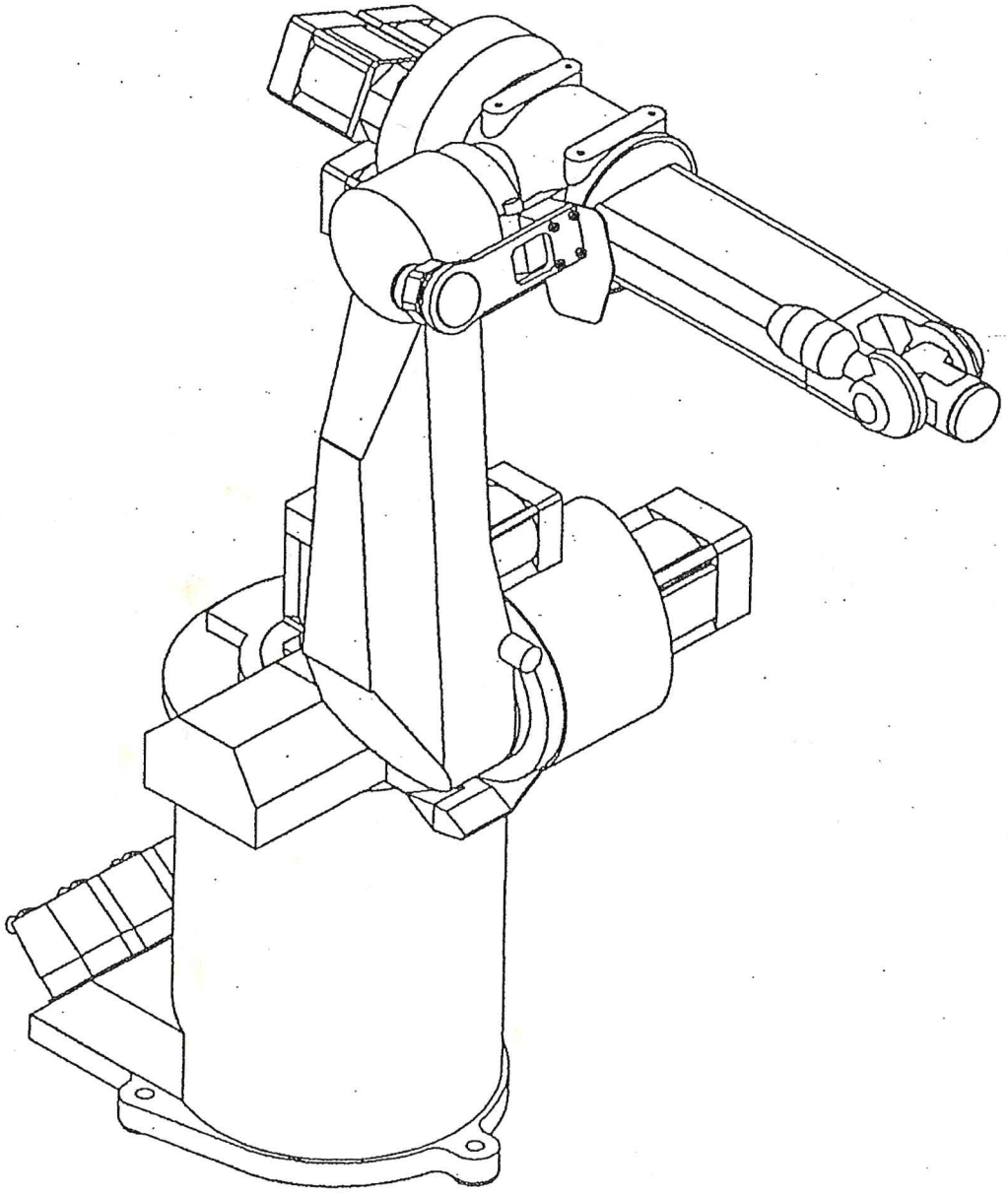
TECHNICAL MANUAL

REIS ROBOT RV6/RV6L/RV16



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UTILIZATION

The Reis Robots RV6/RV16 are 6-axes industrial robot.

Due to rotation axis 2 being displaced to the front the robot has a very large work envelope with a reach of 1525 mm for the RV6 and a reach of 1535 for the RV16. With regard to the arm length and the swivel angles the kinematics were optimized in such a way that both, upright and suspended arrangement of the robot is possible.

The compact design, good movability and the high axes' speeds, especially in the wrist make the robot suitable also for utilization in very small operation areas.

Various application possibilities in fully or semi-automated production installations are e.g.

- Path welding
- Coating
- Assembly
- Handling
- Machining

Solid sealings protect the drive elements from dirt and moisture from outside in case of extreme environmental conditions.

For utilization of the machine the max. loads indicated in chapter "Technical Data" have to be taken into consideration, in order to avoid damage at the unit resp. injuries of persons.

ATTENTION !

Observe safety instructions mentioned in chapter 2 !

DESIGN OF THE MACHINE

The Robot is designed as vertical articulated arm robot equipped with six freely programmable axes.

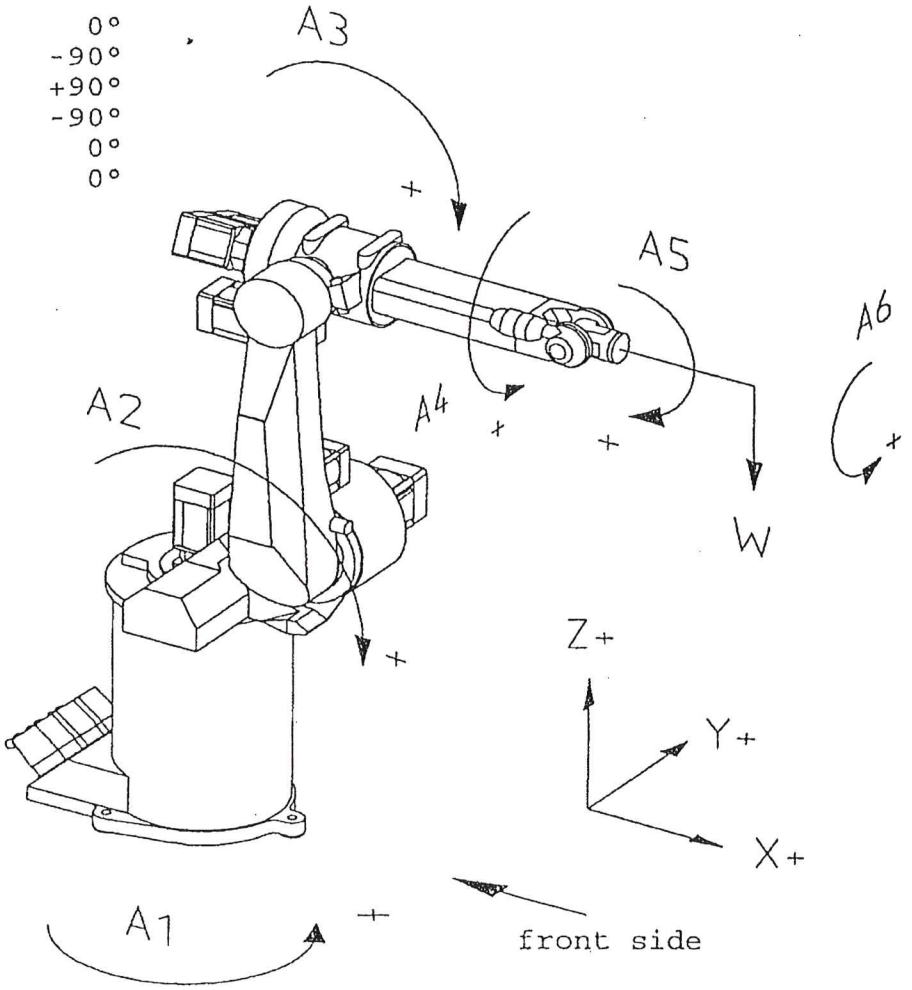
All axes are driven by brushless AC servo-motors equipped with an absolute path measuring system transmitting its electric pulses to the control.

All motors are additionally equipped with a brake in order to keep the axes in position in case of standstill or power failure.

The gear units of the corresponding axes are directly installed at the driven end of shaft. Thus, the RV6/RV16 disposes of highly dynamic and rigid drive systems.

The illustration of the robot in the measurement position corresponds to the axes positions:

A1	0°
A2	-90°
A3	+90°
A4	-90°
A5	0°
A6	0°



TERMS

User

User is the entrepreneur who uses the installation for production purposes, or the person appointed by the company to be vicariously responsible for the machine, e.g. head of a department or foreman.

Insured

Person employed at the machine.

ATTENTION !

Special remark concerning regulations, correct sequence of works etc. In case this will not be observed, damage and destruction of the machine and/or other equipment of the installation might be possible.

Warning: Zone of danger.

Remark for danger to life and limb.

INSTRUCTIONS CONCERNING SAFETY REGULATIONS

Maintenance

(1) The user has to see to it that in case of irregularities in operation of the machine it will be checked if there is any defect. The operation of the machine must be stopped until the detected defect has been eliminated.

(2) Insured who are employed at the machine have to inform the superior immediately of any irregularities in machine operation.

(3) Insured must switch off the drive and actuate the switch-off device during maintenance, inspection and repair.

Instructions of the manufacturer:

(1) Insured who are occupied with assembly, operating, servicing and repair of the machine in the company of the user, must have read and understood the operating manual, particularly chapter "Safety instructions".
The user is recommended to have this confirmed in each case by written evidence.

(2) The machine may be run by trained and authorized insured only. Competences for operating the machine must be clearly fixed and kept so that no unclear competences occur with regard to safety.

(3) In case of inappropriate use or use not according to the application of the machine, or operation by unskilled personnel, the following can impend:

- danger to life and limb
- danger for the machine and other property assets of the user
- danger for the efficient work of the machine

Besides this, it has to be stressed that in case of inappropriate use there might occur faults in functioning or the original quality of the machine might be reduced.

INSTRUCTIONS CONCERNING SAFETY REGULATIONS

(4) The safety regulations indicated in the operating manual must be observed at all works concerning assembly, operation, rearrangement, adaptation, maintenance and repair.

Generally the following safety instructions are valid for insured who are employed at the machine:

- The insured also must take care that no unauthorized person works at the machine.

Any method of working impairing particularly the safety of

- the mechanics
- the hydraulics
- the electrics

of the machine must be omitted.

- The insured is obliged to inform the user immediately of changes occurred which impair safety.

- As a matter of principle, no safety devices must be removed or put out of service.
When the safety devices at the machine in the production cycle are disactioned, no sufficient protection of the insured or of third persons is guaranteed. In this case, considerable dangers threaten the insured or third persons, in the extreme case danger to life!

The main switch must always be switched off during works at the machine and be secured against unauthorized switch on !

- The machine must always be switched off if safety devices are removed during repair or maintenance.
The safety devices must be remounted immediately after completion of the repair or maintenance works, i.e. before starting up the machine again.

- Works at the electric unit may only be executed by skilled personnel with regard to the UVV 7.0 regulation (German accident prevention regulation) or with regard to similar prescriptions in the user's country.

- If hydraulic medium escapes under pressure, injury hazard threatens, when operating the machine close to open fire, explosion hazard and danger of fire threaten !

INSTRUCTIONS CONCERNING SAFETY REGULATIONS

- Prior to works at hydraulic and pneumatic components (especially cylinders, pressure reservoirs) it has to be ensured that those are pressureless.

- All drives or controls have to be switched off prior to maintenance or repair works.

Special safety instructions for the user:

- The user must bind himself always to run the machine in faultless condition only.

- Running of the installation in automatic mode presumes an installed, closed, and controlled protecting installation, also around the individual machines and equipments of this production unit, if necessary.
  No person must stay within this protecting installation during operation !

- If a complete screening of the machine with regard to the safety regulations is not part of the delivery of Messrs. Reis, the user must ensure that the working range of the machine is screened by appropriate measures, based on the safety regulations valid in the user's country.

- As far as required, the user must oblige the insured to wear protecting clothes etc.

- The user must guarantee cleanness and clearness of the workshop place in the machine area by means of corresponding instructions and controls.

(5) Any arbitrary convertment, repair and modification at the machine effected by the user, by the insured or by third persons is prohibited for reasons concerning safety regulations.

(6) According to regulations of the Federal Republic of Germany, the user has to set up a written operating- and working instruction. This has to be done in the language of the insured. This operating manual can partly be taken for formulation.

INSTRUCTIONS CONCERNING SAFETY REGULATIONS

The robot may only be operated by personnel that is trained or instructed accordingly:

personnel	minimum qualification	allowed operating modes
Operators	Instruction by trained programming or service personnel or instruction by service personnel of Messrs. Reis or participation in an operator training at Messrs. Reis	Operation only from outside the safety grid During operation safety devices have to be active, i.e. safety doors have to be closed. Staying inside the safety grid only when drives are switched off.
Programmers	Participation in an operating and programming training at Messrs. Reis	All operating modes as per VDI 2853 as described in the operating manual ROBOTstar.
Servicing staff	Participation in an operating and servicing training at Messrs. Reis	All operating modes as per VDI 2853 as described in the operating manual ROBOTstar.

Safety Datasheet according to 91/155/EEC

Optimol LONGTIME PD 1/Art.-No. 08224

1. Designation of substance/preparation and manufacturing company

1.1 Designation of substance or preparation
Commercial name: LONGTIME PD 1

1.2 Designation of company

Manufacturer/Supplier:	Optimol Ölwerke Industrie GmbH
Street/Post Office Box:	Friedenstraße 10
Country code/Zip code/locality:	D-81671 München
Telephone: 089/4183-0	
Telefax: 089/4183-200	
Department providing information:	Laboratory/UMW
Telephone: 089/4183-116	
Emergency information (poisoning):	Giftnotruf München
Emergency telephone:	089/41402211

2. Composition/Ingredients

2.1 Chemical characteristics (individual substance)

CAS No.	Designation acc. to EEC Directive	Code letter	Risk phrases
	see 2.2 (preparations)		

Identification number: none
Other remarks: none

2.2 Chemical characteristics (preparations) Description:
Lubricating grease based on mineral oil and lithium-12-hydroxystearate

Hazardous ingredients:

CAS No.	Designation acc. to EEC Directive	Contents % by wt	Code letter	Risk phrases
	not applicable			

Other remarks: Identification according to GefStoffV (German Hazardous Goods Regulation) not necessary.

3. Possible hazards

3.1 Designation of risk
none

3.2 Special risks for people and environment
none

4. First aid measures

4.1 General remarks
Immediately remove contaminated and impregnated clothing.

4.2 Inhalation
not applicable

4.3 Skin contact
Clean well with soap and water, then use

4.4 Eye contact
Flush thoroughly with water for several minutes, if necesssary call for medical attention.

4.5 Ingestion
Do not induce vomiting, call for medical attention.

4.6 Medical information

5. Fire fighting measures

5.1 Suitable extinguishing media
Foam, dry chemicals, CO_2

5.2 Extinguishing media unsuitable for safety reasons
Water

5.3 Special risks inherent in the substance, its combustion products or resulting gases
During combustion unhealthy vapours may form (see 10).

5.4 Special protection equipment
not necessary

6. Measures to be taken in case material is released or spilled

6.1 Personal precautions
not necessary

6.2 Measures to protect the environment
Contain polluted water/extinguishing water.
Avoid entry into sewers and waterways.

6.3 Measures of purification/absorption
Remove with a suitable absorbent and dispose of in compliance with applicable legal regulations.

6.4 Other remarks
none

7. Handling and Storage

7.1 Handling

Information for safe storage

See 7.2 with regard to storage together with other materials!

Information concerning protection against fire and explosion

No special measures required if product is handled in conformity with applicable legal regulations.

7.2 Storage

Requirements concerning storage room and containers

Storage in closed containers at room temperature. Avoid pollution and entry of humidity to maintain existing quality standards.

Storage together with other materials

Do not store together with strong oxidizing chemicals.

Other information regarding storage conditions

Total storage period under the above conditions is approx. 20 months.

Storage class not applicable

8. Limitation of exposure and protective equipment

8.1 Other information regarding design of technical plant and equipment

none

8.2 Ingredients for which limit values have to be monitored in relation to the workplace

CAS No.	Designation acc. to EEC Directive	Type	Value	Unity
	not applicable			

The above values have been taken from the lists valid at the time of preparation (e.g. TRGS 900 for Germany).

Other remarks none

8.3 Personal protective equipment

General measures of protection and hygiene

The precautions usual in handling lubricants have to be observed.
Do not eat, drink, smoke, take snuff during work.
Remove contaminated work clothes.
Clean and care skin after work.

Protection against inhalation

not necessary

Hand protection

Protective gloves made of chemical resistant material, e.g. Neoprene

Eye protection

not necessary

Body protection

not necessary

9. Physical and chemical properties

Form pasty Colour brown

Odour

		Value/Range	Unity	Method
Change of physical state				
Kind of ... (1) Point/Range of fusion			°C	not applicable
Kind of ... (2) Point/Range of boiling			°C	not applicable
Kind of ... (3) Dropping Point		> 260	°C	ISO 2176
Flashpoint (base oil)		approx. 200	°C	ISO 2592
Inflammability (solid, gaseous)				not applicable
Ignition temperature			°C	not applicable
Self-ignition				not applicable
Explosion hazards				not applicable
Limits of explosion	UEG		Vol-%	not applicable
	OEG		Vol-%	not applicable
Vapour pressure	at T= 20°C		hPa	not applicable
	at T= 50°C		hPa	
Density	at T= 20°C	0,887	g/cm³	DIN 51 757
Solubility	at T= °C		mg/l	insoluble in H_2O
	at T= °C			
pH	at T= °C			not applicable
Coefficient of distribution	Comp.:		logPOW	not applicable
Viscosity	at T= °C		mm²/s	not applicable
	at T= °C		mm²/s	
Separation of solvents test			%	not applicable
Solvents content			%	not applicable
Other data	none			

10. Stability and Reactivity

Conditions to avoid
The product is stable

Material to avoid
Strong acids and oxidizing chemicals

Hazardous decomposition products
Depending on conditions of decomposition: Oxides of C, S, N, P

Other information
Decomposition temperature > 350°C

11. Toxicological information

11.1 Acute toxicity Information regarding ingredients:

LD/LC_{50} Values determining classification: not defined

Manner:	Value/Range of values	Species	Method
oral	mg/kg		
dermal	mg/kg		
inhalative	mg/l/4h		

Specific symptoms in experiments on animals not defined

Primary irritation effect

	Effect	Species	Method
on skin			
on eye			

Sensibilisation not defined

Other information none
(relating to experimental toxicology)

11.2 Subacute to chronic toxicity

Tests not defined
Species Maximum dosis: mg/kg Method
Results

11.3 Experiments on human beings not defined

11.4 Other toxicological information (particularly with regard to preparations)
Avoid prolonged and repeated skin contact, slight irritations being possible.
Eye contact may lead to slight irritation of the conjunctiva.

12. Ecological information

12.1 Information relating to disposal of waste (persistence and degradation)
not determined

Procedure Method of analysis
Degree of elimination Classification
Evaluation text

Other information Avoid entry into the soil, waterways and sewers.

12.2 Behaviour in different ecological compartments

Ingredient
Mobility and bioaccumulating potential not defined

Other information none

12.3 Ecotoxicological effects

Aquatic toxicity not defined

Sort of test	Active concentration	Method	Evaluation

Remark none

Behaviour in sewage treatment plants not defined

Sort of test	Active concentration	Method	Evaluation

Remark none

Restricted aeration of activated sludge EC 20 = mg/l acc. to ISO 8192 B

Other information none

12.4 Other ecological information

AOX information		Remark:	not defined
CSB value	mg/g	Remark:	not defined
BSB_5 value	mg/g	Remark:	not defined

The formulation contains heavy metals and compounds as per EEC Directive No. 76/464 mentioned hereunder:
The preparation contains the heavy metals molybdenum and zinc.

General remarks: none

13. Information regarding waste disposal

13.1 Product

Recommendation: Disposal in accordance with technical instructions for the disposal of hazardous waste

Waste Code No.	Designation of waste	Proof to be furnished
54202	Waste of greases	yes

13.2 Contaminated packaging

Recommendation: Contaminated packaging to be emptied at best; it may be re-conditioned after proper cleaning.

Recommended means of cleaning:
Cleaning to be effected only by an authorized company.

14. Transport regulations

14.1 Land transport ADR/RID and GGVS/GGVE (crossborder/inland)

ADR/RID-GGVS/E class --- Figure/Letter ---
Warning board: No. of risk: --- No. of substance: ---
Designation of product: ---
Remarks: see 14.5

14.2 Inland water transport ADN/ADR

ADN/R class --- Figure/Letter --- Category
Designation of product: ---
Remarks: see 14.5

14.3 Sea transport IMDG/GGVSee

IMDG/GGVSee class: --- UN-No.: --- PG.: ---
EMS-No.: --- MFAG: ---
Marine pollutant: no
Correct technical designation: ---
Remarks: see 14.5

14.4 Air transport ICAO-TI and IATA-DGR

ICAO/IATA class: --- UN-ID-Nr.: --- PG.: ---
Correct technical designation: ---
Remarks: see 14.5

14.5 Transport/other information

No hazardous goods within the meaning of applicable transport identification rules!

15. Regulations

15.1 Identification according to EEC Directive

Letter of identification and designation of risk inherent in the product:
(according to Annex I of the Directive 88/379/EEC relating to preparations)
No identification required.

Component(s) determining the risk(s) to be specified in labelling:
contains: not applicable

Risk phrases:
none

Safety phrases:
none

Special identification of certain preparations:
(according to Annex II of the Directive 88/379/EEC)
not applicable

15.2 National Regulations

Additional classification according to GefStoffV (German Hazardous Goods Regulation) Annex II No.:
(only in case of deviation from EEC classification)
No classification required.

Information relating to employment restrictions:
none known

Decree about emergencies: not applicable

Classification according to VbF: not applicable

Technical instructions on air quality control: not applicable
Class: --- Figure: --- Content m%: --- (for liquids)

Class of hazard for water: 2 (self-classification)

Other regulations, limitations and interdictions:
[for example principles of industrial medicine and regulations relating to industrial safety (VBG, ZH-1/...instruction leaflets among others)]
none

16. Other information

The information contained herein is based on our present knowledge and experience and cannot in any case be relied upon as complete.

Department preparing safety datasheets: Laboratory/UMW

Persons to be contacted: B. Helbig

DIN safety data sheet

Date: 19.07.1993

Company Harmonic Drive Antriebstechnik GmbH, D-65555 Limburg F.R.G

Commercial product name Harmonic Drive Grease SK -1A

1.1 Chemical characterization: Composition of paraffinic, naphthenic and aromatic hydrocarbons with lithium - 12 - hydroxystearate - thickener and "EP" - additives

1.2 Form: pasty 1.3 Colour: yellow(mustard-like) 1.4 Odour: petrolium-like

2 Physical data and safety data				Tested in accordance with:
2.1 Change in physical state				
Dropping point		197	°C	DIN ISO 2176
Pourpoint		-25	°C	DIN ISO 3016
2.2 Density	(°C)	0.93	g/cm³	DIN 51757
Bulk density		inapplicable	kg/m³	
2.3 Vapour pressure	(°C)	negligible	mbar	
	(°C)		mbar	
2.4 Viscosity (basic oil)	(40 °C)	37	mm²/s	DIN 51562
Consistency No.		2	(NLGI)	DIN 51 818
Worked penetration		290	0.1 mm	DIN ISO 2137
2.5 Solubility in water		insoluble		
2.6 pH value (at g/l H_2O)	(°C)	inapplicable		
2.7 Flash point		170	°C	(base oil) ASTM D 92 (C.O.C.)
2.8 Ignition temperature	Not determined		°C	
2.9 Explosion limits	Lower: not determined		Upper: not determined	

2.10 Thermal decomposition: at 197 ° C the grease becomes liquid

2.11 Hazardous decomposition products: will not occur if application is not contrary to rule; oxides of carbon at combustion temperatures possible

2.12 Hazardous reactions: will not occur whilst storation and handling according to regulations

2.13 Further information: _____

3 Transport GGVSee/IMDG code: UN No.: ICAO/IATA-DGR:
GGVE/GGVS: RID/ADR: ADNR:
Other information: no dangerous good

4 Regulations

4.1 No duty to any designation according to the decree for dangerous goods from August 26. 1986 (version of April 23, 1990)

4.2 "MAK"-value (max.all. concentration at working place): not specified

4.3 "VbF"-value: not classified

4.4 Pay attention to the recommendations of the employer's liability insurance associations concerning industrial medical check-ups.

4.5 "TA Luft" : not applicable

4.6 Pay attention to the "Wasserhaushaltsgesetz" (water resources law) and decrees about devices for storage, rack-off and transfer

Commercial product name

5 Protective measures, storage and handling

5.1 Technical protective measures

Sealings should be able to protect against penetration of lubricant

5.2 Personal protective equipment

Respiratory protection: not necessary

Eye protection: avoid contact with eyes

Hand protection: only recommended in case of prolonged skin contact

Other:

5.3 Industrial hygiene

avoid contact with eyes and prolonged or repeated skin contact; rubber or plastic gloves and aprons could be worn, if required. Before starting to work, lay a protection-cream on the skin. After handling wash well hands and moistened skin with soap and (warm) water. After having cleaned the skin use a skin-care cream. Neither wear nor take with you clothes impregnated by lubricating grease.

5.4 Protection against fire and explosion

Fire classification "B" according to DIN EN 2

Don't smoke and do not handle or store near open flame.

Avoid heating above flash-point.

5.5 Disposal

According to the valid law for waste disposal (waste code : 54202)

6 Measures in case of accidents and fires

6.1 After spillage / leakage / gas leakage

Scrape up with spatula or scoop and place in container

6.2 Extinguishing media

Suitable: Foam, dry chemical, carbon dioxide

Not to be used: water

6.3 First aid

skin-contact: remove lubricating-grease from skin with drycloth or towel, wash with soap and (warm) water

Eyes-contact: Wash thoroughly 10 min. with (warm) water and call a physician

Ingestion: Call a physician

6.4 Further information

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7 Information on toxicity

7.1 Lubricating grease is not suitable for ingestion.

7.2 Till now not any effects detrimental to health are known if the application is under the regulations for working hygiene and protection of labour.

7.3 Occuring of allergic diseases: no experience

8 Information on ecological effects

The lubricating grease endangers the water according to the water resources law ("Wasserhaushaltsgesetz"); class (Wassergefährdungsklasse") 2.

Follow exactly the regulations for disposal of waste oil.

9 Further information

This safety data sheet is based on the present knowledge and experience. The data must not looked upon as juridical assurance of properties.

SAFETY DATA SHEET

Shell Alvania EP (LF) 1

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1. Identification of Substance/Preparation and Company

Product name:
Shell Alvania EP (LF) 1

Supplier:
Deutsche Shell Aktiengesellschaft

Address:
Überseering 35
22297 Hamburg

Contact numbers:
HSE informations: (040) 6324-6255

Emergency telephone number:
(040) 6324-5110

2. Composition/Information on Ingredients

Preparation Description:

A lubricating grease containing highly refined mineral oils and additives.

Dangerous components:
On the basis of available information, the components of this preparation are not expected to impart hazardous properties to this product.

3. Hazards Identification

Human Health Hazards:
Prolonged or repeated exposure may give rise to dermatitis.
No specific hazards under normal use conditions

Safety hazards:
Contains mineral oil for which an exposure limit for oil mist applies.

Environmental hazards:
Avoid spillage.
Not readily biodegradable.

4. First Aid Measures

Other information:

First aid - inhalation
Inhalation of any vapours from this product is not likely to present an acute hazard.
Remove to fresh air.

First aid - skin:
Remove contaminated clothing and wash affected skin with soap and water.
If high pressure injection injuries occur, obtain medical attention immediately.

First aid - eye:
Rinse immediately with plenty of water for at least 10 minutes and

seek medical advice.

First aid - ingestion:

Do not induce vomiting
If rapid recovery does not occur, obtain medical attention

Advice to physicians:

Treat symptomatically

5. Fire Fighting Measures

Extinguishing media:

Foam, Dry chemical powder, carbon dioxide, sand or earth.

Unsuitable extinguishing media:

Do not use water in a jet

Specific hazards:

Combustion is likely to give rise to a complex mixture of gases and airborne particulates, including carbon monoxide, oxides of sulphur, and unidentified organic and inorganic compounds.

6. Accidental Release Measures

Personal precautions:

Ventilate contaminated area thoroughly
Minimise contact with skin.

Environmental precautions:

Prevent further leakage or spillage and prevent from entering drains
Prevent from spreading or entering into drains, ditches or rivers by using sand, earth, or other appropriate barriers.

Clean-up methods:

Shovel into a suitable, clearly marked container for disposal or reclamation in accordance with local regulations.

Other information:

7. Handling and Storage

Handling:

When using do not eat or drink.
When handling product in drums, safety footwear should be worn and proper handling equipment should be used.
Prevent spillages.

Storage:

Avoid direct sunlight, heat sources, and strong oxidising agents.

Recommended materials:
mild steel
high density polyethylene
for containers or container linings.

8. Exposure Controls/Personal Protection

Engineering control measures:

Occupational exposure standards:

Component name	Limit type	Value/Unit	Other Information
Oil mist	8-h TWA	5 mg/m3	ACGIH
15-min STEL	10 mg/m3	ACGIH	

Other information:

Respiratory protection:
Not normally required.

Hand protection:
PVC or nitril rubber gloves if splashes are likely to occur and if applicable.

Eye-Protection:
Safety spectacles

Body Protection:
Minimise all forms of skin contact.

Hygiene measures:
Don't keep oily rags in your pockets.
Wash hands before eating and drinking.

9. Physical and Chemical Properties

Physical state:

Form....: Semi-solid at ambient temperatur

Colour..: brown

Safety relevant data:

Change of physical state:
Dropping point:
() 180 °C

Flashpoint (Base Oil): > 250 °C
(DIN ISO 2592)

Solubility in water (°C): Negligible

n-octanol/water
partition coefficient: Not applicable

10. Stability/Reactivity

Stability:
Stable under normal use conditions

Materials to avoid:
Strong oxidising agents

Hazardous decomposition products:

Hazardous decomposition products are not expected to form during normal storage.

Other information:

11. Toxicological Information

Toxicological Data:

LD 50 expected to be > 2000 mg/kg.

Specific symptomatic results:
Not available

Skin irritation:
Expected to be slightly irritant

Skin sensitisation:
Not expected to be a skin sensitiser

Prolonged and/or repeated contact:
Prolonged/repeated contact may cause defatting of the skin which can lead to dermatitis and may make the skin more susceptible to irritation and penetration by other materials.

Carcinogenicity:
Product is based on mineral oils of types shown to be non-carcinogenic in animal skin-painting studies.
Other components are not know to be associated with carcinogenic effects.

Human effects:

Other information:

Information given is based on a knowledge of the toxicology of similar products.

12. Ecological information

Persistence/degradability:

Information given is based on data on the components and the ectotoxicology of similar products.

Not readily biodegradable.

Mobility:

Floats on water.
Semi-solid under most environmental conditions.
If it enters soil, it will adsorb to soil particles and will not be mobile.
Product has the potential to bioaccumulate.

Ecotoxicity:

Product is expected to be practically non-toxic to aquatic organisms, LC/EC50 >100mg/L.

Other Information:

13. Disposal Considerations

Product:

Precautions:
Dispose to licensed disposal contractor

Waste disposal No.(EU):
12 01 12

Container disposal:

Drain container thoroughly
Dispose to licensed disposal contractor

Recomanded cleaning procedure:
Cleaning by disposal contractor

14. Transport Information

Not dangerous for conveyance under UN, IMO, ADR/RID and IATA/ICAO codes.

15. Regulatory Information

EC Classification:

Not classified as dangerous under EC criteria
(incl.directive 98/98/EC (25. ATP)).

National Regulations:

16. Other Information

Additional informations:

Concawe Report 5/87 Health Aspects of Lubricants.

This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not therefore be construed as guaranteeing any specific property of the product.

TRANSPORT

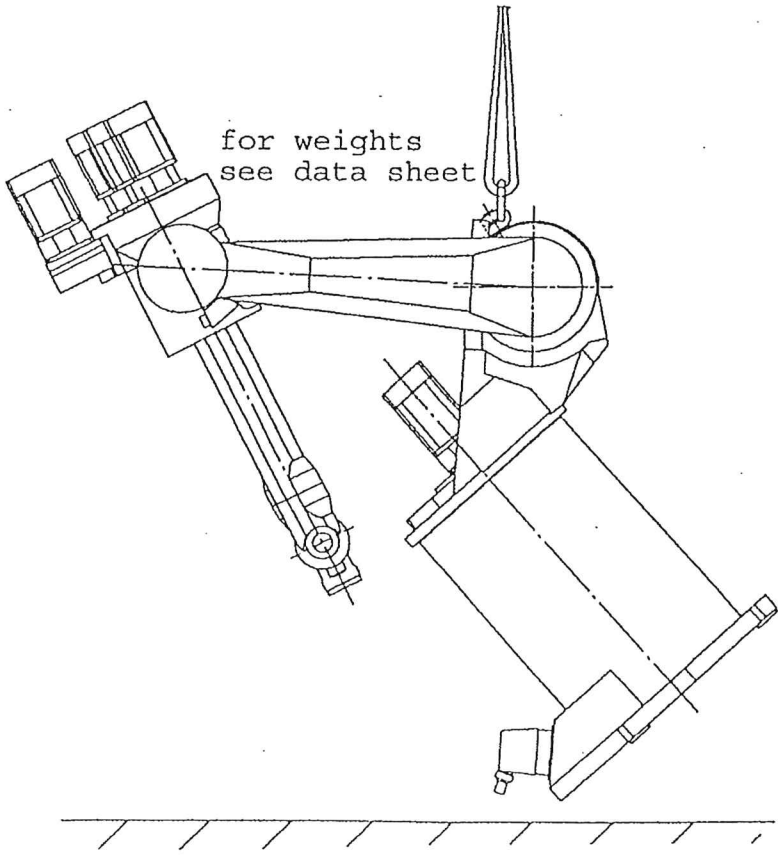
Shocks and vibrations affect the precision of any machine. Therefore special care should be applied during transport, and especially during loading and unloading of the machine.

Transport instructions according to UVV regulation 18.4 "Lastaufnahmeeinrichtungen im Hebezeugbetrieb" (Load lifting devices) have to be observed under any circumstances ! (Prescriptions in the user's country have to be observed). ATTENTION

Upright Robot (without base frame)

For lifting of the robot a thread M10 is located at the upper side of the rotary tower of axis 1. A rope with load key is supended to this thread for transport of the robot.

When using base frames or foundation plates the transportation suspension must not be executed with the robot ! ATTENTION



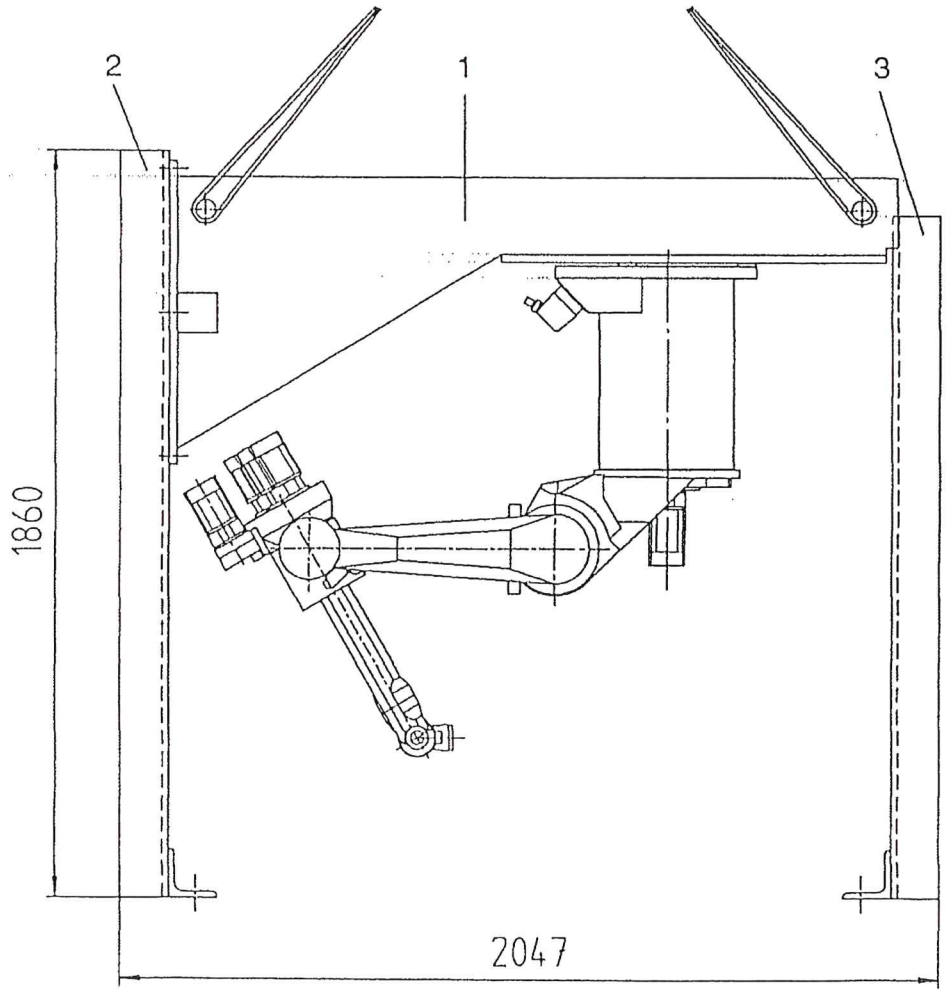
TRANSPORT

Suspended Robot

When being mounted to a support column the robot will be transported together with the supporting arm (1). For this purpose two transportation frames (2,3) are mounted to the supporting arm.

The transportation ropes must not be fixed at the two swivel arms !

ATTENTION



ARRIVAL

Immediately after arrival of the machine you have to check whether:

a) any transport damage has occurred

b) the standard accessories and possible special accessories are complete

Transport damage or missing accessories have to be reported to the forwarding agent and to the manufacturer immediately.

If the installation has to be intermediately stored, this has to be effected in a dry, frost-free room.

Max. ambient temperatures for transport and storage:

-40°C (233 K) up to +60°C (333 K)

The manufacturer is not liable for damage due to inexpert storing.

ASSEMBLY / ALIGNMENT

For space requirements and design of the machine foundation please refer to machine foundation drawing. Foundation has to be prepared accordingly.

The robots RV6/RV16 may either be directly fixed on the foundation or with foundation plates (4). The occurring foundation loads are indicated on the illustration above.

The occurring foundation loads are indicated in the data sheets in chapter "TECHNICAL DATA".

Fixture is ensured via 3 screws M16 (1) and disks (2) resp. the corresponding heavy load anchor.

In any case it has to be observed that the base plate (3) of the robot will not be distorted.

Pinning with the foundation plate (4) is possible. In order to ensure a long-time accuracy it is very useful in many cases to have fixed the robot on a common steel plate together with all peripheral components.