Flexible shaft drives are multi-speed machines. They cover a wide rotational speed range and can be steplessly adjusted electronically or via gears to match individual tool requirements. Flexible shaft drives have very high drive outputs.
They can also be used with compact handpieces or extensions to work in difficult-to-reach areas.

Areas of application

Flexible shaft drives can be used for almost all jobs. They are used successfully in many industrial sectors for different processes. The rotational speed control allows the use of various tools on one single drive.

The PFERD product range

PFERD offers various types of flexible shaft drives, as well as a comprehensive range of matching flexible shafts, handpieces, angle drives, drum drives and special drives.

PFERD flexible shaft drives and their accessories are extremely robust, technically up to date and incorporate the latest ergonomic findings and requirements. This product range was developed especially for the economic use of grinding, milling, brushing, cut-off and polishing tools and covers a wide rotational speed range (40,000–100 RPM) and power range (6,100–500 watts).

Advantages

- Very compact and ergonomic handpieces.
- Very low weight of the handpieces.
- Drives that are very robust and designed for continuous use (Mammoth drives, Master Grinder).
- Sophisticated.
- Very high performance.
- Highly versatile.
- Simple power supply.
- Low-maintenance.
- Easy to service.
- Economical.

Standards, safety, general guidelines

Electrical safety
PFERD flexible shaft drives comply with the standard "Safety for Hand-Guided Motor-Driven Electric Tools".

1. Earthed electric drives (protection class I)
This design is indicated by the protective earthing ⏚ sign:
- Mini-Mammoth Electronic (page 101)
- Mammoth Electronic (page 100, 102)
- Mammoth MD (page 103)
- Maxi-Mammoth Electronic (page 104)
- Master Grinder SD (page 105)

2. Insulated electric grinders (protection class II)
This design is indicated by the insulation sign ⧈ and the supplement "SI":
- RUER 5/250 SI (page 98)
- RUER 10/250 SI (page 98)
- RUER 15/150 SI (page 99)
- RUER 15/60 SI (page 99)
- RUER 15/30 SI (page 99)
- RUG 19/120 SI (page 99)
- RUER 8/180 SI (page 101)

3. Safety extra-low voltage/protective separation
When using alternating current voltage in boilers, tanks, pipelines and similar narrow spaces made of electrically conductive materials, a safety extra-low voltage of 42 volts or protective separation must be used.

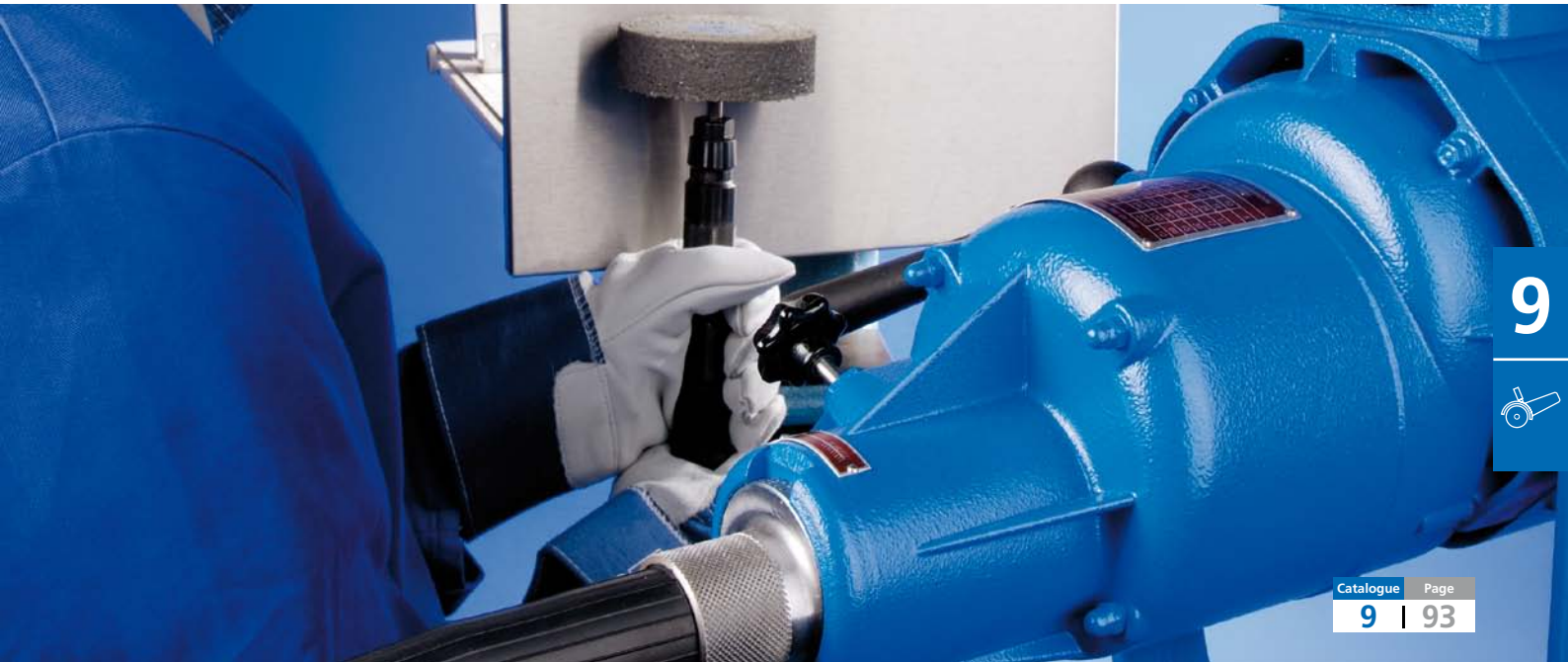
3.1 Electric grinders for safety extra-low voltage (protection class III)
These drives are operated with no more than 42 volts. The following drives are available in 42-volt designs:
- Mammoth MD (page 103)
- Master Grinder SD (page 105)

3.2 Protective separation
For flexible shaft tool drives, one alternative to a safety extra-low voltage is to isolate the drive motor from the mains voltage using a transformer of the same voltage rating.

PFERD electric grinders comply with:
- EC Machinery Directive
- Low Voltage Directive
- Electromagnetic Compatibility

PFERD electric grinders bear the CE mark. CE

Any special regulations (e.g. on the use of safety extra-low voltage) or country-specific regulations must be observed.



Flexible shaft drive
General information

Criteria for selecting the optimum flexible shaft drive

The most important prerequisite for cost-effective work is the selection of the optimum tool. The appropriate tool drive is selected taking the following criteria into consideration:

1. Design, shape and size
Each type of application places specific demands on the shape and size of the tool drive. The different designs can be used for various applications: The ideal tool drive should be selected for the task at hand depending on the dimensions, accessibility, type and frequency of the application.

2. Rotational speed
The tool drive should always be selected according to the rotational speed and cutting speed recommendation for the tool. Please refer to catalogue sections 2–8 for this recommendation.

3. Power output
The drive's power output is the decisive factor for maintaining the rotational speed under load. The load is determined by the stock removal properties of the material to be machined, the cutting characteristics of the tool, the tool diameter, the contact surface and the contact pressure.

4. Tool mounting
Depending on the PFERD tool selected, different tool mountings are available, e.g. collets or threaded spindles. Matching collets are allocated to every drive. Please refer to pages 116–120 for an overview of the collets and drive spindle extensions.

If you have any further questions, your personal PFERD sales representative will be happy to help you.

Flexible shafts (BW)

Flexible shafts consist of three components which can be combined in different ways:

Flexible core (SE)
The flexible core consists of 4 to 10 layers of wire, conforming to DIN 2076, and is specially designed for high-speed clockwise rotation. The coupling is securely press-fitted to the core. After approximately 100 operating hours, the core of the flexible shaft must be re-lubricated. The core and casing must be degreased and new special shaft grease must be applied to the core.

Flexible casing (SCH)
The flexible casing consists of oil-resistant rubber; the interior being a flat steel spiral and the outside being solid rubber. The connection couplings are pressed on firmly and encased in a rubber sheath as reinforcement.

Handpiece (HA)
The handpieces are light and easy to handle in relation to their power output transmission, and cover a wide rotational speed range. Because of low noise emission, continuous operation with little fatigue is possible. Replaceable collets or the special shank mounting for morse cones allow various tools to be mounted. The sliding coupling allows quick handpiece changes.

Repair
It is not possible to repair cores and flexible casings. We recommend replacement with pre-assembled new parts.

Radius of curvature
When using flexible shafts, please ensure that the shafts are not bent beyond the specified radius of curvature. The smallest possible radius of curvature is given for each flexible shaft.

Mammoth MD 10

Special features:
- Speed-adjustable via excentric gears: 850, 1,600, 2,100, 3,200, 5,700, 8,000, 12,000 RPM.
- Restart protection in case of power failure.

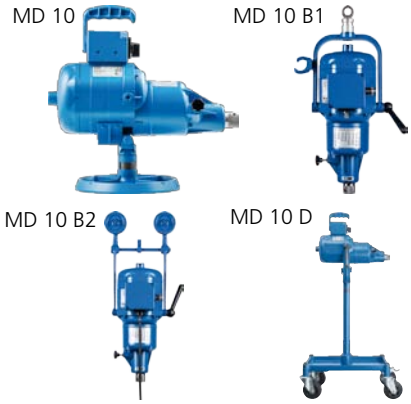
Recommendations for use:
- Suitable for universal use in milling, grinding and polishing work.
- Grinding and polishing tools with diameter ≥ 100 mm are not suitable for use with the Mammoth.

Included in delivery:
3 m power cable without plug, 2 allen keys.

Ordering notes:
- 3-phase AC design for voltages from 42 to 440 volts and 50 or 60 Hz is available on request at an extra charge.
- The drive motor is supplied without flexible shaft, please order separately.

PFERDVALUE:

Waste Saving | Time Saving



Description	EAN 4007220	Type	Three-phase current 50 Hz [volts]	Power consumption [watts]	Power output [watts]	Flexible shaft connection [DIN]	Net weight [kg]
MD 10 400 V 50 Hz	181324	with base	400	1,000	736	10	16.500
MD 10 B1 400 V 50 Hz	181331	B1 hanging	400	1,000	736	10	16.000
MD 10 B2 400 V 50 Hz	181348	B2 on castors, hanging position	400	1,000	736	10	17.000
MD 10 D 400 V 50 Hz	181355	D with base trolley	400	1,000	736	10	39.000

Base trolley D

Base trolley, type D (without machine). 4 steerable wheels, 2 wheels with parking brake. Dimensions L x W x H: 460 x 460 x 605 mm.

Description	EAN 4007220	Net weight [kg]
WA D	182666	23.000

Overdrive ST 103 DIN 10

The overdrive ST 103 DIN 10 transmits the drive operating speed in a ratio of 1:3.

Recommendations for use:
- **Operating speeds with Mammoth** 2,550, 4,800, 6,300, 9,600, 17,100, 24,000, 36,000 RPM
- **Drive operating speed n max.** 12,000 RPM

Included in delivery:
Drive core, 1 socket spanner.

Ordering notes:
- Please refer to page 115 for detailed information regarding overdrive ST 103.

Safety notes:
- Observe the highest rotational speed for the flexible shaft used

SE ST 103 DIN 10

Description	EAN 4007220	Net weight [kg]
ST 103 DIN 10	182673	1.600
SE ST 103 DIN 10	190524	0.070

Direct connection DA 33

Direct connection DA 33 DIN 10/G28 For direct (rigid) connection of handpieces with the sliding coupling G28 to flexible shaft drive motors with DIN 10 connection.

Ordering notes:
- Please order pre-assembled replacement core SE DA 33 DIN 10/G28 for direct connection separately, if required.

SE DA 33 DIN 10/G28

Description	EAN 4007220	Flexible shaft connection [DIN]	Sliding coupling [G]	Net weight [kg]
DA 33 DIN 10/G28	179475	10	28	0.305
SE DA 33 DIN 10/G28	284179	10	28	0.107