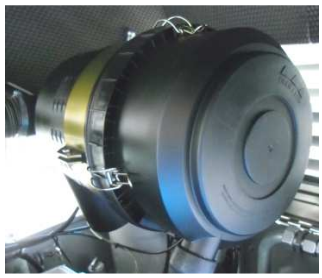


➢ Check the air filter; eventually replace air filter and safety cartouche immediately

➢ Check the compressor oil in the separator.
When the engine is cold, the oil level must not be below Min or over Max!

Only effect this check when the machine is parked and cold!
This applies equally to all other checks.
If the machine was in operation, the check should only be executed after approx. 10 minutes of standstill.

➢ Check automatic greasing. There must be enough grease in the glas bulb.

Check and clean the cooling unit.
If you dispose of the option filter hoods, the cooling unit does not soil as much. However, regular inspection is necessary in any case.

The hydraulically driven fan blades may eventually still move after the engine has been switched off.
There is considerable risk of injury.
Wait until the air blades stand still before opening the flap of the cooler.

Also see chapter Kap. 4.5.2 Interior view
There you find the exact position of the parts that must be checked.

4.6.3.1 Preparation for operating the machine

Never place the machine in closed rooms!
There is risk of poisoning by exhaust gases.

In case of danger turn the central switch on EMERGENCY STOP!

Some of the material used may possibly cause health risks.
Therefore it is essential to always wear the necessary protective clothing according to the data sheets of the manufacturer (respiratory protection, gloves, goggles, helmet, etc.)!
See chapter personal protective equipment.

Observe the regulations of the accident prevention and insurance association, in particular the ones on prevention of accidents!

Process and convey only material that applies to the intended use of the machine (see chapter 4.2 suitability of the machine)!

Keep the engine hood closed during operation!

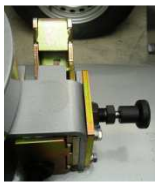
Operate the machine only when all the safety devices are fully functional!

Before switching on the machine, ensure that no one is put into danger by the starting machine!

Check the machine at least once every work shift on external damages and on functional efficiency of the safety devices!

The mixing and conveyor vessel is secured with a dome sieve
The sieve is secured by activating a safety switch before opening it during operation of the machine.
On tilting back the safety switch, the machine switches off.
Do not open the guard while the machine is running! Risk of severe injuries!

Do not put the safety switch out of service and operate only with the dome sieve closed! If the dome sieve is open, the red indicator light is illuminated at the operating panel.



The safety devices must always be used according to the regulations on the proper use of the machine.

Improper use of the machine and safety devices that do not function properly constitute considerable risk of injuries!

4.6.3.2 Personal protection of the operator

Persons that are permanently within the machine's sphere of influence must wear hearing protection.

Protective goggles are obligatory for certain jobs on the machine that are labelled specifically (in particular jobs at the mixing and conveyor vessel, the conveyor hoses, or during the removal of blockages).
This applies particularly for all jobs on pressurized parts!

Protective gloves are obligatory for certain jobs on the machine that are labelled specifically.
Moreover, they are obligatory for working with specifically labelled material (observe instructions of the manufacturer of the material

Observe the respective regulations on the prevention of accidents by the accident prevention and insurance association.
During operation on the worksite additional protective measures may be required.

Notice on noise protection

Noise, even if not very loud, may get us nervous and angry. After being exposed to noise over a longer period, our nerve system may suffer severe damages.

Depending on the sound pressure level at places where persons are staying, the following precautions must be taken:

below 70 dB(A): no specific measures,
exceeding 70 dB(A):

below 85 dB(A): no specific precautions ought to be taken for occasional visitors who are only staying in the sphere of influence for a short time period.

exceeding 85 dB(A): Sphere of influence with dangerous noise level! Persons must be advised to wear hearing protection even if it is only for a short period.

exceeding 95 dB(A): the warning signs in the danger zone must be complemented by the recommendation that occasional visitors must as well wear hearing protection,

exceeding 105 dB(A): specific ear muffs that are adapted to the volume and to the spectral composition of the noise must be at disposal.
A respective warning sign must be placed in the area of the danger zone.

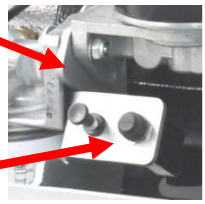
4.6.3.3 Preparation for initial operation

➢ Check *before initial operation*
- the machine is positioned according to regulations.
- the machine is secured against rolling off.
- stable underground.
- all safety devices are installed and fully functional.
- the machine is in good technical condition.
- all wires and connections are connected and secured.
- all closings of the machine are locked (tank, oil, cooler, battery, filter, etc.).
- all lubricating points are greased sufficiently.
- the central lubrication system is fully functional.
- the conveyor hoses are in good order and condition.
- the hose connectors and seals are in good order and condition.
- the discharge stand is in good order and condition.
- the connectors match the conveyor hoses.
- the safety devices for the installed conveyor hoses are at disposal.

After the installation of the conveyor hoses:
- The couplings of the conveyor hoses and the installation are secured.

➢ Placing the hoses (**Instruction on installation see chapter 4.6.2.3**)
Lay out the hoses as straight as possible.
Observe safety instructions!

Switch on the working light if necessary.
The switch for the working light is placed in the engine compartment. (see image).

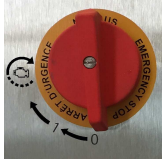


When the working light is used pay attention to switching it off at the end of the job. Otherwise the battery may discharge.

Starting the machine

➢ First press the push button for starting the control system in the interior compartment
➢ close the hood.
➢ turn the central switch from the left to the middle position.
- the charging indicator lamp lights up (yellow).

➢ turn the switch to the right as far as it will go.
- the starter is turning and the motor starts.
➢ Keep the switch in position – depending on the outside temperature this may take some seconds.
➢ As soon as the engine runs on its own, you may let go of the start switch.
The start switch jumps back into the middle position.



If the engine switches off after letting go of the start switch, repeat the starting sequence a couple of times.
Depending on outside temperature (minus degrees), max. 5 times.
If the engine continues to switch off, check once again tank level, compressor oil and engine oil level as well as the indicator lights at the operator panel.
If these checks are positive (everything is in order), there is probably a malfunction concerning the safety control of the machine. In this case inform an authorized service mechanic for a check up of the machine.

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For further steering of the machine use the operating panel.

- Turn the operator switch on "ON" (red light in the switch expires)
- fill in the material
- close the dome lid
- push button automatic mode

The material is conveyed.

4.6.3.3.1 Problems with starting / stopping diesel engine

After changing the pre-filter or after a longer standstill of the machine starting problems may occur due to insufficient fuel supply.
In this case, fuel may be pumped manually into the pipe at the engine.
Pump by pressing the pump button until resistance is felt.

The engine is switched off with the main switch.
If the engine does not stop after switching off the main switch, it may be stopped by using the pivoted lever at the motor

Push the lever to the left until the motor switches off.

4.6.3.4 Operation

Do not pause during the conveying of material, for, material stuck in the pump or in the hose may harden = danger of blockages!

Never switch off the loaded machine over a longer period of time!
Material may break away, obstruct and damage the pump.

Turn the central switch (as EMERGENCY-STOP) to 0 (left) in emergency situations.
If possible, close the air cocks for upper and lower air supply before (vertical position).
Clean the conveyor vessel and hoses immediately!

During preparation the machine was already switched on

In the position „mixer off“ there is an option to continue operating the mixer through the friction of the power belt.
Never open the dome sieve while the machine is running.
It is prohibited to operate the machine without securing the dome sieve.
There is considerable risk of injury through the mixer.

4.6.3.4.1 Filling the mixing vessel

In the mixing vessel the compounds of the material are mixed.
Only fill the mixing vessel when the mixer is running.
The max. fill level is at 20 mm underneath the upper crest of the mixing vessel.
During the mixing procedure with a full mixing vessel, the material is lifted approx. 50 mm into the dome.
Open the lid of the filling dome as far as it will go.
Swing the outlet hopper onto the filling dome of the mixing vessel.
Fill the vessel up to half with material (sand, gravel, etc.).
Add the necessary binding agents and additives according to the requirements for finished products to the mix by using the outlet hopper.
The toothing of the outlet hopper facilitates opening sacks.
Put the required amount of water into the mixing vessel.
Fill up the mixing vessel with the remaining sand, gravel, or additives.
Check the consistency of the mix and add water if necessary.
Switch back the outlet hopper and clean the border of the dome.
Close the dome lid of the mixing vessel and lock it with the toggle closure.
At the end of the mixing time (overtravel time according to time setting if this option has been commanded) the conveying of the mixed material starts.

BMS *alpha* (Standard)

4.6.3.4.2 Closing the lid of the mixing vessel

Clean the edge of the lid of the filling dome.
Close the dome lid.
Clap the vessel venting backwards as far as it will go.

Push the lid downward with the handle and press the toggle closure over the connecting link.
Push the lever of the toggle closure downward as far as it will go.

Close the vessel venting and secure the toggle closure.
The lid of the mixing vessel is closed and secured against involuntary opening.

Check the rubber seal at the lid and replace if damaged.
Jamming of material, aging or other events may lead to fissures and leakages that may constitute danger.
In case of pressure loss, material may be projected and lead to severe injuries.

4.6.3.4.3 Venting after conveying is completed

When the vessel pressure falls below 2 Bar (fixed setting), the compressor switches off.
The compressor does not convey any more air.
However, there still remains a pressure of approx. 2 Bar in the mixing vessel!
Before opening the lid, ensure that the mixing vessel is depressurized.
The actual pressure of the vessel is indicated at the manometer of the vessel.

If the manometer indicates pressure inside the vessel, the vessel must be purged manually.
Slowly pull the venting lever off the dome lid.
If, at this instant, material is conveyed, it will be interrupted by the pressure loss.

The vessel pressure exhausts through the venting system and is lead towards the ground through the venting hose.

4.6.3.4.4 Opening the lid of the mixing vessel

On conveying material, the vessel pressure may rise up to approx. 8 Bar depending on the length of the conveying hose and/ or the conveyor height.
At the end of the conveying process, the machine switches off automatically at a remaining vessel pressure of approx. 2 Bar
The compressor does not convey any more air.
However, there is still a remaining pressure of approx. 2 Bar in the mixing vessel!
Before opening the lid, ensure that the mixing vessel is depressurized.

The actual pressure of the vessel is indicated at the manometer of the vessel.

If the manometer of the vessel indicates pressure inside the vessel, it must be purged manually.
Slowly pull the venting lever off the dome lid.
If, at this instant material is conveyed, it will be interrupted by the pressure loss.

The vessel pressure exhausts through the venting system and is lead towards the ground through the venting hose.

The depressurized vessel may be opened.

4.6.3.4.5 Interrupting operation

If the operation is interrupted for a longer period, the material may harden.
How long this takes depends on the characteristics of the material.
Remaining material in the conveyor hose and/ or the mixing vessel may cause blockages or block the mixer.

To keep material from hardening in the mixing vessel or the hose, the mixing vessel and the conveyor hoses must be emptied completely.

4.6.3.4.6 Switching on the mixer

Turn the operating switch to ON

After starting the machine, the necessary operating pressure will build up.

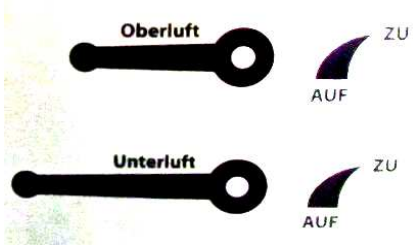
The belt-tightener is pressurized and strains the drive belt of the mixer.

With the optional regulation of mixing time, the mixing time may be individually adjusted.
The regulation of mixing time must be switched on and adjusted before the mixer is switched on.

The regulation of mixing time must not be operated while the machine is running!
There is considerable risk of injuries.

4.6.3.4.7 Conveying mixtures

The lid and the vessel venting must be closed; the mixer must be switched on.

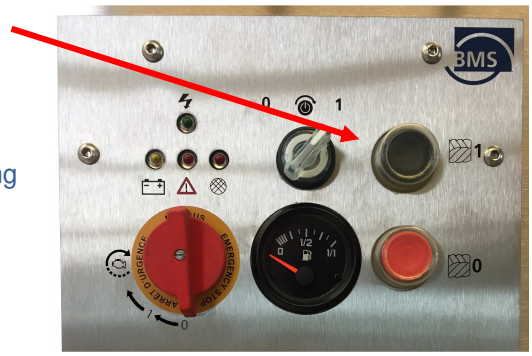


Upper and lower air supply must be adjusted according to the length and diameter of the conveyor hoses as well as to the conveyor height and drawl.

After switching on the conveying mode, the engine runs with the set rotation speed and the compressor conveys the maximum amount of air.
Pressure builds up in the air system of the compressor and in the mixing vessel.
The pressure in the mixing vessel and the turning mixer press the mixture through the vessel outlet into the conveyor hose.
The interaction of pressurized air and mixer convey the mixture through the conveyor hose to the discharge stand where it is ejected.

4.6.3.4.8 Conveying in the automatic mode

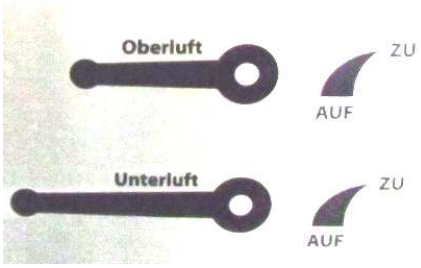
For automatic operation press the button „AUTOMATIC“.



The engine runs at the set rotation speed.
The compressor conveys the maximum amount of air.

The pressure in the mixing vessel builds up and the conveying process starts.

When the content of the mixing vessel decreases, the conveying air exhausts increasingly through the conveyor hoses.The pressure drops.
The conveying process continues automatically until the pressure drops below the pre-set remaining pressure of approx. 2 Bar.
The machine switches off the conveying mode and the pressurized air. The machine continues operating in the mixing mode.



On using the option „regulation of mixing time“, the regulation of mixing time must be switched on before the automatic mode is added!

4.6.3.4.9 Conveying in manual mode

For manual mode, pull out the pull switch at the inside of the control unit.

The machine switches from automatic to manual operation.
During manual operation, the conveying continues even without material until the conveying process is switched off manually.
For switching off, push the pull switch in.

Pull switch "manual operation"

The operating mode „manual operation“ is usually used for cleaning the system or during a disturbance of the automatic mode.

As long as the switch for „manual operation“ is pulled out, automatic operation cannot be activated.
Pay attention to pushing the pull switch for „manual operation“ back in after using manual operation.

4.6.3.4.10 Purging the vessel

After switching off the conveying mode, there may still remain pressure in the mixing vessel.

In the automatic mode and in particular if there are blockages, purging the vessel through the vessel venting is specifically important.

The lid of the mixing vessel disposes of a venting device to release the remaining pressure in the vessel.

The operating lever blocks the mechanic of the lid, so that opening the lid without purging the vessel is not possible.

Open the vessel venting only slowly, so that the pressure drops slowly.
There is danger of material being carried along with the out-streaming air and the venting may be clogged.
Material may blow out and cause injuries.

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4.6.3.4.11 Upper and lower air supply

The setting of upper and lower air supply depends on several factors.
- the nominal diameter of the conveyor hose
- the type of hose connector (inside or outside link)
- the length of the conveyor hose
- the conveyor height
- the kind of material that is to be conveyed
- the kind of conveying process
- the consistency of the material (viscosity).

The setting is effected by positioning the air taps.

The taps are turned to the left: Upper and lower air supplies are open.

The taps are turned to the right: Upper and lower air supplies are closed.

4.6.3.4.12 Conveying the first mixture, standard setting

Open the upper and lower air supplies completely (both levers are positioned to the left).

Start the conveying process
➢ Push the button „automatic“.
Pay attention to the manometer of the vessel!

The machine builds up pressure and slowly starts conveying.
Withdraw a bit of the upper air stream and eventually also of the lower one, until the machine conveys optimally.
If the pressure does not build up within 15 seconds, the air exhausts through the lower air supply of the still empty conveyor hose.
Close the lower air supply completely for an instant, until enough pressure has built up in the mixing vessel.
Then open the lower air supply halfway.
When the conveying process starts, adjust the upper and lower air supplies to the optimal delivery rate.

Option "regulation of mixing time"
If the regulation of mixing time is switched on, the pumping starts retardedly, respective to the chosen length of mixing time.

4.6.3.4.13 Adjusting discharge pressure

The vessel pressure equals the discharge pressure when the lower air supply is open, so that the discharge pressure is indicated on the manometer of the vessel.

The optimal discharge pressure depends on the type of conveying.
The discharge pressure must be optimally set and adapted according to the operating conditions.

Conveying to upper floors:

Optimal discharge pressure between 4 – 5.5 Bar

Conveying to lower floors, for example cellar:

Optimal discharge pressure between 2 – 3 Bar

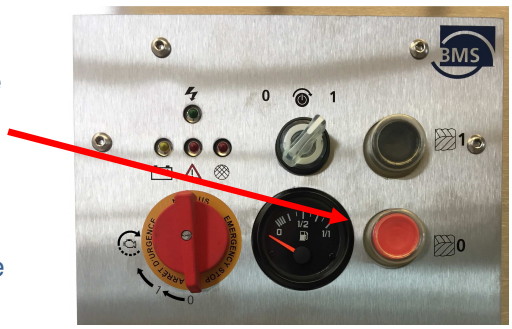
Conveying on plane distances:

Optimal discharge pressure between 3 – 4 Bar

In most cases, a combination of different types of conveying is necessary.
Choose the highest pressure range in this case.

4.6.3.4.14 Venting during the conveying process

The mixing vessel may be vented any time (even when conveying).
For venting during the conveying process or due to a blockage press the button “compressor OFF”.



The compressor stops conveying
The remaining pressure of the vessel is released through the vessel venting.
Depending on the remaining pressure of the mixing vessel, the venting noise may be significantly louder.

Open the vessel venting only slowly, so that the remaining pressure may be released slowly without carrying material along.

When the mixing vessel is vented, material may be released through the venting depending on the remaining pressure.
The venting system may be clogged.
When venting is done very rapidly, great amounts of air pass through the venting system of the vessel.
The strong air flow may swirl up material from the ground and endanger persons as well as damage objects close by.

4.6.3.4.15 Operation of the feeder, only BMS *alpha* B

The feeder facilitates the loading of the mixing vessel.
Loading material when the feeder is lowered down is much easier and more ergonomic than loading the standard machine.
The hydraulic tilting process takes over the filling of the mixing vessel.
The operator may prepare the next mixture during the conveying process, this ensures a faster work sequence while offering physical relief to the operator at the same time.
The feeder may only be lifted when the mixer is switched on. It may be lowered when the engine is switched off.

1. Removal of the rear light unit:
The rear light unit with license plate must be removed before using the feeder.
Pull the plug of the rear light unit out of the socket of the trailer.

Remove the spring safety pins at the backside of the rear light unit.
Pull the rear light unit off the supporting bolts.
Keep the rear light unit at a safe location during the job.
Two locking pins on the towing bar are designated for storing the rear light unit.
See also chapter 3,3,2

2. Loosen the safety device:
The safety device used during the transport of the feeder must be loosened before the feeder may be used.
Take the lashing strap off the feeder and the vessel.
Store the lashing strap at a safe location.

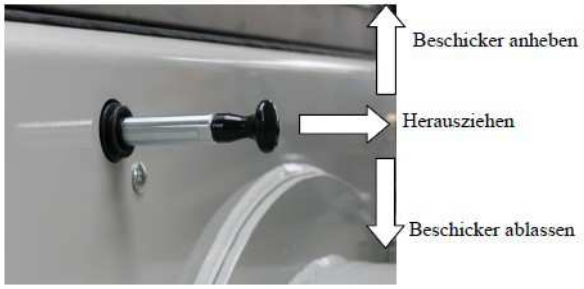
Transporting the machine without securing it with the lashing strap is prohibited!

The dome lid of the mixing vessel must be open when the feeder is moved.
Otherwise dome lid and feeder may be damaged.

The operating lever is positioned on the left at the rear of the machine.
The lever is secured with a safety lock to avoid involuntary activation.
To activate the feeder,pull the lever horizontally out of the lock.

Pull the operating lever out horizontally and lift it upwards.
The feeder is lifted.
.

Pull the operating lever out horizontally and tilt it downwards.
The feeder is lowered.



Persons must not be staying in the pivoting range of the feeder!
Ensure at any time during the whole procedure that no one enters the pivoting range of the feeder.

4.6.3.4.16 Work sequence feeder

Fill screed, sand and/ or gravel into the feeder.
Filling until just below the grid corresponds approximately to one vessel filling.
Lift the feeder until the material flows into the mixing vessel.
Fill the mixing vessel half and lower the feeder (operating lever downwards).
Fill the necessary amount of binding agent into the mixing vessel by using the outlet hopper.
Add the necessary amount of water and eventually other additives.
Lift the feeder (operating lever upwards).
Fill up the mixing vessel with sand or gravel up to the lower edge of the vessel dome.
Lower the feeder.
The feeder may be filled again while the mixing and conveying process is in operation.
Check the consistency of the mixed material.
Add more water if necessary.
Clean the edge of the dome lid (important!)
Close the dome lid.
Set the operation mode to „conveying“ after the preset mixing time has elapsed (see chapter 4,6,3,4,7).

The feeder may be filled again during the mixing and conveying process.

The feeder may only be filled with sand or gravel.
Do not put binding agent or water into the feeder!
Danger of heavy pollution.
The feeder may only be cleaned with great effort.
A dirty feeder may have too much overall weight.
This may impair its functionality (up to non-function!)

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4.6.3.4.17 Operation of the scraper (only BMS *alpha* B/S)

The scraper is additional equipment for the feeder.
The feeder is filled by the scraper paddle.
The scraper is pulled through the pile of sand by a steel wire and transports sand into the lowered feeder.
The sand or gravel is not shoveled manually.

The scraper is operated by a remote control.
The transmitter is fixed to the shovel, the receiver to the engine compartment.

Preparation for using the scraper
Lower the feeder (see operation of the feeder chapter 4,6,3,4,15).
Loosen the spring bolt at the locking rod of the scraper.
Hold the scraper shovel while pulling out the locking rod between the scraper shovel and the feeder.
Store rod and lock at a safe place; transporting the scraper without lock is prohibited.
Take the scraper shovel out of the securing device and position it for work.

Unrol the scraper wire:
The scraper wire is extended by hand (via the rope drum).
If the thumb switch of the radio system is not activated, the rope may be extended via the rope drum.

4.6.3.4.18 Work sequence scraper

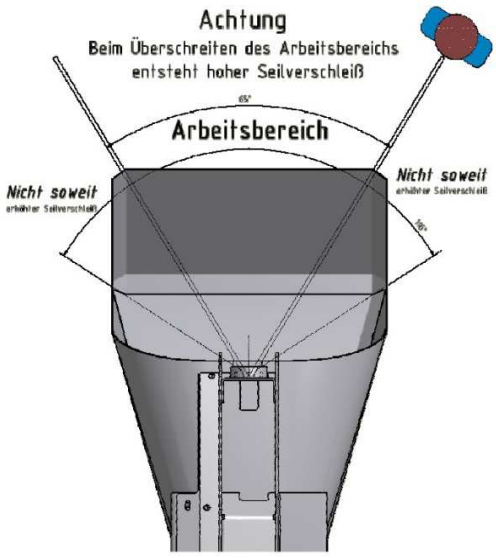
Use the scraper shovel to form a ramp of sand or gravel in front of the feeder.
The filled shovel may now slide over the ramp onto the feeder.
The machine must be positioned so that the sand heap is always centered behind the feeder.
The scraper shovel is pulled manually behind the sand heap.

When the thump switch is activated, the rope winch winds up the wire and the shovel is pulled through the sand. Switch ⇨

By changing the position of the shovel, the operator may influence the quantity of the sand that is to be transported.
The filled shovel is pulled over the ramp to the feeder.
Switch off the draw winch by letting go of the thump switch.
Empty the scraper shovel into the feeder.
Repeat this procedure until the feeder is full.

Operation of the feeder see chapter 4.6.3.4.15.

Do not pull any material that is placed outside the operation zone of the scraper.
The machine must be positioned toward the sand/ gravel heap.
Otherwise there is risk of increased wear of the rope.



4.6.3.4.19 Rolling up the scraper wire

Activate the thump switch of the radio system.
The rope winch rolls up the wire and pulls the scraper toward the feeder as long as the thump switch is activated.

After the job, separate the scraper shovel from the steel wire and roll up the wire with the thumps switch.

Do <u>not</u> let the wire roll over your hand while rolling up.
If the steel wire is damaged (individual steel fibers torn), there is risk of injury.
Check the wire on damages while rolling it up, in particular check on torn steel.
A damaged rope must be replaced immediately.

Clean mixing vessel, feeder and scraper shovel after finishing the job.
Put the scraper shovel onto the feeder.
Lift the feeder up a bit.

Fix the scraper shovel to the feeder with the locking rod.
Secure the locking rod with the spring pin.

If the scraper shovel is not secured, the shovel may get loose during transport.
There is danger to life!

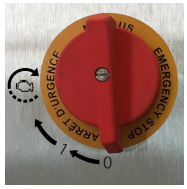
4.7 Blockages in the conveying system

There may be blockages in the conveyor hoses.
The mixture gets stuck inside the conveyor hoses and cannot be moved any more.

4.7.1 Causes for blockages

- The nominal diameter of the conveyor hoses does not correspond to the requirements.
- The mixture and the nominal diameter of the conveyor hoses do not correspond to each other.
- The nominal diameters of the conveyor hoses are different.
- The conveyor hoses are bent or damaged.
- The hoses connectors are damaged or do not correspond to each other.
- The grain size of the material is bigger than 16 mm.
- There is a big foreign body in the conveying system.
- The screed is already setting (additive or too long standstill).

If you notice a blockage (no conveying – high pressure)
Immediately switch off the discharge pressure.
Close both levers for upper and lower air supply (lever to the right).



Switch off the machine (central switch off)

Pay attention to the sequence:
First close upper and lower air supplies and then switch off the machine.

Vent the mixing vessel via the venting system of the vessel.
Check the vessel pressure at the manometer.
The mixing vessel must be depressurized.

Do **not** open the lid of the mixing vessel!
A blockage in the conveyor hose may drop back into the mixing vessel.
There is considerable risk of injuries!

Pressurized hose connectors may not be disconnected!

Ensure that mixing vessel and conveyor hoses are depressurized.

During the removal of blockages it is imperative to wear face protection, (goggles), long-sleeved clothes and gloves.

Ensure that no other person is staying in the operation range.

There is considerable risk of injury through splashing mixture.

Even if the vessel is depressurized, the conveyor hoses may be under pressure.

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Should any material get into your eyes, despite all safety measures, wash your eyes immediately with clean, running water and see an oculist immediately.

4.7.2 How to avoid blockages

Pay attention to the following points in order to avoid blockages:

- conveyor hoses must be linked externally.
- use conveyor hoses with big nominal diameters.
- sufficient consistency of the mixture.

If the mixture is conveyed insufficiently or not at all:

- If the mixture is too dry add more water.
- Replace defective or dirty hose connectors.
- If the hose connectors are defective, water may leak out.
- check hose connectors, if necessary clean connectors, replace seals or change connectors.

Venting during conveying when there is a blockage

The mixing vessel may be vented anytime, even during the conveying process.
Press the button „compressor OFF“ during conveying or when there is a blockage.
The conveying process of the compressor is switched off.
Release the residual pressure of the vessel through the venting system. Depending on the residual pressure of the mixing vessel the volume of the venting noise may be significantly louder.

Open the vessel venting only slowly, so that the remaining pressure may be released slowly without carrying material along. See chapter 4.6.3.4.14

When the mixing vessel is vented, material may be released through the vessel venting depending on the residual pressure.
The venting system may be clogged.
When venting is done very rapidly, great amounts of air pass through the venting system of the vessel.

The strong air flow may swirl up material from the ground and endanger persons as well as damage objects close by.

4.7.3 How to find blockages

As soon as the vessel is depressurized, the conveyor hose is equally depressurized up until the first blockage.
Beginning at the vessel outlet, check where the blockage is starting, by cautiously stepping on and pressing the conveyor hose.
Consider that there may be multiple blockages!
In a zone without blockages the hose will be soft and flexible.
In a zone with a blockage or in between 2 blockages, the conveyor hose will be hard.
Check the rest of the conveyor hose to see if there may be multiple blockages.

If there are multiple blockages= continue at „persistent blockages“.
If there are blockages in the vessel outlet the whole hose will be soft and flexible.

Do not press blockages out of the hose by using pressurized air.
Conveyor hoses or hose connectors may burst.
This may lead to severe, life endangering injuries.

4.7.4 How to remove blockages

To remove blockages, sway the parts where a blockage is suspected strongly from side to side or agitate them.
The blockage should loosen.

Persistent or multiple blockages

Sometimes agitating will not loosen the blockages or there are multiple blockages in the conveyor hose.
The removal of these blockages may cause considerable danger.
Observe all safety precautions described!

Check if the conveyor hose is depressurized by forming it.
There may be residual pressure between 2 blockages in the conveyor hose!
The residual pressure may cause severe injuries.
Sway the hose from side to side; support the release of the residual pressure and the loosening of the blockage by knocking and agitating.
If the whole length of the hose is flexible, the connectors of the conveyor hose may be opened.
Get the blockage out of the hose by knocking, agitating and bending the hose.
If there are more blockages in the hoses, repeat the procedure.

Residual pressure in between blockages

A conveyor hose may „hit“, the mixture may burst out abruptly and lead to severe injuries.
Knead, agitate and bend the parts of the conveyor hose with the blockage until the residual pressure is relieved.
Check the hose on more blockages and in particular on residual pressure.
As mentioned above, the procedure must be repeated until the whole of the conveyor hose is depressurized.
A depressurized hose is soft and flexible. If there is residual pressure, the hose is firm.
The connectors may only be opened cautiously when the conveyor hose is depressurized.
Loosen the blockage(s) by hitting, agitating and bending the hose to get it out.

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If blockages get stuck, the mixture may be washed out of the conveyor hose by using a water hose.
Introduce a water hose into the conveyor hose.
Lay out the conveyor hose sloping downward, so that the water may drain.
Push the water hose through the conveyor hose in opposite direction to the draining water.
The mixture is loosened by the water and flushes out with it.
If there is no more material flushing out, pull out the water hose.
Check if all blockages are removed.
If there are still blockages, repeat the procedure until the conveyor hose is empty.

There may be residual pressure between blockages.
Do not separate hoses with residual pressure in any case!

4.7.5 Recommissioning

After checking the hoses and the connectors, lay out the hoses again and connect them to the machine.
Defective hoses and connectors may lead to blockages or danger and may not be used for operation.
After the safety review, the machine may be operated again.

4.7.6 Interrupting the conveying of mixtures

In case of danger or technical disturbances, it may be necessary to interrupt conveying.
The conveying process may only be interrupted for short time periods for otherwise there may be blockages and/ or the mixture may harden.
The conveying procedure may be shortly interrupted at any moment.
If the interruption lasts longer, proceed as described in chapter 4.9 end of operation.

Switching off conveying:
- Push button compressor OFF
- Close air cocks for upper and lower air supply

The conveying air switches off.
The conveying process of mixtures is interrupted.

4.8 How to clean the machine

If the operation is interrupted for a longer period or at the end of the operation, the mixing vessel and the conveyor hoses must be emptied and cleaned.
Moreover, at the end of the operation, the whole of the machine must be cleaned and the lubricating points must be greased according to the lubrication plan.

Before you clean the machine, it have to be switched off completely by the mainbreaker
(site 56, chapter 4.5.5.5)

If you clean the machine, wear a goggle to avoid injuries.

Observe the effective regulations concerning cleaning and waste disposal, in particular environmental regulations.

4.8.1 Branch connection for air extraction

The machine disposes of a separate connection for the extraction of air in order to offer the connection of an air supply for cleaning purposes or to connect cleaning equipment or other consumer loads.

Close air extraction lever for upper and lower air supply.
Switch off the mixer.
Connect the connecting hose to the air extraction (self-closing quick release coupling).
Connect the air hose to the consumer load.
Start the machine and set to manual operation (pull switch inside the control unit box).

The branch connection for air extraction is inside the engine compartment at the rear on the right.

Do not use the air extraction pipe to convey any other media than air!
The air extraction does not dispose of a non-return valve.
The compressor may get damaged.

Do not direct pressurized air on people.
Do not use pressurized air to clean clothes.
Do not used pressurized air as breathing air.

4.8.2 How to clean the mixing vessel

The engine must be switched off for cleaning the mixing vessel!

Stop the machine and secure it against involuntary or unauthorized use.
See chapter 4.11.2.

Before opening the dome sieve (lift and swing sideways), secure the machine against involuntary or unauthorized operation.
Always loosen one of the battery contacts. For your own safety!
Do not reach into the machine without securing the machine against involuntary or unauthorized operation (disconnect the battery).

After executing the safety measure mentioned before:
Open the safety lock.
Lift the dome sieve and sway it out of the filling dome.
Remove residual mortar in the whole vessel.
Clean the vessel venting and flush it with plenty of water.
Flush the mixing vessel with plenty of water.
Remove remains of mortar at the front and back of the seals of the mixing shaft.
Grease abundantly the lubricating points at the vessel, lid and the vessel venting.

4.8.3 Clean upper and lower air supply:

Upper and lower air hoses and connections may be soiled by mortar.
They must be checked at every end or longer interruption of operation.

Ensure that the machine is stopped and that the vessel is vented.
Ensure that the conveyor hoses are depressurized.
Secure the machine against involuntary and unauthorized recommissioning (disconnect the battery).

Loosen hose connectors of upper and lower air supply at the vessel.
Loosen the hose connectors of upper and lower air supply at the machine.
Flush the hoses thoroughly with water.
Check and thoroughly clean the upper and lower air connections at the vessel.
Check and thoroughly clean the upper and lower air connections at the machine.
Visual check of the non-return valves, clean them thoroughly with water. In case of heavy soiling, loosen the soiling with a pointed object and flush with plenty of water.
Connect the hoses after the cleaning procedure.

Pay attention to install the hoses correctly!
The upper air hose must be connected to the upper air supply at the vessel and to the upper air coupling of the machine
The lower air hose must be connected to the vessel outlet and the lower air connection of the machine.

4.8.4 How to clean the venting system

This check must be effected during operation, at every end of operation and during longer interruptions of the operation, if necessary.

Ensure that the machine is stopped and that the mixing vessel is vented.
Ensure that the conveyor hoses are depressurized.
Secure the machine against involuntary and unauthorized recommissioning (disconnect the battery).

Tilt the venting lever backwards (mixing vessel vents). (image 1)
Open the lid.
Flush the opening of the venting system and the sealing cone with plenty of water. (image 2).
Loosen sticky mortar mechanically with a scraper or a similar object.
Pay attention to not damaging the sealing cone.
Close the lid if mortar remains in the air duct of the lid (image 3)
Loosen the screws of the cover.
Pull out the cover.
Remaining mortar may be removed from the air duct mechanically or with water.
Screw the cover and the lid together after the cleaning is finished.
Close the lid.


Image 1


Image 2


Image 3

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4.8.5 How to clean the conveyor hoses

During the cleaning of the mixing vessel most of the coarse dirt is already removed from the conveyor hoses through the air stream.
Remove remaining dirt with the cleaning procedure described in the following.
It is imperative to undertake correct cleaning measures, for, otherwise blockages may occur in the hoses.

Do not loosen hose connectors until the machine has been stopped, vented and relieved from blockages.
There is considerable danger of injuries.

Loosen the hose connector at the vessel outlet.
Put the wet hose ball into the conveyor hose.
Connect the hose connector to the vessel outlet.
Fill water into the mixing vessel.
Close the dome lid.
Switch on manual operation (manual conveying).
The water and the hose ball are pressed through the conveyor hoses.
The hose ball and the water clean the conveyor hoses.
Switch off manual operation (manual conveying).
Switch off the machine.
Repeat the procedure if necessary.
Clean the mortar off the hose ball with water.
Separate the conveyor hoses and clean the connector.
Check connectors and hoses on damages.
Clean the vessel outlet and check it on damages.
Clean the discharge stand and check it on damages.

Damaged connectors, connections, seals and hoses must be repaired or replaced immediately.

Push the pull switch „manual operation” back in after finishing the job!

4.9 End of operation

Switch on manual operation – pull the pull switch inside the control unit.
Empty the mixing vessel and the conveyor hoses.
Push the button „compressor OFF“.
Vent the mixing vessel.
Turn the central switch on „OFF“ = machine stops.

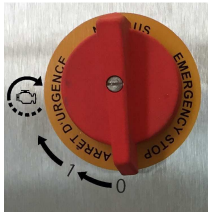
Clean, grease and preserve the machine.
Clean the conveyor hoses and the discharge stand.
Secure the machine against unauthorized use.

- Collect residual material and dispose of it in an environmentally sound way.
  Observe the instructions for the used material on this point.

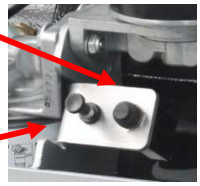
- Wash the whole of the machine’s exterior with water and a hand brush.
  Use clear water to pump the conveyor vessel empty at low rotation speed and use a pointed jet of water to wash off residual material.
- Only now you may switch off the engine.
- Take off the conveyor hose.
- Clean the exterior of the conveyor hose.
  Pay particular attention to cleaning the hose connectors and seals!
- Clean the machine from residual material.
- Preserve the machine:
  Preserve the machine with a biodegradable machine cleaner from **BMS**.

Do not keep the machine running without the mixer (max. 2 minutes). **Danger of overheating!**

After finishing work, switch off the control unit of the machine.
Turn the central switch on „OFF“.



Push the button „control“ in the engine compartment.
Secure against involuntary or unauthorized operation!
Put the start switch (outside the control unit – safety switch) on the position “off”
The control unit is cut off from electricity and blocked against recommissioning.



Switch off the working light. (switch on the left in the engine compartment).

Push in the pull switch for „manual operation“.
Close the hood and block it with a padlock.
The machine is secured against involuntary or unauthorized operation.

4.9.1 Preparation for transport BMS *alpha*

After finishing the jobs mentioned in the caption “end of operation“:

Preparation for transport – see chapter 3.5 Preparation for driving.

4.9.2 Preparation for transport BMS *alpha* B

After finishing the jobs mentioned in the caption “end of operation“:

In addition to the jobs mentioned above for " *alpha*

Clean and preserve the inside and outside of the feeder.
Open the dome lid.
Flap down the dome outlet hopper.
Lift the feeder.
Secure the feeder with a lashing strap.
Fix the rear light unit and secure it with spring locking pins.
Connect the rear light unit electrically to the trailer.

Pay attention to there not being any persons in the pivoting range of the feeder while lifting it!

The feeder must be secured with the lashing strap!
It is prohibited to drive without securing the feeder!

Preparation for transport – see chapter 3.5 Preparation for driving.

4.9.3 Preparation for transport BMS *alpha* B/S

After finishing the jobs mentioned in the caption “end of operation“:

In addition to the jobs mentioned above for "BMS *alpha*

Untighten the towing wire from the scraper shovel.
Use the thumb switch at the scraper shovel to draw in the towing wire.

Do not let the wire roll over your hand while rolling up.
If the steel wire is damaged (individual steel fibers torn), there is considerable risk of injury!

Clean and preserve the inside and outside of the feeder.

Clean and preserve the inside and outside of the scraper shovel.
Place the scraper shovel in the support for the shovel on the feeder.
Insert the safety rod into the scraper shovel.
Secure the safety rod with the spring locking pin.
Put the battery of the remote control into the charger (in the engine compartment).

Open the dome lid.
Flap down the dome outlet hopper.
Lift the feeder.
Secure the feeder with a lashing strap.
Fix the rear light unit and secure it with spring locking pins.
Connect the rear light unit electrically to the trailer.

Pay attention to there not being any persons in the pivoting range of the feeder while lifting it!

The feeder must be secured with the lashing strap!
It is prohibited to drive without securing the feeder!

Secure the scraper shovel with the safety rod.
The safety rod must be secured with the spring locking pin!
It is prohibited to drive without securing the scraper shovel!

Preparation for transport – see chapter 3.5 Preparation for driving.

4.10 Error detection during conveying

General error detection see chapter 6

4.10.1 General error detection during conveying

There may be problems during conveying in form of blockages.
A blockage is a clot of material that got stuck in the vessel outlet or in the conveyor hose.
The clot of material must be removed from the vessel outlet or the conveyor hose.

Blockages occur mostly for three reasons
1. The mixture of material is not suitable for pumping, e.g. too thin or too viscous.
2. The mixture has been standing still for too long.
   Water and viscous material have settled.
3. The conveyor hose is damaged or bent.
   Further causes for the occurrence of blockages may be:
   - the nominal diameter of the conveyor hoses does not correspond to the requirements.
   - the material and the nominal diameter of the conveyor hoses do not correspond to each other.
   - the nominal diameters of the conveyor hoses differ.
   - the conveyor hoses are bent or damaged.
   - the hose connectors are damaged or do not correspond to each other.
   - there is a big foreign body in the conveying system.
   - the material is already setting (additive or too long standstill of the system).

If there is a disturbance caused by a blockage, the blockage must be removed.
It is also important to find the cause for the blockage and to remove it so that further blockages may be avoided.

A blockage may be identified due to the following criteria:
- the material is not conveyed.
- the vessel pressure (display at the control unit) rises although no material exits the discharge stand.

During the removal of blockages it is imperative to wear safety goggles and the protective clothing already mentioned before.
Specifications on the removal of blockages see chapter 4.7

Should any material get into your eyes despite all safety measures, wash your eyes immediately with clean, running water and see an oculist immediately.

4.10.2 Error detection mixing shaft

Error	Potential cause	Remedy
Mixing shaft does not move	Mixing vessel is too full	Empty the mixing vessel, observe maximum filling level (20 mm below the edge of the dome)
	Power belt is defective	Replace the power belt
	Cylinder of the belt tightener is defective	Replace the cylinder
Mixing shaft is blocked	Big solid body (stone) in the vessel	Empty the mixing vessel and remove the blockage of the mixing shaft (solid body)
Tension pulley of the tension belt is without function	No pressure from the cylinder of the belt tightener	Check, replace tension belt Check cylinder of the tension belt

4.10.3 Error detection conveying of mixtures

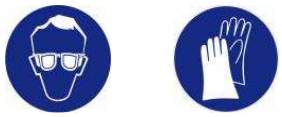
Error	Potential cause	Remedy
Machine does not convey	Mixing shaft does not move	See chapter 4.10 error detection during conveying 4.10.1 error detection mixing shaft
	Blockage in the vessel outlet	See chapter 4.7.4 removal of blockages
	Blockage in the conveyor hose	See chapter 4.7.4 removal of blockages
	Upper or lower air supply is soiled	Check, eventually clean hoses and connectors
	Conveying air may not be switched on	Check switch/ electrical connections
	Option regulation of mixing time Wrong setting of mixing time Button "F" misaligned Regulation of mixing time is defective	 Check mixing time Switch off the control unit (tentatively) button "F" in basic position (see image) Switch off the regulation of mixing time

4.10.4 Battery

The battery charges when the engine is running (like with cars)

Should the battery be empty, in an exceptional case, for example due to not switching off the working light, the engine of the machine may be started in connection with the battery of the towing vehicle. Proceed as following:

Wear safety goggles and gloves while working on the battery.



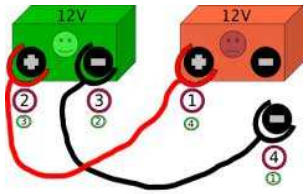
Use exclusively authorized battery jumper cables.

The battery tension of the donor battery and the machine battery must correspond (12V).

Start the engine of the towing vehicle (donor battery).

Connect the battery jumper cables following this sequence:
(The sequence must imperatively be respected!)

- Positive pin receiver battery to the positive pin of the donor battery (1-2)
- Negative pin donor battery to ground (a blank metallic part of the machine). (3-4)



- Start the engine of the machine (see chapter 4.6.3.3).

After starting the machine, disconnect the cables in the following order:
The sequence must imperatively be respected!

- Disconnect the negative pin of the car body/ machine).
- Disconnect the negative pin of the donor battery.
- Disconnect the positive pin of the donor battery.
- Disconnect positive pin of the receiver battery.

4.11 Maintenance

4.11.1 Maintenance jobs in general

This chapter contains information on maintenance jobs that ensure the safe and effective operation of the machine.
We call particular attention to the fact that all necessary controls, checks and preventive maintenance works must be effected correctly and professionally.
All regular maintenance jobs must be effected by an authorized specialist workshop when the operating hours are attained.
Repairs may only be undertaken by persons that are technically suited and dispose of the necessary qualifications.
Maintenance jobs, repairs and controls must be journalized after execution and the used spare parts must be documented. These measures serve to ensure your safety as well as the safety of the machine.
The documentation must be presented on demand. Otherwise we refuse any liability or warranty for this machine.

Avoid dirt at the lubricating points!
Clean grease nipples and the grease gun before use.
Dirt and sand in the suspensions may lead to premature wearing!

Lubricate the machine after each cleaning!

Only the lubricants listed may be used. Do not mix different kinds of lubricants, some lubricants do not agree with each other. They resinify and the lubricating effect abates drastically!

In addition, observe the enclosed instructions of the manufacturers of the engine, the axle and the towing bar!

All movable parts that are not mentioned in the following paragraph must be lubricated or slightly greased bi-annually!

4.11.2 Safety instructions

Do not remove safety devices!
This applies in particular for the dome sieve.
The protective grating protects operators form injuries inflicted by the rotating shaft.

Do not reach into the conveying vessel while the machine is running!

Before working on the machine, ensure that no one may start the machine!
Disconnect the battery.

Ensure that accruing persons note that maintenance or repair jobs are being executed on the machine.

All jobs may only be executed by instructed staff!

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4.11.3 Maintenance intervals at the chassis frame

Activity	Measuring and test equipment	Operating and auxiliary supplies	Note
Check firm seating of the wheel nuts		Use torque key	Observe tightening torque See torques After the first 50 km, after each wheel change
Check tire pressure	Tire pressre (see chapter 5 technical data)	Manometer	After the first 50 km, after each wheel change – min. once a week
Setting the brake system	Brake test bench	Specialist workshop	After the first 200 km
Lubricate all lubricating points of the inertia brake	Grease gun	Grease	Every 1 000 km minimum 1 x month
Check firm seating of screws	Inertia break Frame Chassis		Observe tightening torque regularly every 3 months
Check function of the inertia brake	Brake test bench	Specialist workshop	Regularly every 3 months. In case of anomaly, have parts adjusted or replaced.
Check shock absorbers on oil loss	Brake test bench	Specialist workshop	Regularly every 3 months. In case of anomaly, have parts adjusted or replaced.
Check clearance at the towing bar of the inertia brake.	Max. Clearance 1,5 mm	Specialist workshop	Regularly every 3 months. In case of anomaly, have parts adjusted or replaced.
Check parallel adjustment of the inertia brake on clearance and easy movement.	Manual check	Specialist workshop	Regularly every 3 months. In case of anomaly, have parts adjusted or replaced.
Check function of the brake system	Brake test bench	Specialist workshop	Regularly every 3 months. In case of anomaly, have parts adjusted or replaced.
Check function of the hand brake	Brake test bench	Specialist workshop	Regularly every 3 months. In case of anomaly, have parts adjusted or replaced.
Check safety cable and function of the safety cable	Visual check Manual check	Specialist workshop	Regularly every 3 months. In case of anomaly, have parts adjusted or replaced.
Check function and locking device of the jockey wheel.	Easy running, locking device, condition of the wheel	Specialist workshop	Regularly every 3 months. In case of anomaly, have parts adjusted or replaced.
Clearance of the wheel bearings, check wheel bearings If replacement is necessary, always replace both clearances – not only one!	Manual check Do not replace only one bearing!	Specialist workshop	Regularly every 3 months. In case of anomaly, have parts adjusted or replaced.
Towing eye or ball hitch Check firm seating and wear	Manual check	Specialist workshop	Regularly every 3 months. In case of anomaly, have parts adjusted or replaced.

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4.11.4 Winter maintenance / Storage

In winter, the machine may only be operated at temperatures not falling below 0°C.

The machine must not be operated at minus temperatures.

4.11.5 Specifications on operation in winter

If operation cannot be executed due to low temperatures, this period should be used for maintenance and repair jobs at the machine.
In this period, the annual maintenance may without difficulty be effected by **BMS** or a workshop authorized by **BMS**.
The machine may be properly operated at temperatures of 0°C or higher – it may not be operated at temperatures below 0°C.

At low temperatures the following aspects must be observed:
- Prepare the worksite and the material accordingly.
- Do not use frozen material!
- Use exclusively winter diesel as fuel!
  Due to specific additives it remains fluid even at low temperatures.
  Summer diesel may gel in the pipes and clog them!
- Use engine oil disposing of a viscosity that corresponds to outside temperatures.
- Dismantle the battery at extreme minus temperatures and store it in a warm room.
- Do not re-insert the battery until shortly before starting the machine.
- In case of non maintenance-free batteries, pay attention to the correct acid level (10-15mm above the upper edge of the plate) and the correct acid density.
- Measure the acid density regularly with a customary acid tester.

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4.11.6 Storing the machine

Before storing the machine, have all necessary maintenance jobs effected by BMS or a specialist workshop authorized by BMS.

- Store the machine at a dry and clean place.
- The storage period should not exceed 3 months.

If the machine is stored for a period longer than 3 months, additional protective measures must be taken:

- Clean the machine with a high-pressure cleaner and preserve it.
- In addition, heavy oil encrustations on the inside may be removed with a cold cleaning solvent or chalk cleaner.
- Do the maintenance job on the engine as described in the hand book of the manufacturer.
- Jack up the machine during longer standstill periods to unburden the tires and to prevent deformation.
- Lubricate all parts of the chassis frame and spray the machine with preserving agent.

4.11.7 Preservation of the machine

- Warm the engine up and then switch it off.
- Eventually clean the oil mist filter.
- Fill up anti-corrosive oil instead of normal engine oil.
- Empty the tank.
- Refill the tank with a mixture of 90% diesel fuel (eventually winter diesel) and 10% anti-corrosive oil.
- Keep the engine running for approx. 10 minutes.
- Switch off the engine.
- Turn the engine manually a couple of times to preserve the cylinder and the combustion chambers.
- Dissemble the V-belts and store them packed up.
- Spray the grooves of the V-belt pulleys with anti-corrosive agent.
- Close the suction and exhaust holes.
- Store the machine at a dry and well-aired location.

Environmentally compatible waste disposal

Lubricants, oils and other wastes caused by the operation of the machine may only be disposed of in an environmentally safe way.

Pay attention to general and local regulations.

4.12 Maintenance schedules

Preparation of maintenance and repair jobs

- Switch off the engine – turn the start switch to the left.
- Vent the pressure vessel – check at the vessel manometer if the mixing vessel is depressurized.
- Close upper and lower air cocks -– adjusting lever upwards.
- Check if conveyor hoses are depressurized.
- Push in the switch of the control unit in the engine compartment (OFF).
- Disconnect the battery.
- Secure the machine against involuntary or unauthorized recommissioning.

The machine must be stopped and all conveying devices must be depressurized for maintenance and repair jobs.
The machine must be secured against involuntary or unauthorized operation.
A machine starting unexpectedly may cause injuries that are dangerous to life.
It is only when the machine is secured against involuntary or unauthorized operation that the engine or parts of the machine may not switch on again.
The battery must imperatively be disconnected before working on movable parts of the machine. It is essential to observe all safety prescriptions and the instructions of this manual during maintenance or repair jobs.

Repair and maintenance jobs may only be executed when the machine is switched off, depressurized and secured against unauthorized or involuntary operation.
If, in isolated cases, it should be necessary to operate the machine or parts of it during maintenance or repair jobs, particular safety measures are described and must be met.

4.12.1 Specifications on maintenance and repair jobs

- Use exclusively adapted and undamaged tools.
- Wear necessary protective clothing.
- Clean the machine thoroughly before starting the jobs.
- Do not use inflammable cleaners or dissolvers.
- Use only original parts or spare parts explicitly authorized by the manufacturer.
- Modifications and welding jobs at pressure vessels are prohibited!
- Do not leave lose parts in the machine.

Maintenance jobs must be documented. The jobs that were done, the parts used, the executing workshop, the count of the operating hours counter, the date of the maintenance and eventual special incidents must be documented.
In justified cases, the corresponding documents must be procured on demand.
We reserve the right to refuse any guarantee claims if the documents are not procured.

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4.12.2 Regular maintenance – status control

Revolution counter	Check regularly	Contact **BMS**
Engine oil level (dipstick)	Daily before operation	Check oil dipstick Oil level between max. – and min. Fill up engine oil until the max. marker Only **BMS** engine oil
Compressor oil level	Daily before operation	Open the lid Compressor oil level must be in the green part of the marker. Fill up until oil level is within the green part of the marker.
Air filter for engine Air filter for compressor	Check regularly	Clean, eventually replace compressor filter, engine air filter if necessary. Filter replacement every 500 operating hours at the latest. Never clean or flush a filter with pressurized air.
Level of hydraulic oil	Check regularly	Level of hydraulic oil must be between min. and max. on the dipstick. Fill up eventually. Only check hydraulic oil when cold!
Diesel filter (fuel filter and fuel pre-filter)	Check regularly	Replace the fuel filter if necessary, after 500 operating hours at the latest.
Engine oil filter	Check regularly	Replace engine oil filter if necessary, after 500 operating hours at the latest
Compressor oil filter	Check regularly	Replace compressor oil filter if necessary, after 500 operating hours at the latest
Oil separator element	Check regularly	Replace oil separator element if necessary, after 1000 operating hours at the latest Always replace the seal between the lid and the container case.
Grease nipple at the rear, exterior bearing of the mixing shaft.	Weekly	4 shots of the grease gun
Grease nipples swinging link (in the engine compartment)	Every two weeks	2 shots of the grease gun grease the swinging link regularly
Grease nipples dome lid and locking lever	Daily	2 shots of the grease gun Grease dome lid and locking lever regularly
Grease nipple feeder Clean the cooler	Daily Daily check	2 shots of the grease gun Grease feeder regularly Clean with pressurized air. Caution: do not damage or bent the cooler lamellas!

4.12.3 First service, compulsory after 50 operating hours

Parts to be serviced marked by * are comprised in the servicing kit no. W 50 BMS alpha

* Engine oil	Replace	**BMS** engine oil
* Engine oil filter	Replace	Specify **BMS** number, vehicle identification number
* Hydraulic oil filter compressor	Replace **BMS** compressor oil	Specify **BMS** number, vehicle identification number
V-belt generator	Check	Specify **BMS** number, vehicle identification number
Hose clamps cooling system and at the engine	Check	Retighten, eventually replace in case of leakages.
Level of battery acid	Check	Fill up eventually
Function of central lubrication	Check	**BMS** grease cartridge 4,5 kg
Electric connections	Check	Pay attention to corrosion
Lubricating points	Lubricate, see lubrication plan	**BMS**
Power belt and strap release	Check	**BMS**
Tire pressure	Check	See chapter 5 technical data
Inertia brake	Check	See chapter 3.4.4
Illumination	Check	- Check for damages - Check accordance of trailer voltage and voltage of the towing vehicle (12V or 24V) - check function of illumination system
Upper and lower air hoses	Check	**BMS**
Non-return valve	Check for soiling	**BMS**
Vessel venting system	Check	Grease eventually
2-Bar shutdown	Check	Contact **BMS**
Seal of the dome lid	Check	**BMS**

4.12.4 Maintenance before start of operation

Check proper condition of conveyor hoses and connectors

According to the safety check list for the orderly condition of conveyor hoses and hose connectors, the following checks must be effected:

- check hoses on wear
- check hoses on tears and tissue damages
- check connectors on wear
- check function and fractions of welding seams

In case of damages or wear replace conveyor hoses and connectors immediately. Pay attention to the appropriate operating pressure!

Only use authorized conveyor hoses!
- Minimum diameter 50 mm, operating pressure 10 Bar.

Moreover, the following checks must be effected before every operation of the machine

- check oil level of the diesel engine.
- check hydraulic oil level.
- check fuel level and fill up, if necessary.
- Check the lighting equipment before driving.
- Check firm seating of the hood locks.
- check warning switch of the air filter, eventually replace air filter and safety cartridge (if available) immediately.
- Check tire pressure; condition of the tires / tread depth.

4.12.5 Daily maintenance

The daily maintenance need not be effected if the machine is not in use.

Observe the maintenance before start of operation and the check before each use mentioned in chapter 4.12.4!

In the following chart the respective maintenance jobs are listed.
Have the regular maintenances effected by **BMS** or a specialist workshop authorized by **BMS**.
Use only original spare parts/ accessories or spare parts/ accessories authorized by the manufacturer. Only then the normal and safe operation of the machine may be ensured.

Safety devices	Check	All safety devices must be fixed and fully functional.
Visual check on damages of the machine		Corrosion, pay particular attention to seals, pipes and cables.
Seal of the dome lid	Check	Replace the seal if: Seal is porous or damaged, if mortar has pushed into the seal
Check function of the lock of the dome sieve	Activate the lock of the dome sieve with the master key	Clean and grease the lock thoroughly If the lock is not fully functional, the machine may not be operated.
Conveyor hoses and connectors	Check	As soon as damages or signs of wear are visible, the hoses must be replaced.
Sealing cone of the vessel valve	Check	Check the sealing cone on tightness, clean or adjust eventually. If the sealing cone is damaged, have it replaced by a specialist workshop.
Lubricating points	Daily	Lubricate with grease gun
Check filling level and function of the central lubrication system	Check	Multi-purpose grease **BMS** KL2K DIN 51502 - observe the lubrication plan - fill up the central lubrication system
Level of compressor oil	Check	**BMS** compressor oil
Maintenance of the compressor		
Level of engine oil	Check	**BMS** 15 W 40
Maintenance engine		
Level of hydraulic oil	Check	**BMS** hydraulic oil
Soiling of air filter	Check	Clean or replace **BMS** air filter eventually

Filling level fuel	Check	Diesel (DIN EN 590) Fill up fuel before starting operation
Tire pressure	Check	Tire pressure *See chapter 5 Technical data*
Condition of the tires	Check	Pattern depth gauge, min. 2 mm Due to operation on construction sites it is imperative to pay special attention to tire damages.
Brakes	Check function before driving and before parking the machine.	In case of damages assign to specialist workshop. In case of malfunction before driving, it is imperative to have the brakes repaired.
Inertia brake	Check function before driving and before parking the machine.	In case of damages assign to specialist workshop. In case of malfunction before driving, it is imperative to have the brakes repaired.
Safety cable	Check function before driving and before parking the machine.	Check function and sound condition before every drive, replace eventually.
Hand brake	Check function before driving and before parking the machine.	In case of damages assign to specialist workshop. In case of malfunction before driving, it is imperative to have the brakes repaired.
Lock and safety device of the hood.	Check before driving. Check before operating the machine.	The hood might thud while driving. Check before operation. If the hood is open during operation it may cause insufficient cooling and damages to the machine.
Check illumination	Before driving	Lamps Cables Check plug connections. Replace defective lamps, cables and plug connections.
Secure the feeder	Before driving	Observe the road traffic act! Secure the feeder with the safety chain or the lashing strap against sagging.
Secure the scraper	Before driving	Secure the scraper with the respective safety rod and the spring locking pin.

Eco-friendly waste disposal

Lubricants, oils and other wastes of the operation of the machine may only be deposed of in an environmentally compatible way.
Observe general and local regulations.

4.12.6 Weekly maintenance

V-belt and power belt	Check	Retighten V-belt and power belt eventually If damaged have it replaced by a specialist workshop.
Check air pipes for upper and lower air supply	Disconnect upper and lower air hoses and check if they are soiled.	Clean eventually.
Check function of non-return valve.	Look into the branch connections while the upper and lower air hoses are disconnected, that way the valves may be checked on soiling.	Clean if soiled, remove the valves if necessary.
Vessel venting system	Check for damages and soiling.	Remove the cover of the venting system at the lid, clean the venting system and replace damaged parts eventually.
Wear plates	Check condition	The wear plates must not be worn off as much as to have the vessel casing laid bare.
Mixer Mixing shaft	Check condition	Partially fractured or torn mixing blades must be immediately replaced, risk of damages to the mixer. If necessary, have wear parts replaced by a specialist workshop.
Mixing shaft bearing	Check condition	Replace eventually
Grease lubricating points	Check	Multi-purpose grease **BMS** KL2K DIN 51502 Grease must leak out of the bearings after lubrication, otherwise one of the lubrication tubes may be defective and the bearings may not get greased.
Check function of the central lubricating system	Check	Multi-purpose grease **BMS** KL2K DIN 51502 Observe lubricating instructions!
Steel wire scraper shovel	Check	Replace the wire if damaged (also if individual steel threads are torn).

Eco-friendly waste disposal

Lubricants, oils and other wastes of the operation of the machine may only be deposed of in an environmentally compatible way.

Observe general and local regulations.

4.12.7 Lubricating chart

List of lubricating nipples

Chassis

Clean the lubricating nipples at the inertia brake and at the jockey wheel thoroughly.
Lubricate with grease gun.
Lubricate until grease leaks out!

Slightly lubricate the movable parts of the hand brake lever.

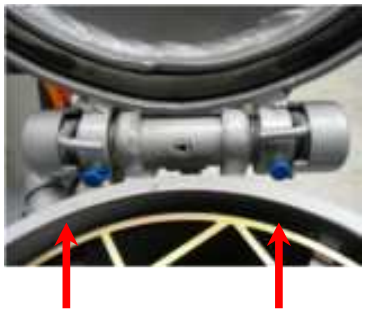
As described in Maintenance chassis chapter. 3.6.3 (lubriating plan).

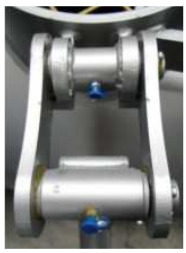
Engine

Lubricating nipple at the front shaft bearing

Machine

Lubricating nipple at the dome lid and at the clamping lever





Lubricating nipples at the cardan shaft and at the lift cylinder.

Feeder

2 x
1x at the top
1x at the bottom

4 x

Eco-friendly waste disposal

Lubricants, oils and other wastes of the operation of the machine may only be deposed of in an environmentally compatible way.

Observe general and local regulations.

4.12.8 Lubricating plans according to operating hours

4.12.8.1 Maintenance interval 500 operating hours

500 hours maintenance interval, due at 500, 1500, 2500 etc. operating hours

We recommend having the obligatory inspections effected by **BMS** or a specialist workshop authorized by **BMS** because the maintenance jobs are crucial for the safety, failure-free operation and the life-span of your **BMS** ***alpha***.
BMS or a specialist workshop authorized by **BMS** dispose professionally and eco-friendly of used material, batteries as well as of lubricants and waste oils.

Parts to be serviced marked with* are comprised in the servicing kit number W500 **BMS alpha**

* Change engine oil	**BMS** engine oil
Replace engine oil filter	Replace
Replace compressor oil	**BMS** –compressor oil
Replace hydraulic oil	**BMS** hydraulic oil
*Fuel filter	Replace (**BMS**)
*Air filter engine	Replace eventually
*Air filter compressor	Replace eventually
Check venting system of the gas adjuster	Clean eventually
Replace oil filter of the separator	Name **BMS** no. Vehicle identification number
* Replace hydraulic oil filter	Name **BMS** no. Vehicle identification number
Check V-belt of the generator	Name **BMS** no. Vehicle identification number
Hose clamps at the cooling system and at the engine	Check on leakages In case of leakages, retighten or replace eventually
Check cooler on soiling	Wash out eventually.
Check level of battery acid	Refill eventually
Check electrical connections	Pay attention to corrosion Clean or replace eventually
Check bearings of engine and compressor	Replace eventually
Check tire pressure	Tire pressure see chapter 5 technical data
Inertia brake	Check, adjust eventually
Contacts of illumination and illuminants	Check contacts, clean/ replace eventually Check illuminants, replace eventually
Lubricating points	Lubricate according to the lubrication plan (chapter 3.6.3) **BMS** lubricating grease
Function of the central lubricating system, refill	**BMS** grease cartridge 2,5 kg
Hydraulic system / hoses / valves / engine / pump (hydraulic system only with **BMS** ***alpha*** B and B/S)	Check, seal or replace eventually
Check power belt and belt release	**BMS**
Check support of the transmission on deformation	Straighten eventually
Check upper and lower air hoses	**BMS**
Check non-return valves on soiling	**BMS**
Check venting system of the vessel	
Check 2-Bar shutdown	
Check bearing of the dome lid	Replace eventually
Check sealing of the dome lid	**BMS**
Check toggle closure and bearing	Replace eventually
Check bearing of the outlet hopper	Replace eventually

Eco-friendly waste disposal

Lubricants, oils and other wastes of the operation of the machine may only be deposed of in an environmentally compatible way.

Observe general and local regulations.

BMS Bau-Maschinen-Service AG Daimlerstraße 10 | 33378 Rheda-Wiedenbrück
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4.12.8.2 Maintenance interval 1000 operating hours

1000 hours maintenance interval, due at 1000, 2000, etc. operating hours
Parts to be serviced marked with* are comprised in the servicing kit number W1000 **BMS alpha**

We recommend having the obligatory inspections effected by **BMS** or a specialist workshop authorized by **BMS** because the maintenance jobs are crucial for the safety, failure-free operation and the life-span of your **BMS** ***alpha***.
BMS or a specialist workshop authorized by **BMS** dispose professionally and eco-friendly of used material, batteries as well as of lubricants and waste oils.

* Change engine oil	**BMS** engine oil
*Replace engine oil filter	Replace
*Fuel filter	Replace
*Air filter engine	Replace eventually
* Air flter compressor	Replace
* Replace oil separator element	Replace
Venting system of the gas adjuster	Check, clean eventually
* Hydraulic oil filter	Replace
* Hydraulic oil	Change
*V-belt generator	Check, replace eventually Name **BMS** no. Vehicle identification number
Hose clamps at the cooling system and at the engine	Check on leakages In case of leakages, retighten or replace eventually
Check cooler on soiling	Wash out eventually.
Check level of battery acid	Refill eventually
Function of the central lubricating system, refill	**BMS** grease cartridge 2,5 kg
Check electrical connections	Pay attention to corrosion Clean or replace eventually
Check bearings of engine and compressor	Check, replace eventually
* Check power belt and belt release	**BMS**
Check support of the transmission on deformation	Straighten eventually
Tire pressure	Check – Pressure see chaper 5 technical data
Inertia brake	Check, adjust eventually
Contacts of illumination and illuminants	Check contacts, clean/ replace eventually Check illuminants, replace eventually
Lubricating points	Lubricate according to the lubrication plan (chapter 3.6.3) **BMS** lubricating grease
Check upper and lower air hoses	**BMS**
Check non-return valves on soiling	**BMS**
Check venting system of the vessel	Check
2-Bar shutdown	Check
Check sealing of the dome lid	**BMS**
Check bearing of the dome lid	Replace eventually
Check bearing of the outlet hopper	Replace eventually
Check toggle closure and bearing	Replace eventually
Hydraulic system / hoses / valves / engine / pump	Check, seal or replace eventually
Display of the hydraulic-return-flow-filter	Check, replace filter and hydraulic oil eventuallly

Eco-friendly waste disposal

Lubricants, oils and other wastes of the operation of the machine may only be deposed of in an environmentally compatible way.

Observe general and local regulations.

4.12.8.3 Maintenance interval 1500 operating hours

1500 hours maintenance interval, due at 1500, 3000, etc. operating hours

We recommend having the obligatory inspections effected by **BMS** or a specialist workshop authorized by **BMS** because the maintenance jobs are crucial for the safety, failure-free operation and the life-span of your **BMS** ***alpha***.
BMS or a specialist workshop authorized by **BMS** dispose professionally and eco-friendly of used material, batteries as well as of lubricants and waste oils.

Change engine oil	**BMS** engine oil
Engine oil filter	Replace
Fuel filter	Replace
Air filter engine	Replace eventually
V-belt generator	Check, replace eventually (Name **BMS** no. Vehicle identification number)
Hose clamps at the cooling system and at the engine	Check on leakages In case of leakages, retighten or replace eventually
Check cooler on soiling	Wash out eventually.
Check level of battery acid	Refill eventually
Check electrical connections	Pay attention to corrosion Clean or replace eventually
Bearing of the engine	Check, replace eventually
Tire pressure	Check – Pressure see chaper 5 technical data
Inertia brake	Check, replace eventually
Contacts of illumination and illuminants	Check contacts, clean/ replace eventually Check illuminants, replace eventually
Lubricating points	Lubricate according to the lubrication plan (chapter 3.6.3)
Hydraulic system / hoses / valves / engine / pump	Check, seal or replace eventually
Hydraulic oil filter	Replace
Hydraulic oil	Change

4.12.8.4 Oil change engine and hydraulic system

We recommend having all oil changes effected by **BMS** or a specialist workshop authorized by **BMS**. **BMS** or a specialist workshop authorized by **BMS** dispose professionally and eco-friendly of waste oils.

Eco-friendly waste disposal

Lubricants, oils and other wastes of the operation of the machine may only be deposed of in an environmentally compatible way.

Observe general and local regulations.

4.12.8.5 Battery maintenance

4.12.8.5.1 General

Eco-friendly waste disposal

Batteries are special wastes and may only be deposed of in an environmentally compatible way.

Observe general and local regulations.

4.12.8.5.2 Battery of the machine

The battery may develop explosive gases.
For this reason, spark formation and naked flames must be avoided close to the battery.

The acid of the battery cauterizes and must not get into contact with skin or clothing.
Wear protective gloves!

Wear protective goggles while working on the battery.

Should, despite all safety measures, any acid end up on skin or in the eyes, immediately wash the concerned skin areas thoroughly with clear water, respectively wash out the eye with clear water and see a dermatologist or an oculist immediately.

Do not place any tools on the battery
Keep the battery clean and dry.
Keep the electrolyte level of the battery at the marking; the liquid must be 10-15mm above the leaden plates of the cells.
Only fill up with distilled water.
Grease the contacts with Vaseline or acid-free pin grease.
Remove and recharge the battery regularly during longer standstill periods.

4.12.8.5.3 Battery radio remote control (only BMS *alpha* BS)

The radio remote control for the scraper disposes of a rechargeable battery.
The device is charged in the charging plug of the radio transmitter that is placed in the engine compartment.

Pay attention to plugging the remote control in the charger after work.

If the battery is defective, send the device to **BMS** for repair.

4.13 Operating fluids (fuels / oils / lubricants)

Operating fluids
This chapter deals with the operating fluids, fuel, oils and lubricants used with this machine. The respective oils, lubricants and change intervals. Look up the change intervals and the specifications in the maintenance recommendations.
If hydraulic oils of different viscosities are mixed, the new viscosity corresponds to the mixing relation of the hydraulic oils.

Drive motor	Lubricants The drive motor of this machine is a 3 cylinder diesel engine that requires all-year multigrade oil. Engine oil: Viscosity: 15 W40 Filling volume: see chapter 5 technical data Filling height max.: until upper mark at the oil dipstick Filling height min.: lower mark at the oil dipstick Fuel type Summer diesel or winter diesel (DIN EN 590) Tank capacity: see chapter 5 technical data
Compressor	Compressor oil: **BMS** compressor oil Filling volume: see chapter 5 technical data Filling height min. must not be exceeded or fall below
Transmission	Transmission oil: **BMS** transmission oil Filling volume: see chapter 5 technical data
Hydraulic system	Hydraulic oil: **BMS** hydraulic oil Filling volume: see chapter 5 technical data Filling height max.: until upper mark at the oil dipstick Filling height min.: lower mark at the oil dipstick
Central lubrication system	Lubricating grease: **BMS** lubricating grease KL2K
Lubricating points	Lubricating grease: **BMS** lubricating grease KL2K

Lubricants, oils and other wastes of the operation of the machine may only be deposed of in an environmentally sound way.

Lubricants, oils and batteries are special wastes.

Observe general and local regulations.

Call us if you need help with categorizing wastes to the respective waste types (household waste, industrial waste, special waste)
We would be pleased to advise you.

4.14 External check intervals

Engineering inspection according to BGR 183, respectively. BetrSichV dating from 27.09.2002	As required, at least once a year.
Demonstration of the machine to check road safety with an approved inspection body, for example TÜV, Dekra	Regularly, every 24 months First inspection has been carried out by **BMS**.
Pressure and approval test mixing vessel	Authorized inspector – Before first operation. Has already been carried out by **BMS**.
External check of the mixing vessel	Authorized inspector regulations on pressurized vessels group IV every 24 months
Interior check of the mixing vessel	Authorized inspector regulations on pressurized vessels group IV every 60 months
Pressure test Mixing vessel	Authorized inspector regulations on pressurized vessels group IV every 120 months

5. Technical data

5.1 Chassis

5.1.1 BMS *alpha* (Standard)

General

Length	4.650 mm
Width	1.510 mm
Height	1.600 mm
Filling height	920 mm
Volume mixing vessel	200 l
Curb weight	1.700* kg
Gross vehicle weight	1.900 kg
Support load	ca. 50 kg
Max. permissible support load	150 kg
	*depending on equipment

Chassis frame

Axle	Spring torsion axle GB19-415618MV
Axle load	Max. 1.900 kg
Tire pressure	4,5 Bar
Wheels	195 / 70 R 14
Torque wheel bolt	120 N•m

5.1.2 BMS *alpha* B (feeder)

General

Length	5.156 mm
Width	1.560 mm
Height	2.165 mm
Filling height	450 mm
Volume mixing vessel	200 l
Curb weight	1.850* kg
Gross vehicle weight	1.900 kg
Support load	ca. 50 kg
Max. permissible support load	50 kg
	* depending on equipment

Chassis frame

Axle	Spring torsion axle GB19-415618MV
Axle load	Max. 1.900 kg
Tire pressure	4,5 Bar
Wheels	195 / 70 R 14
Torque wheel bolt	120 N•m

5.1.3 BMS *alpha* B/S (feeder / scraper)

General

Length	5.120 mm
Width	1.560 mm
Height	2.165 mm
Filling height	450 mm
Volume mixing vessel	200 l
Curb weight	1.940* kg
Gross vehicle weight	2.240 kg
Support load	ca. 50 kg
Max. permissible support load	150 kg
	* depending on equipment

Under carriage

Axle	Spring torsion axle GB25-415613S
Axle load	Max. 2.240 kg
Tire pressure	4,5 Bar
Wheels	225 / 70 R 15C
Torque wheel bolt	120 N•m

5.2 Machine

5.2.1 Machine General

Conveyor height	Up to approx. 30 floors (depending on material)
Draw	ca. 180 m
Drive	DEUTZ D 2011 L 03
Diesel engine	36,5 kW at 2800 min-1
Ambient conditions during operation	
Ambient temperature	max. +50° C min. 0° C
Fuel	Customary summer or winter diesel
Filling volume diesel tank	58 Litres

5.2.2 Hydraulic system

Hydraulic circuit	Open
Pump	Gear pump
Height volume	8,0/17,0 cm³/U
Max.-pressure	190 Bar / 250 Bar
Tank capacity	20 Liters
Hydraulic oil	**BMS**

5.2.3 Compressor

Air quantity	5,0 m³/min
Max.-pressure	9 Bar
Compressor oil	**BMS 46 filling volume max. 10 Litres**

5.2.4 Electrical system

Tension	12V
Battery	12V 74 Ah
Lighting voltage	According to description chapter 1.2.2 (page 10) = 12V or 24 V

5.2.5 Cooling system

Oil cooler	3 separated circuits for engine oil, compressor oil and hydraulic oil
System	Open system

5.2.6 Accessories conveyor hoses

The conveyor hoses must be approved for:

Operating pressure	10 Bar
Diameter	50 mm (minimal diameter)

Only conveyor hoses disposing of the same diameter may be used!

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6. Error detection

6.1 General error detection

6.1.1 Charging indicator lamp

Error	Potential cause	Remedy
Charging indicator lamp (yellow) is not illuminated when switching on the machine	Battery discharged/defective	- check acid level, charge battery, replace defective battery
	Battery connection loose/ oxidized	Clean battery connection, tighten battery clamp
	Cable connection is damaged	Check cable connection, repair eventually
	Safety switch is switched off	Switch on safety switch
	Starter switch defective	Check starter switch, have it replaced eventually
	Safety switch defective	Check safety switch and have it replaced by specialist workshop eventually
	Main fuse has tripped	Switch on main fuse
	Hood is open	Close hood
Charging indicator lamp (yellow) does not switch off after starting the engine	Cable loose/ defective - connections oxidized Generator defective	Check cable/ connections – replace eventually Check generator – replace eventually

6.1.2 Starting the motor

Error	Potential cause	Remedy
Motor does not start	Battery is too feeble	Check, charge, eventually replace battery
	Starter switch is defective	Check starter switch, replace it eventually
	Starter is defective	Check starter, replace it eventually
	Not enough fuel	Check filling level of fuel tank
	Fuel pre filter or fuel filter clogged	Check fuel pre filter or fuel filter, replace it eventually
	Indicator lamp dome sieve illuminated	Dome sieve closed?
Motor stops immediately after letting go of the starter switch	Safety chain, oil pressure switch-, Oil temperature switch	Check liquid levels and safety switch, replace eventually
	Cables of the safety switch are loosened or defective	Check cable connection
	Fuel pre filter and/ or fuel filter are soiled	Check fuel pre filter or fuel filter, replace it eventually
	Generator defective	Check generator, replace eventually
Motor does not perform	Fuel pre filter and/ or fuel filter are soiled	Check fuel pre filter or fuel filter, replace it eventually
	Air filter soiled	Check air filter, clean or replace it eventually
	Injector nozzle(s) defective	Have them checked and eventually replaced by specialist workshop

6.1.3 Compressor

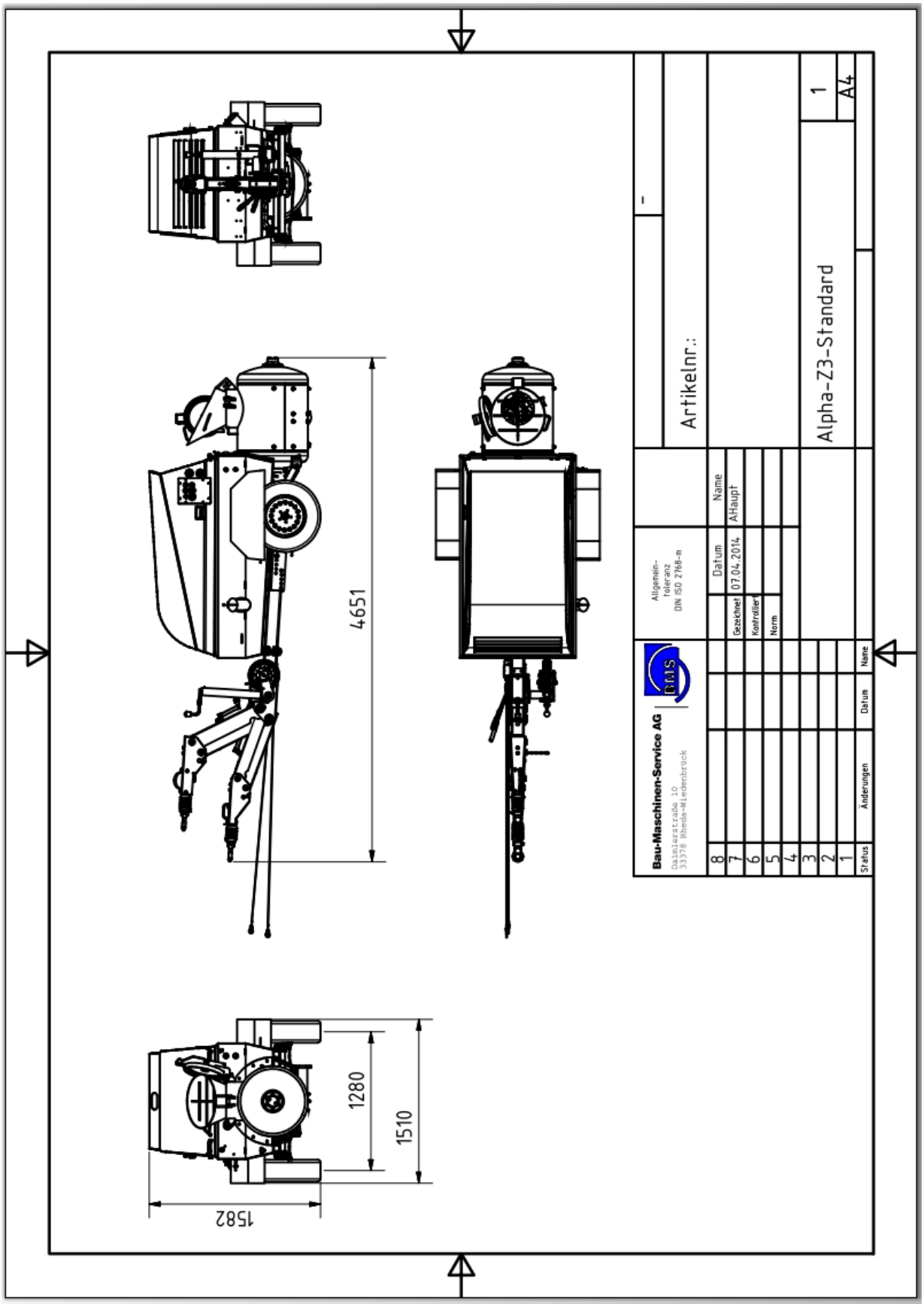
Error	Potential cause	Remedy
Compressor does not throttle down	Air leak in the control system	Have checked by specialist workshop
	Regulating valve defective or soiled	Have checked by specialist workshop
	Pressure relief valve defective or wrongly set	Have checked by specialist workshop
Air consumption exceeds the capacity of the compressor	Air leak in the zone of upper/ lower air supply	Air connections, hoses, mixing vessel
	Main brake pipe defective	Have it repaired by specialist workshop
	Mixing vessel, vessel outlet defective	Check vessel outlet and air removal cock
	Air removal cock leaks	Have repaired by specialist workshop eventually
Delivery quantity of the compressor is insufficient	Air filter soiled	Check, clean, eventually replace air filter
	Oil separator element clogged	Have oil separator element checked, eventually replaced by specialist workshop
	Motor rotation speed too low	Have checked, eventually set by specialist workshop
Oil mist leaks out with air stream, oil rests at the mixing vessel and the hoses	Level of compressor oil too high	Drain oil to the max. mark
		Change oil and oil filter
	Wrong compressor oil	Fill up original compressor oil
	Oil separator element defective	Have checked, eventually replaced by specialist workshop
	Suction control valve defective	Have checked, eventually replaced by specialist workshop
Compressor overheats	Level of compressor oil is too low	Check level of compressor oil
	Compressor oil filter is soiled	Replace compressor oil filter
	Oil-/water cooler is soiled	Clean oil-/water cooler
	Oil separator element soiled	Have checked, eventually replaced by specialist workshop
	Insufficient compressor cooling	Only operate the machine at well aired places.

6.1.4 Radio equipment scraper

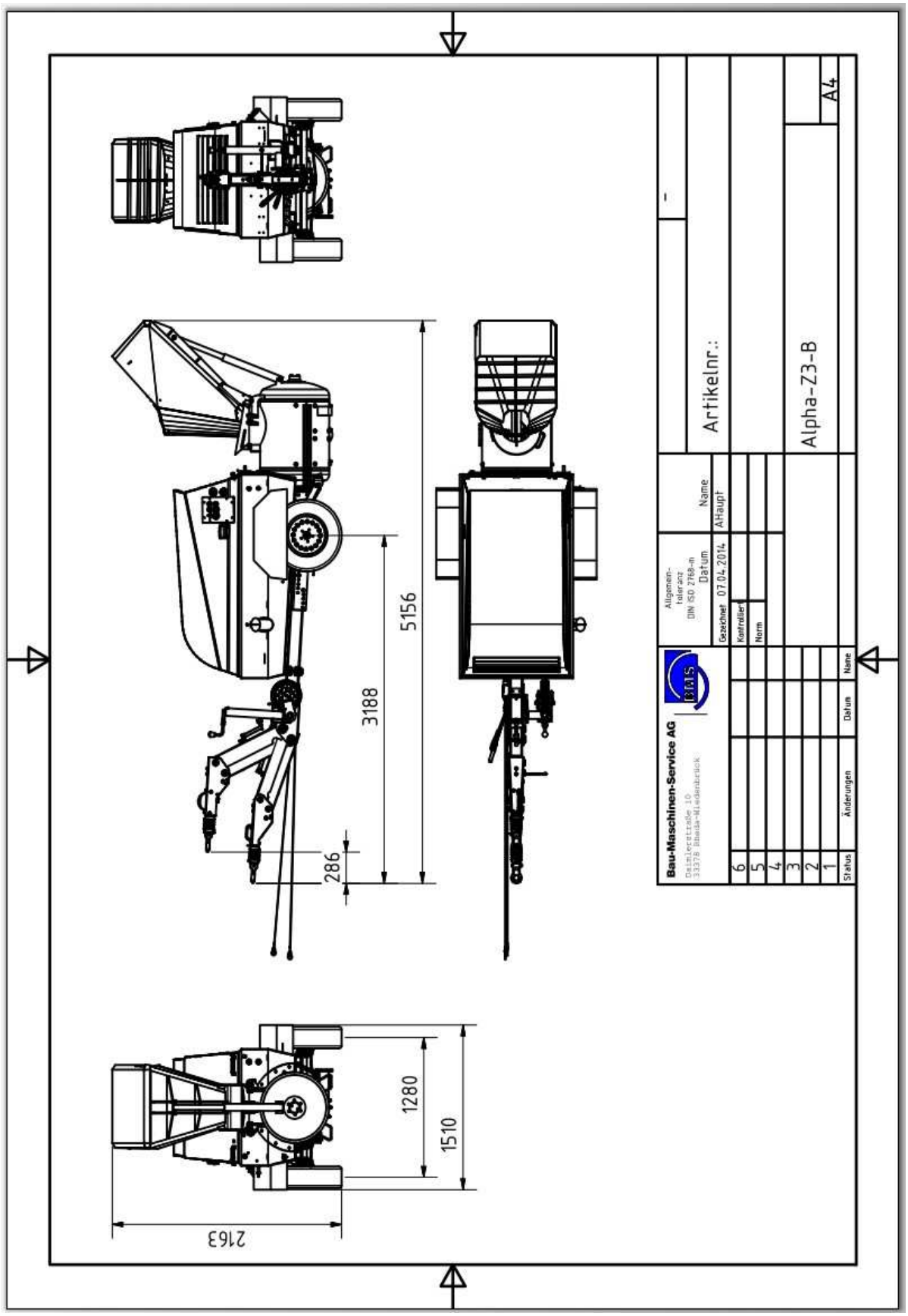
Error	Possible cause	Remedy
Transmission indicator lamp of the remote transmitter is not illuminated	Battery of the transmitter is empty	Use the spare battery in the charger at the transmitter
	Transmitter is defective	Have transmitter checked by specialist workshop
Receiver indicator lamp of the receiver is not illuminated	Cable connection is defective or loosened	Check cable connection
	No radio contact between transmitter and receiver	Transmitter defective – have it checked by specialist workshop
		Receiver defective – have it checked by specialist workshop
	Receiver permuted, does not match the receiver	Check if receiver has been permuted
	A jamming transmitter covers the radio signal of the transmitter	Change location, try again

7. Drafts and plans

General layout drawing BMS *alpha* Standard



General layout drawing BMS *alpha* B



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Hydraulic plan BMS *alpha* Standard

Legende	
Pos.	Bezeichnung
50	Pumpe
51	3-Wege-Stromregelventil
52	DBV
53	Hydraulikmotot 3,15ccm
54	Hydraulikmotot 3,15ccm
55	Kühler
56	Rücklauffilter
57	Hydrauliktank
62	Rücklaufsammler

Baumaschinen-Service AG

		B			
		A	ÄNDERUNG	DATUM	NAME
		INDEX			

Hydraulische Steuerung
BMS-Alpha-Z3- St

ZCH. NR.: HA1-1015-ST
ERSATZ FÜR
ERSETZT DURCH
ÄND. NR.

2007	DATUM	NAME	
GEZ.	12.10.15	Haupt	
BENENNUNG			
MAßSTAB.	PROJEKT: —		

CAD DRAWING

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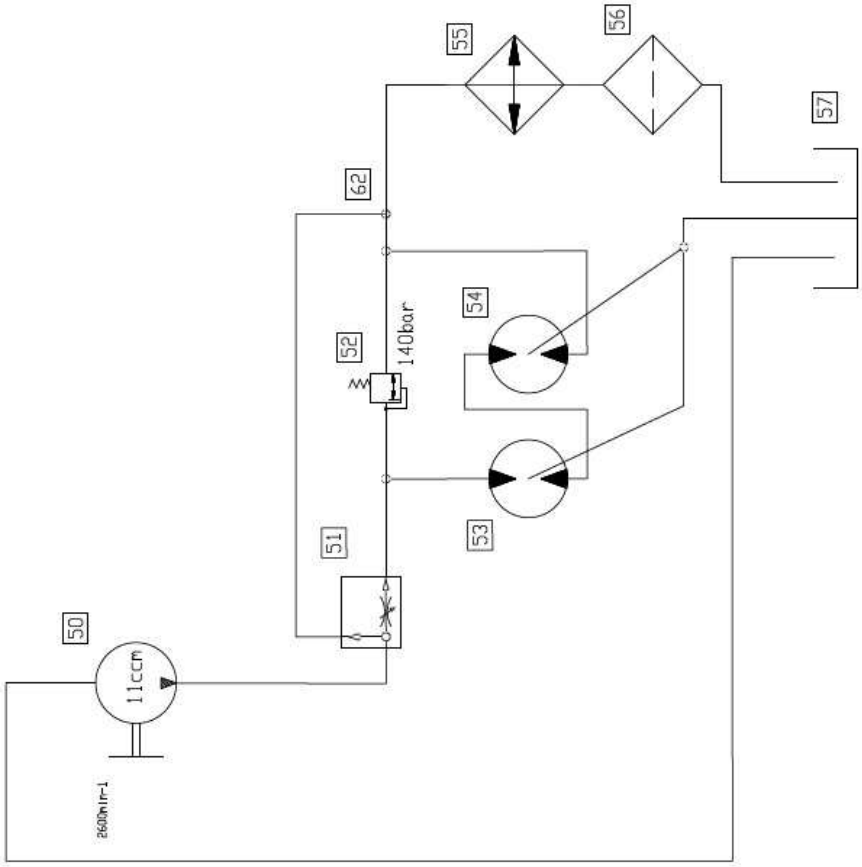
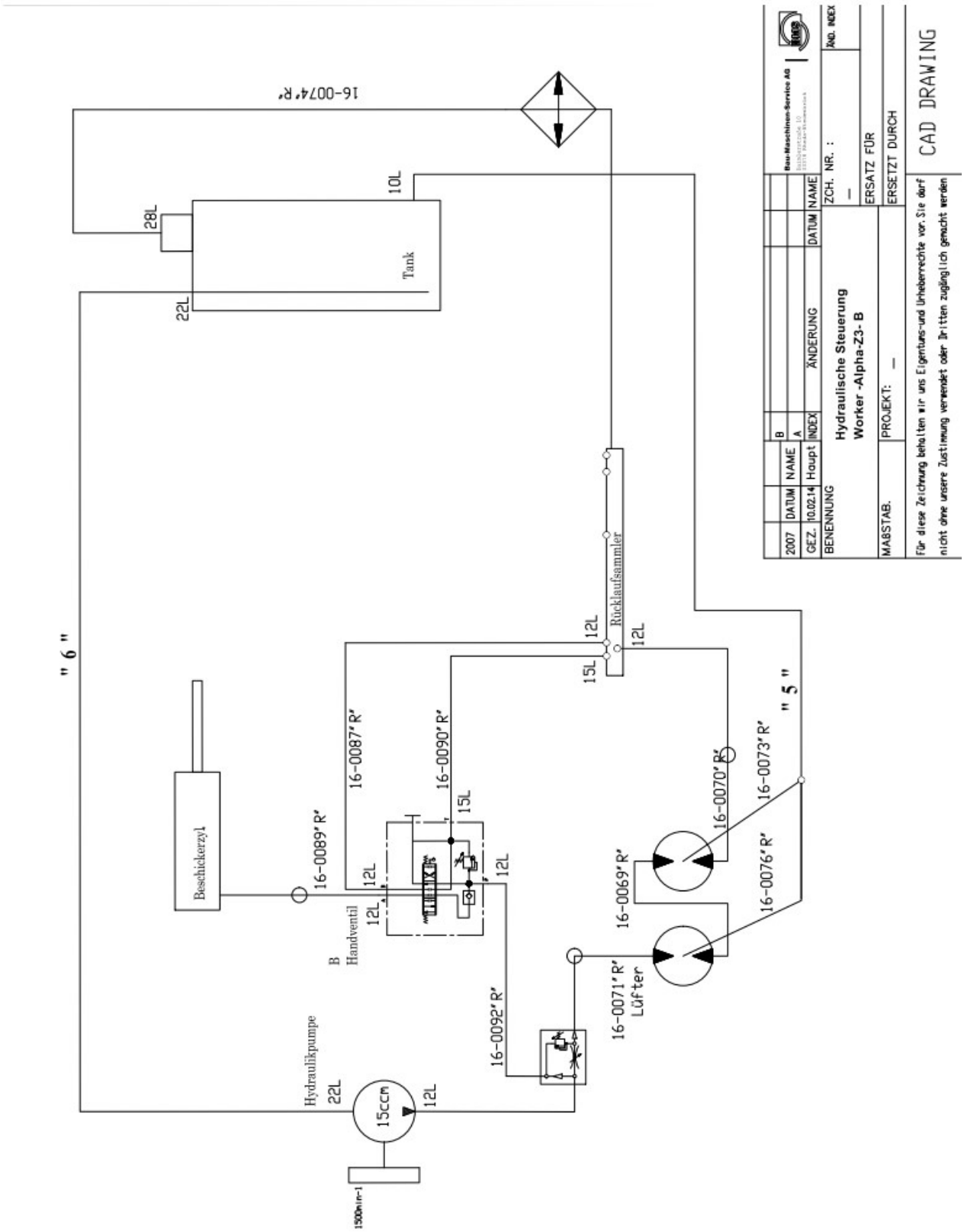
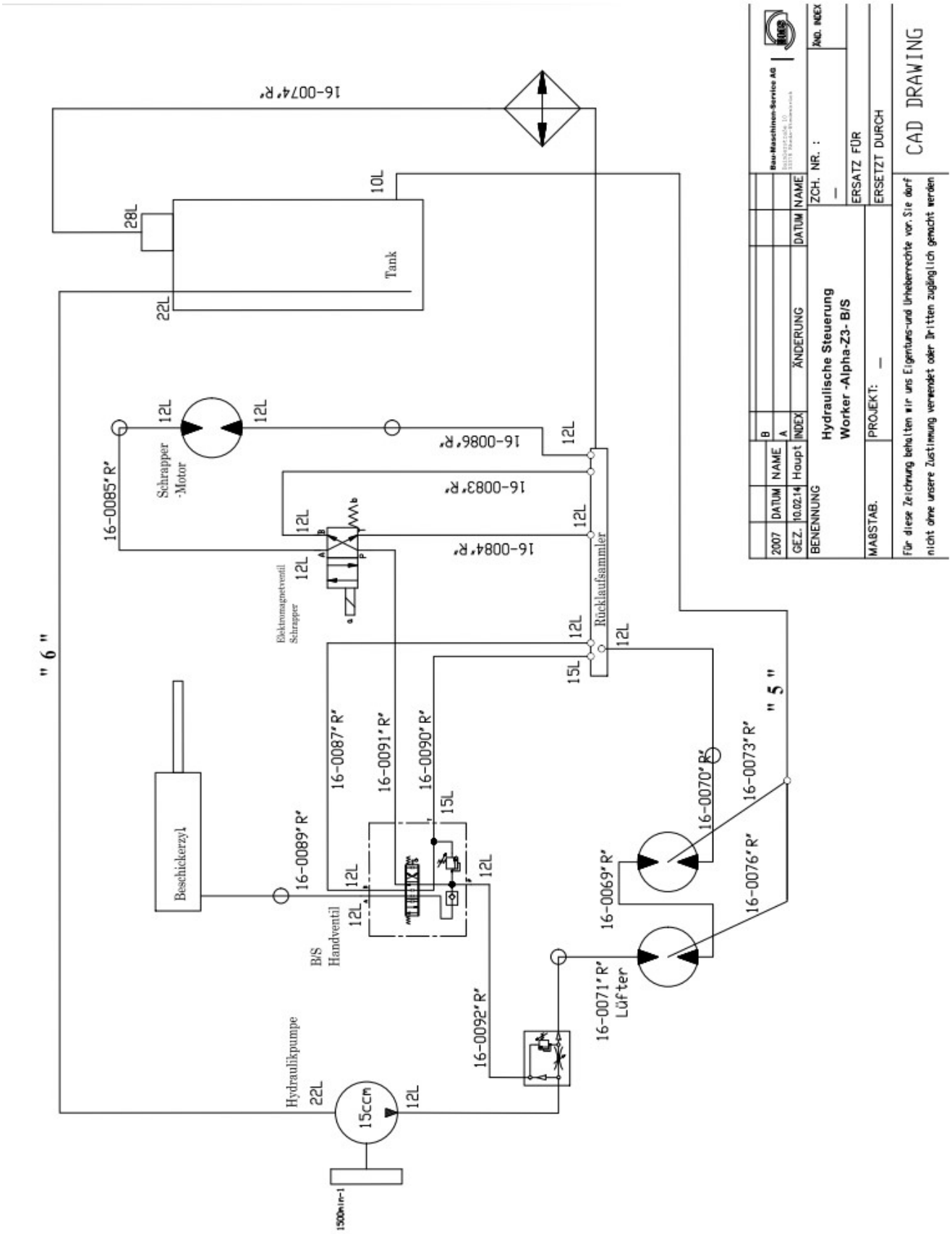


Hydraulic plan *alpha* B



Hydraulic plan BMS *alpha* B/S


16-0074'R'
10L
28L
Tank
22L
12L
Schrapper -Motor
16-0085'R'
16-0086'R'
16-0083'R'
16-0084'R'
Elektromagnetventil Schrapper
Rücklaufsammler
15L
" 6 "
" 5 "
16-0087'R'
16-0091'R'
16-0090'R'
16-0089'R'
Beschickerzyl
B/S Handventil
16-0070'R'
16-0073'R'
16-0069'R'
16-0076'R'
16-0071'R'
Lüfter
16-0092'R'
Hydraulikpumpe
15ccm
1500min-1
Bau-Maschinen-Service AG
ZCH. NR. : —
ERSATZ FÜR
ERSETZT DURCH
Hydraulische Steuerung
Worker -Alpha-Z3- B/S
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MABSTAB.
PROJEKT: —
CAD DRAWING
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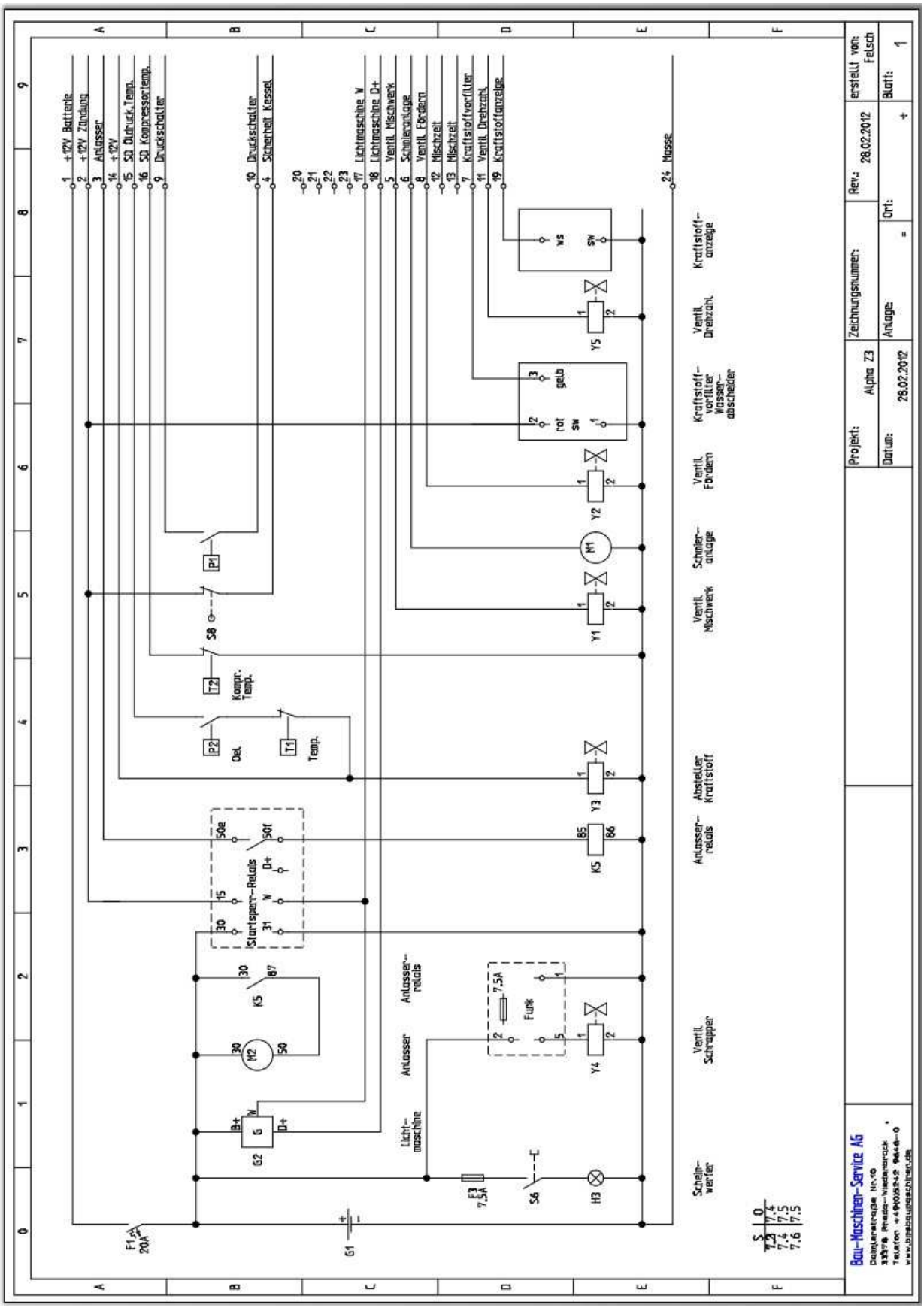
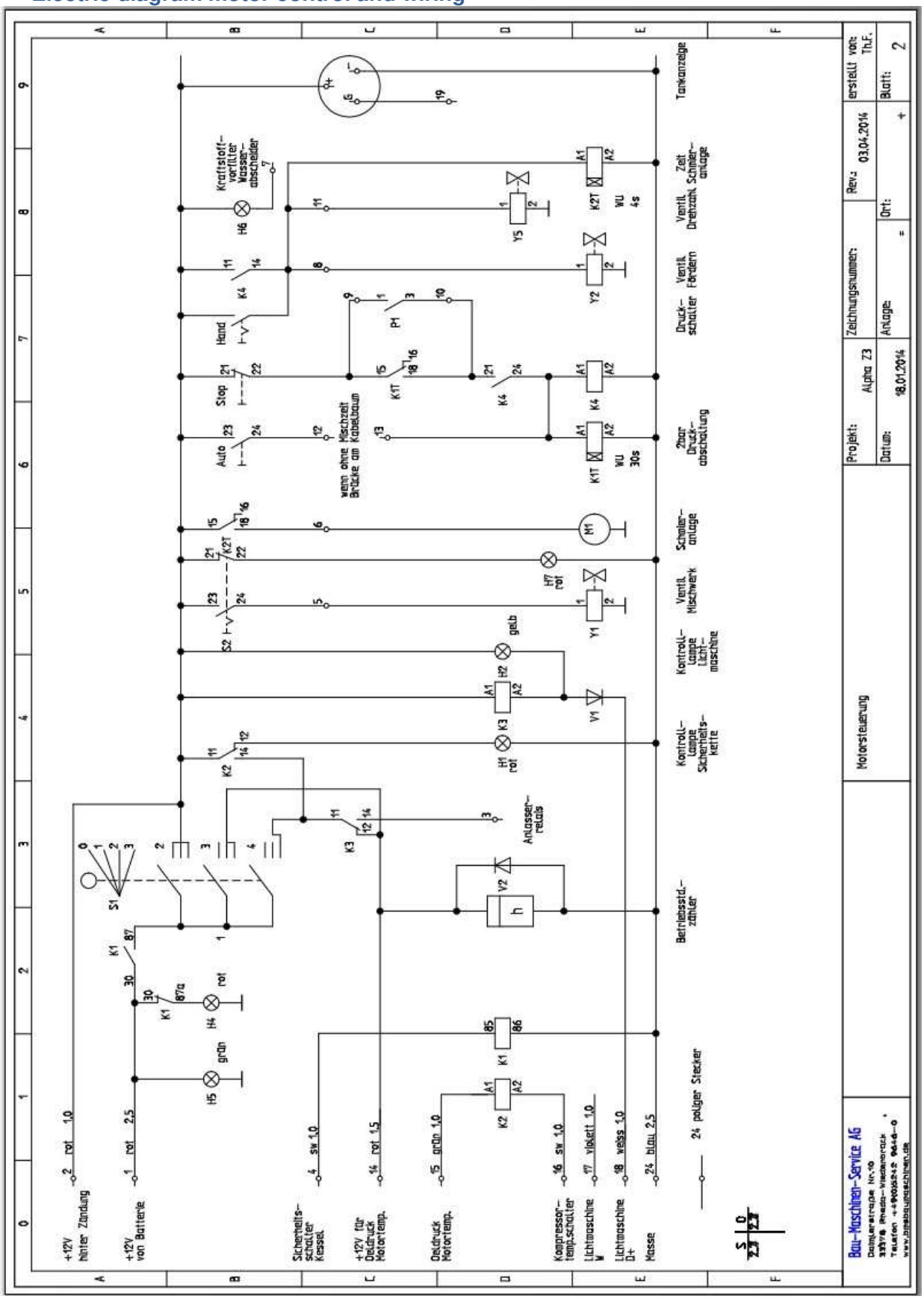
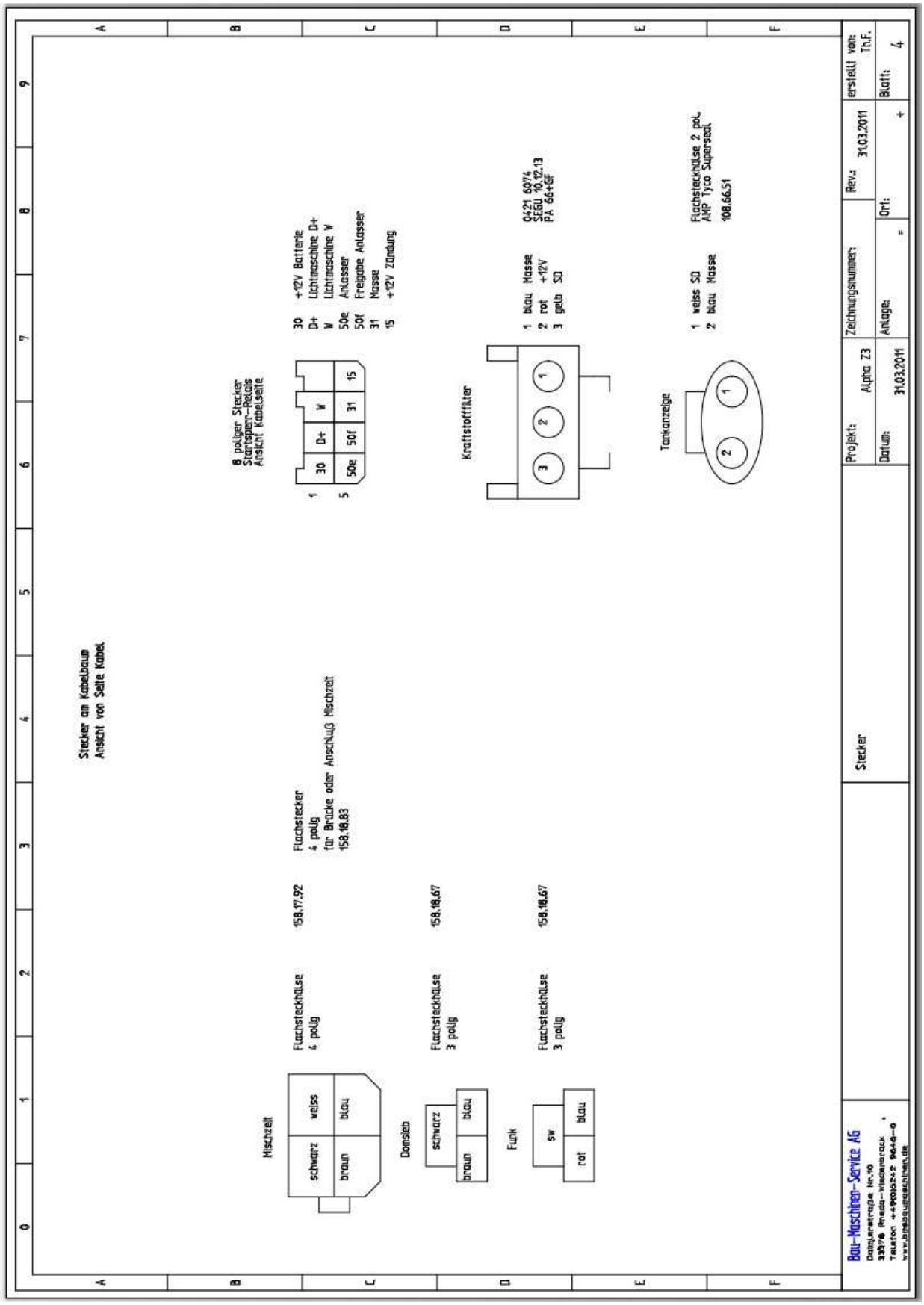
Electric diagram machine control



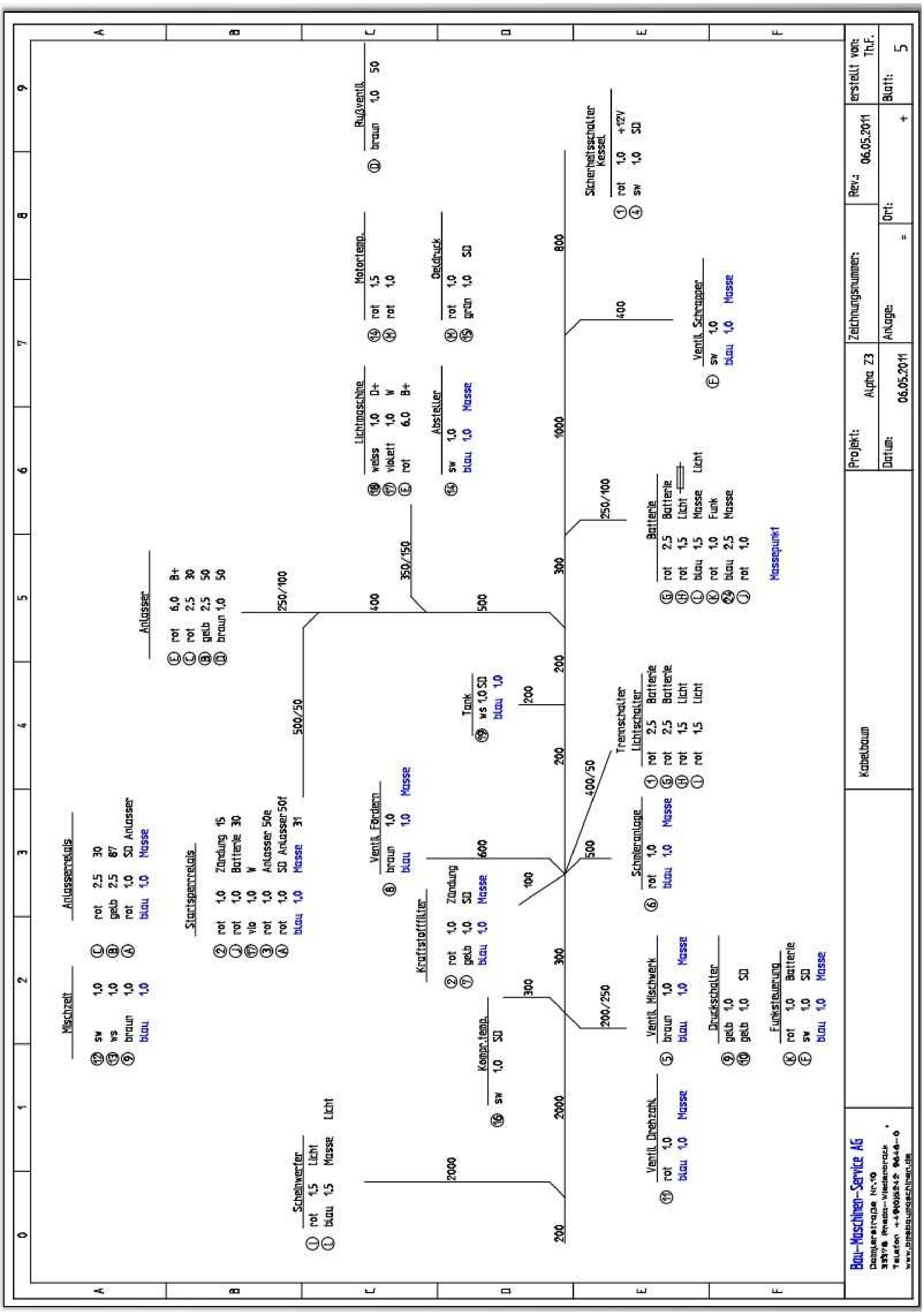
Electric diagram motor control and wiring



Electric diagram mixing time and plugs



Electric diagram cable harness

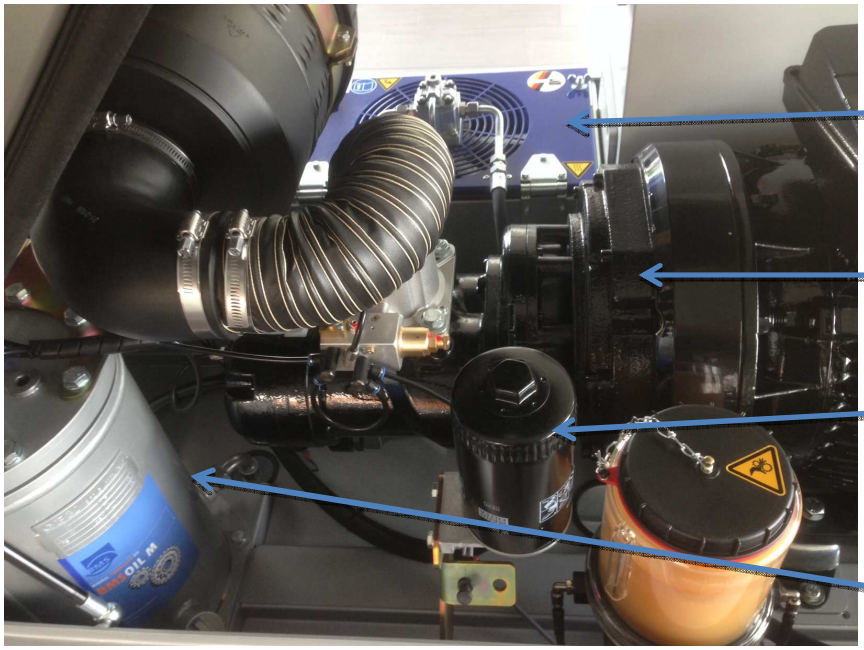


Scheinwerfer
Mischzeit
Anlasserrelais
Startsperrelais
Anlasser
Ventil Drehzahl
Kompr.temp.
Kraftstofffilter
Ventil Fördern
Ventil Mischwerk
Druckschalter
Funksteuerung
Schmieranlage
Trennschalter
Lichtschalter
Tank
Lichtmaschine
Abstelller
Motortemp.
Oeldruck
Rußventil
Batterie
Massepunkt
Ventil Schrapper
Sicherheitsschalter Kessel
Kabelbaum
Projekt: Alpha Z3
Datum: 06.05.2011
Rev.: 06.05.2011
Zeichnungsnummer:
Anlage:
Ort:
erstellt von: Th.F.
Blatt: 5
Bau-Maschinen-Service AG

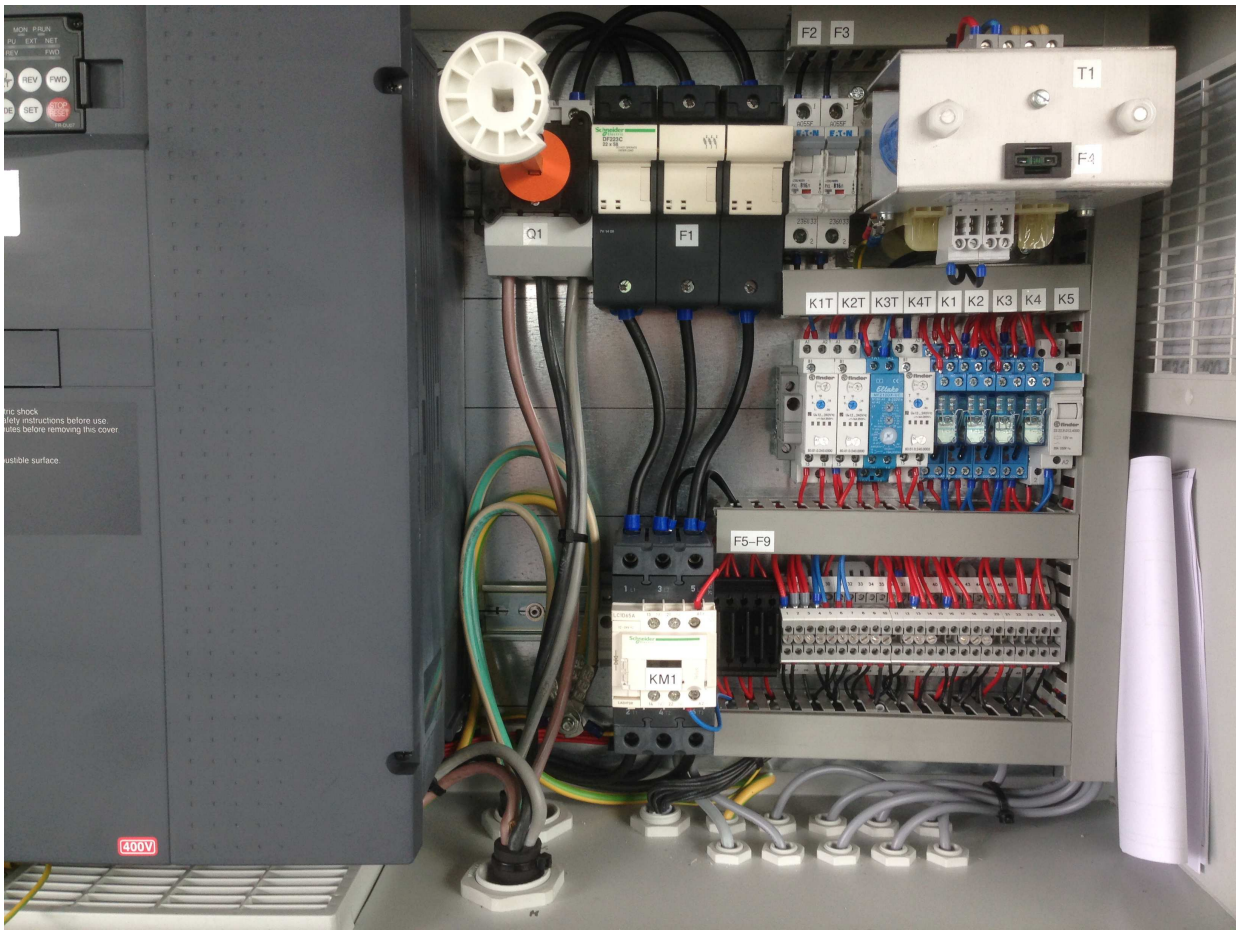
Information and wiring diagrams for models *alpha* E32 and *alpha* E63

8. Model alpha E32

Interior view




Machine distributor
Central switch,
Emergency stop
Oil tank


F2
F3
T1
F4
Q1
F1
K1T
K2T
K3T
K4T
K1
K2
K3
K4
K5
F5–F9
KM1
400V

Caption Machine distributor

Q1	Emergency stop – central switch	
F1	Main fuse	
F2	Fuse	Transformer
F3	Fuse	Transformer
F4	Fuse	Transformer 12VDC
F5	Fuse	Start
F6	Fuse	Central lubrication system
F7	Fuse	Head lights
F8	Fuse	Motor control unit
F9	Fuse	Machine control unit
KM1	Main contactor	
K1	Relay	Safety switch vessel
K2	Relay	Compressor motor start
K3	Relay	Safety chain
K4	Relay	Convey
K5	Relay	Release radio etc.
K1T	Time relay	Release machine control unit
K2T	Time relay	Start up time – pressure shut down
K3T	Time relay	Mixing time
K4T	Time relay	Lubrication system
K4T	Time relay	Lubrication system

Control panel

1: Mixing time on (yellow)

2: Operating voltage (green)

3:Safety switch vessel (red)

4: Disturbance (red)

5: Main switch, Emergency switch

6: Mixer

7: Compressor on

8: Compressor off

9: Compressor pressure

10: Vessel pressure

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General safety specifications

The electric connection may only be effected with the fixed cable (optional) or an approved and safe extension cable.
The connection may only be effected with dry hands (gloves/ clothing) at an appropriate and sufficiently secured connecting point (63 A).
The extension cable must dispose of a cable cross section of minimum 4x16,0mm² and of a length of max. 60 meters. If the cable length exceeds 60 meters, a cross section of min. 4x25mm² is required.
The required safety measures are listed in chapter 1.2.2 machine equipment.

When connecting the machine the regulation on the prevention of accidents “electrical devices and equipment“ must be observed.

The cable connection (extension cable) must be rolled out completely.

Pay attention to supply lines not being obstacles:

In traffic ways, electrical lines must not be installed unsecured.
The isolation and live conductors may get damaged through stepping on or driving over, moreover, loosely installed connection cables constitue tripping points.
This may be avoided by using plastic cable bridges or by guiding the connection from above.

Pay attention to the charger station being sufficiently secured (63 A), in good order and condition and safe.

Only approved conveyor hoses and connectors may be used, disposing of a minimum diameter of 50 mm, operating pressure 10 Bar and bursting pressure 40 Bar!

Hoses and connectors are subject to natural wear and tear due to friction and aging.

Check hoses and coupling connections on good order and condition.
This check must be effected at the latest every 3 months by an expert (safety sheet).
This includes checking the conveyor hoses, the connectors at the hoses, the connections at the vessel and at the pump.

The use of conveyor hoses with different nominal diameters must be avoided. It constitutes an increased risk of blockages.

On placing the machine and installing the conveyor hoses, pay attention to not hindering employees or external persons.
In particular cases, warning signs must eventually be placed.

Remove immediately all disturbances that may endanger safety!
In case of danger activate the central switch (as EMERGENCY-STOP)!

Under certain circumstances the material used may endanger health.
For this reason, the necessary protective clothing must always be worn in accordance with the data sheets of the manufactuerers (respiratory protection, gloves, etc.)!
See chapter 4.4.3 personal protective equipment.

Observe the regulations of the accident prevention and insurance association, in particular the regulations on the prevention of accidents!

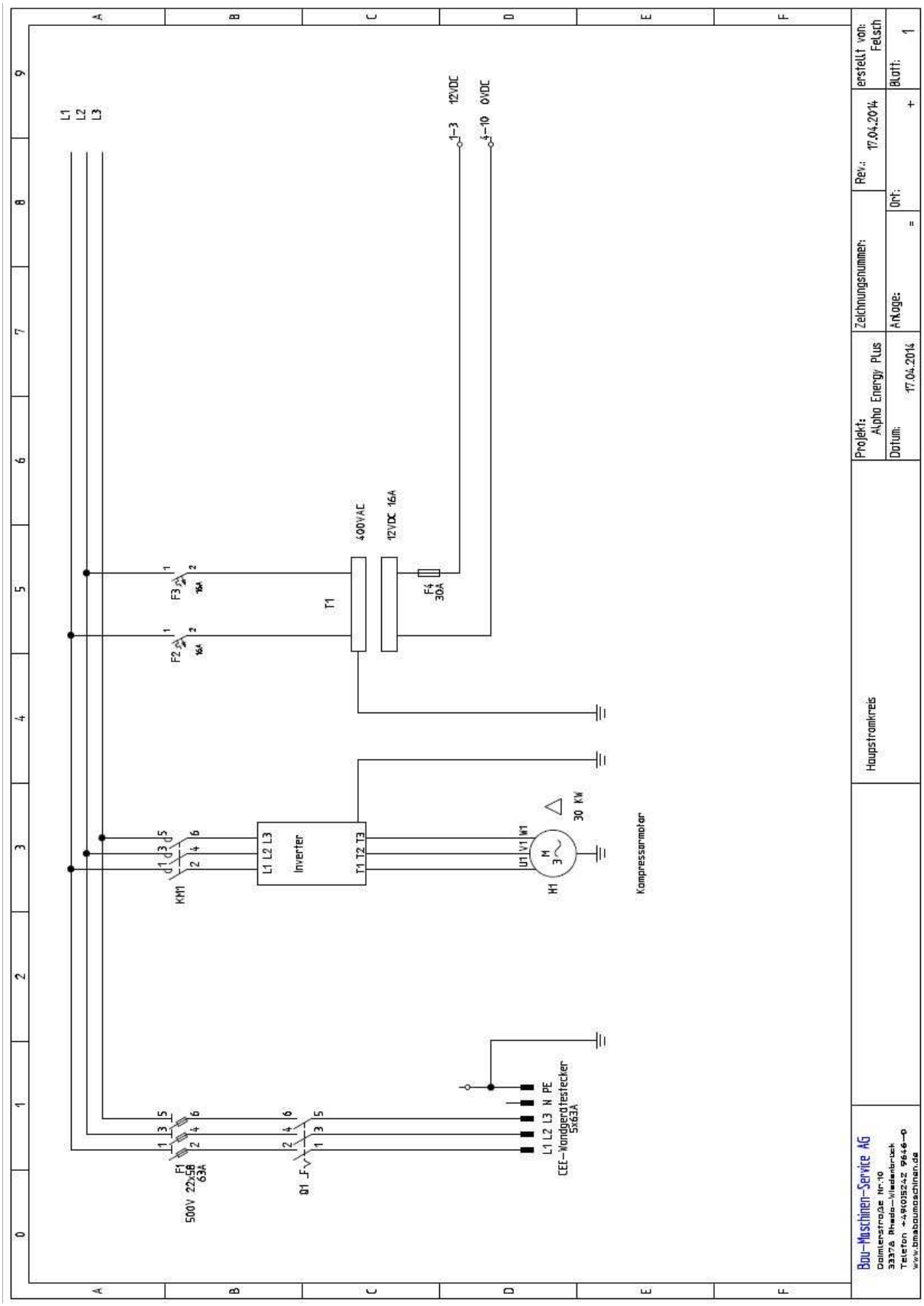
Only material corresponding to the designated use of the machine may be used and conveyed (see chapter 4.2 suitability of the machine)!

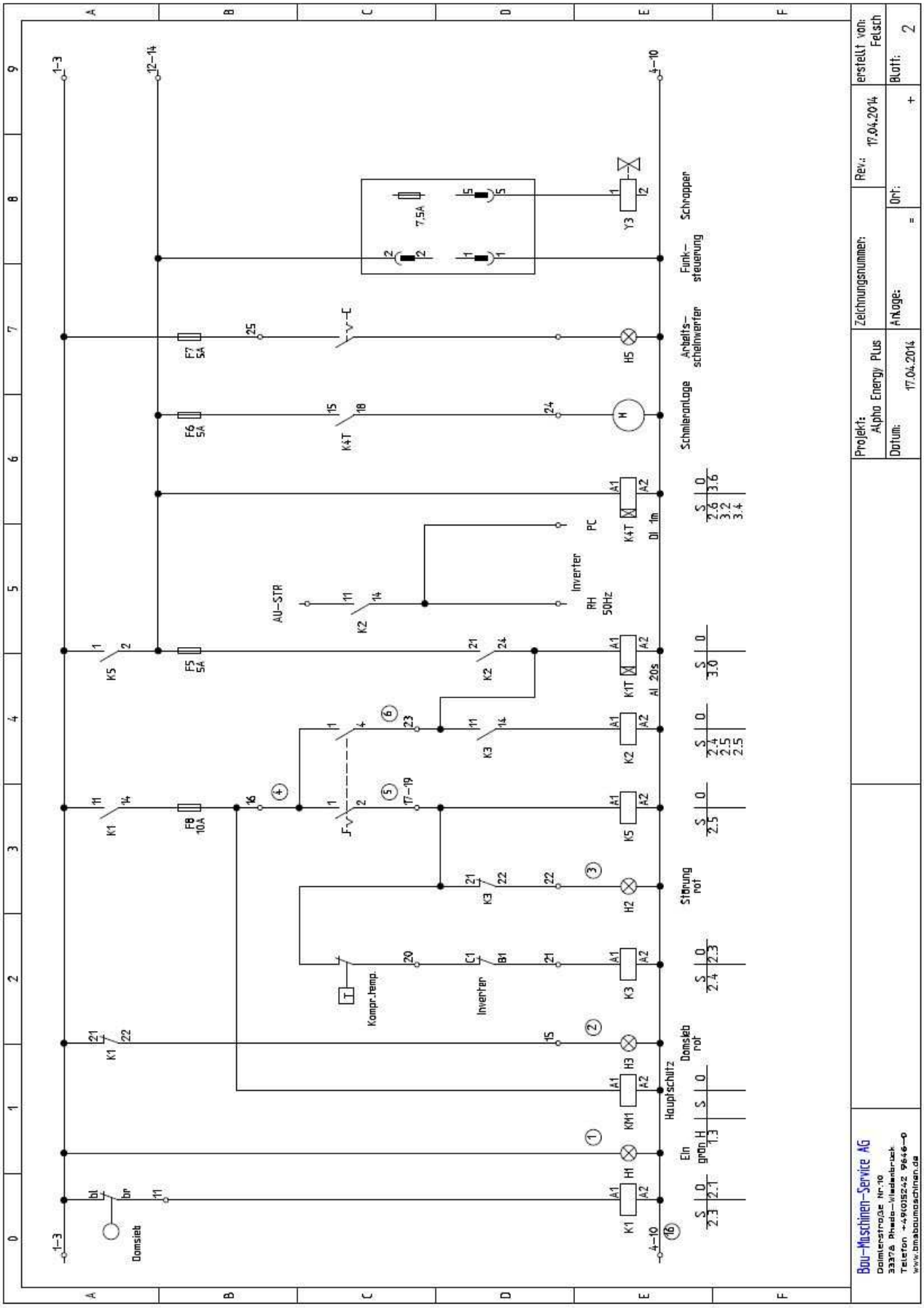
The machine has been manufactured according to generally accepted technological standards. Inappropriate use of the machine as well as non-observance of the safety instructions may constitute danger for the body and life of the operator and third persons as well as cause damages to objects.

Use of frequency converters

If frequency converters are used there may be dc residual currents with low residual ripple in case of disturbances. Pulse sensitive residual current circuit breakers that have proven themselves in the industry cannot deal with this kind of residuel currents. For this reason, universal sensitive residual current circuit breakers must be used in combination with frequency converters. Please pay attention to equipping the worksite distribution board or the supply line accordingly.

Electric diagram for alpha E32 and alpha E63

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Datum: 17.04.2014
Zeichnungsnummer:
Anlage:
Rev.: 17.04.2014
Blatt: 2
erstellt von: Felsch
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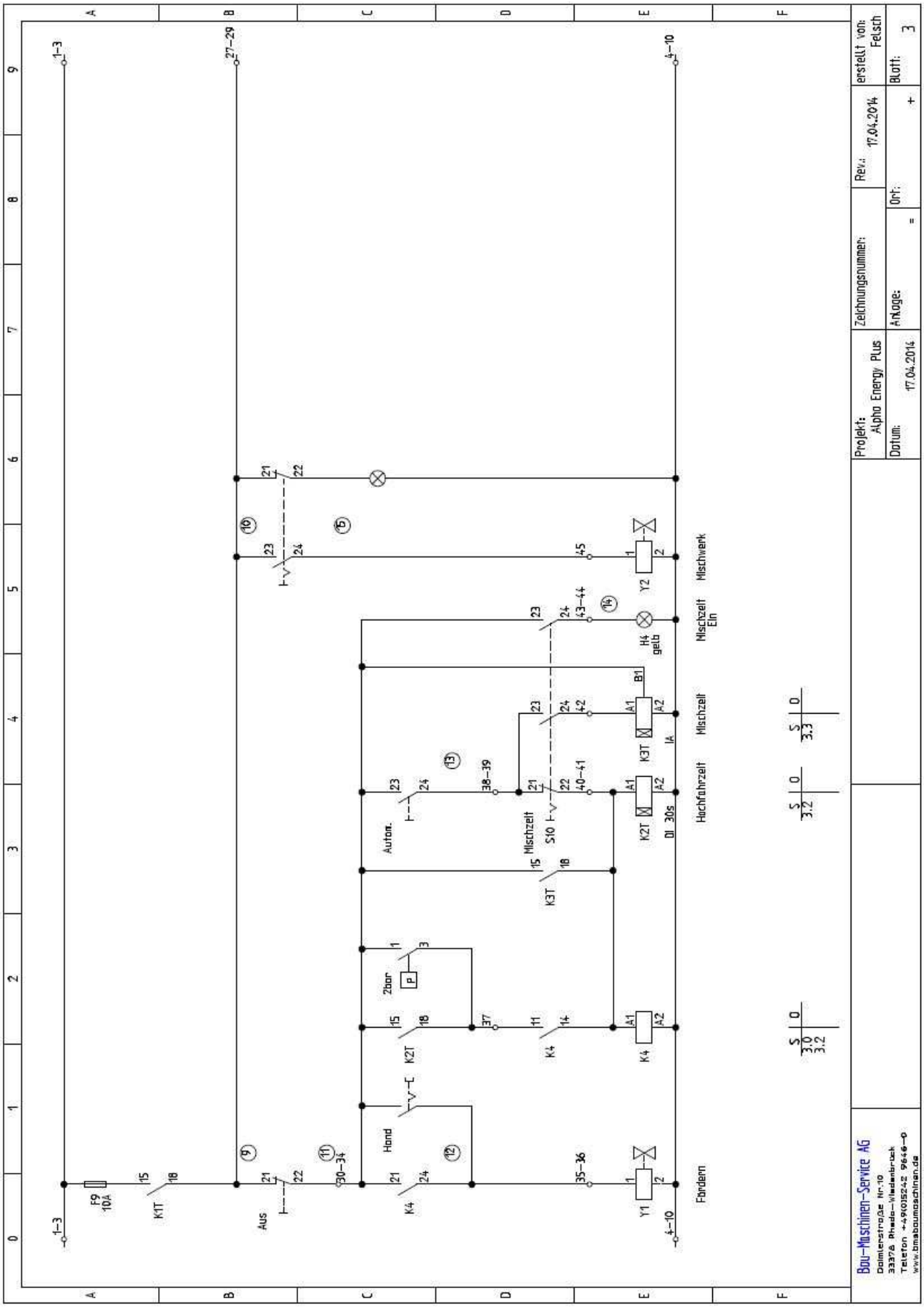
Domsieb
Ein
Hauptschütz
Domsieb rot
Störung rot
Kompr.Temp.
Inverter
Schleranlage
Arbeits-scheinwerfer
Funk-steuerung
Schrapper
Inverter
AU-STR
PC
RH
50Hz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Datum: 17.04.2014
Zeichnungsnummer:
Änloge:
Ort:
Rev.: 17.04.2014
erstellt von: Felsch
Blatt: 3
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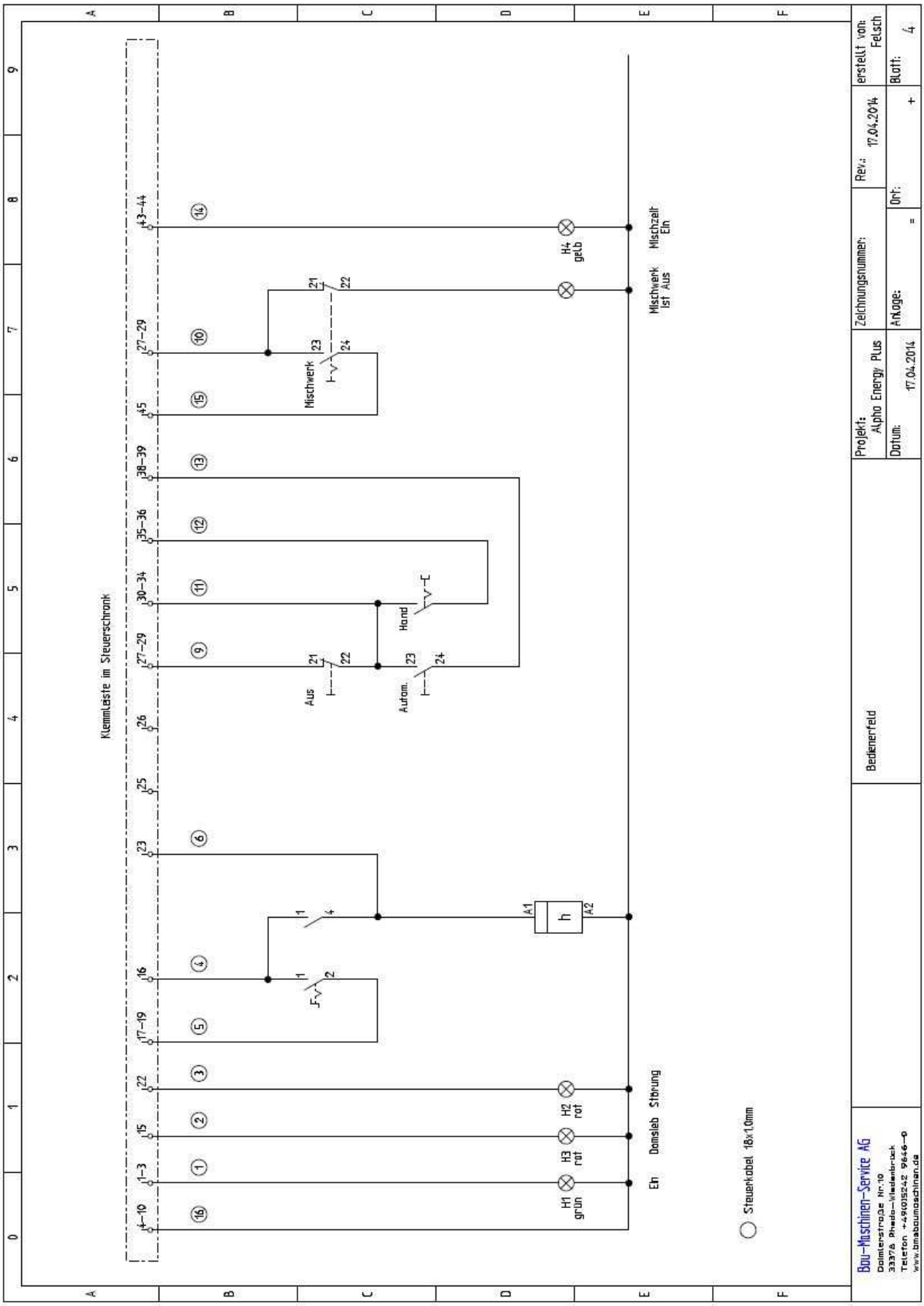
F9 10A
K1T
Aus
Hand
K4
K2T
2bar
Autom.
Mischzeit
S10
K3T
K2T
DI 30s
Hochführzeit
Mischzeit
K3T
Mischzeit Ein
H4 gelb
Mischwerk
Y2
Fördern
Y1


Klemmleiste im Steuerschrank
Mischwerk
Hand
Aus
Autom.
H4 gelb
Mischzeit Ein
Mischwerk ist Aus
H2 rot
H3 rot
H1 grün
Ein Domsleb Störung
Steuerkabel 18x1,0mm
Projekt: Alpha Energy Plus
Datum: 17.04.2014
Zeichnungsnummer:
Anlage:
Rev.: 17.04.2014
Ort:
erstellt von: Felsch
Blatt: 4
Bedienerfeld
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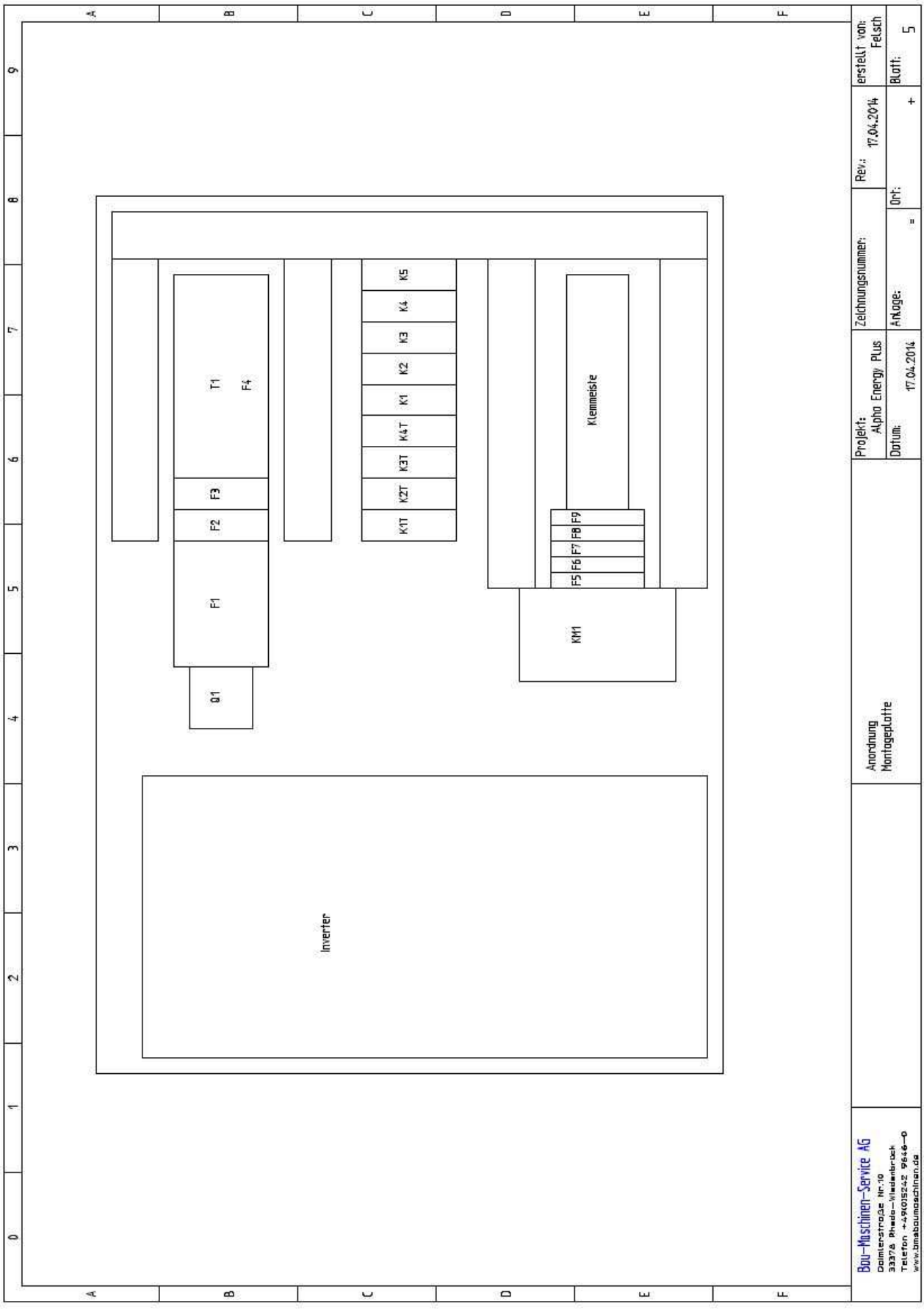
T1
F4
F3
F2
F1
Q1
K5
K4
K3
K2
K1
K4T
K3T
K2T
K1T
Klemmleiste
F5 F6 F7 F8 F9
KM1
Inverter
erstellt von: Felsch
Blatt: 5
Rev.: 17.04.2014
Ort: +
Zeichnungsnummer: =
Projekt: Alpha Energy Plus
Änderung:
Datum: 17.04.2014
Anordnung Montageplatte
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NOTES