

Manual

- MAFA Maflex

transport auger



**Read the instructions carefully before
assembling the parts!**

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Warranty

- A Maflex auger must only be used for transport of animal feed in meal- corn- or pellet form, fuel pellet and plastic in powder- granulated form. Recommended dia. of pellets is 6-8 mm, but must not exceed 8 mm. The supplier has no responsibility for security and function if used in other ways.
- The supplier guarantees that the goods are correct when delivered. The supplier must at once be informed of any defects from transport or installation.
- One year of material warranty is covered, Orgalime S2000.
- Any costs related to looking for sources of errors during warranty is not covered unless the supplier is contacted before start of work.
- The warranty is not valid for labour cost or stoppage, nor for problems due to wrong assembly or wrong handling, nor in connection with thunder and lightning or other interruptions in the mains supply.
- The user is responsible for having the equipment installed by qualified personnel.
- The user is responsible for the function of the plant. At any interruption the user is also responsible for providing alternative transport of the material. MAFA has no responsibility for any costs whatsoever in such cases.
- If any defects are found, please contact your retailer or MAFA i Ängelholm AB.
- To achieve a long life span and the safe running of the plant it is necessary to follow the fitting instructions.

Safety precautions for Maflex auger

- Minimum 850 mm hose or metal tube must be fitted on all open outlets placed lower than 2700 mm from the floor. Assemble with hose clamps.
- A grating must be fitted in inlet hoppers.
- Inlets must be placed to avoid all contact with rotating parts.
- Home built supplies and inlet hoppers must be constructed so it is necessary to use tools to open doors and hatches to avoid contact with auger or other rotating parts.
- Electric installation must be in conformity with EN 60204-1 by qualified electrician.
- Always disconnect and lock the mains supply switch before starting any work on the plant.
- All motors must be equipped with mains supply switch.

The tube can be combined with various sizes of spirals depending of the use. For normal pellet fuel a tube with 90 mm inner dia is used in combination with a spiral of 62 mm outer dia.

Mafa Maflex auger in several designs

Tube in the following dimensions

1. PVC 75 mm
2. PVC 90 mm
3. PET 90 mm

Spiral in the following dimensions

1. Spiral, outer dia of 62 mm
2. Spiral, outer dia of 68 mm

Auger and worm gear motor operation & maintenance

- The auger is oiled to prevent rust during storage and transport. The oil makes the spiral "harsh" and it runs heavy until the oil is worn away and the spiral is "polished". Run the auger at reduced load at first – do not fill up the whole silo or container at start up. Test run the plant with a smaller amount that can be thrown away. Then run the plant with 50 – 100 kg of material before final operation.
- Never run an empty Maflex auger.
- Tighten all bolts about a month after start up of the plant. Then check the plant at least once a year.
- Check that electric motors and other electric components are not covered with dust. Remove dust with compressed air. **NB!** Never wash with water.
- *Lubrication and maintenance of the worm gear motor:* When delivered the gears are filled with synthetic oil and need no more control. If the motor is not used for long periods in a moist environment, we suggest to fill it up completely with oil (ISO VG 320). When it shall be used again the level must be restored.
- *For outdoor use:* The worm gear motor shall normally be fitted horizontally. If the drive shaft is fitted downwards the motor must be fitted with a protective cover over the fan. Motors with the shaft upwards must be protected so water and dust cannot enter the motor along the drive shaft.
- Replace damaged or worn out parts immediately.

Electric installation & Start Up

- The motor, 3-phase or 1-phase, must be connected to a protective motor switch.
- Check separate manual for the type of electric unit used in your plant.

Recommendations when fitting a Maflex auger for pellet fuel

Effects on function and operation:

- Material in the transport tube (plastic tubes are better than metal tubes due to high friction of the fuel pellet)
- Auger length
- Number of bends
- Inclination of the transport tube
- Time of auger operation
- Auger speed
- Pellet quality and size

Things to consider:

- Do not use steel tubes
- Do not use too long augers (max. length 10 - 15 m).
- Do not use more than 2 - 3 bends. Right- and left bend should not follow directly after one another.
- Avoid left bends if possible because the auger works harder due to material build-up on the right side, resulting in lack of material "lubrication" between the auger and the wall of the pipe.
- Do not use inclinations that are too steep. Max. 45°.
- Do not use oversized pellets (10 - 12 mm). Always try to use 6 - 8 mm pellet instead.
- It is better to use non pulsating operation of the auger (operation in at least 2 - 3 min).
- It is better to use higher speed (90 rpm is recommended).
- Check that the angle of the downpipe is sufficient to transport the material. Min. 60°.



Solutions in difficult cases:

- Divide the transport length in several augers. If two augers are connected, the feed auger must not rotate at a higher speed than the receiving one.
- Use 2 separate worm gear motors (one at each end, pushing-/pulling motor) for each auger.
- Use a fast auger (90 rpm) to an intermediate bin.
- Use a short auger from the centre container to the burner where you can use both pulsating operation or use a low speed.
- Use pushing operation if possible.

Assembly instructions MAFA Villa

The following generally applies

Read carefully all assembly- and maintenance instructions before starting to assemble the goods.

Identify all details.

Use silicon sealant (suitable for the job) for all joints to avoid leakage (not included).

The outer pipe's sleeve should point towards the inlet i.e. opposite the direction of transport.

Sleeved joints should be assembled with the joint downwards. Max. rise for transport augers 45°.

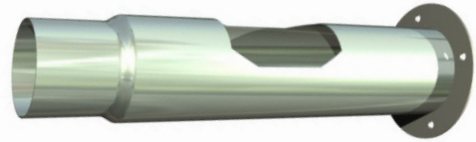
The inlet (where the auger takes the material) for a Maflex auger is dependent on silo choice e.g. auger from a hopper or dischargers underside. See the separate manual for alternative discharge options.

Assemble the goods in this order

- 1.** Assembly of tube and end outlet
- 2.** Assembly of tubes and bends. Insert the auger.
- 3.** Fitting of the auger and shaft at motor end and end bearing.
- 4.** Install the drive unit/motor and electricity supply.
- 5.** Set up the outle and accessories such as tubes, funnels, downpipes, etc.

1. Assembly of tube and end outlet

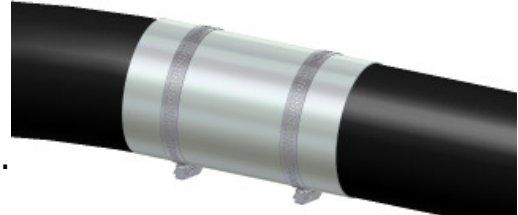
Saw four 60 mm long slits in a cross in each sleeve if the tube isn't already pre-cut. Fit the bends and end outlet(s) together at inlet and outlet acc. to the directions below



Try to limit the inclination of the auger as much as possible. The inclination must not exceed 45° on the transport length.

The sleeves of the tubes must point towards the inlet, i.e. opposite the transport direction.

When sleeves are missing, the tubes are connected with tubular sheet covers. Turn the slit downwards. Seal with silicone sealant.



Check carefully that all tube joints are completely pushed together. Incorrect assembly will shorten the life span of the equipment.

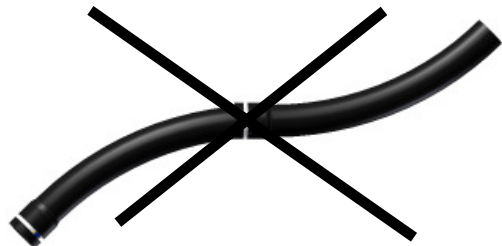
When black tubes are used, assemble the tube directly towards the end outlet without sleeve or tubular sheet covers. Saw four 60 mm long slits in a cross in the tube before fitting. Fit the hose clamp c:a 20 mm from the edge and tighten.

If the tubes are fitted outdoors tighten all joints with silicone sealant.

Supports: Support all tubes. Use nail bands, wire or flat bars in combination with tube clamps for fastening the tubes. If possible try to fit the stays close to tube joints or outlets. Worm gear motors, outlets and inlets must be fastened carefully to avoid rotation. The distance between the stays must not exceed 2,5 m. Note that the tubes must not in any press – they might be oval and worn down in a short time.

When the tubes are placed in ground the Maflex tube shall be placed in 160 - 200 mm ground sewage pipes or similar. Tighten all tube joints with silicone sealant.

Right and left bends must not be directly joined. 1 metre should be used between these bends:



2. Fitting the auger and shaft at motor end

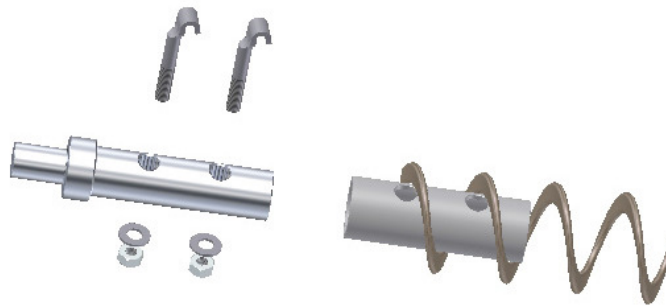
See page 20 for overview.

Be careful when unpacking the auger. There is a risk that it is tightly bundled and could quickly un-coil once the tying wire or packaging is removed.

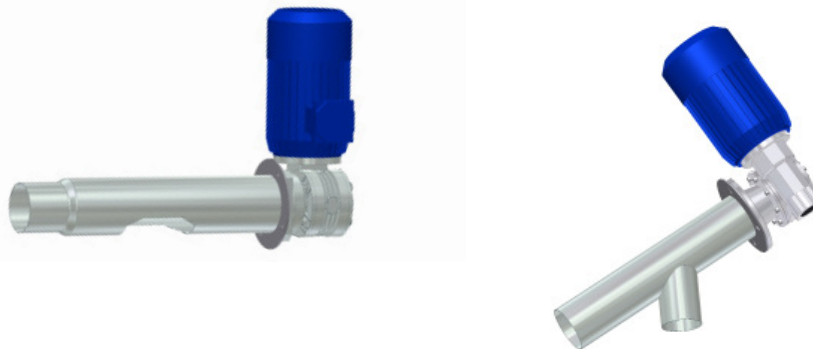
Push the spiral into the tubes, start at motor end.

Slip the centre tube on the shaft. The length of the shaft is based on fitting at motor end (long shaft) or at the end outlet (short shaft). Always use a short centre tube (100 mm) at the end outlet, at the inlet use a tube dependant of the length of the inlet. See page 19 for proper length.

Slip the shaft and centre tube into the spiral so the spiral just reaches the end of the centre tube. Fix the spiral at the drive shaft and centre tube. Tighten the spiral with the two hooks, oiled bolts and washers.



Slip the drive shaft without wedge into the motor and tighten the bolt slightly.



Inlet for augers without end bearing

When using short augers – do not use any end bearing at the auger inlet.

The auger tube is cut to the necessary length. Cut the tube end to 45° angle. Pull the spiral towards you without using any force, mark the spiral with a pencil just at the edge of the bottom part of the tube. Pull out the spiral for easy cutting. The spiral will "flow freely" in the inlet end. The tube end shall be turned c:a 30 - 40 gr seen from above to reduce pressure from the material. Check the length of the spiral when the silo has been filled up sometimes and the length outside the tube shall be cut away.



3. Fitting auger with drive shaft at end bearing

See page 21 for overview.

When the auger is fitted to the motor without using force, pull it towards you and mark exactly at the edge of the in-/outlet. The auger should as "neutral" as possible in the outer pipe. Unscrew the locking bolt in the drive end and pull out the spiral. Cut the spiral c:a 50 mm shorter than the mark with an angle grinder, bolt cropper or hacksaw.

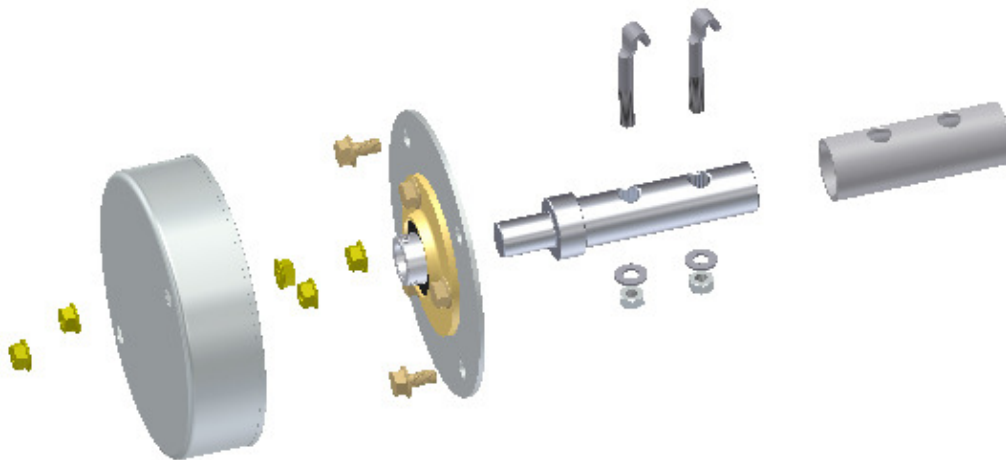
Slip the centre tube on the shaft. The length of the shaft is based on fitting at motor end (long shaft) or at the end outlet (short shaft). Always use a short centre tube (100 mm) at the end outlet, at the inlet use a tube dependant of the length of the inlet. See page 19 for proper length.

Slip the shaft and centre tube into the spiral so the spiral just reaches the end of the centre tube. Fix the spiral at the drive shaft and centre tube.

Tighten the spiral with the two hooks, oiled bolts and washers.

Try to insert the shaft spline. It should fit quite easily. If not, use emery cloth or similar to slightly reduce the size of the spline.

Screw the bearing flange to the end outlet. Fit the two long bolts diagonally on the flange to be used for fitting the end cap.



Fit the end bearing shaft into the end bearing and tighten the stop screw. It might be difficult to get the shaft into the bearing, use a screw driver at the spiral to force the shaft in place. **NB!** Be careful not to squeeze your fingers!

Fit nuts to get 15 mm thread at top on the long bolts. Fit the end cap and tighten.



4. Fitting the drive unit

When the auger is the correct size for the outer pipe, outlet and inlet, the motor is fitted. Fit the shaft in the motor together with the wedge. Check if it is easy to slip in the shaft, if not use emery paper for cleaning.

Lubricate the shaft with grease. Fit the shaft in the motor with bolt and washer at the end of the shaft.

Screw the motor to the flange. If the motor is located outdoors protect it from rain. Fit the motor horizontally to avoid water entering the electric motor along the shaft. Lubricate the end bearing shaft with grease.

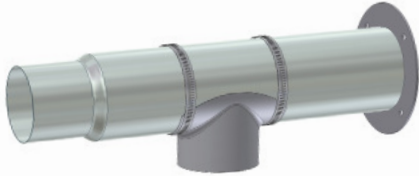
The electric motor must only be connected by a qualified electrician. See circuit diagram at pages 16-18. An electrician should be employed to connect the overfill sensor in the outlet of the auger if this is included. See page 15.

At the same time, without any material in the silo, check that the motor is running in proper direction. Mark the rotation direction with an arrow on the worm gear motor.

5. Fitting inlet/outlet

Fit all inlet/outlets. The blue plastic outlet must be turned in the transport direction according to drawing below and tightened with the socket head cap screws. Tighten the screws crosswise until the outlet is sits firmly, but no more.

100 mm metal outlets shall be tightened with two hose clamps.



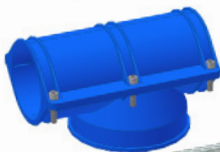
End-outlet (2958) + outlet (8408) for 100 mm downpipe



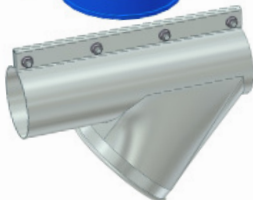
Outlet (2834) with hole for sensor to 100 mm downpipe



Outlet (2837) 45° for 100 mm downpipe



Outlet (2548410) in plastic for OK160 mm



Outlet (128) 45° in metal for OK160 mm



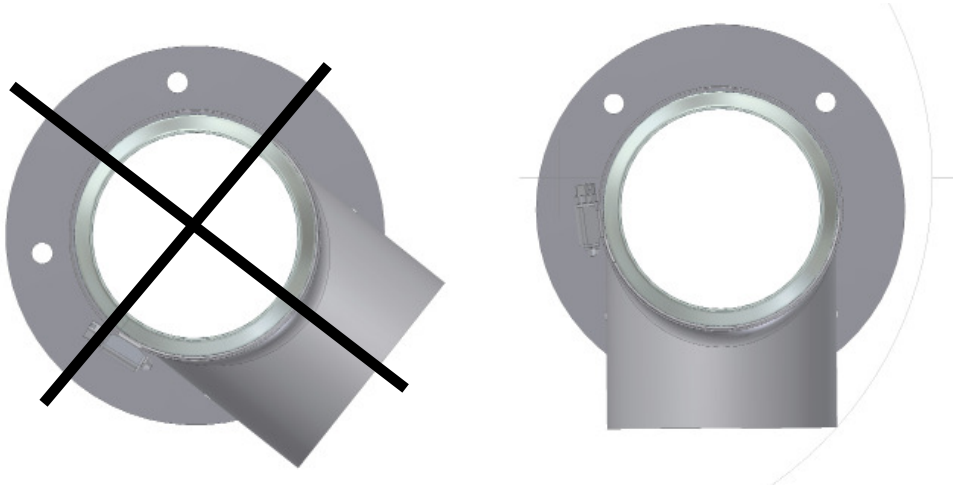
Outlet (S1940035) in metal for OK160 mm

Intermediate outlet: If intermediate outlets are used (art. no. 757411 or 907411), take up a hole in the tube with preferably a hole saw (max dia 55 mm resp. 75 mm). The tube must not be completely cut by the saw. Outlet tubes are attached to the outlets with two screws when two holes are drilled in the upper part of the outlet tube. The slide and string shall not be attached unless the shutter mechanism is used.

NB! When open outlets are used with smaller dia than 120 mm and placed lower than 2,7 m above floor, it is necessary to fit at least 0,85 m flexible hose and/or tube to prevent from reaching the auger accidentally by hand. Outlets with dia above 120 mm must not be open and must always fall into another inlet or be placed higher than 2,7 m above floor. Downpipe is fitted to the putlet. Converters for different tube sizes are available.

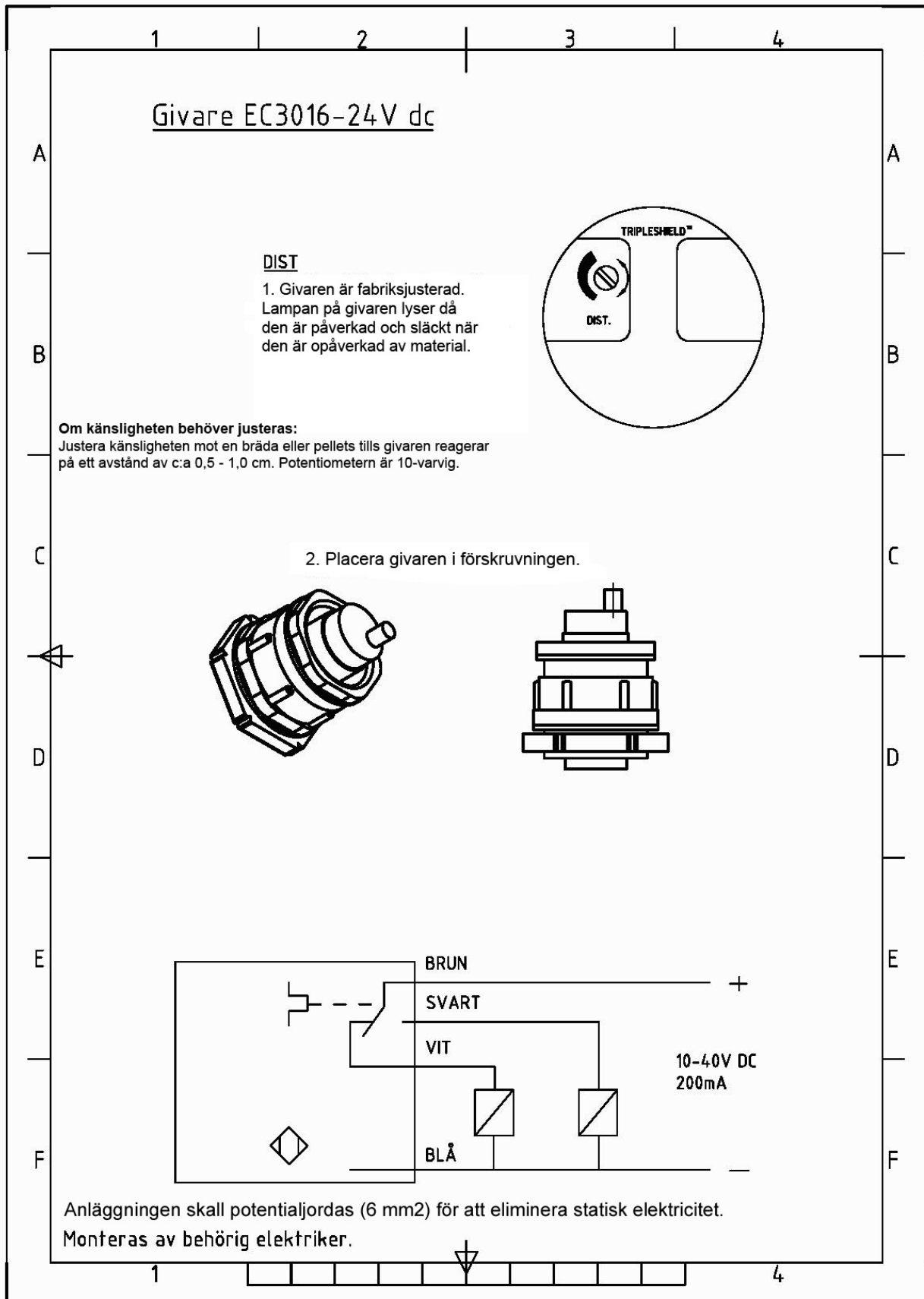
6. Fitting optional parts like hoppers, outlet tubes, flexible tubes, etc.

Fit outlet tubes and/or flexible tubes with quick release clamps or hose clamps depending on the type of outlet. Note that the inclination of the outlet tubes must be enough to avoid hanging (at least 60°). Always place the outlet and outlet tubes pointing downwards and remember that the tube should have sufficient tension to avoid kinks.

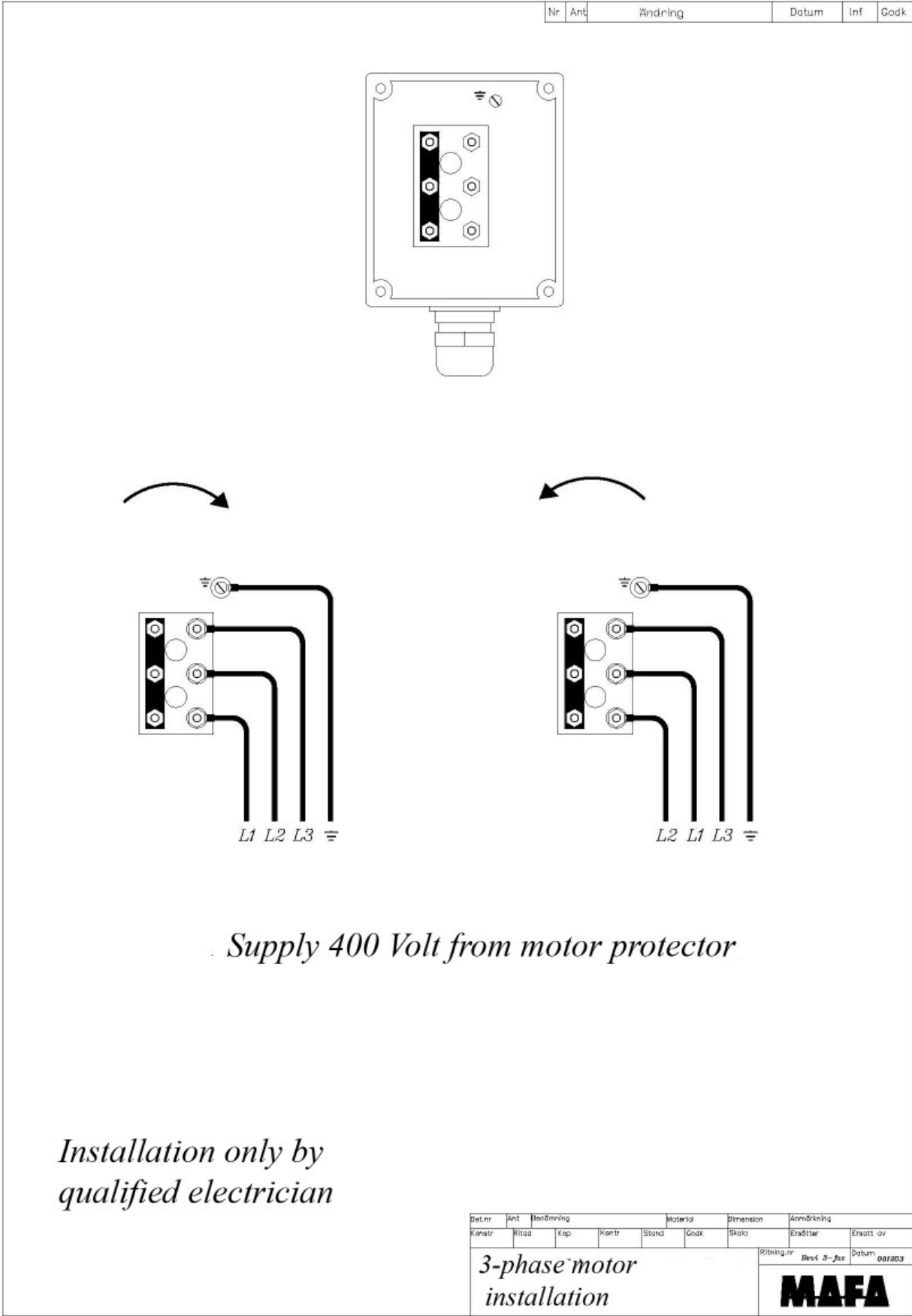


Assembly of level sensor type EC 3016-24 V

The level sensor is supplied pre-adjusted and factory set and probably won't need any adjustments further. Installation of the level sensor to be carried out by suitably qualified electricians.



Circuit description - 3-phase worm gear motors



Circuit description - 1-phase worm gear motors

NB! Blue gear motors.

Nr	Ant	Ändring	Datum	Inf	Godk
----	-----	---------	-------	-----	------

motor direction

Capacitor

F \equiv N

Supply 230 V

motor direction

Capacitor

F \equiv N

Supply 230 V

1 - phase worm gear motor excl. thermistor

Internal thermocontact

Termo

white cables

Capacitor

F \equiv N

Supply 230 V

Internal thermocontact

Termo

white cables

Capacitor

F \equiv N

Supply 230 V

*1 - phase worm gear motor incl. thermistor.
Thermistor must be used.*

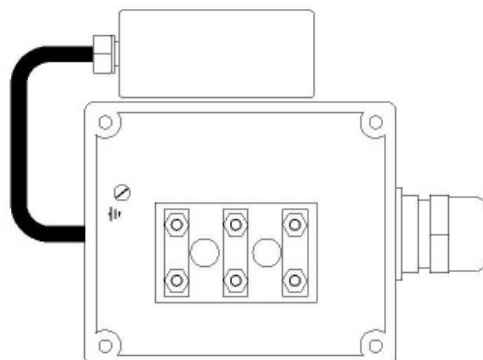
Installation only by qualified electrician!

DeLnr	Ant	Benämning	Material	Dimension	Anmärkning
Konstr	Ritad	Kop	Kontr	Stand	Godk
Installation of 1 - phase motor.					Bevi
					Datum
					MAFA

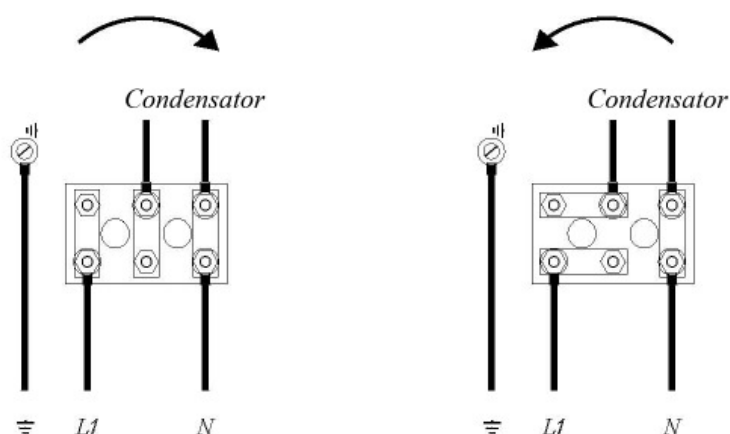
Circuit description - 1-phase worm gear motors

NB! Grey gear motors.

Nr	Ant	Ändring	Datum	Inf	Godk
----	-----	---------	-------	-----	------



*Tinplates to be placed
acc to sketch*



Supply 230 V from motor protector

*Installation only by qualified
electrician*

Det.nr	Ant	Benämning	Material	Dimension	Ämningsning
Konstr	Ritad	Kop	Kontr	Stånd	Godk
1-phase motor installation					Ritning nr Revif-fas Datum 08/203

MAFA

Centre tube lengths

Name	Length (mm)	Art.No
End outlet	100	2966
End inlet	400	2967
1 m Succé, KON, UB	1200	3881
2 m Succé, KOM, UB	2200	3882
3 m Succé, KON, UB	3200	3883
Intermediate outlet	300	3871
Hopper	400	2967

Auger connection at end outlet pulling operation

13	1	Ändutlopp maflex 90 OK 100/160 (hål 140mm)	,4	2958
12	1	Centrumrör L=97mm SF75	0	2966
11	4	Skruv M8x25 H insex MC6S 8.8 FZB	0	3569
10	1	Flexspiral SF75	,1	757310
9	2	Krok f Flexskruv 75 mm L:60mm	0	S865253
8	2	Bricka 8,4x16x1,5	0	3607
7	2	Mutter M8 låsmutter M6M, FZB, DIN 935 låg	0	3227
6	1	Tapp SF75 till motorhylla	,2	2934
5	1	Kil 7x8x50 SMS 2306	0	2921
4	1	Snäckväxelmotor	4,5	FRS50
3	4	Mutter M8 fläns FZB	0	3445
2	1	Bricka 9x35x3	0	3489
1	1	Skruv M8x20 insex	0	3372

Pos	Antal	Beskrivning	Material	Vikt
13	1	Ändutlopp maflex 90 OK 100/160 (hål 140mm)	Steel	
12	1	Centrumrör L=97mm SF75	Generic	
11	4	Skruv M8x25 H insex MC6S 8.8 FZB	Standard	
10	1	Flexspiral SF75	Generic	
9	2	Krok f Flexskruv 75 mm L:60mm	Steel	
8	2	Bricka 8,4x16x1,5	FZB	
7	2	Mutter M8 låsmutter M6M, FZB, DIN 935 låg	Steel, Mild	
6	1	Tapp SF75 till motorhylla	Default	
5	1	Kil 7x8x50 SMS 2306	Generic	
4	1	Snäckväxelmotor	Steel, Mild	
3	4	Mutter M8 fläns FZB	Steel, Mild	
2	1	Bricka 9x35x3	Generic	
1	1	Skruv M8x20 insex	Steel	

Datum	2004-10-20	Erik	Skruvanslutning vid ändutlopp dragande drift	Rev	00-04487
MAFA i Ängelholm AB Framtidsgratan 1 262 73 Ängelholm					

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www.mafa.se
Rengörare

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Auger connection at end outlet pushing operation

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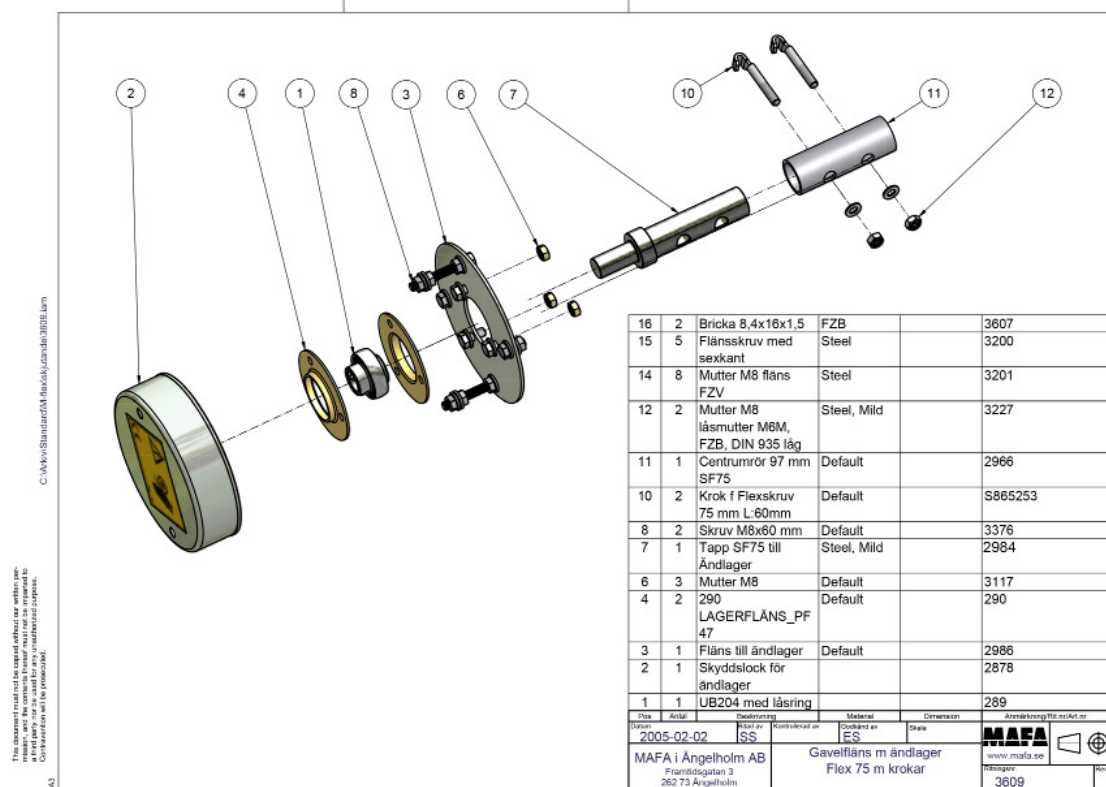
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A3

16	1	Ändutlopp maflex 90 OK 100/160 (hål 140mm)		,4	2958
15	2	Mutter M8 M6M,	Steel, Mild	0	3227
14	2	Bricka 9x18x1,5 FZB	Steel, Mild	0	3105
13	2	Krok f Flexskruv 75 mm L:60mm	Steel	0	S865253
12	1	Skyddslock för ändlager		0	2878
11	1	Skruv spiral	Steel	,7	01-0125-1
10	1	Centrumrör 0.1m SF75	Default	0	2966
9	1	Tapp SF75 till Ändlager	Default	,1	2984
8	2	M8X60	Default	0	01-0307-1
7	8	Flänsmutter M8	Steel, Mild	0	01-0307-1
5	5	Bult M8 X 16	Default	0	3200
4	2	Lagerfläns PF204	Default	0	290
3	1	UB204 med låsring		0	289
2	1	Fläns till ändlager	Default	,1	2986
Pos	Antal	Beskrivning	Material	Vikt	Armräkning/Run/Art.nr.
Datum	2007-08-23	Reviderad av	Godkänd av	Skala	
MAFA i Ängelholm AB Framidsgratan 1 262 73 Ängelholm					
					01-0307-1
					Rev

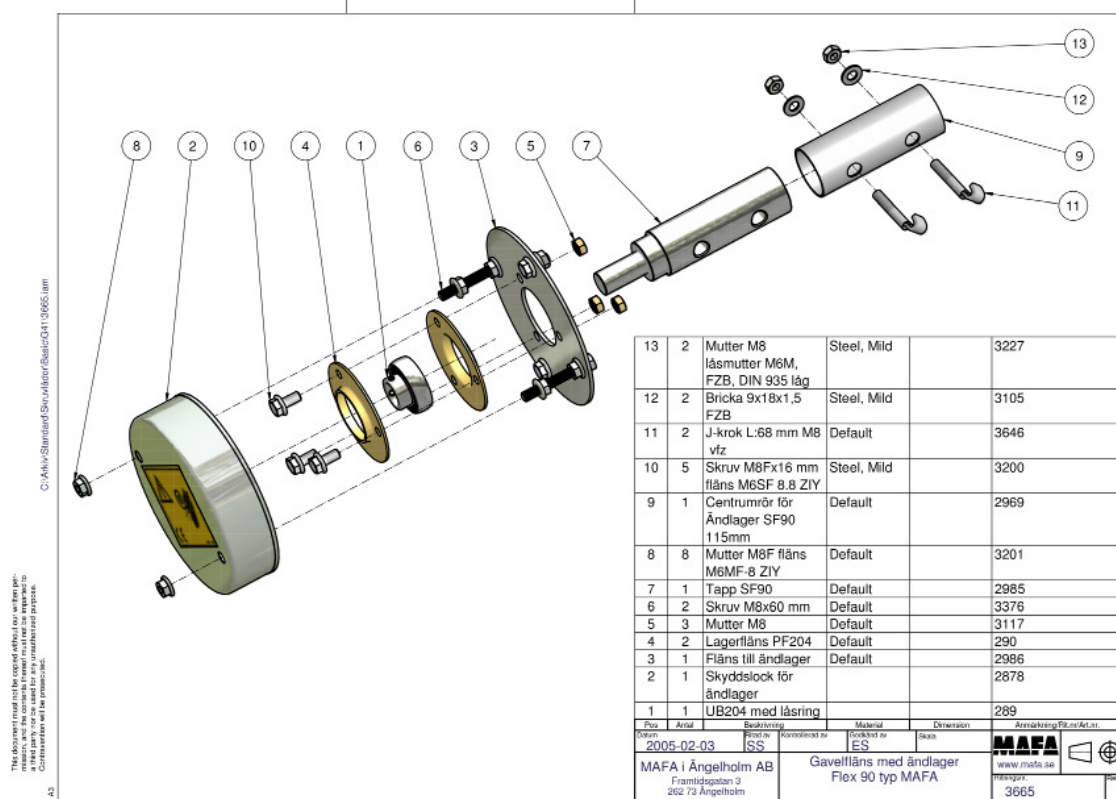
End flange with bearing (art nr 3609)

NB! The short centre tube, 97 mm, is placed on the shaft at the end outlet. The centre tube in the inlet end is adjustable for alternative discharge options. (See page 19)

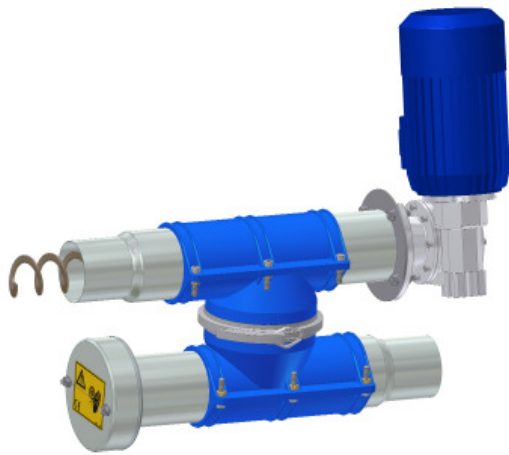


End flange with bearing (art nr 3665)

OBS! The short centre tube, 97 mm, is placed on the shaft at the end outlet. The centre tube in the inlet end is adjustable for alternative discharge options. (See page 19)



Optional auger connection



Two augers, one on top of the other.
Used for draw augers over XX m.
If two augers are joined together, the
feed auger must not have a higher ro-
tation speed tha the receiving one.



Two augers, together with a downpipe,
connected to a control sensor



One auger to a Y-pipe fee-
ding two augers



Framtidsgatan 1, 262 73 Ängelholm, Sweden
Tel + 46 431 44 52 60 Fax + 46 431 41 15 01
e-mail: info@mafa.se Internet: www.mafa.se