IFC
INTELLIGENT
FEEDING COMPONENTS

IFC

Conveyor Belts

with Overhead Drive

FBK

Operating Manual

CE

Original version:
German

Target group: This operating manual is intended for trained specialist staff.

The company *IFC GmbH* reserves the right to make alterations to the machine that are useful for further technical development. These alterations are not documented in each individual case. This operating manual and the information contained therein have been put together carefully. Reprinting, even in extracts, is only permitted with the authorisation of the *company IFC GmbH*.

Belt Conveyor Model:	_ _
Serial Number:	SN _ _ _ _ - _ _ _
Year of Construction:	_ _ _ _
Project:	PR _ _ _ _ . _ _
Dim. Conveyor Belt:	_ _ _ _ x _ _ mm
Conveyor Belt Type:	_ _
IFC-Art.No. Conveyor belt:	_ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _

The belt conveyor is a *replaceable piece of equipment* and can be attached to various components in a modular fashion.

Contents

1. Important Instructions

1.1. General Instructions on the Documentation

Due to the modular construction of the documentation, the design of the equipment may deviate from the figures illustrated.

This documentation is of a general nature and may describe functions that are not within the scope of supply of the machine. Figures are given by way of example and may not have any direct reference to the scope of supply.

1.2. Explanation of Symbols and Notes

Danger Symbols

These symbols are located with all safety instructions in this operating manual which indicate particular risks to persons, material values or the environment.

Follow these instructions and take particular care in these cases.

Also forward the safety instructions to other users.

General risk

Electrical voltage / current

Crushing of hands

Explosive atmosphere

Laser beam

Risk of being drawn into the machine

1.3. Signal words in safety instructions and their meaning

Danger	Immediate danger with high risk, causes physical injury or death if not followed.
Warning	Possible danger with moderate risk, may cause physical injury or death if not followed.
Caution	Danger with low risk, may cause moderate physical injury or material damage if not followed.
Attention	Low risk, however important for function and durability of the plant and as an indication of the sources of errors.

1.4. Structure of Safety Instructions

Signal word

Type and source of risk

Consequences if this warning is not followed

- Measures to avoid the risk

1.5. Structure of Notes

Note

Text of notes

2. Fundamental Safety Instructions

2.1. Proper Use

Danger!

Risk of Explosion

Explosion of flammable materials

- The use of the belt conveyor in the EX area is prohibited!

The belt conveyors are provided for the transporting solid, clean and dry items. A minimum size must be observed when doing this. The belt conveyors are, for example, not suitable for transporting sand, chips and similar.

2.2. Improper Use

A different or further usage is deemed to be improper use. IFC GmbH is not liable for damage incurred as a result. Solely the operator bears the risk.

2.3. Danger of the Machine

Caution!

Rotating Parts

Body parts and items of clothing may get pulled into the machine

- Wear personal protective equipment (hair net).
- Remove any bodily jewellery (chains, Alice bands, etc.).
- Wear tight clothing.
- Only operate the equipment when the protective devices are in operation.
- Covers and barriers must be attached and intact during operation. Only to be opened by authorised personnel for maintenance and repairs.

Caution!

Machine Surroundings

Injuries due to electricity and moving parts

- Keep covers, switching cabinets etc. generally closed and locked.
- Only to be opened by authorised personnel for installation/commissioning.

Attention!

Emergency Stop

Stops the belt conveyor when there is a dangerous situation.

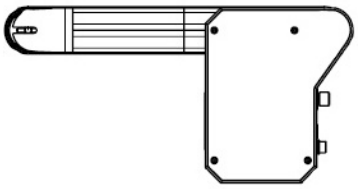
- It is recommended incorporating the belt conveyor into the emergency stop circuit of the overall machine.

If the belt conveyor is not treated with caution, there is the risk that items of clothing or body parts (even hair) may, for example, be carried along with the conveyor belt. For this reason it is recommended that a plant-specific protective housing is to be attached by the customer.

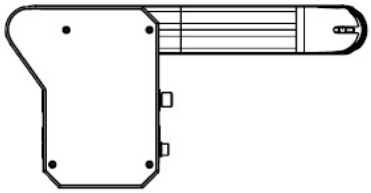
3. Description of the Machine

3.1. Designation of the Direction of the Motor

clockwise (-R):



anticlockwise (-L):

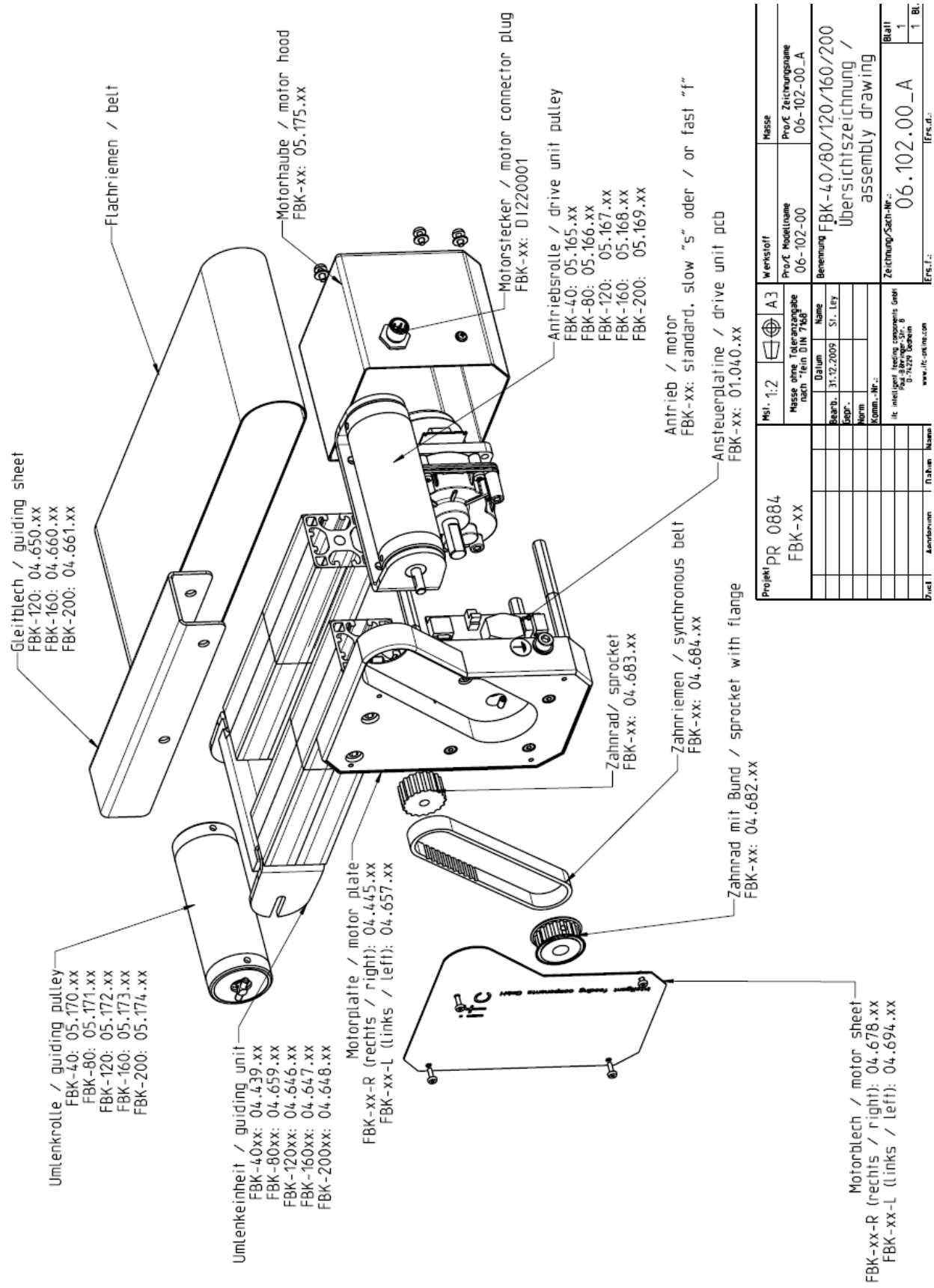


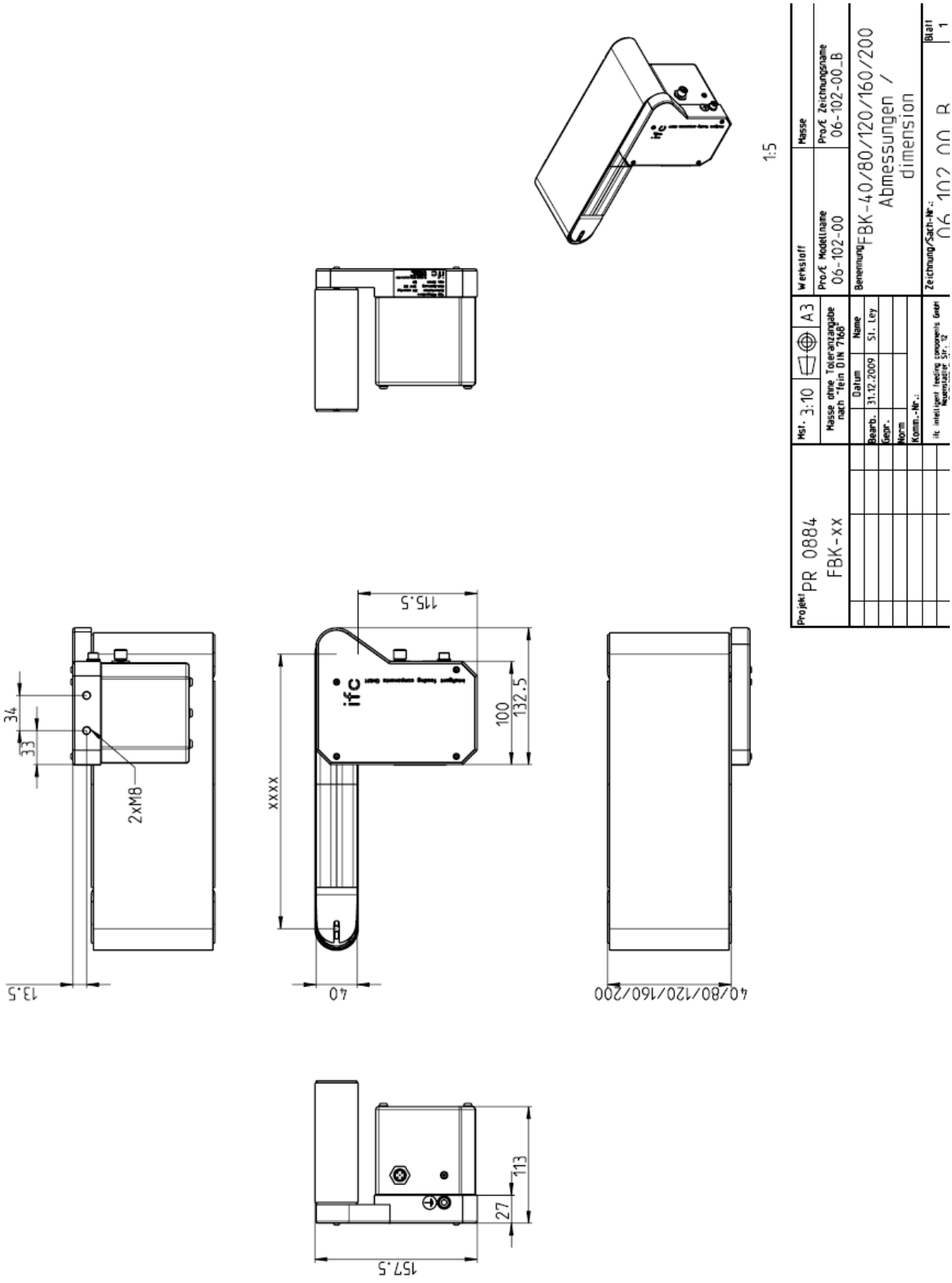
3.2. Technical Data

		FBK40	FBK80	FBK120	FBK160	FBK200
General:	**Length (project-specific) [mm]:**	min. 300 mm, max. 3 000 mm				
	Width of Belt Body [mm]:	40	80	120	160	200
	Width of Conveyor Belts [mm]:	30	70	110	150	190
	Speed [m / min]:	4 to 36 ("Standard") 1.2 to 10 ("Slow") 12 to 72 ("Fast")				
	Temperature Range [°C]:	0 to +40				
	Type of Protection:	IP 54				
	Bearing:	Stainless steel, sealed on both sides				
	Max. Load [kg]:	5				
Motor:	**Design:**	3-phase electronically commutated external rotor DC motor with integrated electronics				
	Rated Voltage [V]:	24 DC				
	Operating Voltage [V]:	24 DC ± 10%				
	Idling Current [A]:	0.14				
	Max. Current [A]:	2 (with anti-blocking protection)				
	Rated Torque [Nm]:	0.4 ("Standard"); 1.4 ("Slow"); 0.4 ("Fast")				
	Direction of Travel:	Switchable by slide switch				
	Speed Adjustment:	integrated potentiometer or Analogue setpoint setting 0-10V DC				
Gearbox:	**Design:**	Multi-stage spur gearbox				
	Lubrication:	Filled with grease for lifetime				
Weight:	**Length 300mm [kg]:**	2.7	3.1	3.7	4.0	4.4
	For every further 100mm [kg]:	+0.3	+0.5	+0.6	+0.7	+0.8
Electrical connection:	**Connection cable:**	In the scope of supply as an original IFC part				
	Cross-section [mm²]:	5 to 0.34				
	Length [m]:	5				
	Fuse [A]:	3.15 / semi-time lag				

Rating plate and CE symbol are attached to the drive block.

3.3. Assembly Drawing




1:5
Projekt PR 0884
FBK-xx
Mst. 3:10
A3
Masse ohne Toleranzangabe nach Fein DIN 7168
Werkstoff
Pro/E Modellname
06-102-00
Masse
Pro/E Zeichnungsname
06-102-00_B
Benennung FBK-40/80/120/160/200
Abmessungen / dimension
Zeichnung/Satz-Nr.: 06 102 00 R
Blatt 1
Datum
Name
Bearb. 31.12.2009 St. Ley
Gepr.
Norm
Komm.-Nr.:
ifc intelligent feeding components GmbH
Kunststoffstr. 5+7, 72
2xM8
34
33
13.5
115.5
100
132.5
xxxx
40
40/80/120/160/200
113
27
157.5

4. Transport, Setup and Connection

4.1. Transport

Attention!

Damaged Parts

Hampered functioning of the belt conveyor

- Check for damaged parts when unpacking the belt conveyor and replace them before putting into operation.
- Report any damage immediately to the haulier.

Delivery is made is boxes or wooden crates. The weight of the individual belt conveyors depends on width and the length of the selected configuration. Accordingly, a suitable means of transport must be selected for transport within the site.

4.2. Installation

Attention!

Fastening

Disruption to system functioning

- The fastenings must be designed for the weight and load of the system.
- The system must be installed to protect against vibrations and impacts.

Fastening Options:

Option 1: Fastening by thread on the underside of the drive unit (2x M8 thread; 8mm deep)

Option 2: Fastening using the profiled groove of the belt body using brackets suitable for this purpose.

The overall weight of the belt conveyor depends on the width and length. Accordingly, a sufficiently stable type of fastening must be selected.

4.3. Electrical Connection

Danger!

Electrical Voltage!

Personal injury and damage to the system by electric shocks

- The electrical connection of the system must only be done by a trained electrician.
- Never undo electrical connection while powered

Attention!

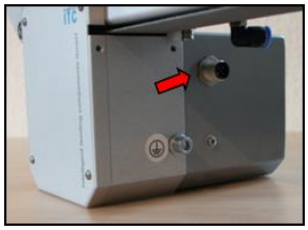
Electrical Voltage!

Damage to or malfunction of the system

- The electrical connection of the system must only be done by a trained electrician.
- Connection voltages that deviate from the specifications may damage the system.

Power Supply

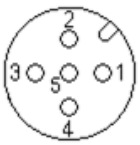
The motor plug of the conveyor belt is located on the side of the drive block cover.

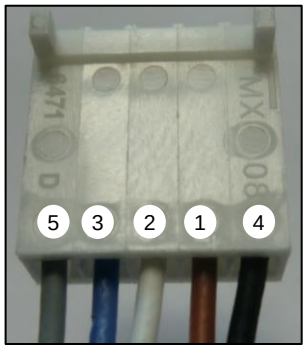


To connect the motor to the power supply and/or to an overall control system, the supplied motor cable (item no. 20.00324-00) is used.

Plug Assignment

The drive unit must be connected according to the following assignment:





Pin	Colour	Function
1	brown	+24V DC “Motor Release”
2	white	GND “Motor Release”
3	blue	GND “Power Supply”
4	black	+24V DC “Power Supply“ (max. 2A)
5	grey	0-10V DC “External Setpoint Specification“, optional

Attention!

Emergency Stop

Stops the belt conveyor when there is a dangerous situation.

- It is recommended incorporating the belt conveyor into the emergency stop circuit of the overall machine.

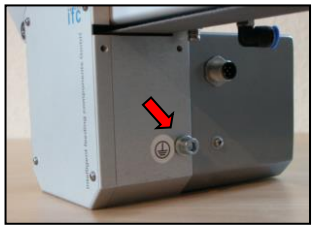
4.4. Earthing Connection

Attention!

Static Discharge!

Damage to the control electronics, impact on functioning and invalidation of the warranty

- Apply earthing expertly



To connect the earthing an earthing cable must be used with a minimum cross section of at least 4 mm^2 in each case. The earthing cable must have a corresponding earthing connection on the customer side.

5. Operation

5.1. Adjusting the Belt Speed

Attention!

Adjustment to running belt

Damage to the system

- Maintenance work and adjustments must only be undertaken by trained specialist staff

The belt speed must be adjusted with the belt running. Therefore, particular attention must be paid to the safety of persons and machines.

The belt speed may be smoothly adjusted by changing the control voltage. This can be done manually by an installed potentiometer or by an external specification for a control voltage (PIN 5 of the motor plug) between 0 – 10 V DC (direct current).

Attention!

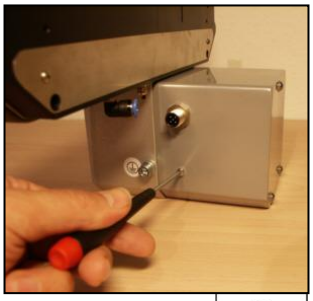
Belt speed too low

Belt is stationary

- Do not turn the potentiometer too far to the left

Manually by internal potentiometer

The internal potentiometer is located on the side of the conveyor belt drive unit.



1. Removing the screw on the motor cover
2. Using the hole in the motor cover, a small screwdriver can be used to adjust the potentiometer.
3. Adjusting the belt speed by adjusting the potentiometer.
4. Fastening the screw onto the motor cover.

Note

Turning to the right: Belt runs faster

Turning to the left: Belt runs more slowly

Attention!

Wrong control voltage

Damage to the control electronics of the motor

- The control voltage must not exceed 10V DC (direct current).

Automatically using analogue rated value specification

0-10V DC

Through pin 5 of the motor plug the speed of the motor can be regulated using an analogue rated value specification of 0-10 V, in which the motor is shut down with 10% of the maximum voltage (10V) and the belt remains stationary.

When operating with the rated value specification ensure that the potentiometer has been turned **completely to the left**, as otherwise the voltage still present can change the rated value using the potentiometer, or the rated value can be controlled upwards to the potentiometer voltage.

5.2. Setting the Direction of Running

The direction of running of the conveyor belt is freely selectable. In the factory, the direction of running can be preset as the customer wishes. If a change of running direction should be necessary for the continued use of the conveyor belt, this can be reset by means of a slide switch under the motor cover of the drive unit.

Caution!

Electrical Voltage

Risk of Injury

- The conveyor belt must be switched off before starting work and be disconnected
- Secure the power supply against unauthorised switching on.

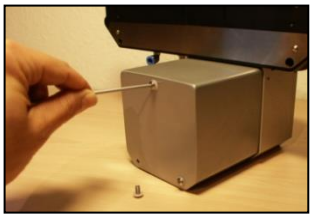
Caution!

Risk of Crushing

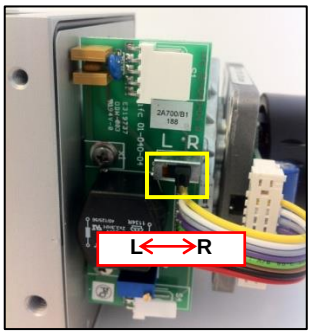
Jamming of fingers

- Secure the system against unauthorised switching on.

Manual



1. Removing the three fastening screws on the motor cover
2. Removing the motor cover
3. Adjusting the direction of running using the slide switch.



4. Attaching and fastening the motor cover. When doing this, ensure that the cable on the inside does not come into contact with the rotating part of the motor.

Note

Upper switch setting ("L")	Direction of running "Left"
Lower switch setting ("R")	Direction of running "Right"

6. Action in Case of Fault

Attention!

Remedying Faults

Personal injury and damage to the system

- Faults must only be remedied by trained specialist staff.

6.1. Troubleshooting

Conveyor belt does not start

1. Does the belt run freely?
   - ➢ Is a foreign body or an attachment blocking the belt?
     YES ⇨ *Remove blockage*
   - Tension of the conveyor drive belt too high?
     YES ⇨ *Reduce the tension of the conveyor drive belt*
2. Is the power supply on?
   - *NO* ⇨ *Connect power supply (PIN 3 + 4)*
3. Is the release signal on?
   - *NO* ⇨ *Switch on release signal (PIN 1 + 2)*
4. With manual rated value specification: Rated value specification too low?
   - *YES* ⇨ *Turn internal potentiometer to the right*
5. For automatic rated value specification:
   - *Is the external analogue voltage on?*
   - *YES* ⇨ *The internal potentiometer must be turned completely to the left.*
6. Is the motor gearbox unit faulty?
   - ➢ *YES* ⇨ *Install replacement*

7. Maintenance and Upkeep

7.1. Maintenance Work and Intervals

The necessary maintenance work and intervals depend on the individual conditions of use, the degree of soiling and the stresses to the system components.

Attention!

Soiling of the Conveyor Drive Belt

Damage by foreign body and oil

- Avoid contact oils and objects getting into contact with the drive belt which can damage these.
- Regularly clean the belt.

The conveyor belt has been developed for the purpose of keeping the maintenance expense as low as possible. However, to ensure permanent and unproblematic functioning, regular inspections should be carried out.

Daily

- ✓ General visual inspection. Check for damage.
- ✓ Check the belt running:
  - Does the belt run completely freely?
  - Does the conveyor drive belt run centrally on the pulleys?

  → *readjust using the adjusting screws on the guide pulley (see 7.3)*
- ✓ Check the conveyor drive belt for wear

  → *Replace conveyor drive belt as required (see 7.3)*

Monthly

- ✓ Check the belt tension by guaranteeing slip-free transport. To do this, block the belt by hand and check whether a corresponding tension is applied to the motor.

  → *Tension the conveyor drive belt if there is insufficient tension (see 7.3)*
- ✓ Check the screw connections are firm

  → *Retighten screws.*
- ✓ Check the ball bearing for the development of noise

Attention!

Tension of the Conveyor Drive Belt

Too high tension may damage the belt

- Tension the conveyor drive belt only enough so that turning of the drive roller is reliably prevented.

7.2. Cleaning

Attention!

Cleaning Materials

Damage if the wrong cleaning materials are used

- Do not use any acidic, alkaline or abrasive cleaning materials or thinners.

The necessary cleaning work and frequency depend on the conditions at the place of installation of the plant and on the type and degree of soiling of the components.

Soiling of the drive belt of the conveyor belt should be removed with a dry or slightly damp cloth. For oil or grease contaminations, soapy water can be used.

7.3. Changing the drive belt

Danger!

Risk of Injury!

Crushing of fingers, hair or clothing may be pulled in

- Before starting work, switch off and disconnect the machine
- Secure the power supply against unauthorised switching on again.

Manual

The operator must have the conveyor drive belt changed by trained specialist staff.

1. Before starting work, shut down the conveyor belt, and ensure that the power supply and compressed air is secured against unauthorised switching on.

2. Untighten the conveyor drive belt: Undo the adjusting screws of the guide pulley on the opposite side of the motor block.

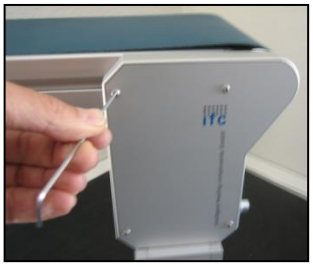
3. Pull the conveyor drive belt off by pulling on one side and moving back and forth, starting with the guide pulley.

4. So that the adjusting screws of the guide pulleys do not come undone during the later operation, it is recommended securing these with screw securing compound (e.g. Loctite 222 or similar) in the axle of the guide pulley. Insert the screws on the guide pulley into the guide pulley bracket. When doing this, ensure that the axles of the guide pulley rest in the rearmost position of the bracket and the screws do not exert any displacement.

5. Pull the new belt back on in the reverse order and bring it onto the top of the belt on its track by pulling it several times. The belt should run centrally on the pulleys.

6. Tension the belt by uniformly screwing in the adjusting screws on both sides of the guide pulley.

7. **Short Conveyor Belts:** Switch on the conveyor belt and block the drive belt by hand. The drive belt should be tightened so that the motor is also blocked by this and the drive roller does not slip through.



8. **Long Conveyor Belts:** Switch on the conveyor belt and block the drive belt by hand. Due to the length of the conveyor drive belt, it is possible that the motor can be brought into sufficient tension not by blocking. The tension is sufficient is a correspondingly large torque is transmitted by the motor to the belt.

9. Fasten the motor sheet with the four fastening bolts.

10. Check the belt running after 3-4h of running.

Attention!

Tension of the Conveyor Drive Belt

Too high tension may damage the belt

- Tension the conveyor drive belt only enough so that turning of the drive roller is reliably prevented.

7.4. Changing the toothed belt

Danger!

Risk of Injury!

Crushing of fingers, hair or clothing may be pulled in

- Before starting work, switch off and disconnect the machine
- Secure the power supply against unauthorised switching on

Manual

The operator must have the toothed belt changed by trained specialist staff.

1. Before starting work, shut down the conveyor belt, and ensure that the power supply and compressed air is secured against unauthorised switching on.

2. Remove the four screws and remove the motor sheet

3. To release the toothed belt, undo the holding screws and push the drive unit onto the drive pulley.

4. Remove the old toothed belt and insert the new toothed belt.

5. Tension the toothed belt by moving the drive unit away from the drive pulley and fasten with holding screws. The belt must be firmly seated, but must not be tightened too much, as otherwise it may cause damage to the toothed belt and bearings.

6. Fasten the motor sheet with the four fastening bolts.

Attention!

Toothed Belt Tension

Too high tension may damage the toothed belt and bearings

- Only tension the belt so much that it runs reliably on the toothed wheels.

7.5. Adjusting the Belt Running

A newly supplied conveyor belt has been adjusted in the factory and tested over several hours. This ensures that the conveyor drive belt and all components have run in and readjustment is no longer necessary.

In spite of this, it cannot be ruled out that the conveyor belt is not running optimally after a short time or particularly after a belt change, i.e. does not run centrally on the guide pulleys and tension pulleys. Then the belt running must be corrected.

Adjustment by Adjusting Screws on the Guide Pulley

The conveyor belt running should be adjusted optimally using the adjusting screws on the guide pulley on the opposite side of the drive pulley unit.

Note

The drive belt should be positioned centrally on the guide pulley and the drive pulley.

8. Disposal

Where no take-back and disposal agreement has been made, components which are no longer used are to be removed in their individual parts and recycled according to the type of material.

9. Wear and Replacement Parts List

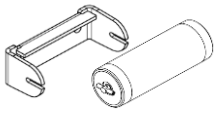
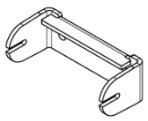
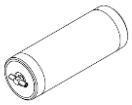
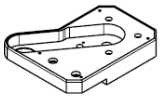
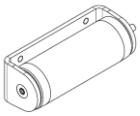
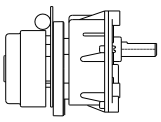
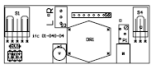
Attention!

Loss of Guarantee

Use of Non-Original Parts

- Only use IFC original spare parts

!! Please give the serial number and type of conveyor belt with every order!!

Item	Description	Figure	Remark
Giving the serial number and conveyor belt code	FBK Conveyor drive belt		See installation manual
Giving the serial number and conveyor belt code	FBK Conveyor belt profile		See installation manual
05.00170 05.00171 05.00172 05.00173 05.00174	FBK40 Guiding pulley unit FBK80 Guiding pulley unit FBK120 Guiding pulley unit FBK160 Guiding pulley unit FBK200 Guiding pulley unit		Complete guiding pulley unit with guiding pulley and bracket
04.00439 04.00659 04.00646 04.00647 04.00648	FBK40 Guiding pulley bracket FBK80 Guiding pulley bracket FBK120 Guiding pulley bracket FBK160 Guiding pulley bracket FBK200 Guiding pulley bracket		Bracket for guiding pulley
05.00204 05.00205 05.00206 05.00207 05.00208	FBK40 Guiding pulley FBK80 Guiding pulley FBK120 Guiding pulley FBK160 Guiding pulley FBK200 Guiding pulley		Guiding pulley with adjustment option
04.00445 04.00657	FBK Motor sheet right FBK Motor sheet left		Fastening plate
05.00165 05.00166 05.00167 05.00168 05.00169	FBK40 Drive pulley unit FBK80 Drive pulley unit FBK120 Drive pulley unit FBK160 Drive pulley unit FBK200 Drive pulley unit		Complete drive pulley unit
20.00156	FB Motor drive unit "standard" (4 to 36 m/min)		Installation in FBK40/80/120/160/200 drive unit
20.00157	FB Motor drive unit "slow" (1.2 to 10 m/min)		
20.00155	FB Motor drive unit "fast" (12 to 72 m/min)		
05.00038	FB Drive electronics		Installation in FBK40/80/120/160/200 drive unit
05.00215	FB Drive unit connection cable		24V connection cable with plug
05.02047	Pinion and drive belt set		Consisting of toothed belts and 2 pinions
04.00682	FBK Pinion with flange		---
04.00683	FBK Pinion		---
04.00684	FBK Drive belt		---
04.00678 04.00694	FBK Motor sheet right FBK Motor sheet left		Cover plate for drive unit
05.00175	FBM bonnet		Bonnet for motor in drive unit

10. Conformity declaration

Conformity Declaration

in the sense of the EC directive

X Machinery 2006/42/EC, Schedule II 1A

Construction of Machine

Manufacturer: **Conveyor Belts (replaceable equipment)**

Serial No.: SN ____-___ Year of Construction: ____

has been developed, constructed and manufactured in accordance with the aforementioned directive, under the sole responsibility of

Company name: IFC Intelligent Feeding Components GmbH

Paul-Böhringer-Str. 8
D - 74229 Oedheim
Tel.: +49 7136 96395-0
Fax: +49 7136 96395-9

The following harmonised standards are applied:

X DIN EN ISO 12100:2011-03, Safety of Machinery

X DIN EN ISO 13857:2008-06, Safety Distances to Prevent Hazard Zones from Being Reached by Upper and Lower Limbs

X DIN EN ISO 619:2011-02, Continuous Handling Equipment and Systems

X DIN EN 60204-1:2011-01, Safety of Machinery; Electrical Equipment of Machines; General Requirements

Name and address of the person responsible for documentation:

Name: *IFC Intelligent Feeding Components GmbH*
Andreas Schirmer
Street: *Paul-Böhringer-Str. 8*
Town: *D-74229 Oedheim*
Telephone: *+49 7136 96395-0*

The operating manual belonging to the machine is present,

X In the original version (German)

Place, Date Oedheim, __-__-____

Signature …….

Andreas Schirmer
Director

IFC Intelligent Feeding
Components GmbH

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