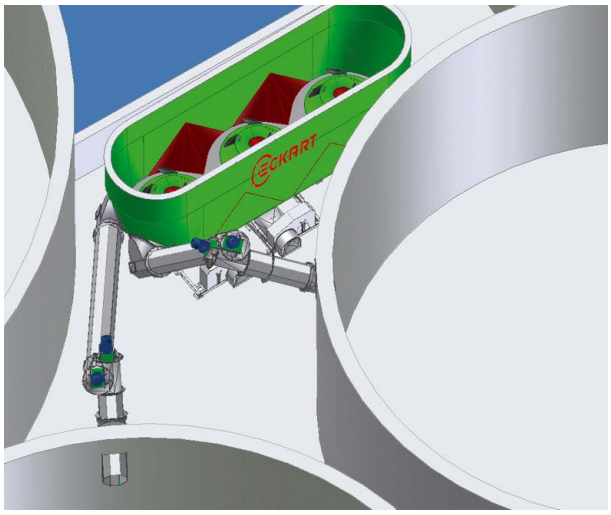
“Explosion-proof WATT- Parallel shaft geared motors for BIODOS automatic feeders“

The operation of biogas installations requires the utilization of gear units with high-degree explosion proofness. This is why this branch is increasingly using WATT Drive Parallel shaft geared motors of the type FUA 85S IA 132M4 in explosion-proof (ATEX) execution.
Messrs. Eckart Maschinenbau GmbH, D-94571 Schaufling (subsidiary of the Austrian company Röhren- und Pumpenwerk BAUER Gesellschaft m.b.H., A-8570 Voitsberg) are considerably increasing their gas production (optimum feeding) out of biogas installations with their all-automatic feeder in conjunction with WATT Drive high-quality drive units.

Eckart BIODOS Automatic feeder

The additional feeding of biogas installations (figure 1) with reproductive materials, like maize, grass, etc. contributes to an increased gas yield and, with this, improves also the economic effectiveness of the installation.
The WATT Drive drives used deliver the raw materials (coenzymes) from the automatic feeder to the biogas plant. Feeding is fully-automatic, either through timing pulses or by means of weighing.
The aggressive gas atmosphere demands an adequate protection of the installation parts as well as of the drives. A closed glass fibre reinforced plastic laminate mantle protects the large-size dimensioned conveyor worm. So, the drives of choice are designed in explosion-proof execution according to **ATEX 95 - II 3G T4**.



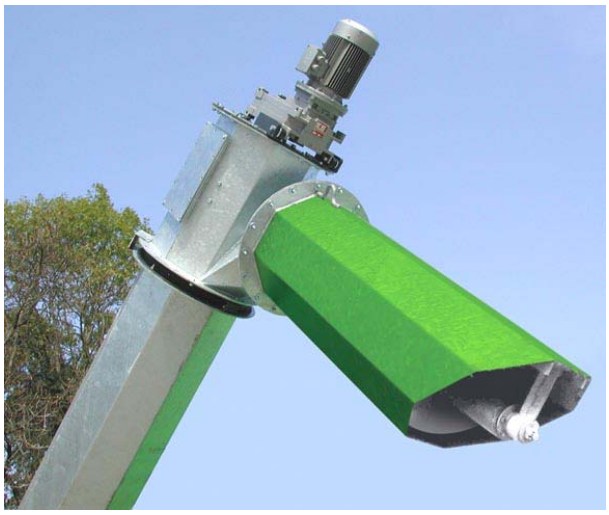


Figure 1: BIODOS Feeding plant with WATT drives

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Application

Automatic feeder

There will be used WATT-Parallel shaft geared motors of the type **FUA 85S IA 132M4**. (figure 2)
The parallel shaft geared motors will be slipped on the conveyor worm through the hollow shaft. The torque link support is made through the two ends of the unilaterally machined Uniblock housing with two each rubber buffers.

Figure 2: WATT -Parallel shaft geared motor

Technical data:

Power:	7,5 kW
Output speed:	35 U/min
Voltage/Frequency/Connection:	400/690V,50Hz, D/Y
Protection class/Isolation class:	IP55/F
Degree of protection for zone 2:	II 3G EEx nA II T3

Design of the gear unit according to ATEX:

- The gear units have been designed with impact proof hollow shaft cover or shrinkage washer covering.
- Screws are secured/locked against working loose.
- Oil types with elevated temperature stability will be used..
- Special pressure vent plug

According to ATEX the gear units can either be used for gas explosion protection (G) or for dust explosion protection (D).

For the following EX areas will be issued an ATEX approval:

Equipment group I category M2:	I M2 c
Equipment group II category 2:	II 2G c T4
	II 2D c 120°C
Equipment group II category 3:	II 3G T4
	II 3D 120°C

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Application

Theater stage

Watt Drive angle parallel shaft geared motors for the opera house Hangzhou !

The great, newly built Grand Theatre of Hangzhou (capital of the east Chinese province Zhejiang) was equipped with drive technology from Watt Drive. Based on the very specific quality claims of the theatre technique (noise level, working reliability, ...) Watt Drive offers it's complete product program of drives, which fulfil all these demands.

The theatre is located in the newly built up city centre and is based on a complete cross – stage with 6 individual scenes.

In this project, Watt angle parallel shaft geared motors in the frame sizes CG70 – CG110 are used for the different stage drives. The compact very flat UNIBLOCK – design of the gear units fits perfectly into the narrow space in the theatre, creating a major advantage. (see picture 1). The drives were executed with hollow shaft in support – shaft mounted design.
The drive motors include a two circuit safety brake, which is licensed for use in theatre applications according to VBG 70 (theatre specific standard).
The brakes with integrated noise suppression in combination with the Watt Drive gear units have a very low noise level, which is very important for operation (actuation noise of the brake is very low).

Picture 1

Additional the motors are equipped with SSI absolute encoders.
A PTC resistor is used as temperature protection for warning and switch off. A second shaft end allows to assemble a hand wheel, to operate the drive unit in the case of emergency.
The power of the inverter duty motors varies from 1,1 kW to 22 kW (EUSAS system motors). The operation mode is S3 (10% operating time) without fan, to minimize the noise emission of the drive unit.

MAS – angle parallel shaft geared motors:

The angle parallel shaft geared motors are available in 5 different frame sizes with 0,12 – 45kW respectively 1.200 – 10.000Nm. A variety of mounting positions and output shaft solutions is available off the shelf.
All advantages of the Watt MAS 2000 program (e.g.: adapter, input shaft, …) are also realizable in this application.

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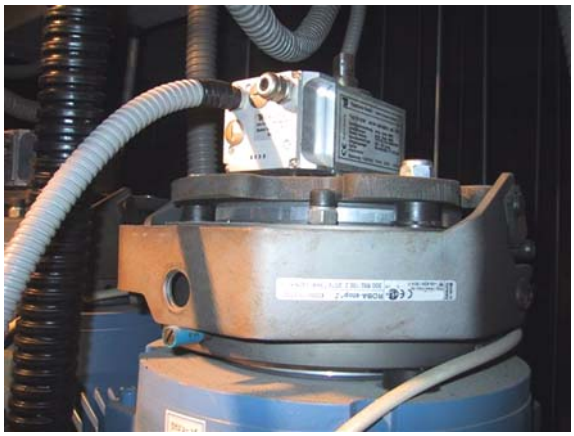
Application

Theater stage

Advantages of this application:

- low noise operation, in spite of the high motor power
- compact, space saving design (little width, see picture 1)
- two circuit safety brake ensures high working reliability
- inexpensive drive solution



Picture 2

Picture 2 shows the design of the two circuit safety brake with an SSI absolute encoder and second shaft end.

Therewith Watt Drive offers complete drive solutions for theatre projects which are tailor made according to the specific requirements of the customers. Our application specialists support you in the design and optimization of your drive system.

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“Water-cooled bevel gear units” - WATT roller table motors for the steel industry!

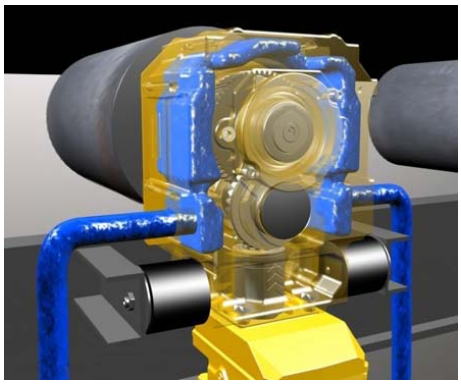
In the metal-processing industry, operating safety and operating life put high demands on the used drives when using modern drive technology. Due to high ambient temperatures, extreme mechanical stress, and an increased risk of pollution, use, e.g. on conveyor lines in continuous casting plants laid the foundation stone for the development of these drives (Picture 1).

Picture 1: Conveyor line of a continuous casting plant with WATT roller table motors

The further developed gear systems of the WATT gear motor range are systematically adjusted to customer-specific specifications.
All interior parts are integral parts of the WATT modular system. Large robust nodular cast iron housing parts as well as the addition of annular ribbed table motors (nodular cast iron, protection class IP 65) via adapters make true power packs out of the used standard components.

Bevel gear units series C and K:

The special gears are bevel gear units which are designed for hot unit parts with integrated cooling jacket. In order to fulfil mechanical requirements, both gear models are from nodular cast iron EN-GJS-400-15.



Picture 2: Integrated cooling jacket of the WATT geared motor CWA 80A IA132 D134MA6U

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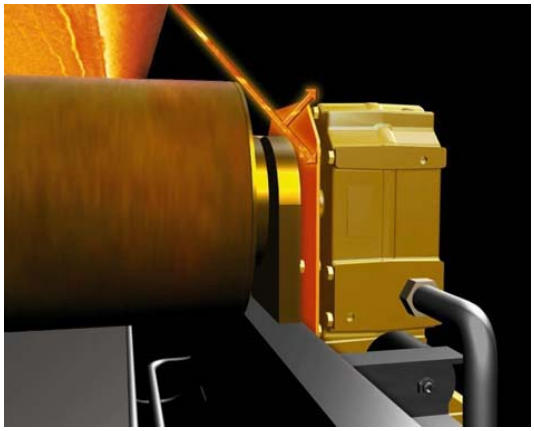
Special technical features:

- Gear housing in nodular cast iron EN-GJS-400#
- An integrated cooling jacket ensures sufficient cooling during operation; in case of malfunction, up to 20 bar water pressure may temporarily be reached (please refer to picture 2).
- VITON shaft seals; shaft seal runner surfaces are inductively hardened
- Protective sheet for the protection of the seal elements against heat (see picture 3)
- Torque support directly fastened to the gear housing
- Integrated oil dip stick
- Synthetic lubricants
- Annular ribbed roller table motor

Protective sheet



Picture 3: WATT geared motor with protective sheet

Due to the customer-specific design of these drives, a significantly higher operating life and operating safety can be achieved as compared to standard drives. Special attention was paid to increased time intervals for drive maintenance and servicing.
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WATT System Solution with Frequency Inverter P6000

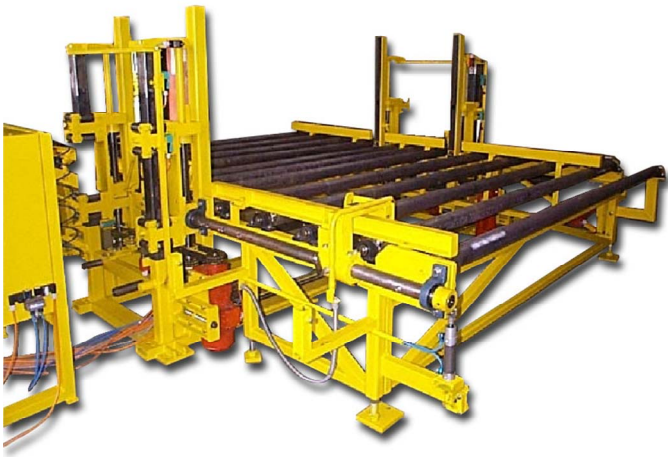
The stacking machine ASP serves for inexpensive stacking of panel form works. The delivered drive components for the various plant parts have thereby been designed by Watt Drive together with the customer and configurated into a fitting system. Modern inverter technique in combination with system motors and appropriate application know how is a strong point of Watt Drive.

Stacking machine ASP

The stacking machine ASP takes over the automatic stacking of formworks with 0.2 up to 2.7m width and 3.3m length in maximum.
Through the chained application of that plant followed by a cleaning machine the tedious stacking with a crane drops out. The result is a time- and thus cost-saving solution.

1. Width adjustment

At the beginning of the stacking process the element width is entered into the operator panel VT 500. By pushing the button (Start BV) the width adjustment is started. The machine adjusts to the entered width. At the end of that process the WATT frequency inverter P6000 gives out the release signal to the control to start the stacking process.



2. Stacking process:

The roller belt transports the elements into the machine up to an end stop. Is the element positioned at the end stop the lifters move upwards. Now the next element moves under the first. The lifters move downwards and place the first onto the second element. When the lifters are positioned under the second element the lifters move upwards again. This process is repeated as many times as the number set is reached and the stack can be transported out of the machine.

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Application

Stacking machine

Drive-configuration:

The used helical geared motors are components of the MAS® Modular Drive System and are equipped with SSI absolute encoders for the width adjustment. The encoder delivers an absolute signal up to 4096 motor rotations to the inverter.
The used WATT frequency inverter of the series P6000 is freely programmable and through the integrated positioning control the user has the opportunity to redeploy controlling intelligence into the inverter. The frequency inverters are available with a multitude of options in a power range of 0.75 up to 90kW.

Used drive components:

Width adjustment:

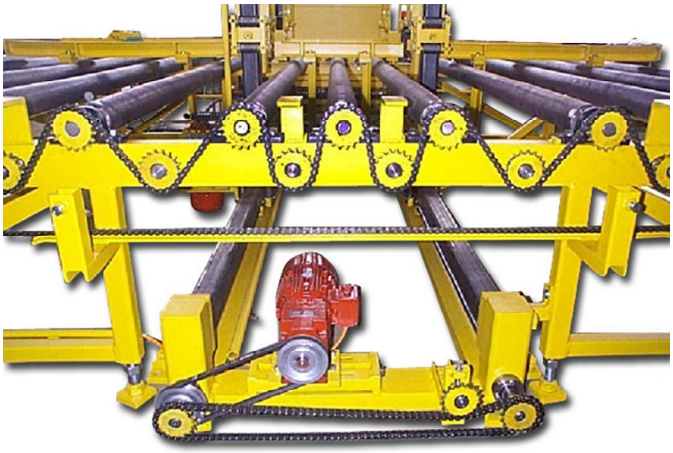
- 1 x HU 50S 91L4 TH IG-SSI (output speed $n_2 = 274 min^{-1}$ at 50Hz)
- 1 x P6000 1.5 kW
- 1 x operator panel VT 500

Stacking machine:

- 2x HU 50A 91L4 ($n_2 = 172 min^{-1}$ at 50Hz)

Transport rollers:

- HU 50A81K4 ($n_2 = 49 min^{-1}$ at 50Hz)



Pict. 2: Width adjustment 1x HU 50S 91L4 TH IG-SSI

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Special worm gear with a sliding coupling for the Snow-machine Gemini Frau Holle S10:

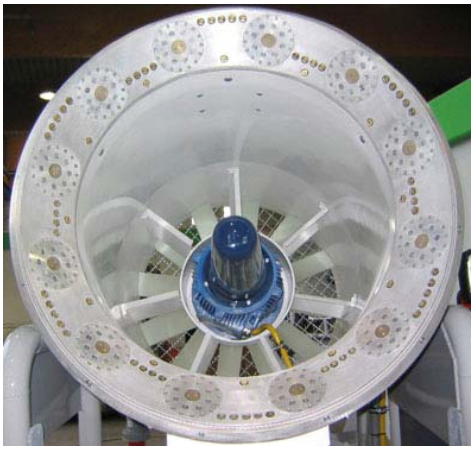
The swinging drive of this mobile snow-machine is carried out through a combination of double WATT MAS mechanism. A helical worm gear unit SUA 455B and single-stage gear unit HF 50E are used. Thanks to the inbuilding of the one stage mechanism, the required high reduction can be achieved. An inside lying sliding coupling (50 Nm sliding moment) is assembled to limit driving turning moments on the output side in a blockade caused by the frozen machine. A turn of the machine in 360° can be herewith safe and a machine considerate. An unaired Watt EUSAS System Motor is used as blowing drive.

Description:
The Snow-machine GEMINI Frau Holle S10 of the HDP - Hochdruckprodukte company (products based on high pressure) from A-8682 Mürzzuschlag-Hönigsberg connects the spray technology of fine and gross holes. The GEMINI-machine uses all advantages of formation of small drops with the fine holes spray within a limited temperature area. This guarantees the best snow quality at possibly high temperatures and low water pressure.

The gross holes spray will be switched on thereto at low temperatures. Snow crystals will be herewith bigger and dry snow quality will be guaranteed over the whole temperature area.

The requirements on the drives responding to the field of the utilization are very high, low temperatures of the environment and conditions of the operation have to be provided.

Picture 1



Picture 2

Swivel drive: (Picture 3)

SU 455B-HF50E SK 64N8 KB K1
The three-stage gear unit is driven with help of an 8-pole engine, besides a condensating water hole– KB, the drive is equipped with a climatic protection – K1as well.

Power:	0,04 kW
Output moment:	max. 50 Nm
Gear ratio:	1333,33
Output speed:	0,47 U/min
Mounting position:	V114

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Application

Snow-machine

Features:

- Protection of parts of the mechanism through the adjustable sliding coupling
- Big reduction through the combination of 2 MAS 2000 gear units
- Special driven shaft with a square SW 17 for turning the mechanism manually
- Safe operation also at the lowest temperatures

Picture 3

Blowing drive: WAF 134ML4U K1 KB (Picture 2)

Power:	15 kW
Speed:	1445 U/min
Mounting position:	B5
Protection class:	IP 55/F

The blowing drive of the snow-machine is one Watt EUSAS System Motor of the manufacturing line WAF and is made without a fan unit. The engine is outfitted like the swinging drive with the condensating water hole and climatic protection as good as possible against tough conditions of the environment.

Sliding coupling:
The sliding coupling is attached to the gear as inside lying. The output moment can be set continuously with help of a shaft nut.

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Application

Smelter- and steel industry

Drive technique solutions from Watt Drive for the smelter- and steel industry.

Watt Drive, as a specialist for drive solutions in the steel industry supplied the company SSC Anlagenbau GmbH based in 8605 Kapfenberg with drive technique for a dip tank manipulator with a transport roller conveyor, weighing- and discharge equipment. For that MAS® helical bevel -, parallel shaft- and shaft mounted geared motors have been used.

Task:
The task of the plant is the manipulation of forgings from the roller conveyor into a dip tank (Picture 1) and to the deposit and transportation area.

Plant description

A 22 m long, very stable construction with a lever serves to be the dip tank manipulator, which has the task to lift and transport hot, up to 8 tons heavy forgings of various dimensions and temperatures out of a roller conveyor to a certain position and deposit it into a dip tank with exact positioning.

Work piece parameter:

- Unit weight: < 8 tons
- Cross section: 110 - 650 mm
- Length: 1500 - 20500 mm
- Temperature: < 1000 °C
- Forging following time: > 3 min

Picture 1:Dip tank manipulator

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Application

Smelter- and steel industry

The forgings are additionally weighed with the integrated weighing equipment onto the roller conveyor and after the dipping they are lifted out of the dip tank, are positioned onto the roller conveyor and are delivered for further transport to various discharge equipments.
The control of the dip tank manipulator processes and files the process parameters for every forging, like for instance temperature, weight, position of dipping and dipping duration. A visualisation displays the complete process of the manipulation of the forgings.

Example: Transport roller conveyor drives for the delivering of the forgings

The rollers of the mounted roller conveyor are supported doublesided. Every second roller is driven. The geared motors are merged into multiple groups and controlled with a frequency inverter in a 100Hz operating mode.

Roller conveyor data:

Length:	50 running metre
Roller pitch:	700 mm
Speed:	62 m/min

Technical data of the geared motor (Picture 2)**:**

Type:	ASA 66A 101L4 TH
Power P_1:	4,40 kW
Output speed n_2:	91 U/min
Torque M_2:	460 Nm
Lubricant:	CLP ISO PG VG 460
Special design:	Hardened shaft with a FPM/HNBR seal
Voltage:	400V, 100Hz, YY
Protection class:	IP65/F
Winding shield:	TH

Picture 2: WATT shaft mounted geared motor ASA 66A 101L4 TH

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“Custom-made WATT shaft mounted geared motors for separators S 655 / S 855”

In agricultural businesses with high animal concentration, the high quantity of liquid manure constitutes is a huge problem. The situation is aggravated by additional statutory requirements. Through separation of this material with separators supplied by Austrian company Röhren-und Pumpenwerk BAUER Gesellschaft m.b.H., A-8570 Voitsberg, valuable fertilisers can be obtained from liquid manure. The engine used is a shaft mounted geared motor of type MAS in combination with a Watt Drive bearing box specifically designed for this purpose.

Fig. 1: Separator S 655 in operation

Bauer Separator S 655 / S 855: (see figure 2)

The fully-automated separation of liquid manure, i.e. the separation of liquid manure into a liquid and a solid phase, has decisive advantages.
The remaining thin liquid manure can be homogeneously applied at any time without costly technology (e.g. via pipe and hose systems).
The odourless solid phase can be stored problem-free and recycled as fertilisers or compost (see figure 1).

Fig. 2: Bauer Separator S 655 with WATT shaft mounted geared motor AVS 85A 114ML4 TH

WATT shaft mounted geared motor AVS 85A 114ML4 TH with add-on bearing box: (see figure 3)

Due to separation, high axial thrusts are produced, which in combination with the aggressive medium, make high demands on gaskets and motor bearings.
The axial thrust absorption is taken over by a separate bearing box with reinforced bearing and caught before the gearbox, which allows the use of a standard shaft mounted geared motor from the WATT MAS range.

The geared motor AVS 85A 114ML4 TH is designed with a shrink disc hollow shaft and slipped over the shaft of the bearing box.
Occurring torques are supported with elastic ultra-bushings that are installed on the gearbox flange. Because they are inserted into the bearing box, they can be easily dismantled in case of repair.

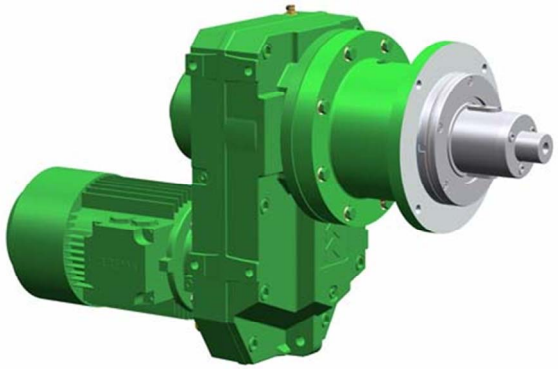

Fig. 3: WATT shaft mounted geared motor AVS 85A 114ML4 TH with add-on bearing box

Technical data:

Power:	5,5 kW
Output speed:	31 rpm
Voltage/Frequency/Connection:	400/690V,50Hz, D/Y
Protection class/Isolation class:	IP55/F
Winding protection:	TH

Locking off aggressive media:

The bearing box is protected from aggressive media through a combination of grease-packed groove with cartridge sealing ring. An additionally applied grease blocking layer caters for increased operating safety. All components coming into contact with the liquid manure are made in high-alloy stainless steel, material no. 1.4404 or 1.4571 to further prolong the operating life of the motor unit.

Areas of application of separators:

Besides agricultural enterprises, separators can also be used in the food industry, in slaughterhouses, as well as in biogas plants and distilleries.

Long bearing operating life and operating safety are the results of this customer-specific WATT special solution.

Application

Screw compactors

Efficient waste disposal using screw compactors.

The Austrian mechanical engineering company UT Umwelttechnik M. Lechner GmbH is based in Bergheim near Salzburg and developes, produces and markets innovative screw compactors for the waste disposal sector. The compactor screw in these units is driven by a Watt helical geared motor (custom design). The feeder unit (optional) is driven using a helical worm gear motor.

Mobile and stationary screw compactors

The product range includes two screw compactor systems based on modular designs, which can be selected depending on the logistics system being used or the space available.
Mobile systems (MSC type, 18 - 22m^3) are used wherever flexibility is required and the waste volume is not excessively high. Stationary systems (SSC type, 4 - 32m^3) are used for high waste volumes (see Figure 2).

The most efficient waste disposal system is chosen in consultation with the customer during the planning phase.

Applications

The screw compactors can be used for the disposal of the following waste types:

- Cardboard boxes and loose paper
- Pallets, wooden crates and disposable containers
- Plastic films and mixed plastic waste
- Other industrial waste

Benefits to the customer:

The main benefits of the system include:

- High turnover up to 75m3/h
- Space-saving thanks to high compaction
- rates (up to 10:1 compaction)
- Considerable savings on transport costs
- (containers require less frequent emptying)
- Custom modification for constructional conditions

Figure 1: HK 110A 134ML4 TH

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Gear data for SSC 9 main drive

HK 110A 134ML4 TH (see Figure 1)

Input power P1:	9.2 kW
Voltage/frequency:	400/690V, 50Hz, D/Y
Protection rating/ISO class:	IP55/F

The used HK 110A helical geared motor is manufactured with a customised output shaft and output flange. The drive units are designed for peak torque load. A chain wheel is positioned on the output shaft which drives the screw compactor shaft via the chain drive.

Gear data for feeder unit

SUA 608B 81N4

Input power P1:	0.75 kW
Voltage/frequency:	230/400V, 50Hz, D/Y
Protection rating/ISO class:	IP55/F

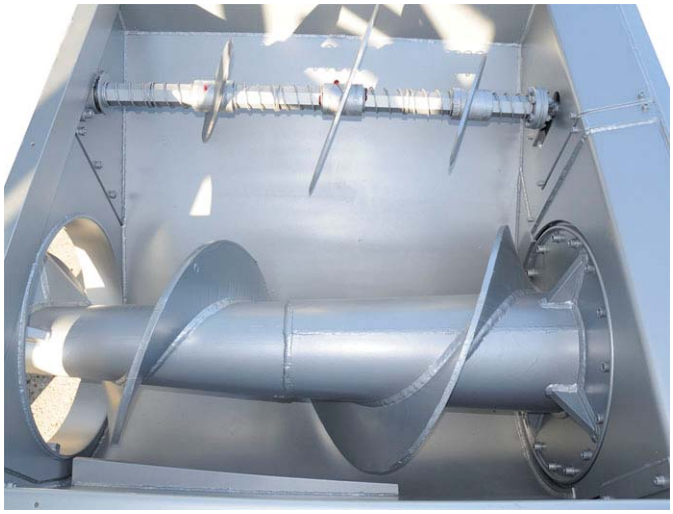


Figure 2: SSC9 stationary screw compactor

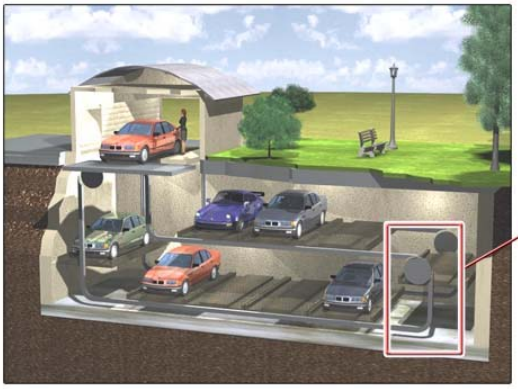
Application

Parking garage

Helical bevel gear unit for the parking garage project “Baulücke 2000“ !

Watt Drive is providing modern drive technology out of the MAS geared motors program to the company Johann Scholl Ges.m.b.H. The geared units are used in the new project called “Baulücke 2000“. The mechanical design of this system is patented and is used in city areas where conventional parking systems are not suitable because of limited space. Per parking place the system only requires approximately 15m2, compared to multistorey car parks which need approximately 30m^2 per car.

In this application the customer is using 4 geared motors per system, which provide the transport of the vehicles without any problems. Short access times, usability for handicapped as well as the safe function are the most important requirements of this system.
The assigned gear box is a helical bevel gear unit with 8000Nm, a ratio of i = 141,75 and an input power of 11 kW.
The limited space issue of this application is solved by the WATT Uniblock – gear unit with its compact design and the flexible mounting possibilities (see picture 2 and 3).



Picture 1: Parking system of the company Johann Scholl Ges.m.b.H.

Picture 2: One of the 4 drives of the parking system

Picture 3: Helical bevel gear unit KU 110A 161M4

The drives have been supplied with special output shafts according to the customers requirements.
As motor the WATT-EUSAS integral motor WAR 161M4 has been used. In addition the motor has been supplied with a 100Nm spring-applied brake, a motor temperature sensor KTY84 and an encoder for control of the motor speed.

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Application

Parking garage

The complete MAS helical bevel gear unit program offers gear ratios of up to i=8600, a maximum output torque of up to 14000 Nm and a maximum driving power of up to 90 kW.

In the basic executions the gear boxes are designed as 2 stage gears up to the size K. 75 (1.250Nm). The bigger gear boxes, beginning with the K. 77 (1.500Nm) are designed as 3 stage gears. A wide diversity of gear box and motor designs is available in the standard program and can be delivered in short time.

Other features of the gear units:

- Compact design
- Low backlash
- High efficiency
- Quiet running
- Flexible mounting possibilities
- Reliability in operation

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WATT EUSAS system motors in standard IEC dimensions used in milling machines BL100 and BL100A for wooden house construction.

The company AUERTECH, headquartered in Abtenau, Austria, is a young, flexible business specialising in the manufacture and sale of machines for the construction of wooden houses. Watt Drive supplies this customer with modern motor technology from the modular motor drive system.

The main product line from the AUERTECH company is the BL100 milling machine for modern wooden house construction, which was developed and produced in-house.
The BL100 with manual workpiece infeed and automatic machining process, and the BL100A with the addition of a transport and positioning system, are two of the machine versions available.
Thanks to the modern PC control and pre-installed software, all the pieces for an entire wooden building can be produced at the touch of a button with minimal waste.
The work process, triggered by a two-handed clamping – milling – sawing or drilling operation, is carried out automatically.
EUSAS system motors are used as drive motors for the individual work stages.
Watt EUSAS standard motors to DIN EN 50347 are available in the designs WAG, WAF and WAC. The drives used in the wood processing machines are equipped with wide-range voltages and can therefore be used worldwide.

Machining units in the BL 100/BL 100A:

4-way milling machine:	Horizontal:	2 x 3 kW
	Vertical:	2 x 4 kW
Face groove cutter:		3 kW
Drilling unit:		1.5 kW
Flashing saw:		4 kW

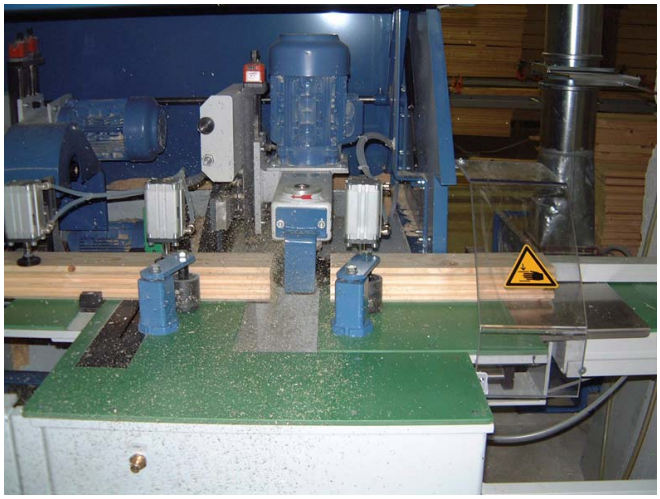

Fig. 1: Face groove cutter with WAC 101L2 TH (3kW)

The face groove cutter (Figure 1) is used to produce the grooves for the ends of the workpieces. The 4-way milling machine (Figure 2) is used to produce the corner joints. The workpieces are cut to length using the integrated flashing saw.

Application

Milling machine

WATT EUSAS standard motors:
The motor technology used forms part of the modular motor system from Watt Drive.
The motors are fitted with safety devices for TH temperature monitoring. The thermal protection contact is normally closed and opens when the temperature of the coil reaches the danger zone for the insulation.
Watt customers also have the option of accessing modified standard motors. Due to the modular concept, the delivery times for custom drive solutions are kept short.

Benefits to the customer:

- **High thermal overload capacity** (insulation class F utilised according to B)
- **Compact motor terminal boards** (low installation height)
- **Robust bearing design** (Watt standard)

Motor system:
Based on a standard motor, countless custom mechanical and/or electric motor modules can be built on:

- Brakes (-BR)
- Backstops (-RSM)
- Encoders (-IG)
- Forced cooling (-FL)
- Temperature sensors (-TH, TF, KTY,…)

Fig. 2: 4-way milling machine with drive motors (3 or 4kW)

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Twin worm gears in special construction for the laminating plant MENES 1.0 of company König

Watt Drive and the company König Maschinen Gesellschaft m.b.H. connect a very narrow technical and business relation since its existence. Watt Drive drives thus are a mainly propelling factor in the bakery industry. Delivery ranges from serial drives to, like in this case, specialised drives, which are designed according to the customer's requirements. They are used in the newly developed laminating plant MENES 1.0 as the main drive component for the twin satellite head. Based onto the gear modular system MAS® Watt Drive excels as a flexible, quality orientated partner of the industry.

MENES 1.0 (Picture 1)

The newly developed MENES 1.0 displays a milestone in laminating technology. The great difference to the usual satellite technology with standard cylindrical rollers lies within the twin satellite head, which reduces the heavy mechanical load to a minimum and largely forestalls dough tension.
Through the construction of two, one above the other positioned, satellite roller heads "TwinSat – principle" (Picture 3), it is possible to produce almost tension free dough. The satellites thereby rotate with nearly the same circumferential speed opposite to the planets. The dough can be cut, formed and processed after the rolling out without proofing.

Advantages:

- Dough structures are not shifted, no shear stress is created, fermentation gases stay in the dough.
- The dough is pressed rapidly in serial by the counteractive movement and thus moves unstressed into production direction.
- The speed of the planets and satellites can be varied and thus optimally adjusted to dough consistency and production speed.

Picture 1: Laminating plant MENES 1.0

The choice of the most advantageous plant concept for the customer is done at the company König to the soonest possible point of time, to fully show off the advantages of the combination talent MENES 1.0

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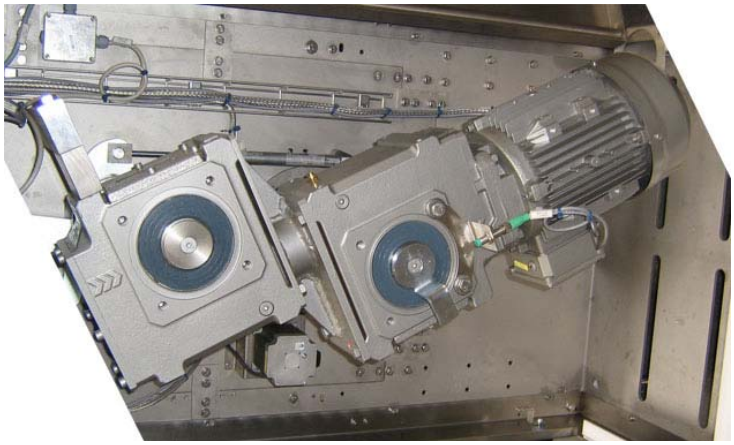
WATT gear SUA 608A/608A 114M4 (Picture 2)

The combined drive unit consists of a helical worm geared motor with a built on worm drive. The connection of both worm shafts is ensued with an elastic connect coupling, both gears have separate oil chambers.

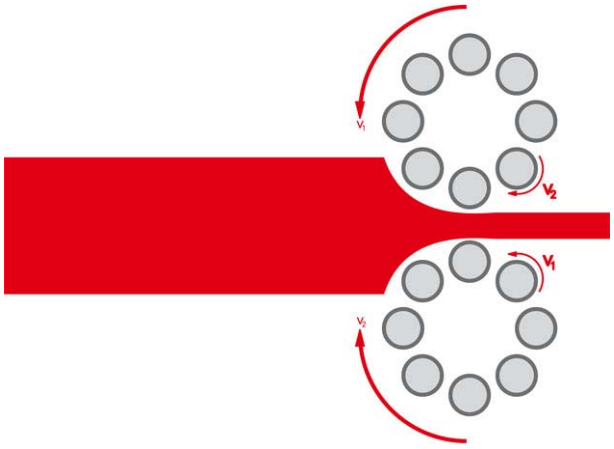


Picture 2: Twin worm gear SUA 608/608

Technical data of the drive:

Size: SUA 608A/608A 114M4
Power: 4 kW
Torque: 220 Nm

Satellite roller heads "TwinSat principle" (Picture 3):



Picture 3: TwinSat principle

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MAS - Shaft mounted geared motors for ATT type industrial mesh welding systems

The company EVG Entwicklungs- und Verwertungs- Gesellschaft m.b.H headquartered in Raaba, Austria, produces and sells powerful mesh welding systems. Watt Drive supplies this global player with powerful drive components from the WATT MAS range of geared motors. The drive motor can be connected simply and easily using the expanded connection box (MIP box).

The range of products manufactured by the company EVG - who will once again be represented this year at WIRE 08 in Düsseldorf - primarily consists of:

- Complete mesh welding systems and truss girder welding machines
- Automatic rebar straightening, cutting and shaping machines
- EVG 3D construction technology with 3-dimensional, insulated construction panels
- Steel wire cold rolling lines
- Wire processing machines

The ATT type mesh welding line (figure 1) is used to manufacture welded mesh sheets for concrete reinforcing and industrial mesh for many different applications.
The powerful welding units use high-precision pressure welding to produce sheets which are then stacked using sheet stackers (SH3). The products are transported from the system using chain conveyors (CTS), achieving a consistently high degree of automation.
Watt Drive series A shaft mounted geared motors, type "ASA 66A 114M4 TH" (figure 2), with the expanded connection box (MIP box), reliably convey the products from the welding machine through to the removal point at the end of the line.

Figure 1: ATT type industrial mesh welding system

MAS modular drive system

The combination of frequently used motor options in different configurations such as:

- Brakes (-BR)
- Incremental and absolute value encoders (- IG, - SSI)
- Forced cooling (-FL)
- Anti condesation heating (-SH) and
- Thermal elements (TH, TF)

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based on WATT EUSAS system motors, demands a modern and simple connection concept due to the wide variety of designs. The MIP box can be fitted with up to 22 slots including bridge rectifiers for brake control. Terminal boxes for IEC motor sizes 63 - 180 are available.

Figure 2: Shaft mounted geared motor ASA 66A 114M4 TH with MIP box

Benefits to the customer:

- **Central motor connection technology** (complete wiring in one terminal box)
- **Large terminal box** (easy-to-use cage tension spring connections)
- **Compact design of the entire MAS geared motor range**

Modern Drive Technique for an Historic Carillon in Salzburg.

The carillon in the historic district of Salzburg at the 'Residenzplatz' has been established in a tower built by Wolf Dietrich von Raitenau in front of the 'Neue Residenz'. It originally had five stores. In the course of a renovation this has been equipped with a gear motor of the MAS gear system.

History

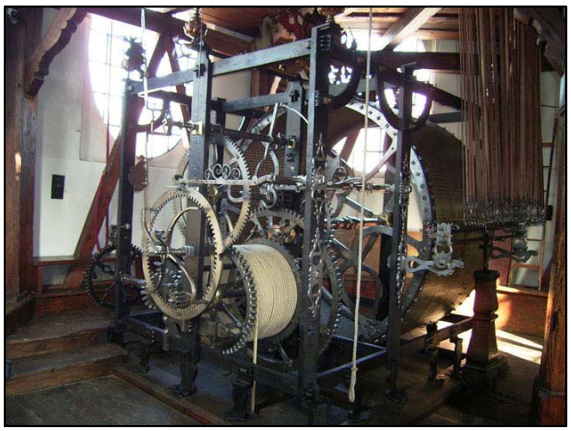
In 1701, an octagon construction was built onto the tower with open circular arcs and equipped with 35 bells from the Antwerp caster Melchior de Haze. The Archbishop Johann Ernst Graf von Thun ordered them, the Salzburg royal clock maker Jeremias Sauter did the assembling.

The carillon

The Salzburg carillon consists of the bells and a 6.3 tons heavy musical mechanism that has 3,655 components. It is controlled by a drum and a mechanical, later on an electric clock. The bells comprise three octaves with all semitones.

Restoration

In December 2008 the bells have been taken down and brought to the workshop of the restorer Elisabeth Krebs in Vienna. The clockwork followed in spring 2009.
The company Ing. Predl- Sondermaschinenbau with its office in A-2344 Maria Enzersdorf has taken over the reworking of the shaft parts and the brazen bearing housing within the restoration of the historic carillon. The old gearwheel has been replaced as well due to damages according to permanent removal and installation.



Picture 1: Clockwork carillon

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Application

Historic carillon

Drive solution

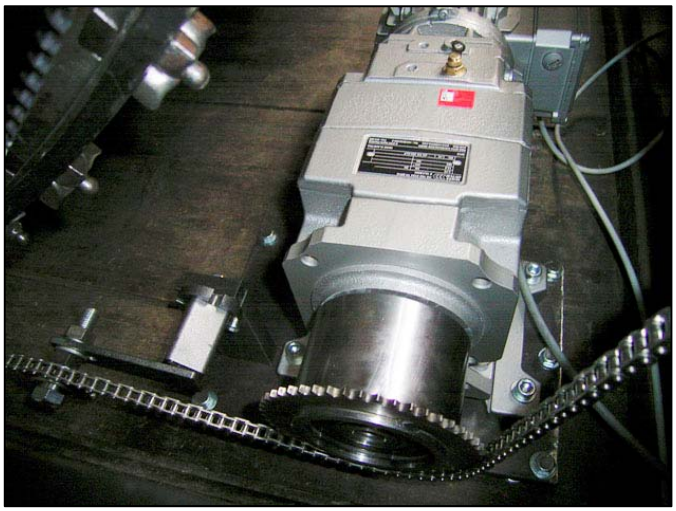
At the edge of the drum is a chain wheel with a diameter of 2,200 mm and 720 cogs. The gear motor (Picture 2) is located on the bottom right under the drum and moves it with a chain. One drum rotation takes about up to 3.5 minutes stepless with a frequency inverter (depending on the melody).

On the output shaft of the WATT gear, a chain wheel is positioned with freewheel and roller bearing. It spins freely, when the drive of the drum (Picture 1) is accomplished over the rope drum and the weight on the wire. Thus a removal and installation is not necessary anymore and the specifications of monumental protection are fulfilled.

The carillon is operated with PLC and a time program, 3 times per day for 3 minutes at 7, 11 am and 7 pm, in order not to come into conflict with other bells in the area. Cams operate the levers; pulling transmission is done with wooden strips, deflection rollers und wires to the bells. About 35 melodies exist for which the cams are reset monthly.

Gear data: HG 70C 81N4 TH BR10

Power:	0.75 kW
Output torque:	5.2 U/min
Protection type:	IP 55/F
Brake:	10 Nm, 102 V DC



Picture 2: Drive gear motor

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GVS Glass Gluing Stations back on Quality Drives from Austria!

At the glass gluing station GVS of the company URBAN, WATT helical geared motors are used, whereas the production of those high-grade drive components is exclusively done in Austria. Watt Drive thus stands for high quality standard …

The URBAN MASCHINENBAU GmbH with its office in A-6670 Forchach has been founded in 1982 as supplier for the parent company URBAN GmbH & Co. Maschinenbau KG, based in Memmingen / Allgäu. Worldwide the company employs 450 workers.

Glass gluing station GVS

The GVS represents an important development in the fields of vinyl window production. Compared to conventional production methods, the gluing technology offers many advantages.
The glass panes are loaded manually before or after the gluing. The gluing process is CNC controlled and fully automatic. Depending on the process the gluing takes place in the casement or in the readymade element. All customary adhesive materials (one- or two component adhesives) can be used.

Advantages of gluing frames and windows:

- Reinforcement of the casement is unnecessary
- More light incidence by thinner profiles
- Better thermal qualities
- The glass pane takes over the main part of the load
- Easing of the corner joint

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Application

Glass gluing station

Pict. 1: Helical geared motor HF 40A IA 81N4 TF

Working process

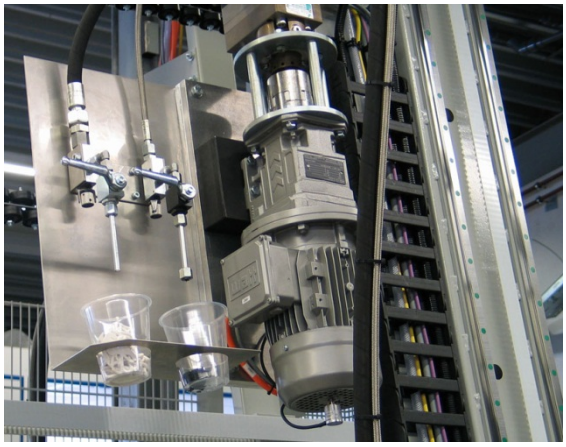
The data input for the element is done manually (by touchscreen) or automatically by laser supported measuring of the element. Furthermore an online processing by data record and scanner can be made. The setting of the travel speed of the nozzles and the injection quantity is automatically adjusted.

WATT gear data: HF 40A IA 81N4 TF (Pict. 1)

The used helical geared motor with output flange and IEC motor adapter is part of the modular drive system MAS®. A tough grey cast iron housing and highgrade manufactured gearing parts, which are exclusively manufactured in the parent plant in Markt Piesting guarantee quality.

Power:	0.75 kW
Output speed:	84 U/min
Torque:	85 Nm

The geared motors convey both silicone components A & B to the gluing head with gear pumps (Pict. 2). From there a static mixer mixes the 2K silicones. Depending on the required mix ratio, the drives are fed controlled by a frequency inverter.



Pict. 2: Gear pump A-component

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100Hz WATT geared motors for galvanizing line FVZ 3.

The cold-rolled strip produced in the cold rolling mill is surface-finished on the "voestalpine STAHL GMBH galvanizing line". During the process, the steel strips are annealed on a single line, before being coated with liquid zinc. This type of steel sheet galvanization ensures excellent corrosion protection, thus fulfilling the highest requirements of the automotive and household appliance industry. The various machine components are powered by the MAS gear motor program of WATT Drive Antriebstechnik GmbH.

Fig.: FVZ 3 - Discharge unit

The annual output of the galvanization line FVZ3 in Linz (Fig. 1) is 320,000t.
As compared with current lines, treatment speed was raised by 20% to max. 180m/min. This constitutes a big challenge for the line and the used components, and is always subject to reliability and long operating life.

The line mainly consists of 3 parts:

1. Feed unit
2. Treatment unit
3. Discharge unit (see Fig. 2)

Additional equipment like a cleaning unit completes the FVZ3.

Here the following classes of WATT transmissions are used:

- Shaft mounted gear unit, A series
- Angle parallel shaft gear unit, C series
- Helical gear unit, H series

Application

Galvanizing line

Fig. 2: Galvanizing line 3 - There follows the description of a furnace motor as an application example.

Used WATT MAS geared motor:

HG 133A 161L6 KB KTY84 IG

Power:	22 kW
Voltage/Frequency:	400 V, 100 Hz
Connection:	ΔΔ
Output speed:	54,5 rpm at 100 Hz
Output torque:	3.855 Nm

The motors are fitted with:

- KTY 84 PTC resistors for temperature recording
- HTL pulse generators with 1024 pulses/rev.
- Condensating water holes
- FPM Viton seal rings on hardened shafts

Special specifications:

- High ambient temperature + 60°C
- High speed range - 12 up to 72 rpm with constant torque and self-ventilated

Drive power system: Frequency inverter with 100 Hz characteristic line

When operating with a characteristic line of 100 Hz (motor winding is operated at 400 V in double delta connection), constant torque and increased power up to 100 Hz are reached. The constant output torque can thus be decreased across a large speed range.
Over 100 Hz, the motor gets into field weakening mode and works with reduced torque and constant power. By using 6-pin motors, the gear unit input speed can be kept low, which results in significantly higher operating life expectancy of sealing elements and bearings. Furthermore, this solution enables the use of a smaller motor construction size (more compact dimensions), which again helps significantly reduce the drive overall weight.

Application

Facade lift

Dubai puts its trust in Watt Antriebstechnik

Watt Drive customers are able to rely upon made-to-measure, customised solutions that meet 100% of the demands made of them. At Watt Drive, developing solutions for all sectors of machine engineering and implementing them alongside our customers is not something we undertake lightly, but instead we relish the challenge.

The company Power Machines LLC in Dubai is a market leader in façade service applications in the Middle East and focuses on developing and producing systems for skyscraper window cleaning and facade renovation. What this customer requires from Watt Drive is the conception of complete drive solution for newly developed traversing systems.
System suppliers with quality management systems conforming to DIN ISO 9001-2000 are an essential requirement here.
The drives must meet all safety standards in the field of crane construction, withstand an ambient temperature of +10°C to +50°C and must of course offer easy maintenance.

The MAS geared motor concept from Watt Drive meets all these requirements to the letter. The modular drive system of the drive components and the directly mounted add-on motors (WAR) are selected as required to meet the customer's requirements and supplied as drive systems by Watt Drive!

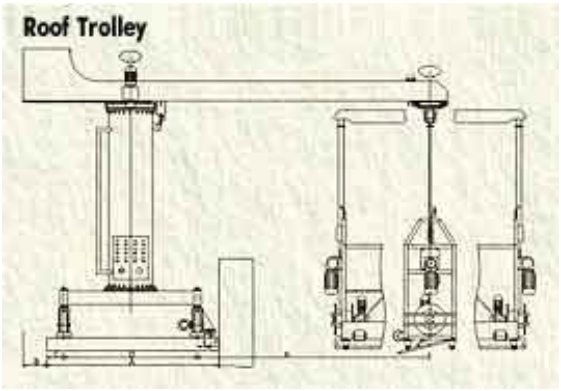

Figure 1: Operation journey of a facade lift in Dubai

The commissioning and subsequent test run of a facade lift is shown in figure 1. Numerous mechanical and electrical safety components are used in this system. Correspondingly high demands with regard to operating safety and reliability are placed on the drive technology used.

Geared motors utilised:

The drives used in this project are geared motors in the parallel shaft geared motors F.. series and shaft mounted geared motors in the A.. series.

Rotary drive: FFA 110D 72K4 BRR5 KB K2 TH ZL

Travel drive: AFA 65C 72N6 BRR5 KB K2 TH ZL

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Application

Facade lift

All drives are equipped with the following additional equipment, among others:

- Rust-proof spring loaded brake (BRR5)
- Corrosion protection (K2)
- Condensate holes (KB)
- Bi-metal thermal protection switch (TH)
- Fly wheel fan (ZL)

Figure 2: Travel drive

Figure 3: Rotary drive

The universal UNIBLOCK gear units with their flexible assembly and fitting options offer the customer benefits in terms of efficiency and availability.

Thanks to our customer's confirmed trust in our expertise, other projects are also planned for coming years and some work has already started on implementation.

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Application

Desalination plant

Drinking Water from the Sea

Through environmental pollution, explosive population growth and periods of droughts drinking water is becoming ever more a luxury good. Several areas on earth have no access to natural fresh water resources and have to either buy it in expensively or treat it from waste water or if available out of salt water. The state Singapore focuses on a autarchic drinking water supply and invests inter alia in modern seawater desalination plants. Watt Drive agitator gearboxes are employed in those desalination plants.

In September 2005 the state Singapore opened its first seawater desalination plant with the aim to produce drinking water independently from supplying countries. Singapore mainly obtains water from Malaysia and sustainably strives to reduce its water dependency.

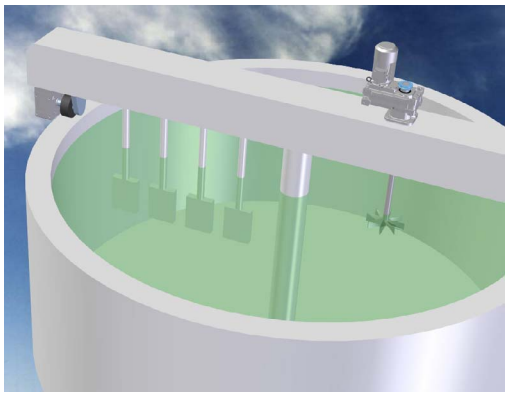
The daily water consumption of 1,2 bn. litres is expected to be continuously growing by a third within the next 10 years. To ensure the water supply in that wealthy island state on the long run, Singapore concentrates on four strategic subareas:

- The creation of rain water reservoirs
- Recycling of waste water from toilettes and water basins
- Desalination of seawater
- Import from neighbouring countries

Operator and builder of the desalination plant is the hundred percent subsidiary of Singapore, the water treatment specialist Hyflux. The American company SPX with its branch in Singapore was responsible for the mixing- and treatment technique.

The desalination process:

Desalination is a treating process, which removes dissolved salts out of seawater. Two important processes for the desalination of seawater are the distillation and the membrane processing. In the field of distillation numerous methods are used to vaporise seawater. The water, being obtained out of the condensed vapour and distilled, is mainly free from salts. In the membrane processing the pretreated seawater is pumped through a semipermeable membrane with high pressure to separate the dissolved salts.



To sustainably obtain drinking water it has to be clarified afterwards. In that process special bacteria are added, it is illuminated with ultraviolet rays and treated with chloride and fluoride. Only after this treatment chain the water can be drunken without consideration

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Application

Desalination plant

Employed WATT gearboxes

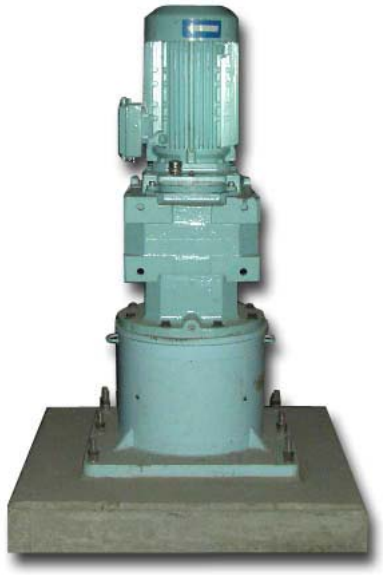
For that processing 40 pieces of the proven WATT agitator gearbox FRA 130A 160M4 (Picture 1) have been employed among other devices. The agitator drives are used for the so-called „Anoxic mixing process“.

Technical data of the gear:

Power:	7,5 kW
Output speed:	22 U/min
Output torque:	3348 Nm

Furthermore the gears have been equipped with the following options:

- Second oil inspection glass
- Special varnishing LA3 for sea- and sewage water environment
- Explosion protected motors (Zone 2) with standstill heating



Picture 1: Vertical mounted agitator gearbox FRA 130A 160M4

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Usage of turbo couplings with monitoring devices and drum brakes.

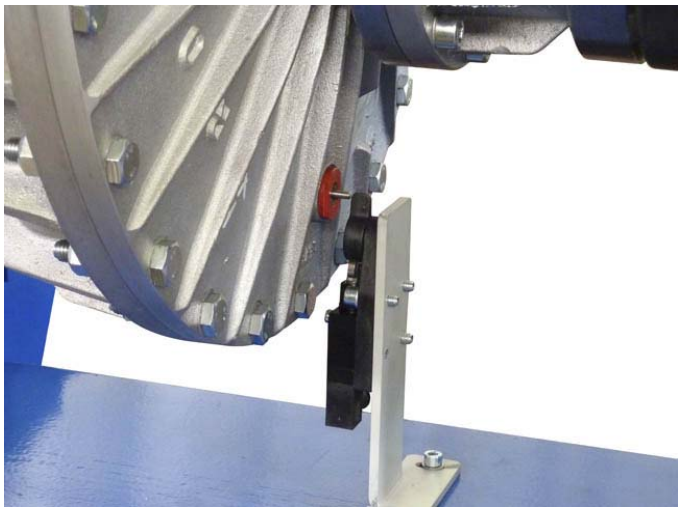
The use of Watt drive packages for conveyor technique has already been described in previous editions of WATT e-news. One possible customer specific amendment, the use of drum brakes and fluid couplings with protectoral devices, ensures a temperature-dependent operating monitoring and thus helps to increase the operating safety, avoiding possible costs caused by repair.

Field of application

The described drives are used in conveying systems. The mounting of the individual components is carried out onto base frames, differently than described before, whereas the drives are equipped with output shafts and couplings. A quick and easy dismounting of the drive section are here standing in the foreground.

Mechanical - thermal protection (ET)

To protect the fluid couplings from thermal overheating, safety fuse screws are fitted in the standard. On reaching a certain activating temperature, the operating liquid is oozing out. The protectoral device ET (see picture 1) releases a pin to avoid the leakage whereby a switch is activated.
According to the switching mode, the triggering of the switch can be used as an alarm signal or as a switch-off for the motor. The drive is thus effectively protected against overheating. The switching element has to be changed after this operation.



Picture 1: Monitoring device ET

On the drive part, the monitoring device is mounted on the swing base, respectively the base frame (pict. 1).

Drum brakes according to DIN 15435

The drum brake will be implemented between motor and drive, whereas the mounting will be on a base plate. The setting of the braking torques will be according to the customer's data; or rather will be set by Watt Drive when all the relevant data is issued.
The brake has the task to securely decelerate at all operation statuses. At that, the brake has to manage next to the static torque, additional torques out of translatory inertia and rotatory inertia.
The optimal interaction of the single components, concerning thermal and mechanical strain, is the task to master thereby.

Drive data

Motor power:	45 kW
Output speed:	44 U/min
Output torque:	9767 Nm
Brake:	A250-M60/50RG
Lifting device:	M60/50

Picture 2: Helical bevel geared motor with drum brake, fluid coupling and base frame
Type: KU 136A WN RSG FK 226M4

Mobility and quality - Concrete mixing plants equipped with Watt drive technology

EUROMIX plants rely on a high level of flexibility and low relocation costs. The required concrete can be produced and processed directly at the construction site while maintaining high quality levels. Watt bevel gear units in the K.. series reliably transport the materials required via various conveyor belts into the plant mixer.

The company SBM Mineral Processing GmbH based in Laakirchen, Austria is an international company with branches and sales offices worldwide. Sales of mobile wheel-based concrete mixing plants with capacities of 60 - 200 m^3/h are becoming increasingly familiar worldwide thanks to the numerous benefits they offer.
The EUROMIX concept is **based on just-in-time production directly at the construction site** (economically efficient at a concrete requirement of approx. 3000m^3). The low relocation costs combined with easy operation and maintenance, as well as the high quality standards, are the benefits to SBM customers.
The drive technology from Watt Drive used in the mixing plants includes series K. bevel gear units, covering a torque range of 2,700 – 14,000Nm. The drive units are used in all relevant parts of the plants to convey the raw materials into the double shaft mixer.

SBM produces the EUROMIX plants in 4 different sizes (1000/1600, 2000, 3000 and 4000). In the EUROMIX 2000, for example, the following drive units are used:

- Batching conveyor: 1x KUA 85A 134M4 KB
- Weighing belt: 1x KUA 110A 161M4 TF K1 KB SD
- Steep-angle conveyor: 2x KUA 80A 161L4 RSM KB

The bunker unit, with the batching conveyor and weighing belt underneath, is shown in Figure 1. The ballast stone size appropriate for the concrete grade is weighed, batched and transported on to the steep-angle conveyor. The material is moved from here into the double shaft mixer. Cement, water and the additives required are transported directly into the mixer.

Figure 1: Bunker unit with conveyor belts

Application

Concrete mixing plant

Extreme operation and ambient conditions, total availability and the high operation grade of the equipment on the construction site are an extreme demand to the drive systems on components.

Drive unit specification

The used drive units are components of the MAS range of geared motors. The optimum drive unit was designed together with the customer according to the climatic environmental conditions.

The drive units are equipped with the following additional options:

- Condensate holes - KB
- Humidity protection - K1
- Protection rating IP56
- Protective cap - SD
- PTC thermistor - TF
- Backstop - RSM
- Viton seal rings on hardened running surfaces
- Synthetic lubricants
- Double chamber seal rings

Figure 2: Concrete removal on the EUROMIX 1000/1600

Once completed the concrete can be transported away once complete either using trucks or using concrete mixer wagons.
The powerful mixers can be used to produce up to 4m^3 of concrete per batch.

The reliability and high quality of the Watt geared motors increases our customers' trust in our products, with particular value being placed on low maintenance requirements and long service life.

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WATT special gear unit with 14,000 Nm for high-end cable winders/unwanders

In the production of large power cables, cable drums of 2000 mm to 4000 mm in diameter are used, depending on the design and diameter of the cables. The total weight of these cable drums can be up to 20 tons. An important part of these units is the winding drive unit. The drive unit developed by Watt Drive permits the geared drive shaft to be used as a centre sleeve shaft at the same time, which means that additional storage can be dispensed with.

The Rosendahl Maschinen GmbH company with its headquarters in A-8212 Pischelsdorf, Austria develops and produces high-end machines and systems for the international glass fibre, wire and cable industry.

A developmental goal oder target of the Rosendahl company was a series of winders and unwinders (RWH 10 – RWH 20) with load capacities of 10, 16 and 20 tons as well as the corresponding drum diameters. The winders and unwinders are designed as “suspended winders”, similar to an overhead crane with a trolley.

An important part of this system is the winder drive unit (see figure 1). This winder drive unit was developed in collaboration with Watt Drive and implemented to meet customer requirements.

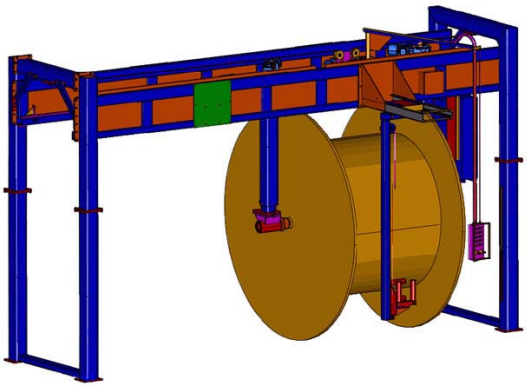

Fig. 1: Schematic diagram of a gantry winder

By combining different gear reductions with different drive outputs (11 and 15 kW motors), all applications can be realised using the same drive unit each time. The advantage here is the gear housing which always remains the same, and the geared drive shaft which can be used as a centre sleeve.

Application

Cable winders

Cable drums of different sizes are used depending on the production line. The winder hoisting gear has been developed to allow various size ranges to be covered.
A significant advantage of this winder is that the individual modules, such as the hoisting units, and the width setting are always the same and can therefore be produced in greater volumes for warehousing. This flexible modular system means that shorter delivery times can be provided for customers.

Drive unit data:

- Output: 15 kW
- Drive speed: 16 rpm
- Output Torque: 8950 Nm

The gear unit is a 4-stage helical bevel gear unit with 14,000 Nm nominal torque. The housing is manufactured from ductile iron due to the extremely high lateral forces, and the drive shaft bearing is designed using spherical roller bearings.

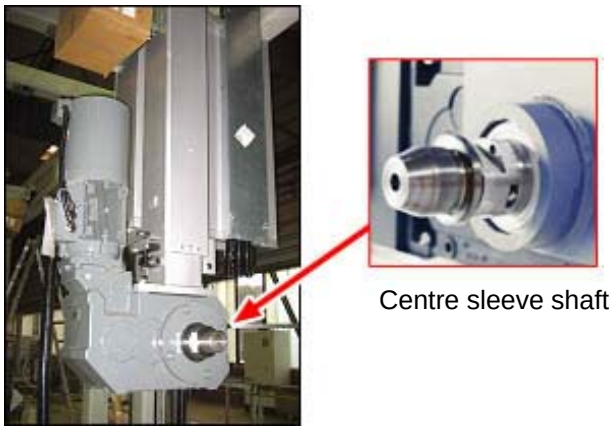

Fig. 2: Winder drive unit KK 136A 161L4 BR150 IG FLTH

Motor design: (Figure 3)

- Incremental position encoder (-IG): HTL, 1024 imp/rot.
- Brake (-BR): 150 Nm
- Forced cooling (-FL)
- Thermal element (-TH)
- Protection rating/insulation class: IP55/F

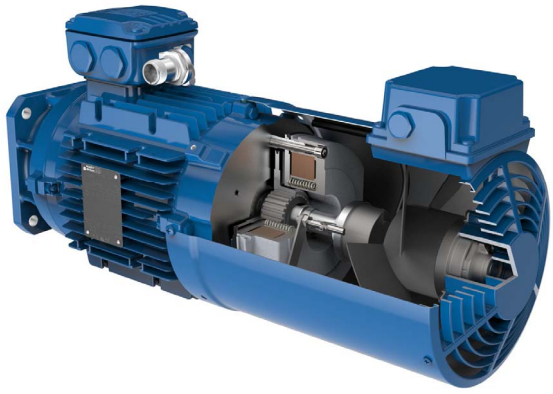

Fig. 3: WATT EUSAS system motor

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Application

Cable winders

Customer benefits thanks to the WATT drive unit:

- Gear housing can be used universally for all winder sizes
- Drive shaft can be used as centre sleeve shaft
- Ductile iron housing with robust bearing for absorbing the significant radial forces

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Application

Cable Cars

Customer-optimized drives from WATT Drive for Cable Cars.

In order to meet the growing requirements in the field of carriage of passengers in the alpine grounds, drives with high operational reliability will be required. In altitudes over 2,000 metres the drives have to withstand extreme environmental conditions, which due to the application Know-How of Watt Drive is being fulfilled entirely. For the drive of the of the chair lift line, as well as for the autoleveller section in the valley station WATT MAS geared motors are being used.

For the coupleable chair lifts and gondola ski lifts of Messrs. Doppelmayr Seilbahnen GmbH from A-6961 Wolfurt (figure 1) are being used WATT MAS geared motors with different capacities for the area of the valley and hill stations, in order to move the chairs and gondolas in the stations. This is being achieved mainly through collars, which are connected to the pertained geared motor (figure 2 and 3).

Figure 1: 6-person chair lift in St. Anton am Arlberg (Austria)

Figure 2: Roadway with Watt helical gear motor

In order to maintain a certain, constant spacing between the chairs entering the station it will be used a frequency inverter controlled WATT MAS drive unit assembly with modules out of the WATT modular motor system.

Technical data:

Helical geared motor

Power:	3,8 kW
Voltage/Frequency:	400V / 87 Hz / D
Output speed at 5-87 Hz:	3-53 U/min
Output torque:	687 Nm
Ratio:	i= 46,77

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Additional features: (Figure 3)

- Spring loaded disc brake with corrosion protection and hand release
- and manual hand release locking device
- climatic protection and anti condensation heating (50W)
- temperature switch
- motor and forced cooling with Ecofast - connection system
- encoder protected by the fan cover
- magnetic oil drain plug

Figure 3: WATT helical geared motor with motor modules

Description of the regular course:

During draw-in into the station the spacing between the individual chairs is being measured.
If same is not in accordance with the allowances, the corresponding chair will be either accelerated or delayed in the auto leveller section by means of a WATT geared motor, so that a uniform spacing between the chairs will be obtained.
By this, this geared motor operates independent of the remaining chair lift line and is only being influenced by the general control of the installation (transportation speed, start, stop, emergency stop etc.).

Features and advantages of the WATT MAS geared motors:

- Thanks to the compact design of the geared motor it will be possible to be perfectly integrated into the construction.
- The Ecofast motor connection system facilitates a simple starting procedure and makes maintenance work much easier (plug and play).
- In case of maintenance work the lockable manual release of the brake facilitates rotation of the motor, without the necessity to hold the brake constantly in a released condition by hand.
- The magnetic oil drain plug (positively known from the automotive industry) will impede that a possible metal abrasion will damage the gear unit.

Application

Bulk material handling

WATT drive solutions for bulk material handling

Belt conveyors are continuous conveyors which, in addition to standard conveying tasks, are frequently used as link elements in various sectors of industry. The need for reliability in linked processes is corresponding high. The failure of a drive element means that all systems come to a standstill, and this incurs considerable costs for the plant operator. WATT drive units, from the tried and trusted MAS geared motor range, are always a reliable partner for sectors of industry with these requirements.

The main component in a belt conveyor is a continuous belt supported on rollers used as a load bearing and feed device. The belt strap is driven by at least one drive drum here using a frictional lock.
The drive and guide rollers are supported via a plummer block or flange bearing housing fitted onto the steel structure.
WATT helical bevel gear units are fitted onto the drive drum in many cases. The drive unit package consists of an asynchronous motor, a fluid coupling and a helical bevel gear unit. The entire drive unit is mounted on a swing base. The reaction forces resulting from the torque are conducted away via an elastic rubber-metal bushing on the support construction.

KSS … gear units for belt conveyors in the cement industry:

The shrink disc-execution simplifies the mounting/dismountling of the drive unit. The gear units must be set up according to the mechanical and thermal aspects of the generally high ambient temperatures.

Overview of models:

Gear units KSS 80… – KSS 139... can be used as belt conveyor gear units from Watt Drive. These provide torques of 2,700 Nm to 20,000 Nm.
Asynchronous motors with ratings up to 90 kW can be attached to the gear units using fluid couplings or flexible couplings.

Gear unit options offered by WATT:

- **Back stop:**
  Depending on the drive unit design, a back stops can be fitted directly onto the gear unit inlet when using fluid couplings, and onto the motor when using elastic connector couplings.

- **Fluid couplings:**
  With direct activation of the drive unit, a fluid coupling is installed between the motor and gear unit for torque limitation on starting and for gentle acceleration of heavy loads.
  In addition, the coupling protects the motor and the working machinery against knocks and vibration.

- **Elastic couplings:**
  Different elastic coupling designs can also be used between the gears and the motor.

- **Swing base:**
  The robust swing bases are used as torque supports onto which the entire drive unit is fastened. The torque support is provided by elastic rubber-metal bushings; the swing base can be of any design desired by the customer.

Benefits:
The components used are part of the MAS range which includes various models for customised project solutions.

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Application

Bulk material handling

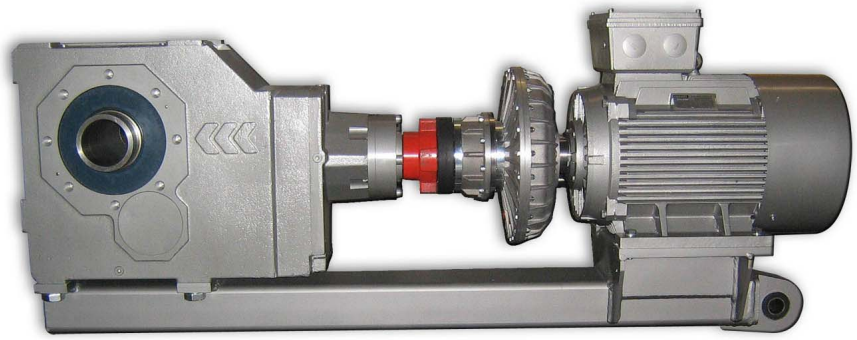

Fig. 1: Helical bevel gear units (M_{nom} = 14,000 Nm) with fluid, elastic coupling and torque beam
Type: KSS 136A WN FK 201L4

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Bucket elevator drive units with auxiliary drives for the cement industry.

Bucket elevators convey bulk materials such as the raw materials of limestone, clay and sand for the cement industry. These materials are conveyed across significant hoisting heights. The elevators are therefore an important part of this production chain. The drive units used must be designed for continuous operation and need to be modified with additional options such as auxiliary drives.

Applications:

In cement works, the elevators are used in the area of the tube mill or the cement mill. Conveying the relevant materials for the individual process stages to the separators is ensured by using reliable drive units. The material being conveyed is fed in at the lower diversion point (elevator base) and discharged at the top diversion point (elevator head). A bucket elevator drive is always located at the top diversion point and has a backstop to prevent accidental elevator return should there be a break in operations.

Gear unit design:

The gear unit used is a 3-stage helical bevel gear unit. A VOITH 487TV fluid coupling (see figure 1) is installed between the motor and gear unit. The coupling ensures a gentle start-up of the heavy loads, and it also limits the torque during start up and acts as overload protection for the motor and the working machine. The coupling design must be appropriate for the bucket elevator data calculated, and the coupling is filled with oil in line with the power levels calculated.
The gear unit is equipped with an integrated backstop and has an auxiliary drive mounted on it.

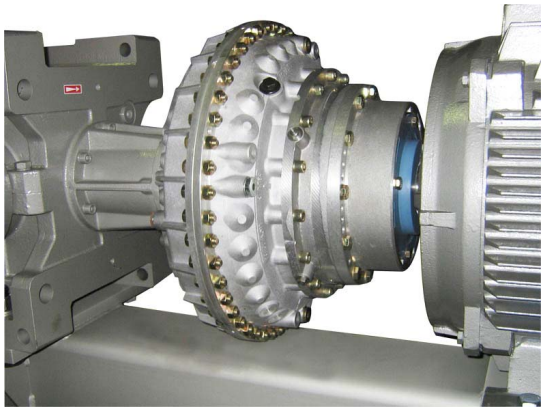

Fig. 1: VOITH 487TV fluid coupling

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Application

Bucket elevator drive unit

Gear unit data:

KSS RXO2 818 – O140 WN RSG FK 316M4

- Motor power: 132kW
- Output speed: 28rpm
- Output torque: 45021Nm
- Nominal output torque: 61300Nm
- Auxiliary drive: 15kW, 2.7rpm

Gear unit design:

- Backstop in the gear unit
- Shrink disc hollow shaft (d_H = 160mm)
- Fluid coupling
- Auxiliary drive (helical bevel geared motor) Swing base with elastic bush (60 Shore A)

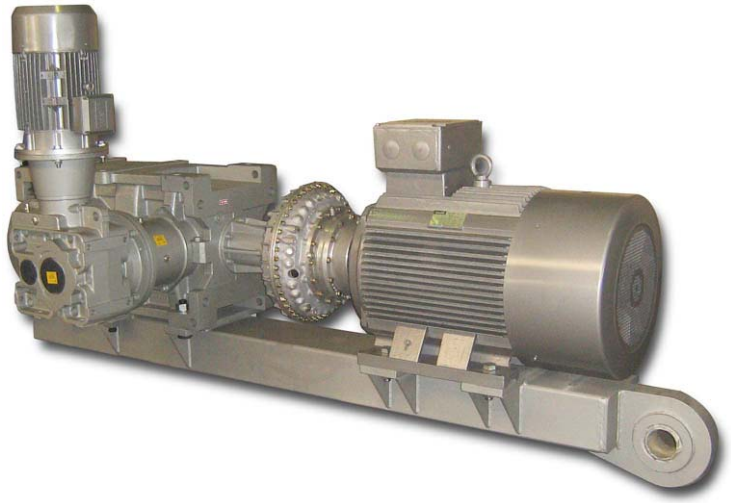

Fig. 2: KSS RXO2 818-O140 WN RSG FK 316M4

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“DC300A CutMaster” – Precision cutting with fully automated and extremely compact band saws.

The Slovenian company PETRA Machines Ltd., headquartered in Ljubljana (www.pe-tra.com), develops, produces and sells industrial band saws. The drive unit on the DC300A CutMaster is the hollow shaft version of the WATT MAS shaft mounted geared motor. The saw band speed is controlled using frequency converters. The system can also be equipped with a numberless of options.

PE-TRA DC300A CutMaster:

The PE-TRA CutMaster (figure 2) is a fully automated high-performance band saw in a two-column construction; the perfect design for continuous production. The machine is used for automatic cutting of different types of steel, grey cast iron, cast iron, non-ferrous heavy metals, solid material, pipes and profiles. Thanks to innovative design solutions, the machine is very compact in comparison to competitor units. Despite its minimal size, it delivers precise and reliable cutting of workpieces up to 300 x 300mm with saw band dimensions of 4150 x 34 x 1 mm.

Benefits:

- Low price per cut thanks to low investment and maintenance costs
- Extended service life of the band thanks to the 35° inclined frame position
- Shorter cycle time thanks to adjustable height limitation with retraction
- Increased productivity
- Reduced power consumption

The saw band is driven by a WATT ASA 66A 101LA4 shaft mounted geared motor (figure 1). This maintenance free gear unit impresses thanks to its high efficiency level, offering reduced power consumption as a result. The saw band speed is set using frequency converters to between 20 and 120m/min depending on the material being cut.

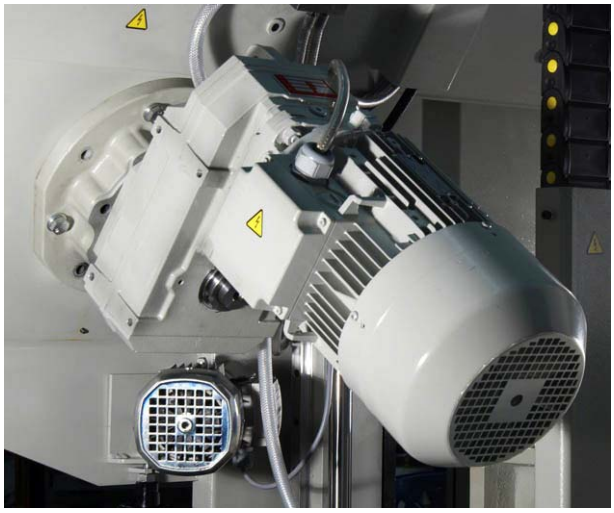

Figure 1: ASA 66A 101 LA4

Application

Band saw

Drive data:

Performance P1:	3.0 kW
Voltage/frequency:	400/690V, 50Hz, D/Y
Protection rating/ISO class:	IP55/F
Terminal box position:	2

WATT MAS shaft mounted geared motors:

In addition to their compact design, this range of shaft mounted geared motors up to 14,000 Nm and 55 kW motor output offers a high efficiency level with minimized backlash. Thanks to the universal design of the housing, the flange version of the gear unit with side mounting surfaces can be used in many different ways.

The drive units can be supplied with hollow shaft, solid shaft and hollow shaft with shrink disk as standard. High flexibility for customised solutions such as special hollow shafts can be implemented even for small production runs thanks to the modular system.

Figure 2: PE-TRA DC300A CutMaster

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MAS helical geared motors of the type series MINI REX used in bakery machines

The Company König Maschinen Gesellschaft m.b.H. with its office in A-8045 Graz develops, produces and distributes highly qualified bakery machines worldwide. As compact power packs Watt Drive drives of the MAS geared motors programme are used among others in MINI REX head machines as specially designed models.

MINI REX AND MINI REX FUTURA (Picture 1)

The 2-pocket head machine programme of the company König stands for fully automated dividing and molding of wheat and mixed doughs with a max. 40% share of rye. The high output of 1500 to 3000 pieces per hour at an optimal cost/performance ratio presents the Mini Rex as an ideal solution for shop bakeries and industrial establishments.

Product characteristics:

- Fully automated dividing and grinding of doughs
- Easy one-man operation
- 1500 to 3000 pieces stepless hourly output
- Stainless steel design
- Chamber funnel with 10kg dough capacity
- Optional with wheeled base frame

The MINI REX can be used as a solo machine as well as in combination with small pastry equipment.

Picture 1: Baking machine MINI REX

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Application

Bakery machines

The drive concept has been transmuted through a helical geared motor. A build on chain drive realises the neccessary motion sequences. Picture 2 shows the cramped conditions in the inner section of the machine. A special gear housing developed according to the customers' needs matches the spatial conditions.

Specification of the geared motor:

Type: HU 55A 80N6

The gear bases on the MAS modular system and has been constructed individually for the company König with a specially designed housing and a tailor made output shaft matching the application.

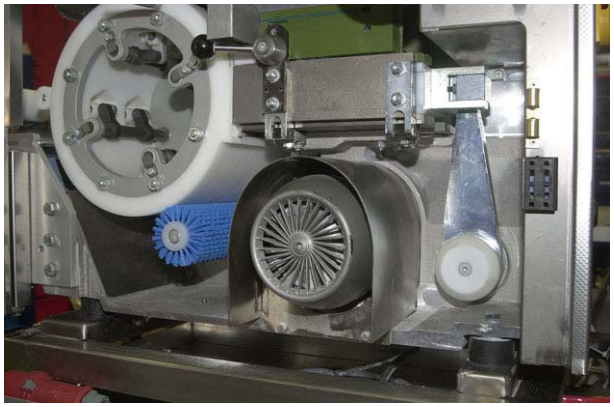
Advantages for the customer of the flexible MAS modular system:

- Short development time
- Openness towards special solutions
- On schedule realisation of customers' objectives
- Close cooperation with suppliers

Watt Drive always endeavours to develop innovative special solutions together with the customer through continuous optimisation of the product programme. Thus the company König can obtain product advantages in competition.

Technical data of the drive:

Sizes:	H.55.
Power range:	0.12 - 4kW
Torque range:	270Nm
Reductions:	max. 342.63



Picture 2: Implemented drive geared motor

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