

Mounting and operating instructions

Dry Rapid DR 1500

Code No. 99-97-4021 GB

Edition: 03/2005



EC declaration of conformity

as defined by the following EC directives

- machinery 98/37/EEC, Annex II A
- electromagnetic compatibility 89/336/EEC as amended by 92/31/EEC and 93/68/EEC
- low voltage 73/23/EEC

The equipment

Make: Dry feeding system
Type: Dry Rapid DR1500
System no. and year of construction: see customer order no.

has been designed, constructed and manufactured in compliance with the above-mentioned EC directives; under the sole responsibility of



Big Dutchman
PIG EQUIPMENT

Big Dutchman Pig Equipment GmbH
P.O. Box 1161 D-49360 Vechta Germany
Tel. +49 (0) 4447 /810-0
Fax +49 (0) 4447 /810-237

The following harmonised standards apply:

- EN 12100/1 and EN 12100/2: safety of machinery - basic concepts, general principles for design
- EN 418: safety of machinery - emergency stop equipment, functional aspects - principles for design
- EN 60204-1: safety of machinery - electrical equipment of machines, part 1: general requirements

A complete technical documentation exists.

The operating instructions referring to the equipment machinery are available.

Vechta 13.09.04
Place Date

Dr. Thomas Gnosa
Product Manager
Signer and information regarding signer

Thomas Gnosa
Signature

Vechta 13.09.04
Place Date

Marco Dreyer
Managing Director
Signer and information regarding signer

Marco Dreyer
Signature

1	Basic instructions	1
1.1	Basics	1
1.2	Designated use	1
1.3	Explaining the symbols	2
1.3.1	Safety symbols	2
1.3.2	Safety symbols in the manual and on the installation	2
1.3.3	Warnings and safety instructions on your installation	2
1.4	Ordering spare parts	3
1.5	Obligations	3
1.6	Warranty and liability	3
1.7	Disorders due to power failure	4
1.8	First aid	4
1.9	Pollution abatement regulations	4
1.10	Waste disposal	5
1.11	Notes for use	5
1.12	Copyright	5
2	Safety instructions	6
2.1	General safety instructions	6
2.2	Safety instructions when operating electrical appliances	6
2.3	Special safety instructions	8
2.3.1	Danger zone	8
2.3.2	Danger signs on DR 1500	8
2.4	Specific safety devices	9
2.4.1	Clothing for personal safety	10
2.4.2	Assembly and maintenance	10
2.4.3	Employing external personnel	11
2.5	Safety contrivances	12
2.5.1	In General	12
2.5.2	Safety contrivances	12
2.5.3	Emergency stop function	12
2.6	Dangers resulting from the non-compliance with the safety instructions	13
3	System description	14
3.1	Application	14
3.2	Limit values for dry feed	16
3.3	Technical information	16
3.3.1	Technical data	16
3.3.2	Sound level	17

4	Assembly and operation	18
4.1	Assembly	18
4.2	Functional description	18
4.3	Outline of the whole installation	19
5	Planification and preparation	22
5.1	Preparation	22
5.2	Planification of the drive unit	23
5.3	Planification of the feed pipe	23
5.4	Planification of the feed discharge points	24
5.5	Planification of the feed supply	24
5.6	Control unit	24
6	Transport and storage	25
6.1	Transport	25
6.2	Storage	25
7	Preparatory measures and technical requirements before the assembly	26
7.1	Notes for mounting	26
7.2	Explanation on the lay-out of the assembly instructions	26
7.3	Before starting to assemble the system	27
7.4	Personnel	27
7.5	Tooling	27
7.6	Placing the dowels	28
7.6.1	Prerequisites	28
7.6.2	Assembly order for dowelling	28
7.7	Sealing	29
7.7.1	Sealing with sealing tape	29
7.7.2	Sealing with silicone	29
7.8	Glueing	30
8	Feed supply	31
8.1	Silo extraction	31
8.2	Connecting the feed supply with the feed hopper	32
8.2.1	Connection with shutter	32
8.2.2	Adaptor with shutter SST cpl. for sack-silo	33
8.2.3	Adaptor with shutter galvanized cpl.	34

8.2.4	Adaptor with shutter SST cplt. for hopper with forced feed return	35
8.2.5	Y-tube cpl for feed hopper RAS	36
8.3	Feed hopper	37
8.3.1	Operation	37
8.3.2	Hopper 1line cplt. SST	38
8.3.3	Hopper 2line cplt. SST	40
8.3.4	Hopper 1line SST with forced feed	40
8.3.5	Hopper 1line SST with forced feed return	43
8.4	Feed hopper RAS	47
8.4.1	Operation	47
8.4.2	Feed hopper RAS 1line	48
8.4.3	Feed hopper RAS 1line with recirculation	49
8.5	Accessories	51
8.5.1	Covering SST cplt. for motor for forced feed return	51
8.5.2	Foot fully threaded M12x165	52
8.6	Dosimeter for small quantities	52
8.6.1	Application	52
8.6.2	Installation and assembly	53
8.6.3	Operation	55
9	Drive unit	56
9.1	Assembly and operation	56
9.2	Driving modes	58
9.2.1	Drive DR 1500	58
9.2.2	Drive DR 1500 - XXL	60
9.2.3	Mounting set for all drives	61
9.3	Mounting instructions	62
9.4	Accessories	63
9.4.1	Wall fastening for the drive	63
9.4.2	Floor rack galv. cplt	65
9.4.3	Foot fully threaded M12x165	66
9.4.4	Foot SST M10x200	66
9.4.5	Covering SST cplt. for motor	67
9.4.6	Tensioning device cpl. for the drive	68
10	Feed pipe	70
10.1	Tube-units and couplers	70
10.1.1	Tube-unit with conveyor rope	70
10.1.2	Tube-unit with conveyor chain	71
10.2	Control segment and flat steel reinforcement	72
10.2.1	Control segment	72
10.2.2	Flat steel reinforcement cpl. for control segment	73

10.3 Turns	74
10.3.1 Corner 90deg PA6	74
10.3.2 Corner 90deg SST	76
10.4 Tube supports	78
10.4.1 Tube support cpl. for 1 tube with tube clamp	78
10.4.2 Tube support cpl. for 1 tube	80
10.4.3 Support C-profile for 1 tube	82
10.4.4 Support cpl. for 2 tubes with tube clip	84
10.5 Wall fastenings	86
10.5.1 Wall bracket for 1 tube with tube clip	86
10.5.2 Wall bracket for 2 tubes with tube clip	87
10.6 Suspension	88
10.7 Recommended assembly order	90
10.7.1 Laying out the feed line	90
10.7.2 Assembly of the feed discharge points	92
10.7.3 Inserting of the conveyor chain / conveyor cable	93
10.7.4 Connect the conveyor chain / conveyor cable	95
11 Feed discharge points	98
11.1 Weepholes	98
11.2 Draw-Offs	100
11.2.1 Outlet MI cpl. and drop pipe telescopic for outlet MI	100
11.2.2 Outlet with telescopic drop pipe	101
11.2.3 Outlet without shutter for forced feed return	102
11.3 Volume dispenser	103
11.3.1 Volume dispenser BR	103
11.3.2 Volume dispenser TI	104
11.4 Drop pipes for volume dispensers	106
11.4.1 Drop-pipe cpl. for volume dispenser BR/TI	106
11.4.2 Drop-pipe cpl. s-shaped for volume dispenser TI	107
11.4.3 Drop-pipe for volume dispenser BR/TI at crate stand	108
11.4.4 Drop pipe DR-BR cpl. HT Standard	109
11.4.5 Drop pipe DR-BR cpl. HT Garthe	110
11.5 Protecting tubes	111
11.5.1 Protecting pipe SST cpl for trough built in the wall	111
11.5.2 Protecting pipe SST cpl. at wall or partition PVC	112
11.5.3 Protecting pipe SST cpl for trough built in the wall	113
11.5.4 Protecting pipe galv cpl. Standard tiltable / concrete trough	114
11.5.5 Protecting pipe galv cpl. Garthe tiltable / standard & standard stand	114
11.6 Recommended assembly order	115

12 Release for volume dispenser	116
12.1 General component parts for the release	116
12.1.1 Release ropes	116
12.1.2 Guidance for release rope	116
12.1.3 Guide wheel at corner cpl.	117
12.1.4 Tension spring with accessories	118
12.1.5 Idler roller 107mm cpl.	118
12.1.6 Idler roller 105mm cpl.	119
12.1.7 Alternative idler rollers	119
12.2 Release with cable winch	120
12.2.1 Assembly and operation	120
12.2.2 Release with wall-mounted cable winch cpl.	122
12.2.3 Safety regulations for the cable winch	123
12.3 Automatic release	124
12.3.1 Assembly and operation	124
12.3.2 Automatic release with winch motor	127
12.3.3 Winch motor incl. limit stop	128
12.3.4 Assembly of the winch motor	130
12.4 Recommended assembly order	132
13 Control and operation	133
13.1 Sensors	133
13.1.1 Sensor with fastening cpl. at conveyor tube	133
13.1.2 Sensor with fastening cpl. at drop pipe	135
13.1.3 Sensor at volume dispenser TI	137
13.1.4 Sensor for volume dispenser BR	137
13.2 Control and operating unit	138
13.3 Operation	138
14 Electrical connection	139
14.1 Terminal connection plan	139
14.2 Feed hopper with forced leading-in resp. feedback	139
14.3 Drive unit	140
14.4 Adjustment drive of the automatic release	141
15 Operation	142
15.1 Initial operation	142
15.1.1 Prerequisites	142
15.1.2 Dosing	142
15.1.3 Hopper 1line SST with forced feed	143
15.1.4 Drive unit	143

15.1.5 Conveyor chain / Conveyer cable	143
15.2 Operation	143
15.2.1 Drive unit	143
15.2.2 Adjustment drive of the automatic release	144
16 Servicing and maintenance	145
16.1 Maintenance	145
16.1.1 Entire system	145
16.1.2 Drive unit	145
16.1.3 Feed pipe	145
16.1.4 Turns	145
16.1.5 Conveyor chain / Conveyer cable	145
16.1.6 Feed hopper with forced leading-in resp. feedback	146
16.1.7 Adjustment drive of the automatic release	146
16.2 Malfunction identification and removal	146
16.2.1 In General	146
16.2.2 Drive unit	147
16.2.3 Feed supply and feed pipe	147
16.2.4 Adjustment drive of the automatic release	148
17 Cleaning	149
17.1 Entire system	149
17.2 Drive unit	149
17.3 Feed hopper	149
17.4 Draw-Offs	149
17.5 Volume dispenser	149
17.6 Adjustment drive of the automatic release	150
18 Spare parts	151

1 Basic instructions



Please take care of this manual and always keep it in the same place for quick reference.

All persons working with the system, assembling, cleaning and servicing it have to be familiar with the contents of these instructions.

Please take into consideration the comprised safety instructions !

If this manual should get damaged or lost, **Big Dutchman** will be glad to provide you with a new copy.

1.1 Basics

The DR 1500 has been constructed according to the current state of the art and all acknowledged regulations regarding technical safety. The system is reliable. Upon operation, however, dangers to life and limb of the user or third persons or impairments of the system or other material property are still possible.

The system may only be mounted, attended, repaired and used

- for due use
- in an excellent state from the safety and technical point of view
- by persons who are familiar with the safety regulations and who have been authorized by the owner.

In the event of special problems which are not described in detail in this manual, we recommend to contact us for your own safety.

1.2 Designated use

The dry feeding system DR 1500 is used for transporting and metering out dry feed as meal or pellets. It can be used in sow management, piglet rearing and finishing.

The **Big Dutchman** installation may only be used according to its designated use. Every other use is considered as non-designated use. The manufacturer does not accept liability for damages resulting from other uses, the user alone has to bear the risk.




The designated use also includes the exact observance of the operation, maintenance and repair instructions as prescribed by the manufacturer.

The limit values indicated in the technical data must never be exceeded.

1.3 Explaining the symbols




1.3.1 Safety symbols

Upon reading this manual you will come across the following symbols:

	Warning	This symbol indicates risks possibly leading to personal injury resulting in death or to severe injuries.
	Caution	This symbol indicates risks or insecure procedures possibly leading to injuries or material damage.
	Note	This symbol indicates notes leading to an effective, economic and environmentally-conscious handling of the installation.

1.3.2 Safety symbols in the manual and on the installation

These safety symbols illustrate remaining dangers when handling the system. They are supplements to the above-mentioned symbols:



	Warning against the cold
	Warning against dangerous electric tension
	Warning against slippery surface

1.3.3 Warnings and safety instructions on your installation

On the **installation** you will find the following safety signs (see chapter 2.3.2). They indicate remaining technical dangers when handling the system and give information on how to avoid these dangers.

Implicitly observe the instructions attached to the installation, such as the arrow on the motor indicating the direction of rotation.

1.4 Ordering spare parts

	<p>Operational safety is the prime necessity !</p> <p>For you own safety only use original Big Dutchman spare parts. For foreign products that have not been released or recommended we cannot judge whether there is a safety risk in connection with Big Dutchman systems.</p>
	<p>You can find the exact description of the parts for ordering spare parts by means of the pos. no. in the spare parts list.</p>

Indicate the following for ordering spare parts:

- Code No. and description of the spare part or
- Invoice No. of original invoice
- Current supply, e.g. 220/380V

1.5 Obligations

Closely adhere to the instructions in this manual.

A basic condition for safe operation and trouble-free handling of this system is the knowledge of the basic safety instructions and regulations.

These mounting instructions, particularly the safety instructions, have to be observed by everyone working with this system. Moreover, the regulations and instructions for the prevention of accidents valid at the respective place of use have to be observed.

The manufacturer is not responsible for any damages to the machine resulting from changes done by the user.

1.6 Warranty and liability

Warranty and liability claims regarding personal or material damage are excluded if they result from one or several of the following causes:

- non-designated use of the installation,
- inappropriate mounting and operating of the system,
- operating the system with defective safety equipment or not duly fixed or not functioning safety and protective devices,

- non-observance of the instructions in this manual regarding transport, stock keeping, mounting, maintenance and upgrading of the system,
- unauthorized modifications on the system
- inappropriate repairs,
- in the event of a disaster caused by foreign matters or force majeure.

1.7 Disorders due to power failure

We recommend the installation of warning systems for a better control of your production units or the use of an emergency power-generating set for supplying the system with power in case of power failure. By this, you protect the animals and thus your own economical health.

1.8 First aid

For the case of an accident, unless specified otherwise, a first-aid kit must always be available at the place of work. Material taken out and used is to be replaced immediately.

If you need help, describe the accident as follows:

- where it happened
- what happened
- the number of persons injured
- what type of injury
- who is reporting the accident! (your data)

1.9 Pollution abatement regulations

All works on and with the installation have to be carried out in compliance with the legal requirements concerning waste prevention and proper recycling / disposal of waste.

Special care has to be taken when carrying out installation, repair and maintenance works, as water pollutants like lubricating grease and oils, as well as solvent-containing cleaning solutions are not to pollute the soil or get into the canalisation! These materials have to be kept, transported, collected and disposed of in appropriate containers!

1.10 Waste disposal

After finishing the assembly or repair of this installation, dispose of the packing material and remains which do not need to be further used according to the legal provisions for recycling.

The same applies to the component parts after putting the installation out of service.

1.11 Notes for use

We reserve the right to modify the construction and technical data for reasons of further development.

Therefore, no claims can be derived from the information, pictures, drawings and descriptions. Subject to correction !

Get the information on mounting, adjusting, operating and maintaining before taking the system into operation.

Apart from the safety-relevant instructions in this manual and the safety precautions valid in the country of use, also consider the generally acknowledged technical regulations (safe and appropriate working according to UVV, VBG, VDE etc.).

1.12 Copyright

This manual is subject to copyright. The information and drawings included in this manual shall not be copied without the manufacturer's consent, nor shall they be used for anything other than the designated use. Neither shall they be given to third parties.

The contents of this manual can be altered without prior notice.

If you find mistakes or unclear information in this manual, please do not hesitate to let us know.

All trade marks mentioned or shown in the text are trade marks of their respective owners and are recognised as patented.

©Copyright 2005 by **Big Dutchman**

For further information please contact:

Big Dutchman Pig Equipment GmbH, P.O. Box 1163, D - 49360 Vechta, Germany
Phone +49 (0)4447/ 801-0, Telex: 25510 big d, Fax: +49 (0)4447/801-237

E-Mail: big@bigdutchman.de, Internet: www.bigdutchman.de

2 Safety instructions

2.1 General safety instructions

All established safety precautions and other generally accepted safety regulations and medical references have to be observed. Please check safety and function control devices to ensure safe and accurate operation:




- before putting into operation
- at adequate time intervals
- after modifications or repairs.

Check the proper functioning of the system after any kind of repair works. You may only take the device into operation, when all protective systems have been put into place again.

Also observe the regulations of local water distribution and power supply companies.

2.2 Safety instructions when operating electrical appliances

You have to make sure that the system with the electrical appliances is operated and maintained according to the electro-technical regulations.

	Installations and work on the electric components/structural groups may only be carried out by qualified personnel according to electro-technical regulations (e.g. EN 60204, DIN VDE 0100/0113/0160).
	Dangerous electric tensions are bare in case of open control equipment. Please be aware of the danger and keep workers of other professions away from the danger zone !
	Do not install control units directly in the house but in the service room in order to prevent damages due to ammonia vapours (NH ₃).

Immediately switch off the installation in the event of malfunctions of the power supply units. Use a bipolar voltage probe to make sure that the electrical equipment is not alive.

Check the electrical wiring and cables for recognisable damage before putting the device into operation. Replace damaged wiring and cables before taking the device into operation.

Only use the fuses indicated in the circuit diagram. Immediately replace damaged fuses. Never repair or bypass the fuses!

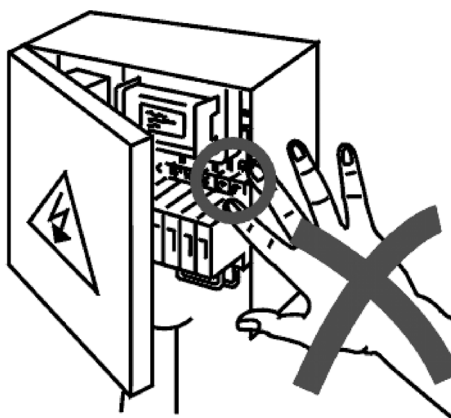
Never cover the electrical motor. This can cause high temperatures resulting in fire and a break-down of the equipment.

The control box as well as the terminal and connector boxes of the installation must always be kept shut.

Let damaged or broken plugs be replaced by an electrician.

Do not pull the plug from the socket at the flexible cable.

For the respective connections please see the enclosed connecting plan of the system parts delivered.



DANGER OF INJURY due to electric voltage!

Touching live parts results in electric shock!

During repair or maintenance work, live parts may be bare.







Never touch bare electrical components. Equipment with bare electrical components must not be used.



2.3 Special safety instructions


2.3.1 Danger zone



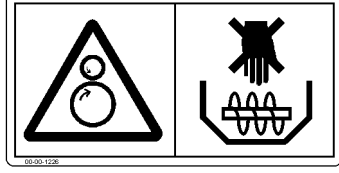
	<p>Never reach into the running installation. Before reaching into the installation, turn the system off and secure it against unintentional actuation.</p> <p>Assure yourself beforehand that the main switch is in the OFF position and can not be put in the ON position without your knowledge.</p>
	<p>At the drive, the chain or the rope is actuated by a gear motor over a driving wheel. As certain mounting and maintenance works are only possible with an open cover, it is necessary to be extremely careful.</p>
	<p>In the feed containers with forced leading-in resp. feedback or RAS the feed is further transported with a feed auger. Never try to push your fingers into the feed opening to remove possibly stuck material.</p>
	<p>If the release switches, do not try to help with your fingers if it jams.</p>

2.3.2 Danger signs on DR 1500

DR 1500 has been equipped with all mechanisms that guarantee a safe operation. In places where the danger zone could not be safeguarded totally, with consideration to the operational reliability, safety signs have been placed. They indicate remaining technical dangers when handling the system and give information on how to avoid these dangers.

For your safety, the following safety symbols have been fixed to the installation. Please make yourself familiar with the signification of these symbols. The following explanatory notes will provide you with detailed information.

	<p>GENERAL DANGER!</p> <p>Installation automatically starts working. Before starting any repair, maintenance or cleaning works, put main switch to "OFF".</p>
---	--

	<p>DANGER OF BRUISING due to rotating machine parts!</p> <p>Close protective devices every time before taking the system into operation. Protective devices may only be opened by authorized persons, when the system is idle.</p>
	<p>DANGER OF INJURY due to operating auger, chain and/or rope sheave!</p> <p>Never reach into the drive unit and/or feed container while the motor is running.</p>
	<p>PULL-IN DANGER due to operating auger!</p> <p>Never reach into the feed auger while the motor is running.</p>

These signs and safety instructions always have to be visible and must not be damaged. If they are soiled by dust, manure, feed remains, oil or grease, clean them by means of a water-detergent mixture.

Damaged, lost, or unreadable safety signs have to be replaced immediately. The code-no. in the bottom left corner of every safety sign can be used as order number.


If a safety symbol or instruction is fixed to a part to be replaced, ensure that it will be fixed to the new part as well.

2.4 Specific safety devices




These safety instructions are meant to make you familiar with important information on the handling of the installation. They are important for your safety and for the safety of the installation.

The service personnel has to familiarize itself with the function and arrangement of the safety devices, in particular of the emergency stop button.

Any maintenance works should only be carried out by especially trained personnel.

	<p>Missing knowledge on the structural design of the installation can lead to injuries.</p> <p>Make yourself familiar with the design and construction of the installation. Inform yourself and your colleagues about the remaining dangers in connection with this installation!</p>
---	---

2.4.1 Clothing for personal safety

	<p>When operating, maintaining and cleaning the system, avoid wearing wide, fluttering clothes, rings and watches.</p>
	<p>Make sure that long hair is tied back when approaching moving system parts. Hair can get caught in the moving parts and thus create severe injuries.</p>
	<p>Wear protective clothes and safety footwear upon operating, maintaining and cleaning the system, if required also use safety glasses and protective gloves.</p>



2.4.2 Assembly and maintenance

Assembly of the installation can be carried out by the farmer himself or by an authorized person. We assume that the operator or authorized person either have some sort of technical training or have the necessary knowledge or practical experience that are a main condition for a proper assembly of the installation.



Repairs may only be carried out by persons who are competent and can guarantee proper handling because of special training or knowledge and practical experience with the unit. The farmer has the sole power of decision.

Work on the electric components may only be carried out by technically skilled personnel and under consideration of German Industry Standards, VDE regulations, safety instructions and electro-technical regulations of the power supply industry (EVU).

Only work with appropriate tools; in case of possible danger to hands, use protective gloves, and safety glasses in case of danger to the eyes.


	Repair, maintenance and cleaning operations as well as the removal of functional disorders may generally only be carried out when the installation is turned off and the power supply is disconnected.
	Protect the installation by means of a sign fixed to the main switch reading Do not put into operation! Refer to maintenance works in case of need.

After any assembly, repair or maintenance works, check the proper functioning of the system. Scattered parts on the installation and around the installation can cause someone to trip or to fall, thus leading to injuries caused by the building components of the installation. Scattered parts in resp. on the building components can lead to serious damage of the installation.

	Never deposit objects (e.g. spare parts, replaced parts, tools, cleaning tools etc.) after repair or maintenance works in the accessible areas of the installation or in the surrounding area. Before re-starting the system, assure yourself that all loose or replaced parts have been removed from the installation components.
	You may only take the device into operation, when all protective systems have been put into place again.

2.4.3 Employing external personnel

Mounting, maintenance and repair work is frequently carried out by non-operating personnel, which is not familiar with the special circumstances and the inherent dangers.

	As supervisor, you are responsible for the safety of external personnel!
---	--

You as operator are to survey the personnel and to define responsibilities and powers. Inform these people in detail on the dangers of their area of work. Check their method of working and intervene as soon as possible.

2.5 Safety contrivances

2.5.1 In General

	It is strictly forbidden to remove or put out of operation any safety contrivances. This leads to risk of injury and danger of life! Should the safety devices be damaged, the system has to be put out of operation immediately. The main switch has to be locked in zero position.

2.5.2 Safety contrivances

The drive unit is completely enclosed by a screwed casing. To guarantee that the drive is only operated when the cover is closed, a safety switch is built-in. The safety switch immediately shuts down the installation if the cover is removed.

The feed hopper RAS is equipped with a foreign-matter separator that prevents foreign objects such as screws, nuts or similar parts from getting into the feed line.

The dosing device for small amounts is equipped with protective grids that keep people from reaching into the agitator wheel and auger and / or the feed line.

2.5.3 Emergency stop function

The main switch that is located at the terminal box of the control unit has to be switched to the OFF position immediately, if a dangerous situation occurs. That way the power supply is cut and the system immediately stops .

	<p>Never manipulate the safety devices, even if the system is not in operation at the safety devices:</p> <p>When working on the system, assure yourself beforehand that the main switch is in the OFF position and can not be put in the ON position without your knowledge.</p>
--	---

2.6 Dangers resulting from the non-compliance with the safety instructions

Non-observance of these instructions can cause severe danger for life and health of people or can lead to material or environmental damages and to the forfeiture of any claim for damages. To be precise, the non-observance of these instructions can lead to:

- Failure of vital functions of the installation
- Failure of prescribed maintenance methods
- Dangers for people owing to electrical and mechanical influences.

3 System description

3.1 Application

The DR 1500 dry feeding system is a tube feeder that forms a closed system directly from the silo delivery up to the individual feeding places. The dry feeding system is used for transporting and metering out dry feed in the form of meal or pellets. It is designed as a modular system and can therefore be used for the following management types:

Sow management:

- individual sow feeding via volume dispensers
- Supplies the computer-controlled CALLMATIC 2 feeding-on-demand system for feeding pregnant sows in groups
- SIMULTAN feeding of pregnant sows in group management
- Supplies tube feeders for feeding pregnant sows in group management;

Piglet rearing and finishing:

- Supplies all types of self-feeders
- As a conveying system for the computer-controlled DRY EXACT dry feeding concept

Poultry management:

- Supplying poultry feeders in floor management

Feeding methods:

- ad libitum (supplying automatic feeders)
- restricted (simultaneous, volume dispensers)

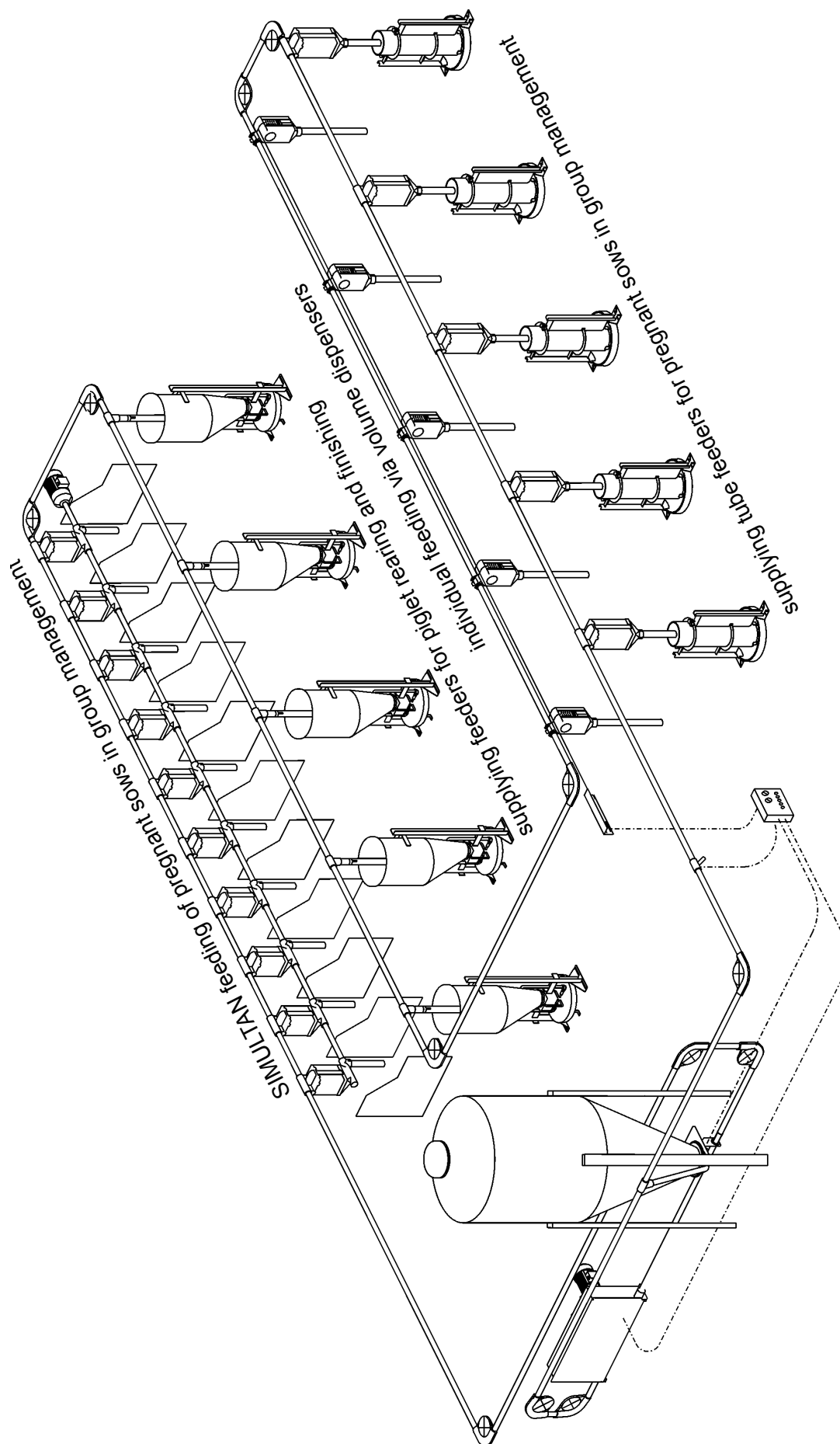


Figure 3-1: Possible forms of application for DR 1500

3.2 Limit values for dry feed

The DR 1500 may only be used for transporting and metering out dry feed (standard feed) with the following properties:

- Humidity content max. 15 %
- particle size $K < 3$ mm, pellet length max. 15 mm
- a max. of 60% may be milled smaller than 1 mm
- a high share of grease and oil in the feed decreases the pourability (bridging).



Not suitable for CCM feeding!

3.3 Technical information

3.3.1 Technical data



The quoted performance data varies depending on the type of transported feed, the number of turns and length of the installation.

Table 3-1: System

conveying capacity (at a filling level of 66% and a feed density of 650 kg/m ³)	1580 kg/h
---	-----------

Table 3-2: Drive unit

driving power (length of installation up to 450 m)	1,50 kW
driving power (length of installation up to 200m)	0,75 kW
cable or chain speed	27m/min

Table 3-3: Feed pipe

max. system length incl. 4 corners	300 m ¹
reduction in length per corner	6 m
inclination	max. 45°
reduction in length in case of 45° inclination	0,5 m per m
chain dimension	35,75 x 5 mm
rope Ø	5 mm



sheave Ø	49 mm
distance of sheaves	71,5 mm
pipe outside Ø	60 mm
pipe inside Ø	57 mm

1 with drive unit XXL 450 m are possible, but no feeding of pellets



When using drive unit XXL, the max. length of the installation is 450 m, incl. 4 corners 300 m ! Any further corner reduces the length of the installation by 6 m (see picture 3-2).

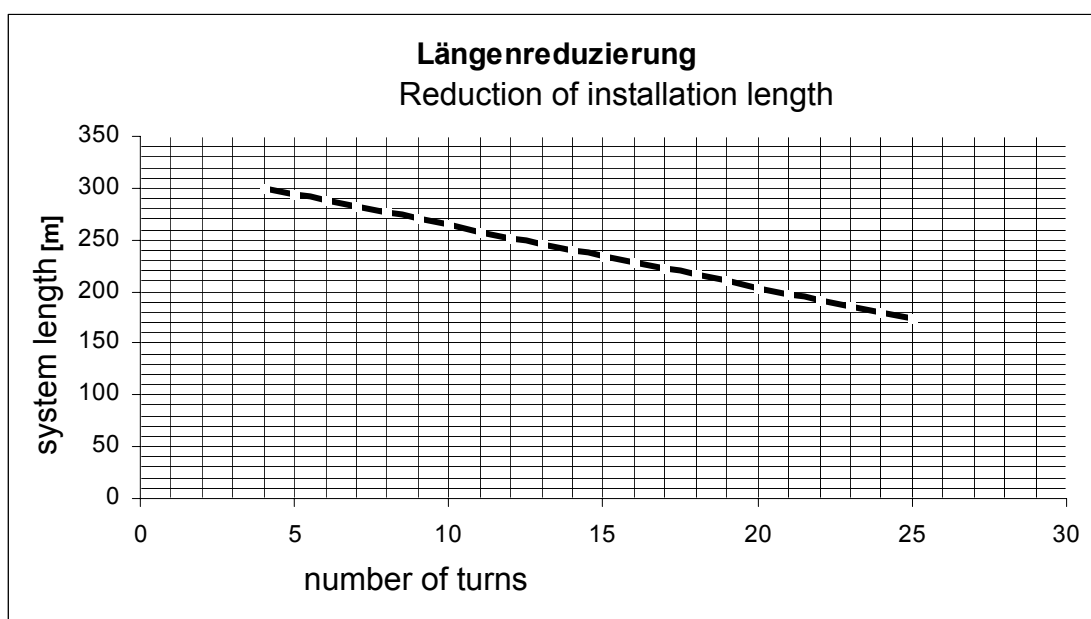


Figure 3-2: Reduction of installation length in dependence on the number of built-in corners

3.3.2 Sound level

The A-rated continuous sound level of DR 1500 is below 70 dB(A).

4 Assembly and operation

4.1 Assembly

The DR 1500 feeding system is delivered in the following pre-mounted assembly groups:

- **Drive unit**
- **Feed pipe**
- **Feed discharge points**
- **Feed supply**
- **Control unit**

4.2 Functional description

From the feed silo, the feed reaches the feed pipe(s) via a feed container made of corrosion-proof stainless steel. One or two loops can be supplied with feed, depending on whether a single or dual feed container is used.

A **feed pipe** consist of a pipe system made of strong galvanised steel pipe and 90° corners (turns) made of plastic or stainless steel. A conveyor chain resp. rope on which equispaced carrier plates made of plastic are spray-painted runs in this pipe system. Between these discs, the feed is transported through the pipe system to the individual discharge points. Due to pipe and chain or rope couplers the system forms an endless unit.

The system can either run with a conveyor rope or chain. The conveyor chain or rope is driven by a **drive unit** made of stainless steel with integrated tensioning device for chain and/or rope.

At the **discharge points** in the feed pipe, automatic feeders are filled via draw-offs with sliding valves and drop tubes or feed troughs via volume dispensers and drop tubes.

In the standard version, the system fills each individual feed discharge point after the other until the sensor after the last feed discharge point switches off the system.

In most cases, the **feed is supplied** directly by means of a feed container via a sliding valve from the silo.

Furthermore, there is a possibility to combine a Flex-Vey-feed-transport system by **Big Dutchman** with a DR 1500. Here, the feed is transported with a feed auger via a hopper into the feed container.

4.3 Outline of the whole installation

Pos.	Code No.	Description
1	83-01-2662	drive unit 1.5 kW SST DR1500 230/400V 50Hz 3Ph / rope + chain
	83-01-2663	drive unit 1.5 kW SST DR1500 230V 60Hz 1Ph / rope + chain
	83-01-2664	drive unit 1.5 kW SST DR1500 200V 60Hz 3Ph / rope + chain
	83-01-3547	drive unit 1.5 kW SST DR1500 230V 60Hz 1Ph / CSA / rope + chain
	83-01-3557	drive unit 0.75 kW SST DR1500 230/400V 50Hz 3Ph / rope + chain
	83-02-1463	drive unit 1.5 kW SST DR1500XXL 230/400V 50Hz 3Ph / rope + chain
	83-02-1464	drive unit 1.5 kW SST DR1500XXL 230V 60Hz 1Ph / rope + chain
	83-02-1466	drive unit 1.5 kW SST DR1500XXL 200V 60Hz 3Ph / rope + chain
	83-02-1467	drive unit 1.5 kW SST DR1500XXL 230V 60Hz 1Ph / CSA / rope + chain
2	10-86-3090	wall bracket for drive unit TF
3	83-02-1138	floor rack galv. cpl for drive
4	10-84-3635	connection with shutter GRP for silo GRP/AW
5	10-88-3402	adaptor with shutter SST cpl. for sack-silo
6	10-87-3005	adaptor with shutter galv. cpl.
7	83-01-0483	adaptor with shutter SST for hopper with forced feed return
8	83-02-6697	Y-tube cpl. for hopper RAS 850/1500 cpl.
10	10-87-3751	hopper 1 line cpl. SST DR1500
11	10-87-3752	hopper 2 lines cpl. SST DR1500
12	10-87-3753	hopper 1 line 0.37kW SST DR1500 with restr. guidance
	10-87-3756	hopper 1line 24V SST DR1500 with restr. guidance
13	10-87-3757	hopper 1 line cpl. SST DR1500 w/ restr. guidance
14	10-87-3691	hopper RAS 1line FKA cpl. DR1500 without recirculation
15	10-87-3692	hopper RAS 1line FKA cpl. DR1500 with recirculation
20	10-87-3730	corner 90° PA6+GK30 DR1500 ball-bearing
21	83-00-2198	corner 90° SST cpl. DR1500
22	10-87-3700	tube unit 60 x 5000 DR 1500 with conveyor cable
23	10-88-3401	tube unit 60 x 5000 DR 1500 with conveyor chain
24	10-87-3758	branch piece wo/ shutter for DR1500 w/ rest. guidance
25	10-88-4190	outlet BD DR1500 with drop tube telescopic 63 mm
26	10-89-3765	outlet MI - DR1500 cpl.
27	10-86-3081	support C-profile x 2000mm for 1 tube 60mm

Pos.	Code No.	Description
28	20-50-3680	support 1"x1800 cpl. for 1 tube 63mm with pipe clamp
	20-50-3706	support 1"x1500 cpl. for 1 tube 63mm with pipe clamp
29	10-86-3078	support 1"x1500 cpl. for 2 tubes 60mm with pipe clamp
30	20-50-3058	wall bracket for 1 tube 63 mm with pipe clamp
31	20-50-3059	wall bracket for 2 tubes 63 mm with pipe clamp
33	10-87-3980	dosimeter incl. control box for small quantities DR1500
34	10-87-3287	dosimeter for small quantities without transfer
35	10-38-3642	volume dispenser 6L BR DR1500 cpl.
36	10-88-3200	volume dispenser 6L TI DR1500 cpl.
	10-88-3210	volume dispenser 10L TI DR1500 cpl.
	10-88-3220	volume dispenser 15L TI DR1500 cpl.
38	10-87-3135	drop-pipe cpl. 63x4.7-1650 for volume dispenser BR/TI
39	10-87-3235	drop-pipe cpl. 63x4.7-1650 s-shaped for volume dispenser TI
40	83-00-1598	drop-pipe for volume dispenser BR/TI at crate stand
41	83-01-5343	drop-pipe DR-BR cpl. for Garthe tiltable/stand & stand/stand
42	83-01-5308	drop-pipe DR-BR cpl. standard tiltable / concrete trough
43	10-87-3275	protection pipe 600 mm SST cpl. at aisle or partition PVC
	10-87-3270	protection pipe 600 mm SST cpl for wall-trough
	10-87-3280	protection pipe 600 mm SST cpl for wall-trough
44	10-88-3440	releasing device automatic DR with winch motor LA28.1-450-24
45	10-87-3190	handrelease w/winch f/wall for volume dispenser DR850/1500
46	10-88-3415	sensor with fastening cpl. at conveyor tube DR1500
47	10-88-3805	sensor with fastening cpl. at drop-pipe 50-60 mm DR850/1500
48	10-87-3195	sensor with fastening cpl. at volume dispenser TI DR850/1500
49	91-00-3985	sensor MS-45R with union
	91-08-3032	control box DR850/1500 1.5 kW for sensor at drop-pipe
	91-08-3031	control box DR850/1500 0.75kW for sensor at conveyor pipe
	91-08-3033	control box DR850/1500 1.5 kW for sensor at conveyor pipe
	91-08-3050	control box DR850/1500 with transfer onto 2nd conv.tube
	91-08-3171	control box DR 850/1500 1.5kW with automat. relasing device f. 1-3 releases
	10-87-3754	control-unit 0.37 kW for DR1500 w/ restr. guidance
	91-40-1320	time clock 4QTB 230V 50/60Hz minim. switching time 10min
	91-40-1345	time clock digital TC4-T10 1-channel w/ seconds timing

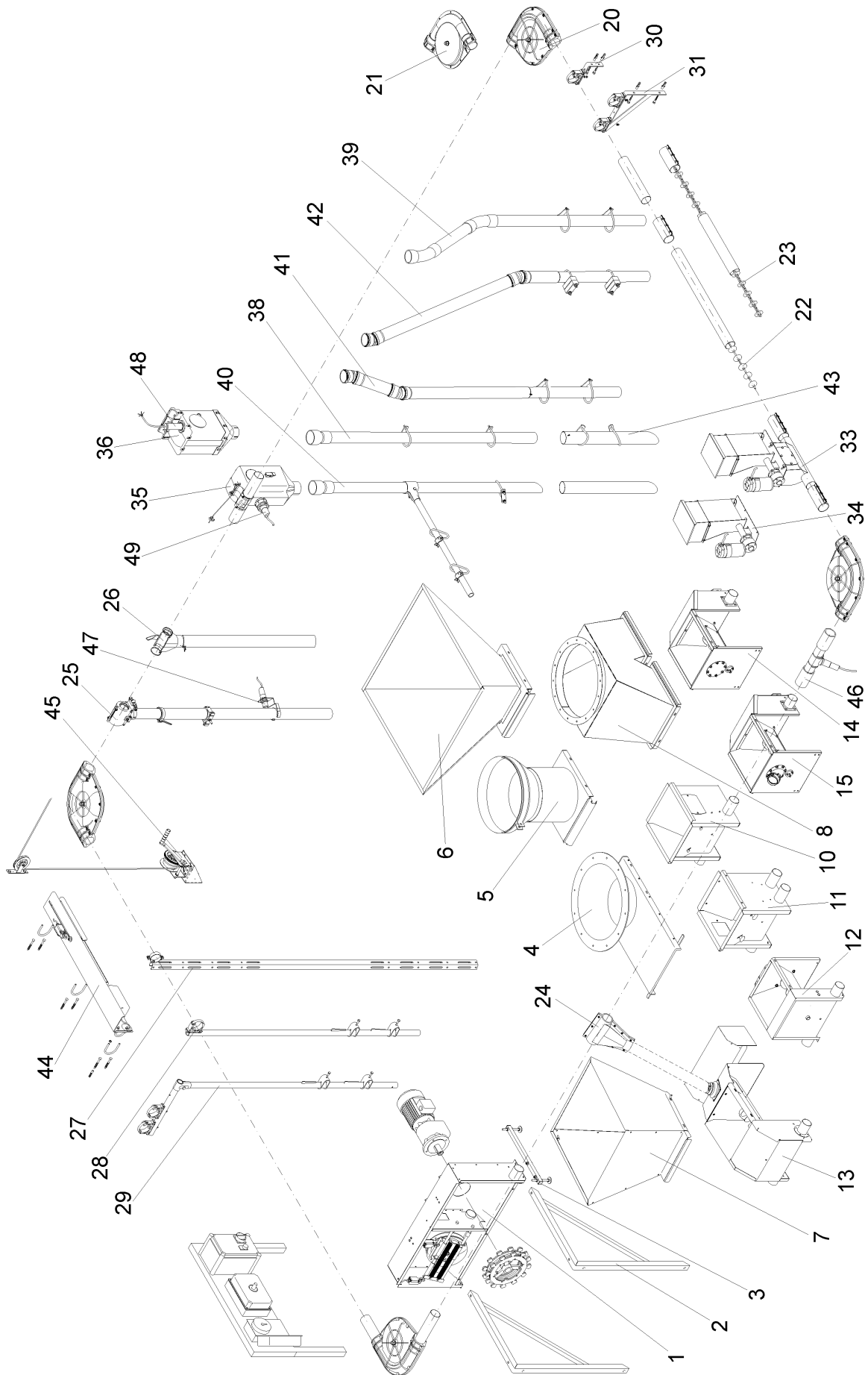


Figure 4-1: general view Dry Rapid

5 Planification and preparation

5.1 Preparation

Draft a plan for the installation of the feeding system. Place the system components within the building according to the local and dimensional conditions that have been evaluated before.

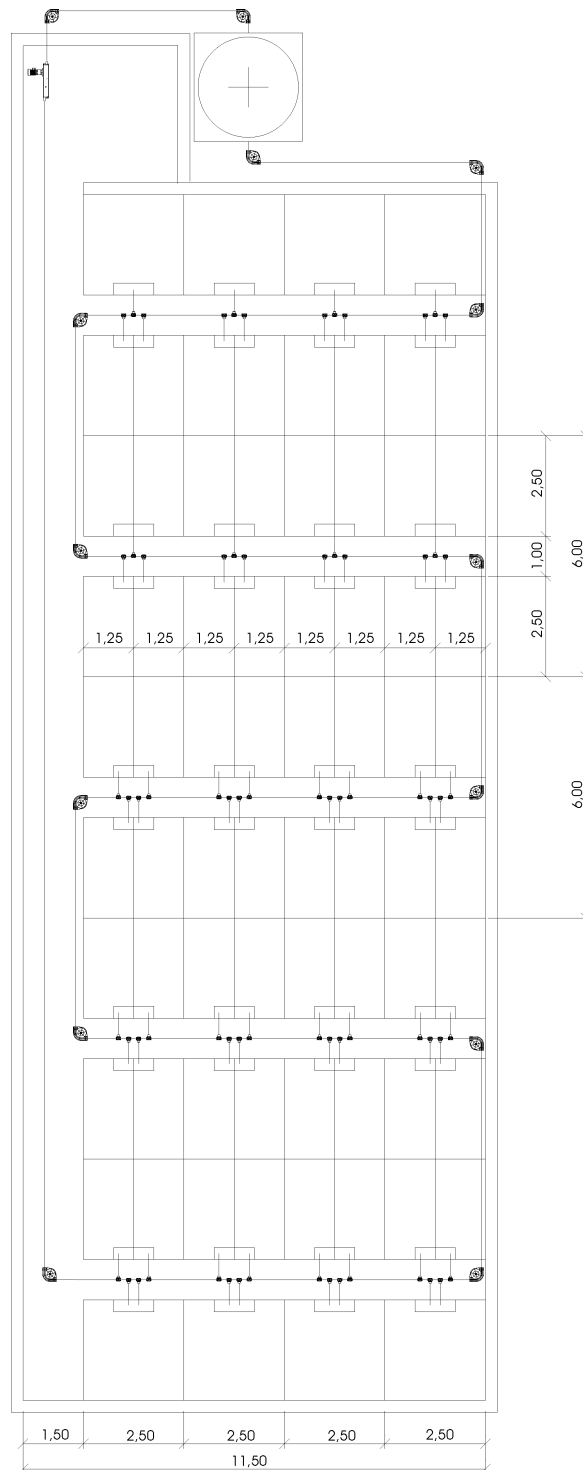


Figure 5-1: Example of a plan for a dry feeding system

5.2 Planification of the drive unit

Plan the drive unit in the return circuit at a location that provides easy access, if possible in the service room. To make sure that feed is not permanently transported via the drive unit, no feed discharge point should be installed between the drive unit and the feed hopper.



You avoid the installation of further turns if you plan the drive unit at the same height as the feed pipe in the house.

Power supply to the drive has to be ensured.

Should the drive units be located outside, make sure to protect the drive units against weather exposure (direct rain, snow and ice). Operation at temperatures lower than -20°C are forbidden, if not otherwise agreed on by **Big Dutchman**.

5.3 Planification of the feed pipe

The **feed pipe** runs straight. With the rectangular turns (corner 90°) it can be deviated into every desired direction. The installation has a total length of max. 300 m incl. 4 turns, if the drive unit XXL is used, a max. of 450 m is possible. Every additional turn reduces the total length by 6 m. Make sure to plan the feed pipe with as few turns as possible.

The inclination of the feed pipe has an influence on the conveying capacity due to feed flowing back. Because of this, the feed pipe should be as level as possible. At an inclination of 45° , the total length of the installation is reduced by additional 0.5 m per m.

Plan the loop in such a way that the connection to the feed hopper can be realised with a minimum of turns. The feed pipe is supported by suspensions, wall fastenings or other supportive devices every 2.5 m.



In special cases, which should be avoided if possible, a max. 90° inclination can be installed in the return circuit. Make sure to confer with **Big Dutchman** about this topic.

Depending on the type of installation, one or two feed pipes per installation have to be planned.

5.4 Planification of the feed discharge points

For the discharge of feed, plan definite spots in the feed pipe where feed is discharged to the automatic feeders and/or troughs. The feed discharge points where drop pipes with draw-offs or volume dispensers are to be installed are marked at the feed pipe. Later, the outlet hole is cut into the feed pipe at these marked points and respectively equipped.

5.5 Planification of the feed supply

The single or dual feed hopper can be located inside the house or outside directly underneath a silo. Depending on the installation layout, the feed hopper is connected to the silo, either with a hopper with slide valve, for feed supply via a feed auger, or it is connected to the silo directly via a sliding valve.

In case of large systems it might be useful to supply with a second system. Furthermore, there is a possibility to combine a Flex-Vey-feed-transport system by **Big Dutchman** with a DR 1500.

5.6 Control unit

The **control unit** should be installed in the service room so that trouble-free cabling and power supply of the system is ensured.

6 Transport and storage

6.1 Transport

Because of the high number of possible building units we can only supply general information in this manual. This information should be sufficient for experienced technicians and transport experts. If you are in doubt, do not hesitate to ask!

The building parts of the installation are delivered individually or pre-mounted in building units. The individual building units have to be secured accordingly against shifting and tilting during the transport. The transport has to be carried out by expert personnel.

The building parts and units are transported to the construction site with appropriate means of transportations. To avoid possible damage, make sure, loading and unloading are done with care. See that the goods are standing in a secure position throughout the whole transport. If the goods are transported by hand, please keep in mind the reasonable human lifting and carrying abilities.

See that the transport is carried out safely. Avoid bumps and impacts and see to a secure standing at every stage of the transport.

Small parts like screws, nuts and washers come in transparent bags packed in cardboard boxes.

The contents of the delivery are listed in the shipping documents. Please check for completeness when receiving the delivery. Possible transport damages and / or missing parts have to be reported immediately in written form.

6.2 Storage

Store the building parts where they are supposed to be installed. Thus you avoid linear expansion caused by temperature differences.

The storage area should be dry and roofed. If this is not possible, the parts should be covered with PE-foil and stored with sufficient ground clearance. Make sure when stored that the parts are protected against dust and moisture

The drive unit and all other electric building parts have to be stored in a dry and closed room. Open-air storage is acceptable only for a short time. If stored outside for a longer time, they have to be protected against harmful environmental influences. They also have to be protected against mechanical damages.

A rust film that develops during storage does not interfere with the use of the conveyor chain.

7 Preparatory measures and technical requirements before the assembly

7.1 Notes for mounting



Do not put these instructions aside before reading them. Even if you have already installed similar systems, there may always be things and alterations you do not yet know. Being properly informed will help you to avoid unnecessary work, troubles and expenses.

The instructions, descriptions and data contained in this manual have been compiled to cover the various existing installation possibilities. We therefore request you to select and apply those paragraphs of this manual that apply to your specific system.

7.2 Explanation on the lay-out of the assembly instructions

The table of contents gives an overview of the sections of the manual. You will find:

- in the chapter 8 the building parts for the drives with assembly instructions
- in the chapter 9 the building parts for the drives with assembly instructions
- in the chapter 10 the building parts for the feed pipe with assembly instructions
- in the chapter 11 the building parts for the feed discharge points with assembly instructions
- in the chapter 12 the building parts for the release with assembly instructions
- in the chapter 13 the building parts for the control unit with assembly instructions



The position numbers used in the drawings in the chapters refer to the component parts. The item numbers also appear, together with the code number and the description, in the parts list.

- There are special assembly instructions for the assembly of the automatic feeders.



7.3 Before starting to assemble the system

Before starting to assemble the system, check whether:

- house dimensions, installation drawing and order correspond to one another
- the ventilation and the lighting system in the house as well as all electrical connections are completely installed
- the house floor is level and / or the slatted floor has been laid out
- the housing and automatic feeders or troughs have been erected
- all building parts, necessary for the assembly, are available

7.4 Personnel

Assembly and mounting of the installation is to be carried out by experienced personnel only.

7.5 Tooling

You will need the following tools for the assembly. We recommend to have them at hand before starting to work.

For various fixing operations:

open-ended / ring / socket spanner sizes 13, 17 and 19

Hexagon socket screw key SW 5

accumulator screwdriver with inserts for hexagon head screws M8, M10 and M12

portable electric drilling machine

impact drilling machine

twist drill with 6.5, 8.5, 10.5 and 12.5 mm diameter

stone drill with 6.5, 8.5, 10.5 and 12.5 mm diameter

spanner set

ring spanner set

vise-grip wrench

screw clamp

engineer's hammer

For aligning:

spirit level

For fitting and separation of the tubes:

pipe cutter

half-round file

straight back handsaw with open handle

parting-off grinder

drill bit

compass saw

To shorten the chain:

pair of pincers

For mounting works:

ladder

7.6 Placing the dowels

7.6.1 Prerequisites

Find out the type and condition of the holding ground (walling or concrete floor) to ensure solid fixing of the wall bracket to the building or of the floor rack to the concrete floor. A safe way of fixing can be achieved by dowelling into concrete and walling materials (adhesion between solid bricks and mortar).



Applying dowels to one of the following building materials can result in a loss of the mechanical strength of the dowel connection. Contact your building material supplier for fixing with appropriate dowels.

- hollow brick
- solid building material with porous structure
- light-weight brick
- plates and boards (precast elements).

7.6.2 Assembly order for dowelling



Always read the assembly instructions on the packaging.



1. Copy the hole spacing of the component part to the holding ground.
2. The distance from edge to core material should at least be one length of a dowel.
3. Select the appropriate drilling method for the building material.
4. Depth of drill hole = dowel length + 1 x screw diameter
5. Apply and clean drill holes (remove bore dust).

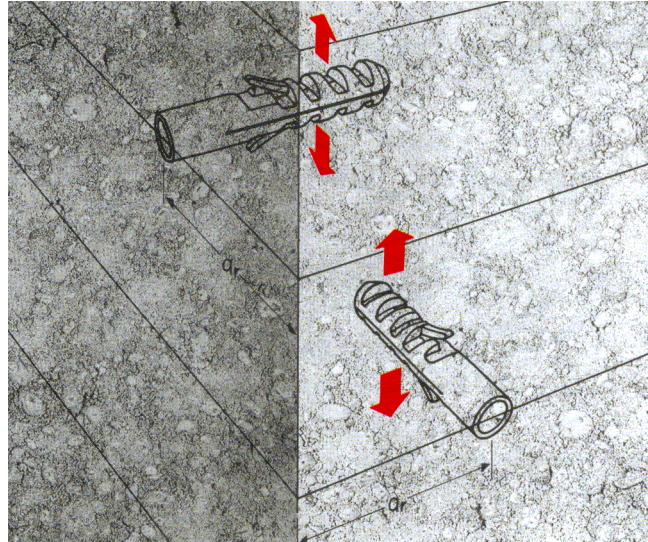


Figure 7-1: Expanding direction of dowels

6. Insert dowels in expanding direction so that the expanding force of the dowel is working parallel to the edge. This is counteracting separation of materials.

7.7 Sealing

7.7.1 Sealing with sealing tape

1. Clean the areas that are to be sealed.
2. Adhere the sealing tape centrally to a surface.
3. Place the parts on top of each other and align them.
4. Push the screws through the parts and screw them together.

7.7.2 Sealing with silicone

1. Clean the areas that are to be sealed.
2. Evenly spread silicone on the surface.
3. Compress the sealing surfaces until they are bound by silicone.

7.8 Glueing

1. Clean the areas that are to be glued.
2. Evenly spread glue on the surface.
3. Compress the adherents until they are bound by glue.

8 Feed supply

8.1 Silo extraction

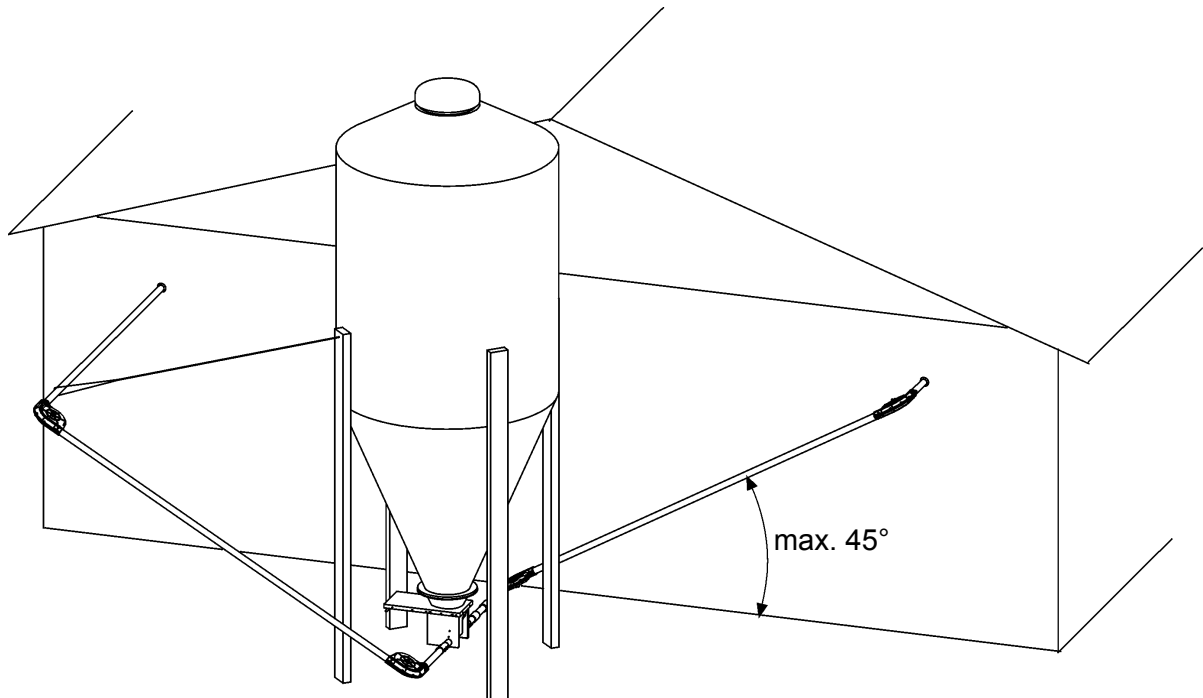


Figure 8-1: Example of a direct silo extraction



The conveying capacity is reduced because of returning feed. The ascending gradient of the conveyor pipe should therefore be as small as possible - max. 45°, better 30°.

8.2 Connecting the feed supply with the feed hopper

8.2.1 Connection with shutter

The connection with shutter is used with direct silo extraction. It is mounted between the silo and the feed hopper.

Attach the connection with shutter by means of screw clamps to the connecting flange of the silo and drill the flange hole pattern into it. Screw both parts together and seal the joint with silicone.

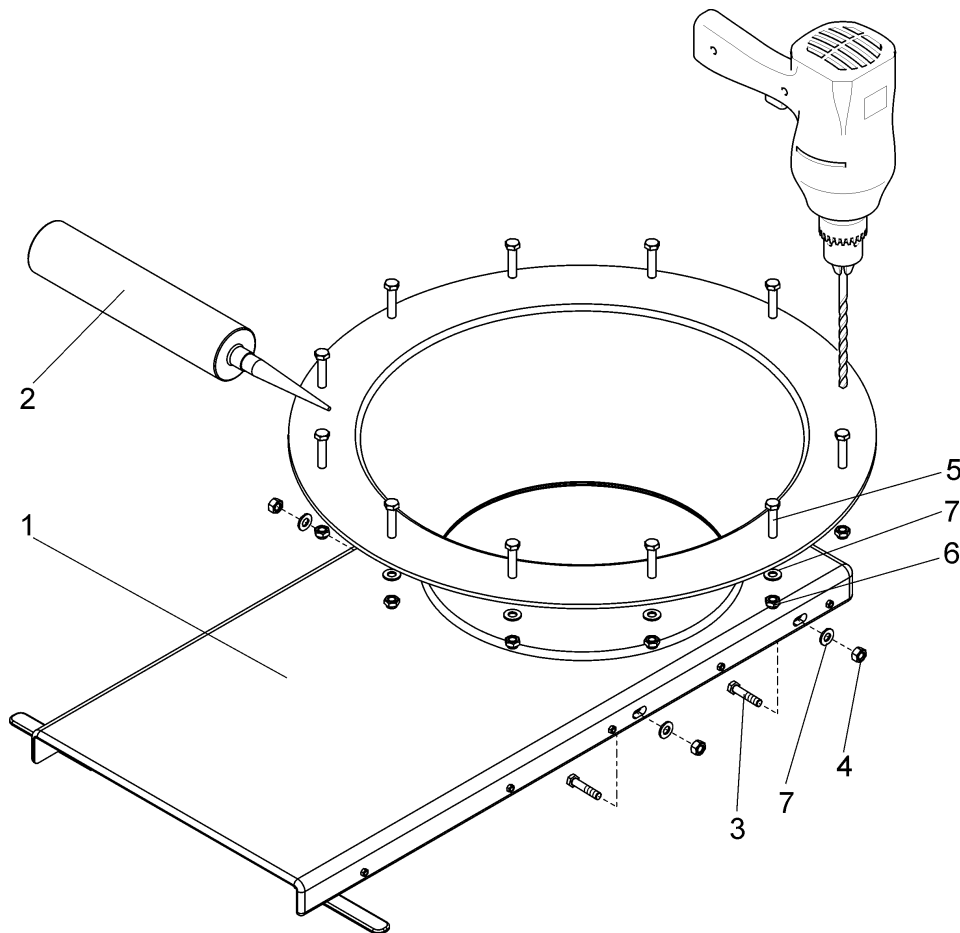


Figure 8-2: Code no. 10-84-3635

Pos.	Quantity	Code No.	Description
	1	10-84-3635	Connection with shutter cpl for silo GPR/AW/R
1	1	83-00-2163	Connection with shutter for hopper with silo R/BD/GRP
2	1	99-50-3810	Silicone transparent 300ml
3	12	99-20-1402	Hexagon head screw M 8x 35 DIN 933 SST
4	4	99-20-1176	Hexagon nut M 8 SST DIN 934
5	4	99-20-1417	Hexagon head screw M 8x 25 DIN 933
6	12	99-20-1193	Self-locking counter nut M 8 DIN 985 SST
7	16	99-20-1600	Washer SST A 8,4 DIN 125

8.2.2 Adaptor with shutter SST cpl. for sack-silo

Install the sack-silo between the adaptor and the clamp. Draw up the screw (Pos. 6) and the nut (Pos. 7) in order to tighten the clamp around the adaptor so that no feed can fall next to the adaptor.

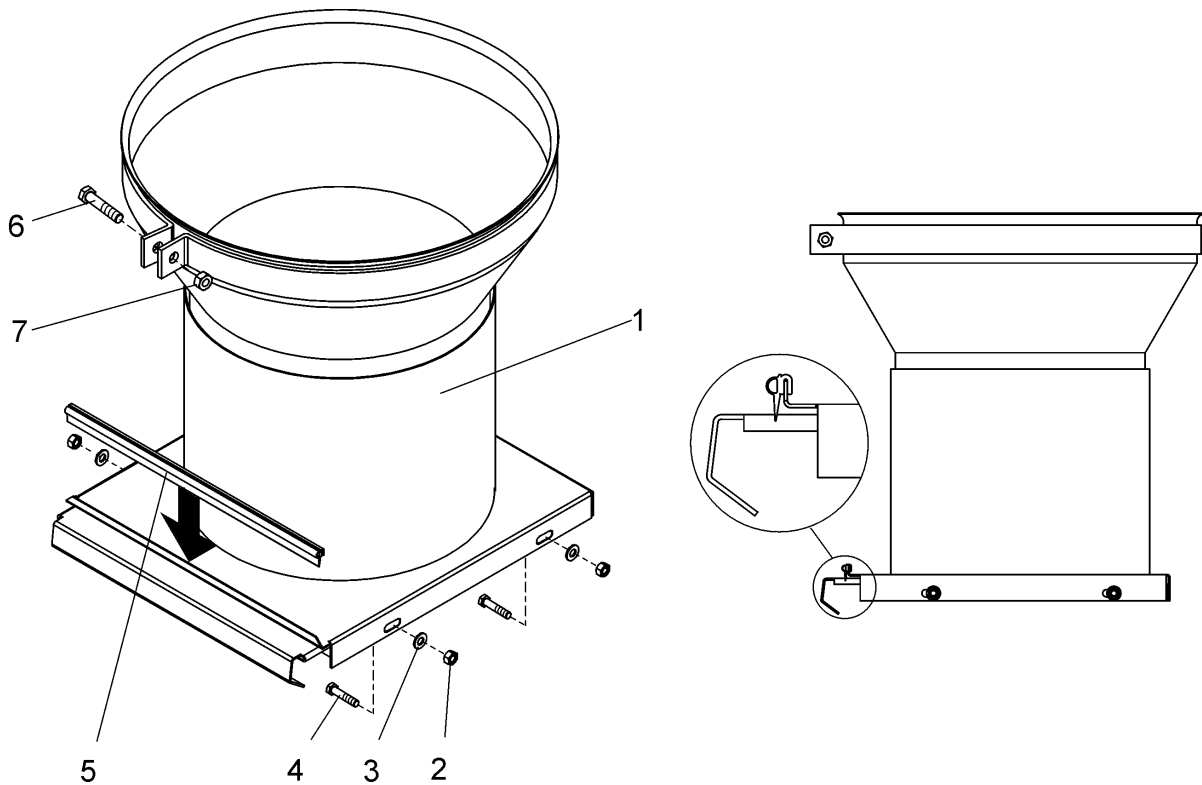


Figure 8-3: Code no. 10-88-3402

Pos.	Quantity	Code No.	Description
	1	10-88-3402	Adaptor with shutter SST cpl. for sack-silo
1	1	83-00-0301	Adaptor with shutter SST for sack-silo
2	4	99-20-1176	Hexagon nut M 8 SST DIN 934
3	4	99-20-1600	Washer SST A 8,4 DIN 125
4	4	99-20-1417	Hexagon head screw M 8x 25 DIN 933
5	1	10-87-3003	Profiled joint 360mm
6	1	99-10-1258	Hexagon head screw M 10x 50 DIN 558 galv
7	1	99-20-1029	Hexagon nut M 10 galv DIN 555



The profiled joint (Pos. 5) prevents that dust and dirt get into the feed. Always see to it that the clamp fits correctly and change it in case of wear.



8.2.3 Adaptor with shutter galvanized cpl.

When a supply system is used (auger or centerless auger), the adaptor with shutter is mounted onto the feed hopper.

Max. content: 100 litre

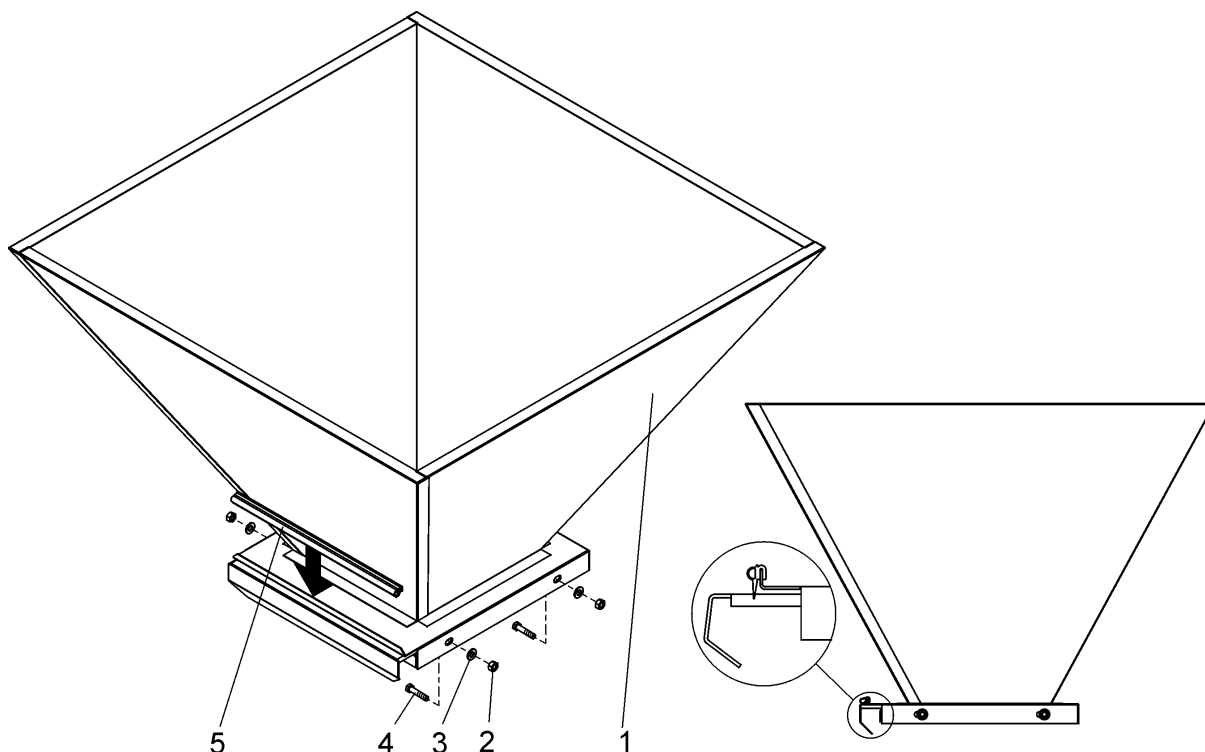


Figure 8-4: Code no. 10-87-3005

Pos.	Quantity	Code No.	Description
	1	10-87-3005	Adaptor with shutter galv. cpl.
1	1	10-87-3002	Adaptor with shutter galv for hopper with foreign silo
2	4	99-20-1176	Hexagon nut M 8 SST DIN 934
3	4	99-20-1600	Washer SST A 8,4 DIN 125
4	4	99-20-1417	Hexagon head screw M 8x 25 DIN 933
5	1	10-87-3003	Profiled joint 360mm



The profiled joint (Pos. 5) prevents that dust and dirt get into the feed. Always see to it that the clamp fits correctly and change it in case of wear.

8.2.4 Adaptor with shutter SST cplt. for hopper with forced feed return

When a supply system is used (auger or centerless auger), the adaptor with shutter is mounted onto the hopper with forced feed return.

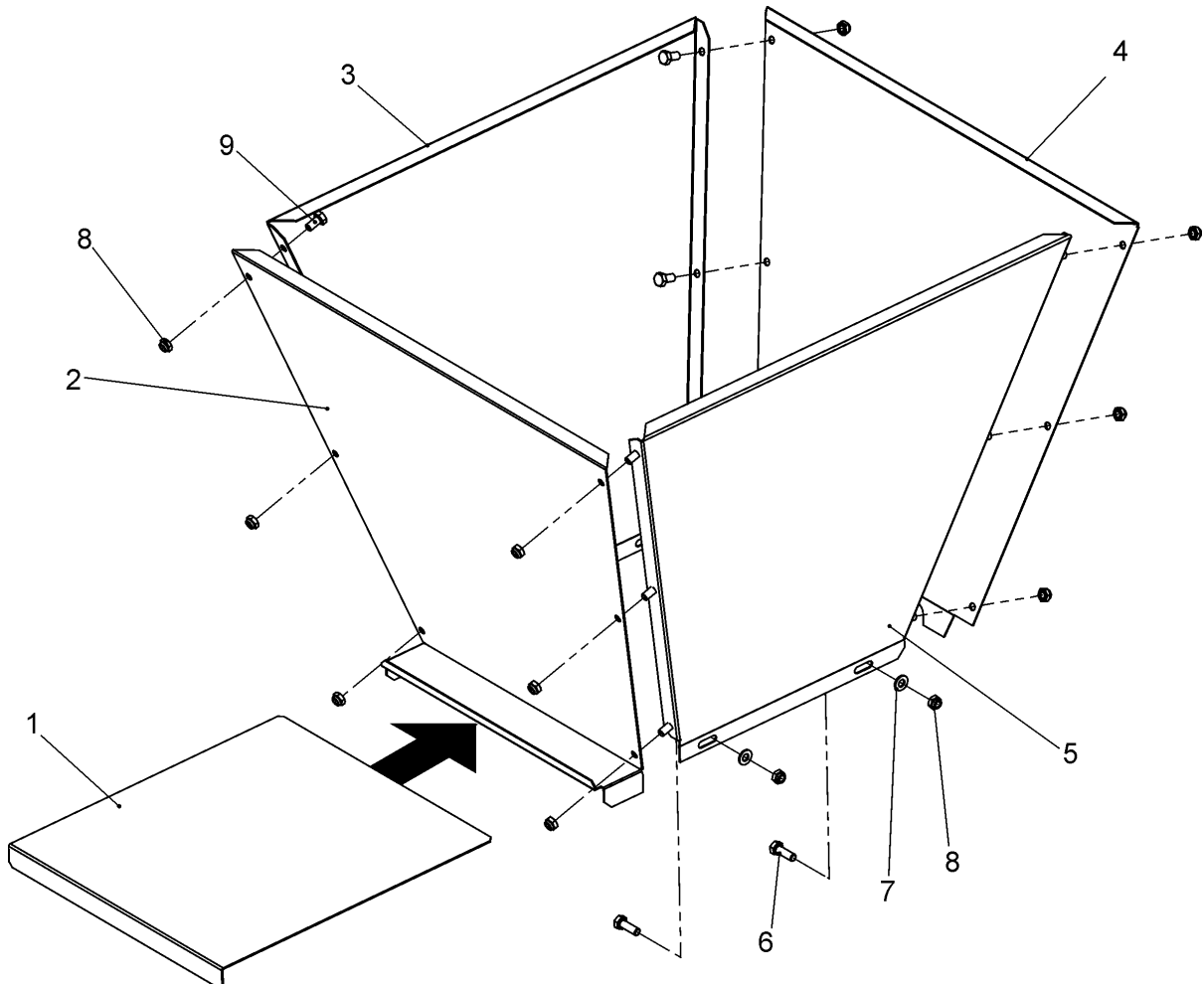


Figure 8-5: Code no. 83-01-0483

Pos.	Quantity	Code No.	Description
	1	83-01-0483	Adaptor with shutter SST cplt. for hopper with forced feed return
1	1	83-01-0482	Shutter for adaptor
2	1	83-01-0480	Rear plate for adaptor
3	1	83-01-0478	Side plate left for adaptor
4	1	83-01-0481	Front plate for adaptor
5	1	83-01-0479	Side plate right for adaptor
6	4	99-20-1600	Washer SST A 8,4 DIN 125
7	4	99-20-1417	Hexagon head screw SST M 8x 25 DIN 933
8	16	99-20-1193	Self-locking counter nut SST M 8 DIN 985
9	12	99-20-1400	Hexagon head screw SST M 8x 16 DIN 933

8.2.5 Y-tube cpl for feed hopper RAS

A system with two feed lines is equipped with two feed hoppers RAS. Between the feed hoppers RAS and the silo, a Y-tube is installed directly underneath the silo.

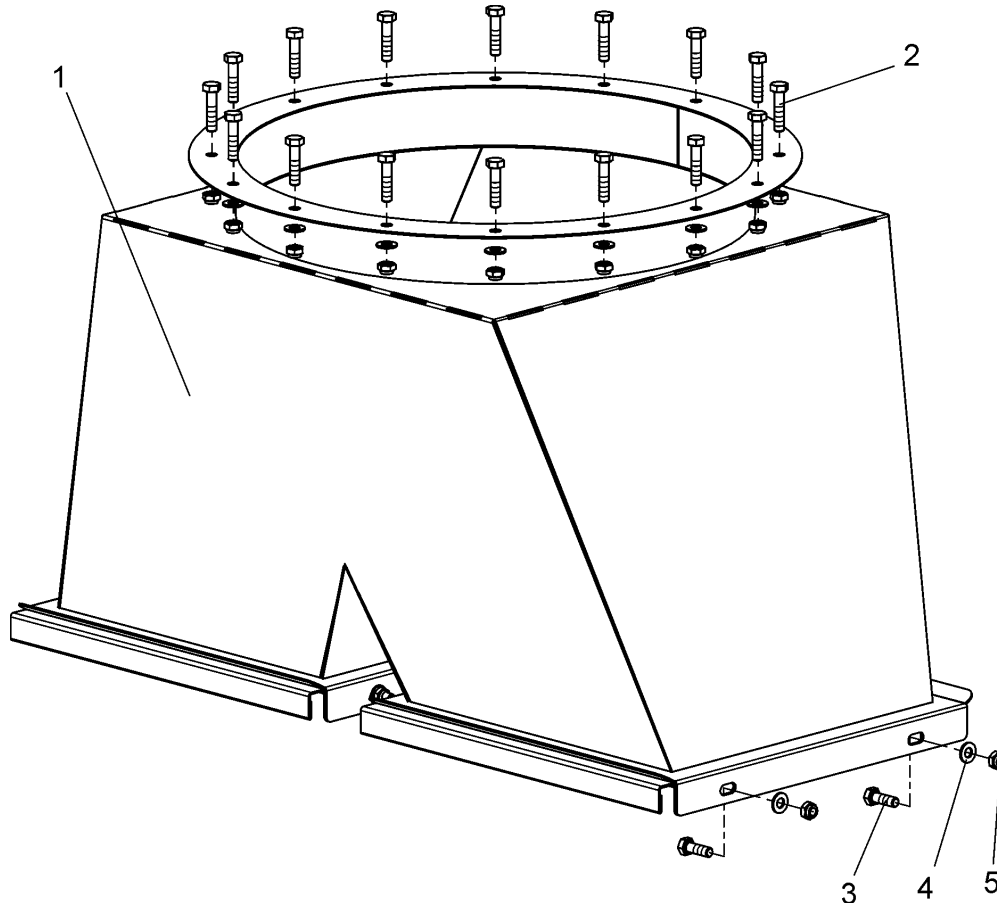


Figure 8-6: Code no. 83-02-6697

Pos.	Quantity	Code No.	Description
	1	83-02-6697	Y-tube cpl for feed hopper RAS
1	1	83-02-3419	Y-tube SST pre-assembled
2	16	99-20-1402	hexagon head screw SST M 8x 35 DIN 933
3	8	99-20-1417	hexagon head screw SST M 8x 25 DIN 933
4	24	99-20-1600	washer SST A 8.4 DIN 125
5	24	99-20-1193	self-locking counter nut SST M 8 DIN 985

8.3 Feed hopper

8.3.1 Operation

The continuous level adjustment of the hopper (without forced feed- or -forced feed re- turn) regulates the required conveying capacity. Here adjustment buttons (Pos. 1) are used to move the swing plate (Pos. 2) up and down. In order to avoid bridging in the hopper, the swing plate is loosely attached and is moved via a vibrating rocker (Pos. 3) by the driving plates of the continuous conveyor cable or conveyor chain.

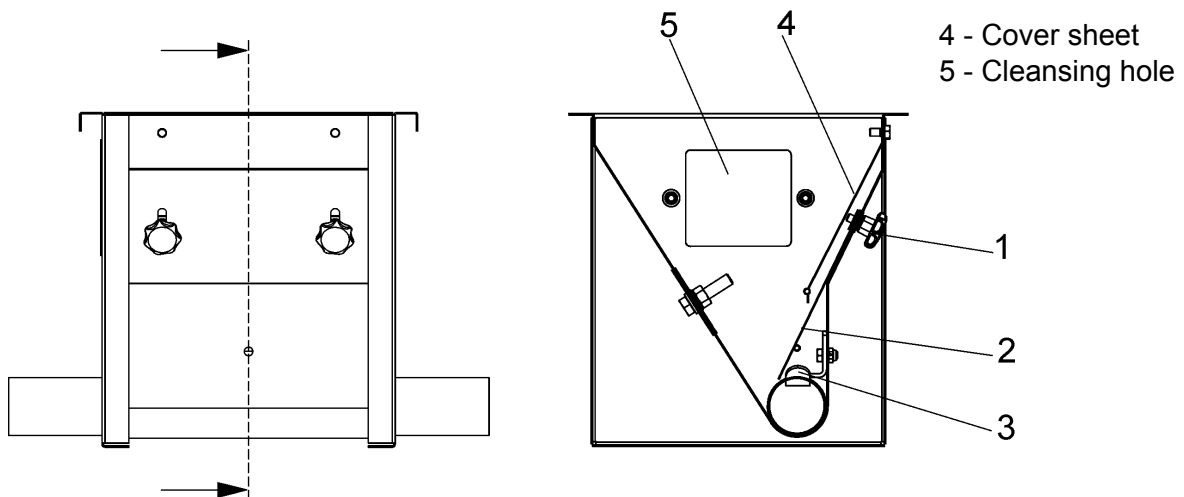


Figure 8-7: Level adjustment



Nuts, screws and other objects can inadvertently fall into the feed hopper during the mounting process and can thus reach the feed line. Before starting the mounting process, move the swing plate completely to the bottom using the adjustment buttons.

8.3.2 Hopper 1line cpltd. SST

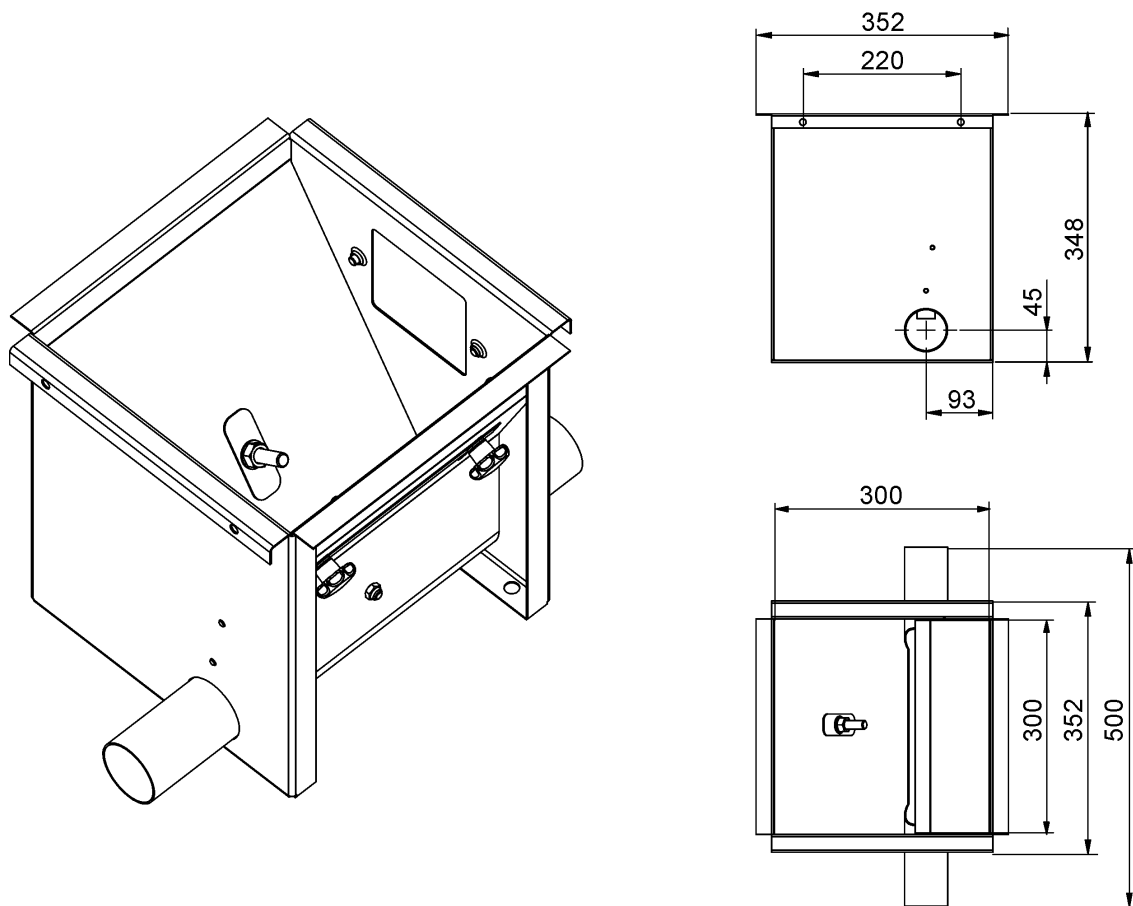


Figure 8-8: Code no. 10-87-3751

Equipment for hopper 1line

In order to avoid bridging in the hopper, an agitator wheel can be mounted, which is driven by the conveyor chain.

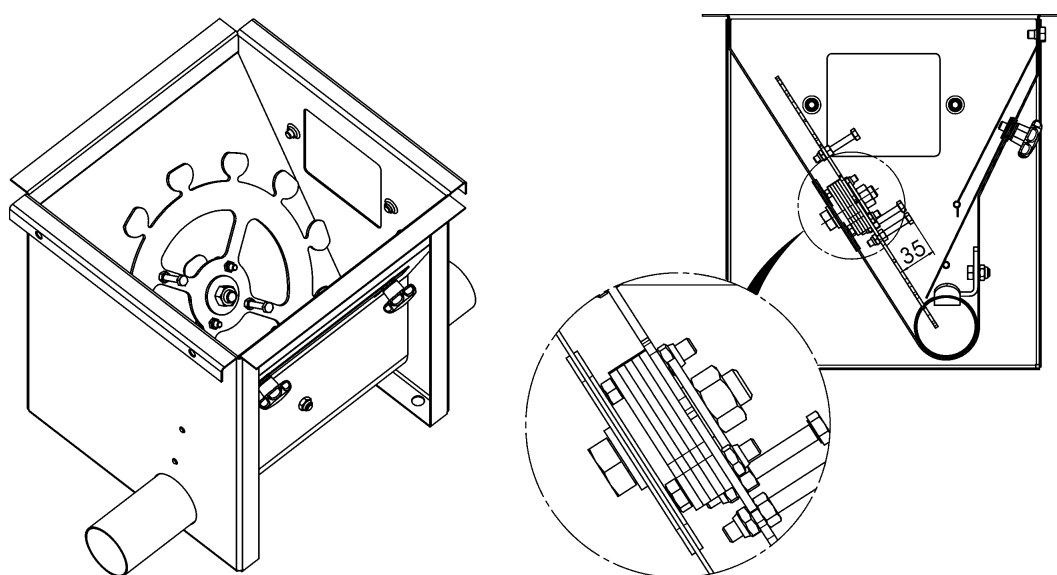


Figure 8-9: Hopper 1line with agitator wheel

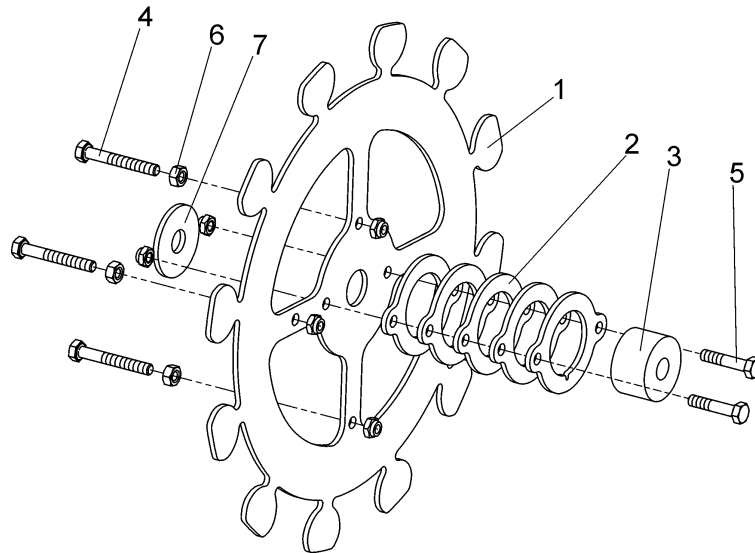


Figure 8-10: Code no. 83-01-6481

Pos.	Quantity	Code No.	Description
	1	83-01-6481	Agitator wheel cpltd DR1500
1	1	83-01-5872	Chain wheel DR1500
2	5	83-01-6205	Guide ring for bush
3	1	83-01-6204	Bush PA for agitator wheel hopper
4	5	99-20-1043	Self-locking counter nut M 6 DIN 985-6 galv
5	3	99-10-1260	Hexagon head screw M 6x 45 DIN 933-8,8 galv
6	2	99-10-1257	Hexagon head screw M 6x 30 DIN 558 galv
7	3	99-10-1045	Hexagon nut M 6 galv DIN 934-8
8	1	99-20-1150	Washer A 13 DIN 9021 galv



When the agitator wheel is used, the swing plate cannot be completely moved down anymore.



Retrofit hoppers 1line which were delivered before 2004 with the retrofit kit agitator wheel DR 1500 (Code-No. 83-01-7037).



8.3.3 Hopper 2line cpltd. SST

With this hopper the direction of transportation can be opposed.

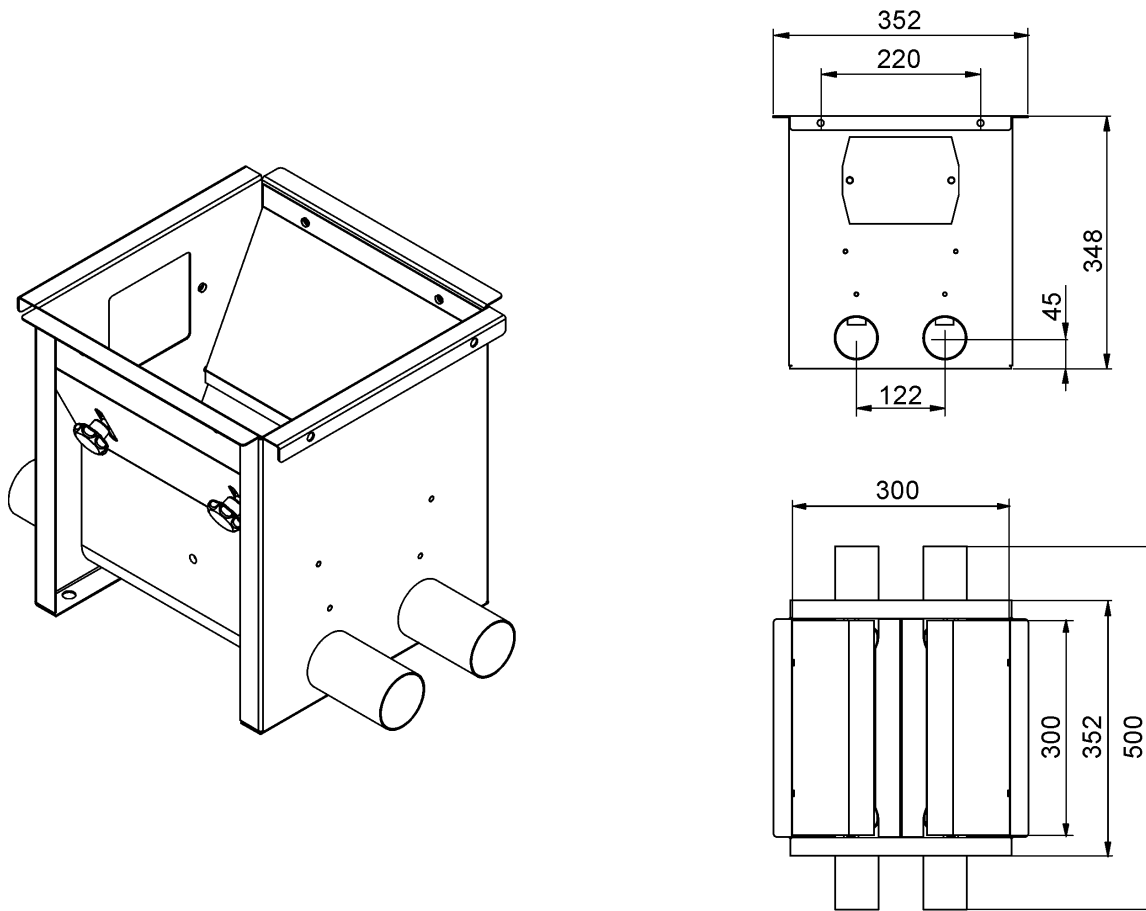


Figure 8-11: Code no. 10-87-3752

8.3.4 Hopper 1line SST with forced feed

These hoppers dose the feed into the feed line. They are especially suitable for multi-phase feeding.



If feed returns from the house, the installation stops working. You can prevent this with a reversible sensor, which you install at the last feeding station.

If this is not possible, you should use a hopper with forced feed return.



The hopper with forced feed may only be used with the extension for the control unit DR 1500 with forced feed (Code-Nr. 10-87-3754).

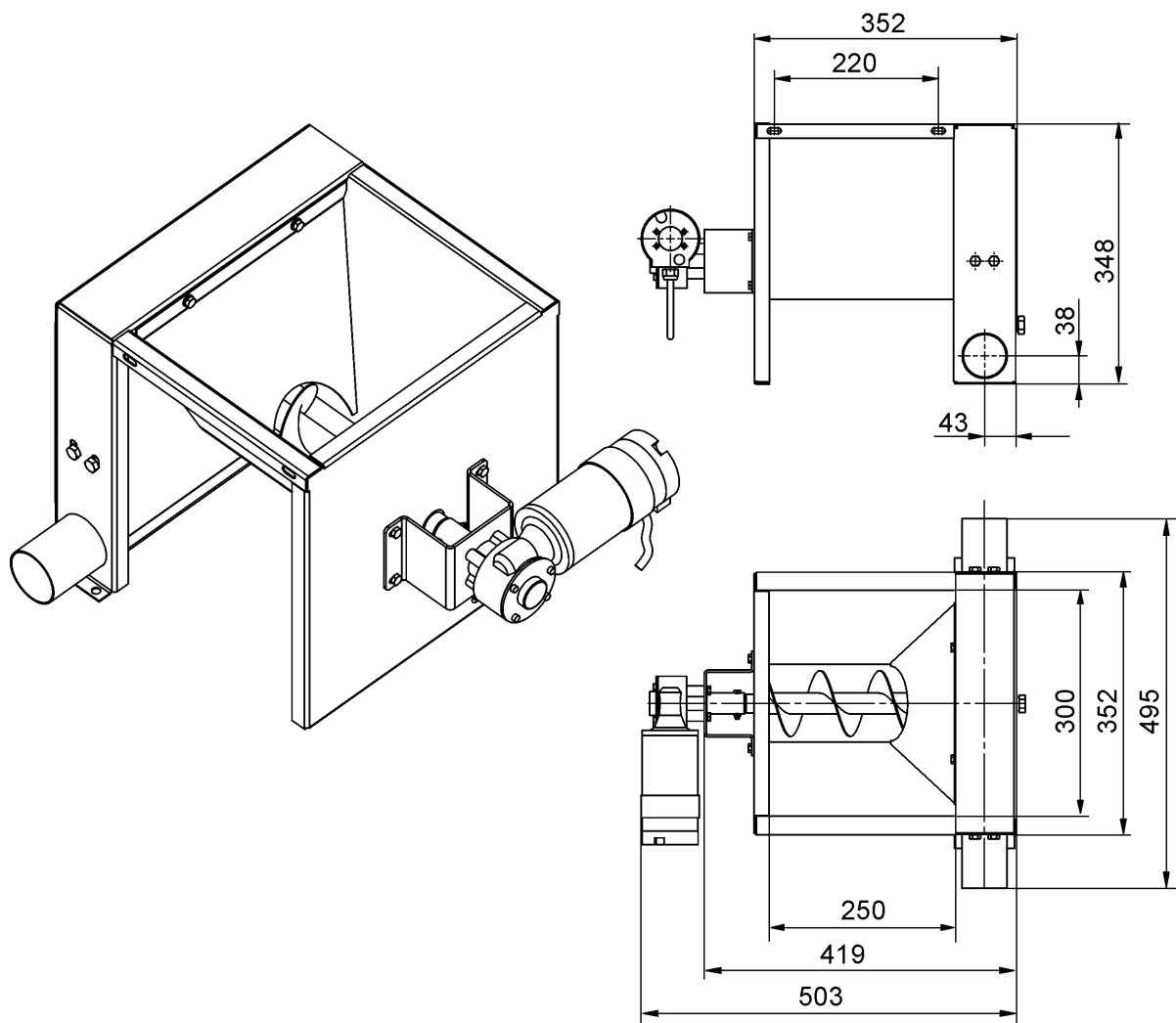
Hopper 1line 24V SST with forced feed

Figure 8-12: Code no. 10-87-3756

Table 8-1: Technical data of the gear motor

Drive capacity	55 W
Voltage	24 V
Speed	35 min ⁻¹
max. fuse protection	23 A
Protective system	IP 55

Hopper 1line 0,37 kW SST with forced feed

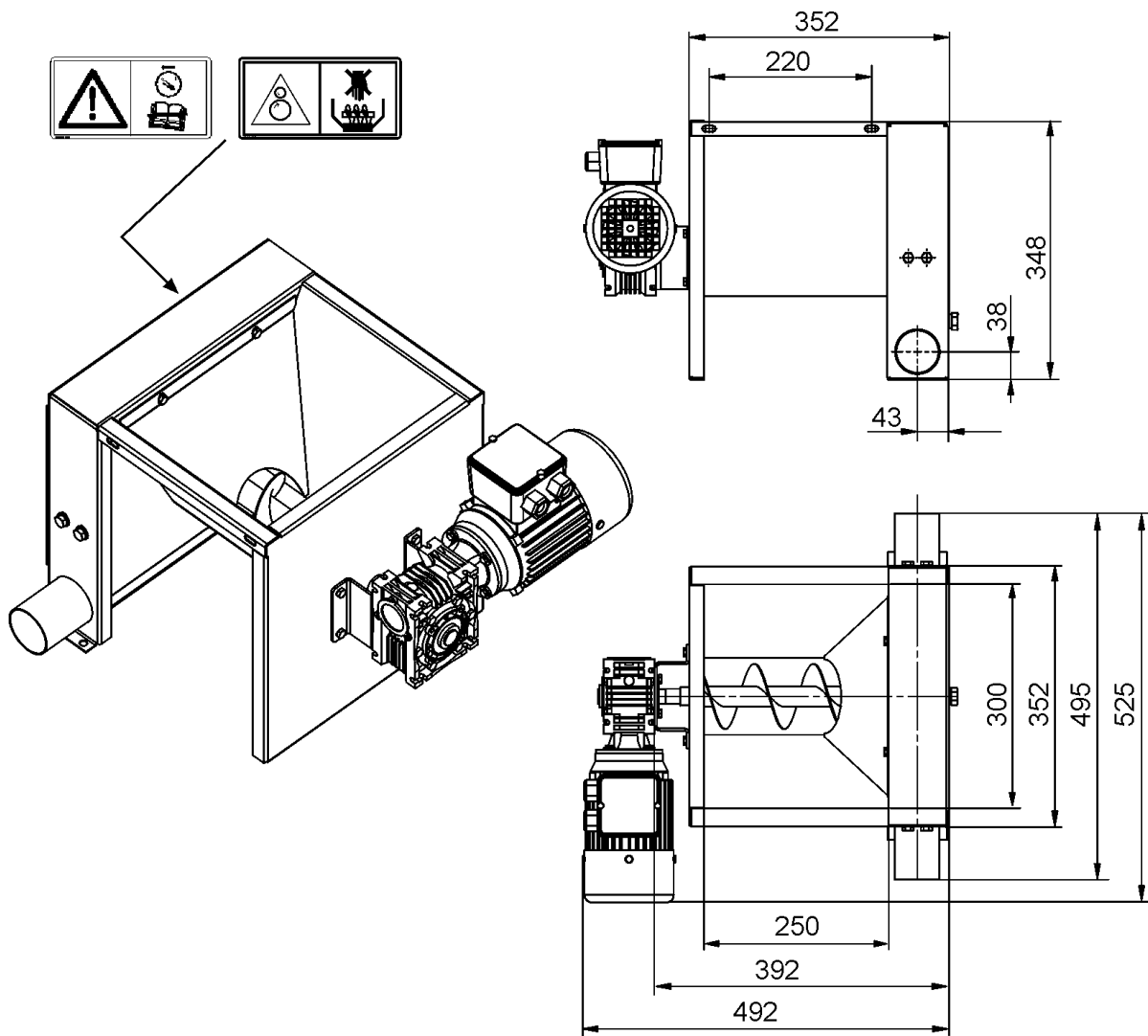


Figure 8-13: Code no. 10-87-3753

Table 8-2: Technical data of the gear motor

Drive capacity	0,37 kW
Voltage	230/400 V
Speed	56 min ⁻¹
Protective system	IP 55



To avoid leakage and thus a possible defect at the gear motor, make sure to install vent screws before taking the system into operation.

8.3.5 Hopper 1line SST with forced feed return

The use of these hoppers allows for a continuous running time of the installation. The feed that returns from the circuit falls back into the feed hopper by means of the drop pipe. The rotating auger inside the feed hopper transports the feed back in to the circuit. Feed rests that remain in the system do not cause blockages any more. Thus the system is kept from stalling.

Hopper 1line 0,37 kW cpl. SST with forced feed return

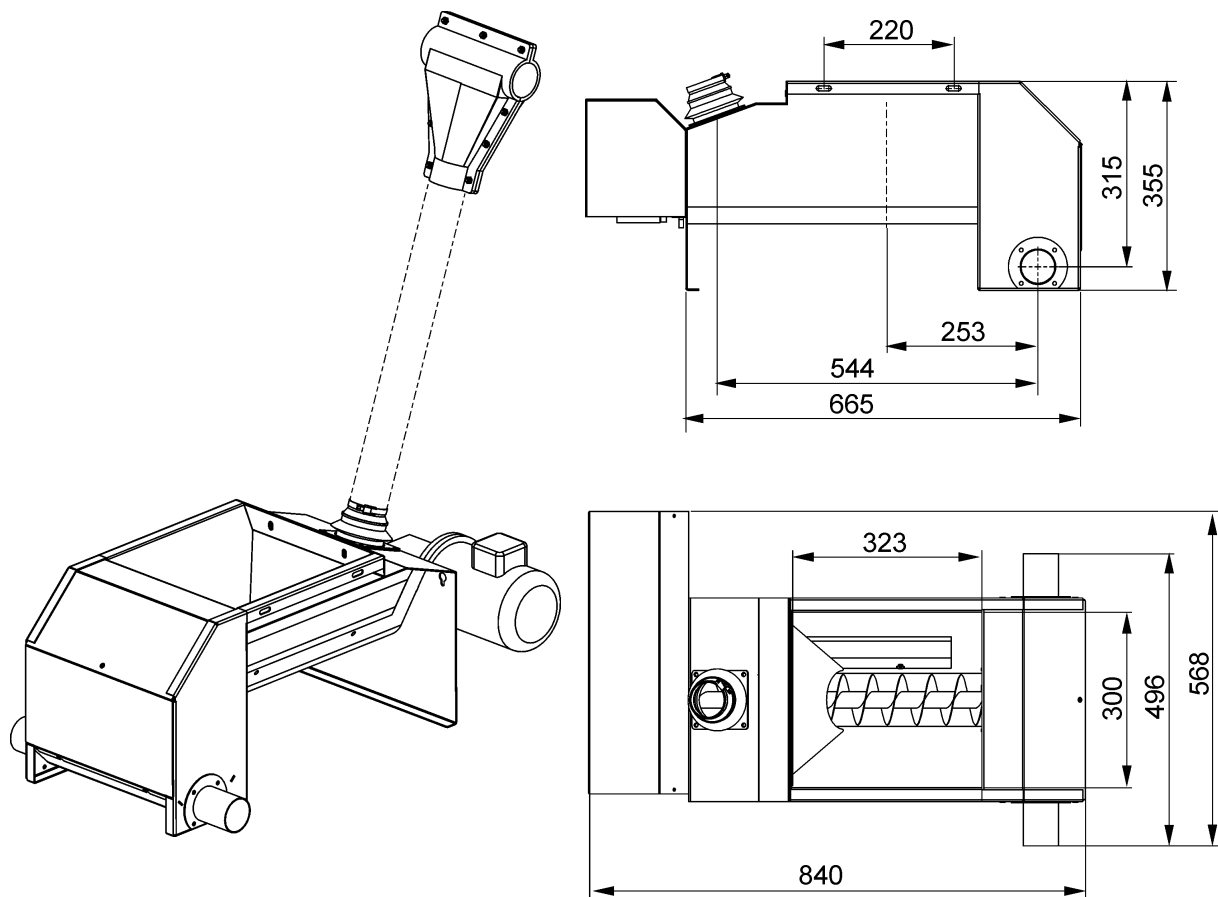


Figure 8-14: Code no. 10-87-3757

Table 8-3: Technical data of the gear motor

Drive capacity	0,37 kW
Voltage	230/400 V
Speed	91 min ⁻¹



You can prevent a clogging up of the system by cutting the weep hole of the feed discharge as large as possible.

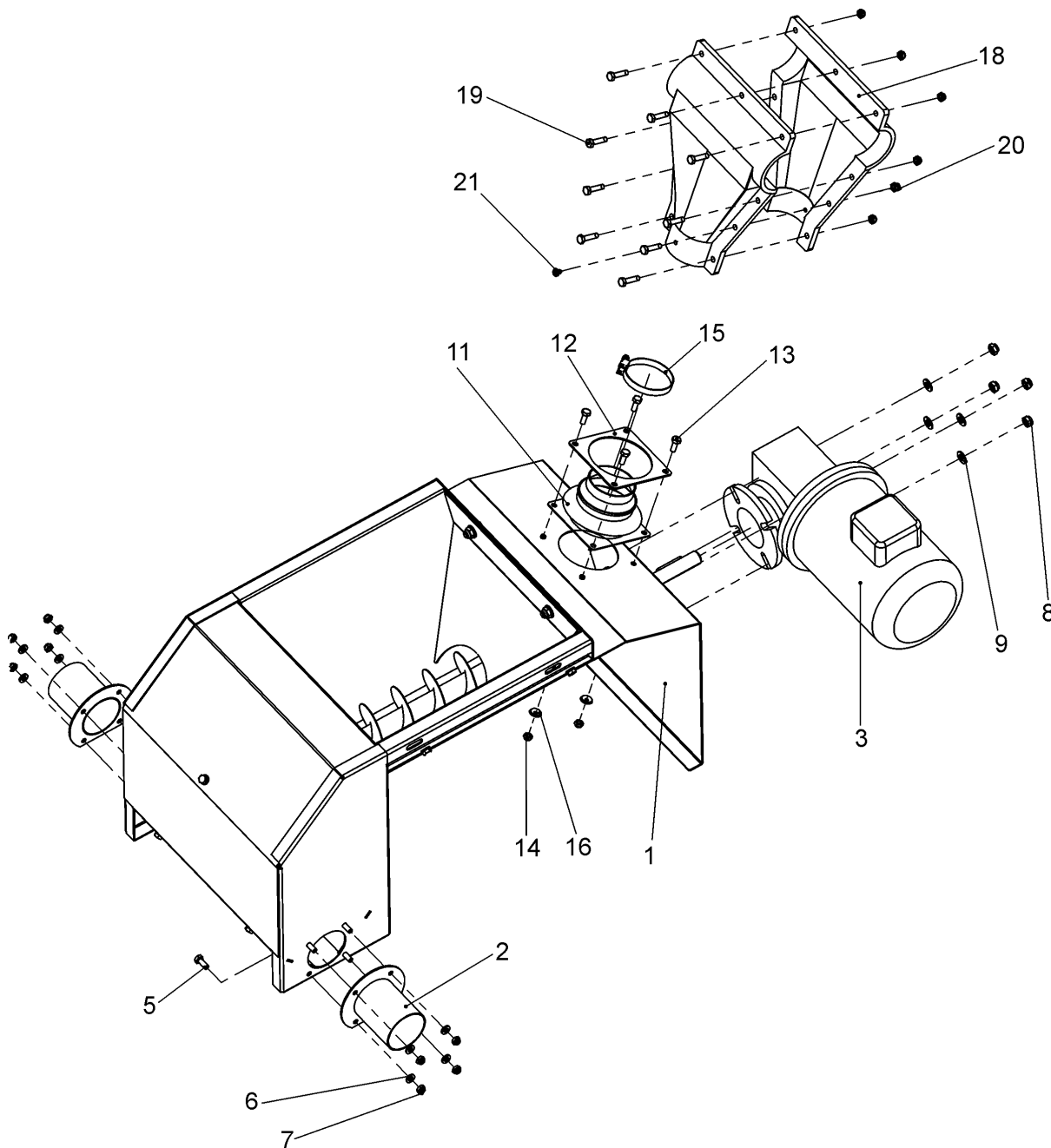
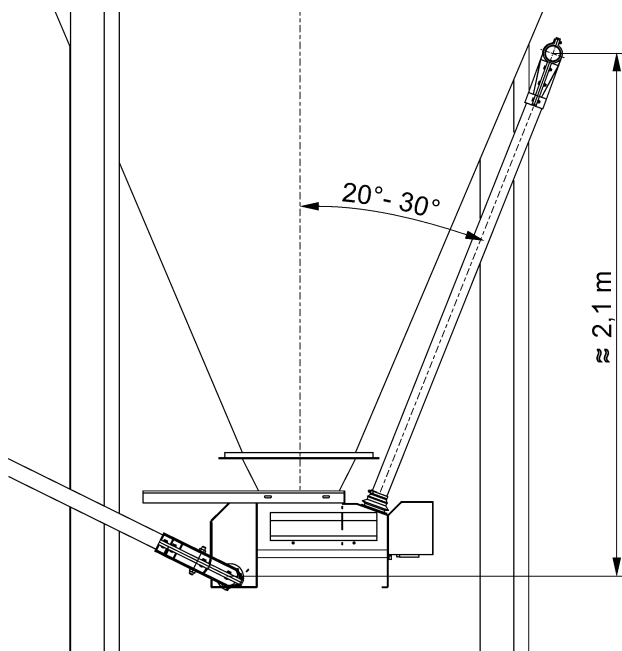


Figure 8-15: Code no. 10-87-3757 Explo

Pos.	Quantity	Code No.	Description
	1	10-87-3757	Hopper cpltd 0,37KW SST DR1500 with forced feed
1	1	83-00-8934	Hopper SST DR850/1500 assembled
2	2	83-00-8937	Pipe flange DR 1500
3	1	83-00-9025	Mot-g 0,37 230/400 50 96r shaft dia 18
4	1	20-52-3118	Sealing strip CR30 15x5mm reel 10m for mixing tank SST
5	8	99-20-1404	Hexagon head screw M 6x 16 DIN 933 SST
6	8	99-20-1602	Washer SST A 6,4 DIN 125
7	8	99-20-1131	Self-locking counter nut M 6 DIN 985 SST
8	4	99-20-1193	Self-locking counter nut M 8 DIN 985 SST
9	4	99-20-1600	Washer SST A 8,4 DIN 125
	1	25-16-3045	Filler neck flexible 63/75 cpl
11	1	83-00-0864	Rubber connection piece dia 63/75
12	1	83-00-0866	Flange plate SST for rubber connection piece dia 63/75
13	4	99-20-1404	Hexagon head screw M 6x 16 DIN 933 SST
14	4	99-20-1131	Self-locking counter nut M 6 DIN 985 SST
15	1	60-50-3988	Tube clamp 60-215mm
16	4	25-17-3279	Washer SST with mounted gasket for screw M 6
	1	10-87-3758	Branch piece less shutter for DR1500 with forced feed
18	2	83-00-9214	Half shell for outlet D60 L160
19	9	99-20-1422	Hexagon head screw M 6x 25 DIN 933 SST
20	9	99-20-1131	Self-locking counter nut M 6 DIN 985 SST
21	2	99-10-1223	Tapping screw B 4,8x9,5 DIN7971

Mounting instructions



Lay the return pipe with an adequate height as close to the silo as possible. Like this the drop tube can be mounted as steep as possible.

Figure 8-16: Installation of the drop tube

	Make sure during the assembly that the weep hole is as large as possible and that the drop tube is as steep as possible. Otherwise feed build-up and overconveyance can occur. In the case of overconveyance the installation can clog up and, at the worst, it can break!
	Seal everything with silicone after the assembly in order to prevent humidity from entering the system.

Silo extraction

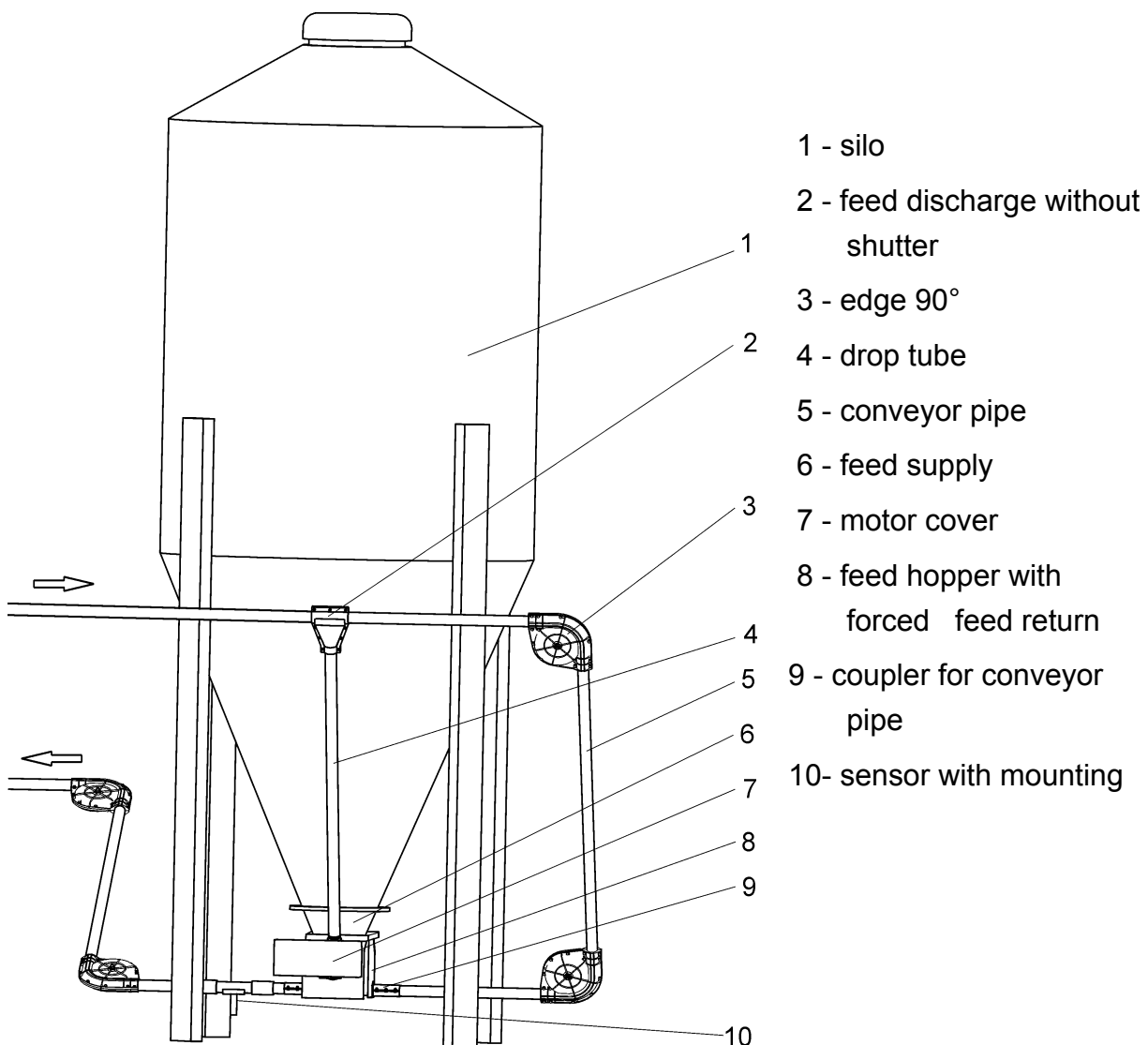


Figure 8-17: Example of the installation of the silo extraction

8.4 Feed hopper RAS

8.4.1 Operation

This feed hopper takes feed into the feed line as soon as the drive unit is activated. The feed chain is put into motion. The driving plates of the chain cause the driving wheel (pos. 2) inside the feed hopper to turn, thus moving the feed auger (pos. 1).

A foreign-matter separator (pos. 3) ensures that no foreign matter gets into the feed line.

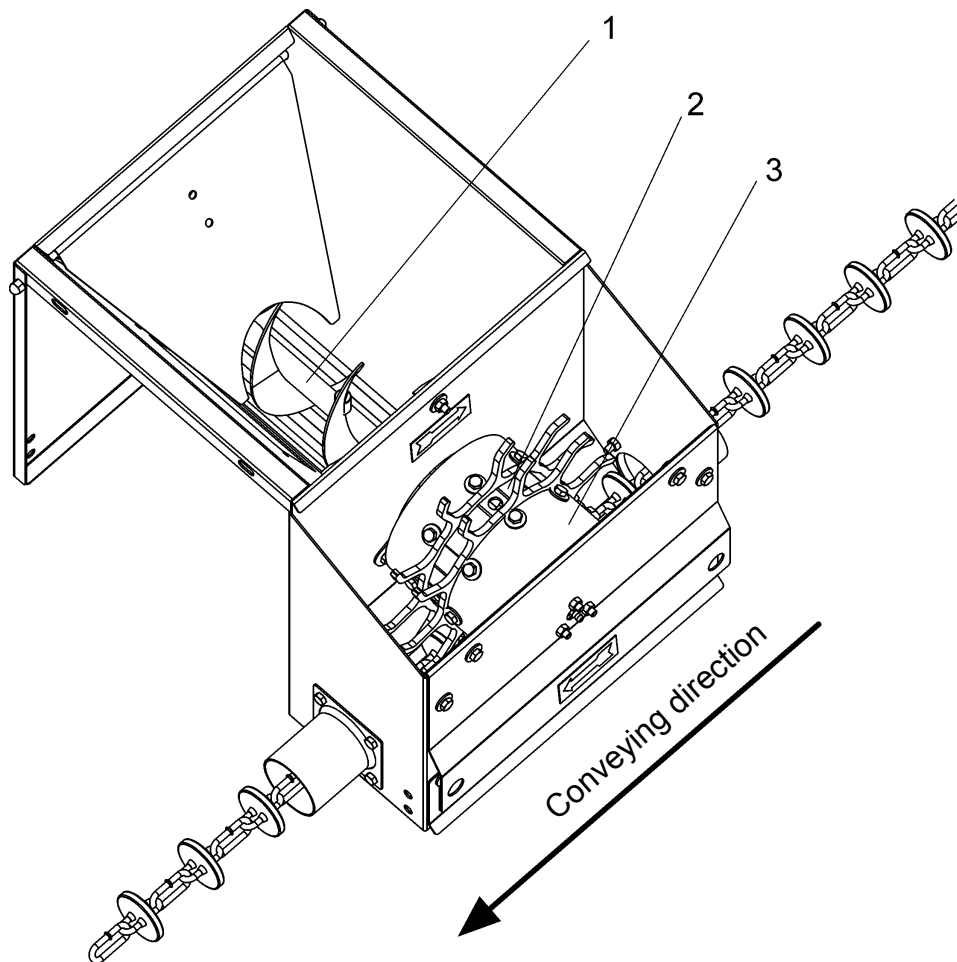


Figure 8-18: Mode of operation of the feed hopper RAS

8.4.2 Feed hopper RAS 1line



Please note the instruction leaflet by **Big Dutchman** (code-no. 99-97-1673) with explosion drawing and parts list. Use the instructions for the assembly and spare parts orders.

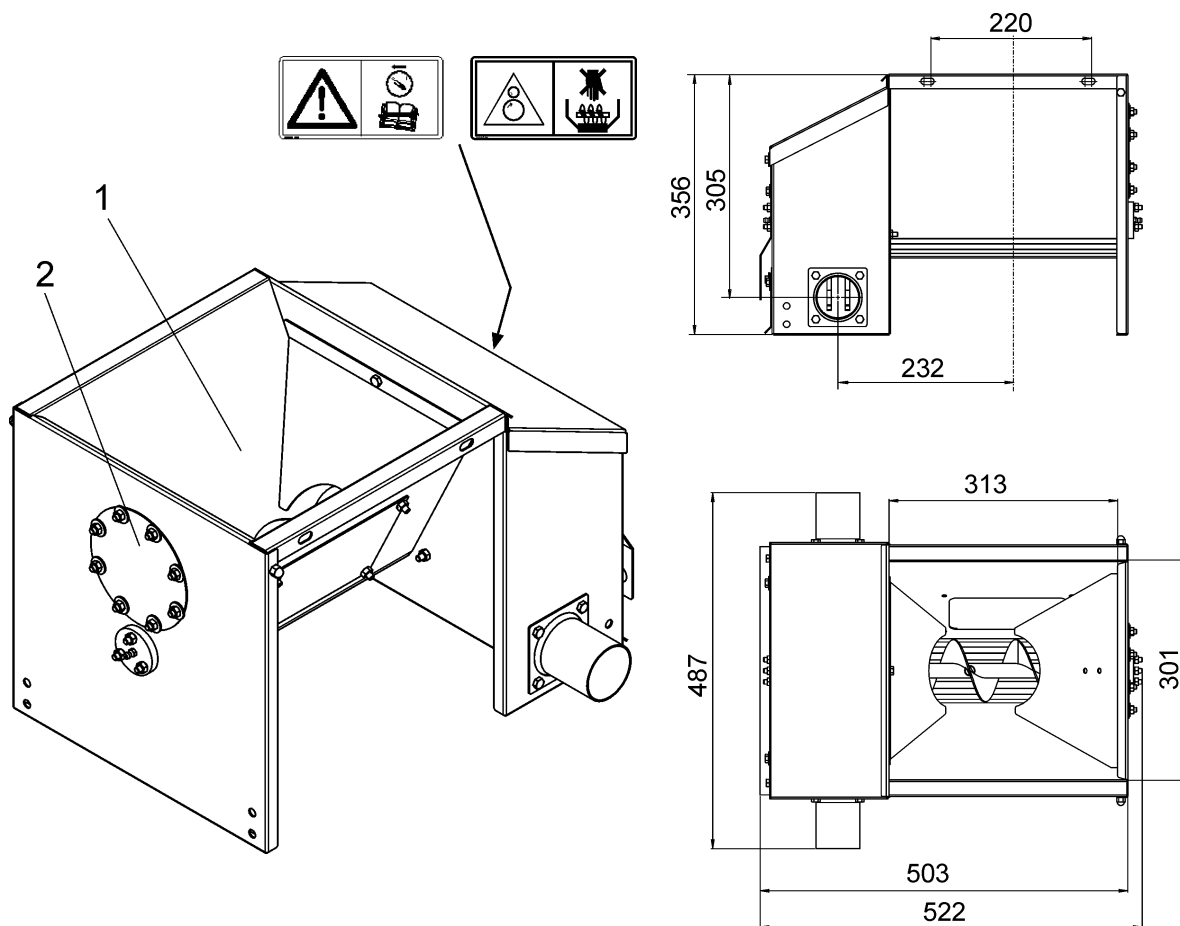


Figure 8-19: Code no. 10-87-3691

Pos.	Quantity	Code No.	Description
	1	10-87-3691	feed hopper RAS 1line DR1500 with FKA
1	1	83-02-0098	feed hopper RAS 1line DR1500 with FKA
2	1	83-02-3375	cover plate DN 69 SST for hopper wo/ recirculation
	1	99-50-3810	silicone transparent 300ml

8.4.3 Feed hopper RAS 1line with recirculation

The use of these hoppers allows for a continuous running time of the installation. The feed that returns from the circuit falls back into the feed hopper by means of the drop pipe. The rotating auger inside the feed hopper transports the feed back in to the circuit. Feed rests that remain in the system do not cause blockages any more. Thus the system is kept from stalling.



Please note the instruction leaflet by **Big Dutchman** (code-no. 99-97-1673) with explosion drawing and parts list. Use the instructions for the assembly and spare parts orders.

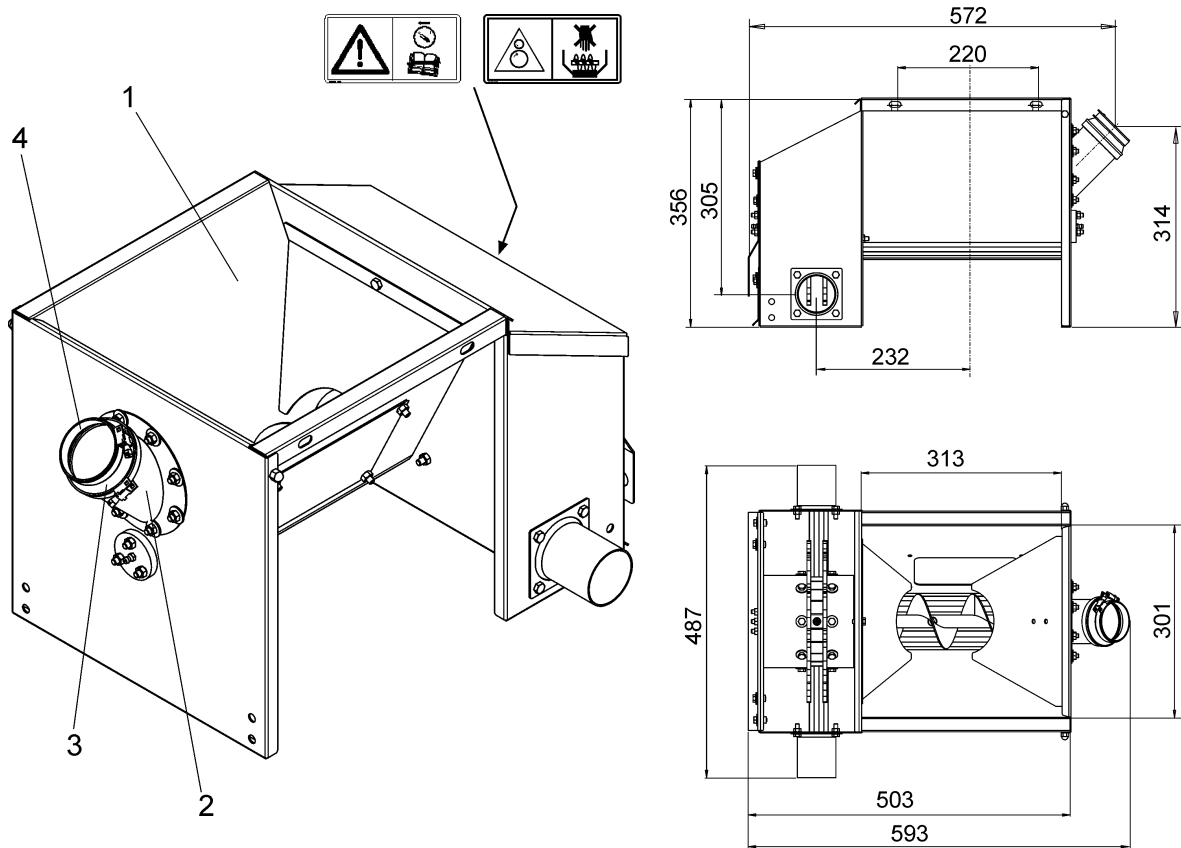


Figure 8-20: Code no. 10-87-3692

Pos.	Quantity	Code No.	Description
	1	10-87-3692	feed hopper RAS 1line DR1500 with FKA with recirculation
1	1	83-02-0098	feed hopper RAS 1line DR1500 with FKA with recirculation
2	1	83-02-3382	pipe flange DN69 for recirculation
3	1	83-02-3402	rubber connection piece dia 60/72
4	2	60-50-3988	tube clamp 60-215mm
	1	99-50-3810	silicone transparent 300ml

DR 1500

Edition: 03/05 M 4021 GB

Silo extraction

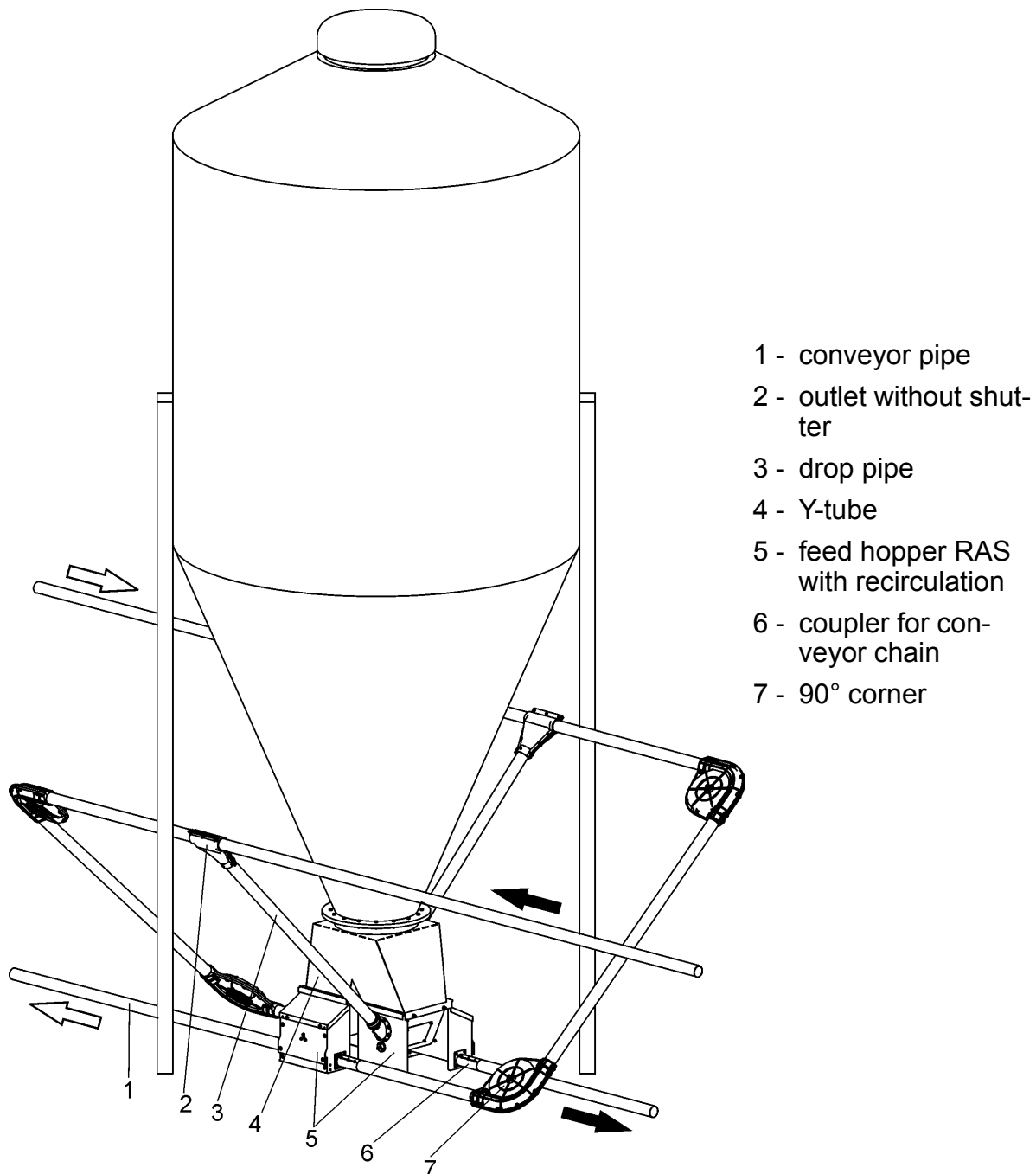


Figure 8-21: Example for the set-up of a silo extraction with 2 feed hoppers RAS with recirculation



Make sure during the assembly that the weep hole is as large as possible and that the drop tube is as steep as possible. Otherwise feed build-up and overconveyance can occur. In the case of overconveyance the installation can clog up and, at the worst, it can break!

8.5 Accessories

8.5.1 Covering SST cplt. for motor for forced feed return

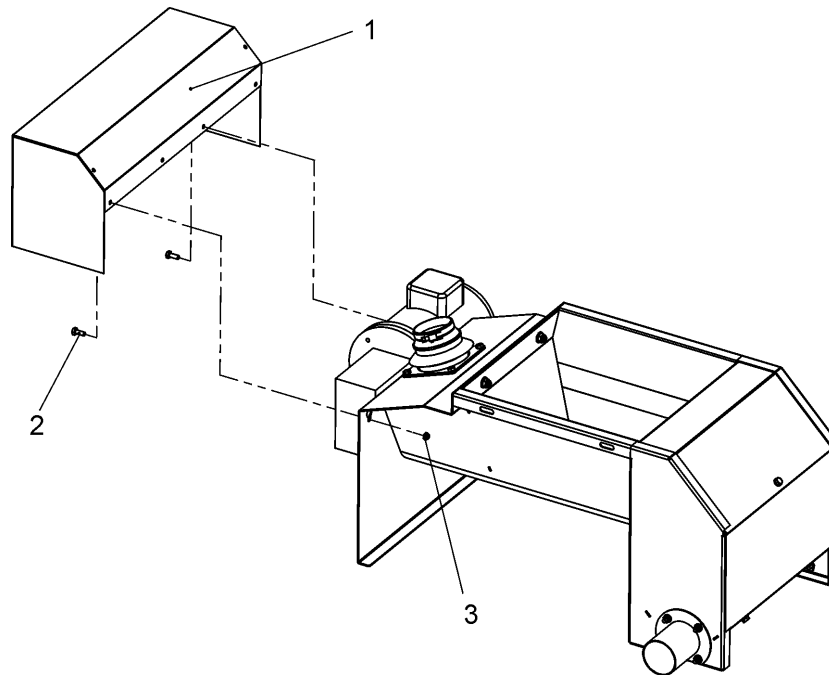
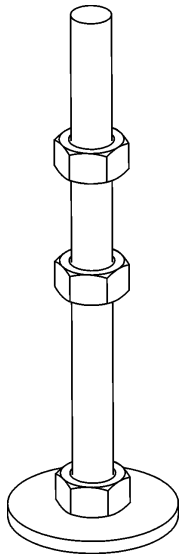


Figure 8-22: Code no. 10-87-3759

Pos.	Quantity	Code No.	Description
	1	10-87-3759	Covering SST cplt. for motor for forced feed
1	1	83-00-9376	Covering SST for motor
2	2	99-20-1404	Hexagon head screw M 6x 16 DIN 933 SST
3	2	99-20-1131	Self-locking counter nut M 6 DIN 985 SST

8.5.2 Foot fully threaded M12x165



When a hopper is mounted, the feet are used on the ground. They can compensate for uneven spots in the ground.

Figure 8-23: Code no. 38-98-3611

8.6 Dosimeter for small quantities

8.6.1 Application

Mineral feed, drugs, etc. can be added with the dosimeter for small quantities. The max. filling is approx. 8 kg (depending on the density of the small quantities that are to be dosed).

When drugs are given, the principle of no tolerance is valid (at least in Germany). This means that remaining drugs in the feed tube and the feed are not tolerated. The feed may especially remain in the edges. This feed entrainment is not very large, but it can become a problem. That is why there should always be a separate loop for drugged feed.



The use of drugs is at the operator's own risk.



8.6.2 Installation and assembly

The continuous metering even of fine, pulverised mineral feed is ensured by an additional agitator.

The metering quantity per unit of time is adjusted by the speed control of the control unit.

Install the dosimeter (vertical position) with two pipe clips into the horizontal feed line before the first discharge point.

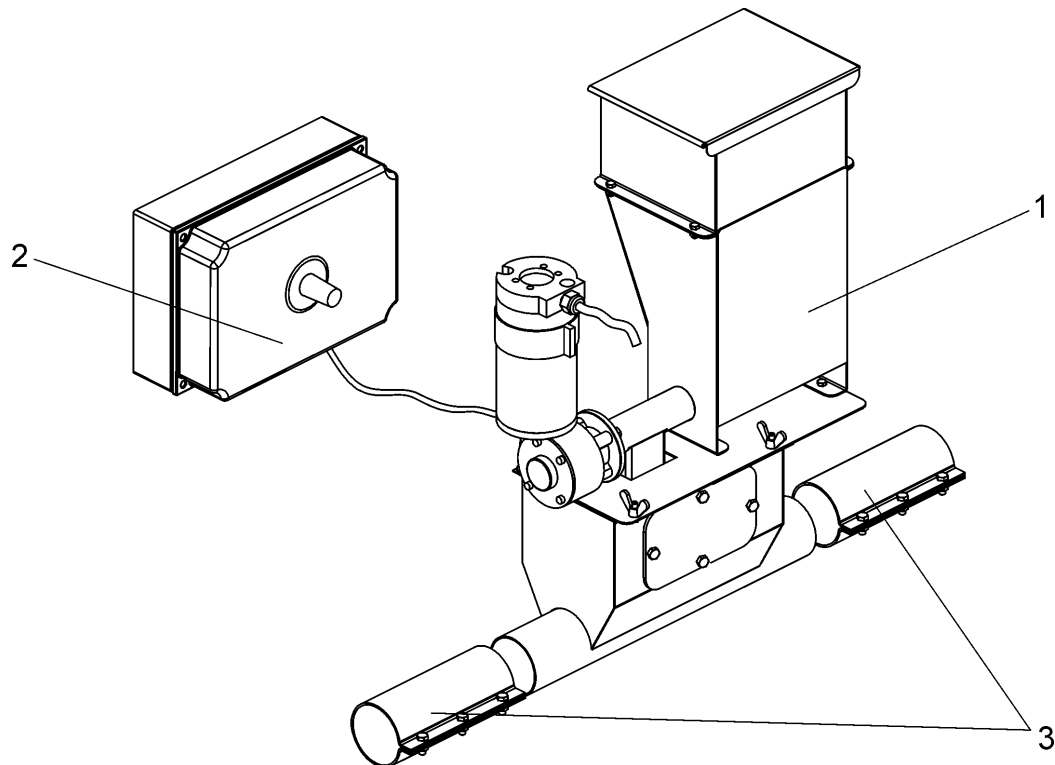


Figure 8-24: Code no. 10-87-3980

Pos.	Quantity	Code No.	Description
	1	10-87-3980	Dosimeter incl. control-box for small quantities DR1500
1	1	10-87-3785	Dosimeter cpl't. for small quantities DR1500
2	1	91-08-3086	Control-box for speed control of dosimeter for small quantities
3	2	83-01-6691	Coupler cpl't. for conveying tube DR1500

For flexible use with several feed circuits, the dosimeter can be screwed on the respective transfer point. The transfer can be adapted to different pipe diameters.



Replace dosimeter (pos. 1) with base plate (pos. 2) and cover (pos. 3.1) only when the installation is in idle position.

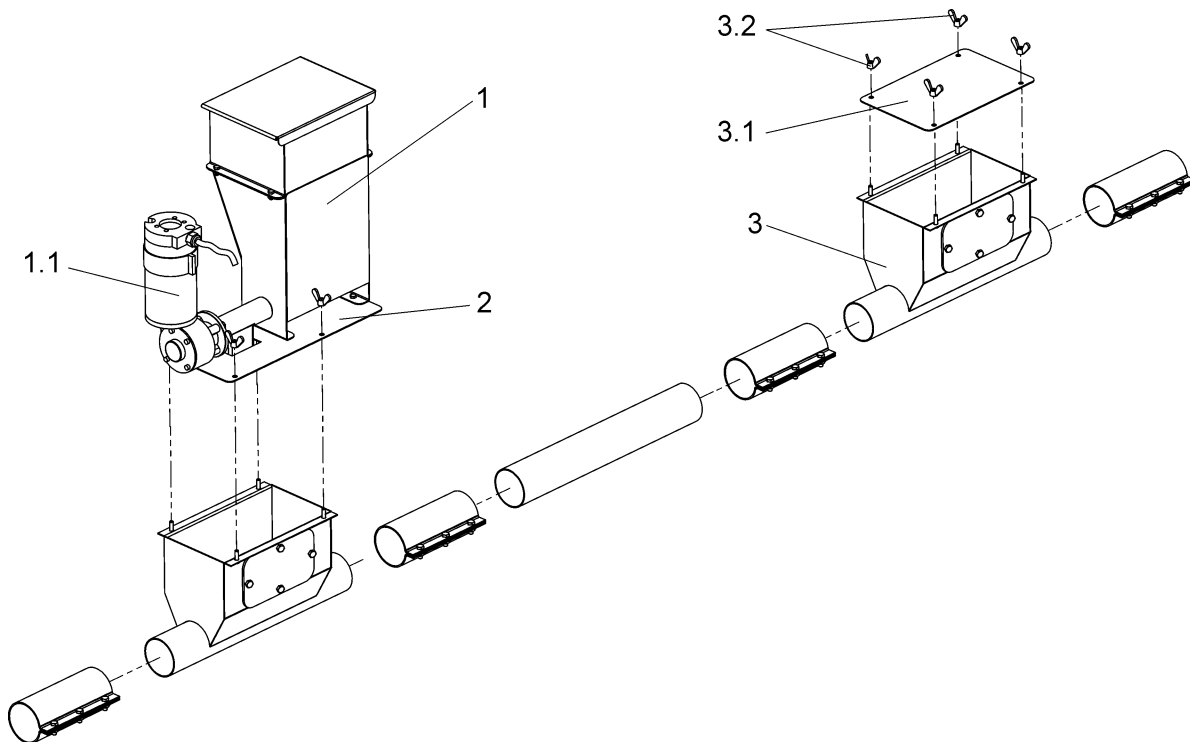


Figure 8-25: Code no. 10-86-3186 and 10-87-3287

Pos.	Quantity	Code No.	Pos.
1	1	10-87-3287	Dosimeter for small quantities without transfer
1.1	1	10-87-3288	Motor 24V IP 54 for dosimeter for small quantities
2	1	83-00-1536	Mounting plate of dosimeter for small quantities DR850/1500
3	1	10-86-3186	Transfer-set with inspection window for small quantities DR1500
3.1	1	10-87-3289	Cover for transfer of small quantities
3.2	1	99-20-1042	Wing nut M5

Table 8-4: Motor data for dosimeter for small quantities

Drive capacity	55 W
Voltage	24 V
max. fuse protection	23 A
Protective system	IP 55

8.6.3 Operation

Calculating the required mineral feed quantity

$$m_{Mt} = \frac{m_t \times 1000 \times n}{100}$$

m_{Mt} mineral feed [g/min]

n mineral feed content [%]

m_t conveying capacity of the DR 1500 [kg/min]

Evaluating the conveying capacity of a dry feeding system at one drop tube:

Place the container underneath a drop pipe and let the installation run for 1 minute. Subsequently weigh out the caught quantity.

Example:

Desired mineral feed content: 0,5%

Conveying capacity determined in self-experiment DR 1500: 50 kg/min

The following mineral feed quantity results from this when the formula is used:

$$m_{Mt} = \frac{50 \text{ kg/min} \times 1000 \times 0,5\%}{100}$$

$$m_{Mt} = 250 \text{ g/min}$$

Adjusting the mineral feed dosimeter at the transfer shaft:

1. Open cover of vessel. Collect and weigh the quantity dispensed by the mineral feed dosimeter.
2. Finally compare the weighed quantity with the required quantity and readjust at the control if necessary.
3. Repeat this procedure until the dispensed quantity matches the calculated quantity.



If the mineral feed is changed, the mineral feed quantity has to be adjusted according to the manufacturer's instructions!



9 Drive unit

9.1 Assembly and operation

The driving wheel (pos. 1) is directly driven by the gear motor (pos. 2). The tensioning wheel (pos. 3) is bedded on a rider (pos. 4) that is tensioned by springs (pos. 5).

During operation, the correct initial tension is controlled by a limit switch (pos. 6). The limit switch immediately stops the drive unit, if the tension in the rope / chain increases too much and the rope or chain stretches too much.



The limit switch (pos. 7) fulfils the function of a safety switch. It switches off the drive, as soon as the cover is opened.

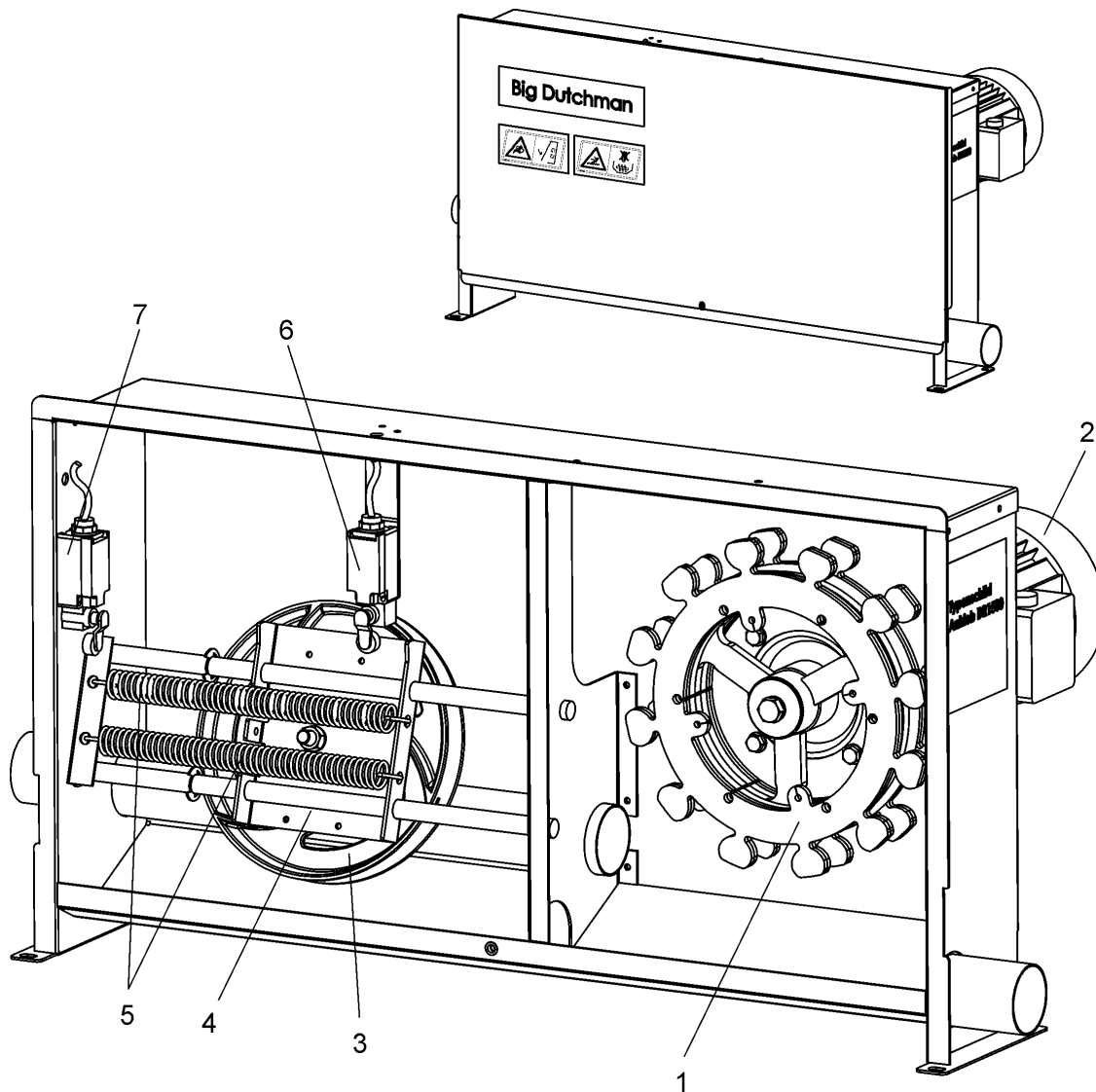


Figure 9-1: drive DR 1500



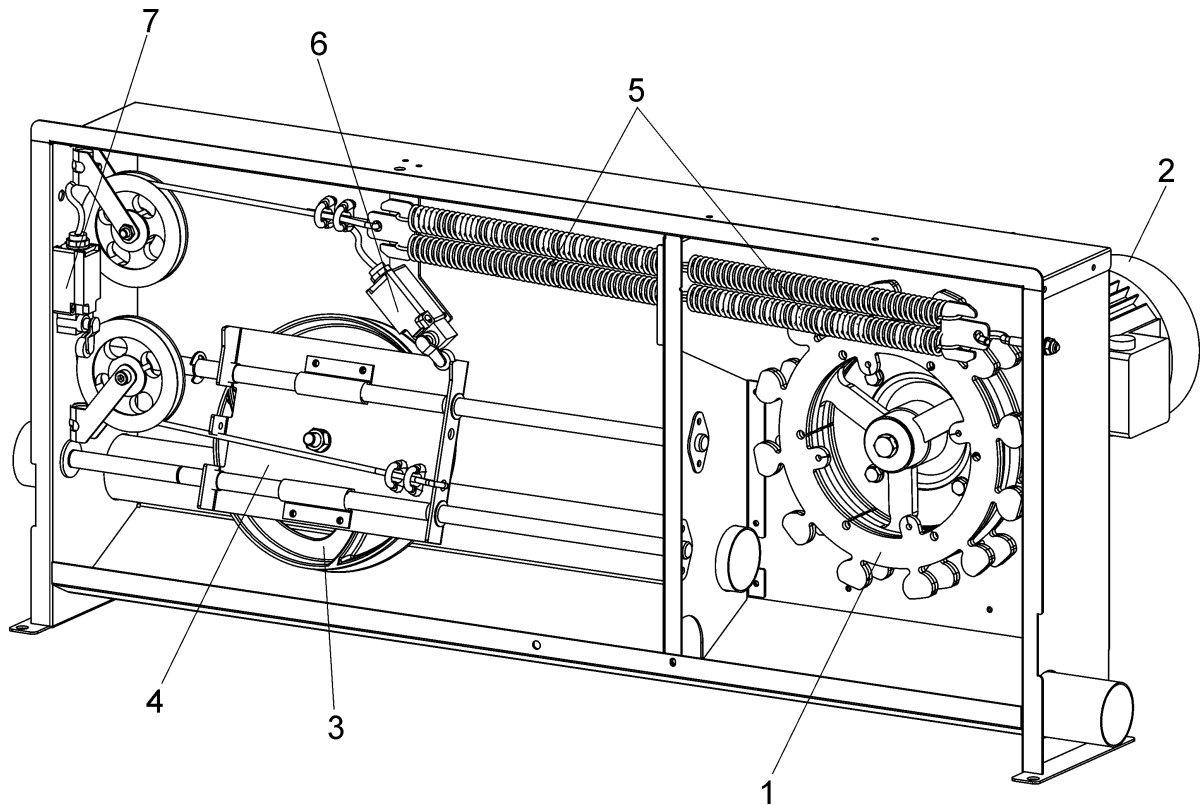


Figure 9-2: drive DR 1500 XXL

9.2 Driving modes

9.2.1 Drive DR 1500



Please note the instruction leaflet by **Big Dutchman** (code-no. 99-97-2607) with explosion drawing and parts list. Use the instructions for the assembly and spare parts orders.

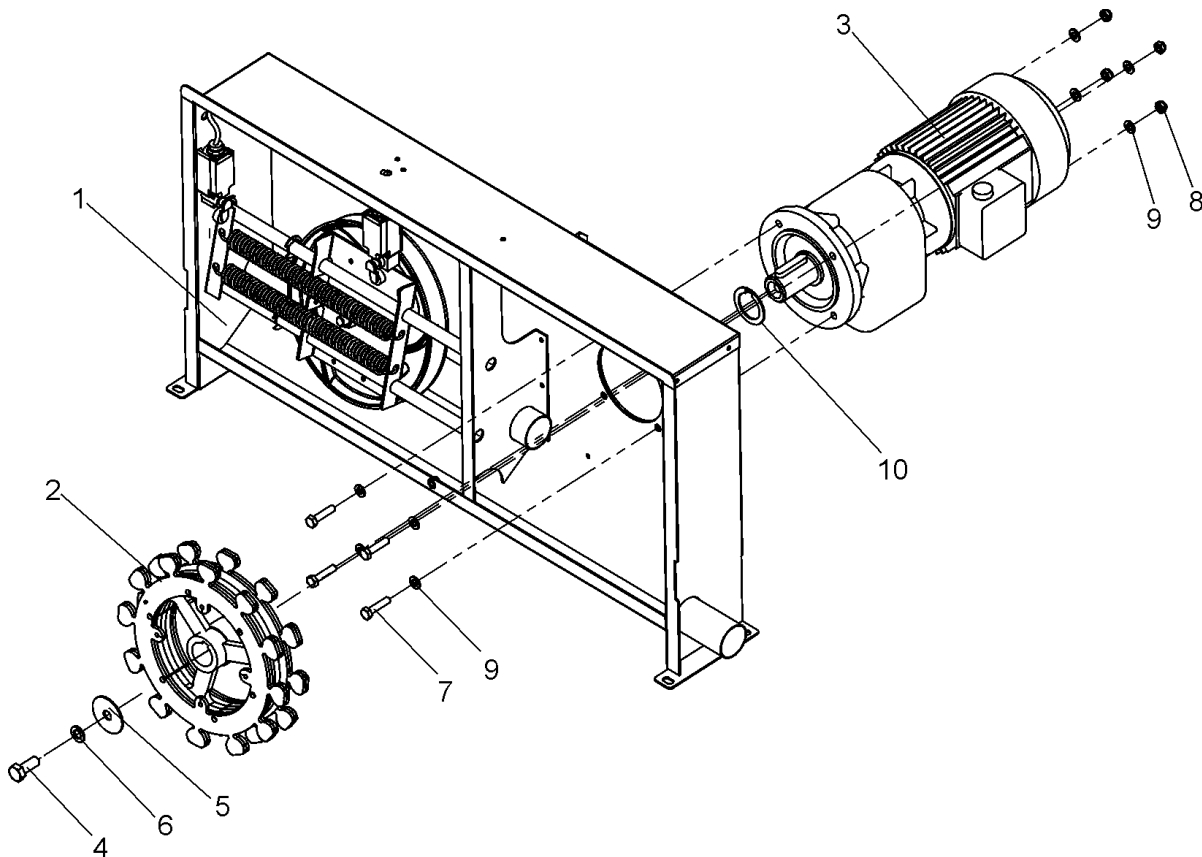


Figure 9-3: Code no. 83-01-2662, -2663, -2664, -3547, -3557

For feed lines up to 200 m:

Pos.	Quantity	Code No.	Description
	1	83-01-3557	Antrieb 0,75KW Edelst. DR1500 230/400V 50Hz 3PH / Umlauf 200m
1	1	83-01-2657	Drive DR1500 assembled without motor and driving wheel
2	1	83-00-5610	Driving wheel w/spoke DR1500 conveyor cable + chaine white
3	1	10-88-3729	Mot-g 0,75 230/400 50 3PH 31r shaft 35x56 G112F 4D80B-4
4-10	1	83-01-2665	Mounting-set for motor and driving wheel DR850/1500

For feed lines up to 300 m:

Pos.	Quantity	Code No.	Description
	1	83-01-2662	Drive 1,50KW SST DR1500 230/400V 50Hz 3PH / cable+chain
1	1	83-01-2657	Drive DR1500 assembled without motor and driving wheel
2	1	83-00-5610	Driving wheel w/spoke DR1500 conveyor cable + chaine white
3	1	10-88-4029	Mot-g 1,50 230/400 50 3PH 31r shaft 35x56 G112F 4D80B-4
4-10	1	83-01-2665	Mounting-set for motor and driving wheel DR850/1500

Pos.	Quantity	Code No.	Description
	1	83-01-2663	Drive 1,50KW SST DR1500 230/230V 60Hz 3PH / cable+chain
1	1	83-01-2657	Drive DR1500 assembled without motor and driving wheel
2	1	83-00-5610	Driving wheel w/spoke DR1500 conveyor cable + chaine white
3	1	10-88-4049	Mot-g 1,50 230 60 1PH 31r shaft 35x56 G112F 4D80B-4
4-10	1	83-01-2665	Mounting-set for motor and driving wheel DR850/1500

Pos.	Quantity	Code No.	Description
	1	83-01-2664	Drive 1,50KW SST DR1500 230/200V 60Hz 3PH / cable+chain
1	1	83-01-2657	Drive DR1500 assembled without motor and driving wheel
2	1	83-00-5610	Driving wheel w/spoke DR1500 conveyor cable + chaine white
3	1	10-88-4039	Mot-g 1,50 200 60 3PH 31r shaft 35x56 G112F 4D80B-4
4-10	1	83-01-2665	Mounting-set for motor and driving wheel DR850/1500

Pos.	Quantity	Code No.	Description
	1	83-01-3547	Drive 1,50KW SST DR1500 230/230V 60Hz 3PH / cable+chain
1	1	83-01-2657	Drive DR1500 assembled without motor and driving wheel
2	1	83-00-5610	Driving wheel w/spoke DR1500 conveyor cable + chaine white
3	1	10-88-4048	Mot-g 1,50 230 60 1PH 31r shaft 35x56 G112F 4D80B-4
4-10	1	83-01-2665	Mounting-set for motor and driving wheel DR850/1500

Pos.	Quantity	Code No.	Description
	1	83-02-1464	Drive 1.50,50KW SST DR1500 XXL 230V 60Hz 1PH / cable+chain
1	1	83-01-5353	Drive DR1500-XXL assembled without motor and driving wheel
2	1	83-00-5610	Driving wheel w/spoke DR1500 conveyor cable + chaine white
3	1	10-88-4049	Mot-g 1,50 230 60 1PH 31r shaft 35x58/no CSA
4-10	1	83-01-2665	Mounting-set for motor and driving wheel DR850/1500

Pos.	Quantity	Code No.	Description
	1	83-02-1466	Drive 1.50 SST DR1500 XXL 200V 60Hz 3PH / cable+chain
1	1	83-01-5353	Drive DR1500-XXL assembled without motor and driving wheel
2	1	83-00-5610	Driving wheel w/spoke DR1500 conveyor cable + chaine white
3	1	10-88-4039	Mot-g 1.50 200/60 3PH 31r shaft 35x58
4-10	1	83-01-2665	Mounting-set for motor and driving wheel DR850/1500

Pos.	Quantity	Code No.	Description
	1	83-02-1467	Drive 1.50 SST DR1500 XXL 230V 60Hz 1PH /CSA/ cable+chain
1	1	83-01-5353	Drive DR1500-XXL assembled without motor and driving wheel
2	1	83-00-5610	Driving wheel w/spoke DR1500 conveyor cable + chain white
3	1	10-88-4048	Mot-g 1,50 230 60 1PH 31r shaft 35x58/with CSA
4-10	1	83-01-2665	Mounting-set for motor and driving wheel DR850/1500

9.2.3 Mounting set for all drives

Pos.	Quantity	Code No.	Description
	1	83-01-2665	Mounting-set for motor and driving wheel DR850/1500
4	1	99-10-1274	Hexagon head screw M 12x 30 DIN 558 galv
5	1	20-90-3759	Washer 13x50-2 galv
6	1	99-50-1205	Spring washer A 12 DIN 127-A2E
7	4	99-20-1402	Hexagon head screw M 8x 35 DIN 933 SST
8	4	99-20-1193	Self-locking counter nut M 8 DIN 985 SST
9	8	99-20-1600	Washer SST A 8,4 DIN 125
10	1	83-01-3389	Spacing ring 50x36-2 with key-way drive DR850/1500

9.3 Mounting instructions

Mount the driving wheel to the shaft, treat the gear bearing with care. For drawing up, use the tappings at the front end of the shaft.



As shaft, bearing and other parts of the drive might be damaged, it is not allowed to dash the driving wheel against the shaft.

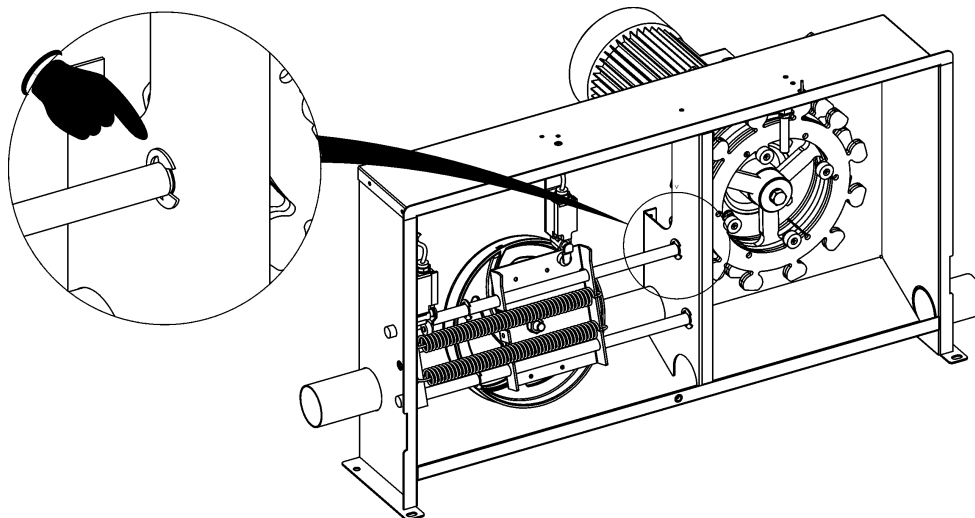


Figure 9-5: Drive unit: correct fit of the snap ring



Make sure that the snap ring sits directly at the housing wall (see figure 9-5).

Make sure that the ventilator cowl always stays free. It has to be protected from blockages caused by dust or similar substances.



If the ventilation is not working properly, the gear motor can get too hot and the motor might burn through.

Check the sense of rotation of the drive unit before taking the system into operation to avoid possible damages at the installation.



After the assembly is finished, let the motor run for some moments and check if the driving wheel runs with the correct sense of rotation.

9.4 Accessories

9.4.1 Wall fastening for the drive

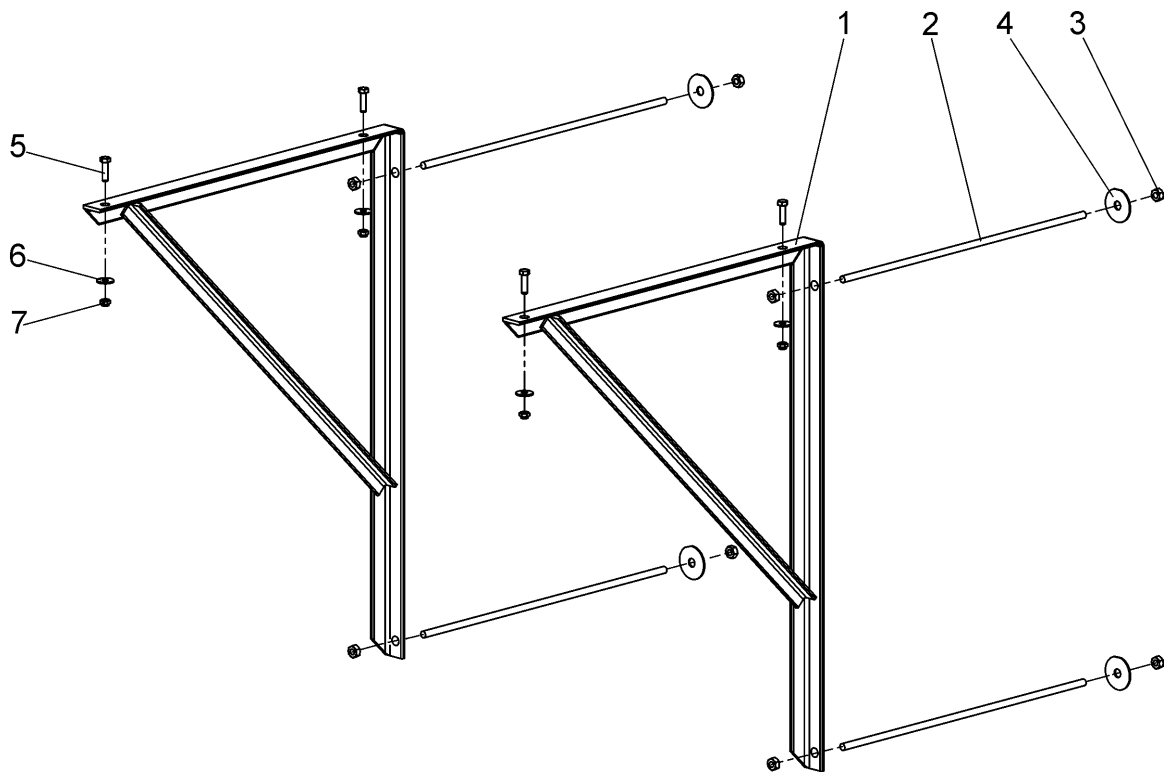


Figure 9-6: Code no. 10-86-3090

Pos.	Quantity	Code No.	Description
	1	10-86-3090	Wallbracket for drive DF
1	2	30-00-3780	Bracket
2	2	99-10-3710	Rod threaded M10x1000 DIN 975 galv
3	8	99-20-1029	Hexagon nut M 10 galv DIN 555
4	4	20-90-3759	Washer 13x50-2 galv
5	4	99-10-1058	Hexagon head screw M 8x 30 DIN 558 galv
6	4	37-80-2011	Washer A 8.4x25x2.0 DIN 9021 galv
7	4	99-20-1064	Self-locking counter nut M 8 DIN 985-6 galv



For fastening of the drive, bore a second bore hole of $\varnothing 9\text{mm}$ in every bracket at the distance as shown in figure 9-7.



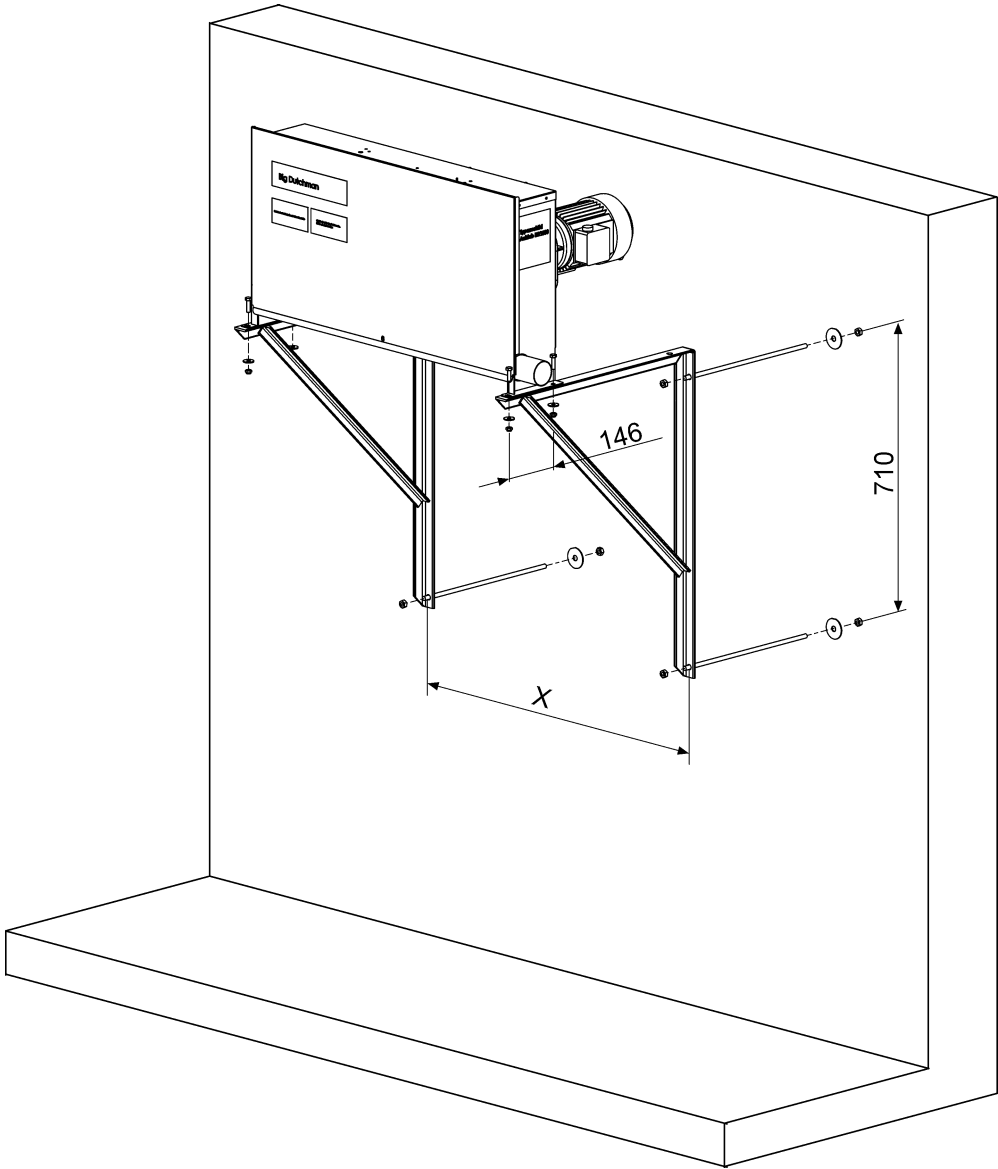


Figure 9-7: Drive with wall fastening

dimensions:

	X
Drive DR 1500	870mm
Drive DR 1500 XXL	1070mm

9.4.2 Floor rack galv. cpl

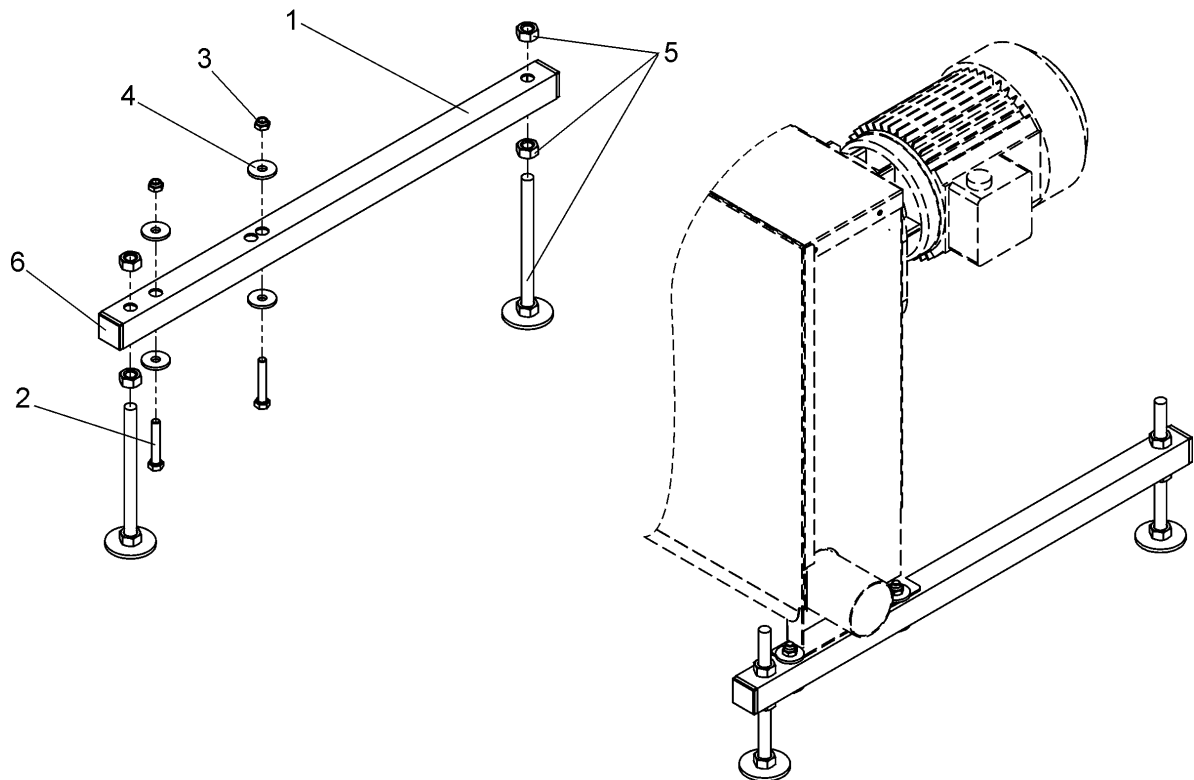


Figure 9-8: Code no. 83-02-1138

Pos.	Quantity	Code No.	Description
	1	83-02-1138	Floor rack galv. cpl. for drive DR850/1500
1	2	83-02-1126	Foot galv DR850/1500
2	4	99-20-1409	Hexagon head screw M 8x 50 DIN 933 SST
3	4	99-20-1193	Self-locking counter nut M 8 DIN 985 SST
4	8	99-20-1177	Washer A 8.4x25x2.0 DIN 9021 SST
5	4	38-98-3611	Foot fully threaded M12x165
6	4	65-02-3918	Plug for square tube 30x30x2



As an alternative to foot M12x165 (pos. 5), foot SST M10x200 (code-no. 83-02-1136) can be used.

9.4.3 Foot fully threaded M12x165

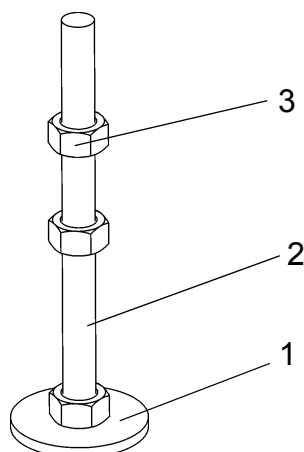


Figure 9-9: Code no. 38-98-3611

Pos.	Quantity	Code No.	Description
	1	38-98-3611	Foot SST M12x165
1	1	83-02-1156	Foot plate M12 galv.
2	1	83-02-1153	Threaded rod galv. M12x160
3	2	99-20-1053	Hexagon nut M 12 galv. DIN 555

9.4.4 Foot SST M10x200

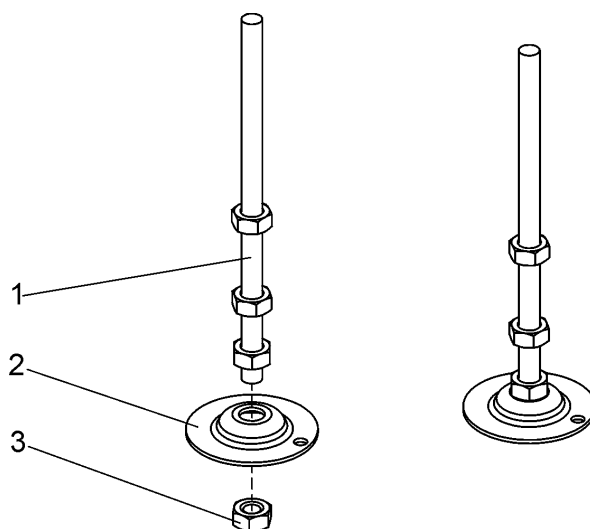


Figure 9-10: Code no. 83-02-1136

Pos.	Quantity	Code No.	Description
	1	83-02-1136	Foot SST M10x200
1	1	20-45-3276	Threaded rod SST m 10x 200
2	1	83-01-5022	Base plate SST for foot
3	4	99-20-1500	Hexagon nut M 10 SST DIN 934

9.4.5 Covering SST cplt. for motor

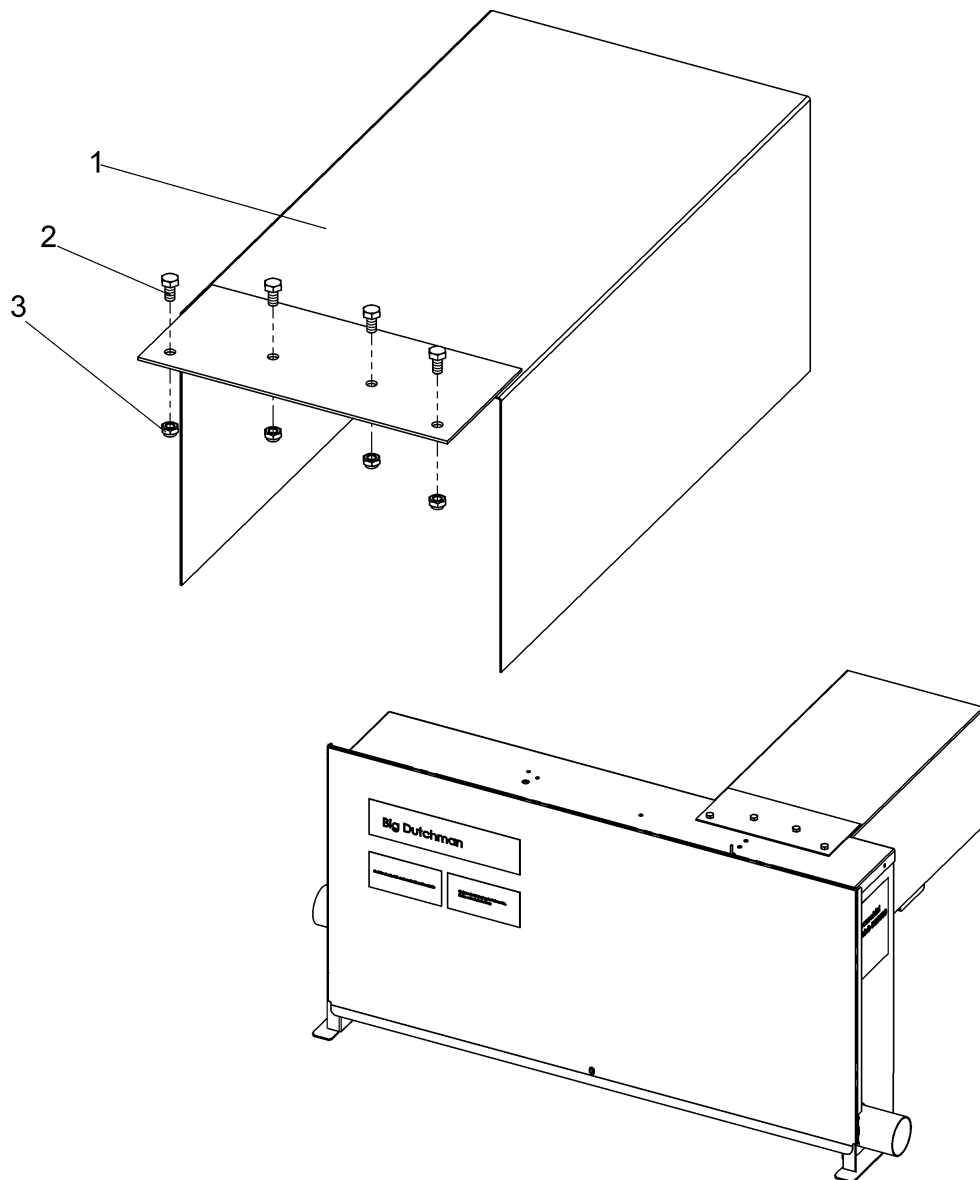


Figure 9-11: Code no. 83-02-1203

Pos.	Quantity	Code No.	Description
	1	83-02-1203	Cover SST cplt for motor DR850/1500
1	1	83-02-1185	Cover SST cplt for motor DR850/1500
2	4	99-20-1470	Hexagon head screw M 6x 12 DIN 933 SST
3	4	99-20-1131	Self-locking counter nut M 6 DIN 985 SST



Bore the boreholes for the motor cover fastenings with $\varnothing 6,5\text{mm}$ into the drive, according to the hole pattern.

9.4.6 Tensioning device cpl. for the drive

The tensioning device relieves the conveyor chain / conveyor rope at the drive:

- during the assembly
- during straightening of twisted conveyor chains
- during shortening in the scope of maintenance works.

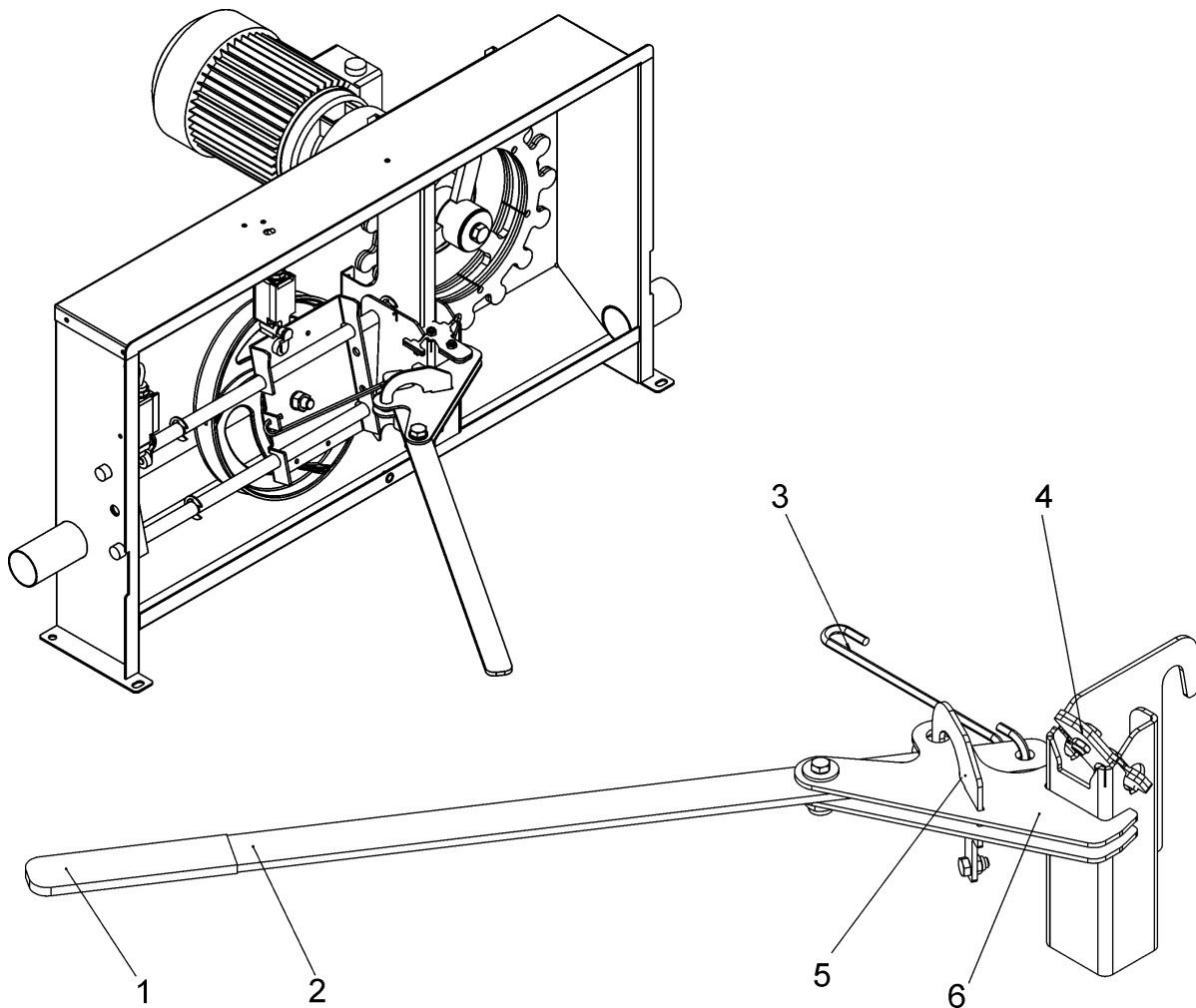
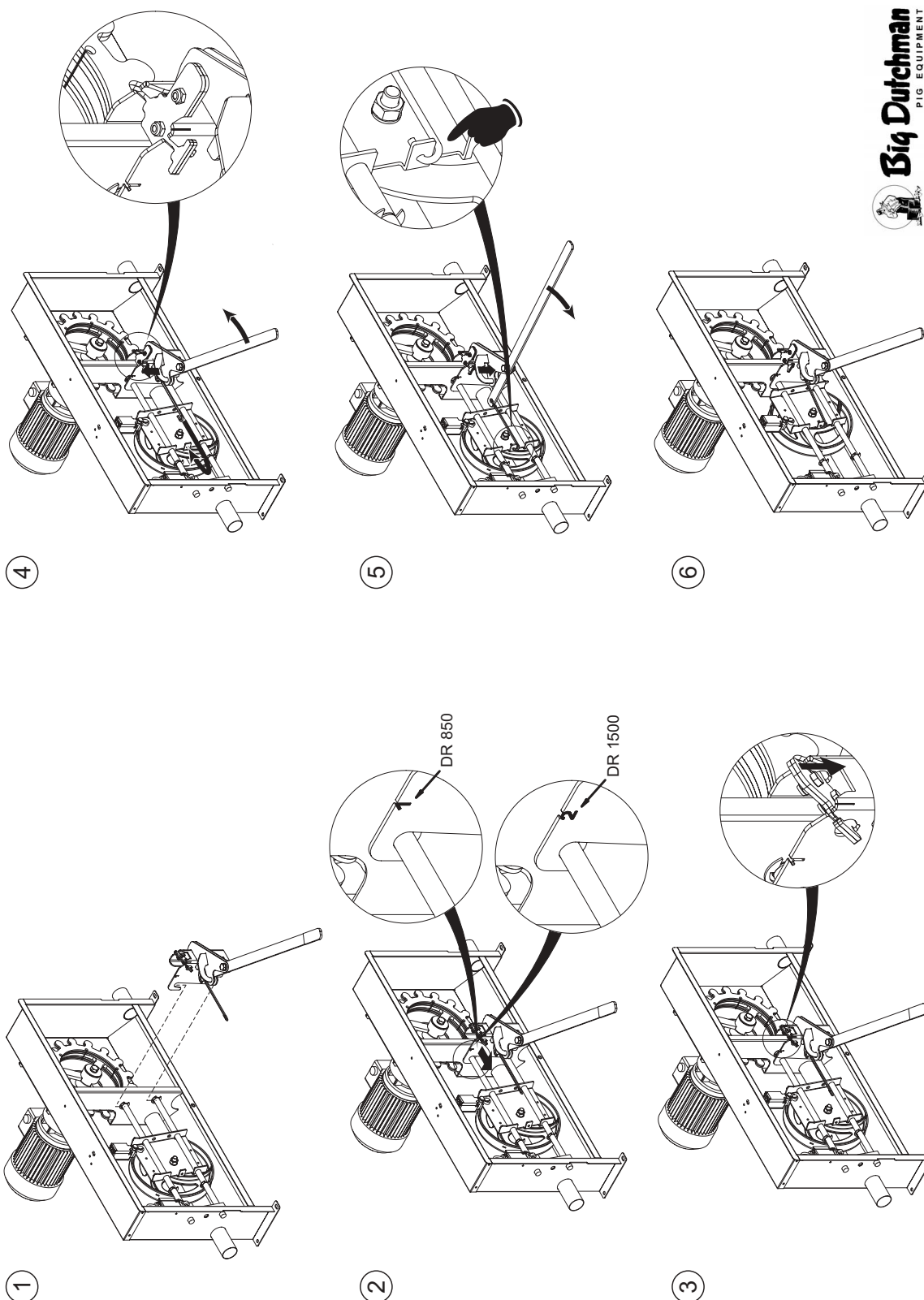


Figure 9-12: Code no. 83-01-5136

Pos.	Quantity	Code No.	Description
	1	83-01-5136	Tensioning device cpl for drive DR1500
1	1	83-01-5154	Handle PVC black 29x5-120
2	1	83-01-5359	Lever
3	1	83-01-4915	Hook for tensioning device DR
4	2	83-01-5357	Bolt
5	1	83-01-5358	Stop plate
6	1	83-01-6152	Bracket for tensioning device DR 1500



10 Feed pipe

10.1 Tube-units and couplers

10.1.1 Tube-unit with conveyor rope

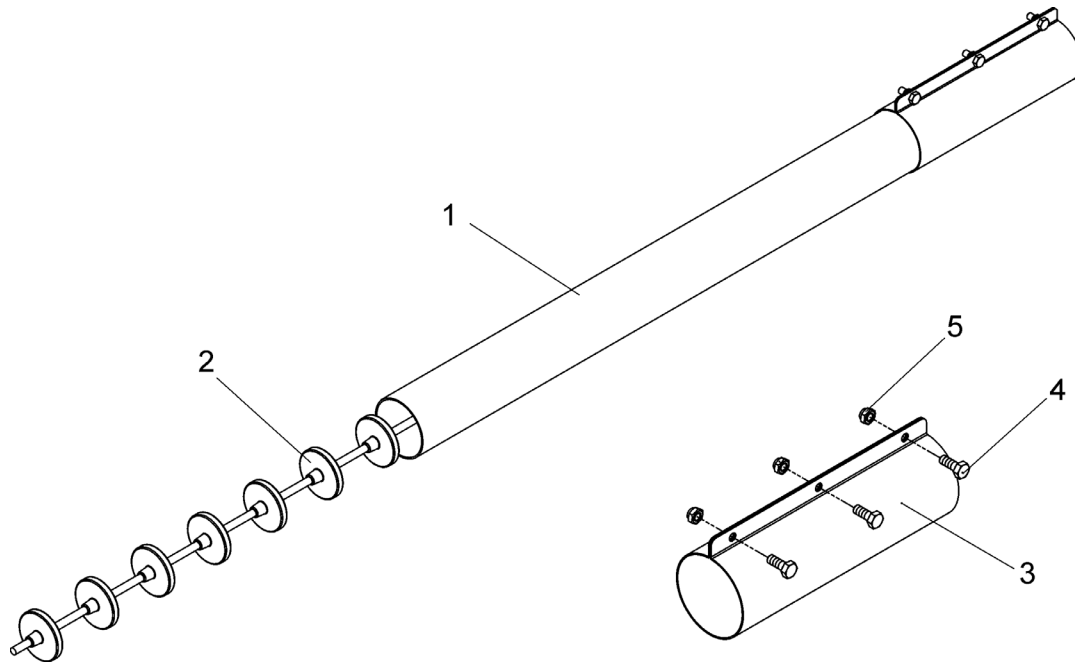


Figure 10-1: Code no. 10-87-3700

Pos.	Quantity	Code No.	Description
	1	10-87-3700	Tube-unit 60x5000 DR1500 with conveyor rope
1	1	10-87-3701	Tube 60x1,50-5000 wo/ hole TF D60/DR1500
2	5m	10-87-3707	Conveyor cable 7/49/71,5 DR1500
	1	83-01-6691	Coupler cplt. for conveying tube DR1500
3	1	83-01-4389	Coupler for conveying tube DR1500
4	3	99-10-1067	Hexagon head screw M 6x 16 galv. DIN 558
5	3	99-20-1043	Self-locking counter nut M 6 DIN 985-6 galv.

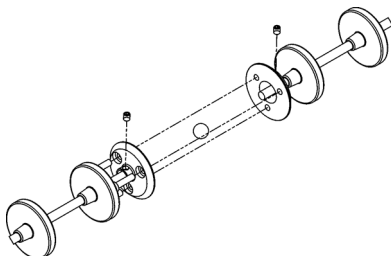


Figure 10-2: Code no. 10-87-3760

Pos.	Quantity	Code No.	Description
	1	10-87-3760	Coupler for conveying cable DR1500

10.1.2 Tube-unit with conveyor chain

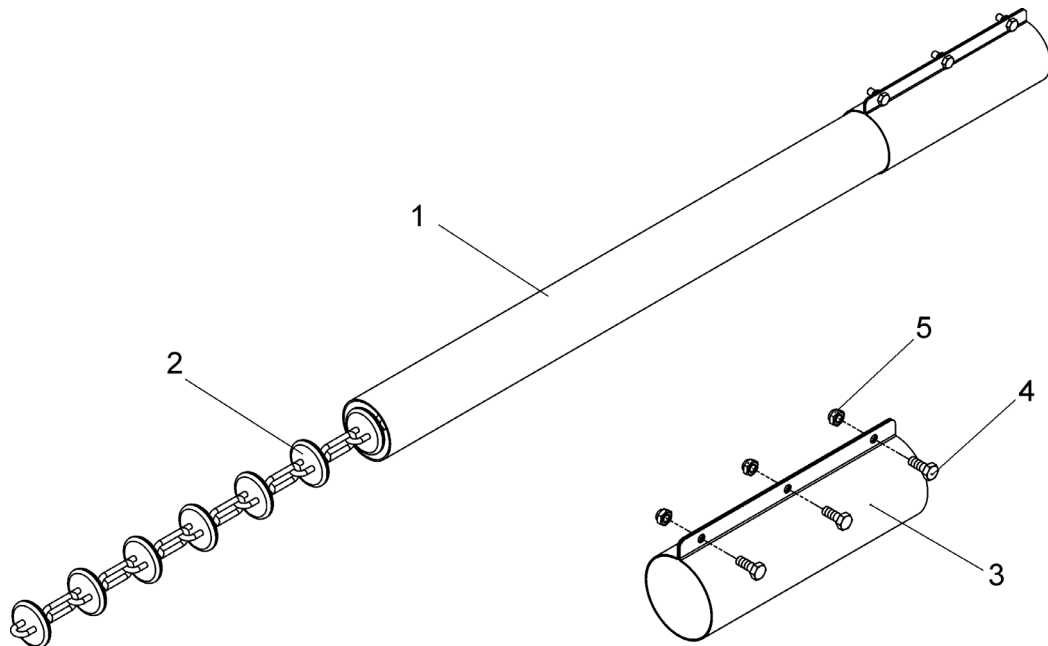


Figure 10-3: Code no. 10-88-3401

Pos.	Quantity	Code No.	Description
	1	10-88-3401	Tube-unit 60x5000 DR1500 with conveyor chain
1	1	10-87-3701	Tube 60x1,50-5000 wo/ hole TF D60/DR1500
2	5m	83-00-2367	Conveyor chain with 71,5 mm distance between discs white DR 1500
	1	83-01-6691	Coupler cplt. for conveying tube DR1500
3	1	83-01-4389	Coupler for conveying tube DR1500
4	3	99-10-1067	Hexagon head screw M 6x 16 galv. DIN 558
5	3	99-20-1043	Self-locking counter nut M 6 DIN 985-6 galv.

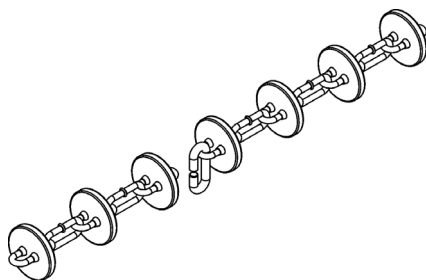


Figure 10-4: Code no. 10-88-4709

Pos.	Quantity	Code No.	Description
	1	10-88-4709	Coupler for conveyor chain DR1500

10.2 Control segment and flat steel reinforcement

10.2.1 Control segment

By means of the control segment, the filling amount is monitored. In order to allow for a correct adjustment of the right conveying capacity at the level adjustment of the feed hopper, a horizontally aligned conveyor tube is mounted directly to the feed hopper in the flow.

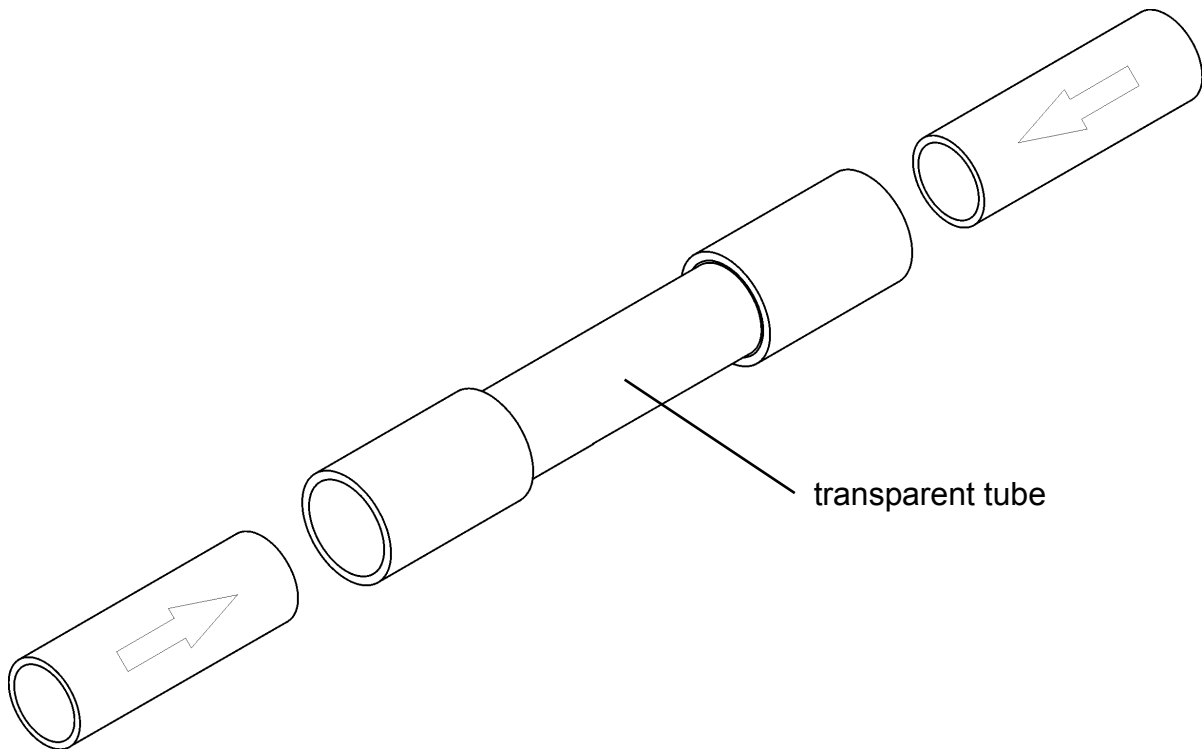


Figure 10-5: Code no. 83-00-9900

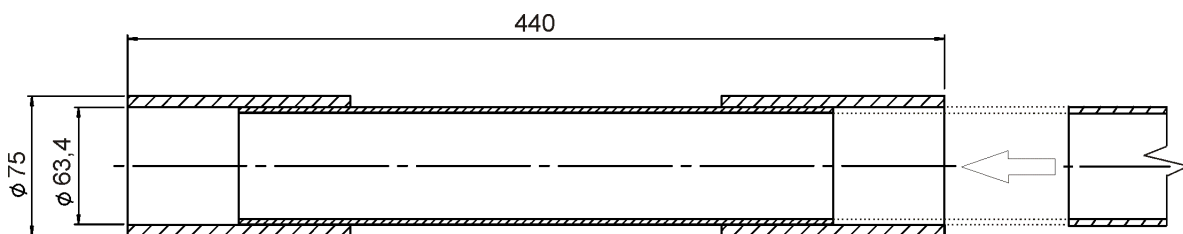


Figure 10-6: dimensions

10.2.2 Flat steel reinforcement cpl. for control segment

The flat steel reinforcement stabilises the conveyor tube (pos. 1) with integrated control segment (pos. 2).

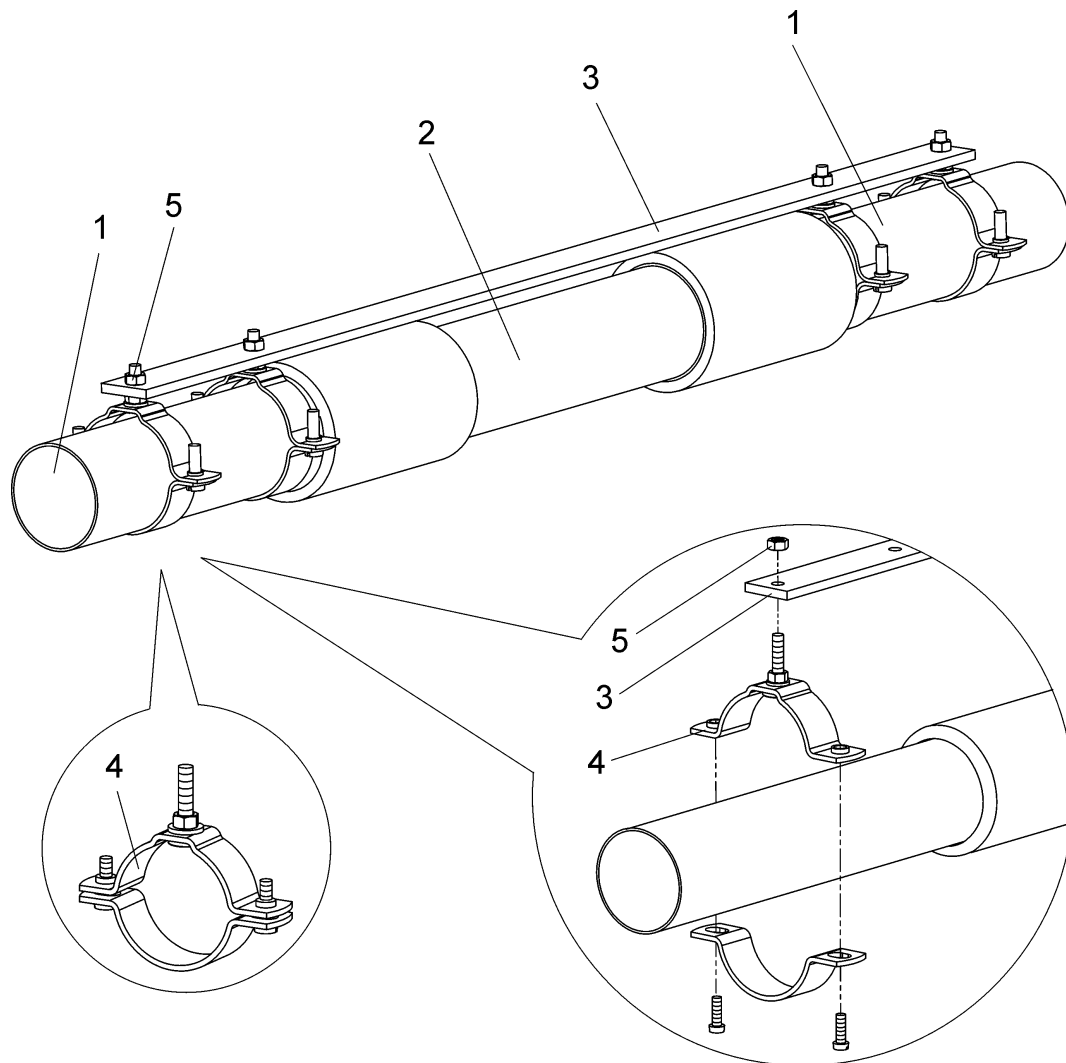


Figure 10-7: Code no. 83-01-1146

Pos.	Quantity	Code No.	Description
	1	83-01-1146	Flat steel reinforcing cpl. for control segment DR1500
3	1	83-01-1131	Flat steel for reinforcing of control segment DR1500
4	4	99-50-3038	Tube clamp dia60 w/screw 6x25
5	4	99-10-1045	Hexagon nut M 6 galv DIN 934-8

10.3 Turns

10.3.1 Corner 90deg PA6

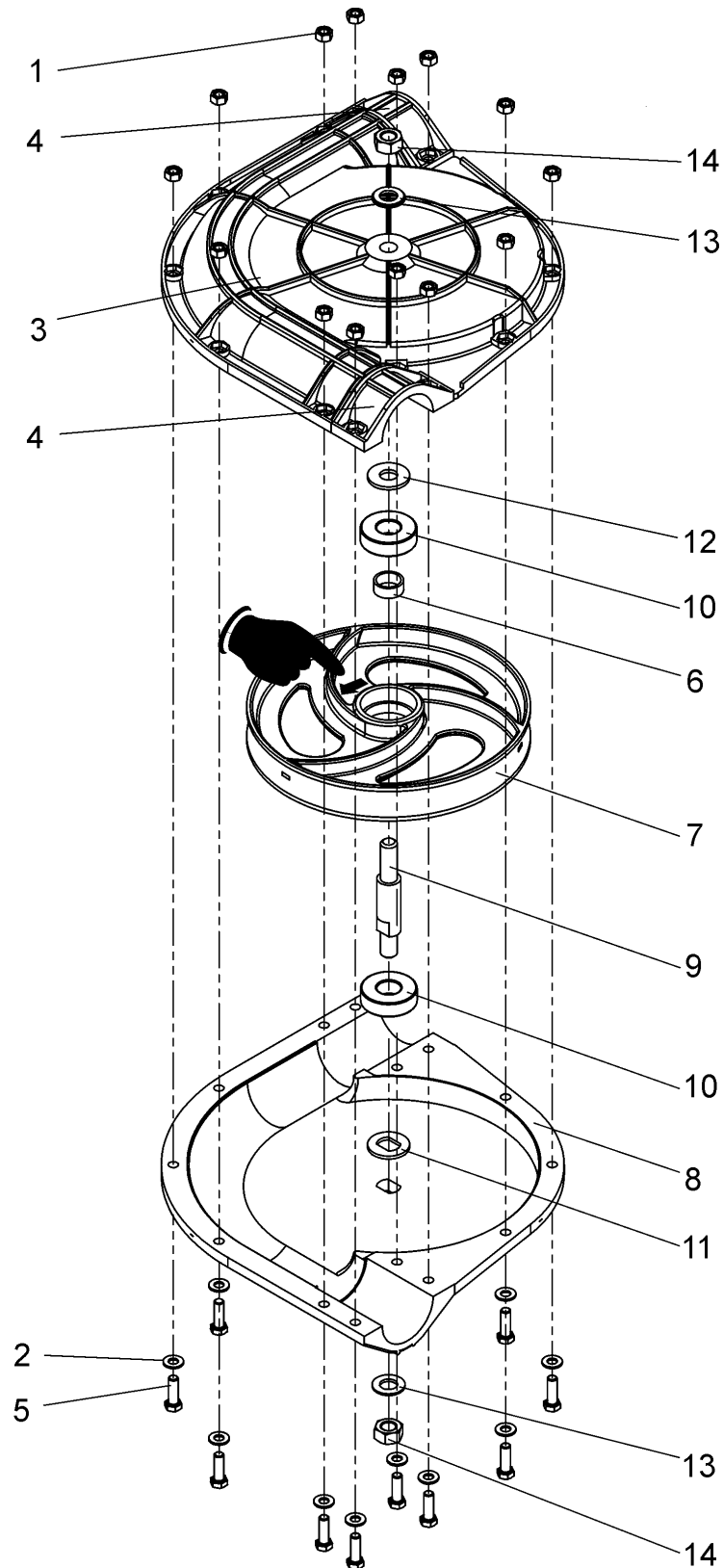


Figure 10-8: Code no. 10-87-3730

Pos.	Quantity	Code No.	Description
	1	10-87-3730	Corner 90deg PA6+GK30 cpl DR1500/TF-D60
1	14	99-20-1176	hexagon nut M 8 SST DIN 934
2	14	99-20-1600	Washer SST A 8,4 DIN 125
3	1	10-87-3732	body half upper PA6+GK30 DR1500
4	2	10-87-3733	Clamp ABS for corner TF-D60 /DR1500
5	14	99-20-1417	Hexagon head screw SST M 8x 25 DIN 933
6	1	10-87-3739	Distance sleeve for corner wheel TF-D60/DR1500
7	1	10-87-3745	corner wheel PA DR1500/TF-D60
8	1	10-87-3731	body half lower PA6+GK30 DR1500
9	1	10-87-3734	Axle for corner ABS/POM TF-D60 /DR1500
10	2	99-98-4682	ball bearing 6204 LLU
11	1	10-87-3736	Washer V 14,5x20x3x35 galv
12	1	10-87-3737	Washer R 15x35x3 galv
13	2	99-50-1085	Washer B 15 DIN 125 galv.
14	2	99-20-1050	hexagon nut M 14 galv. DIN 555



When assembling the corner wheel (pos. 7), pay attention to the conveying direction (see figure 10-21).



Make sure to assemble washer R and washer B in the correct order. If the washers are mixed up, the inner ring of the ball bearing is going to get jammed once the hexagon nuts M12 are tightened.



In case of an outside-assembly, seal the corner with silicone.



10.3.2 Corner 90deg SST

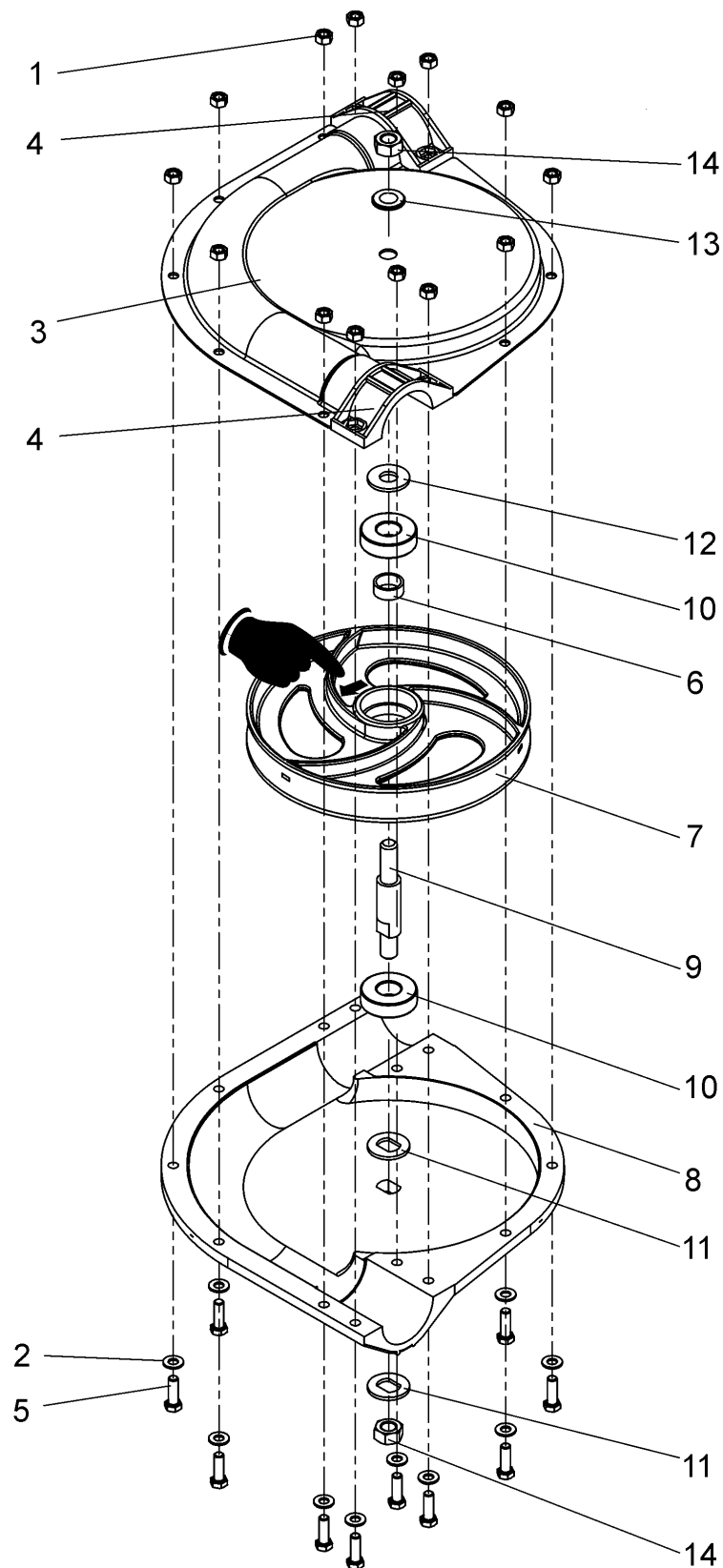


Figure 10-9: Code no. 83-00-2198

Pos.	Quantity	Code No.	Description
	1	83-00-2198	Corner 90deg SST/SST cpl. DR1500/TF-D60
1	14	99-20-1176	hHexagon nut M 8 SST DIN 934
2	14	99-20-1600	Washer SST A 8,4 DIN 125
3	1	83-00-2191	Body half upper SST DR1500
4	2	10-87-3733	Clamp ABS for corner TF-D60 /DR1500
5	14	99-20-1400	Hexagon head screw SST M 8x 16 DIN 933
	1	83-00-2197	Body half lower SST DR1500 with corner wheel and ball bearing
6	1	10-87-3739	Distance sleeve for corner wheel TF-D60/DR1500
7	1	10-87-3745	Corner wheel PA DR1500/TF-D60
8	1	83-00-2193	Body half lower SST DR1500
9	1	83-00-2196	Axle for corner SST TF-D60 /DR1500
10	2	99-98-4682	Ball bearing 6204 LLU
11	2	83-00-3827	Washer V 14,5x20x3x35 SST
12	1	83-00-3826	Washer R 15x35x3 SST
13	1	83-00-3829	Washer SST B 15 DIN 125
14	2	83-00-3828	Hexagon nut M 14 SST DIN 934



When assembling the corner wheel (pos. 7), pay attention to the conveying direction (see figure 10-21).



Make sure to assemble washer R and washer B in the correct order. If the washers are mixed up, the inner ring of the ball bearing is going to get jammed once the hexagon nuts M12 are tightened.



In case of an outside-assembly, seal the corner with silicone.



10.4 Tube supports



The spacing of supports is not to be larger than a max. of 2.5 m.

10.4.1 Tube support cpl. for 1 tube with tube clamp

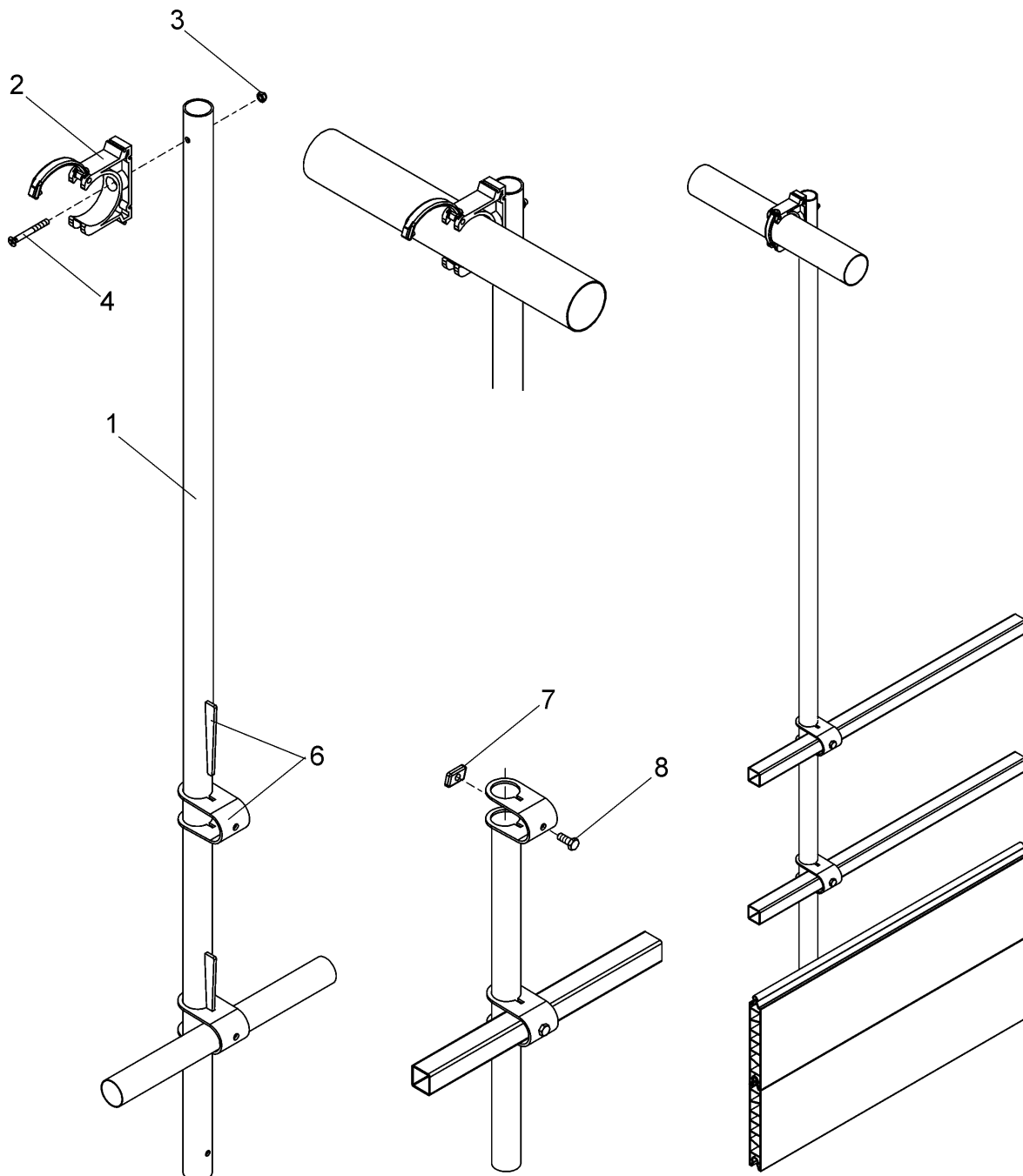


Figure 10-10: Code no. 20-50-3680 & 20-50-3706

Pos.	Quantity	Code No.	Description
	1	20-50-3680	Support 1"x1800 cpl for 1 tube 63mm
1	1	20-51-3008	Pipe 1"x1800 galv with boring
2	1	99-40-3766	Tube clip A 63 w/bracket
3	1	99-20-1043	Self-locking counter nut M 6 DIN 985-6 galv
4	1	99-10-1680	Cross recessed countersunk head screw M 6x55 DIN 965-5.8
	2	99-50-1188	Pipe clamp cpl for pipe 1" and 30x30x2
6	1	99-50-1183	Clamp pipe 1" galv with cotter
7	1	99-50-1189	Screw plate galv M8-30x17x6
8	1	99-10-1038	Hexagon head screw M 8x 20 DIN 558 galv

Pos.	Quantity	Code No.	Description
	1	20-50-3706	Support 1"x1500 cpl for 1 tube 63mm
1	1	20-50-3518	Pipe 1"x1500 galv with boring
2	1	99-40-3766	Tube clip A 63 w/bracket
3	1	99-20-1043	Self-locking counter nut M 6 DIN 985-6 galv
4	1	99-10-1680	Cross recessed countersunk head screw M 6x55 DIN 965-5.8
	2	99-50-1188	Pipe clamp cpl for pipe 1" and 30x30x2
6	1	99-50-1183	Clamp pipe 1" galv with cotter
7	1	99-50-1189	Screw plate galv M8-30x17x6
8	1	99-10-1038	Hexagon head screw M 8x 20 DIN 558 galv

10.4.2 Tube support cpl. for 1 tube

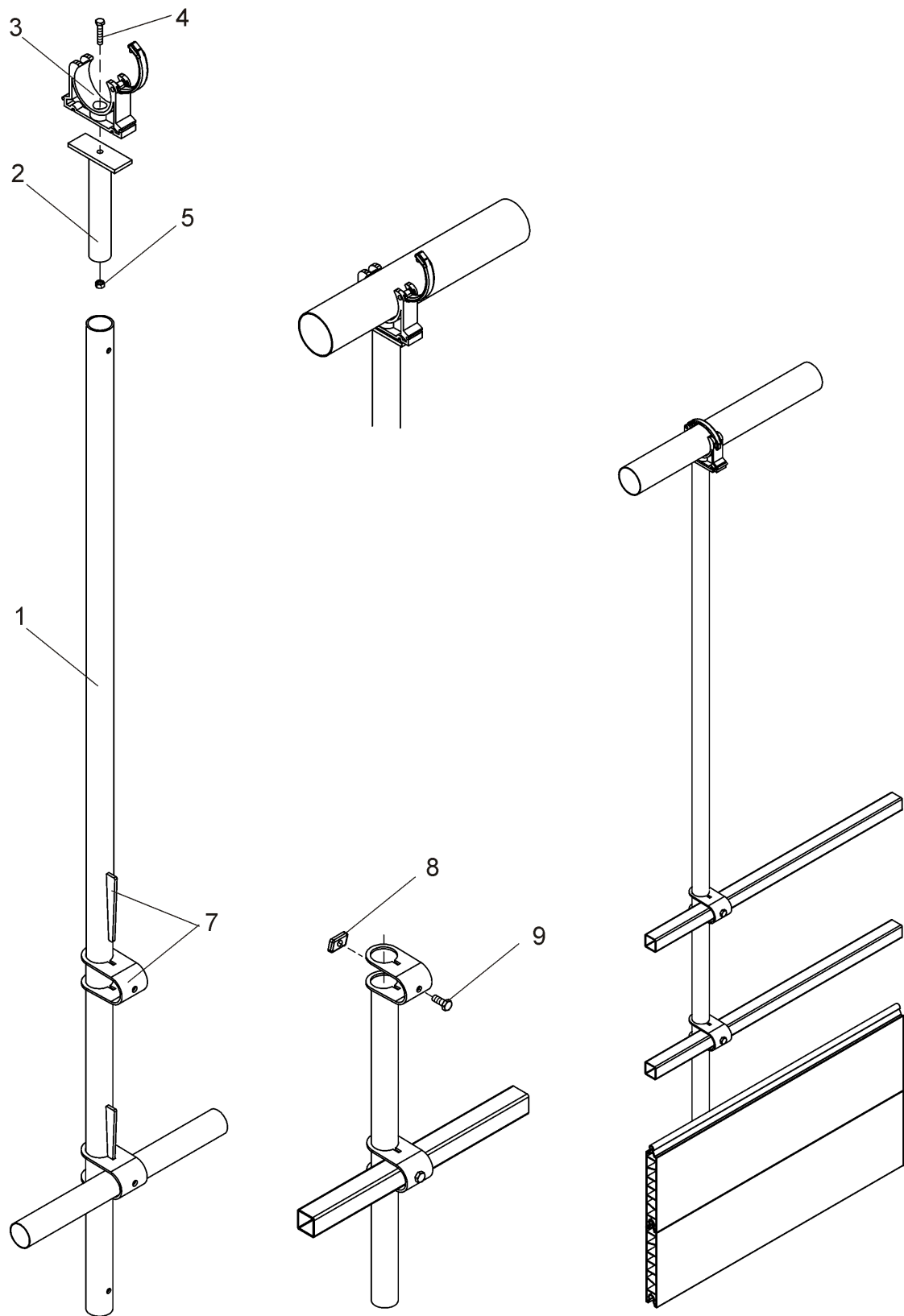


Figure 10-11: Code no. 10-86-3070

Pos.	Quantity	Code No.	Description
	1	10-86-3070	Support 1"x1500 cpl for 1 tube 60mm
1	1	20-50-3518	Pipe 1"x1500 galv with boring
2	1	10-86-3075	Upper part f/tube support TF60/DR1500
3	1	99-40-3766	Tube clip A 63 w/bracket
4	1	99-10-1679	Cross recessed countersunk head screw M 6x25 DIN 965-5.8
5	1	99-20-1043	Self-locking counter nut M 6 DIN 985-6 galv
	2	99-50-1188	Pipe clamp cpl for pipe 1" and 30x30x2
7	1	99-50-1183	Clamp pipe 1" galv with cotter
8	1	99-50-1189	Screw plate galv M8-30x17x6
9	1	99-10-1038	Hexagon head screw M 8x 20 DIN 558 galv

10.4.3 Support C-profile for 1 tube

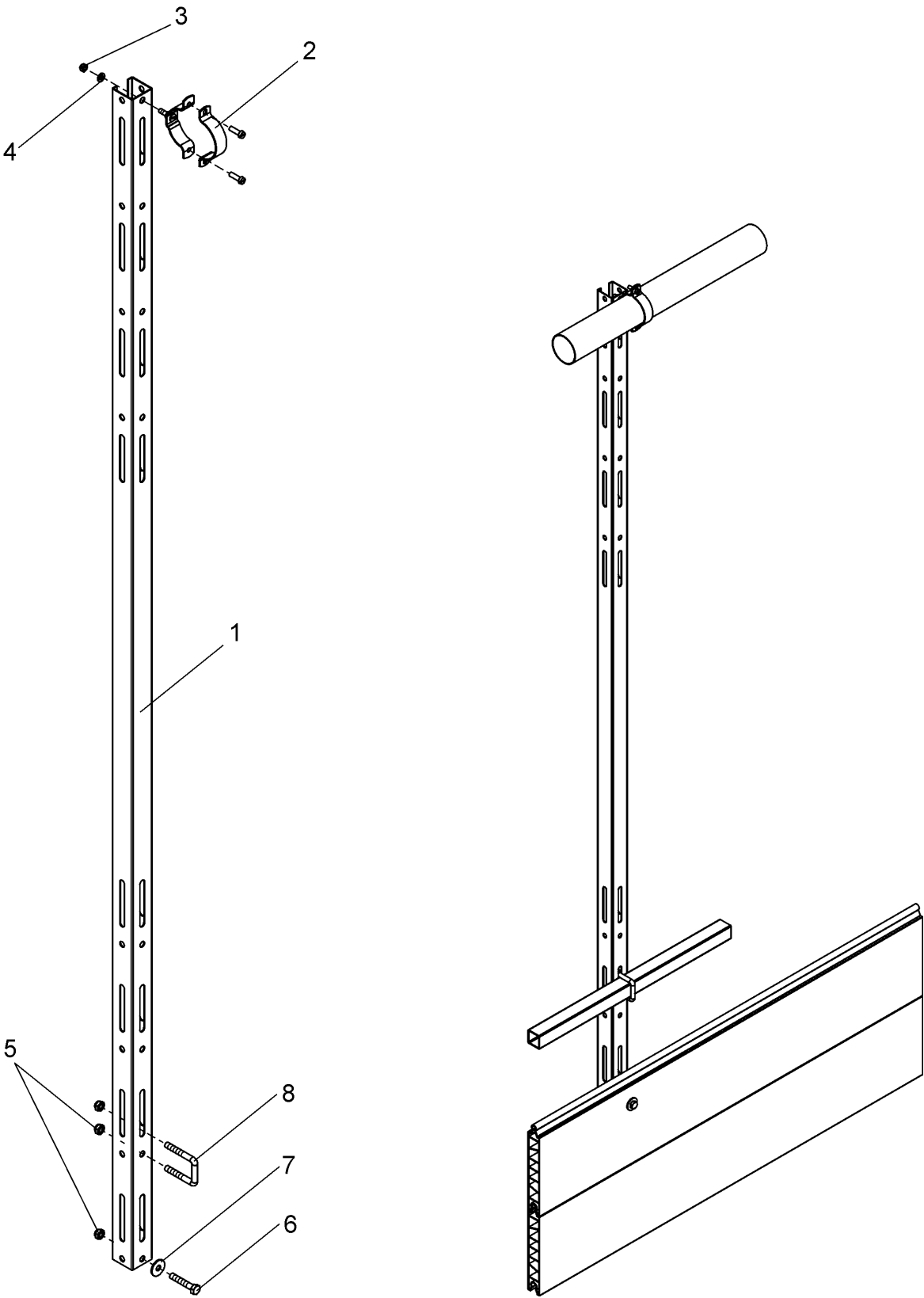


Figure 10-12: Code no. 10-86-3081

Pos.	Quantity	Code No.	Description
	1	10-86-3081	Support C-profile x 2000mm for 1 tube 60mm with pipe clamp
1	1	10-87-3094	Support C-profile x 2000mm
2	1	99-50-3038	Tube clamp dia60 w/screw 6x25
3	1	99-20-1043	Self-locking counter nut M 6 DIN 985-6 galv
4	1	99-50-1147	Washer B 6,4 DIN 125 galv
5	3	99-20-1064	Self-locking counter nut M 8 DIN 985-6 galv
6	1	99-10-1207	Hexagon head screw M 8x 45 DIN 558 galv
7	1	37-80-2011	Washer A 8,4x25x2,0 DIN 9021 galv
8	1	99-50-3024	U-bolt rectangul. 8x20/W32/H45 galv

10.4.4 Support cplt. for 2 tubes with tube clip

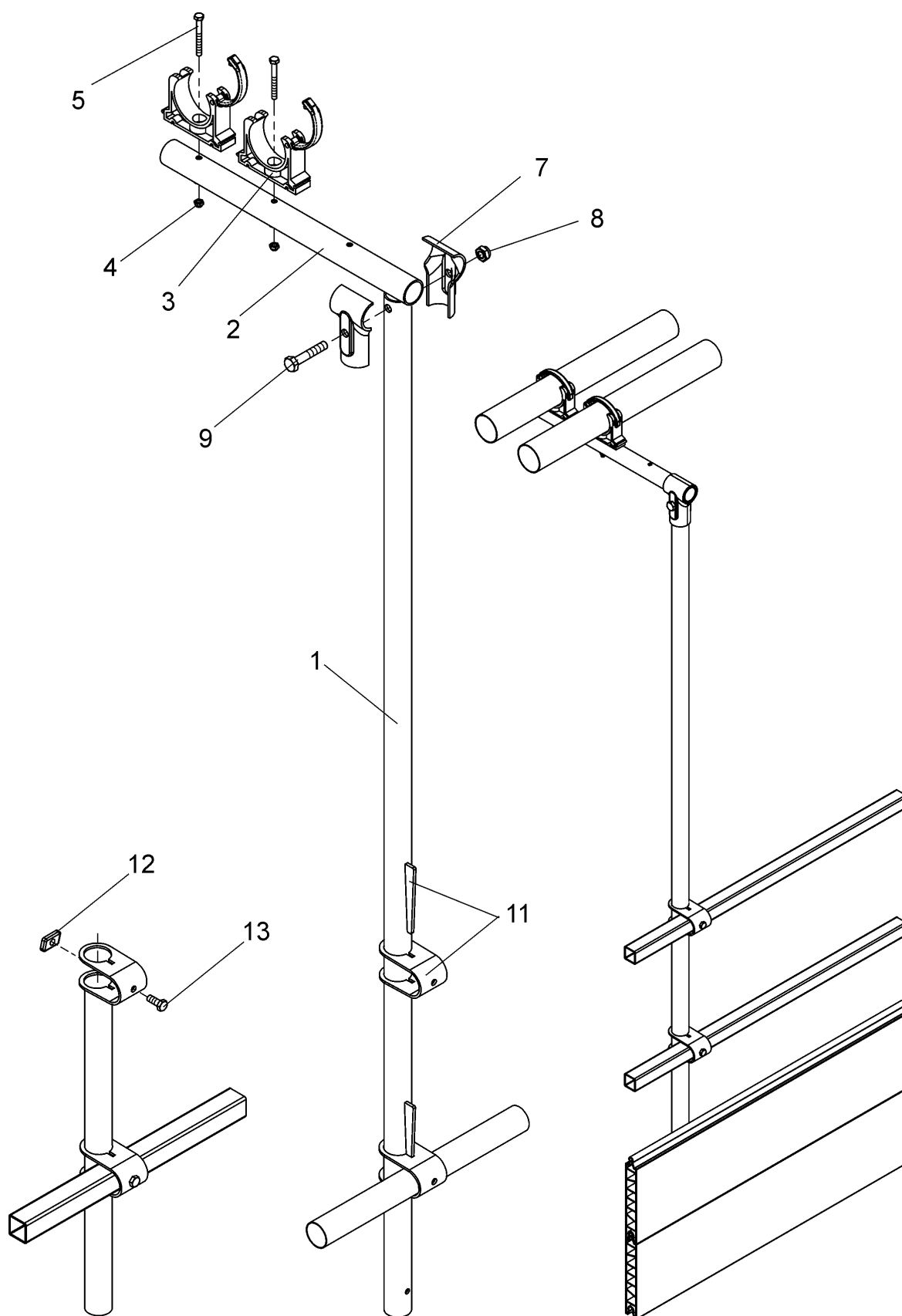


Figure 10-13: Code no. 10-86-3078

Pos.	Quantity	Code No.	Description
	1	10-86-3078	Support 1"x1500 cpl for 2 tubes 60mm
1	1	20-50-3518	Pipe 1"x1500 galv with boring
2	1	10-86-3077	Pipe 1"x 420 with 3 borings
3	2	99-40-3766	Tube clip A 63 with bracket
4	2	99-20-1043	Self-locking counter nut M 6 DIN 985-6 galv
5	2	99-10-1680	Cross recessed countersunk head screw M 6x55 DIN 965-5.8 galv
	1	99-50-3030	T-pipe clamp cpl 1"x1"
7	2	65-00-3676	T-pipe clamp half 1"x1"
8	1	99-20-1065	Self-locking counter nut M 10 DIN 980-8 galv
9	1	99-10-1236	Hexagon head screw M 10x 60 DIN 558 galv
	2	99-50-1188	Pipe clamp cpl for pipe 1" and 30x30x2
11	1	99-50-1183	Clamp pipe 1" galv with cotter
12	1	99-50-1189	Screw plate galv M8-30x17x6
13	1	99-10-1038	Hexagon head screw M 8x 20 DIN 558 galv

10.5 Wall fastenings



The spacing of supports is not to be larger than a max. of 2.5 m.

10.5.1 Wall bracket for 1 tube with tube clip

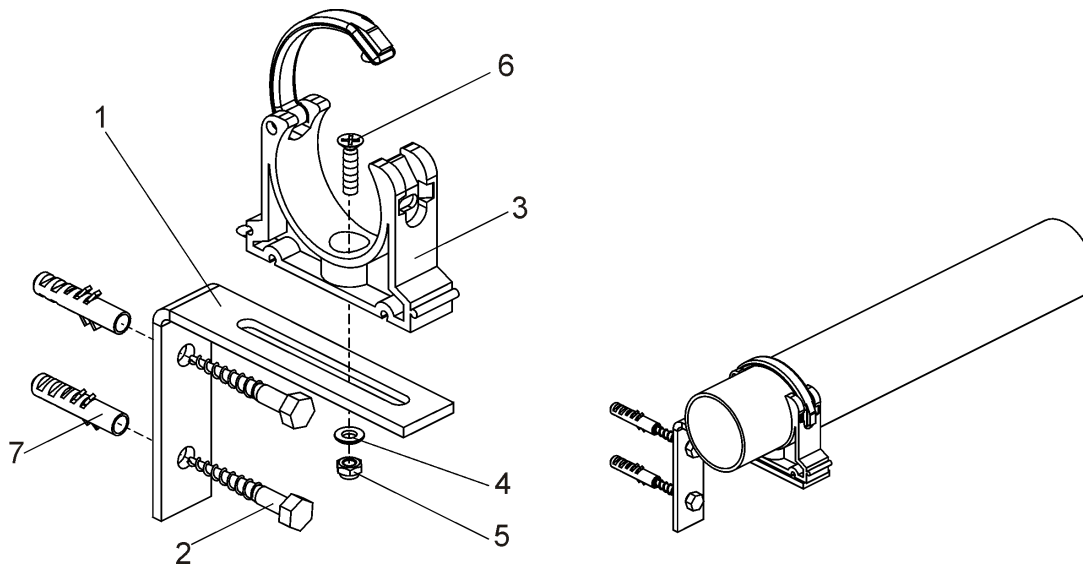


Figure 10-14: Code no. 20-50-3058

Pos.	Quantity	Code No.	Description
	1	20-50-3058	Wall bracket for 1 tube 63mm
1	1	20-50-3716	Angle bracket galv for 1 tube
2	2	99-10-3733	Hexagon wood screw 8x 60 DIN 571-ST galv
3	1	99-40-3766	Tube clip A 63 with bracket
4	1	99-50-1147	Washer B 6,4 DIN 125 galv
5	1	99-20-1043	Self-locking counter nut M 6 DIN 985-6 galv
6	1	99-10-1679	Cross recessed countersunk head screw M 6x25 DIN 965-5.8
7	2	99-98-3822	Dowel S 10 MEA

10.5.2 Wall bracket for 2 tubes with tube clip

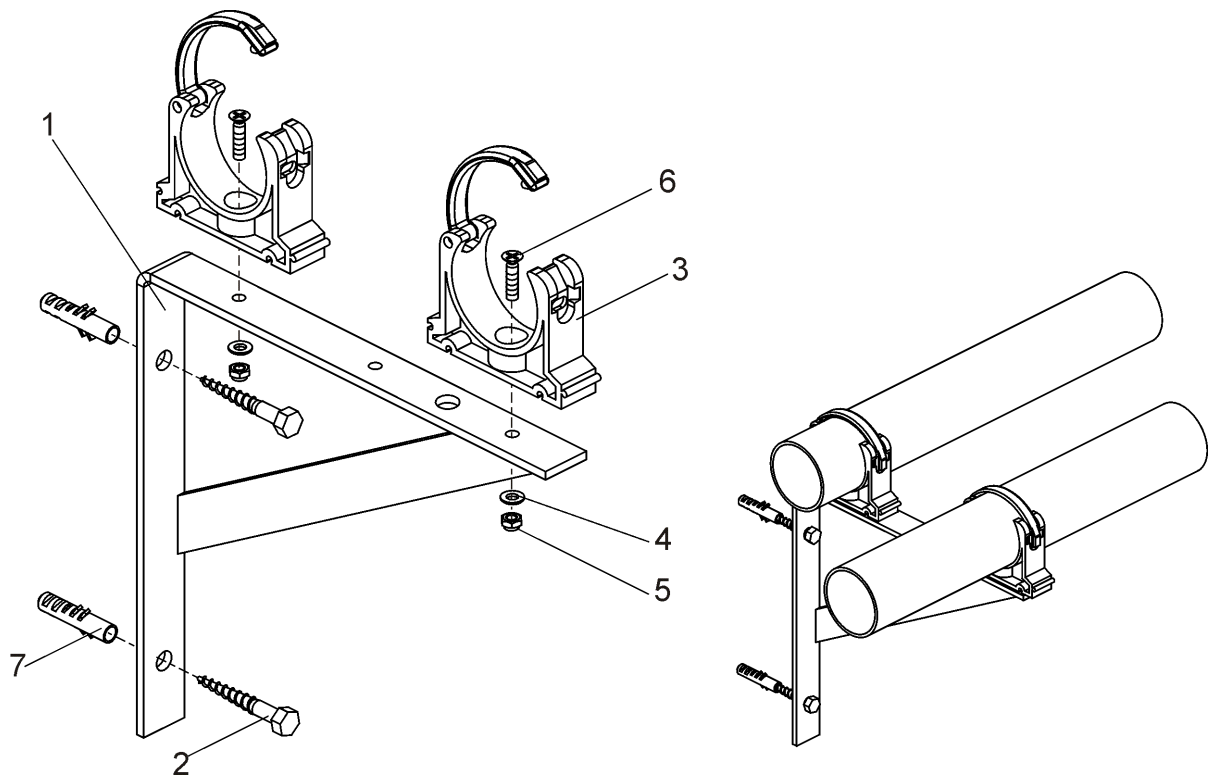


Figure 10-15: Code no. 20-50-3059

Pos.	Quantity	Code No.	Description
	1	20-50-3059	Wall bracket for 2 tubes 63mm
1	1	20-50-3717	Angle bracket galv for 2-3 tubes
2	2	99-10-3733	Hexagon wood screw 8x 60 DIN 571-ST galv
3	2	99-40-3766	Tube clip A 63 with bracket
4	2	99-50-1147	Washer B 6,4 DIN 125 galv
5	2	99-20-1043	Self-locking counter nut M 6 DIN 985-6 galv
6	2	99-10-1679	Cross recessed countersunk head screw M 6x25 DIN 965-5.8
7	2	99-98-3822	Dowel S 10 MEA

10.6 Suspension

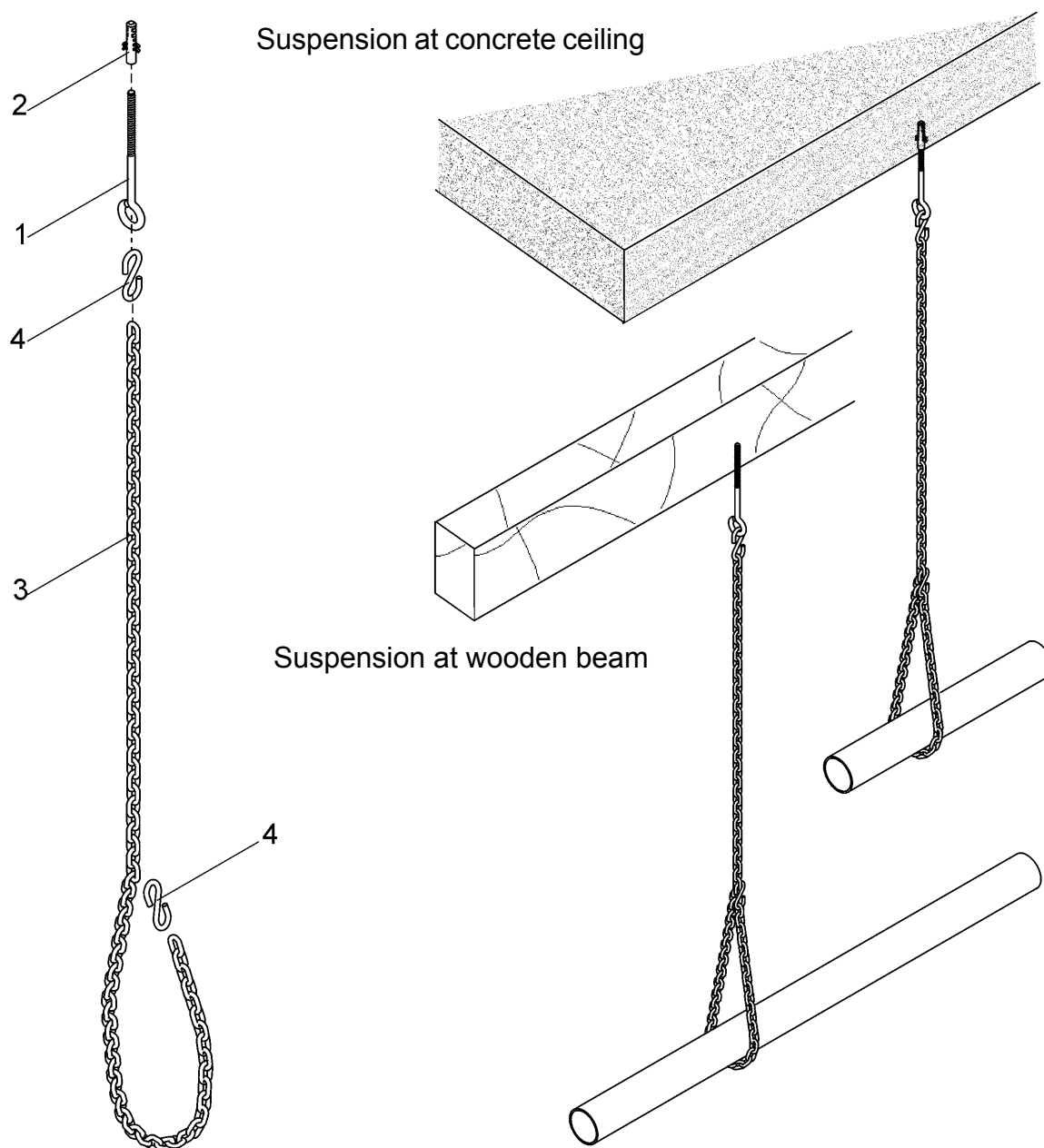


Figure 10-16: Suspension

Pos.	Quantity	Code No.	Description
1		90-50-3834	Tripod jack galv 140x22x7.8
		10-93-1642	Tripod jack galv 120x22x7.8
		10-93-1629	Tripod jack galv 80x22x7.8
2		99-98-3822	Dowel S 10 MEA
3		99-50-0012	Suspension chain no. 30
		63-00-0080	Suspension chain SST 28x8,5x1,7
4		99-50-0005	S-hook 2" no 60 / 6x55
		63-00-0081	S-hook SST 30x3



When cutting up the suspension chains, keep in mind that a certain length is required in order to form an eye around the tube.

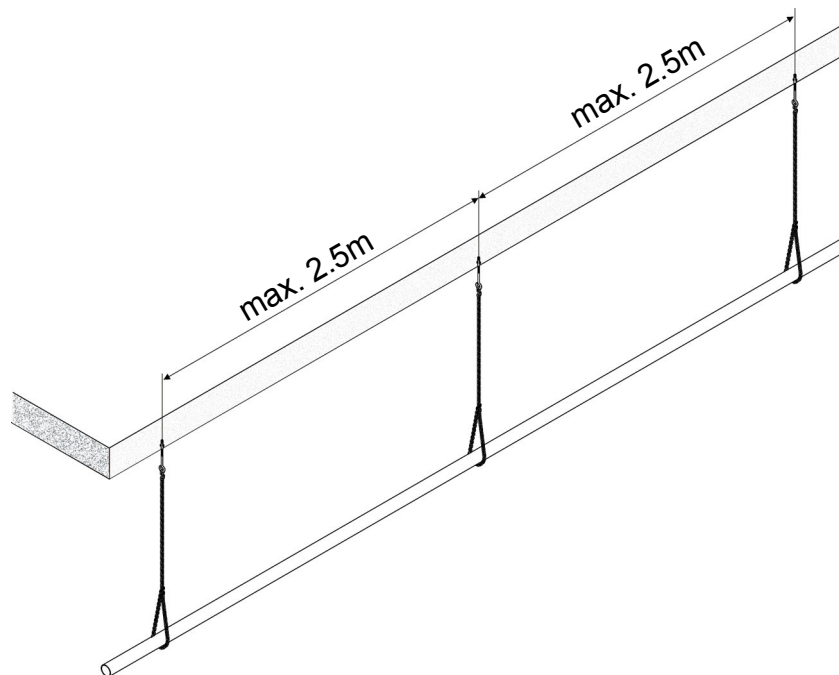


Figure 10-17: Spacing of the suspension points



By enlarging or decreasing the diameters of the eyes around the tube, the height of the feed line can be corrected and the feed line can be aligned.

In case there are not enough beams or supports in the house for the fixing of the suspension points, you may choose the following solutions. For this, you need additional suspension material.

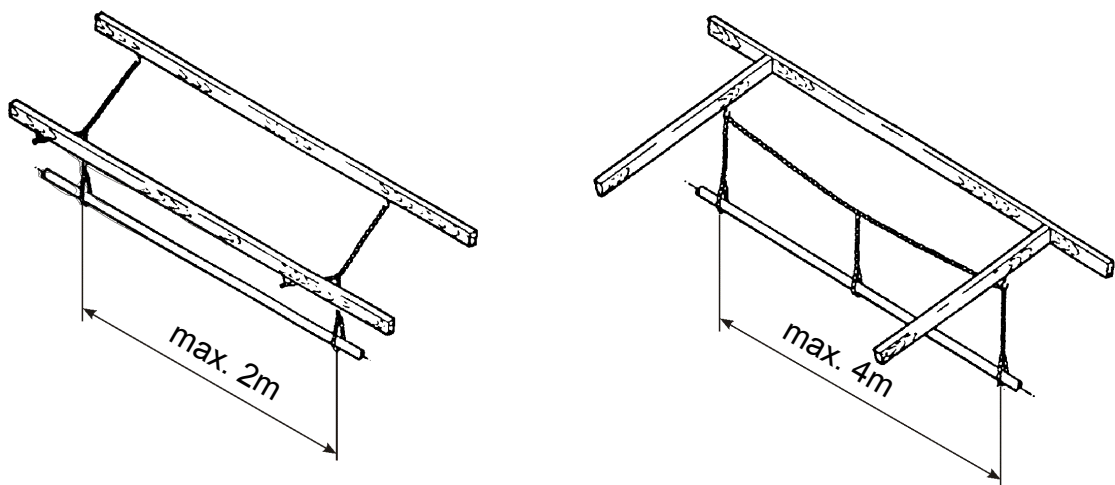


Figure 10-18: Suspension options

10.7 Recommended assembly order

10.7.1 Laying out the feed line

1. Measure out the house and compare the local conditions with those in the planification drawing.
2. Determine the course of the feed line, keep in mind that the feed line should run directly above the automatic feeders / troughs. Mark the height at the walls.
3. Distribute all tubes, couplers, corner housings, erection material and accessories according to the blue prints in the house.
4. If required, drill cuttings through the wall for the feed pipes.

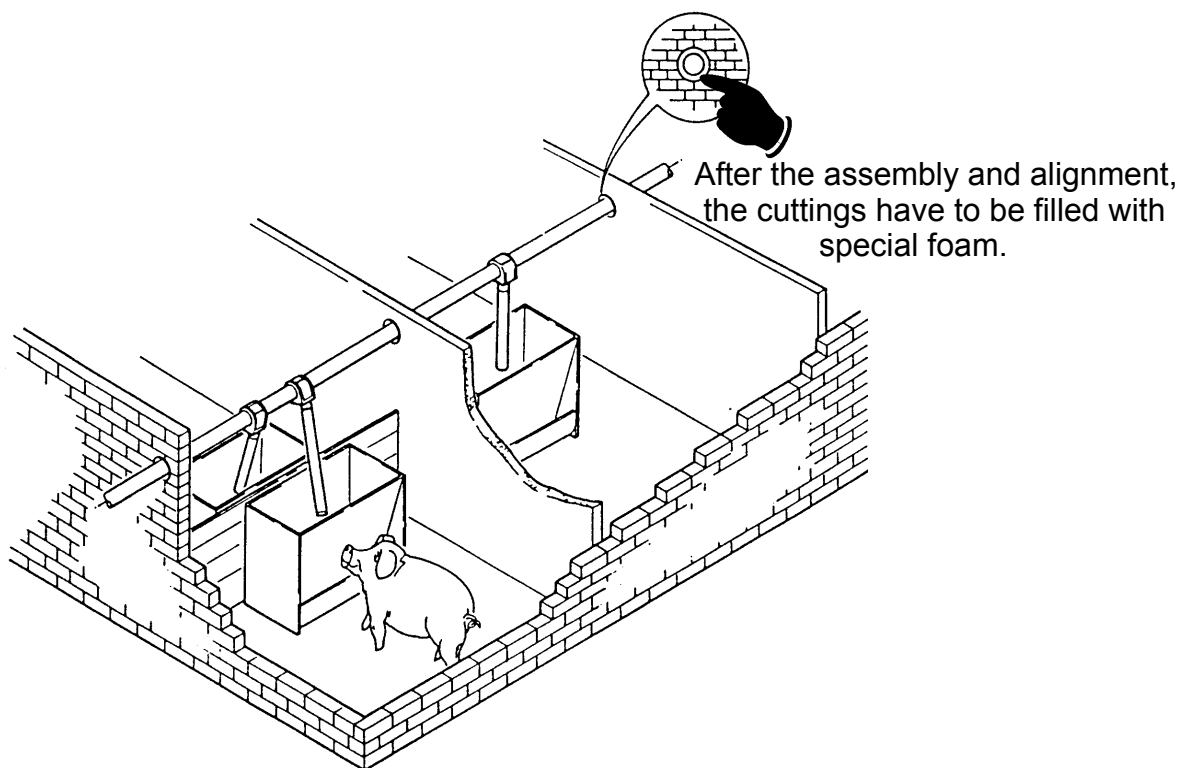


Figure 10-19: cuttings for the feed pipe




5. Determine the locations for the support points of the feed pipe and mount them accordingly:
 - tube support (see chapter 10.4)
 - wall fastening (see chapter 10.5)
 - tube support (see chapter 10.6)



To allow for small adjustments when aligning the feed pipe, tighten the screws only loosely.



6. Assemble all tubes in the house, starting at the drive. Make sure that the inner weld seam lies on the upper side.

	<p>DANGER OF INJURY !</p> <p>Always wear safety gloves and goggles when working with the abrasive cutting-off machine.</p>
	<p>For short tube segments you have to cut the tube straight and rectangular to the tube axis. Thus, you avoid the tube being pushed too deep into the corners.</p>
	<p>The carrier plates of the conveyor chain / rope might get caught at messy cutting edges when the system is in operation, which might lead to damages at the conveyor system. Thus, make sure to burr the tube thoroughly.</p>

7. Connect the tubes to the couplers. For this, the pipe ends have to meet exactly in the middle of the coupler, make sure that they are not caved in.

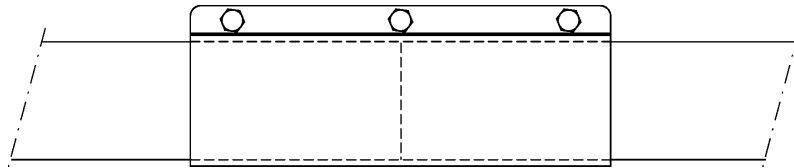


Figure 10-20: Installation of the coupler

8. Remove the lid of the corners and insert the corner wheels according to the conveying direction.

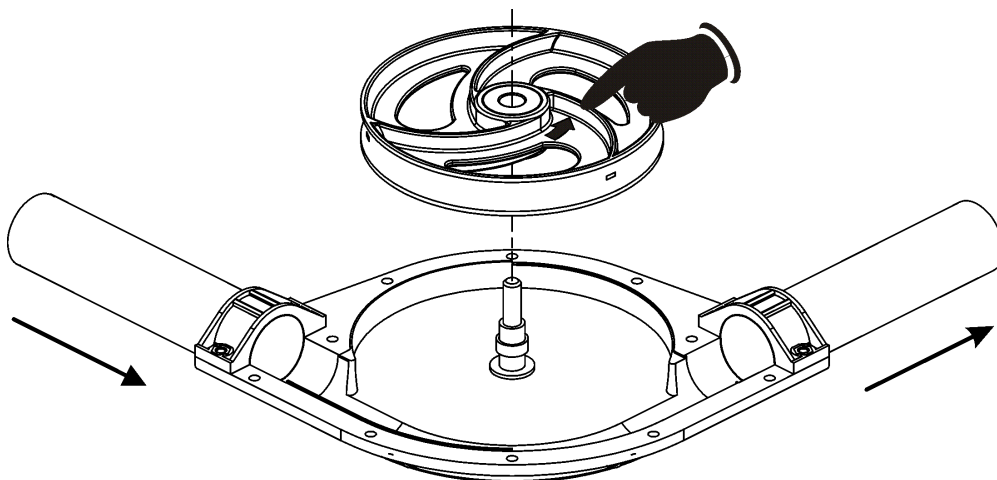


Figure 10-21: Installation direction of the corner wheel

9. Push the tubes up to the limit stop into the corners and fasten them.

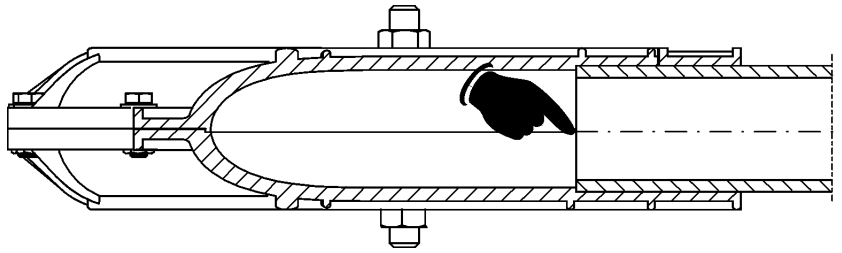


Figure 10-22: Insertion of the tubes in the corners



Support the corners (at-site) and seal them with silicone in case of an outside assembly.

10. Align the feed pipe horizontally. Make sure that there are no tube distortions.
11. Tighten all screws of the supports.

10.7.2 Assembly of the feed discharge points



Mount the feed discharge points (see chapter 11) before carrying out the next steps of the assembly.

10.7.3 Inserting of the conveyor chain / conveyor cable

The conveyor chain / conveyor cable is delivered wound up on tube.



Check for damages caused during the transport when un-winding the conveyor chain / cable.

To avoid the formation of knots or distortions, un-wind the roll around a horizontal axis.

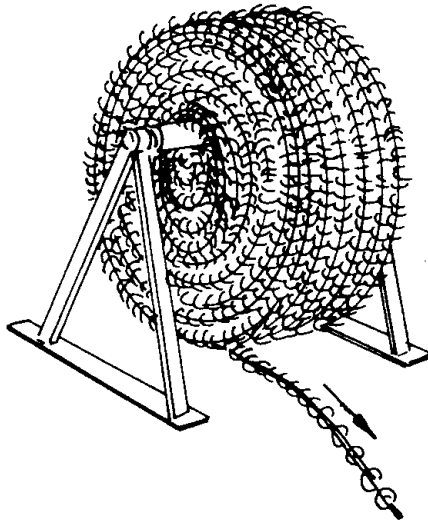


Figure 10-23: Un-winding the conveyor chain / conveyor cable



Loosen twisted chain segments when un-winding the chain, so that the chain plates can be pulled in parallel.

1. Push a (rigid) steel rope into the feed pipe. If necessary, use a new steel rope for every feed pipe section in case of long feed pipes.



Start at the drive unit and work from one corner to the next.

2. Connect the beginning of the conveyor chain / cable with the end of the steel rope.



The conveyor chain / rope have to be inserted by 2 people.

3. Carefully pull the chain from one corner to the next and assemble every corner. At the same time, a second person inserts every segment of the conveyor chain / rope into the opening of the corner.



Make sure that the conveyor chain / cable does not twist during the insertion.

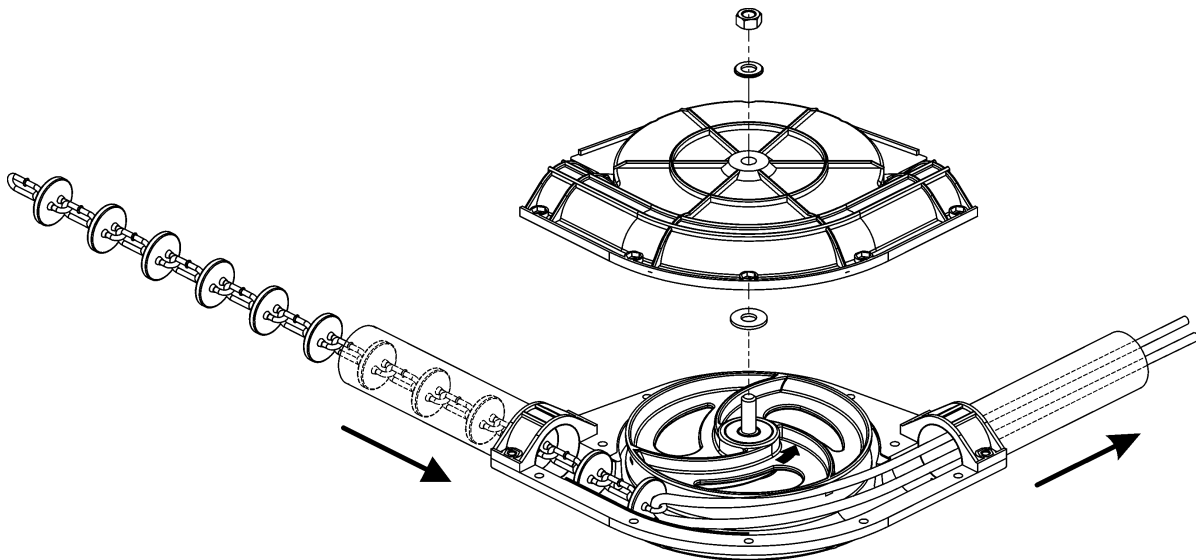


Figure 10-24: Insertion of the conveyor chain into one corner

4. Insert the chain up to the drive unit and guide the chain correspondent to figure 10-25 through the drive.

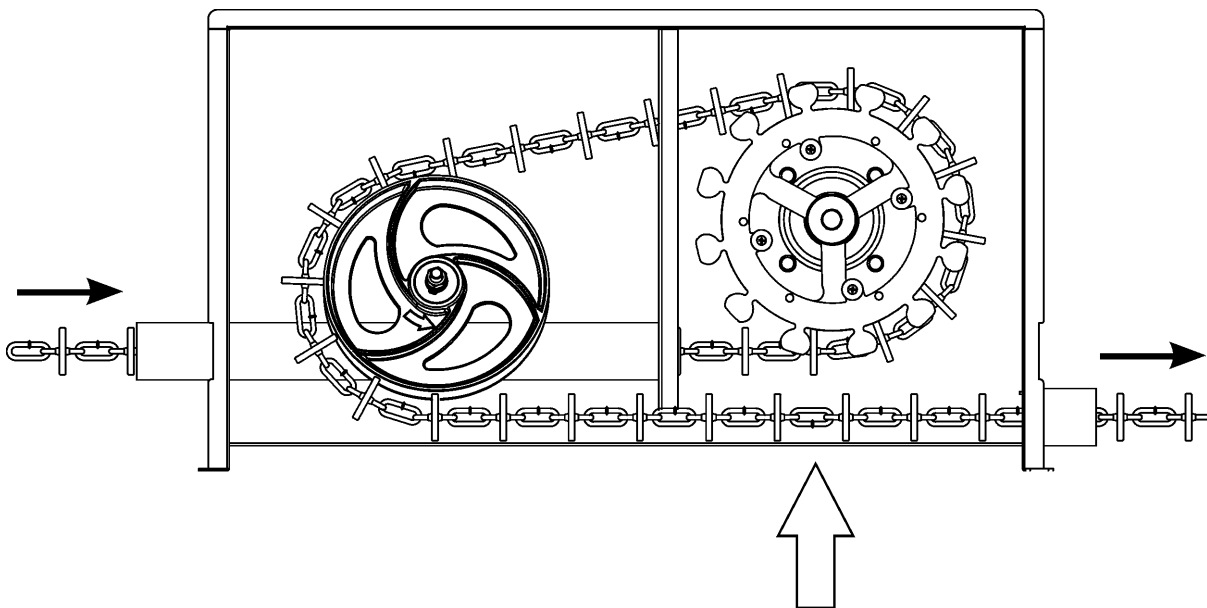


Figure 10-25: Guidance of chain through the drive

5. Release the tensioning wheel of the drive with the tensioning device (code-no. 83-01-5136).
6. Shorten the conveyor chain / rope by the required length and connect both ends at the location shown in figure 10-25.
7. Remove the tensioning device.

10.7.4 Connect the conveyor chain / conveyor cable

Coupler for conveyor chain

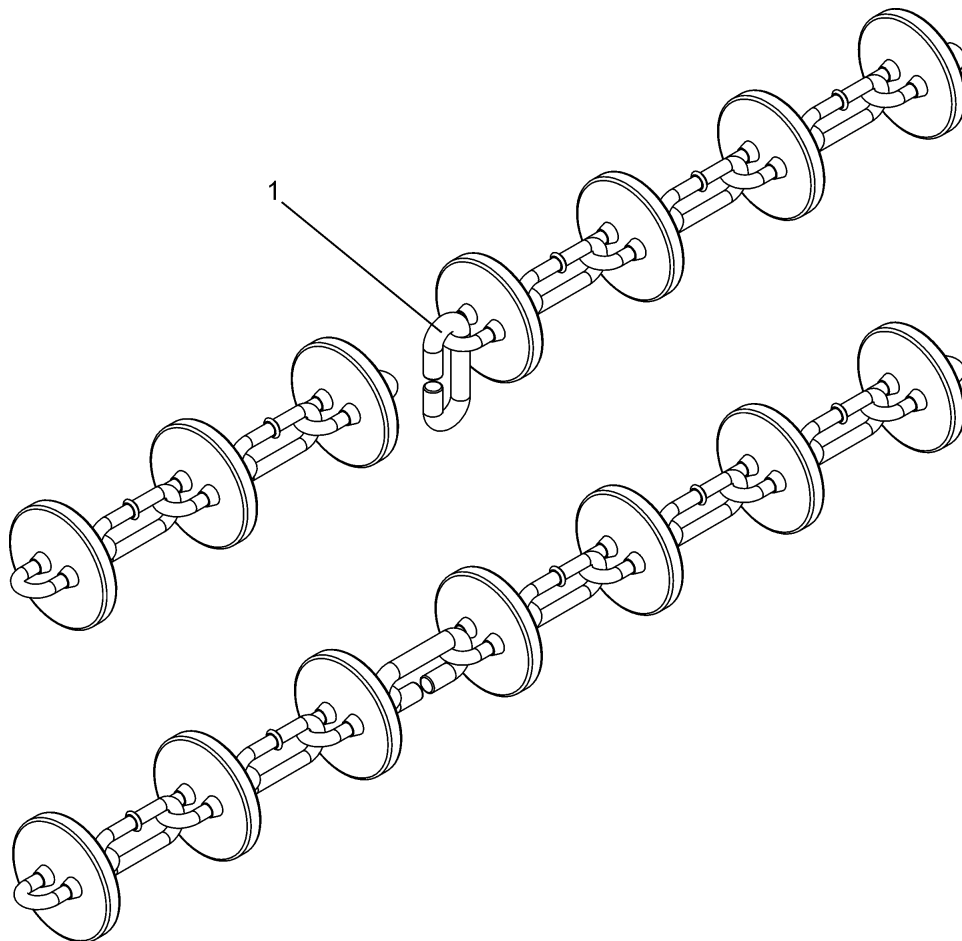


Figure 10-26: Mounting the coupler for the conveyor chain



If necessary, shorten the chain always at the same location.
It will be easier to locate the coupler if you wrap it with yellow or red tape.

Coupler for conveyor cable

The cable coupler is installed into the conveyor cable instead of a cable disc.



Make sure that the cable coupler does not sit centrally between the cable discs.

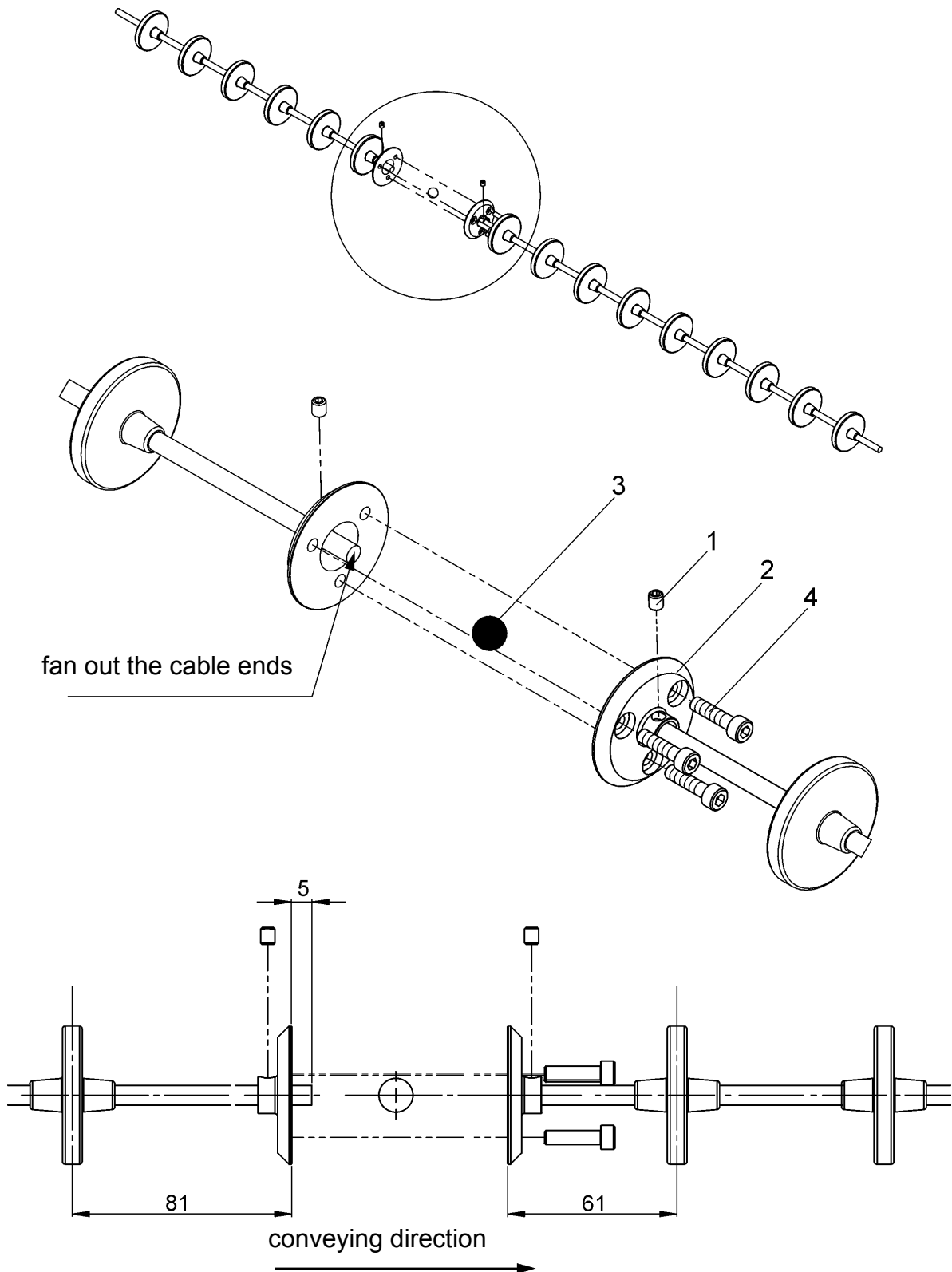


Figure 10-27: Assembly of the cable coupler

1. Fix the cable ends with the grub screws (pos. 1) in the coupler halves (pos. 2).
2. Fan out the cable ends and place the ball (pos. 3) in between.
3. Connect the coupler halves with 3 hexagon socket screws (pos. 4).
4. Remove the grub screws. They were only meant to be used as assembly help.
5. Cut off the shanks of the hexagon socket screws evenly.

11 Feed discharge points

11.1 Weepholes

**DANGER OF INJURY !**

Always wear safety gloves and goggles when working with the abrasive cutting-off machine.

Before terminating the assembly of the feed pipe, cut out the necessary weepholes in the conveyor tube across from the inner weld seam. To make sure that the feed drops down without any problems, the length of the opening (X) should be as long as possible, as determined by the slider.

Figure 11-1 shows an ideal form of a weephole.

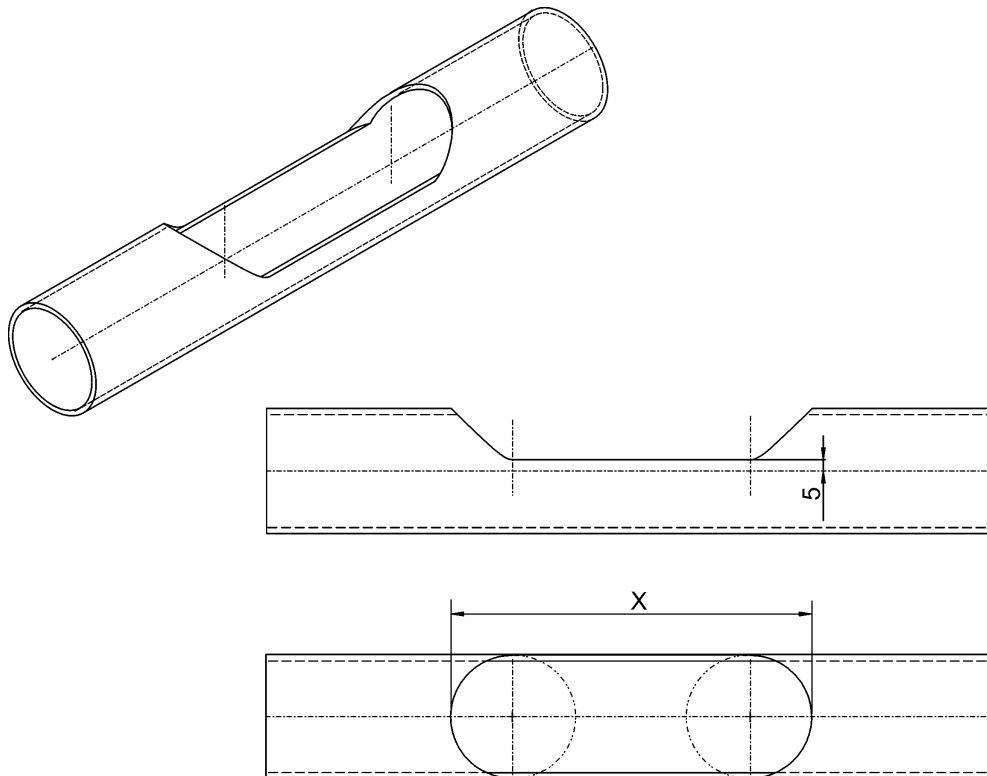


Figure 11-1: Weephole

1. Drill 2 bore holes into the tube by means of a drill bit or compass saw.
2. Remove the piece between the bore holes by means of an abrasive cutting-off machine.

Figure 11-2 shows another possibility.

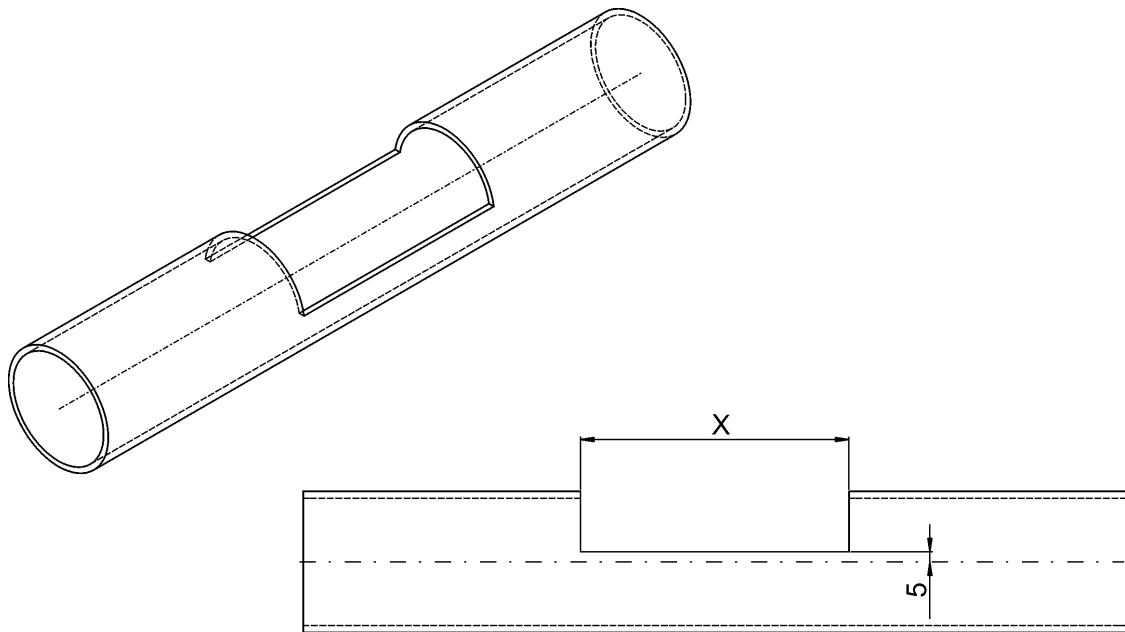


Figure 11-2: Weephole - rectangular



The carrier plates of the conveyor chain / rope might get caught at messy cutting edges when the system is in operation, which might lead to damages at the conveyor system. Thus, make sure to burr the weepholes thoroughly.

11.2 Draw-Offs

11.2.1 Outlet MI cpl. and drop pipe telescopic for outlet MI

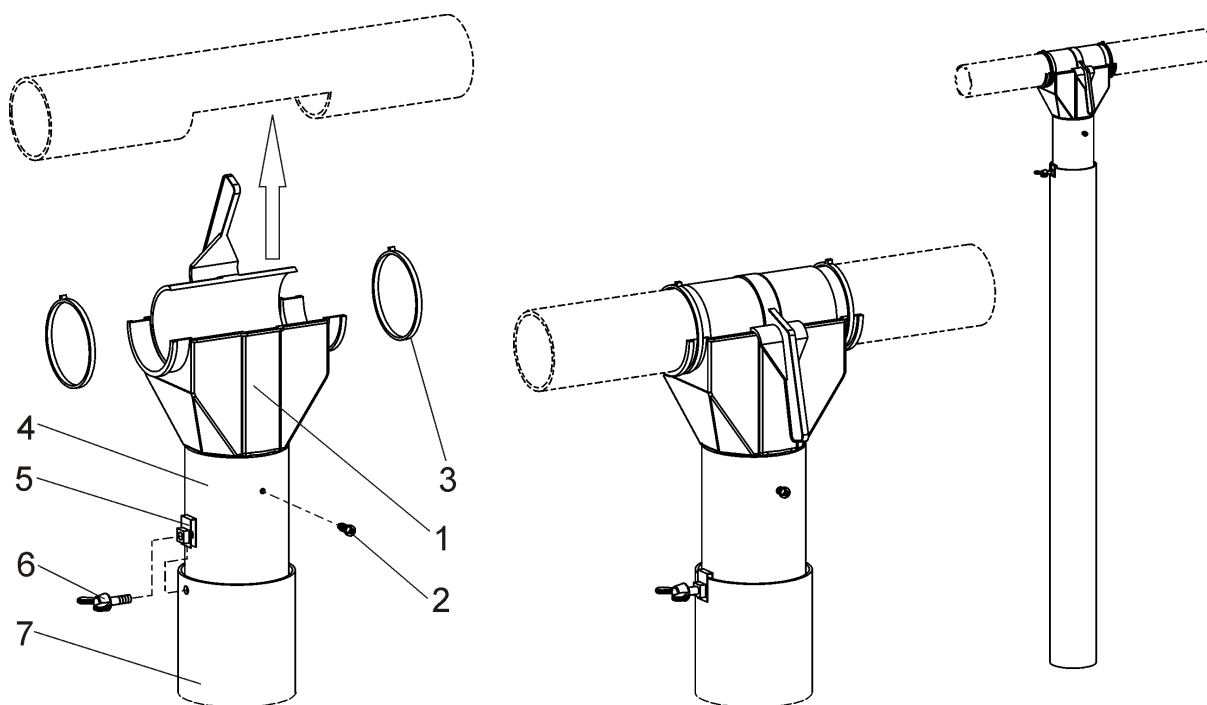


Figure 11-3: Code no. 10-89-3765 & 83-01-1096

Pos.	Quantity	Code No.	Description
	1	10-89-3765	Outlet MI-DR1500 cpl
1	1	83-01-1423	Outlet MI-DR1500 with shutter
2	1	99-10-3868	Drilling screw 3,9x16 DIN 7504-P-H
3	2	99-50-3775	Strap 280mmx4,5

Pos.	Quantity	Code No.	Description
	1	83-01-1096	Drop-pipe telescopic 75x1900 for outlet MI-DR1500
4	1	83-01-1092	PVC pipe transparent diameter 800mm
5	1	83-01-1095	Sheet clip M6
6	1	83-01-1094	Wing screw M6x20
7	1	83-01-1093	PVC pipe transparent diameter 900mm

11.2.2 Outlet with telescopic drop pipe

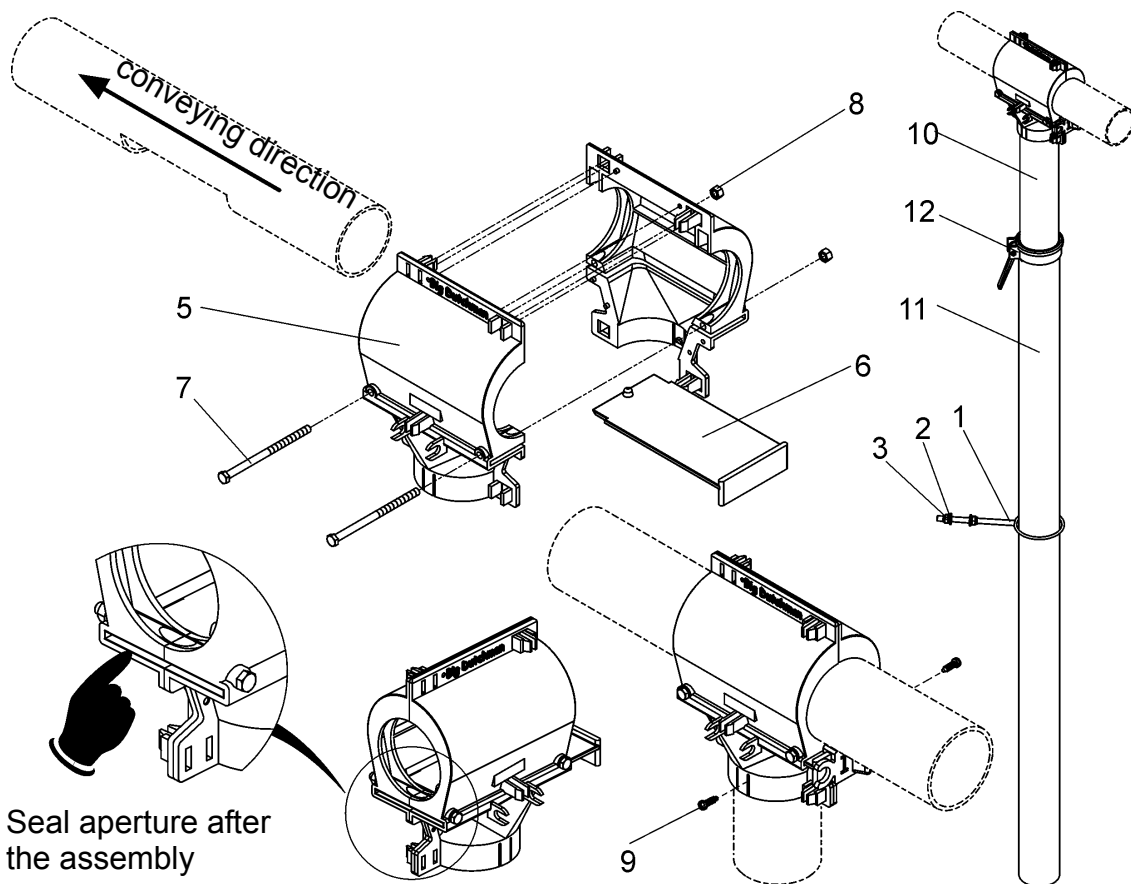


Figure 11-4: Code no. 10-88-4190 incl. 83-00-1976 & 83-00-1951

Pos.	Quantity	Code No.	Description
	1	10-88-4190	Outlet BD-DR1500 with drop pipe telescopic 60x2300
1	1	10-88-4091	Pipe bracket SST for drop-pipe telescopic 63mm
2	2	99-20-1177	Washer A 8,4x25x2,0 DIN 9021 SST
3	2	99-20-1176	Hexagon nut M 8 SST DIN 934
	1	83-00-1976	Outlet BD-DR1500 cpl
5	2	83-00-1975	Outlet half BD-DR1500
6	1	83-00-1968	Shutter for outlet DR850/1500
7	2	99-10-3903	Hexagon head screw M 5x 80 DIN 558 galv
8	2	99-10-1023	Hexagon nut M 5 galv DIN 934-8
9	1	99-10-3868	Drilling screw 3,9x16 DIN 7504-P-H
	1	83-00-1951	Drop pipe telescopic 60x2300 BD-DR850/1500
10	1	83-00-1510	Pipe 60x1,50-1200 PVC
11	1	83-00-1511	Pipe 63x1,25-1200 PVC
12	1	83-00-2640	Straining ring dia 60 with excentric



When transporting small crumbs or loose meal, feed might trickle out. This can be prevented by sealing the groove with silicone.



11.2.3 Outlet without shutter for forced feed return



This outlet is only used in combination with a feed hopper with forced feed return (see chapter 8.3.4 and 8.4.3).

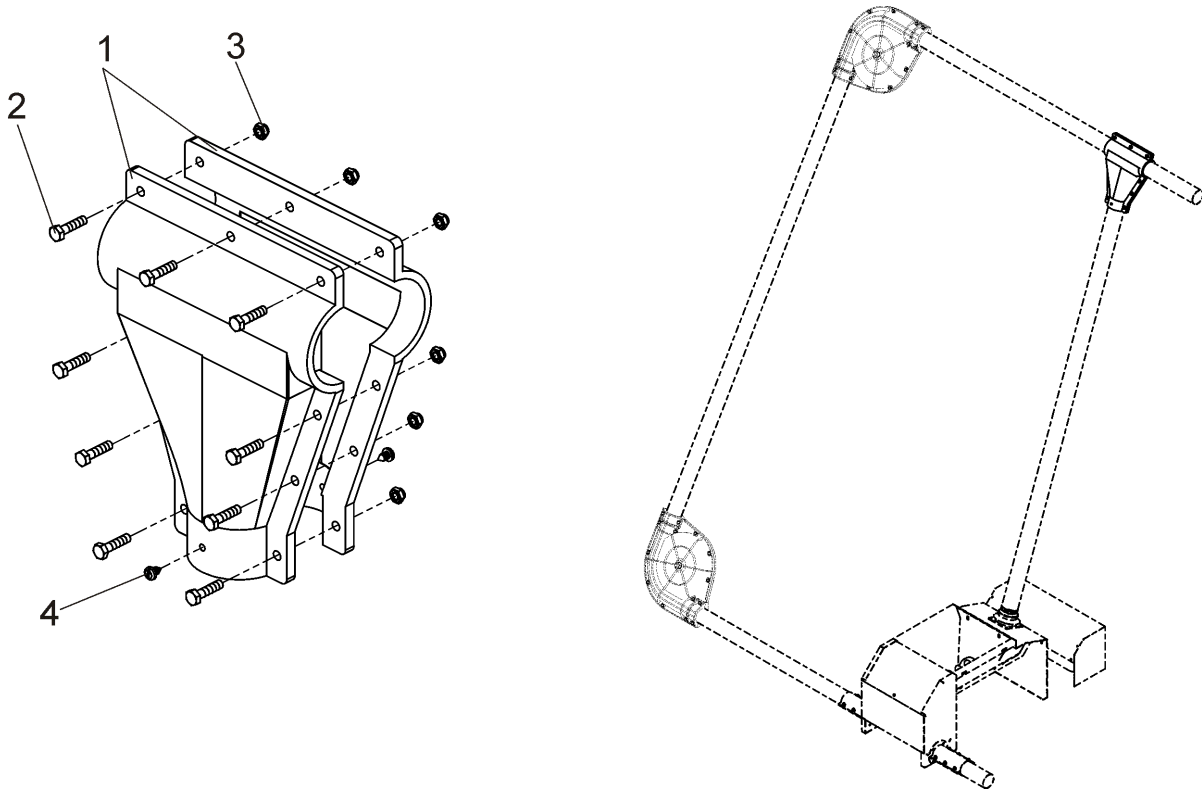


Figure 11-5: Code no. 10-87-3758

Pos.	Quantity	Code No.	Description
	1	10-87-3758	Branch piece without shutter for DR1500 with forced feed
1	2	83-00-9214	Half shell for outlet D60 L160
2	9	99-20-1422	Hexagon head screw M 6x 25 DIN 933 SST
3	9	99-20-1131	Self-locking counter nut M 6 DIN 985 SST
4	2	99-10-1223	Tapping screw B 4,8x9,5DIN7971



You can prevent a clogging up of the system by cutting the weep hole of the feed discharge as large as possible.



Seal everything with silicone after the assembly in order to prevent humidity from entering the system.

11.3 Volume dispenser

11.3.1 Volume dispenser BR



Please note the instruction leaflet by **Big Dutchman** (code-no. 99-97-2656) with explosion drawing and parts list. Use the instructions for the assembly and spare parts orders.

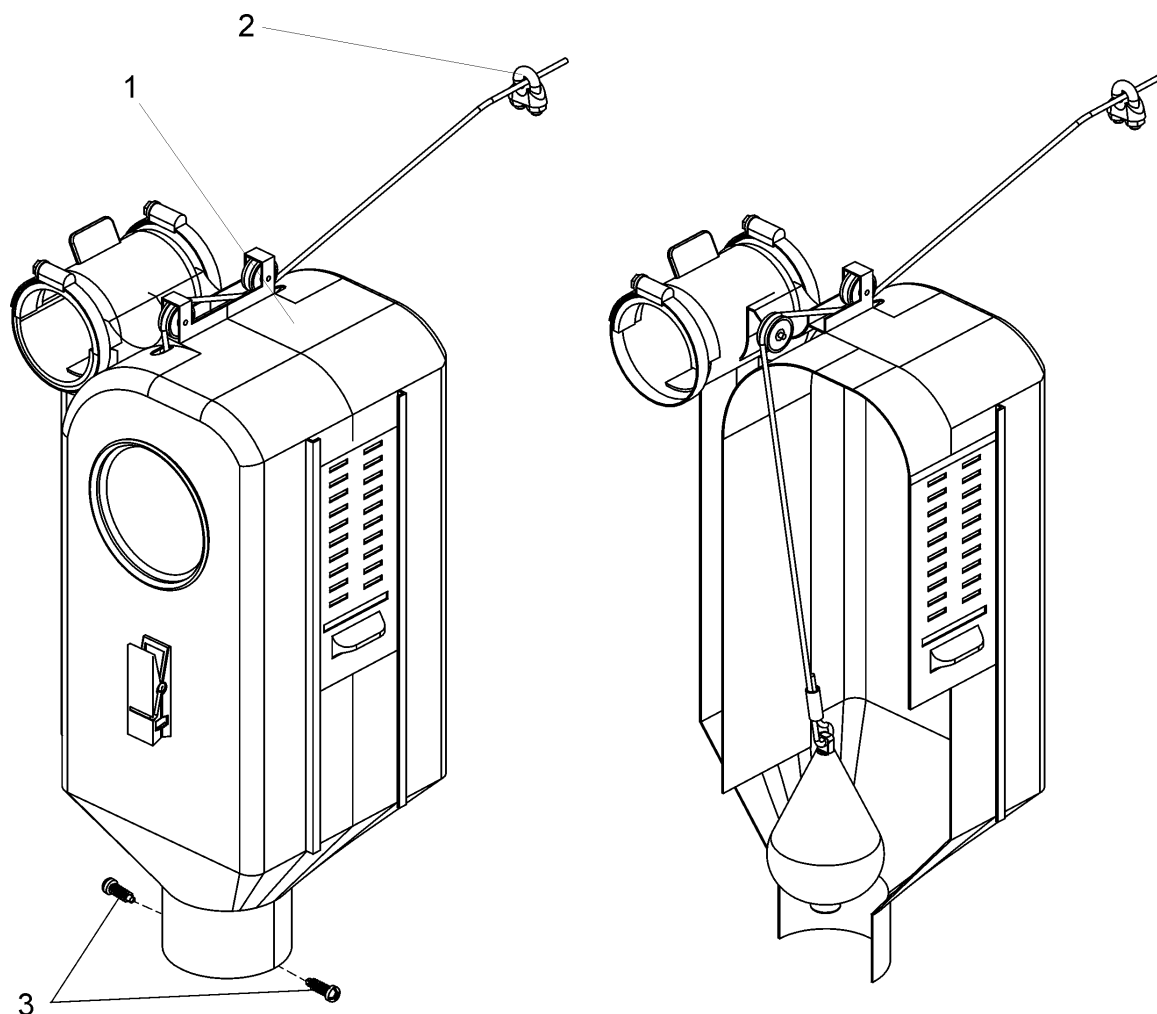


Figure 11-6: Code no. 10-38-3462

Pos.	Quantity	Code No.	Description
1	1	10-38-3462	volume dispenser 6L BR cpl DR1500
2	1	99-50-0120	cable clamp 5mm 3/16"
	1	99-50-0009	cable clamp 6-7mm 1/4" galv. DIN 741
3	2	99-10-3882	drilling screw 4,8x16 DIN 7504-L



Fasten the drop pipes with drilling screws (pos. 2).



11.3.2 Volume dispenser TI

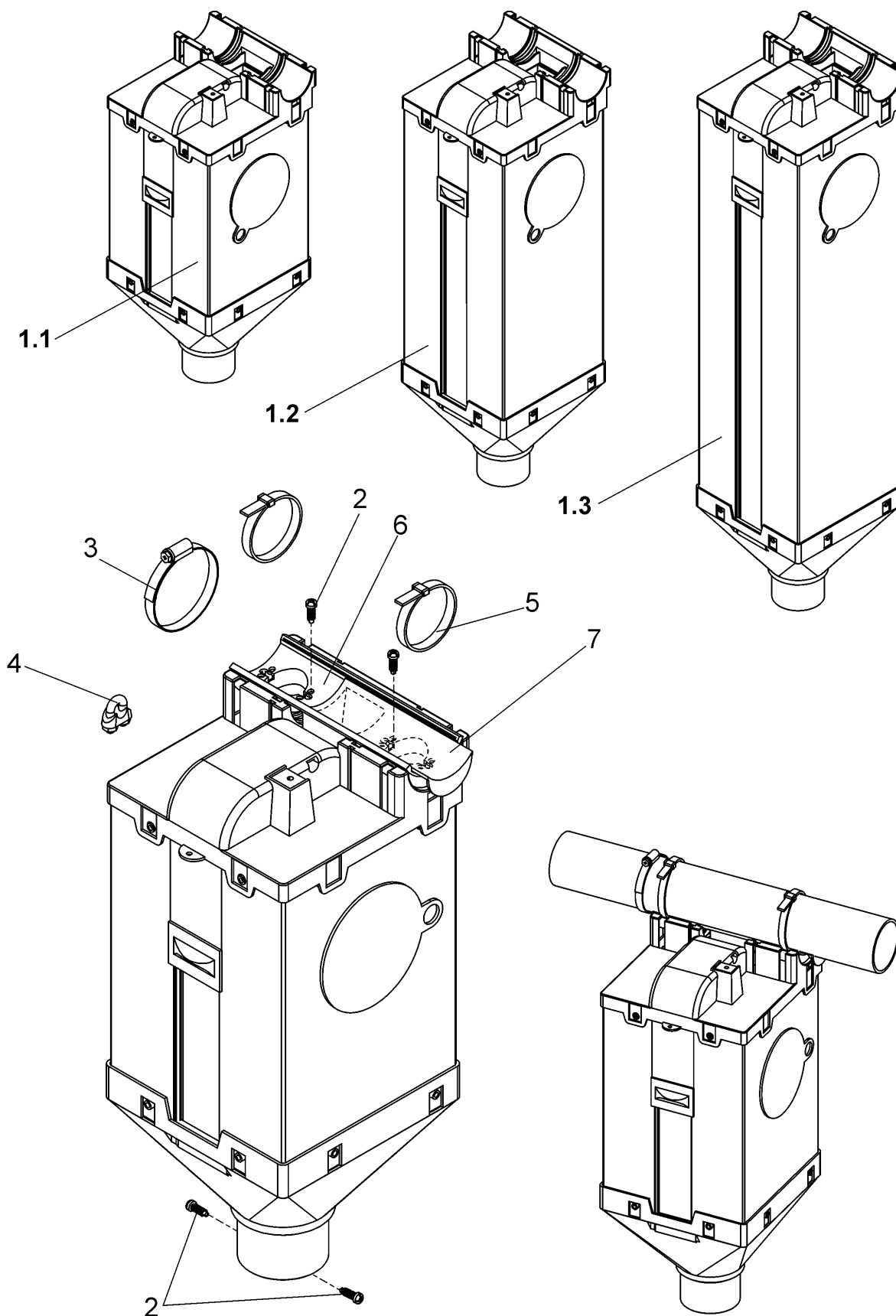


Figure 11-7: Code no. 10-88-3200, -3210 and -3220

Pos.	Quantity	Code No.	Description
	1	10-88-3200	Volume dispenser 6L TI cpl DR1500
1.1	1	10-87-3110	Volume dispenser 6L TI DR 850/1500
2	4	99-10-3868	Drilling screw 3,9x16 DIN 7504-P-H
3	1	99-50-3922	Hose band clip 50- 70
4	1	99-50-0120	Cable clamp 5mm 3/16" galv
5	2	10-88-3412	Strap 360mmx7,5
6	1	10-87-3116	Adapter for volume dispenser TI DR1500/TF-D60
7	1	10-87-3117	Shutter for volume dispenser TI DR1500/TF-D60

Pos.	Quantity	Code No.	Description
	1	10-88-3210	Volume dispenser 10L TI cpl DR1500
1.2	1	10-87-3240	Volume dispenser 10L TI DR 850/1500
2	4	99-10-3868	Drilling screw 3,9x16 DIN 7504-P-H
3	1	99-50-3922	Hose band clip 50- 70
4	1	99-50-0120	Cable clamp 5mm 3/16" galv
5	2	10-88-3412	Strap 360mmx7,5
6	1	10-87-3116	Adapter for volume dispenser TI DR1500/TF-D60
7	1	10-87-3117	Shutter for volume dispenser TI DR1500/TF-D60

Pos.	Quantity	Code No.	Description
	1	10-88-3220	Volumen dispenser 15L TI cpl DR1500
1.3	1	10-87-3260	Volume dispenser 15L TI DR 850/1500
2	4	99-10-3868	Drilling screw 3,9x16 DIN 7504-P-H
3	1	99-50-3922	Hose band clip 50- 70
4	1	99-50-0120	Cable clamp 5mm 3/16" galv
5	2	10-88-3412	Strap 360mmx7,5
6	1	10-87-3116	Adapter for volume dispenser TI DR1500/TF-D60
7	1	10-87-3117	Shutter for volume dispenser TI DR1500/TF-D60



Fasten the drop pipes with drilling screws (pos. 2).



If you use wire rope 6 mm (Code-No. 99-50-1050) for the release, you also have to use cable clamp 6-7 mm (Code-No. 99-50-0009).



11.4 Drop pipes for volume dispensers



To make sure that possible vibrations during operation of the installation have no effect, never tightly connect the drop pipes with the volume dispensers.

11.4.1 Drop-pipe cpl. for volume dispenser BR/TI

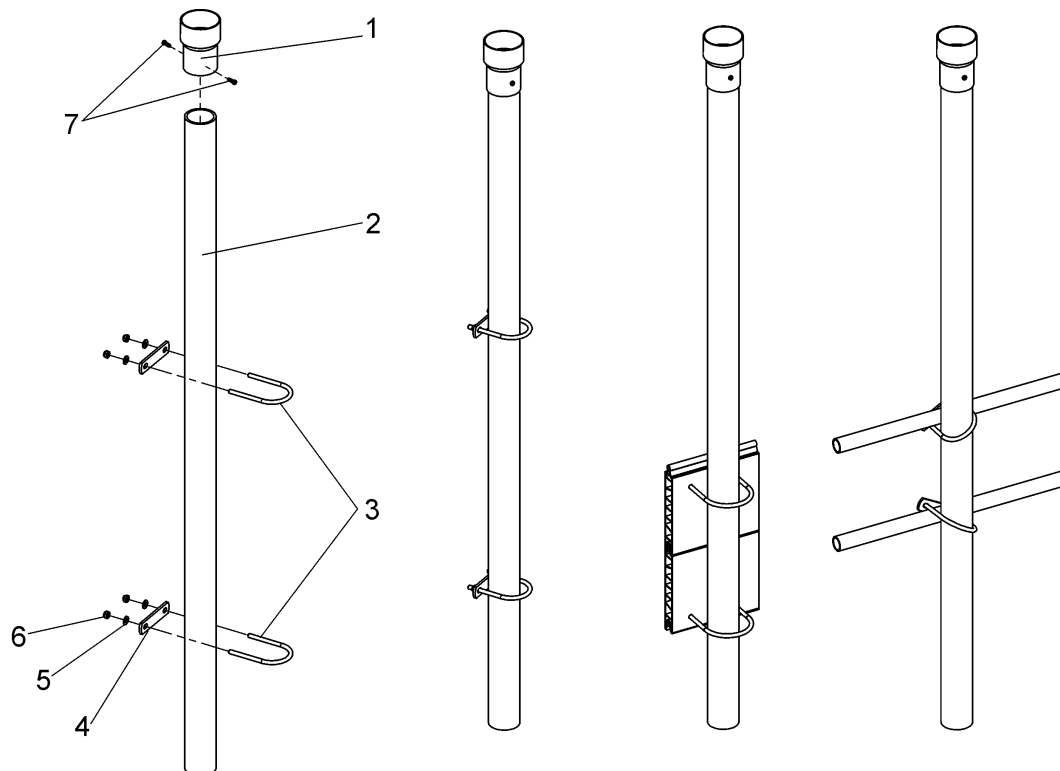


Figure 11-8: Code no. 10-87-3135

Pos.	Quantity	Code No.	Description
	1	10-87-3135	Drop-pipe cpl. 63x4.7-1650 for volume dispenser BR/TI
1	1	83-01-3794	Connecting sleeve 60-63/75
2	0,33	99-40-3767	Pipe 63x4,70-5000 PVC DIN 8061/62
3	2	99-50-3866	U-bolt galv. 8x50/W67/110
4	2	99-50-3867	Counter plate galv for U-bolt 8mm/W67
5	4	99-20-1026	Washer A 8.4 DIN 125 galv.
6	4	99-20-1064	Self-locking counter nut M 8 DIN 985-6 galv.
7	2	99-10-3882	Drilling screw 4,8x 16 DIN 7504-L



Glue connecting sleeve (pos. 1) and tube (pos. 2) together.

11.4.2 Drop-pipe cpl. s-shaped for volume dispenser TI

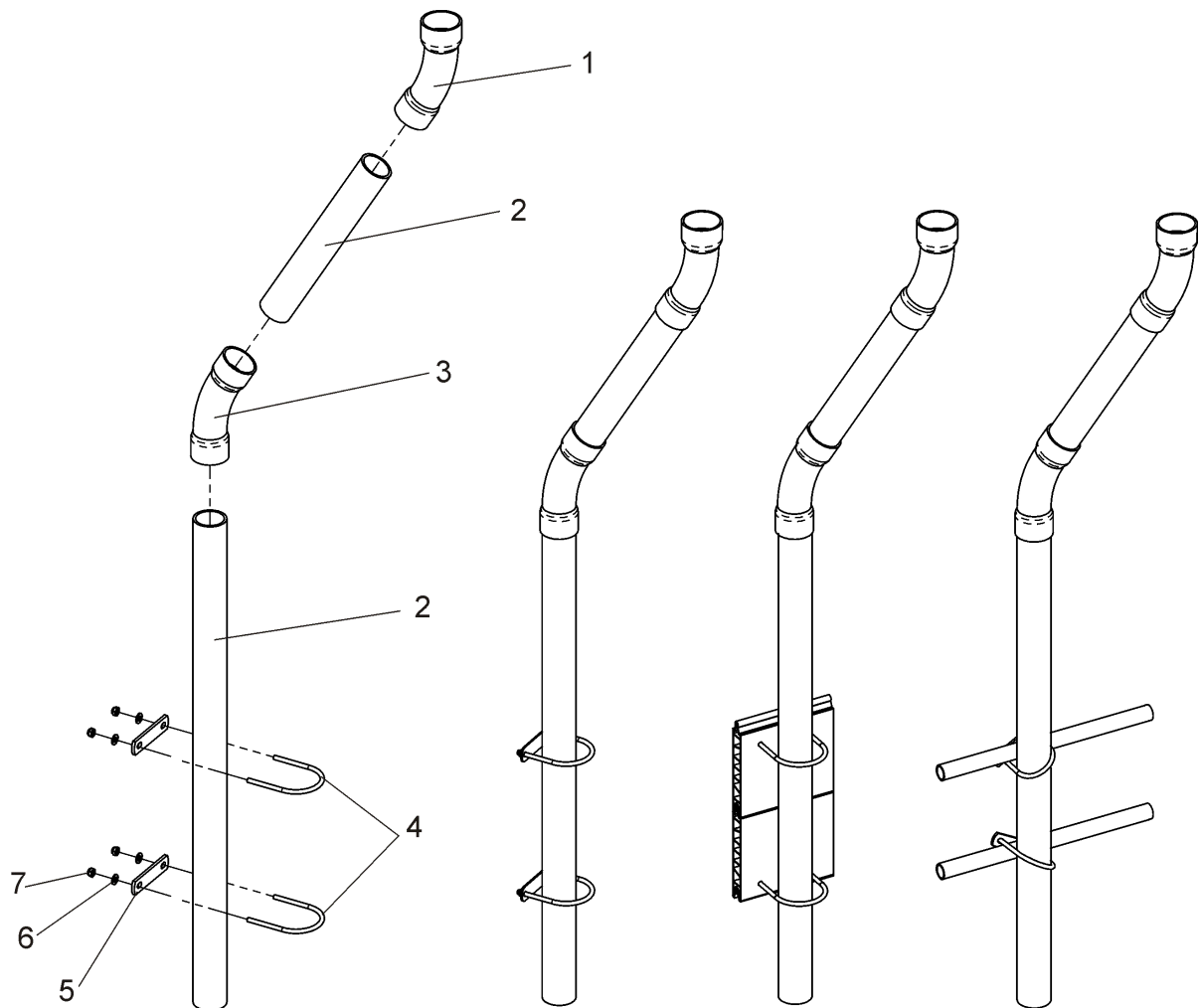


Figure 11-9: Code no. 10-87-3235

Pos.	Quantity	Code No.	Description
	1	10-87-3235	Drop-pipe cpl. 63x4.7-1450 s-shaped for volume dispenser TI
1	1	99-40-3850	Bend 63x68-30 deg small PVC
2	0,28	99-40-3767	Pipe 63x4,70-5000 PVC DIN 8061/62
3	1	99-40-3851	Bend 63x63-30 deg small PVC
4	2	99-50-3866	U-bolt galv. 8x50/W67/110
5	2	99-50-3867	Counter plate galv for U-bolt 8mm/W67
6	4	99-20-1026	Washer A 8.4 DIN 125 galv.
7	4	99-20-1064	Self-locking counter nut M 8 DIN 985-6 galv.
		99-50-3758	Glue Tangit 1 kg tin



Glue bends (pos. 1 and 3) and tubes (pos. 2) together.



11.4.3 Drop-pipe for volume dispenser BR/TL at crate stand

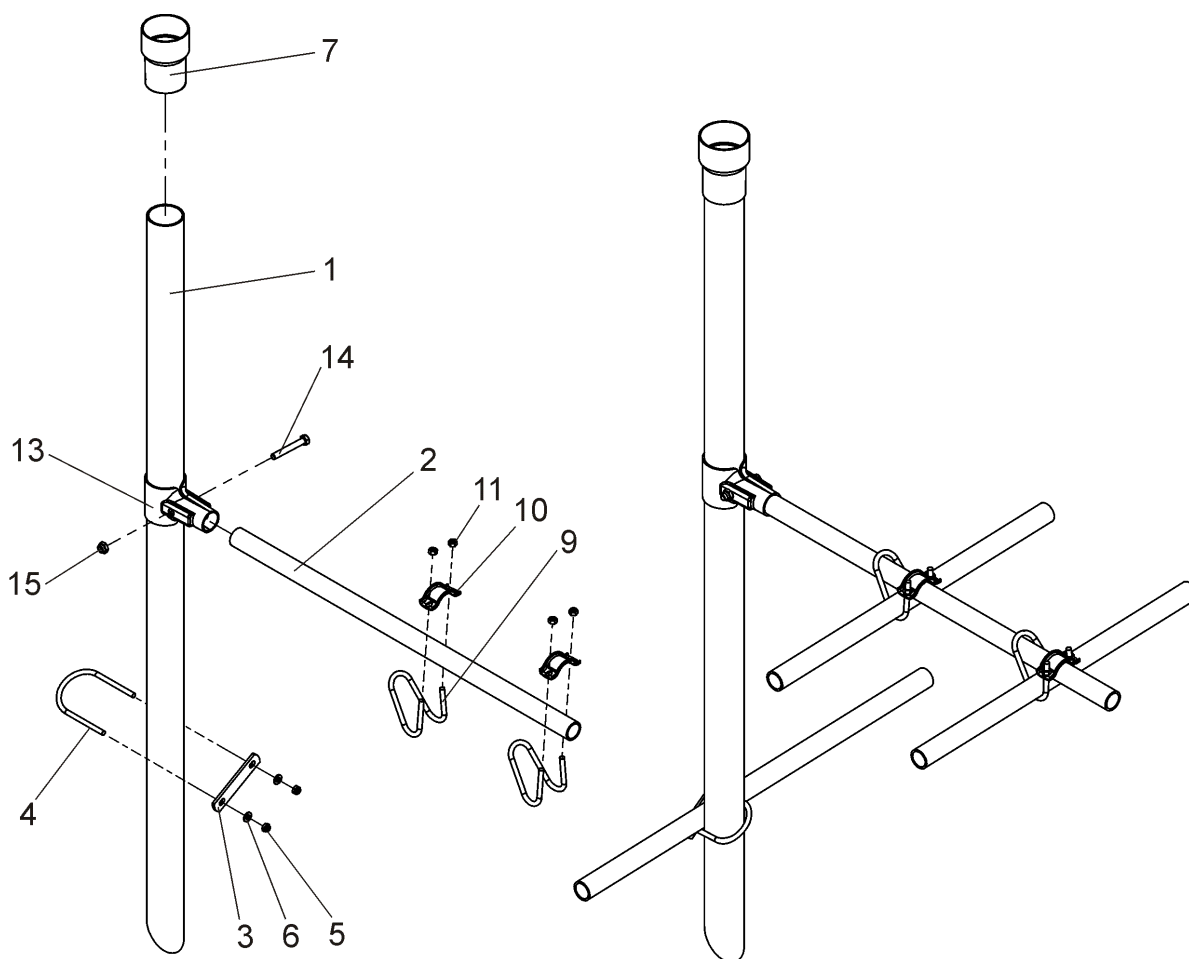


Figure 11-10: Code no. 83-00-1598

Pos.	Quantity	Code No.	Description
	1	83-00-1598	Drop pipe for volume dispenser BR/TL at crate stand
1	1	83-00-1599	Tube 63x3,0-1500 galv 45deg
2	0.14	99-40-3813	Pipe 1"x6000 galv DIN 2440
3	1	83-00-1784	Counter plate galv for U-bolt 8mm/W75
4	1	99-50-3029	U-bolt galv 8x50/W75/125
5	2	99-20-1064	Self-locking counter nut M 8 DIN 985-6 galv
6	2	99-20-1026	Washer A 8,4 DIN 125 galv
7	1	83-01-3794	Connecting sleeve 60-63/75
	2	99-50-3065	Cross pipe clamp 1"x1" cpl
9	1	83-00-1179	Cross pipe clamp 8x40-1"x1"
10	1	83-00-1180	Counter plate for cross pipe clamp 1"
11	2	99-10-1040	Hexagon nut M 8 galv DIN 934-8
	1	83-00-1034	T-pipe clamp cpl 2"x1"
13	2	83-00-1012	T-pipe clamp half 2"x1"
14	1	99-10-3951	Hexagon head bolt M 10x 70 DIN 931 galv
15	1	99-20-1065	Self-locking counter nut M 10 DIN 980-8 galv

11.4.4 Drop pipe DR-BR cpl. HT Standard

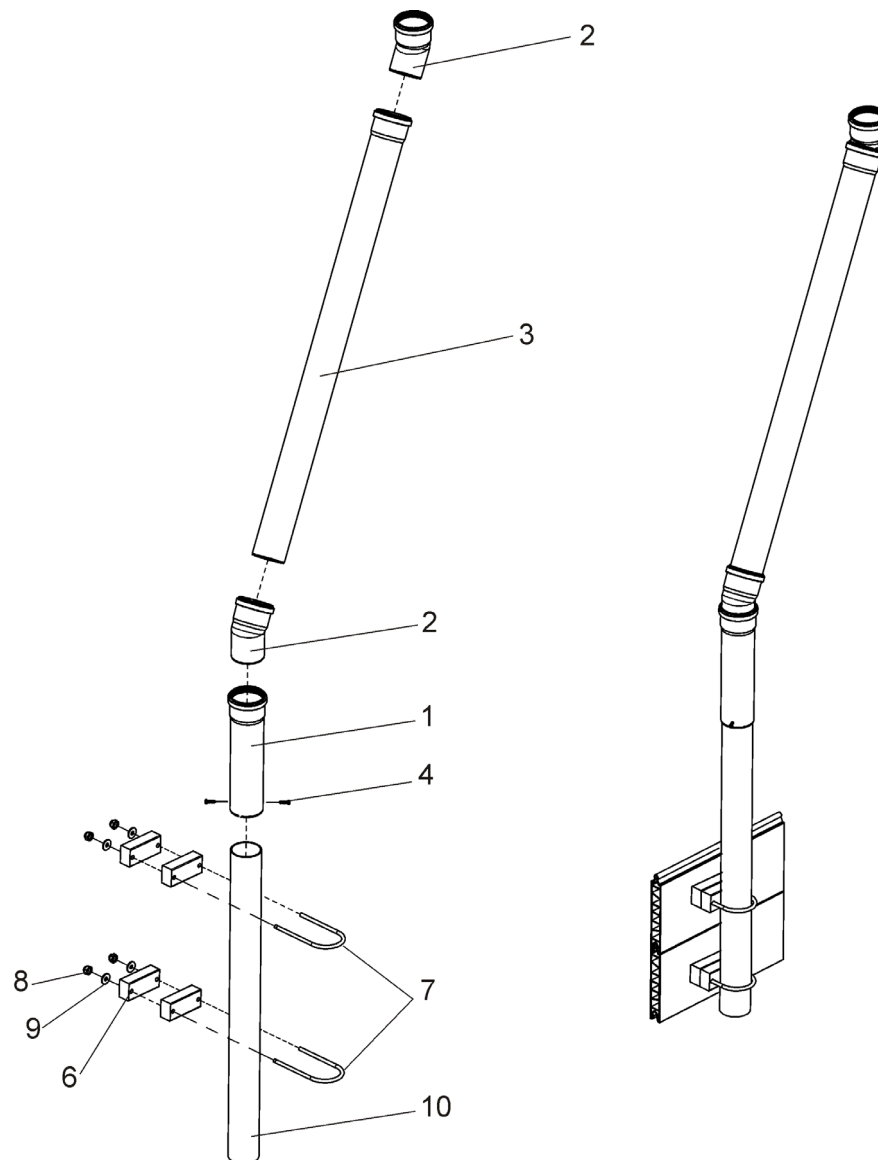


Figure 11-11: Code no. 83-01-5308

Pos.	Quantity	Code No.	Description
	1	83-01-5308	Drop pipe DR-BR cpl standard tiltable-/concrete trough
1	1	83-01-5172	Pipe plastic 75x 250
2	2	99-50-3763	Bend plastic 75mm-30deg
3	1	83-01-5342	Pipe plastic 75x1000
4	2	99-10-3879	Tapping screw B 4,2x19 DIN7981
	1	65-02-3355	Protect. pipe galv cpl stand.- tiltable/concrete
6	4	83-00-8102	Spacer 130x45-30 f. protect. pipe at farrowing crate stand.
7	2	83-00-8650	U-bolt galv 8x45/W75/150
8	4	99-20-1064	Self-locking counter nut M 8 DIN 985-6 galv
9	4	37-80-2011	Washer A 8,4x25x2,0 DIN 9021 galv
10	1	10-88-3429	Tube 70x2,60- 800 galv

DR 1500

Edition: 03/05 M 4021 GB

11.4.5 Drop pipe DR-BR cpl. HT Garthe

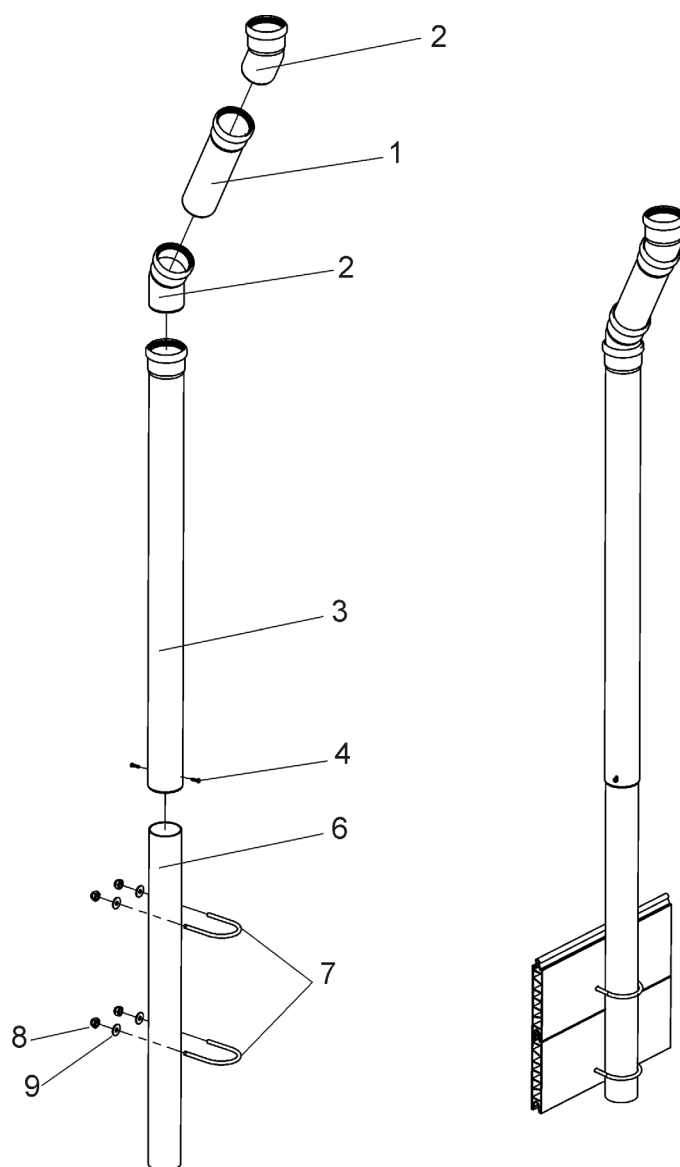


Figure 11-12: Code no. 83-01-5343

Pos.	Quantity	Code No.	Description
	1	83-01-5343	Drop-pipe DR-BR cpl Garthe tiltabl.-/stand. stand./stand.
1	1	83-01-5172	Pipe plastic 75x 250
2	2	99-50-3763	Bend plastic 75mm-30deg
3	1	83-01-5342	Pipe plastic 75x1000
4	2	99-10-3879	Tapping screw B 4,2x19 DIN7981
	1	65-02-6371	Protect pipe galv cpl Garthe- tiltable/stand. & stand.-stand.
6	1	10-88-3429	Tube 70x2,60- 800 galv
7	2	10-87-3132	U-bolt galv 8x35/W75/100
8	4	99-20-1064	Self-locking counter nut M 8 DIN 985-6 galv
9	4	37-80-2011	Washer A 8,4x25x2,0 DIN 9021 galv

11.5 Protecting tubes



In areas where the drop pipe is accessible for the animals also install a protecting tube against gnawing.

11.5.1 Protecting pipe SST cpl for trough built in the wall

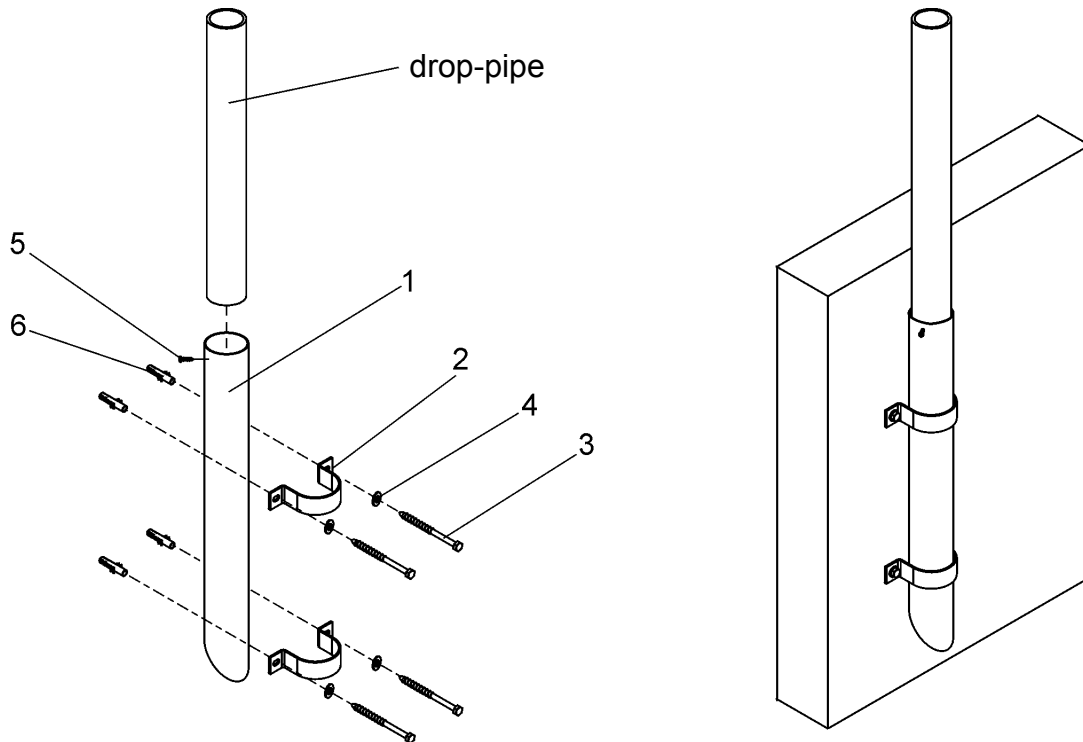


Figure 11-13: Code no. 10-87-3270

Pos.	Quantity	Code No.	Description
	1	10-87-3270	Protection pipe 600mm SST cpl for trough built-in wall
1	1	10-87-3271	Protection pipe 70x2-600 SST
2	2	99-50-3914	Pipe clip 70x30 SST
3	4	99-20-1408	Hexagon wood screw 8x 80 DIN 571-A2 SST
4	4	99-20-1600	Washer SST A 8,4 DIN 125
5	1	99-50-3915	Tapping screw B 3,9x16 DIN7981 SST
6	4	99-98-3822	Dowel S 10 MEA

11.5.2 Protecting pipe SST cpl. at wall or partition PVC

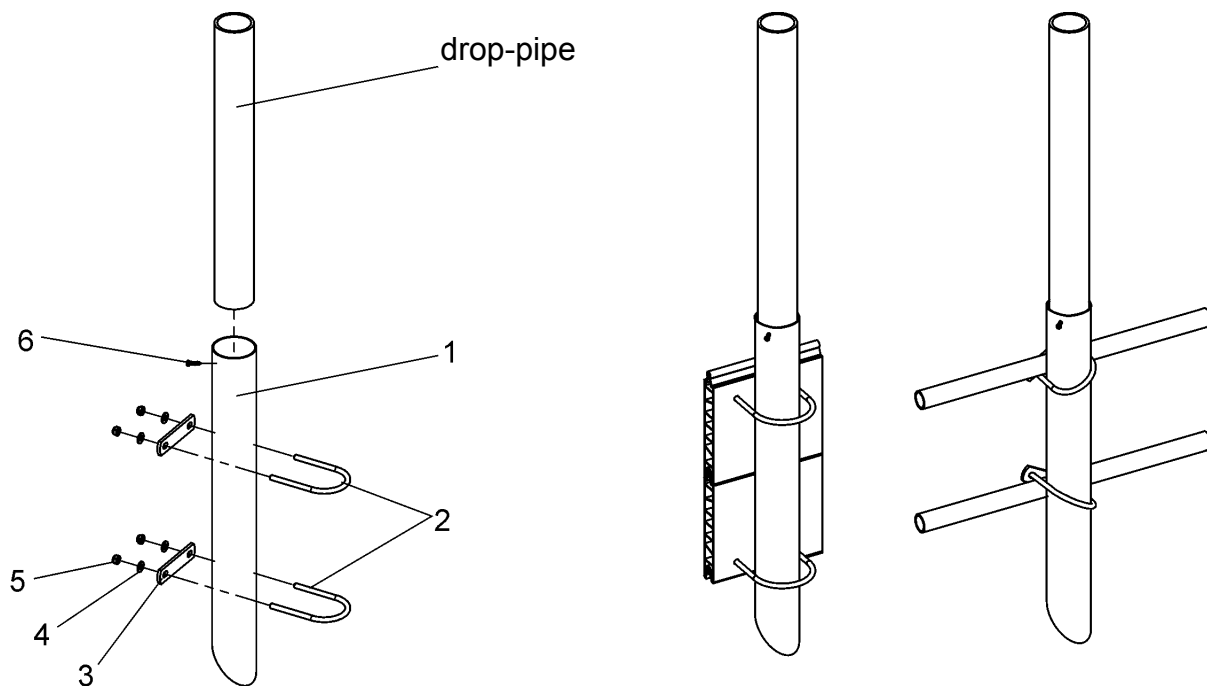


Figure 11-14: Code no. 10-87-3275

Pos.	Quantity	Code No.	Description
	1	10-87-3275	Protection pipe 600mm SST cpl at aisle or partition
1	1	10-87-3271	Protection pipe 70x2-600 SST
2	2	99-50-3042	U-bolt SST 8x30/W90/120
3	2	99-50-3043	Counter plate SST for U-bolt 8mm/W90
4	4	99-20-1600	Washer SST A 8,4 DIN 125
5	4	99-20-1193	Self-locking counter nut M 8 DIN 985 SST
6	1	99-50-3915	Tapping screw B 3,9x16 DIN7981 SST

11.5.3 Protecting pipe SST cpl for trough built in the wall

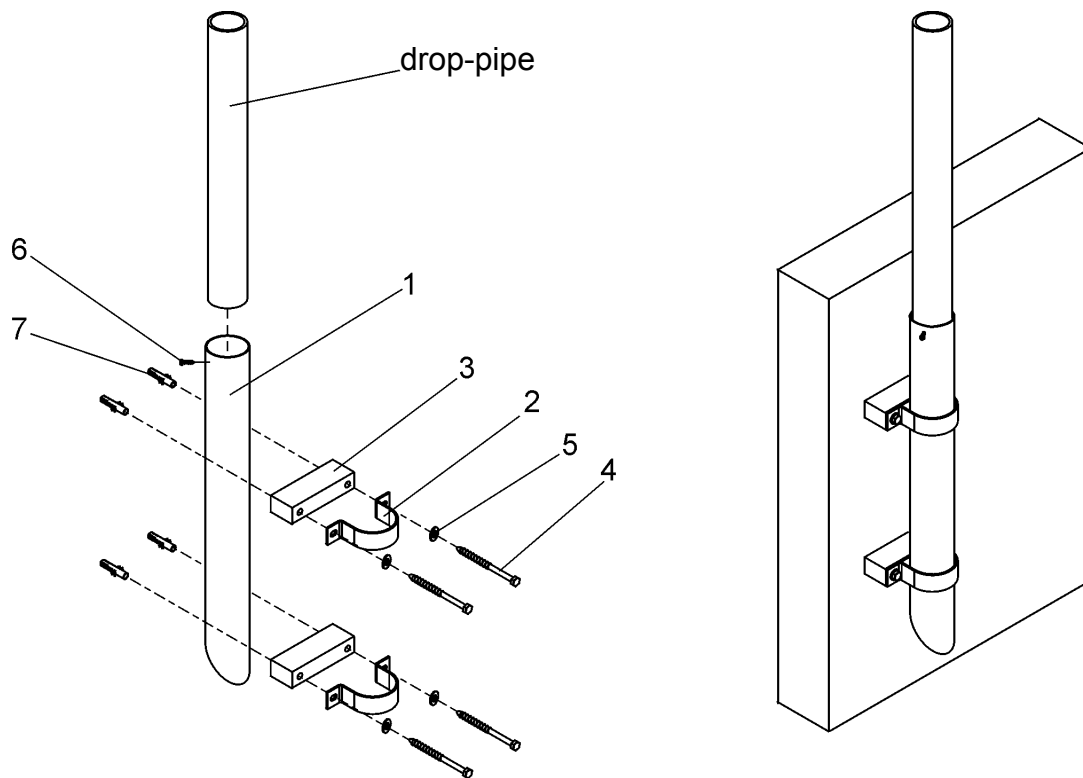


Figure 11-15: Code no. 10-87-3280

Pos.	Quantity	Code No.	Description
	1	10-87-3280	Protection pipe 600mm SST cpl for trough built in front of wall
1	1	10-87-3271	Protection pipe 70x2-600 SST
2	2	99-50-3914	Pipe clip 70x30 SST
3	2	10-87-3671	Spacer 130x45-30 for drop-pipe at wall
4	4	99-20-1427	Hexagon wood screw 8x120 DIN 571-A2 SST
5	4	99-20-1600	Washer SST A 8,4 DIN 125
6	1	99-50-3915	Tapping screw B 3,9x16 DIN7981 SST
7	4	99-98-3822	Dowel S 10 MEA

11.5.4 Protecting pipe galv cpl. Standard tiltable / concrete trough

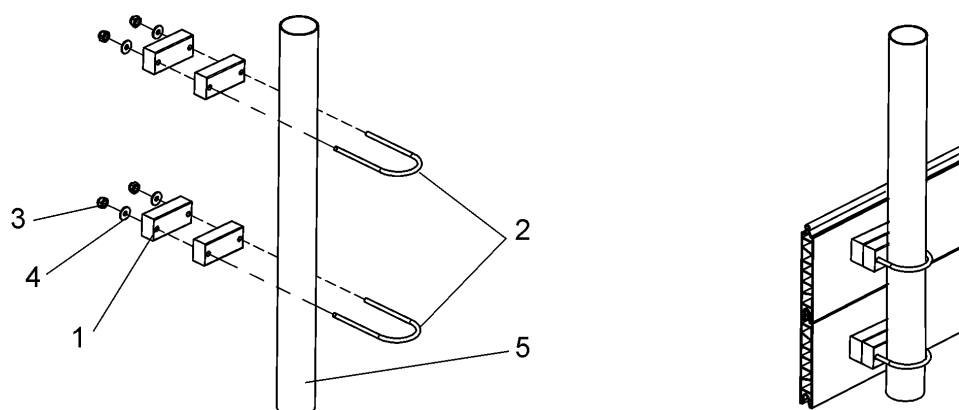


Figure 11-16: Code no. 65-02-3355

Pos.	Quantity	Code No.	Description
	1	65-02-3355	Protection pipe galv cpl standard- tiltable-/concrete trough
1	4	83-00-8102	Spacer 130x45-30 for protect. pipe at farrowing crate stand.
2	2	83-00-8650	U-bolt galv 8x45/W75/150
3	4	99-20-1064	Self-locking counter nut M 8 DIN 985-6 galv
4	4	37-80-2011	Washer A 8,4x25x2,0 DIN 9021 galv
5	1	10-88-3429	Tube 70x2,60- 800 galv

11.5.5 Protecting pipe galv cpl. Garthe tiltable / standard & standard stand

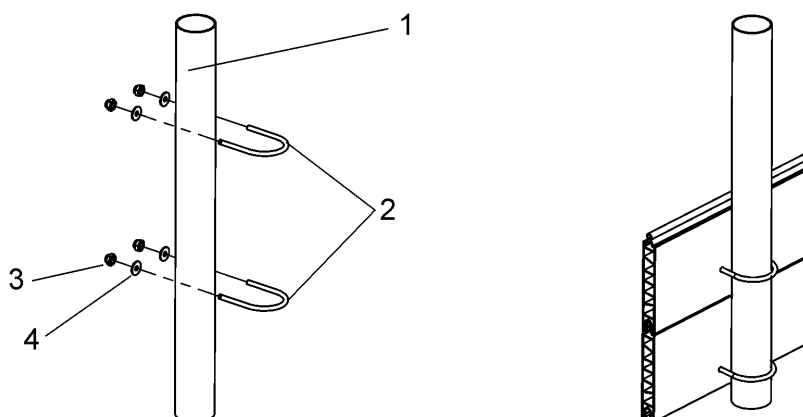


Figure 11-17: Code no. 65-02-6371

Pos.	Quantity	Code No.	Description
	1	65-02-6371	Protection pipe galv cpl Garthe-tiltable-/stand & standard stand.
1	1	10-88-3429	Tube 70x2,60- 800 galv
2	2	10-87-3132	U-bolt galv 8x35/W75/100
3	4	99-20-1064	Self-locking counter nut M 8 DIN 985-6 galv
4	4	37-80-2011	Washer A 8,4x25x2,0 DIN 9021 galv

11.6 Recommended assembly order

1. Mark the feed discharge points on the underside of the feed pipe.
2. To make sure that all holes for the feed discharge points lie directly on the center line of the underside of the tube, draw a cord.
3. Drill out the weepholes (see chapter 11.1).
4. Assemble the feed outlets according to your individual requirements:
 - outlets (see chapter 11.2)
 - volume dispenser (see chapter 11.3)and the respective drop pipes, if necessary with protecting tubes.

12 Release for volume dispenser

12.1 General component parts for the release

12.1.1 Release ropes

Pos.	Quantity	Code No.	Description
		60-40-3105	Wire rope 3 mm SST 1.4301
		99-50-1050	Wire rope 6mm PP-coated core 5 mm

12.1.2 Guidance for release rope



Set 2 rope guides per tube (5m).

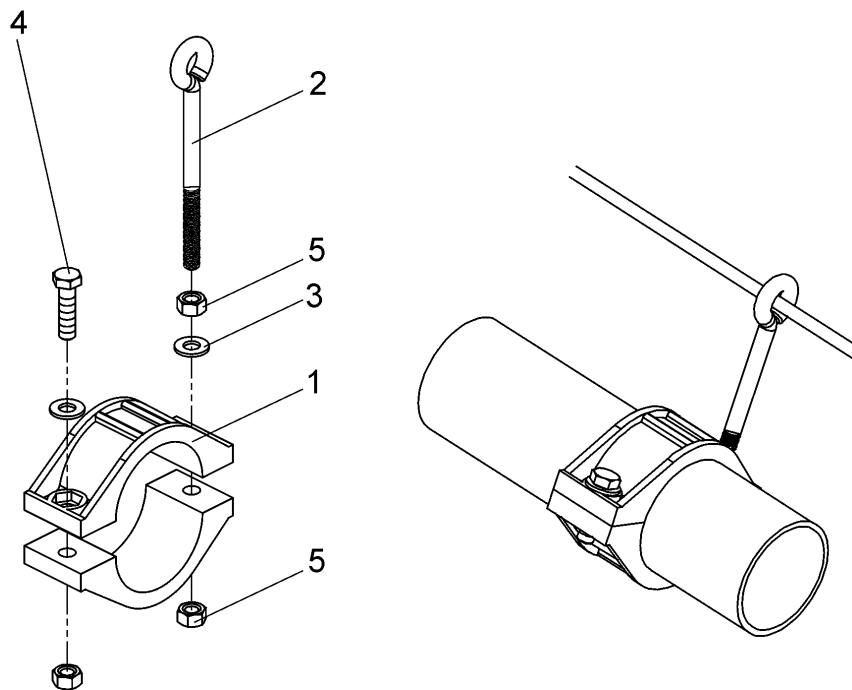


Figure 12-1: Code no. 10-88-3461

Pos.	Quantity	Code No.	Description
	1	10-88-3461	Guide for releasing rope at volume dispenser TI/BR DR1500
1	2	10-87-3733	Clamp ABS for corner TF-D60 /DR1500
2	1	38-92-3517	Lifting eye bolt 48/M 8x 80
3	3	99-10-1040	Hexagon nut M 8 galv DIN 934-8
4	1	99-10-1058	Hexagon head screw M 8x 30 DIN 558 galv
5	2	99-20-1026	Washer A 8,4 DIN 125 galv

12.1.3 Guide wheel at corner cpl.

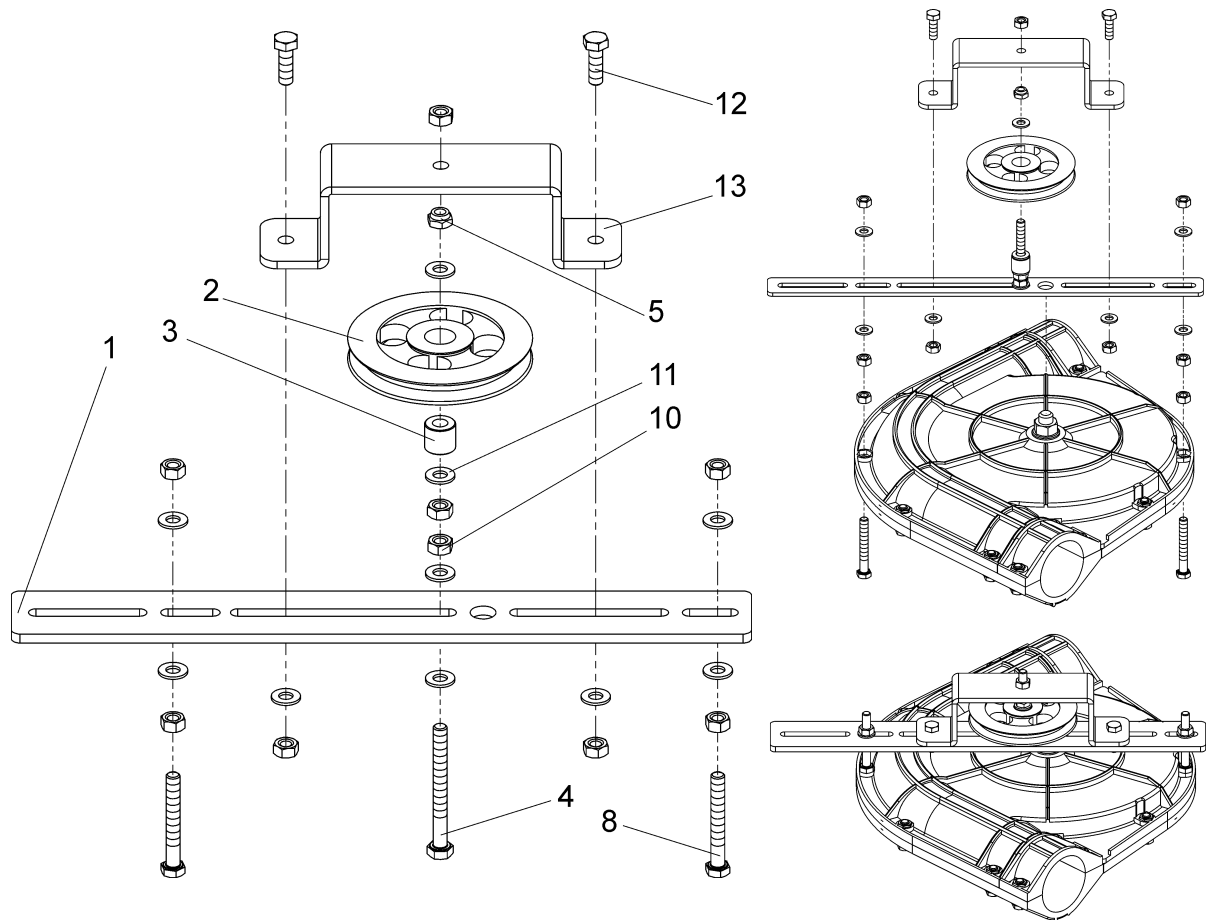


Figure 12-2: Code no. 83-01-2209

Pos.	Quantity	Code No.	Description
	1	83-01-2209	idler at corner for release adjustable cpl for DR
1	1	83-01-2207	joint shackle for idler roller at corner DR
2	1	83-00-0126	idler wheel
3	1	83-00-0127	bearing bush
4	1	99-10-1317	hexagon head screw M 8x80 galv. DIN 558
5	1	99-20-1064	self-locking counter nut M 8 DIN 985-6 galv.
	2	99-10-1276	hexagon head screw M 6x 60 galv. DIN 558 (for DR850)
	4	99-10-1045	hexagon nut M 6 galv. DIN 934-8 (for DR850)
8	2	99-10-1278	hexagon head screw M 8x60 galv. DIN 558
	4	99-50-1147	washer B 6.4 DIN 125 galv. (for DR850)
10	9	99-10-1040	hexagon nut M 8 galv. DIN 934-8
11	10	99-20-1026	washer A 8.4 DIN 125 galv.
12	2	99-10-1039	hexagon head screw M 8x25 galv. DIN 558
13	1	83-02-6186	bracket for idler roller for idler at corner

12.1.4 Tension spring with accessories

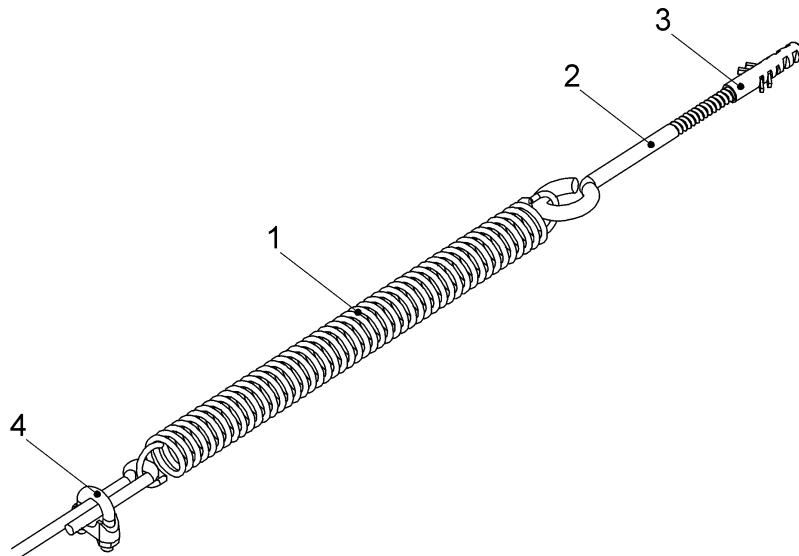


Figure 12-3: Code no. 37-76-3814 with 10-93-1642

Pos.	Quantity	Code No.	Description
1	1	37-76-3814	Tension spring 2,5x25x280 B DIN 17223
2	1	10-93-1642	Cup hook galv 120x22x7,8
3	1	99-98-3822	Dowel S 10 MEA
6	1	99-50-0120	Cable clamp 5mm 3/16" galv

12.1.5 Idler roller 107mm cpl.

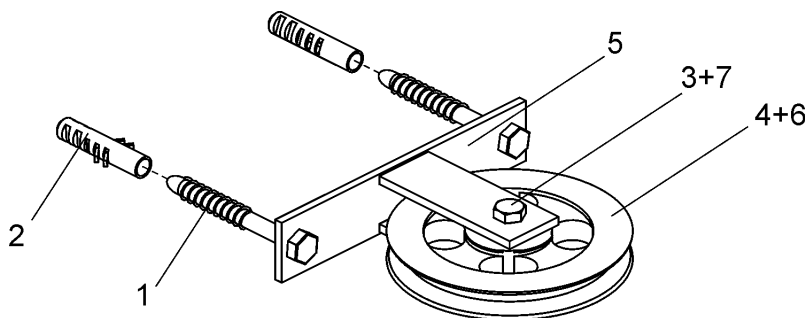


Figure 12-4: Code no. 83-00-0129

Pos.	Quantity	Code No.	Description
	1	83-00-0129	Idler roller 107mm cpl. with wall bracket for DR
1	2	99-10-3780	Hexagon wood screw 8x 80 DIN 571-ST galv.
2	2	99-98-3822	Dowel S 10 MEA
3	1	99-20-1193	Self-locking counter nut M8 SST DIN 985
4	1	83-00-0127	Bearing bush
5	1	83-00-0128	Bracket for idler roller 415315
6	1	83-00-0126	Idler wheel
7	1	99-10-1248	Hexagon head screw M 8x35 galv. DIN 558

12.1.6 Idler roller 105mm cpl.



Use this idler roller as an alternative for long installations.

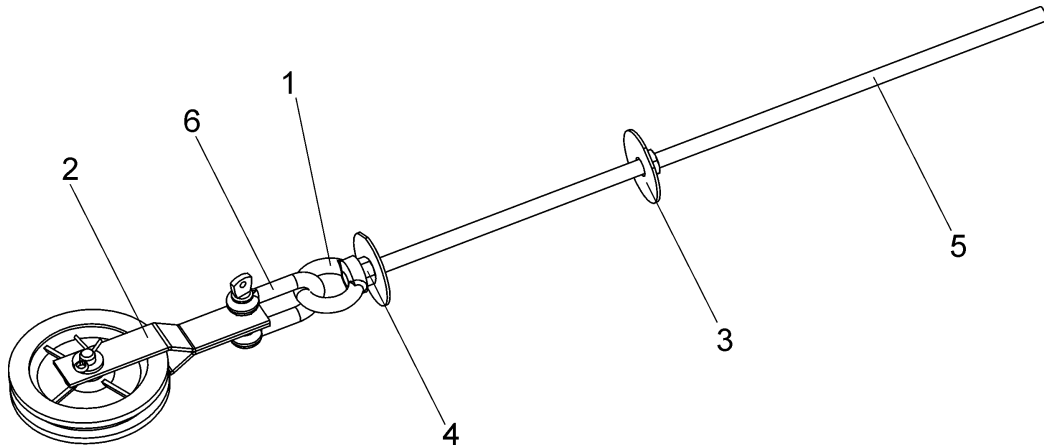


Figure 12-5: Code no. 10-87-3149

Pos.	Quantity	Code No.	Description
	1	10-87-3149	Idler roller 105mm cpl w/threaded rod for DR
1	1	99-20-3708	Lifting eye nut M 10 DIN 582 galv
2	1	00-00-3006	Pulley 4 1/8" 105mm plastic with split strap
3	2	20-90-3759	Washer 13x50-2 galv
4	2	99-20-1029	Hexagon nut M 10 galv DIN 555
5	0.5	99-10-3710	Rod threaded M10x1000 DIN 975 galv
6	1	99-50-1251	Shackle 3/8" galv

12.1.7 Alternative idler rollers

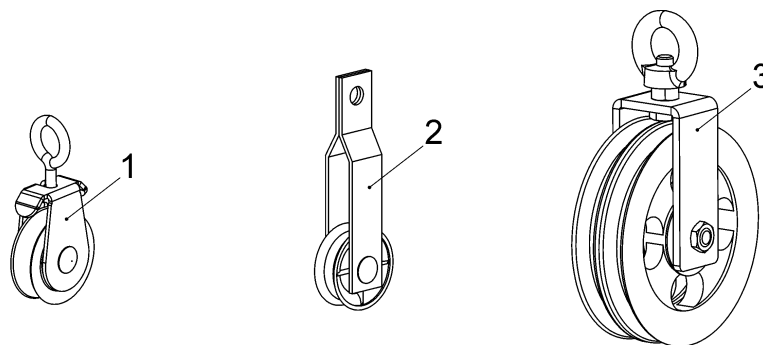


Figure 12-6: Code no. 00-00-0313, 00-00-3004 and 60-41-5017

Pos.	Quantity	Code No.	Description
1	1	00-00-0313	Pulley 1 7/8" 47,6mm plastic w/ suspension eye
2	1	00-00-3004	Pulley 1 1/3" 38,1mm plastic
3	1	60-41-5017	Idler pulley double PVR for lifting block



12.2 Release with cable winch

12.2.1 Assembly and operation

By means of this release, the volume dispenser BR and TI for dry feeding systems can be opened manually via a cable winch.

Example

The component parts and groups are described in detail in the respective chapters. Component parts without pos.-no. stand for alternative options.

Pos.	Code No.	Description	Chapter
1	83-01-1794	Release rope 3 mm SST 1.4301	12.1.1
	99-50-1050	Wire rope 6mm PP-coated core 5 mm	12.1.1
2	10-87-3701	Tube 60x1,5	10.1
3	10-38-3412	Volume dispenser 6L BR cpl DR 1500	11.3.1
	10-88-3200	Volume dispenser 6L TI cpl DR 1500	11.3.2
	10-88-3210	Volume dispenser 10L TI cpl DR 1500	11.3.2
	10-88-3220	Volume dispenser 15L TI cpl DR 1500	11.3.2
4	99-50-0120	Cable clamp 5mm 3/16" galv	11.3.1
5	83-01-5343	Drop-pipe DR-BR cpl. HT Garthe tiltable / stand. & standard stand.	11.4.5
6	83-00-1598	Drop-pipe for volume dispenser BR/TI at crate stand	11.4.3
7	10-87-3135	Drop-pipe cpl. 63x4,7-1650 for volume dispenser	11.4.1
8	83-01-5308	Drop pipe DR-BR cpl. HT standard tiltable / concrete trough	11.4.4
9	10-87-3235	Drop-pipe cpl. 63x4.7-1450 s-shaped for volume dispenser	11.4.2
10	10-88-3461	Guide for releasing rope at volume dispenser TI/BR DR 1500	12.1.2
11	83-01-2209	Idler at corner for release adjustable cpl for DR	12.1.3
12	10-87-3730	Corner 90deg PA6+GK30 cpl DR1500/TF-D60	10.3
13	99-50-3038	Tube clamp dia 60 w/screw 6x25	10.4
14	10-93-1642	Cup hook galv 120x22x7,8 galv	12.1.4
15	37-76-3814	Tension spring 2,5x25x280 B DIN 17223	12.1.4
16	83-00-0129	Idler roller 107mm cpl. with wall bracket for DR	12.1.5
	10-87-3149	Idler roller 105mm cpl. with threaded rod for DR	12.1.6
17	65-00-3151	Winch 450 kg for tipping trough feeding	12.2.2
18	83-00-0894	Bracket universal for cable winches and pulleys 3 1/2" (universal)	12.2.2

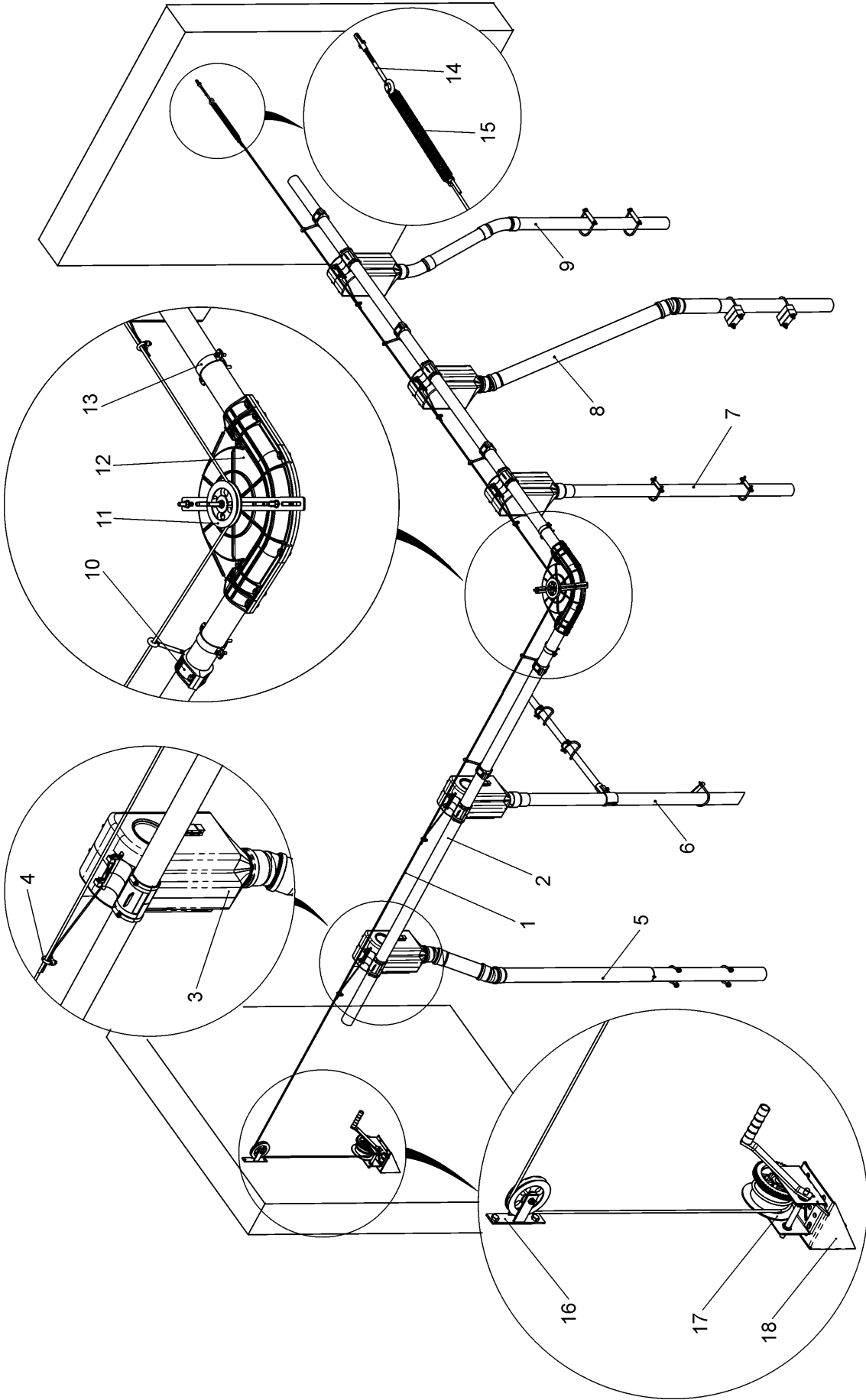


Figure 12-7: Example for a release with wall-mounted cable winch

12.2.2 Release with wall-mounted cable winch cpl.

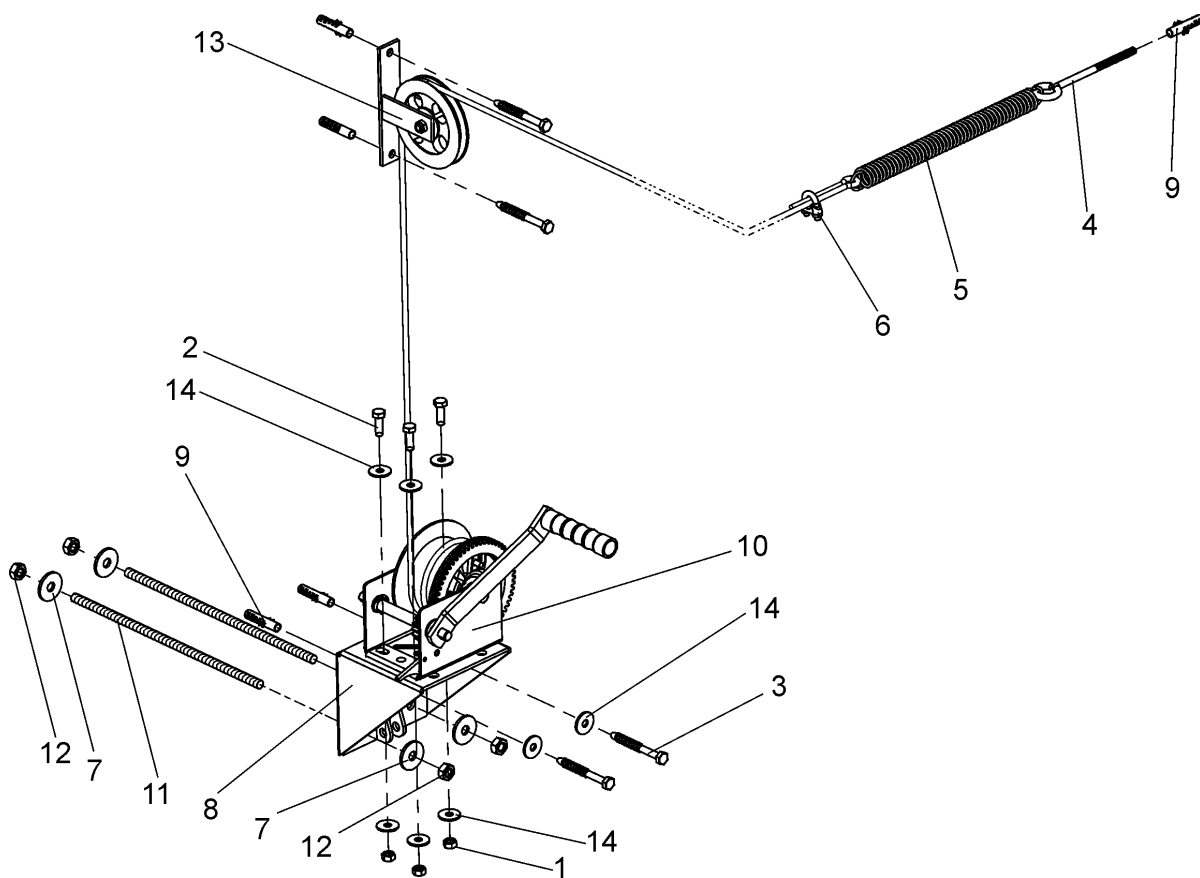


Figure 12-8: Code no. 10-87-3190

Pos.	Quantity	Code No.	Description
	1	10-87-3190	Hand release with winch for wall for volume dispenser DR850/1500
1	4	99-10-1040	Hexagon nut M 8 galv DIN 934-8
2	4	99-10-1039	Hexagon head screw M 8x 25 DIN 558 galv
3	4	99-10-3733	Hexagon wood screw 8x 60 DIN 571-ST galv
4	2	10-93-1642	Cup hook galv 120x22x7,8
5	1	37-76-3814	Tension spring 2,5x25x280 B DIN 17223
6	1	99-50-0120	Cable clamp 5mm 3/16" galv
7	4	99-50-1483	Washer A 10,5x30x2,5 DIN 9021 galv
8	1	83-00-0894	Bracket universal for cable winches and pulley 3 1/2"
9	6	99-98-3822	Dowel S 10 MEA
10	1	65-00-3151	Winch 450kg for tipping trough feeding
11	1.5	99-10-3710	Rod threaded M10x1000 DIN 975 galv
12	6	99-20-1029	Hexagon nut M 10 galv DIN 555
13	1	83-00-0129	Idler roller 107mm cpl with wall bracket for DR
14	10	37-80-2011	Washer A 8,4x25x2,0 DIN 9021 galv



If the release rope gets too long when the volume dispensers are closed, it slides from the idler rollers. Therefore you have to implement a lift stop consisting of a tripod jack and cable clamp.

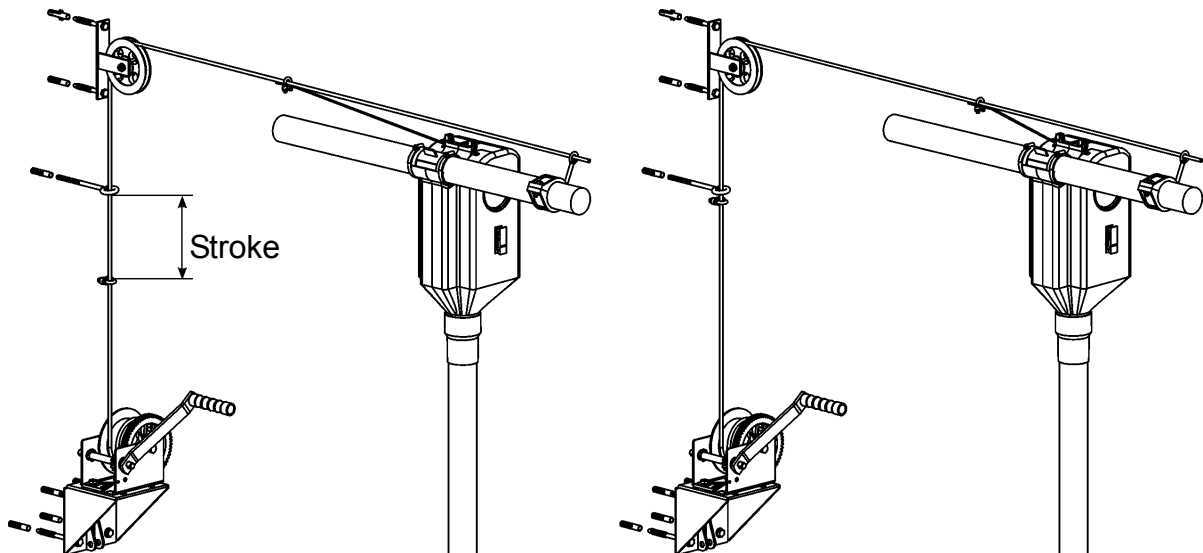


Figure 12-9: lift stop

12.2.3 Safety regulations for the cable winch

- This winch is built for multi-purpose hauling and pulling operations. It is not recommended for lifting operations !
- Large forces are released when using a winch, creating potential safety hazards. It should be operated and maintained in accordance with the respective instructions. Never allow children or anyone who is not familiar with the operation of the winch to use it.
- Maintain a firm grip on the winch handle at all times, and never release the handle when the ratchet lever is in unlocked position with a load on the winch. Otherwise, the handle will spin violently, thus causing severe injuries.
- Check for proper ratchet operation before each use of the winch. Do not use if damaged. Seek immediate repairs.
- Never pull on the winch handle against a locked ratchet.
- Never exceed the rated capacity. Excess load may cause premature failure and could result in serious personal injury. The winch is rated at 500 kg with three layers of line on a 7/8" hub.
- Never apply load on winch with cable fully extended. Keep at least three full turns of rope on the reel.
- The winch should not be operated with a motor of any kind.



12.3 Automatic release

12.3.1 Assembly and operation

By means of this release, the volume dispensers BR and TI for dry feedings systems can be opened automatically.

Example

The component parts and groups are described in detail in the respective chapters. Component parts without pos.-no. stand for alternative options.

Pos.	Code No.	Description	Chapter
1	83-01-1794	Release rope 3 mm SST 1.4301	12.1.1
	99-50-1050	Wire rope 6mm PP-coated core 5 mm	12.1.1
2	10-87-3701	Tube 60x1,5	10.1
3	10-38-3412	Volume dispenser 6L BR cpl DR 1500	11.3.1
	10-88-3200	Volume dispenser 6L TI cpl DR 1500	11.3.2
	10-88-3210	Volume dispenser 10L TI cpl DR 1500	11.3.2
	10-88-3220	Volume dispenser 15L TI cpl DR 1500	11.3.2
4	99-50-0120	Cable clamp 5mm 3/16" galv	11.3.1
5	83-01-5343	Drop-pipe DR-BR cpl. HT Garthe tiltable / stand. k standard stand	11.4.5
6	83-00-1598	Drop-pipe for volume dispenser BR/TI at crate stand	11.4.3
7	10-87-3135	Drop-pipe cpl. 63x4,7-1650 for volume dispenser	11.4.1
8	83-01-5308	Drop pipe DR-BR cpl. HT standard tiltable / concrete trough	11.4.4
9	10-87-3235	Drop-pipe cpl. 63x4.7-1450 s-shaped for volume dispenser	11.4.2
10	10-88-3461	Guide for releasing rope at volume dispenser TI/BR DR 1500	12.1.2
11	83-01-2209	Idler at corner for release adjustable cpl for DR	12.1.3
12	10-87-3730	Corner 90deg PA6+GK30 cpl DR1500/TF-D60	10.3
13	99-50-3038	Tube clamp dia 60 w/screw 6x25	10.4
14	10-93-1642	Cup hook galv 120x22x7,8 galv	12.1.4
15	37-76-3814	Tension spring 2,5x25x280 B DIN 17223	12.1.4
16	83-00-0129	Idler roller 107mm cpl. with wall bracket for DR	12.1.5
	10-87-3149	Idler roller 105mm cpl. with threaded rod for DR	12.1.6
17	10-88-3340	Automatic release DR with adjustable drive	12.3.2

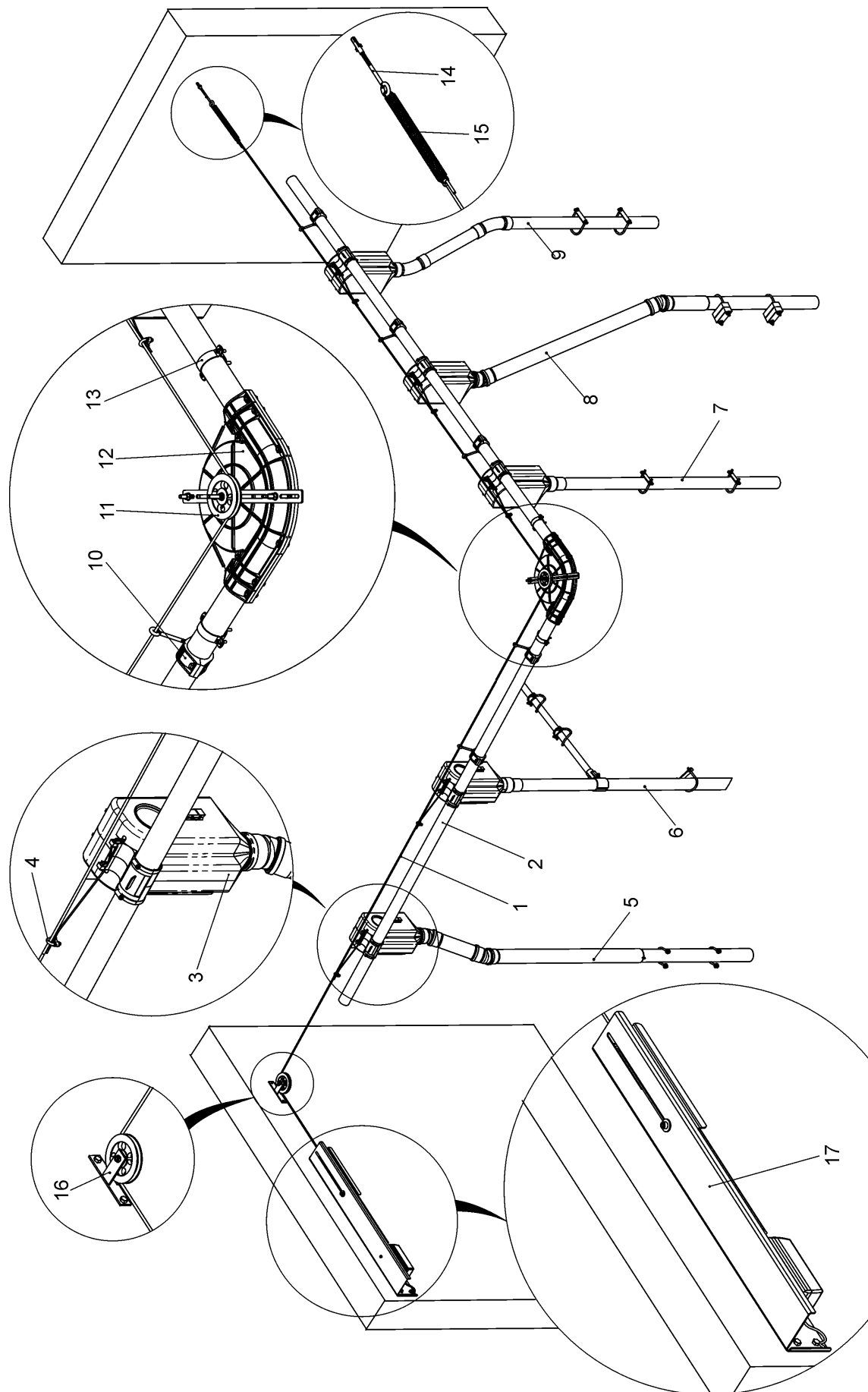


Figure 12-10: Example of a wall-mounted automatic release

The bracket for winch motor can be fixed to the conveying pipe as well as to the wall. The required lifting height is adjusted by means of displacing the limit switches. They are located below the detachable rubber band at the adjusting spindle.

For opening / closing of the volume dispenser a max. of 290mm lifting height are provided. Provided that the opening rope with the closing ball of the volume dispenser is fixed to the central release rope with different lengths, up to 100 volume dispensers can be opened this way.

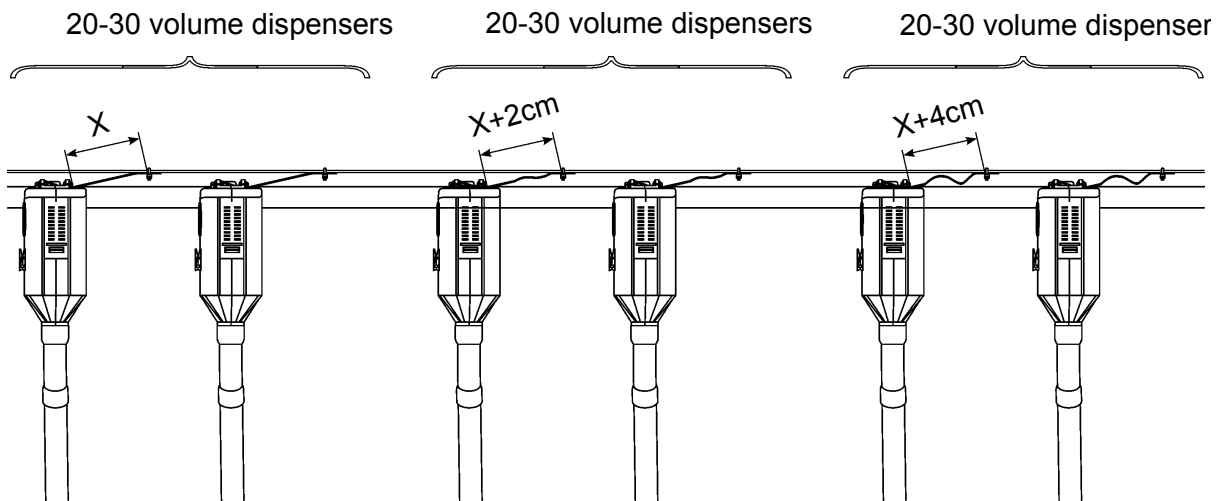


Figure 12-11: Release for up to 100 volume dispensers

12.3.2 Automatic release with winch motor

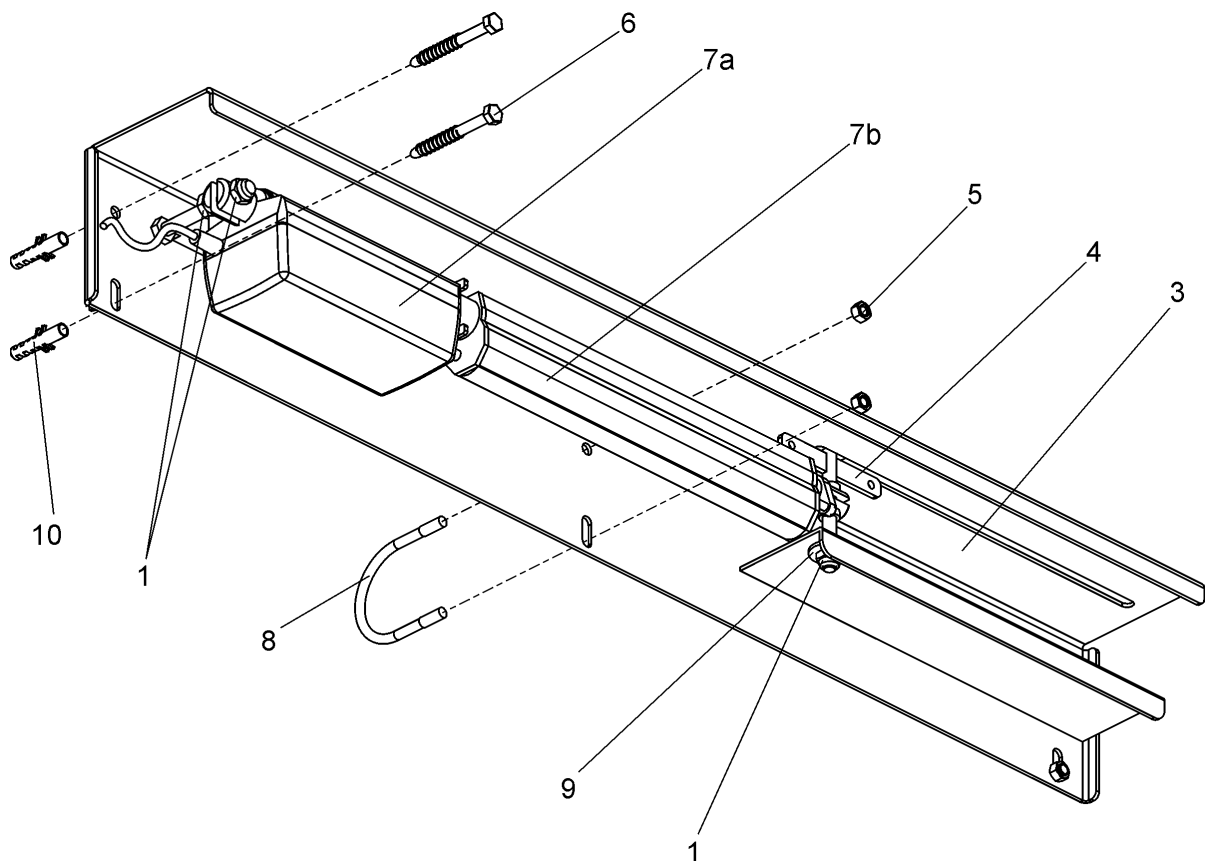


Figure 12-12: Code no. 10-88-3440

Pos.	Quantity	Code No.	Description
	1	10-88-3440	Releasing device automatic DR with winch motor LA28.1-450-24
1	3	99-20-1065	Self-locking counter nut M 10 DIN 980-8 galv
2	3	99-50-1420	U-bolt cadm. cpl 8x25/W52/H69 Pipe 2"
3	1	83-00-1680	Bracket for winch motor LA28.1-450-24-01
4	1	83-00-1141	Tension screw for automatic releasing device
5	6	99-10-1040	Hexagon nut M 8 galv DIN 934-8
6	6	99-10-3780	Hexagon wood screw 8x 80 DIN 571-ST galv
7a	1	83-00-1683	Winch motor LA28.1-450-24 incl.
7b			limit switch
8	3	99-50-3027	U-bolt galv 8x20/W67/H80
9	1	99-50-1483	Washer A 10,5x30x2,5 DIN 9021 galv
10	6	99-98-3822	Dowel S 10 MEA



The automatic release DR with winch motor is to be used only with control unit DR850/1500 1.5kW with automatic release (code-no. 91-08-3171).



12.3.3 Winch motor incl. limit stop

Safety regulations

Observe the following points, before insertion or removal, as well as during fault finding or fault removal:

- The winch motor is out of operation.
- Power supply has been disconnected and the main plug has been unplugged.
- The winch motor is free of loads that could otherwise be released during one of these operations.

Before taking the winch motor into operation the following points have to be checked:

- The winch motor has been assembled correctly as described in the respective instructions.
- The object that is to be moved, can move freely corresponding to the working way of the winch motor.
- The winch motor is connected to the main power supply / transformer with the correct tension for the respective winch motor.

During operation:

- Pay attention to abnormal sounds and irregular operation. Immediately turn off the winch motor, as soon as you notice anything strange.

If the installation is not running:

- Disconnect power supply or unplug the main plug, to prevent putting the installation into operation by accident.

During the erection or assembly of objects in which the winch motor is to be built in, any possible risk of injury (such as jamming of fingers or arms) has to be ruled out.



Do not expose the winch motor to dissolvents or basic or alkaline liquids.

Mode of operation

The winch motor is run by a low-voltage DC motor (pos. 3), that drives a threaded spindle via a transmission system (pos. 4). A safety nut is attached to the spindle. As the nut is not able to turn because the piston rod is kept in place (pos. 6) it moves back and forth when the spindle turns. Together with the piston rod, the actuating rod (pos. 8) for the limit stops is retracted and extended. The type of motor, type of gearing and type of spindle determine the shearing force and the speed.

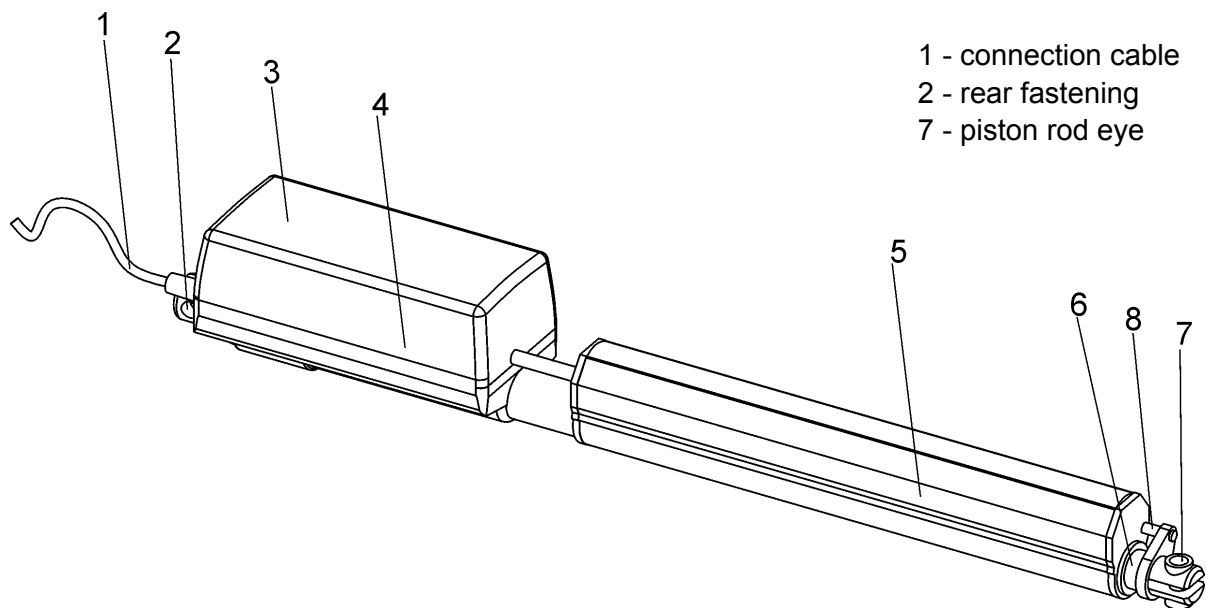


Figure 12-13: Code no. 83-00-1683

The electrical stop control XLSD (pos. 5) limits the stroke and stops the winch motor at two positions that can be pre-set with limit switches. The winch motor is turned off, as soon as it reaches its final position or in case of overstressing.

Technical data

max. capacity:	2000 N
Voltage:	24 V
max. current consumption:	2 A
Protective system:	IP 51

Assembly

During the assembly, always make sure that:

- the winch motor sits tightly but that there is enough freedom of movement at its holding straps
- it is supported in the bushes of the seat that twist is prevented
- the motor is mounted at the correct angle to the fastening levels

- the drive is mounted with the right pin bolt sizes
- is assembled with screws and nuts made of steel
- is protected against loosening of screws and nuts.

12.3.4 Assembly of the winch motor

1. Pre-setting the spindle travel.

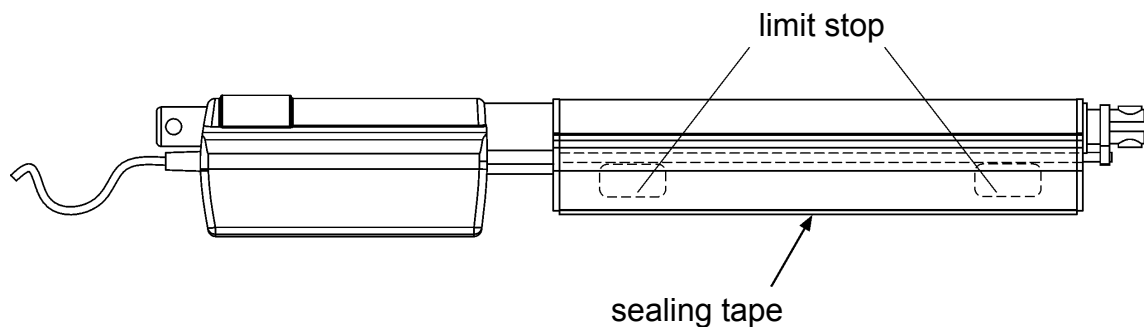


Figure 12-14: winch motor with limit stops

Remove the sealing tape. Release the pan head screw at the limit switch by means of a slotted screwdriver. Push the limit switch forward until the required travel is reached. This is measured from the centre of the pan head screw of the first switch up to the centre of the pan head screw of the second.



A wrong adjustment of the limit switches might lead to damages at the gearing once the system is put into operation.

2. Fix the bracket at the conveyor pipe by means of a U-bolt or at the wall by means of hexagon wood screws depending on the correct position.

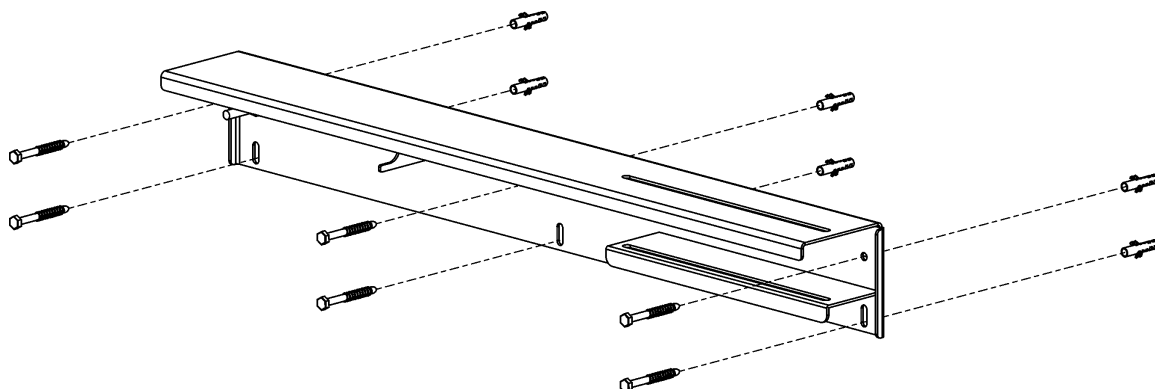


Figure 12-15: wall assembly

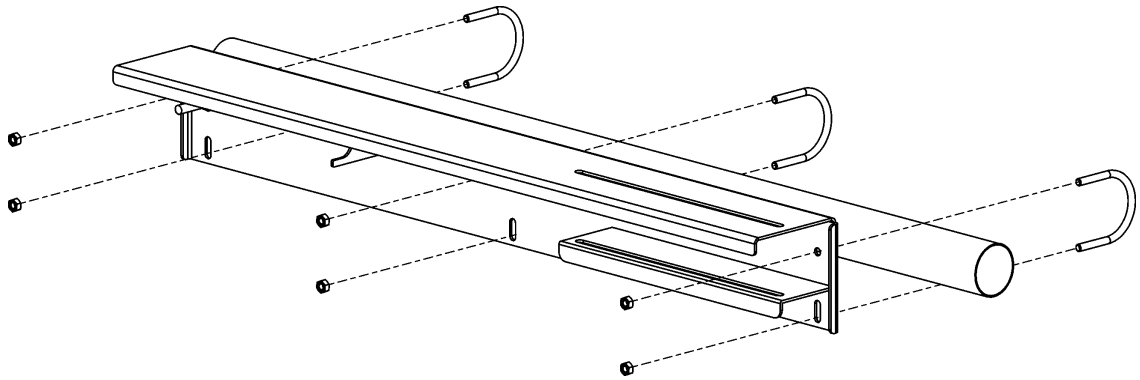


Figure 12-16: tube assembly

3. Place the winch motor into the bracket in half-extended position (spindle can be reeled out by turning). Fix the winch motor with safety nut M 10.

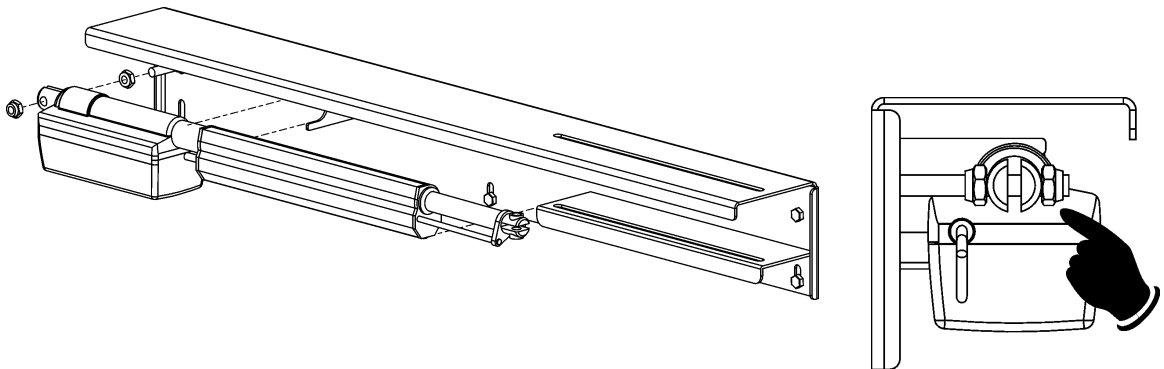


Figure 12-17: Assembly of the winch motor

4. Insert the tension screw trough the opening at the top of the bracket and through the drill hole in the spindle rod

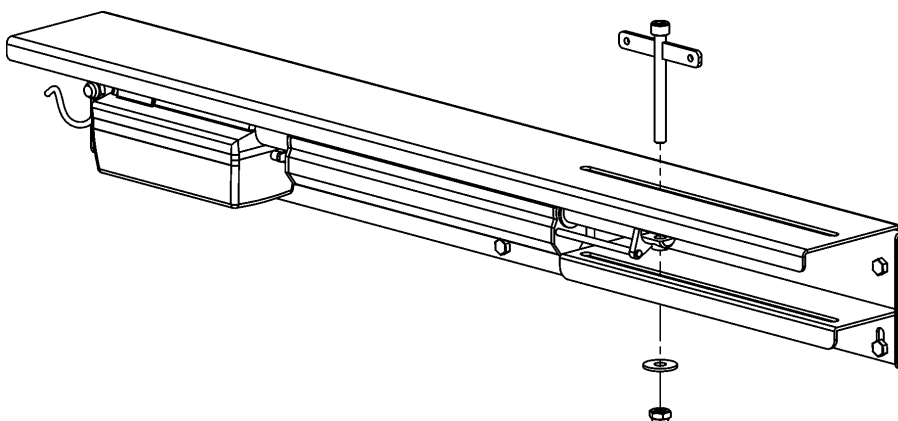


Figure 12-18: Inserting the tension screw

Screw down the tension screw by means of washer and self-locking counter nut M10. For this, loosen the self-locking counter nut so that the tension screw can no longer be moved in vertical direction.

5. At open release circuit, lay the release rope around the tension spring at the fork head and fix it with rope clamps.

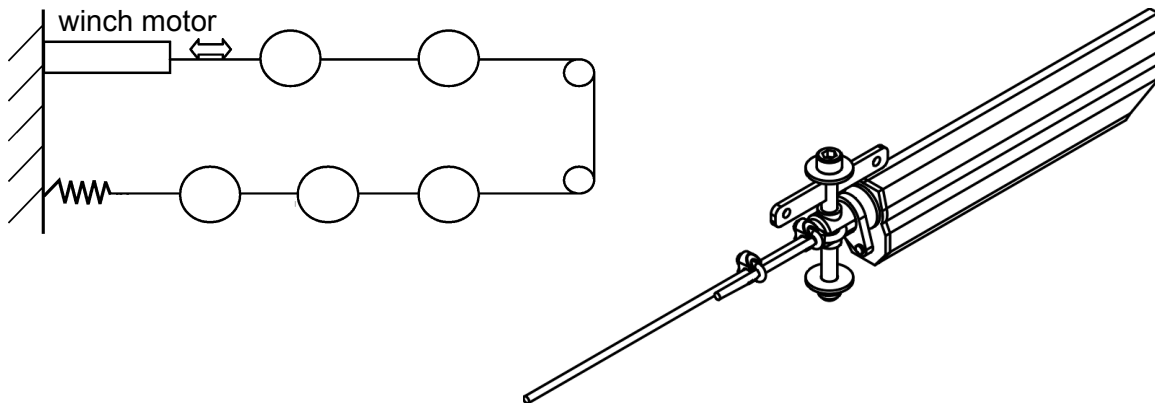


Figure 12-19: Fastening of the release rope when it is open

6. We recommend to seal the rubber band with silicone at the adjusting spindle after the installation of the release system is completed.

12.4 Recommended assembly order



For a better understanding, take a look at figure 12-7 (page 121) for release with cable winch or figure 12-10 (page 125) for automatic release.

1. Determine the distribution of the release rope and the location for the release devices (cable winch and winch motor).
2. Attach the idler rollers at the idler corners and the guides for the release rope at the feed pipe.
3. Position the wire rope in the area of the volume dispensers.
4. Assemble the idler rollers at the same height and alignment as the course of the release wire at the wall.
5. Fix the release devices to the wall / tube, and for an open release circuit the cup hook for the tension spring at the wall.
6. Tension the release rope around the idler corners and guide it through the guides up to the release devices.
7. Connect the traction ropes of the volume dispensers BR resp. the combed slivers of the volume dispensers TI with the cable clamps at the release rope.
8. Fix the release rope to the release device.

13 Control and operation

DR 1500 is controlled automatically by a capacitive proximity switch.

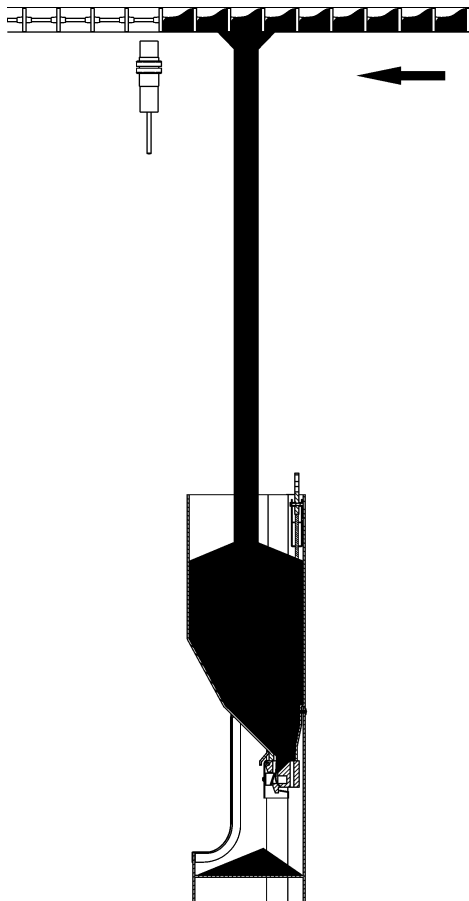
13.1 Sensors



During connection and adjustment of the sensor, follow the enclosed installation instructions by **Big Dutchman** (code-no. 99-97-1314).

13.1.1 Sensor with fastening cpl. at conveyor tube

Functioning



The sensor sits at the conveyor tube, directly behind the last automatic feeder. If this automatic feeder is filled, the sensor is activated and the drive is turned off.

When feed is ingested and the sensor is released, the drive is switched on again after an appropriate time delay and refills the automatic feeders.

Figure 13-1: Sensor at conveyor pipe



The sensor with bracket cpl. at conveyor tube may only be used with the control unit DR 850/1500 for sensor at conveyor tube (code-no. 91-08-3031 / 91-08-3033 *).

* drive motor 0.75kW: 91-08-3031 or 1.5 kW: 91-08-3033

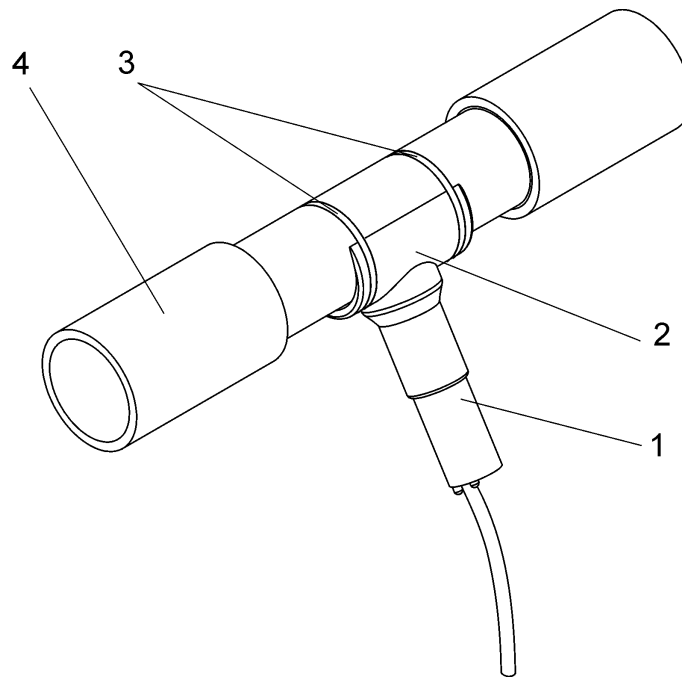
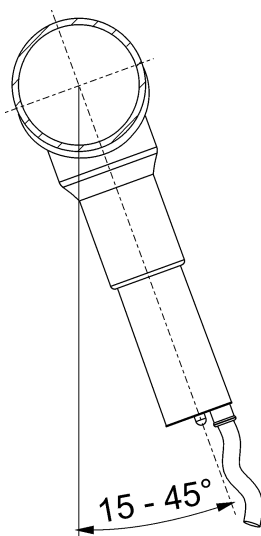


Figure 13-2: Code no. 10-88-3415

Pos.	Quantity	Code No.	Description
	1	10-88-3415	Sensor with fastening cpl at conveyor tube DR1500
1	1	60-40-0654	Sensor MS-45R 220V
2	1	60-41-0112	T-piece for sensor MS-45R
3	2	10-88-3412	Strap 360mmx7,5
4	1	83-00-9900	Control-segment DR1500

Assembly

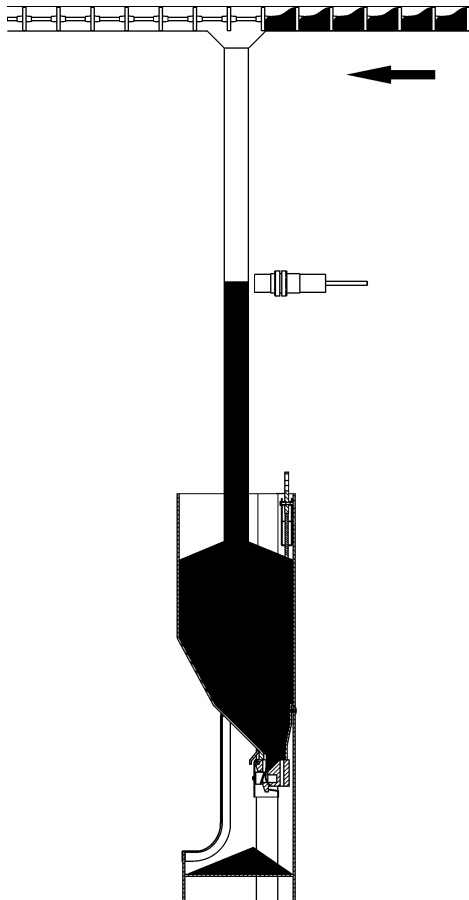
Insert the control segment (pos. 4) without gluing inbetween the conveyor tubes and mount the sensor (pos. 1) with the straps (pos. 3) and the T-piece (pos. 2) to the tube.



Feed remains in the conveyor tube are likely to influence the sensor. Install the sensor at an angle.

Figure 13-3: Installation angle of sensor

13.1.2 Sensor with fastening cpl. at drop pipe



The sensor sits directly at the drop pipe of the last automatic feeder. If this automatic feeder is filled, the sensor is activated and the drive is turned off.

When feed is ingested, the sensor is released and the drive is switched on again after an appropriate time delay and refills the automatic feeders.

Figure 13-4: Sensor at drop pipe



The sensor with fastening cpl pluggable at drop pipe may only be used with control unit DR850/1500 for sensor at drop pipe (code-no.91-08-3032).



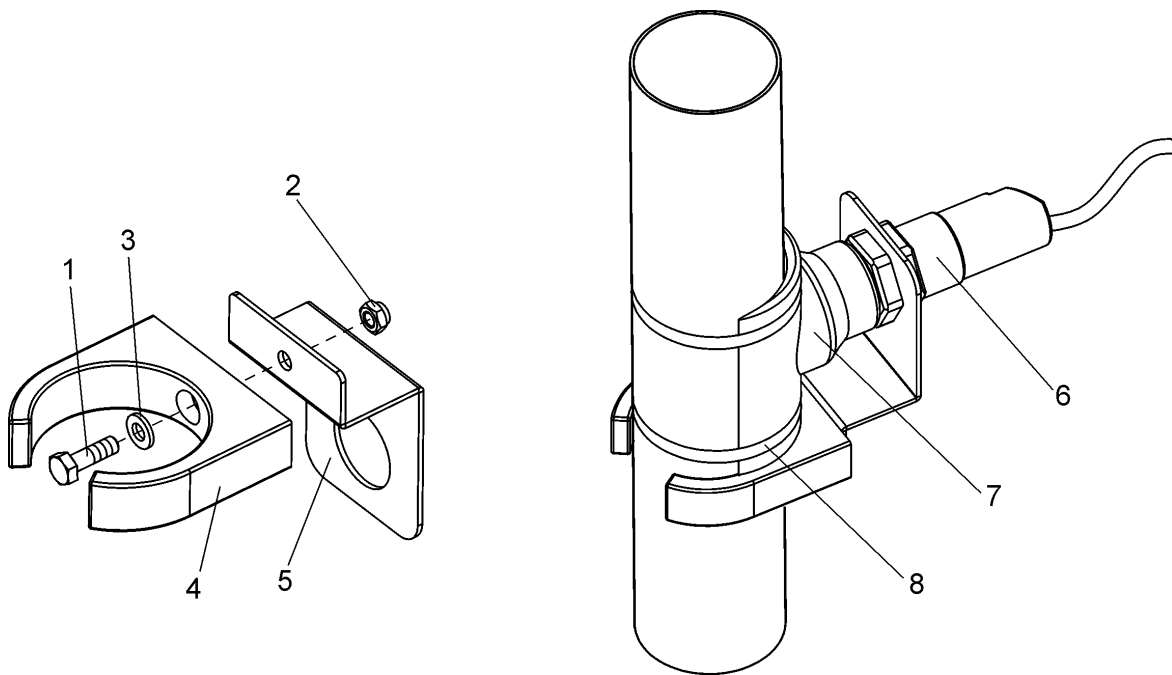


Figure 13-5: Code no. 10-88-3805

Pos.	Quantity	Code No.	Description
	1	10-88-3805	Sensor with fastening cpl. pluggable at drop-pipe 60mm
1	1	99-20-1420	Hexagon head screw M 6x 20 DIN 933 SST
2	1	99-20-1131	Self-locking counter nut M 6 DIN 985 SST
3	1	99-20-1602	Washer SST A 6,4 DIN 125
4	1	83-01-0079	Clamp PG48
5	1	83-00-6824	Bracket for pluggable sensor
6	1	60-40-0754	Sensor MS-45R 220V threaded
7	1	60-41-0112	T-piece for sensor MS-45R
8	2	10-88-3412	Strap 360mm x 7,5 nature/white



Shorten the T-piece (Pos. 7) according before assembling it..

No tools are necessary to change the sensor. The sensor with fastening cpl. can easily be pulled off the tube and attached again at a different location.

13.1.3 Sensor at volume dispenser TI

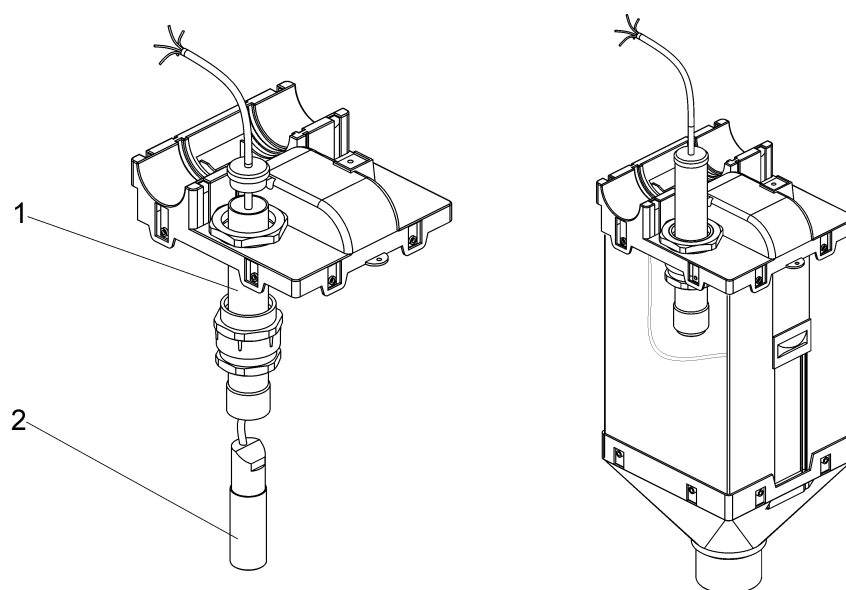


Figure 13-6: Code no. 10-87-3195

Pos.	Quantity	Code No.	Description
	1	10-87-3195	Sensor with fixing device at volume dispenser TI
1	1	10-87-3196	Tube with fixing device for sensor at volume dispenser
2	1	60-40-0654	Sensor MS-45R 220V

13.1.4 Sensor for volume dispenser BR

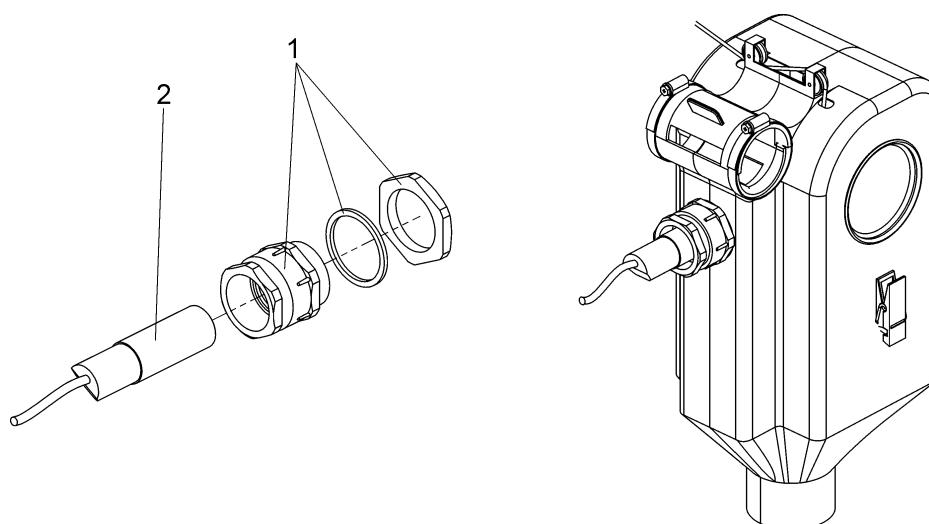


Figure 13-7: Code no. 91-00-3985

Pos.	Quantity	Code No.	Description
	1	91-00-3985	Sensor MS-45R with screw union
1	1	99-30-3001	Screw union PG 36
2	1	60-40-0654	Sensor MS-45R 220 V

13.2 Control and operating unit

Depending on the model, the control unit includes:

- clock relay (pos. 1) to pre-set feeding times
- potentiometer (pos. 2) for speed control of the dosimeter for small quantities
- terminal box (pos. 3) with main switch (pos. 4) and Start-switch (pos. 5)

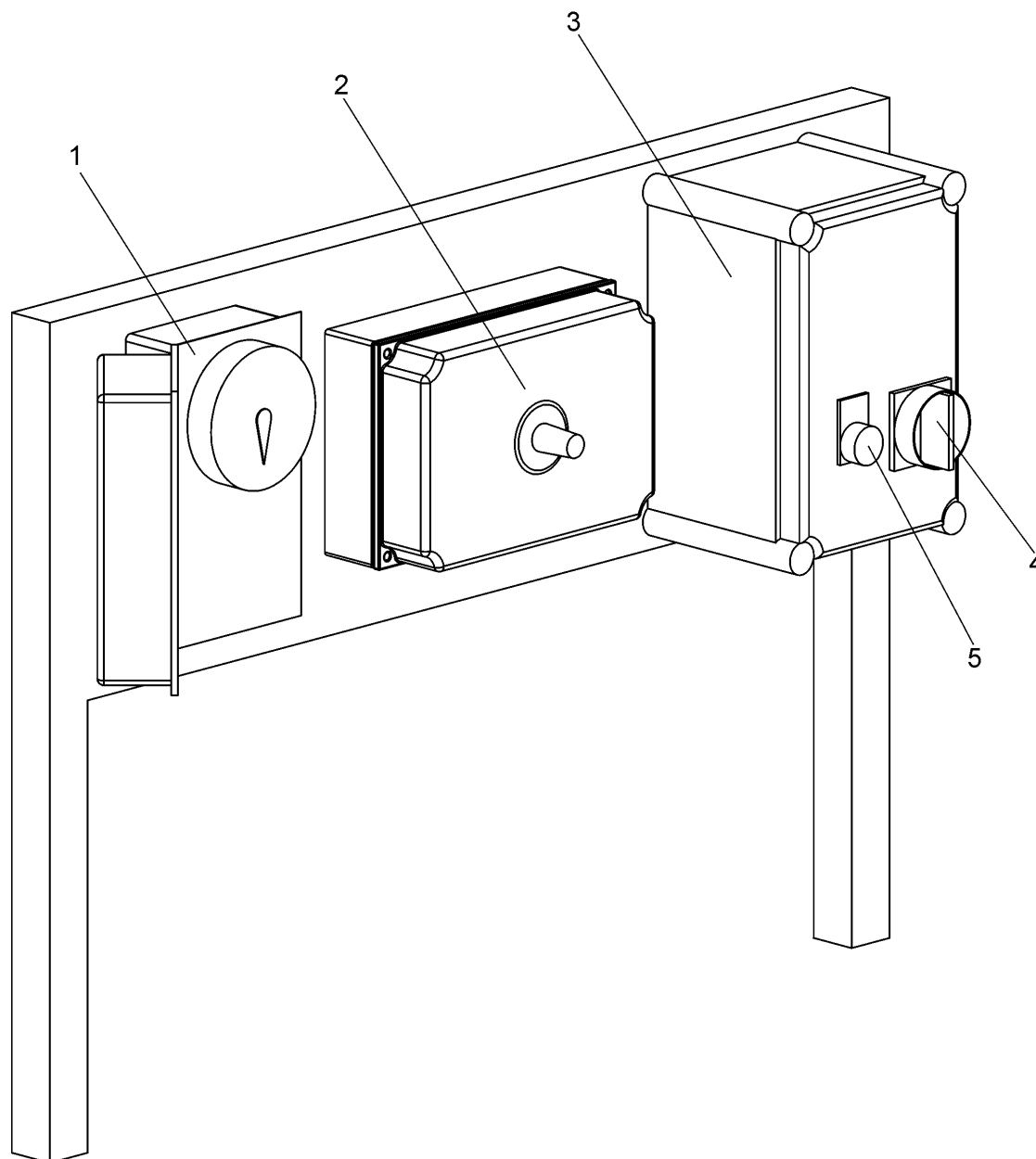



Figure 13-8: Example for the layout of a control unit


13.3 Operation

To take the installation into operation, put the main switch to the "ON" position and press the Start-key.

14 Electrical connection

	<p>All work involved may only be carried out by authorized personnel and under consideration of the established regulations (e.g. VDE)!</p>
---	---

14.1 Terminal connection plan




	<p>When installing the electrical connections, go by the instructions provided in the extra folder.</p> <p>If you lack one of these pieces, contact Big Dutchman for a new copy.</p>
---	---

These instructions include:

- general data with connection values and technical data
- plan of connections
- inspection sheet
- terminal connection plan.

Connect the electric connection cables according to the terminal connection plan. The connection must be carried out by means of a durable and safe bonding. All cable and tubes have to be protected against damages during operation.

14.2 Feed hopper with forced leading-in resp. feedback

	<p>Supply voltage and supply frequency have to match with the data on the motor rating plate.</p>
	<p>Operation is permitted only with duly connected earthed conductor.</p>
	<p>Operation of the feed auger with the wrong direction of rotation leads to malfunction. See that the motor works with the correct direction of rotation.</p>

14.3 Drive unit



Electric installation must be carried out by trained personnel under observance of the valid regulations and general installation regulations:

- VDE 0100: Regulations on the erection of high voltage systems up to 1000 V V
- VDE 0113: regulations on the electrical equipment of machinery
- VDE 0160: electronic equipment for use in high voltage installations.


All works have to be carried out with idle drive unit.

First of all, compare the power supply conditions (voltage and frequency) with the rating plate of the drive unit.

The dimensions of the connecting cables have to be adapted to the nominal current of the drive unit.

	Supply voltage and supply frequency have to match with the data on the motor rating plate.
	Operation of the drive unit is permitted only with duly connected earthed conductor.

For direct operation of the gear motor, only one cable admission is necessary. The second opening in the control box has to be closed by a blind plug. The motor casing has to be earthed at the marked safety screw. The phase sequence in the network has to be determined before connecting the gear motor. At a normal connection of phases L1, L2, L3 with the binders U1, V1, W1, of the motor, the motor has a right-handed rotation, as seen from the motor shaft.

	After installation, the full working voltage can be applied at the idle drive (n = 0)!
---	--

Before closing the terminal box, make sure that

- all connections are tightened
- the inside of the terminal box is clean and free of foreign matter
- unused cable admissions are closed and the locking screws are tightened.



Operation of the drive unit with the wrong direction of rotation leads to malfunction. See that the motor works with the correct direction of rotation.

14.4 Adjustment drive of the automatic release



The adjustment drive may only be operated with 24 V DC.

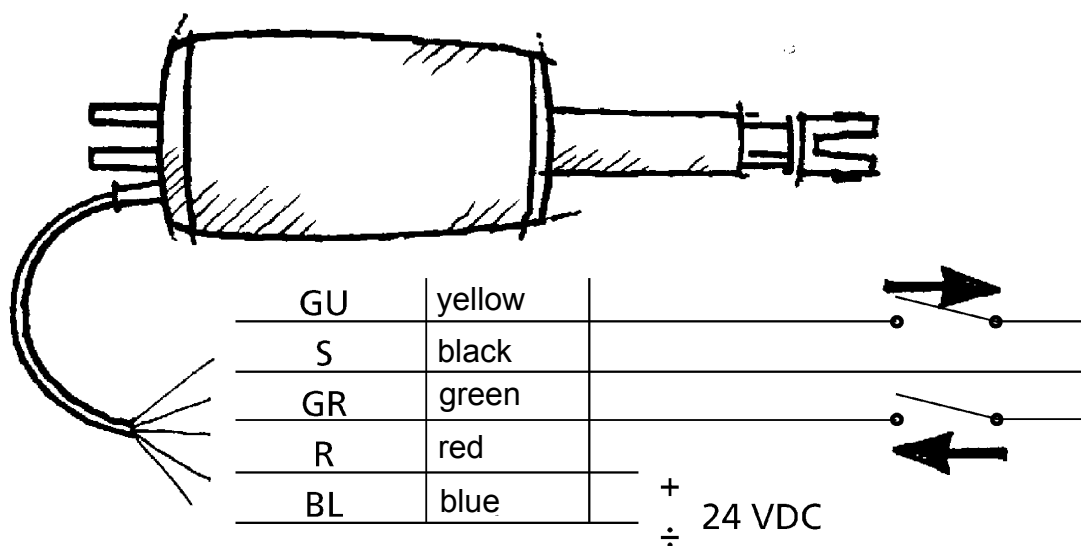


Figure 14-1: Connection of adjustment drive

15 Operation



You may only take the device into operation, when all components have been completely integrated in the installation.

All protective systems have to be correctly installed.

15.1 Initial operation

15.1.1 Prerequisites

- Check whether all works as described in chapters 8 to 14 have been carried out accordingly.
- Once all casings and safety devices are mounted and operative, the main switch can be turned to the ON position.
- Carry out a visual inspection before starting the system.
- Check and examine:
 - the system in its starting position
 - the faultless mechanical working of all moving parts
 - the sense of rotation of the driving motor and all other motors
 - the limit switch of the adjustment drive
 - the emergency-stop function
- Test the different operating procedures.

15.1.2 Dosing



Remove all items that might have fallen into the feed hopper before setting the swing plate back to its original position via the adjustment knobs.

Adjust the flow of material immediately after turning on the level adjustment of the feed hopper. Slowly pull up the adjustment knobs and observe the material flow through the inspection glass.



The space between the individual carrier plates must not be filled more than 3/4 with material to be conveyed.

15.1.3 Hopper 1line SST with forced feed

Before taking the system into operation, make sure that the vent screws for the gear motor 0.37kW were screwed into the gearing.

15.1.4 Drive unit

Before putting the system into operation, make sure that the spring ring fits closely to the middle part of the casing (see figure 9-5).

15.1.5 Conveyor chain / Conveyor cable

At an initial operation of a new system, the track sets and the edges grind off by and by. Because of this, it is necessary to check and correct the tension of the chain / cable during the first few days. In case of the conveying chain also pay attention to torsion of the chain links. You might have to make improvements during the running-in period until you realise that corrections are no longer necessary.



At a re-installation of a system, the rope tension has to be checked after approx. 20 operating hours. If necessary, the conveyor chain / cable might have to be shortened and the coupler has to be re-fitted.

15.2 Operation

15.2.1 Drive unit

During operation, the correct initial tension is monitored by the magnetic switch. The magnetic switch immediately stops the drive unit, if the tension in the rope / chain increases too much due to over stressing and the rope stretches too much. The magnetic switch has to be connected to the control unit according to the diagram of connections.

15.2.2 Adjustment drive of the automatic release

- Check for faultless functioning after the assembly.
- The adjustment drive must not be operated with higher values than the ones stated in the specification.
- The operating cycle must not be exceeded by more than 10%, unless stated otherwise.



In case of malfunction, the adjustment drive has to be replaced.

16 Servicing and maintenance

16.1 Maintenance

16.1.1 Entire system



Regular inspection and preventive maintenance guarantee a reliable operation!

Most building components of the feeding system require little maintenance. Check the functioning of the components at regular intervals. Immediately replace damaged parts that are no longer fully operative and make sure that all screw unions are tightened.

16.1.2 Drive unit

The gear motor comes fully lubricated and ready for use. The lubrication lasts for approx. 10,000 operating hours (oil filling) or approx. 8000 operating hours (grease filling). It is not necessary to refill, as an overfill might lead to excessive heat generation.

You can gather the amount and type of lubricant from the lubricant sign that is attached to the gearing. Different lubricants must not be mixed. If the lubricant is changed, the gearing has to be cleaned thoroughly.

16.1.3 Feed pipe

Damaged pipes lead to blockages and excessive friction that might lead to damages of the carrier plates. Because of this, you have to make sure to check the feed pipe at regular intervals for dents or other damages and replace damaged pipes.

16.1.4 Turns

The ball bearings in the turns are lubricated for life and therefore maintenance-free.

16.1.5 Conveyor chain / Conveyor cable

In case some carrier plates are broken or deformed, replace the respective rope part. The carrier plates might be damaged because of foreign matter in the feed pipe. In any case, you should find out what the cause is and remove it.



Fractures on individual wires or the whole cable directly at the carrier plate indicate that the whole conveyor cable might have to be replaced. To prevent further fractures or tearing of the cable, immediately replace the conveyor cable.

16.1.6 Feed hopper with forced leading-in resp. feedback

The gearing is lubricated for life and does not need maintenance or lubrication.

The lubricant in the gearing housing should be examined and, if it is dirty, it should of course be changed. Only use lubricants that are listed on the type plate. Different lubricants must not be mixed.

16.1.7 Adjustment drive of the automatic release

To avoid mechanical damages and wear, regularly check the adjustment drive. Check fastening points, cables, piston rods, housing, pluggs and the entire system for faultless operation.

The adjustment drive is a closed unit and therefore does not need maintenance of the inner parts.



Intervention at the adjustment drive might lead to damages.

To reduce the risk of malfunctioning, all repairs concerning the adjustment drive have to be carried out by shops that are authorised by the manufacturer, as special tools and -seals are necessary.

16.2 Malfunction identification and removal

16.2.1 In General

trouble	cause	procedure
system does not start	defective driving motor	replace driving motor
	driving motor overloaded	check feed for foreign matter and remove it if necessary
	power failure	check all electric circuits, fuses etc.
installation stops right after initial operation	rope / chain is stretched too far	shorten rope / chain (2-3 plates)
	draw spring in the drive is overstretched and no longer operative	replace the spring

16.2.2 Drive unit

trouble	cause	procedure
excessive heat generation at gear motor.	motor is not cooled sufficiently due to dust deposit on the motor casing	remove dust
	protective motor switch is not set to the right ampere value	correct the value
	wiring of gear motor is incorrect or loose	check and adjust see wiring diagram on the bottom side of the connector lid
	a motor that has been wired for 380 V, runs slow at 220 V	correct the wiring

16.2.3 Feed supply and feed pipe

trouble	cause	procedure
corner wheels do not operate	chain or rope tension is too low or too tight	check and adjust
	foreign matter is stuck between the corner casing and the corner wheel	check corners for foreign matter and remove it if necessary
	ball bearing is dry, worn-out or stalled	take corner apart and replace ball bearing
	shaft for corner wheel is not mounted correctly into the casing	dismantle the corner and put it back together in correct order (see chapter 10.3)
	corner wheel is not mounted correctly, the running direction has not been observed	dismantle the corner and turn the corner wheel (see chapter 10.7).
chain / rope broke	rope / chain is stretched too far	shorten chain / rope (see chapter 10.7.4).
	foreign matter accumulated in the feed lines	check feed line for foreign matter and remove it
	the drive unit is built-in backwards	mount drive unit correctly
	corner wheels are assembled backwards	turn corner wheels (see chapter 10.7)
too much feed accumulates in the corners	dosage is too high	re-adjust the dosage at the sliding valve and the feed hopper
	corner wheel is not mounted correctly, the running direction has not been observed	dismantle the corner and turn the corner wheel (see chapter 10.3 and 10.7).

trouble	cause	procedure
feed accumulates in the feed container	internal incrustation due to moisture	remove incrustations through the inspection opening
	riddle rocker is worn-out	replace riddle rocker
automatic feeders are no longer filled	draw-offs are clogged	clean draw-offs
volume dispensers are no longer filled	release is defective	see chapter 16.1.7
larger amounts of feed return via the return circuit	sensor after the last feed discharge point is not correctly adjusted	adjust sensor properly
	sensor is damaged	replace sensor
loud noise	carrier plates are bent or broken	renew cable or chain sector

16.2.4 Adjustment drive of the automatic release

trouble	cause	procedure
no motor sound or no movement of the piston rod	damaged cable	adjustment drive in need of repair
excessive power consumption		adjustment drive in need of repair
motor is running but no movement of spindle or piston rod	gearwheel or spindle are damaged	adjustment drive in need of repair
adjustment drive does not work with full shearing force	damaged motor	adjustment drive in need of repair
motor runs too slow / motor power is too low	insufficient distribution voltage	sufficient distribution voltage
	line drop	use thicker cable

17 Cleaning

17.1 Entire system

Empty out and clean the installation each time you move out animals, at least once a year.

17.2 Drive unit

Keep the motor clean and make sure there is a free cooling air stream. Check the ventilator cowl at regular intervals for dirt and, if necessary, clean it with a dry cloth.

17.3 Feed hopper

Due to humidity, incrustations might form in the feed hopper and lead to malfunction. Therefore, clean the feed hopper at regular intervals.

Open the inspection opening and clean the inside of the hopper by hand. Use safety gloves. Carefully remove persistent incrustations, e.g. with a spatula.

After finishing the cleaning works, close the inspection opening.

17.4 Draw-Offs

Small quantities of feed rests stay on the sliding valve and paste together. To loosen up the incrustations, rapidly move the sliding valve back and forth a couple of times.

17.5 Volume dispenser

If feed with a high fat content is used, fat might deposit in the volume dispenser. This can cause problems when you want to adjust the feed quantity. Check at regular intervals that the volume dispenser is relatively clean inside.

Every volume dispenser is equipped with a cleansing hole at the side. Through the hole you can clean the dispenser with a cloth, brush or rinsing. Make sure that the plug is open, so that the volume dispenser is able to dry.

17.6 Adjustment drive of the automatic release

The adjustment drive has to be cleaned of dust and dirt at regular intervals.

To ensure that the pre-lubricated inner tube stays lubricated, the adjustment drive may only be cleaned when the piston rod is fully retracted.

Only protective system IP 66 is regarded as watertight and allows for cleaning with water.



Never clean the adjustment drive with a high-pressure cleaner.

18 Spare parts

All options of the individual assembly groups and sub assembly groups are described in the manual. All spare parts are marked with position numbers in the drawings. They also appear, together with the code number and the description, in the respective spare parts lists.

For ordering spare parts indicate the code no., description of the spare part and the number of the original invoice.



For ordering spare parts, also use the manuals:

- "Feed hoppper RAS 850/1500" (code-no. 99-97-1673)
- "DR 1500 - Drive" (code-no. 99-97-2607)
- "DR 1500 XXL - drive" (code-no. 99-97-2658)
- "volume dispenser BR" (code-no. 99-97-2656)

by **Big Dutchman**.