NOZAG Transmission

Screw jacks

in accordance with Directive 2014/34/EU for use in potentially explosive atmospheres

1. Responsibility

- Our customer commits himself to communicate us all necessary data.
- Our customer must check the applicability on the basis of the data provided by us.
- The operator is responsible for
  - > the respect of the performance limit of the jack/of the lifting system
  - > the avoidance of potentially explosive atmospheres
  - > the reduction or the limitation in time of the explosion hazard
  - > the compliance with the specifications of the instruction manual produced by us.
- The declaration of conformity pursuant to 2014/34/EU becomes null and void in the event of non-compliance with the operating instructions !
- In the quotation/order stage, Nozag prepares a checklist, which will become subsequently an integral part of the order documentation.

2. For which Ex area does Nozag supply drive elements?

2.1 Equipment class

Equipment group	Use	Remark
I	Mining	not available
II	All other devices	available

2.2 Equipment category

Equipment group II

Category	Safety	Zone
Category 1 (= Zone 0/20)	Devices ensuring a very high level of safety. Rare disturbances!	Intended for use in areas where a potentially explosive atmosphere made of a mix of air and gases, vapors or mists or a mix of dust and air is present constantly, for long periods or frequently.
Category 2 (= Zone 1/21)	Devices ensuring a high level of safety. If disruptions are expected!	Intended for use in areas where a potentially explosive atmosphere made of a mix of air and gases, vapors or mists or a mix of dust and air occurs occasionally.
Category 3 (= Zone 2/22)	Devices ensuring a normal level of safety. Safe in normal operation!	Intended for use in areas where a potentially explosive atmosphere due to gases, vapors mists or whirled-up dust is not expected to occur, or if it does occur, it does so in all probability only rarely and for a short period.

Category 2 includes category 3.
Category 1 includes categories 2 and 3.

2.3 Zoning

Zone		Likelihood of occurrence of an explosive atmosphere
Gas	Dust	
0	20	Areas where explosive atmospheres made of a mix of air and flammable substances occur constantly, over long periods or frequently.
1	21	Areas where an explosive atmosphere made of a mix of air and flammable substances may occur occasionally during normal operation.
2	22	Areas where an explosive atmosphere made of a mix of air and flammable substances normally cannot occur, or only for short periods, during normal operation.

2.4 Temperature classes and explosion groups

Temperature class	Max. surface temperature of the equipment (°C)	Ignition temperature of the flammable substances (°C)	Explosion group		
			II A	II B	II C
T1	450	> 450	Ammonia, acetone benzene, ethane, ethyl acetate, carbon monoxide, methanol, toluene, propane methane,	Coke oven gas, town gas	Hydrogen
T2	300	> 300... < 450	n-butanol, n-butyl alcohol, cyclohexanone, acetic anhydride, natural gas, liquid gas	Butadiene-1,3 Ethyl alcohol Ethylene Ethylene oxide	Acetylene
T3	200	> 200... < 300	Gasoline, diesel fuel, fuek oil, jet fuel, n-hexane	Oil, isoprene Hydrogen sulfide	
T4	135	> 135... < 200	Acetaldehyde ether	Ethyl ether	
T5	100	> 100... < 135			
T6	85	> 85... < 100			Carbon disulfide

The NOZAG drive elements have been designed on the basis of a housing temperature Δ of 80° C, so that, for an ambient temperature of 40° C, a maximum surface temperature of 120° C is reached. This results in a safety coefficient of 1.12 with respect to the max. surface temperature of 135° C. For the dust Ex protection, the operator must specify the ignition temperature of the dust-air mix .

2.5 Ignition protection type

of non-electrical equipment for use in potentially explosive atmospheres

EN 13463-2	Protection by flow-restricting enclosure "fr"
EN 13463-3 EN 60079-1	Protection by flameproof enclosure "d" Equipment protection by flameproof enclosure "d"
EN 13463-7 EN 60079-2	Protection by pressurized enclosure "p" Equipment protection by pressurized enclosure "p"
EN ISO 80079-36	Non-electrical equipment for explosive atmospheres – Basic method and requirements
EN ISO 80079-37	Non-electrical equipment for explosive atmospheres – Protection by constructional safety "c" Control of ignition sources "b", Liquid immersion "k"

- Nozag drive elements are designed in accordance with ignition protection "c" – Constructional safety.
- For applications in zones 1 and 2 (gas), the drive elements are manufactured in accordance with ignition protection "k – Liquid immersion" (oil-lubricated drive element).
- Ignition protection type "b – Control of ignition sources" means that sensors detect a possible ignition source (temperature, spark, etc.) and initiate measures to avoid the ignition source, e.g. switch drives off.

3. Which certification or test for which zone?

RL 2014/34/EU Chapter II Article 8 and Annex VIII

Category	2		3	
Zone	1	21	2	22
Ex atmosphere*	G	D	G	D
Motor	EU type examination certificate issued by a notified body	EU type examination certificate issued by a notified body	Internal manufacturing control by the manufacturer (2014/34/EU Annex VIII), declaration of conformity by the manufacturer	
Jack	Internal manufacturing control by the manufacturer (2014/34/EU Annex VIII), declaration of conformity by the manufacturer and deposit of the Ex protection documentation with a notified body			

G = Gas / D = Dust

4. Basics and methodology according to DIN EN 1127

This European standard specifies procedures for detecting ans assessing hazardous situations which may lead to explosions, and describes appropriate planning and manufacturing measures to achieve the required safety. This is achieved by:

- Risk assessment
- Risk reduction

The safety of equipment, protective systems and components can be achieved by eliminating hazards and/or by limiting the risk, e.g. by:

- Appropriate constructive design (without using technical protection measures)
- Technical protection measures
- User information
- Other precautionary and safety measures

Danger of ignition by

- Hot surface
- Mechanical generation of sparks by friction, impact and abrasion processes
- Electrostatic charge
- Chemical reaction
- Faulty assembly

5. Documents to ensure the Ex protection

- Checklist for the collection of all Ex protection-relevant data
- Questionnaire for the definition of the technical data
- Order for the design of the drive elements
- Calculation proof for the definition of the thermal limits and of the bearing service life
- Manufacturing checklist for the inspection of the components: sealing seats, roughness of the spindle and support nut, toothing contact pattern
- Operating instructions with declaration of conformity 2014/34/EU
- Type plate

5.1 Marking

	Gas	Dust
Ex mark		
Equipment group	**II**	**II**
Category	**2**	**2**
Ex atmosphere	**G**	**D**
Ignition protection type	**Ex h**	**Ex h**
Explosion group	**IIA or IIB or IIC**	
Dust group		**IIA or IIB or IIC**
Temperature class	**T4**	
Max. surface temperature		**100°C**
Equipment protection level	**Gb**	**Db**

Ex protection data collection

This checklist must mandatorily be filled in and all pending questions relating to the explosion protection must be rigorously clarified to allow the design of NOZAG lifting systems/drive elements in accordance with EU Directive 94/9EC

Company: _____ Phone: _____

Address: _____ Fax: _____

_____ E-mail: _____

Contact person: _____ Date: _____

Signature: _____

Stamp:

Equipment group, equipment category and zoning (see point 2.1)

Equipment group		Please tick
Equipment group 1		not possible
Equipment group II		x

Category / Zone	Ex atmosphere	
Category 1 (= Zone 0/20)	… is present constantly, for a long period or frequently.	not possible
Category 2 (= Zone 1/21)	… occurs occasionally.	
Category 3 (= Zone 2/22)	… occurs rarely and for a short period.	

Ex atmosphere (see point 3)

		Please tick
Gases/vapors	G	
Dust	D	

	Please complete
Ambient temperature (only permissible in the range of - 20 °C to + 40 °C)	
Flammable medium (e.g. wood dust, methane gas)	

Customer visa: _____

Explosion groups (see point 2.4)

Gases are classified in explosion groups.
The dangerousness of the gases increases from group IIA to IIC.
The explosion group is indicated in the marking only for the ignition protection types "d", "i", "nC" and "nL".

Gas	Please tick
II A (propane)	
II B (ethylene)	
II C (hydrogen)	

Dust	Please tick
III A (lint)	
III B (standard dust)	
III C (fine conductive dust)	

Temperature classes (see point 2.4)

Temp. class	Max. surface temperature of the equipment (°C)	Ignition temperature. of the flammable substances (°C)	Please tick
T1	450	> 450	
T2	300	> 300 … < 450	
T3	200	> 200 … < 300	
T4	135	> 135 … < 200	
T5	100	> 100 … < 135	not possible
T6	85	> 85 … < 100	not possible

	Please complete
Ignition temperature of the dust-air mix	
Maximum surface temperature for dust (°C)	

Equipment protection level

Gas	Dust	Zone	Please complete
Ga	Da	0 or 1 or 2/20 or 21 or 22	
Gb	Db	1 or 2/21 or 22	
Gc	Dc	2/22	

Customer visa: _____

Screw jack execution

Lifting capacity in kN

_____ kN per jack
_____ kN traction
_____ kN static load
_____ kN whole system
_____ kN thrust
_____ kN dynamic load

Stroke

_____ mm stroke
_____ mm spindle length

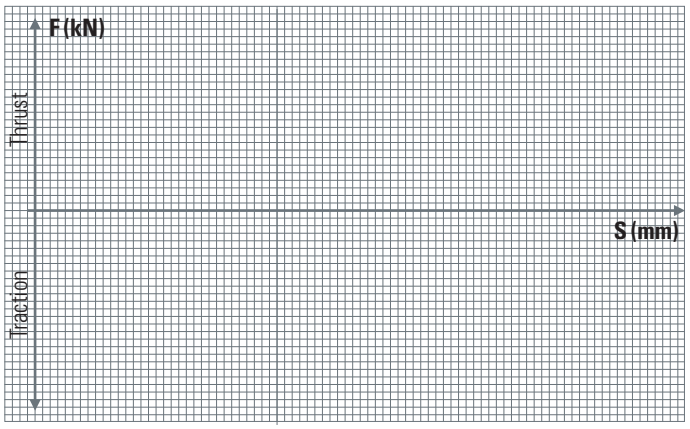
Mounting position

☐ vertical
☐ horizontal

Lifting speed (for 1400 min^{-1} drive)

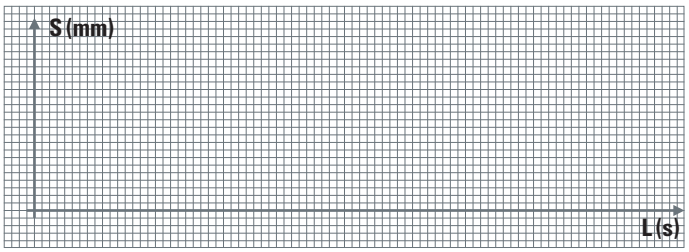
☐ Typ = 1.4 m/min (NSE2-SN = 1.12 m/min)
☐ Typ = 0.35 m/min (NSE2-SL = 0.28 m/min)

Force progression



(F=force, S=stroke)

Work cycle



(S=stroke, L=time)

Duty cycle, work cycle

_____ Strokes per day
_____ Strokes per hour

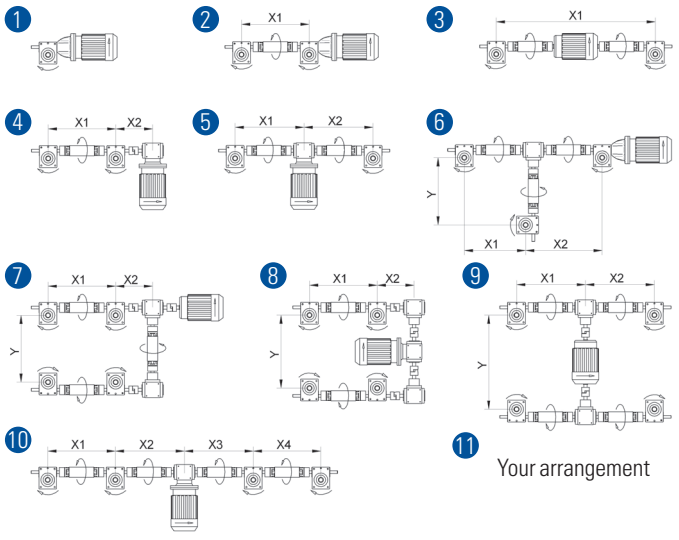
Load

☐ Steady load (uniform)
☐ Vibrations (alternating)
☐ Impact load (pulsating)
☐ _____

Hours per day

☐ 8 ☐ 16 ☐ 24 ☐ _____
_____ % Duty cycle (ED) referring to 10 min

Arrangement



Motor

☐ Three-phase motor
☐ Manual actuation
☐ Brake motor
☐ _____

Operating conditions

☐ Dryness
☐ Humidity
☐ Dust
☐ Chips

Ambient temperature

_____ °C min.
_____ °C max.

Quantity

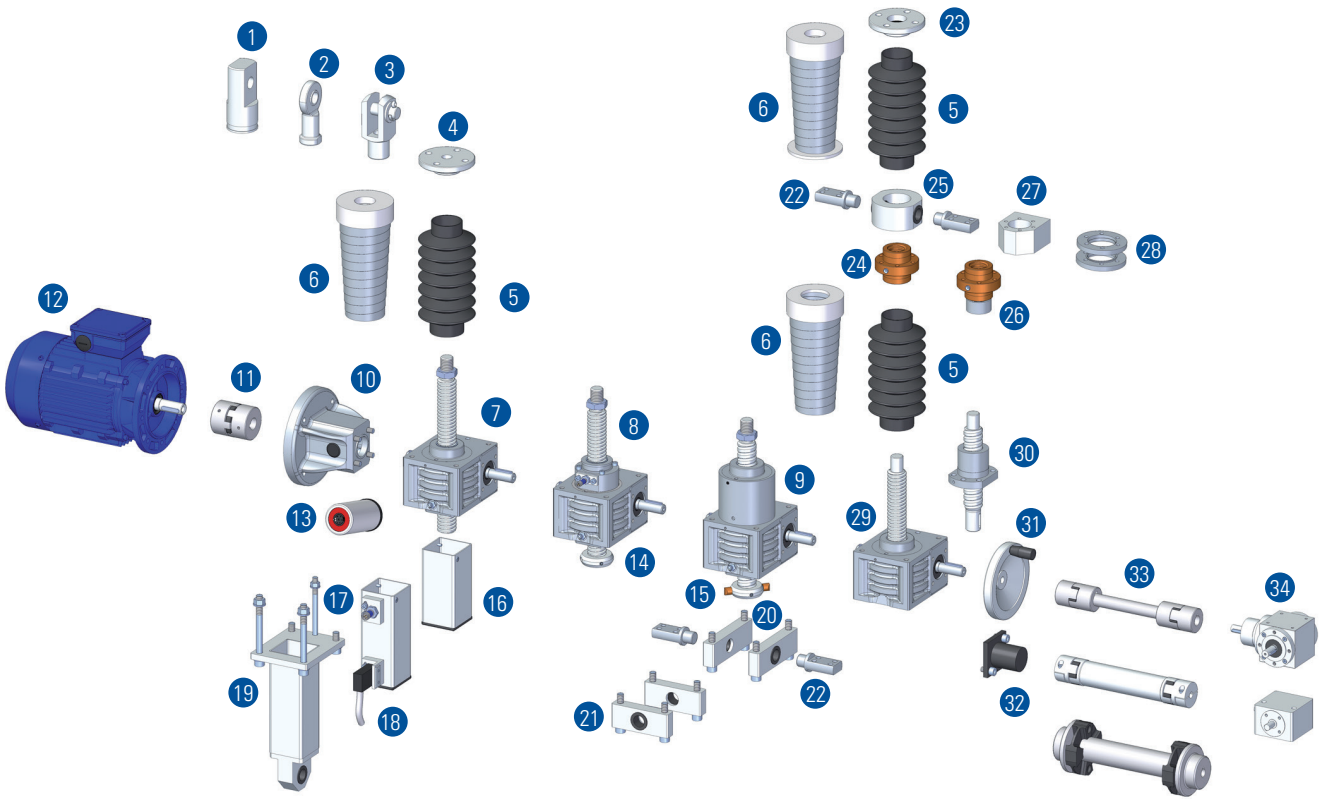
_____ Pieces
☐ Prototype first

Desired dates

_____ for the quotation
_____ for the delivery

Customer visa: _____

Attachment parts at a glance



- ☐ **1** Swivel bearing head
- ☐ **2** Ball joint head
- ☐ **3** Fork head
- ☐ **4** Mounting flange
- ☐ **5** Bellows
- ☐ **6** Spiral spring cover
- ☐ **7** Screw jacks, non-rotating
- ☐ **8** Screw jacks, non-rotating with safety trap nut
- ☐ **9** Screw jacks, non-rotating with ball screw
- ☐ **10** Motor adapter
- ☐ **11** Flexible coupling
- ☐ **12** Motor/brake motor
- ☐ **13** Lubricant dispenser
- ☐ **14** Unscrew protection
- ☐ **15** Anti rotation lock
- ☐ **16** Protection tube
- ☐ **17** Limit switch inductive
- ☐ **18** Limit switch mechanical
- ☐ **19** Support tube
- ☐ **20** Suspension adapter long
- ☐ **21** Suspension adapter short
- ☐ **22** Suspension bolt
- ☐ **23** Flange bearing
- ☐ **24** Flange nut/Duplex nut
- ☐ **25** Suspension adapter for flange nut
- ☐ **26** Safety trap nut
- ☐ **27** Carrier flange
- ☐ **28** Calotte disks
- ☐ **29** Screw jack, rotating
- ☐ **30** Ball screw flange nut
- ☐ **31** Hand wheel
- ☐ **32** Protection cap
- ☐ **33** Connecting shafts
- ☐ **34** Bevel gearboxes

Customer visa: _____

Subsidiaries

Switzerland
Nozag AG
Barzloostrasse 1
CH-8330 Pfäffikon/ZH

Phone +41 44 805 17 17

Service extérieur Romandie / Tessin
Phone +41 79 886 76 83

www.nozag.ch
info@nozag.ch

Germany
Nozag GmbH
Phone +49 6226 785 73 40

www.nozag.de
info@nozag.de

France
Nozag GmbH
Phone +33 387 09 91 35

www.nozag.fr
info@nozag.fr

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