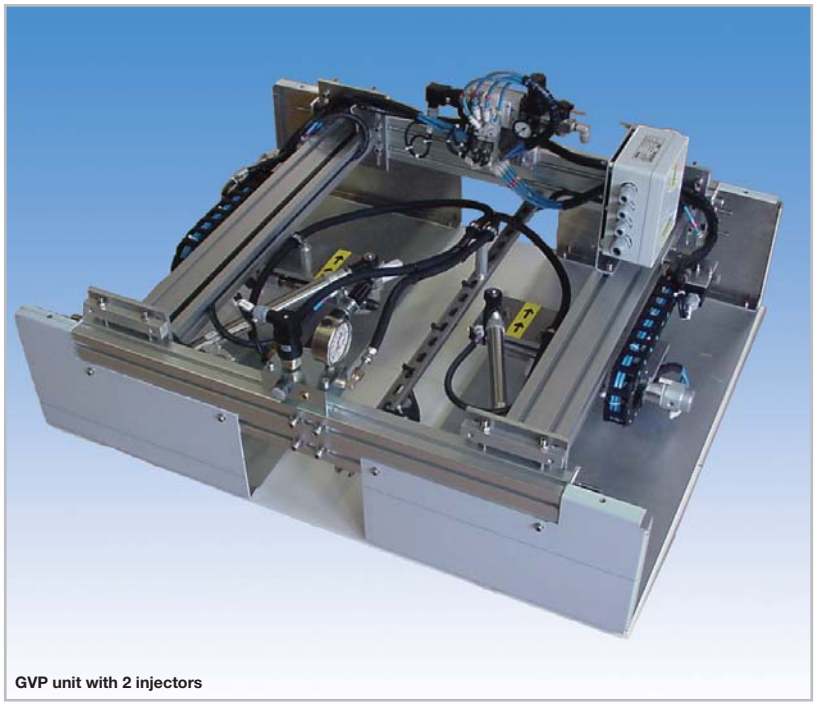
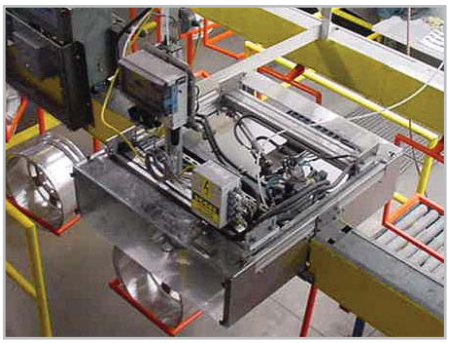
GVP, chain lubrication

Grease injecting lubrication system for moving conveyor chain pins and rollers



GVP unit with 2 injectors



Application

The grease injecting lubrication system GVP has been developed to carry out the conveyor chain lubrication. These chains are fitted with grease nipples. The lubrication process is automatically performed while the chain keeps moving. There is no production slow down.

The lubricant is injected under pressure directly into the chain pins and/or rollers. This injected volumetric metered quantity of lubricant is adjustable. It remains independent from lubricant viscosity and from any back pressure due to the pin or roller type.

There is a large range of conveyor chains and operating conditions are never the same. Therefore the GVP unit is often the result of a close collaboration - development, installation, starting - between the user and different departments of the VOGEL group. This is the guarantee the GVP unit meets perfectly the user's requirements.

GVP units are in used in many sectors of the industry around the world:

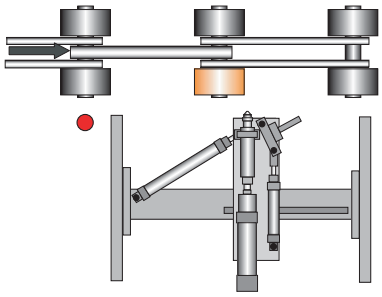
- car industry,
- food industry,
- iron and steel industry,
- surfaces treatment, sawmills, mines...

Advantages

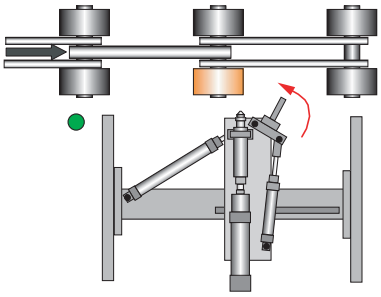
- less conveyor downtimes and reduction of human intervention for maintenance tasks,
- longer service life of the chain,
- very easy installation thanks to its aluminium profile frame,
- the lubricant is injected directly into the lube point via a nipple, which makes the lubrication more reliable,
- adjustable volumetric metering, lubricant consumption under control,
- reduction of environmental pollution, which was the result of an excessive lubricant consumption,
- controlled injection frequency,
- full automatic lubrication cycles with the programmable control and monitoring unit AEP2-GV,
- analysis of the chain state during the lubrication process with the software VISIOLUB®.

Function principle of a GVP chain lubrication unit

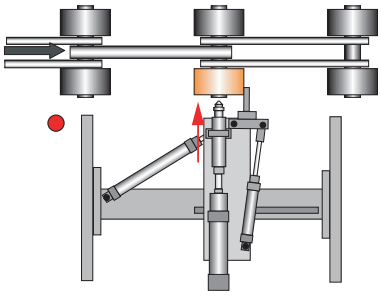
It is possible to describe the lubrication process as a 6 steps cycle.



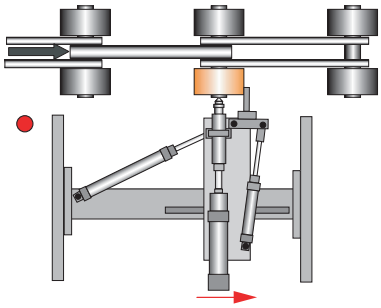
1 / **The GVP unit is in its starting position**
The pick-up system and the injection system are in their resting position on the carriage.
A lubrication cycle will be initiated by a proximity switch.



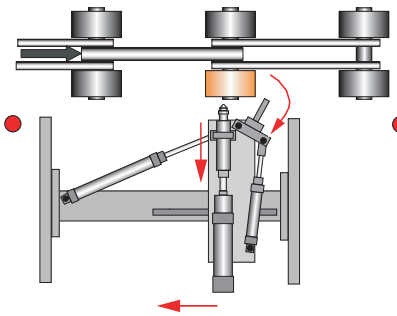
2 / **The proximity switch detects the roller to be lubricated.** A signal is sent to the control unit, which triggers a injection phase.
The pick-up system moves forward to the roller to be lubricated.



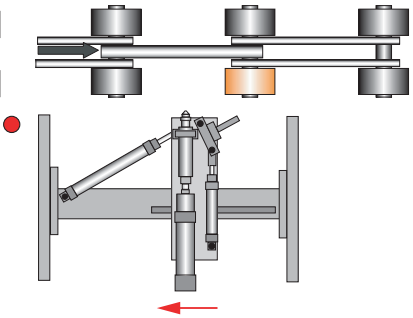
3 / **The pick-up finger is in contact with the roller to be lubricated.**
The carriage is now moving exactly in parallel to the roller. An injection order has been given.
The injection head moves simultaneously forward onto the roller to be lubricated.



4 / **Lubrication phase.** Contact time between the injection head and the lubrication point. The injection time has been previously set by the user with the control unit.
The carriage keeps moving in parallel to the lubrication point.



5 / **The injection time,** which has been previously set, **has elapsed.** The injection head is pulled backwards. The injection head leaves the lubrication point. The pick-up finger leaves the chain.
There is no more contact between the GVP unit and the chain.



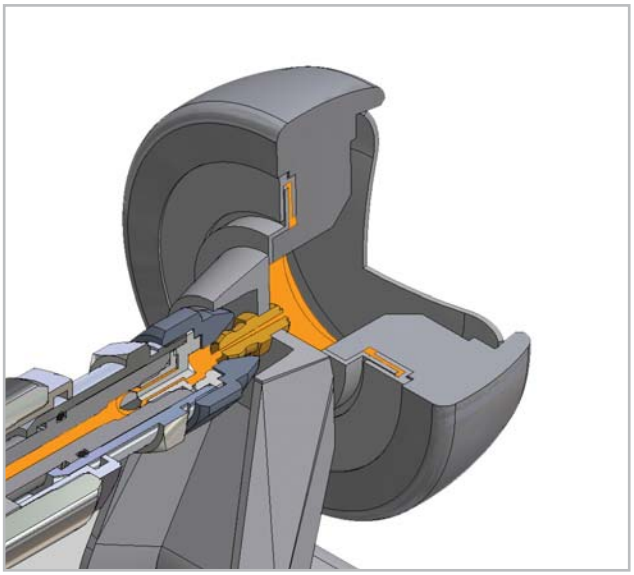
6 / **Return to the initial position.**
The injection system, followed by the pick-up system, are going back to their resting position on the carriage.
The carriage also goes back to its initial position.

Lubricant injection directly into the roller

A volumetric metered quantity of lubricant is delivered by the injection head directly into the roller to be lubricated.

A piston is supplying the lubricant to the lubrication point. Therefore the injected volumetric quantity is independent from any viscosity or operating temperature change (within the limit of the operating temperature).

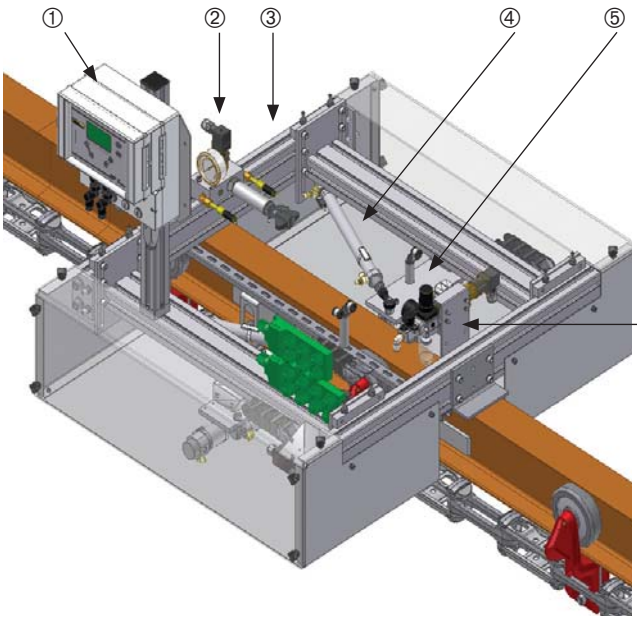
As the injection is made directly into the roller, the lubricant, which has been consumed because of the bearing friction, is perfectly regenerated.

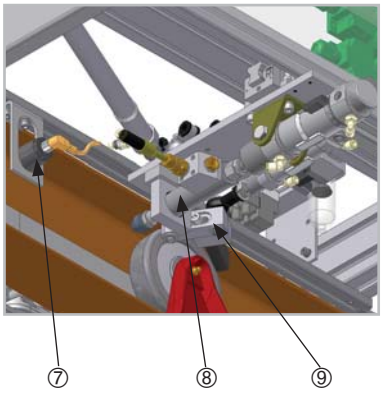


Example of a lubrication unit type GVP: GVP-D-001

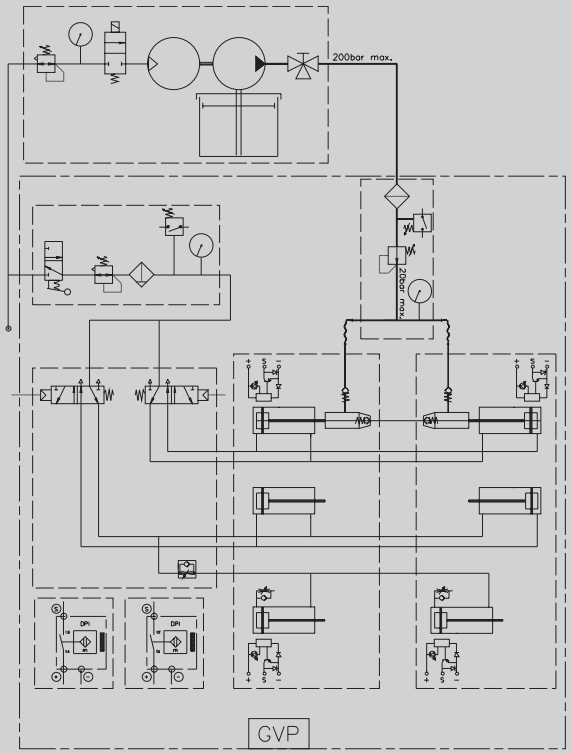
The chain lubrication unit GVP-D-001 can be used in many different industrial sectors, particularly in the car industry. It has been developed to lubricate conveyor chains type WEBB (3˝, 4˝ or 6˝ chain and others).
The GVP-D-001 unit has two injection heads, a roller proximity switch, an origin proximity switch (if option VISIOLUB®) and a “stroke end” position switch.

The lubricant is supplied to the GVP unit by a barrel pump.
The lubrication cycles are controlled and monitored by the electronic control unit AEP2-GV.





1 Electronic control unit AEP2
2 Grease regulating and control unit
3 Aluminium profile frame
4 Carriage return cylinder
5 Carriage with pick-up system and injection head
6 Air regulating and control unit
7 Roller proximity switch
8 Injector
9 Pick-up system

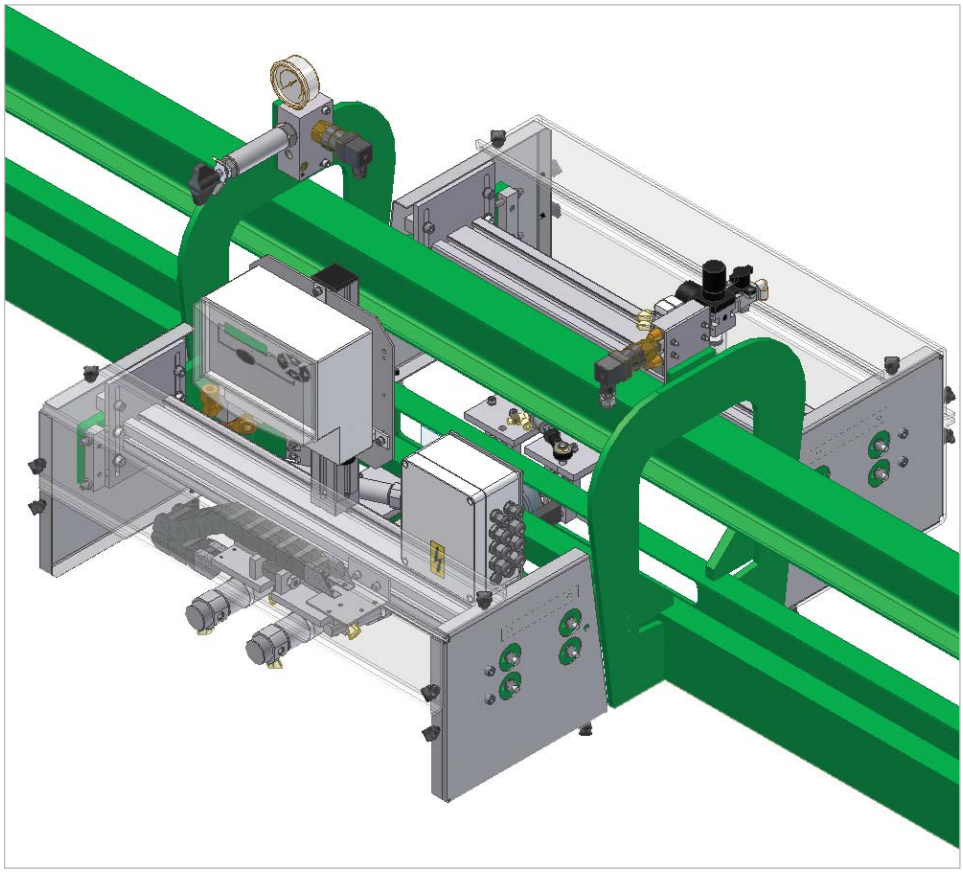


GVP-D-001, hydropneumatic diagram

Technical data

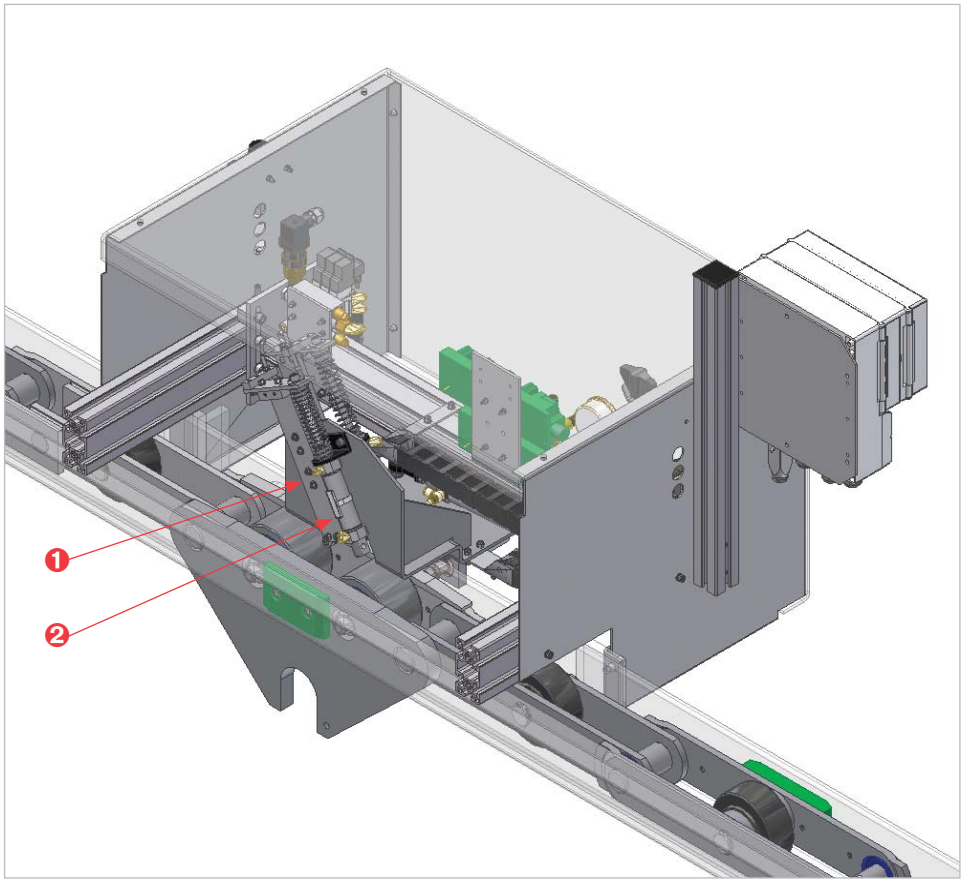
Air inlet pressure	5 to 7 bars
Max. injection pressure	100 bars
Injection volume	0.37 / 0.5 / 0.75 or 1 cm³ per stroke
	(factory setting 0.5 cm³/stroke)
Lubricant	grease NLGI grade 2 or oil
Operating temperature	5 to 50 °C
Max. chain speed	24 m/min
Air consumption	300 Nl/min
Air inlet connection	tube OD 8
Electric (GVP unit only)	
Voltage	24 V DC
Power consumption	28 W
Protection	IP 65

GVP unit examples



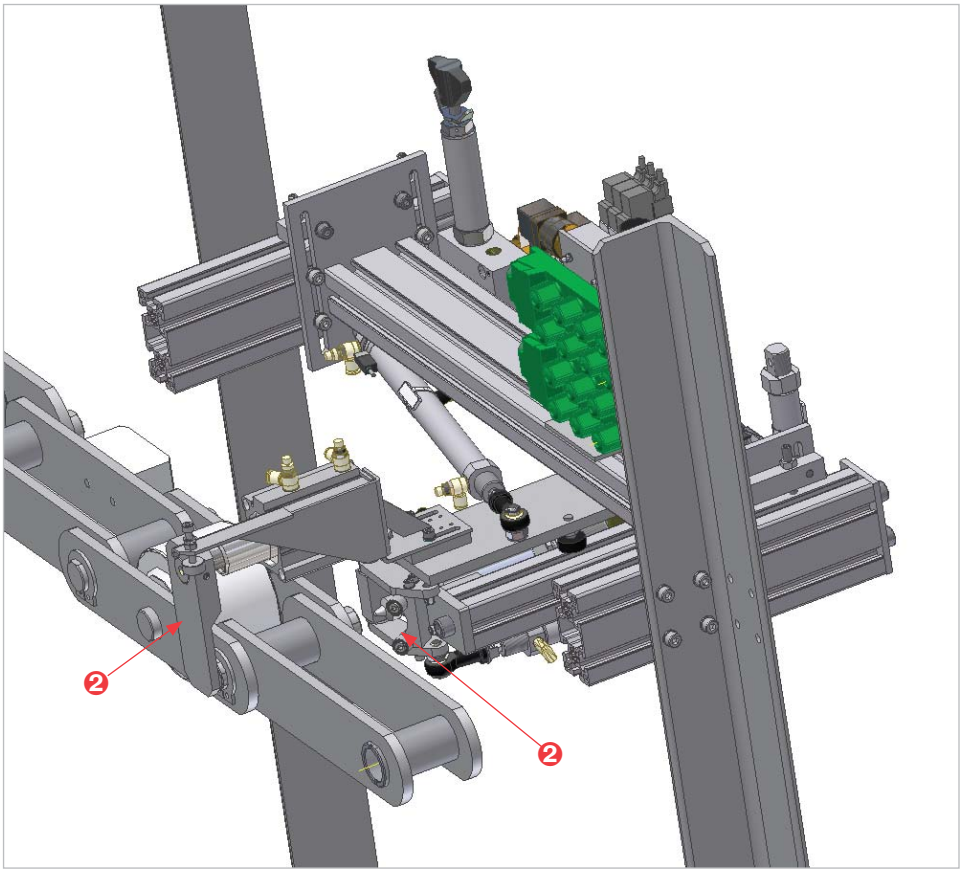
GVP “4 heads”

GVP lubrication unit with 4 injection heads. Possibility to lubricate 4 lubrication points simultaneously.
Only one lubrication cycle.
Aluminium profile frame.
This system has been developed as well for overhead conveyors as for floor conveyors in the industry.



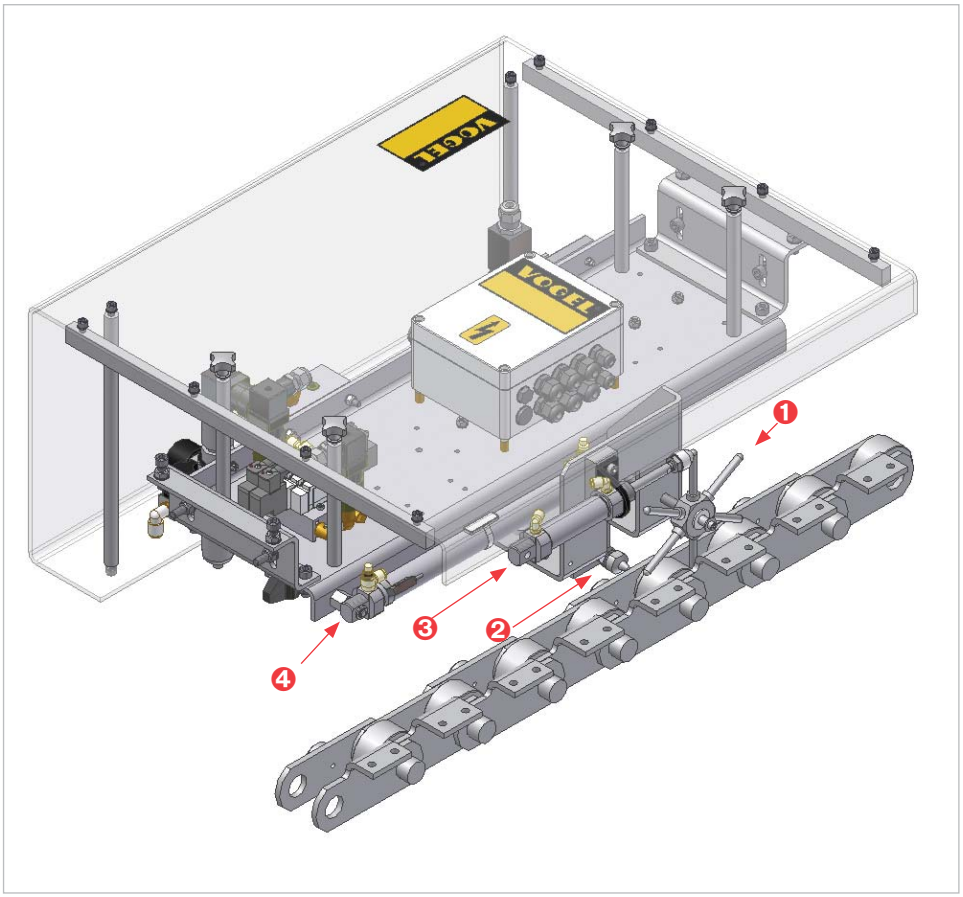
GVP lubrication unit with one injection head, two pick-up systems and one return cylinder. Two independent lubrication cycles for the greasing of the chain pins and rollers
Aluminium profile frame.
This system is essentially used in the car industry.

1 Pick-up system for rollers
2 Pick-up system for pins



GVP lubrication unit with one injection head, one holding system, one pick-up system and one return cylinder. Three different lubrication cycles for the chain pins, the plastic rollers and the metallic rollers. Aluminium profile frame. This system is essentially used in the car industry.

1 Holding system
2 Injection head



GVP lubrication unit with one injection head, one pick-up system with star wheel and one return cylinder. Stainless steel frame This system has been especially developed for the food industry.

1 Star wheel (pick-up system)
2 Injection head
3 Pick-up cylinder
4 Return cylinder

AEP2-GV

Electronic programmable control unit dedicated to the chain lubrication unit type GVP.

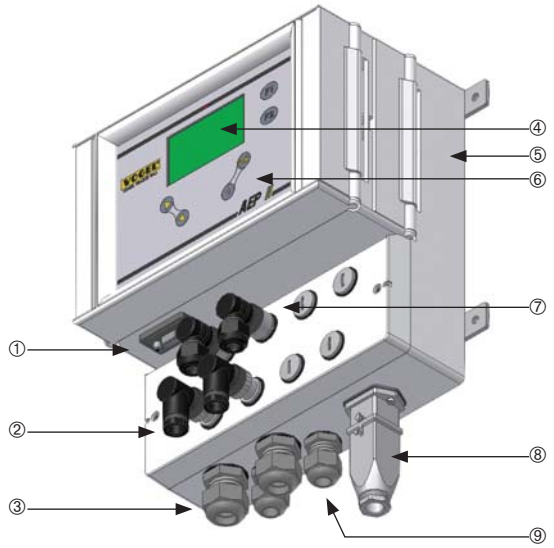
The AEP2-GV control unit has been especially developed by Vogel France SAS to meet the automatization requirements of the lubrication process on industrial conveyor installations. The AEP2-GV unit can control and monitor a GVP lube unit, whatever its configuration is.

The main function of the AEP2-GV control unit is to trigger a lubrication cycle after a pause time has elapsed. This time has been set previously by the user.

The AEP2-GV control unit can manage up to 4 different lubrication cycles. The user can independently set several main parameters for each cycle in regards with his needs.

- Number of pins: The user gives the exact pin number of his chain. Then he can better manage his lubrication process and exactly identify every pin.
- Lubrication: The user can choose the lubrication frequency, which is calculated according to the pin number. It is possible either to lubricate all pins during a single chain lap or one pin out of n pins. Thanks to this parameter it is getting easier to adjust the lubrication process to the chain speed.
- Type of cycle: It can be a continuous or a cyclic lubrication process. For a cyclic lubrication, the pause period can be time-dependent (from 1 hour to 30 days) or load-dependent (up to 1 000 chain laps).
- Injection time: It indicates the time the injection head is in contact with the pin.

The control unit AEP2-GV is really user friendly thanks to its LCD display and the six keys. Messages appear on the display in the form of short texts (several languages available) or graphic symbols.



1 RS 232 connector (PC)
2 Additional individual outputs
3 Inputs
4 LCD display
5 Location of the internal wiring
6 Control panel
7 Additional individual inputs
8 Power supply
9 Outputs

Technical data

There are three different model of AEP2-GV. The designations 428, 429 and 924 indicate the operating voltage range (voltage code).

Rated input voltage Un
- version +428 ..... 100/120 V AC
- version +429 ..... 200/240 V AC
- version +924 ..... 20..24V DC

Input voltage range
- versions +428/+429 .. 0.85 Un to 1.1 Un (58..132 V /170..264 V)
- version + 924 ..... 0.85 Un to 1.1 Un (17..26.4 V)

Rated frequency
- versions +428/+429 ..... 50/60 Hz

Requency range
- versions +428/+429 ..... 49..61 Hz
- version + 924 ..... DC

Disengaging value
- versions +428/+429/+924 ..... max. 10% de Un

Reclosing time
- versions +428/+429/+924 ..... 1 s

Residual ripple of input voltage
- versions +428/+429 .....not relevant
- version + 924 ..... DC : max. 5%

MAx. fusing
- version + 924 ..... 4 A

Max. switching current
- versions +428/+429 ..... 2A AC
- version + 924 ..... 0.5A CC ou 2 A

Max. relay switching voltage
- versions +428/+429 ..... 250V AC
- version + 924 ..... 250V AC / 24V DC

(Versions +428, +429 and +924)

Rated voltage of iputs ..... 24V DC

Input dependance version +428/+429/+924
- digital ..... 1,8KΩ +/-10%
- analog ..... 15Ω +/- 1%

Input level, low (digital) ..... 0V..4 V

Input level, high (digital) ..... +13V..+24 V

Output voltage for inputs
and external consumers ..... 24V DC +10% / -15%

Rated output current (sortie “+”) ..... 1A max.

included for external consumers ..... 500 mA

MK input

Max. input frequency ..... 30 Hz

Pulse duty factor ..... 1 :1

Enclosure type ..... IP 65

Rated isolation voltage ..... 250V AC

Operating temperature ..... 0 °C to 60 °C

Storage temperature ..... -25 °C to 70 °C

Supply voltage / Relay contacts ..... 1780 V

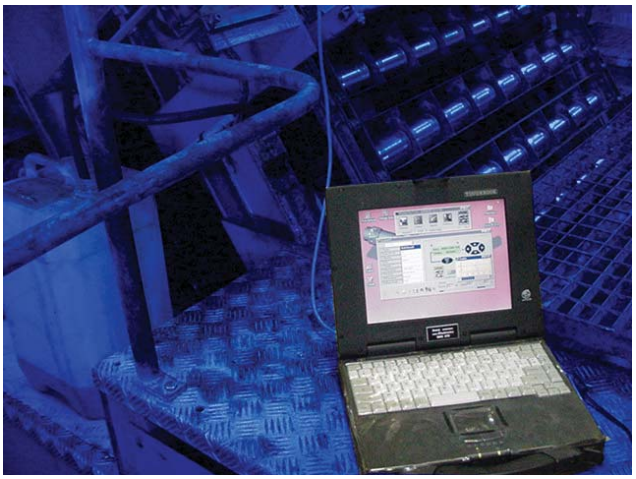
Supply voltage / Electronics ..... 2830 V

Relay contacts / Electronics ..... 2830 V

EMC, noise emission ..... EN 500081-1

VISIOLUB®

Productive maintenance software for Vogel France SAS chain lubrication systems.



- **Preventive maintenance**
  Study of the conveyor chain state evolution
- **Active maintenance**
  On site chain state analysis without production stop

The VISIOLUB® software has been especially designed to meet operation quality requirements of the lubrication systems.

The lubrication system GVP allows the automation of the greasing process. In the association with the VISIOLUB® software it is from now on possible to control and monitor the state of the chain and like this to prevent any production stop due to chain malfunctions. The chain life is increasing significantly.

VISIOLUB® is also really helpful for maintenance department. All the information gathered by VISIOLUB® are decisive to approve a new lubricant. It is also easier to determine the right amount of lubricant necessary for the lubrication tasks.

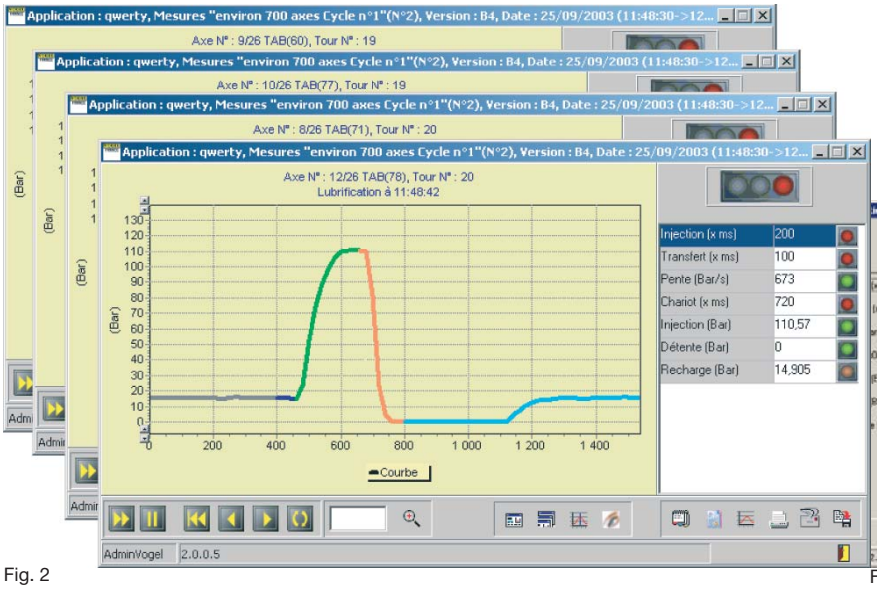


Fig. 2

Fig. 1

Function principle

VISIOLUB® is directly connected to the lubrication system control unit AEP2-GV via a computer. Thanks to a pressure sensor mounted on the injection head the pressure of each lubricant injection is measured.

The user set the different parameters corresponding to the lubrication cycle of his chains - theoretic value, minimal and maximal values (fig.1).

For each chain pin he is getting a succession of curves (fig.2) representing the different grease injection made into this pin during a lubrication cycle. The analysis of these curves helps him to find out possible malfunctions during the operation. A the end of the measure a report is edited and informs the user about the number of defectuous pins and identifies them precisely (fig.3).

On the one hand he can check the good operation of his greasing system, but on the other hand he can also identify the defective link of the chain (pin broken, no ball in the nipple...) and undertake preventive maintenance measures in order to prevent a chain break.

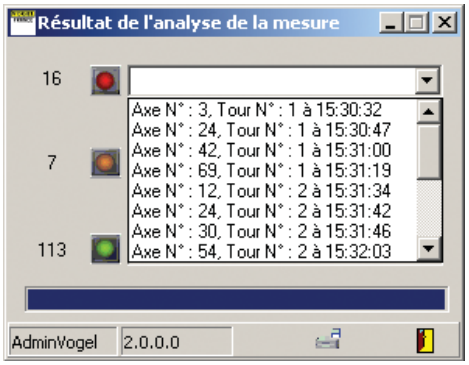


Fig. 3

Leaflet information

1-4105-US Brushing device BR (for chains)

Notice!

All products from VOGEL may be used only for their intended purpose. If operating instructions are supplied together with the products, the provisions and information therein of specific relevance to the equipment must be observed as well.

In particular, we call your attention to the fact that hazardous materials of any kind, especially the materials classified as hazardous by EC Directive 67/548/EEC, Article 2, Par. 2, may only be filled into VOGEL central lubrication systems and components and delivered and/or distributed with the same after consultation with and written approval from VOGEL.

All products manufactured by VOGEL group are not approved for use in conjunction with gases, liquefied gases, pressurized gases in solution and fluids with a vapor pressure exceeding normal atmospheric pressure (1013 mbars) by more than 0.5 bar at their maximum permissible temperature.

VOGEL®

A brand of the SKF Group

Willy Vogel AG
Motzener Strasse 35/37
12277 Berlin, Germany
PF 97 04 44 · 12704 Berlin
Tel. +49 (0) 30-7 20 02-0
Fax +49 (0) 30-7 20 02-111
info@vogel-berlin.de
www.vogelag.com

Willy Vogel AG
2. Industriestrasse 4
68766 Hockenheim
Germany
Tel. +49 (0) 62 05-27-0
Fax +49 (0) 62 05-27-132
info@vogel-berlin.de
www.vogelag.com

Vogel France SAS
Rue Robert Amy, B.P. 70130
49404 Saumur cedex
France
Tel. +33 (0) 241 404 200
Fax +33 (0) 241 404 242
info@vogelfrance.com
www.vogelfrance.com

VOGEL FRANCE SAS - SAS capital 1.283.525 € - RCS Saumur B 353 166 044 - NAF 291F - TVA FR 27 353 166 044

Dimensions in mm

Subject to modifications- 1-4101-US Edition 03/04