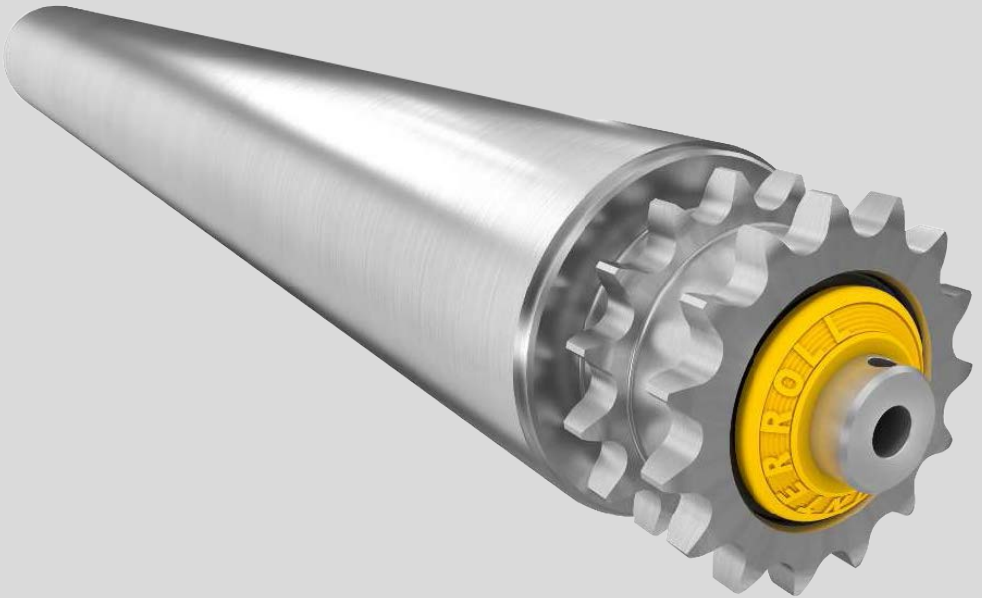


User Manual

Interroll Pallet Drive

DP 0080

DP 0089



Manufacturer

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1 Introduction

1.1 Information about the operating instructions

The following Pallet Drive types are described in these operating instructions:

- DP 0080
- DP 0089

1.1.1 Contents

This instruction manual contains important notes and information about the various operating phases of the Pallet Drive.

The instruction manual describes the Pallet Drive as it is delivered by Interroll.

In addition to this instruction manual, special contractual agreements and technical documents apply to special versions.

1.1.2 The instruction manual is part of the product

- For trouble-free, safe operation and warranty claims, read the instruction manual first and follow the instructions.
- Keep the instruction manual close to the Pallet Drive.
- Pass the instruction manual on to any subsequent operator or occupant.
- NOTICE! The manufacturer does not accept any liability for faults or defects due to non-observance of this instruction manual.
- If you still have questions after reading the instruction manual, please contact Interroll customer service. Contact persons close to you can be found on the Internet under www.interroll.com/contact.

1.2 Warning notices in this manual

The warning notices refer to risks that may arise while using the Pallet Drive. They are available at four danger levels with the following signal words:



DANGER

Identifies a danger with high risk that will result in death or serious injury if it is not avoided.



WARNING

Identifies a danger with medium risk that could result in death or serious injury if it is not avoided.



CAUTION

Identifies a danger with low risk that could result in minor or medium injury if it is not avoided.

NOTICE

Identifies a danger that results in property damage.

Safety

2 Safety

2.1 State of the art

The conveyor is designed according to the state of the art and is reliable in operation, once distributed. However, risks may still arise.

Disregarding the notices in this manual may lead to serious injury.

- Carefully read the manual and follow its content.
- Observe local accident prevention regulations and general safety regulations that apply in the area of use.

2.2 Intended use

The Pallet Drive is intended for use in industrial environments, super markets and airports and is used for the transport of unit handling, such as pallets, cartons or crates. The Pallet Drive must be integrated into a conveyor module or conveyor system. Any other use is considered inappropriate.

Any modifications that affect the safety of the product are not permitted.

The Pallet Drive may only be operated within the defined operating limits.

2.3 Unintended use

The Pallet Drive must not be used for transporting people.

The Pallet Drive is not intended for use under impact or shock loads.

The Pallet Drive is not designed to be used under water. Such a use leads to personal or fatal injuries from electrocution as well as the penetration of water, resulting in a short circuit or motor damage.

The Pallet Drive may not be used as a drive for cranes or lifting devices or for the corresponding hoist ropes, cables or chains.

Use of the Pallet Drive for anything other than the intended purpose is subject to approval by Interroll.

Unless otherwise stated in writing and/or specified in a quote, Interroll and its dealers shall assume no liability for product damage or failure which result from failure to observe these specification and restrictions (see the chapter „Technical data“ and „Electrical data“ of the respective series).

2.4 Personnel qualification

Unqualified personnel cannot recognize risks and, as a result, is subject to greater dangers.

- Authorize only qualified personnel to perform the activities described in these instructions.
- The operating company must ensure that personnel follow locally applicable regulations and rules about safety and hazards while working.

The following target groups are addressed in these instructions:

Operators

Operators have been instructed in operating and cleaning the Pallet Drive and follow the safety guidelines.

Service personnel

The service personnel features a technical training or has undergone training by the manufacturer and performs the transport, assembly, maintenance and repair tasks.

Electricians

Persons working on electrical installations must have pertinent technical training.

2.5 Dangers

The following list informs you about the various types of danger or damage that may occur while working with the Pallet Drive.

Bodily injury

- Maintenance or repair work on Pallet Drives must only be performed by authorized service persons in accordance with applicable regulations.
- Before turning on the Pallet Drive, ensure that no unauthorized persons are near the conveyor

Electricity

Perform any installation and maintenance tasks only after following the five safety rules:

- Disconnect
- Secure against reactivation
- Determine de-energized state at all poles
- Ground and short circuit
- Cover or block neighboring live parts

Rotating parts

- Do not reach into areas between Pallet Drive and conveyor belts or roller chains.
- Tie long hair together.
- Never wear loose clothing.
- Never wear jewelry, such as necklaces or bracelets.

Hot motor parts

- Attach appropriate warning notices to the conveyor.
- Do not touch the surface of the Pallet Drive. It can result in burns, even under regular operating temperature.

Working environment

- Do not use the Pallet Drive in explosive atmospheres.
- Remove equipment or material which is not required from the workspace.
- Wear safety shoes.
- Clearly specify and monitor the way materials are placed on the conveyor.

Safety

Faults during operation

- Regularly check the Pallet Drive for visible damage.
- In case of fumes, unusual noise or blocked or damaged materials, stop the Pallet Drive at once and ensure that the RollerDrive cannot be started accidentally.
- Contact qualified personnel immediately to find the source of the fault.
- During operation, do not step on the Pallet Drive or the conveyor/the system in which it is installed.

Maintenance

- Check the product regularly for visible damages, unusual noise and firm seating of fittings, screws and nuts. An additional maintenance is not required.
- Do not open the Pallet Drive.

Accidental motor start

- Caution during installation, maintenance and cleaning or in the event of a malfunction: Secure the Pallet Drive against unintentional start-up.

2.6 Interfaces to other devices

Hazards may occur while integrating the Pallet Drive into a complete system. These are not part of this manual and have to be analyzed during the design, installation and startup of the complete system.

- After assembling the Pallet Drive in a conveyor module, check the whole system for a new potential dangerous spot before switching on the conveyor.
- Additional constructive measures may be required.

2.7 Legal provisions

Ecodesign Regulation (EU) 2019/1781

Interroll Pallet Drives are not subject to the requirements of the Ecodesign Regulation.



Interroll Pallet Drives are excluded from the scope of Regulation (EU) 2019/1781 on the basis of Article 2(2) (a), as the integrated electric motor cannot be tested and operated independently of the gearbox.

3 Product information

3.1 Product description

The Pallet Drive is a completely enclosed electrical drive roller. It replaces external components such as motors and gears, which require frequent maintenance.

The Pallet Drive can be operated in environments with heavy coarse and fine dust exposure.

The Pallet Drive is driven by an asynchronous three-phase induction motor. It is available in a single power stage only and for most of the international supply voltages.

The Pallet Drive does not contain any oil and is not intended for continuous operation.

3.2 Options

Integrated thermal overload protection

A thermal circuit breaker integrated in the winding head protects against overheating. The switch trips if the motor overheats. However, it has to be connected to a suitable external control device that interrupts the current supply to the motor in case of overheating:

Integrated electromagnetic brake

The integrated electromagnetic brake can hold loads. It acts directly on the rotor shaft of the Pallet Drive and is driven by a rectifier. The holding force of each Pallet Drive with brake corresponds to the belt pull of the motor. The electromagnetic brake is available for all Pallet Drive:

3.3 Thermal protection

Under normal operating conditions, the thermal circuit breaker integrated in the stator winding is closed. When the motor limit temperature is reached (overheating), the switch opens at a preset temperature to prevent damage to the motor.



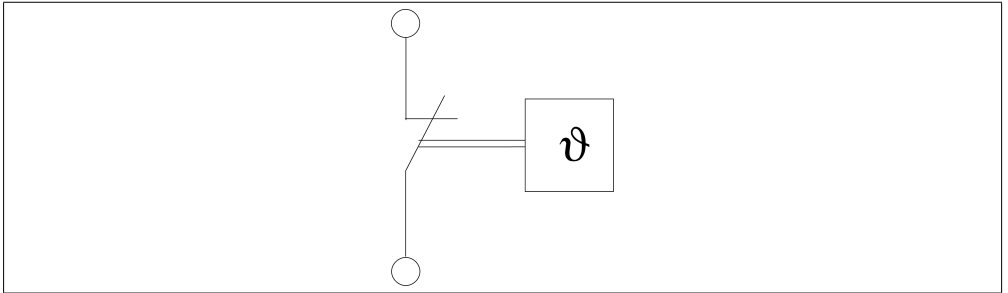
WARNING

The thermal circuit breaker is automatically reset after the motor has cooled off.

Inadvertent start-up of the motor

- Connect the thermal circuit breaker in series with a suitable relay or contactor so that the current supply to the motor is safely interrupted when the switch trips.
- Ensure that the motor can be switched on again after overheating only with a confirmation button.
- After the switch has tripped, wait until the motor has cooled off, and ensure prior to switch-on that there is no danger to persons.

Product information



Standard design: temperature limiter, automatically switching back

Service life: 10.000 cycles

| | | | |
|----|----------------------|--------|----------|
| AC | $\cos \varphi = 1$ | 2,5 A | 250 V AC |
| | $\cos \varphi = 0,6$ | 1,6 A | 250 V AC |
| DC | | 1,6 A | 24 V DC |
| | | 1,25 A | 48 V DC |

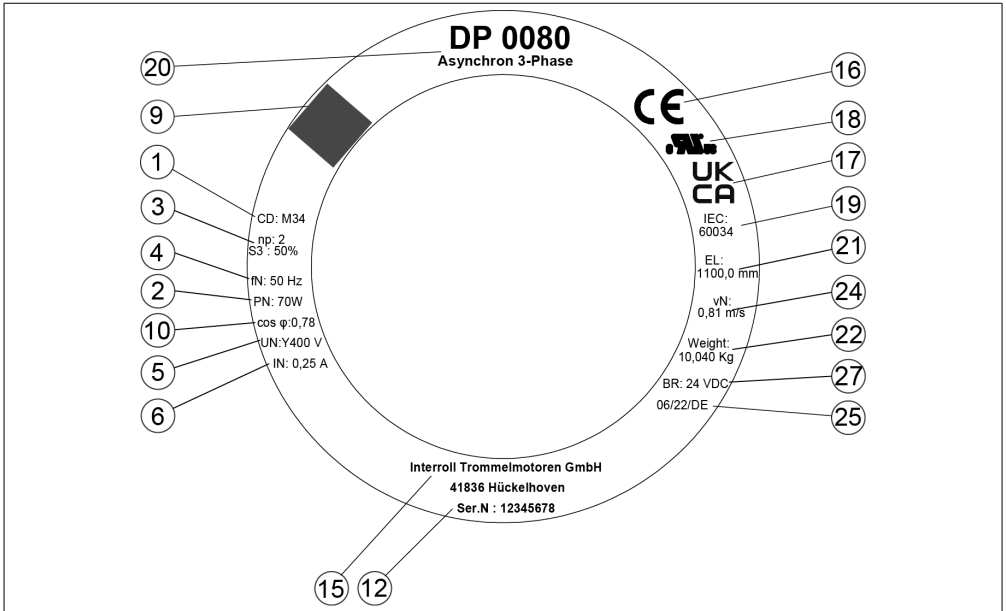
Service life: 2.000 cycles

| | | | |
|---------------------|--------------------|-----------------|----------|
| AC | $\cos \varphi = 1$ | 6,3 A | 250 V AC |
| Reset temperature | | 40 K \pm 15 K | |
| Resistance | | < 50 m Ω | |
| Contact bounce time | | < 1 ms | |

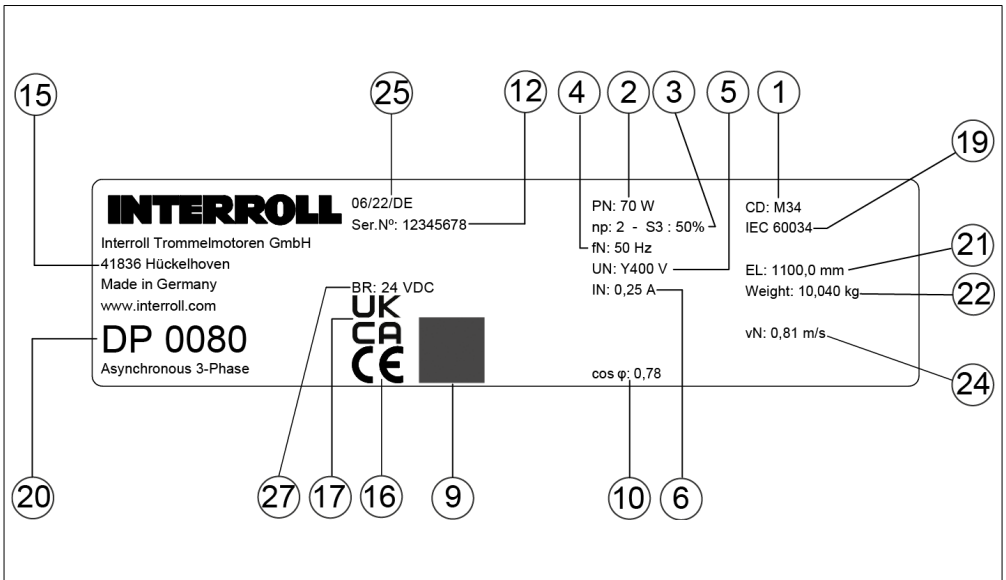
3.4 Type plate of Pallet Drive

The information on the nameplate of the Pallet Drive is intended for its identification. This is the only way for the Pallet Drive to be used properly.

A laser-cut nameplate is located on the cover of the Pallet Drive. In addition, the Pallet Drive includes a label that can be used for documentation.



Nameplate (1) for Pallet Drive DP 0080/DP 0089



Nameplate (2) for Pallet Drive DP 0080/DP 0089

Product information

| | |
|------------------------------------|--|
| 1 Connection diagram number | 16 CE mark |
| 2 Rated power | 17 UKCAmark |
| 3 Number of poles + operating mode | 18 UL mark |
| 4 Rated frequency | 19 International Electrotechnical Commission: Standard for drum motors |
| 5 Rated voltage at rated frequency | 20 Type + design |
| 6 Rated current at rated frequency | 21 Installation length |
| 9 QR code | 22 Weight |
| 10 Power factor | 24 Circumferential speed of drum tube |
| 12 Serial number | 25 Manufactured week/year/country |
| 15 Manufacturer's address | 27 Technical data of option |

3.5 Product identification

The information given below is required in order to identify a Pallet Drive. The values for a specific Pallet Drive can be entered in the last column.

| Information | Possible value | Own value |
|-------------------------------|--|-----------|
| Type plate of Pallet Drive | Motor type Speed in m/s Serial number Between frames (BF) in mm Number of poles Power in kW | |
| Drum diameter (tube diameter) | e.g. 80 mm | |

Interroll Product App

Product-specific data can be read out using the QR code printed on the type plate. The Interroll Product App is available in all major app stores:



3.6 Technical data

| | |
|---|----------------------------|
| Protection rate | IP54 |
| Ambient temperature range for standard applications | -5 °C to +40 °C |
| Cycle times (duty cycle DC50) | 120 pallets per hour |
| Ramp times | Pallet Drive: $\geq 0,5$ s |
| Installation altitude above sea level | max. 1000 m |

3.7 Electrical data

| P_N | n_p | n_N | f_N | U_N | I_N | $\cos \varphi$ | η | J_R | I_s/I_N | M_s/M_N | M_b/M_N | M_p/M_N | M_N | R_M |
|-------|-------|-------------------|-------|-------|-------|----------------|--------|-----------------|-----------|-----------|-----------|-----------|-------|----------|
| W | | min^{-1} | Hz | V | A | | | kgcm^2 | | | | | Nm | Ω |
| 70 | 2 | 2889 | 50 | 400 | 0,33 | 0,56 | 0,54 | 1,25 | 4,2 | 4 | 4,5 | 4 | 0,23 | 72,7 |
| 70 | 2 | 2889 | 50 | 230 | 0,57 | 0,56 | 0,54 | 1,25 | 4,2 | 4 | 4,5 | 4 | 0,23 | 72,7 |

Abbreviations see page 34.

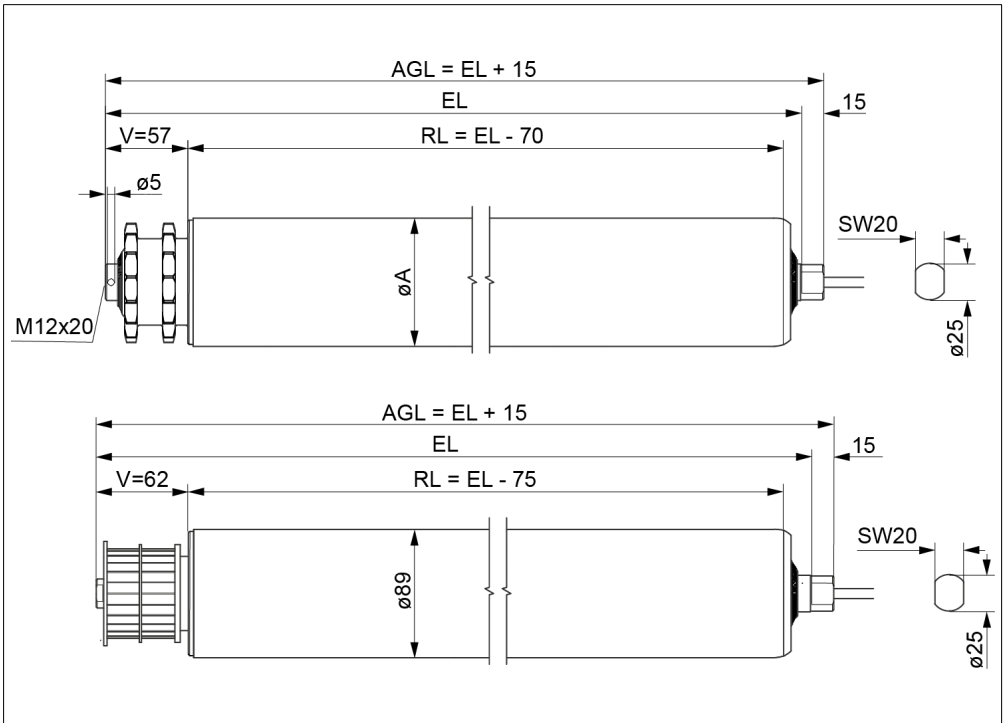
3.8 Dimensions

All length-related dimensions in the catalog and in these operating instructions comply with the requirements of DIN/ISO 2768 (medium quality).

Product information



The recommended distance between the mounting brackets (EL) while taking into account the maximum thermal expansion and internal tolerances is $EL + 2$ mm.



Dimensions of Pallet Drive

| Type | A | EL | AGL |
|---------|----|-----------|-----------|
| | mm | mm | mm |
| DP 0080 | 80 | $RL+V+13$ | $RL+V+28$ |
| DP 0089 | 89 | $RL+V+13$ | $RL+V+28$ |

4 Options and accessories

4.1 Electromagnetic brake for the Pallet Drive

The electromagnetic brake, which is available as an option, acts directly on the rotor shaft. If the power supply is interrupted, the brake is applied and holds the Pallet Drive in position until the power supply is re-established. The load held by the brake corresponds to the maximum transport weight specified for the Pallet Drive.

Features:

- Applied directly to the rotor shaft of the Pallet Drive.
- Holds a load equal to the specified transport weight.
- Operation via an external rectifier.
- Operating temperature from -10 °C to +120 °C.



The rated braking torque is heavily influenced by the operating conditions inside of the Pallet Drive as well as the ambient temperature. For safety reasons, the specified braking torque should be reduced by 50% for load calculations.

| Brake type | Rated braking torque | Rated output | Rated supply voltage | Rated current |
|------------|----------------------|--------------|----------------------|---------------|
| | Nm | W | V DC | mA |
| 24 | 2 | 11 | 24 | 500 |

The installed brake disk is a wear part and has a limited service life in relation to the operating conditions. In case of premature wear, the operating conditions must be checked and evaluated. The wear parts of the brake are not included in the product warranty.



The braking torque at the Pallet Drive tube corresponds to the gear ratio of the motor times the braking torque listed in the table above. For safety purposes, 25% reserve have to be figured into the dimensioning of the brake. The brake is not a safety holding brake.

All brakes are dimensioned for start/stop operation.

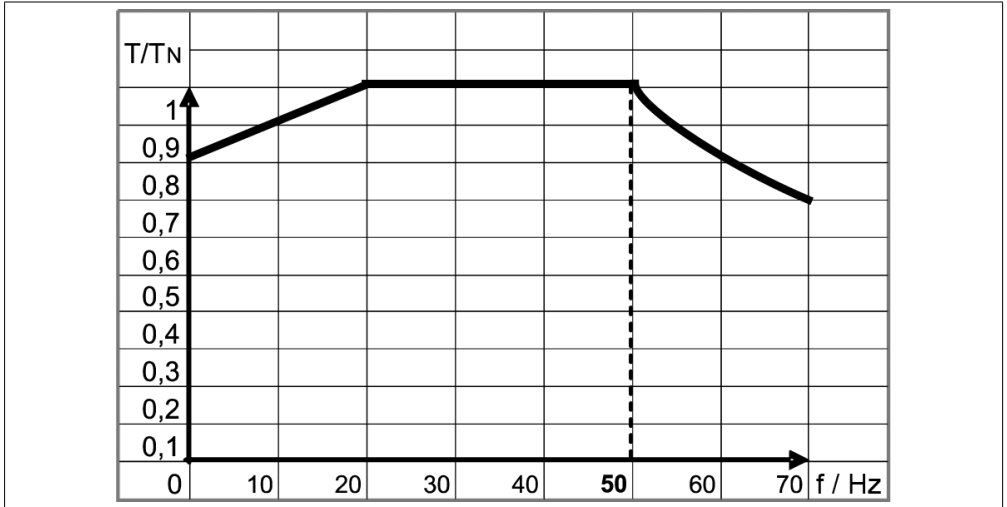
The rise and fall delays of the brakes can vary significantly depending on the following factors:

- Ambient temperature
- Internal operating temperature of Pallet Drive

Options and accessories

4.2 Asynchronous Pallet Drive with frequency inverters

4.2.1 Torque dependent on input frequency



| | | | | | | |
|--|----|----|----|----|-----|-------|
| Operating frequency [Hz] | 5 | 10 | 15 | 20 | 25 | 30-50 |
| Available motor torque in % of rated motor frequency 50 Hz | 80 | 85 | 90 | 95 | 100 | 100 |

The torque dependency depicted in the figure above is expressed as $P = T \times \omega$. With a reduced operating frequency of below 20/24 Hz, the motor torque is reduced by changing heat dissipation conditions.

4.2.2 Frequency inverter parameters

Clock frequency:

A high clock frequency leads to a better utilization factor of the motor. Optimum frequencies are 8 or 16 kHz. Parameters such as smooth running test quality (motor is running smoothly) and noise development are also affected positively by high frequencies.

Voltage increase:

Pallet drives are generally suitable for operation with frequency inverters and therefore also for high voltage rise speeds.

Nevertheless, high voltage rise speeds in conjunction with long motor cables cause high pulse voltages, which stress and age the insulation system. To prevent premature ageing of the winding insulation and thus damage to the pallet drive, motor chokes, dU/dt filters or even sine filters can be installed between the inverter and the pallet drive.

Please refer to the operating instructions of the frequency inverter for the cable length above which this measure is recommended.

Voltage:

If a frequency inverter with single-phase supply is installed in the Pallet Drive, the specified motor must be designed for the frequency inverter output voltage and must be connected accordingly. Single-phase motors cannot be operated with a frequency inverter.

Frequency inverter parameters:

Frequency inverters are usually delivered with factory settings. Given these settings, the inverter is generally not immediately ready for operation. The parameters have to be adjusted to the respective motor. For frequency inverters sold by Interroll, startup instructions specifically created for Pallet Drive for the respective frequency inverters can be supplied upon request.

Maximum frequency:

The Pallet Drive may be operated only in a frequency range from 10 - 60 Hz.

Transport and storage

5 Transport and storage

5.1 Transport



CAUTION

Improper transport poses a risk of injury!

- Transport-related tasks should only be carried out by qualified and service personnel.
- For Pallet Drives with a weight of 20 kg or more, use a crane or hoisting equipment during the transport. The rated load of the crane or hoisting equipment must be greater than the weight of the Pallet Drive. Crane rope/cable and hoisting equipment must be securely fastened to the shafts of the Pallet Drive during lifting.
- Do not stack pallets.
- Before the transport, ensure that the Pallet Drive is sufficiently secured.

NOTICE

Risk of damage to the Pallet Drive due to improper transport!

- Avoid strong impacts during transport.
- Do not lift the Pallet Drive at the cable or at the terminal box.
- Do not transfer the Pallet Drives between warm and cold environments. This may cause condensation to form.
- For transport in shipping containers, ensure that the temperature in the container is not permanently above 70 °C (158 °F).

1. Check each Pallet Drive for damage after transport.
2. In the event of damage, take photos of the damaged parts.
3. In case of a transport damage, immediately notify the carrier and Interroll to avoid losing any claims for compensation.

5.2 Storage



CAUTION

Risk of injury due to improper storage!

- Do not stack pallets.
- Do not stack more than four cardboard boxes on top of each other.
- Ensure that proper fastening is in place.

1. Store the Pallet Drive in a clean, dry and enclosed location at +15 to +30 °C; protect it from moisture and humidity.
2. Check each Pallet Drive for damage after storage.

6 Assembly and installation

6.1 Warning notices concerning the installation



CAUTION

Risk of injury due to incorrect assembly!

The Pallet Drive strikes against the mounting bracket during reversing operation if it is installed incorrectly. This can lead to material breakage in the long term, causing components to fall or the cable to be damaged.

- Observe the installation position.
- Observe axial play of min. 1.0 mm and max. 2.0 mm.
- Observe torsional play of max. 0.4 mm.

NOTICE

Risk of damage leading to failure or shortened service life of the Pallet Drive!

- Do not drop or mishandle the Pallet Drive to avoid internal damages.
- Prior to the installation, inspect each Pallet Drive for damage after storage.
- Do not hold, carry, or support the Pallet Drive by the wires or terminal boxes extending out of the mounting shaft to avoid damage to the internal parts and seals.
- Do not twist the motor cable.

6.2 Installing the Pallet Drive

6.2.1 Positioning the Pallet Drive

Ensure that the data on the type plate are correct, and match the ordered and confirmed product.



The installation of a Pallet Drive is permissible only in horizontal applications. In case of doubt, contact Interroll.



The Pallet Drive must be mounted horizontally with a clearance of $\pm 2^\circ$.
The Pallet Drive can be installed in any orientation.

Assembly and installation

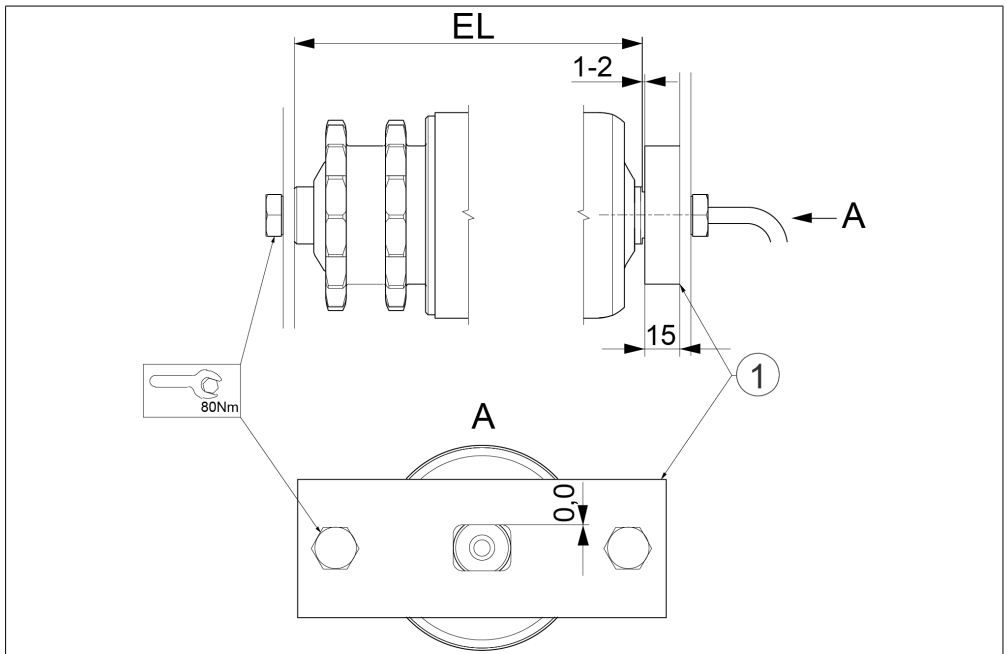
6.2.2 Installation of Pallet Drive in mounting brackets

The mounting brackets must be sufficiently robust to withstand the motor torque.

1. Install the brackets at the conveyor or machine frame. Ensure that the Pallet Drive is installed parallel to the transport rollers and at a right angle to the conveyor belt frame.
2. Ensure that at least 80% of the key surfaces of the Pallet Drive are held by the mounting brackets (cable side).
3. Ensure that the distance between the key surfaces and the bracket is free from play.
4. On the side without cable, use a screw M12; 8.8 and tighten with a tightening torque of 80 Nm.



The Pallet Drive can also be installed without mounting brackets. In this case, the shaft end of the cable side must be installed in a corresponding recess in the conveyor belt frame; this recess must be designed in such a way that the aforementioned requirements are met.



Axial play

1 Torque tension displacement

The entire axial clearance of the Pallet Drive should measure 1 mm minimum and 2 mm maximum.

6.3 Warning notices concerning the electrical installation



WARNING

Electrocution due to improper installation!

- All electrical work must only be performed by qualified electricians.
- Disconnect the power supply before installing, removing or rewiring the Pallet Drive.
- Always observe the connection instructions and ensure that the power and control circuits of the motor are correctly connected.
- Ensure that metal conveyor belt frames are sufficiently grounded.

NOTICE

Damage of the Pallet Drive due to incorrect power supply

- Do not connect an AC Pallet Drive to an excessive DC voltage supply – it will lead to permanent damages.

6.4 Electrical connection of the Pallet Drive

6.4.1 Connection of the Pallet Drive - with cable

1. Ensure that the motor is connected to the correct supply voltage according to the motor type plate.
2. Ensure that the Pallet Drive is correctly grounded with the yellow-green cable.

NOTICE

Damage of the Pallet Drive due to incorrect polarity

In case of incorrect polarity, the brake cannot lift properly which leads to overloads.

- Ensure that the correct polarity of the brake is observed.

Connect the Pallet Drive according to the connection diagrams (see „Connection diagrams“). Observe the correct polarity of the brake.

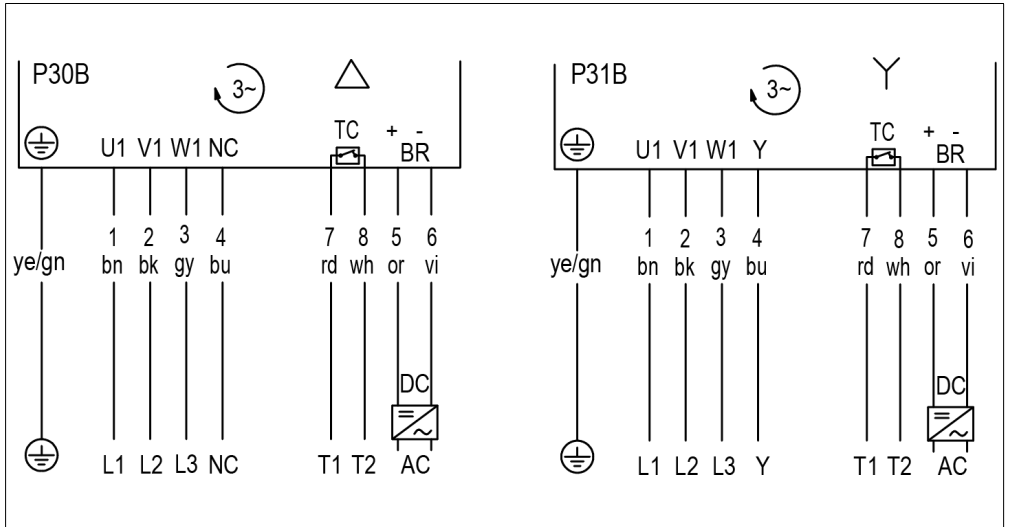
6.4.2 Connection diagrams

These operating instructions list only standard connection diagrams. For other connection types, the connection diagram is supplied separately with the Pallet Drive.

Abbreviations see page 34.

Assembly and installation

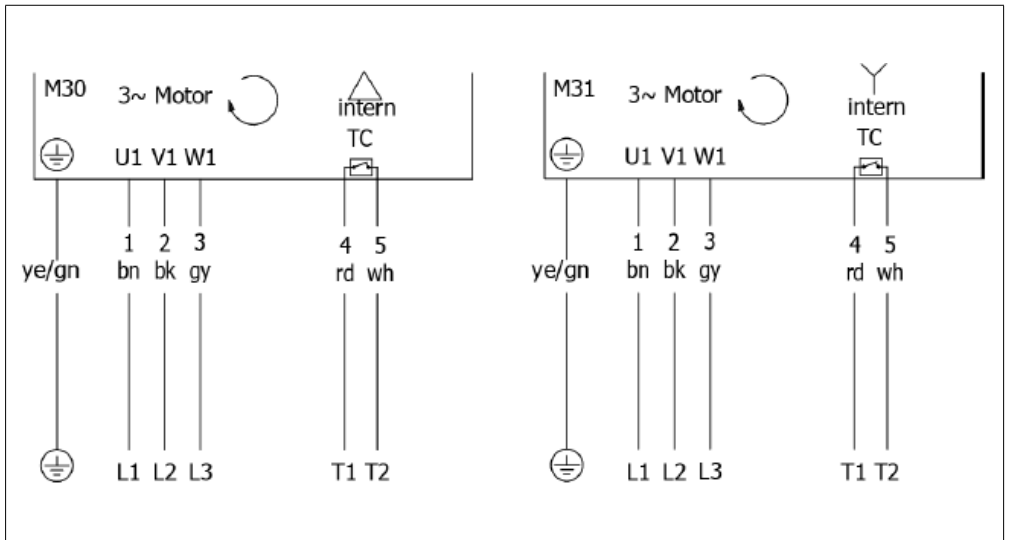
Cable connections



3-phase, 7+2-core cable, winding for 1 voltage, delta or star connection (switched internally), with brake

Delta connection: Low voltage

Star connection: High voltage

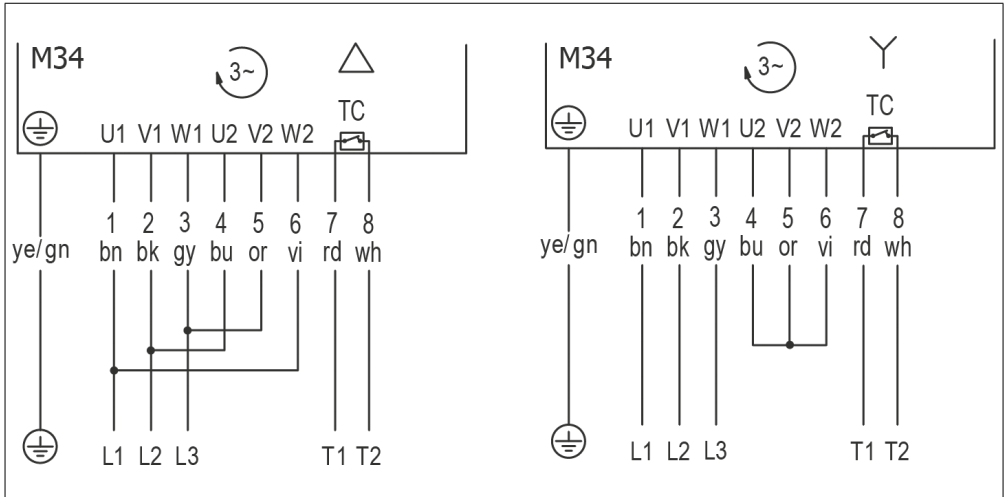


3-phase, 4+2-core cable, winding for 1 voltage, delta or star connection (internally connected)

Delta connection: Low voltage

Star connection: High voltage

Assembly and installation



3-phase, 7+2-core cable, winding for 2 voltages, delta or star connection

Delta connection: Low voltage

Star connection: High voltage

Assembly and installation

6.4.3 External motor protection

The motor must always be installed together with suitable external motor protection, e.g., a motor circuit breaker or frequency inverter with protection against excessive current. The protective device must be adjusted to the rated current of the corresponding motor (see type plate).

6.4.4 Integrated thermal protection



CAUTION

Accidental motor start

Crushing hazard for fingers

- Connect the integrated thermal circuit breaker to an external control device that interrupts the current supply to the motor at all poles in case of overheating.
- After the thermal circuit breaker has tripped, examine and remove the cause for overheating before the current supply is reactivated.

The standard maximum switching current of the thermal circuit breaker is 2.5 A. For other options, please contact Interroll.

For operational safety, the motor must be safeguarded against overload with an external motor protection, as well as an integrated thermal protection; otherwise, there is no warranty if the motor fails.

6.4.5 Frequency inverter

Asynchronous Pallet Drives can be operated with frequency inverters. Frequency inverters from Interroll are general adjusted to factory setting and have to be parameterized for the respective Pallet Drive. For this purpose, Interroll can supply parameterization instructions. In this case, please contact your local Interroll partner.

- If no frequency inverter from Interroll is used, the frequency inverter must be correctly parameterized according to the specified motor data. Interroll can provide only very limited support for frequency inverters that are not being sold by Interroll.
- Resonance frequencies in the power supply line must be prevented since they create voltage spikes in the motor.
- If the cable is too long, frequency inverters generate resonance frequencies in the line between frequency inverter and motor.
- Use a completely shielded cable to connect the frequency inverter to the motor.
- Install a sine-wave filter or a motor choke if the cable is longer than 10 meter or if a frequency inverter controls several motors.
- Ensure that the cable shield is connected to a grounded part according to the electrotechnical guidelines and local EMC recommendations.
- Always observe the installation guidelines of the frequency inverter manufacturer.

6.4.6 Electromagnetic brake

The Pallet Drive is delivered with an installed electromagnetic brake (if it does not feature a 24V DC brake). The rectifier is an accessory part and must be ordered separately from the motor.

Connect the rectifier and the brake according to the connection diagrams.



The rectifier has an AC input and a DC output to the brake winding.



DANGER

Risk of injuries when used as safety brake!

When large loads are being held, the motor can unexpectedly rotate in the opposite direction. As a result, loads may fall down and hit or fatally injure persons.

- Do not use the electromagnetic brake as safety brake.
- If a safety brake is required, install a suitable additional safety brake system.

NOTICE

Damage of the Pallet Drive and the brake if both are operated simultaneously!

- Route the control circuits in such a way that motor and brake do not work against each other.
- Consider the response time for applying and releasing the brake (depending on temperature and oil viscosity, it can amount to 0.4 to 0.6 seconds).
- Apply the brake only after the current supply to the motor has been switched off.
- Start the motor only after the brake has been released.

The cable should be as short as possible, and the cable cross section should correspond to the national/international regulations so that the voltage supply at the rectifier does not deviate from the rated voltage by more than $\pm 2\%$.

The electromagnetic brake is a pure holding brake and should not be used for positioning or braking the motor. Braking applications should be implemented with a frequency inverter.

Initial startup and operation

7 Initial startup and operation

7.1 Checks before the initial startup

Prior to the initial startup of the motor, the following steps have to be performed:

1. Ensure that the motor type plate matches the version ordered.
2. Ensure that no contact points exist between objects, conveyor belts and rotating or moving parts.
3. Ensure that the Pallet Drive and the conveyor belt can move freely.
4. Ensure that the belt features the correct tension according to the recommendations from Interroll.
5. Ensure that all bolts are tightened according to the specifications.
6. Ensure that no additional dangerous areas arise due to interfaces to other components.
7. Ensure that the Pallet Drive is correctly wired and connected to the voltage supply with the correct voltage.
8. Check all safety devices.
9. Ensure that no bystanders are in dangerous areas around the conveyor.
10. Ensure that the external motor protection is correctly adjusted to the rated motor current and a corresponding switching device can switch off the motor voltage at all poles if the integrated thermal circuit breaker trips.

7.2 Initial startup

The Pallet Drive may be put into operation only if it is correctly installed and connected to the power supply and all rotating parts have been fitted with the corresponding protective devices and guards.

7.3 Checks before every startup

1. Check the Pallet Drive for visible damage.
2. When using Interroll Pallet Control, ensure that the latest software version is installed.
3. Ensure that no contact points exist between objects, conveyor belts and rotating or moving parts.
4. Ensure that the Pallet Drive and the conveyor belt can move freely.
5. Check all safety devices.
6. Ensure that no bystanders are in dangerous areas around the conveyor.
7. Clearly specify and monitor the way materials are placed on the conveyor.

7.4 Operation



CAUTION

Rotating parts and accidental starting!

Risk of crushing for fingers.

- Do not reach between Pallet Drive and belt.
- Do not remove the protection device.
- Keep fingers, hair and loose-fitting clothes away from Pallet Drive and chains/toothed belts.
- Keep watches, rings, chains, piercings and comparable jewelry away from the Pallet Drive and chains/toothed belts.

NOTICE

Damage of Pallet Drive in reversing operation!

- Ensure that a time delay is in place between forward and reversing movement. Before reversing, the motor must come to a complete standstill.
-



If exact speeds are required, a frequency inverter and/or encoder may have to be used.

The specified rated speeds of the motor can deviate by $\pm 10\%$. The belt speed indicated on the type plate is the calculated speed at the drum diameter under full load, rated voltage and rated frequency.

7.5 Procedure in case of accident or fault

1. Stop the Pallet Drive at once and ensure that it cannot be started accidentally.
2. In case of an accident: Provide first aid and make an emergency call.
3. Inform the responsible person.
4. Have the malfunction repaired by service personnel.
5. Start the Pallet Drive only after this has been approved by service personnel.

Maintenance and cleaning

8 Maintenance and cleaning

8.1 Warning notices concerning maintenance and cleaning



CAUTION

Risk of injury due to improper handling or accidental motor starts!

- Maintenance and cleaning work must only be performed by authorized service persons.
- Perform maintenance work only after switching off power. Ensure that the Pallet Drive cannot be turned on accidentally.
- Set up signs indicating that maintenance work is in progress.



CAUTION

Risk of injury from hot surfaces!

The Pallet Drive can heat up during operation and therefore has hot surfaces even after it has been switched off. This leads to burns on contact.

- Allow the Pallet Drive to cool down to ambient temperature before maintenance and cleaning.
- Wear personal protective equipment.

8.2 Preparation for maintenance and cleaning by hand

1. Switch off the power supply to the Pallet Drive.
2. Switch off the main power switch to switch off the Pallet Drive.
3. Open terminal box or distribution box and disconnect the cables.
4. Attach a sign to the control station that maintenance work is in progress.

8.3 Maintenance

Generally, Interroll Pallet Drives do not have to be maintained and require no special care during their regular service life. Nevertheless, certain checks have to be performed at regular intervals.

8.4 Checking the Pallet Drive

- Ensure daily that the Pallet Drive can rotate freely.
- Check the Pallet Drive for visible damage every day.
- Ensure weekly that motor shaft and brackets are firmly fastened to the conveyor frame.
- Ensure weekly that cables, lines and connections are in good condition and securely fastened.

8.5 Cleaning

1. Remove foreign material from the drum shell.
2. Do not use sharp-edged tools to clean the drum shell.

9 Troubleshooting

Troubleshooting

| Fault | Possible cause | Remedy |
|--|---|--|
| Motor does not start or stops during operation | No voltage supply | Check the voltage supply. |
| | Incorrect connection or loose/ defective cable connection | Check connection according to connection diagram. Check whether cables are defective or connections are loose. |
| | Motor overheating | See the fault „Motor heats up during regular operation“. |
| | Motor overload | Disconnect main power supply, determine and repair cause of overload. |
| | Internal thermal circuit breaker tripped/failure | Check whether there is overload or overheating. After cooling off, check continuity of internal thermal protection. See the fault „Motor heats up during regular operation“. |
| | External overload protection tripped/ failure | Check whether there is overload or overheating. Check continuity and function of external overload protection. Check whether the correct motor current is set in the external overload protection. |
| | Motor winding phase error | Replace Pallet Drive or contact the local Interroll dealer. |
| | Motor winding short circuit (insulation fault) | Replace Pallet Drive or contact the local Interroll dealer. |
| Motor does not start or stops during operation | Brake is not triggered | Check whether the brake works during start-up. During the brake release, the clicking noise of the brake in the motor can generally be heard. It must then be possible to turn the drum tube manually. Depending on the gear ratio, the motors can be turned more easily or with more difficulty. Check connections and continuity of the brake winding. If connections and brake winding are OK, check the rectifiers. |
| | Drum or chain blocked | Ensure that the Pallet Drive is not being blocked and all rollers and drums can turn freely. If the Pallet Drive cannot turn freely, the gear box or the bearing may be blocked. In this case, contact the local Interroll dealer. |
| | Gear box or bearing blocked | Check by hand if the drum shell can be turned freely. If not, replace Pallet Drive or contact local Interroll dealer. |
| Motor is running, but drum shell does not turn | Incorrect assembly | Ensure that the motor is not rubbing against the conveyor belt frame. |
| | Transfer loss | Contact the local Interroll dealer. |

Troubleshooting

| Fault | Possible cause | Remedy |
|---|--|---|
| Motor heats up during regular operation | Overload of Pallet Drive | Check rated current for overload. Ensure that the motor is not rubbing against the conveyor belt frame. |
| | Ambient temperature above 40 °C | Check ambient temperature. If the ambient temperature is too high, install a cooling unit. Contact the local Interroll dealer. |
| | Excessive or frequent stops/ starts | Check whether the number of stops/starts and the weight of the pallets corresponds to the specifications of the Pallet Drive and reduce this number if necessary. Install a frequency inverter to optimize the motor output. For Pallet Drive, the start-and-stop ramps may not be less than 0.5 seconds. Ramps can be set with a frequency inverter. Contact local Interroll dealer. |
| | Motor is not suitable for the application | Check whether the application meets the specifications of the Pallet Drive. |
| | Wrong voltage supply | Check the voltage supply. For 3-phase motors, ensure that no phase has failed. |
| | Wrong settings at frequency inverter | Check whether the frequency inverter settings meet the specifications of the Pallet Drive and change them if necessary. |
| Loud noise of Pallet Drive during regular operation | Incorrect settings at frequency inverter | Check whether the frequency inverter settings meet the specifications of the Pallet Drive and change them, if necessary. |
| | Loose motor mount | Check motor mount, shaft tolerances and fastening screws. |
| | An outer conductor failed | Check connection, check power supply. |
| Pallet Drive vibrates heavily | Incorrect settings at frequency inverter | Check whether the frequency inverter settings meet the specifications of the Pallet Drive and change them, if necessary. |
| | Loose motor mount | Check motor mount, shaft tolerances, and fastening screws. |
| Pallet Drive runs with interruptions | Pallet Drive/chain/toothed belt is partially or intermittently blocked | Ensure that chain and Pallet Drive are not being blocked and all rollers and drums can turn freely. |
| | Incorrect or loose power cable connection | Check connections. |
| | Gear box is damaged | Check by hand if the drum shell can be turned freely. If not, replace the Pallet Drive or contact the local Interroll dealer. |
| | Incorrect or faulty voltage supply | Check the voltage supply. For single-phase motors: check capacitors. |

| Fault | Possible cause | Remedy |
|--|--|--|
| Pallet Drive/chain runs more slowly than specified | Incorrect motor speed ordered/ delivered | Check Pallet Drive specifications and tolerances. Replace Pallet Drive or contact the local Interroll dealer. |
| | Pallet Drive/chain is partially or intermittently blocked | Ensure that chain and Pallet Drive are not being blocked and all rollers and drums can turn freely. |
| | Incorrect settings at frequency inverter | Check whether the frequency inverter settings meet the specifications of the Pallet Drive and change them, if necessary. |
| Pallet Drive runs faster than specified. | Incorrect motor speed ordered/ delivered | Check Pallet Drive specifications and tolerances. Replace Pallet Drive or contact the local Interroll dealer. |
| | Incorrect settings at frequency inverter | Check whether the frequency inverter settings meet the specifications of the Pallet Drive and change them, if necessary. |
| Motor winding: one phase failed | Failure/overload of winding insulation | Check continuity, current and resistance of each phase winding. Replace Pallet Drive or contact the local Interroll dealer. |
| Motor winding: two phases failed | Power failure in one phase which leads to overload in the other two phases/ separating failure | Check power supply to all phases. Check continuity, current and resistance of each phase winding. Replace Pallet Drive or contact the local Interroll dealer. |
| Motor winding: three phases failed | Motor overload/incorrect power connection | Check whether the correct supply voltage is applied. Check continuity, current and resistance of each phase winding. Replace Pallet Drive or contact the local Interroll dealer. |
| Cable defective or damaged | Wrong operation by the customer or damage during installation | Check type of damage and possible cause. Replace Pallet Drive or contact local Interroll dealer. |
| | Damage during transport | Check type of damage and possible cause. Replace Pallet Drive or contact local Interroll dealer. |
| Cap bearing failed | Overload | Check whether the load of the application meets the specifications of the Pallet Drive. |
| | Impact load | Check whether the load of the application meets the specifications of the Pallet Drive. |
| | Load or incorrect adjustment of shaft | Check whether screws have been overtightened and whether frame or motor mount are incorrectly adjusted. |
| | Loose or tight seating of bearing on shaft | Contact the local Interroll dealer. |
| Gear box failure | Overload/impact load or regular wear | Check whether the load of the application meets the specifications of the Pallet Drive. |
| | | Check service life. |

Troubleshooting

| Fault | Possible cause | Remedy |
|--|---|--|
| Rotor drive worn or teeth broken off | Excessive or frequent stops/starts, very high starting torque | <p>Check whether the load of the application meets the specifications of the Pallet Drive.</p> <p>Check maximum number of stops/starts and permissible starting torque.</p> <p>Use frequency inverter with start-and-stop ramps (0.5 s or more).</p> |
| Toothed sprocket worn or teeth/bolts broken off | Start-up under overload and/or impact load or while blocked | <p>Check whether the application and load meet the specifications of the Pallet Drive.</p> <p>Check whether start-up is blocked.</p> <p>Use frequency inverter with start-and-stop ramps (0.5 s or more).</p> |
| Complete or temporary failure of brake and rectifier | Wrong operating voltage applied | Ensure that the correct rectifier was installed and that the correct input voltage (V/ph/Hz) is present. |
| | Wrong connection | <p>Never connect the rectifier to the frequency inverter.</p> <p>Ensure that the brake was connected according to connection diagram.</p> |
| | Insufficient shielding against external voltage spikes from cables and external devices | Ensure that all cables between brake, rectifier and voltage supply are shielded and grounded according to IEC recommendations. |
| Complete or temporary failure of brake and rectifier | Voltage drop due to cable with excessive length | Check whether a voltage drop occurs in long cables and ensure that the cable cross section meets the IEC specifications. |
| | Excessive stops/starts | Ensure that the specifications for brake and rectifier meet the requirements of the application. |
| | Wrong rectifier connected | Contact Interroll. We will give you the name of the correct rectifier for the corresponding brake and application. |
| | Short circuit of brake winding | Check continuity of winding and rectifier. |
| Slow switching of brake and rectifier | Wrong brake/wrong rectifier selected or specified | Ensure that the specifications for brake and rectifier meet the requirements of the application. |

10 Decommissioning and disposal

- The packaging must be recycled to provide environmental relief.

10.1 Shutdown



CAUTION

Risk of injury due to incorrect handling!

- Shut-down may only be executed by service personnel.
- Allow the Pallet Drive to cool down to ambient temperature before decommissioning.
- Only shut down the Pallet Drive after switching off the power. Ensure that the Pallet Drive cannot be turned on accidentally.

1. Disconnect the motor cable from the power supply and motor control.
2. Remove holding plate from the motor mount.
3. Remove the Pallet Drive out of the conveyor frame.

10.2 Disposal

In principle, the operator is responsible for the professional and environmentally friendly disposal of the products.



The implementation of the WEEE Directive 2012/19/EU in national laws must be observed.

Alternatively, Interroll offers to take back the products.

Contact:

www.interroll.com

When disposing of the Pallet Drive and its packaging, follow local and industry-specific regulations.

Appendix

11 Appendix

11.1 List of abbreviations

Electrical data

| | |
|----------------------------|---|
| P_N in W | Rated output in watt |
| n_p | Number of poles |
| in 1/min. | Rated speed of rotor in revolutions per minute fN in Hz |
| f_N in Hz | Rated frequency in Hz |
| U_N in V | Rated voltage in volt |
| I_N in A | Rated current in amperes |
| $\cos \varphi$ | Power factor |
| η | Efficiency |
| J_R in kgcm ² | Rotor moment of inertia |
| I_S/I_N | Ratio of startup current to rated current |
| M_S/M_N | Ratio of starting torque to rated torque |
| M_P/M_N | Ratio of pull-up torque to rated torque |
| M_B/M_N | Ratio of pull-out torque to rated torque |
| M_N in Nm | Rated torque of rotor in Newton meters |
| R_M in Ω | Phase resistance in ohms |

Connection diagrams

| | |
|----|---|
| 3~ | Three-phase motor |
| BR | Brake (optional) |
| L1 | Phase 1 |
| L2 | Phase 2 |
| L3 | Phase 3 |
| N | Neutral conductor |
| NC | Not connected |
| T1 | Input thermistor |
| T2 | Output thermistor |
| TC | Thermal protection |
| U1 | Input winding phase 1 |
| U2 | Output winding phase 1 |
| V1 | Input winding phase 2 |
| V2 | Output winding phase 2 |
| W1 | Input winding phase 3 |
| W2 | Output winding phase 3 |
| Z1 | Input auxiliary winding single-phase motor |
| Z2 | Output auxiliary winding single-phase motor |

Color coding

Color coding of cables in the connection diagrams:

| | | | |
|---------------------|------------|---------------|---------------------|
| bk: black | gn: green | pk: pink | wh: white |
| bn: brown | gy: gray | rd: red | ye: yellow |
| bu: blue | or: orange | vi/vt: violet | ye/gn: yellow/green |
| (): alternate color | | | |

Appendix

11.2 Translation of the original Declaration of Conformity

EU Declaration of conformity

EMC Directive 2014/30/EU

RoHS Directive 2011/65/EU

The manufacturer

Interroll Trommelmotoren GmbH
Opelstraße 3
41836 Hueckelhoven/Baal
Germany

hereby declares that the "incomplete machine"

- **Pallet Drive DP 0080; DP 0089**

conforms to the applicable provisions and the associated CE marking in accordance with the aforementioned Directives.

List of the coordinated standards that have been applied:

EN ISO 12100:2010

EN 60204-1:2018

EN IEC 63000:2018

Declaration of incorporation

EC Machinery Directive 2006/42/EC

In addition to the information specified above, the manufacturer declares that:

The health and safety requirements have been applied in accordance with Annex I (1.1.2, 1.1.5, 1.2.6, 1.3.2, 1.3.4, 1.3.9, 1.5.1, 1.5.2, 1.5.4, 1.5.5, 1.5.6, 1.5.8, 1.5.9, 1.5.10, 1.5.11, 1.6.1, 1.6.4, 1.7.2, 1.7.3, 1.7.4, 1.7.4.2). The relevant technical documentation has been compiled in accordance with Annex VII B and has been passed on to the relevant authorities where applicable.

The commissioning of the incomplete machine is prohibited until the conformity of the overall machine/system in which it is installed with the EC Machinery Directive has been declared.

Authorised for compiling technical documentation:

Interroll Trommelmotoren GmbH, Opelstraße 3, D-41836 Hueckelhoven/Baal



Nico Schmidt
Product Compliance Counsel – Interroll Trommelmotoren GmbH
Hueckelhoven/Baal, 05.12.2023

11.3 UKCA Declaration of Conformity

Declaration of conformity

UK Electromagnetic Compatibility Regulations 2016

UK Restriction of the Use of Certain Hazardous Substances in
Electrical and Electronic Equipment Regulations 2012

The manufacturer

Interroll Trommelmotoren GmbH
Opelstraße 3
41836 Hueckelhoven/Baal
Germany

represented in the UK by

Interroll Limited
Unit 1a, Orion Way, Kettering, Northants
NN15 6NL
England

hereby declares that the "incomplete machine"

- **Pallet Drive DP 0080; DP 0089**

**conforms to the applicable provisions and the associated UKCA marking in accordance with the
aforementioned Directives.**

Declaration of incorporation

UK Supply of Machinery (Safety) Regulations 2008

In addition to the information specified above, the manufacturer declares that:

The health and safety requirements have been applied in accordance with the EC Machinery Directive 2006/42/EC as listed in the EC Declaration of incorporation. The relevant technical documentation has been compiled in accordance with Annex VII B and has been passed on to the relevant authorities where applicable.

**The commissioning of the incomplete machine is prohibited until the conformity of the overall
machine/system in which it is installed with the UK Supply of Machinery (Safety) Regulations 2008
has been declared.**

Authorised for compiling technical documentation:

Interroll Trommelmotoren GmbH, Opelstraße 3, D-41836 Hueckelhoven/Baal



Nico Schmidt
Product Compliance Counsel – Interroll Trommelmotoren GmbH
Hueckelhoven/Baal, 05.12.2023

Appendix

INSPIRED BY EFFICIENCY

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