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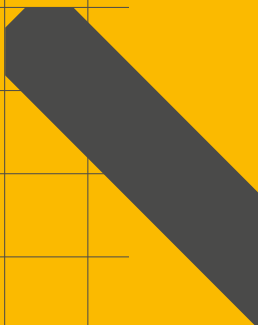
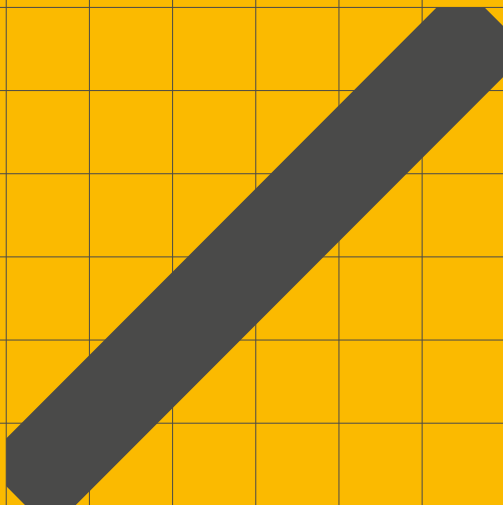
MAKERS IN MOTION

INSTALLATION, OPERATION AND MAINTENANCE MANUAL

CAT 33, 33H and 32B

Linear actuator





Contents

1.0 General information.....	4
1.1 Information on this manual.....	4
1.2 Explanation of symbols and signal words.....	4
2.0 Important safety information.....	5
3.0 Intended use.....	6
3.1 Duty Factors.....	6
3.1.1 DC Versions.....	6
3.1.2 AC Versions.....	7
3.2 Requirements for correct installation.....	8
4.0 Available versions.....	9
5.0 Optional equipment.....	9
6.0 Technical data.....	9
7.0 Installation.....	11
7.1 Actuator assembly.....	11
7.2 Overview of front and rear attachment options.....	12
8.0 Wiring Diagrams.....	13
9.0 Encoder E2.....	14
9.1 Two-channel quadrature encoder for CATR/L 32 and 33.....	14
9.2 Technical information.....	14
10.0 Maintenance.....	16
11.0 Remaining risks.....	16
12.0 Destruction/waste.....	17

WARNING

Read this manual before installing, operating or maintaining this actuator. Failure to follow safety precautions and instructions could cause actuator failure and result in serious injury, death or property damage.

1.0 General information

1.1 Information on this manual

This manual provides important information on how to work with the actuator (also called device or drive) safely and efficiently.

The manual is part of the device, must always be kept in the device's direct proximity and should be available for personnel to read at any time. All personnel working with the device must read and understand this manual before starting any work. Strict compliance with all specified safety notes and instructions is a basic requirement for safety at work.

Moreover, the accident prevention guidelines and general safety regulations applicable at the place of use of the device must also be complied with.

For a better representation of the circumstance of use, the illustrations used are not necessarily to scale and may vary from the actual design of the device.

All information and notes in this manual were compiled with due consideration given to applicable standards and regulations, the present status of technology and our years of knowledge and experience.

1.2 Explanation of symbols and signal words

Safety precautions are identified by symbols and signal words defined on the right hand side of this page.

These signal words indicate the severity of the hazard.

Adhere to these safety precautions and take caution in order to avoid accidents that may result in personal injuries or damage to property.

DANGER

Indicates a dangerous situation, which will lead to death or serious personal injury, if the precautionary measures are ignored.

WARNING

Indicates a dangerous situation, which can lead to minor or moderate injury or property damage, if the precautionary measures are ignored.

CAUTION

Indicates a dangerous situation, which can lead to minor or moderate injury, if the precautionary measures are ignored.

NOTICE

Indicates information considered important, but not hazard-related (e.g. messages relating to property damage).



NOTE

Emphasizes useful hints and recommendations as well as information for efficient and trouble-free operation.

2.0 Important safety information

The actuator is assembled and delivered by Ewellix according to the ordering key. Modification of the actuator is not allowed in any way. Any modification will void the warranty and could create a safety hazard. Ewellix disclaims any and all liability or responsibility for the modified product and for any claims, demands or causes of action for damage or for personal injury resulting from modification and/or use of such product. In addition, if the actuator has been disassembled, misused or altered without prior written authorisation, warranty will be voided. These installation instructions are part of the actuator and should be kept together with all relevant documentation regarding the application in which it is used.

The following are important safety precautions that must be followed during installation:

- All electrical installation and maintenance should be carried out by qualified personnel.
- Terminate power supply to the actuator before installation or maintenance.
- Make sure that the actuator is not under load or in tension before installation or maintenance.
- Use the appropriate safety equipment when installing/repairing the actuator.
- When connecting the actuator, make sure that the power supply corresponds to what is required in the technical specifications. See section 5 below.

WARNING

When heavy load and high duty factor is used, motor and surrounding components can get hot.

3.0 Intended use

The actuator is intended to be used for linear movements and axial load only, pushing and/or pulling, and intermittent duty. The actuator is designed to be used in an industrial environment and is defined as a "partly completed machine", meaning it must be incorporated in a safe way into its intended machine.

The actuator can not be used for hoisting people.

3.1 Duty Factors

Permitted load is related to the duty factor and the ambient temperature where the actuator operates. Consequently, when load and/or temperature raise the duty factor must be lowered to prevent the actuator from being damaged.

⚠ CAUTION

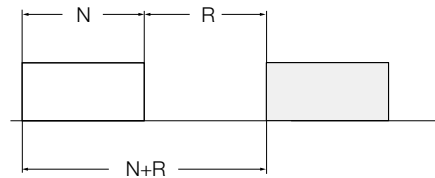
If the recommended duty factor is exceeded the actuator may be overheated and damaged.

Duty factor is defined as amount of time running under load vs. total cycle time.

By using the formula below one can calculate the duty and determine the risk of overheating.

$$\text{Duty factor \%} = \frac{N}{N + R} \times 100$$

- N = running under load
- R = rest period
- N+R = total cycle time



Permitted load for DC actuators at a specific duty factor is expressed in percentage of maximum dynamic load capacity, ↪ **table 1**.

Do not permit the motor surface temperature to exceed 70°C.

⚠ CAUTION

Caution, it may take several hours for the actuator to be overheated.

⚠ WARNING

If temperature is permitted to raise uncontrolled the actuator can eventually cause fire.

3.1.1 DC Versions

Table 1

Actuator	Max duty factor at max dynamic load and at 20 °C (68 °F)
CAT 33	15%
CAT 32B	20%
CAT 33H	20%

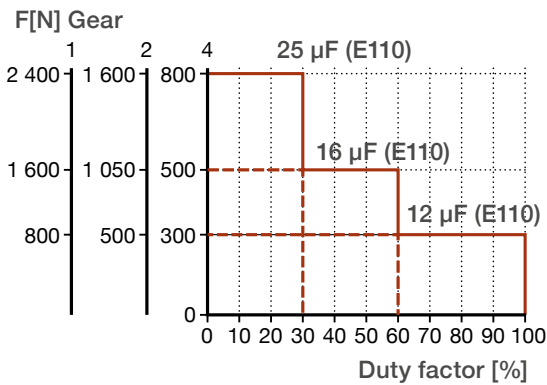
3.1.2 AC Versions

E110C E220C motors

Below diagrams show how the actuators will function when using different capacitors with single phase motor E220C & E110C.

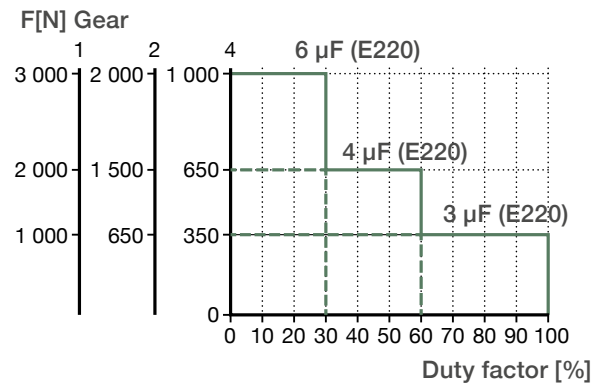
CAT 33

120 V AC



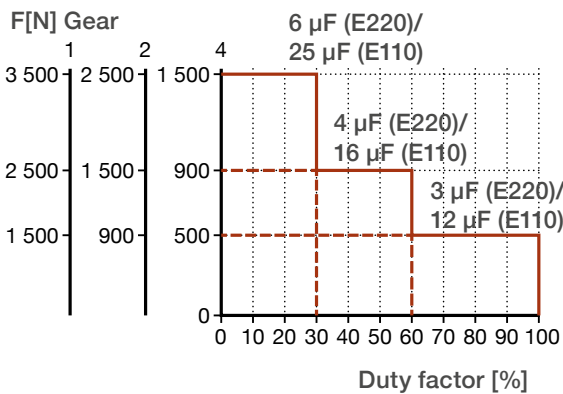
CAT 33

230 V AC



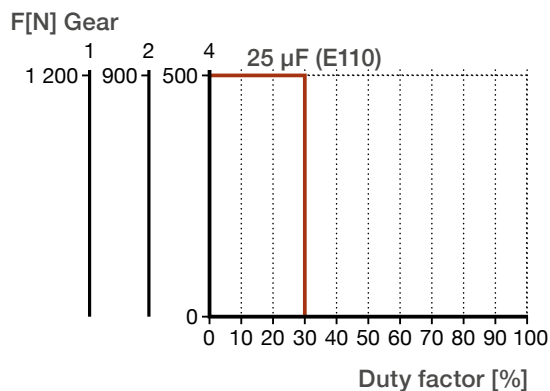
CAT 32B

230/120 V AC



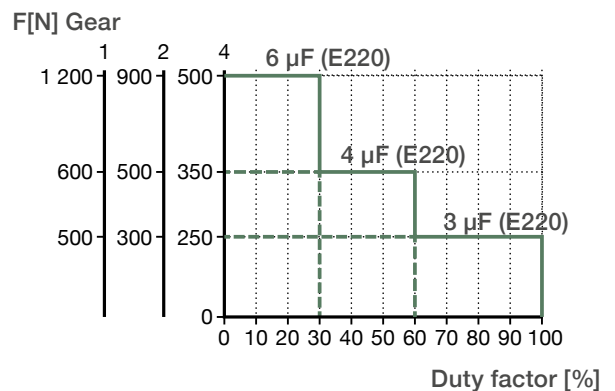
CAT 33H

120 V AC



CAT 33H

230 V AC



3.2 Requirements for correct installation

- Maximum angle between the actuator's attachment and the rear mounting attachment must not exceed 30° (↳ **fig. 1**).
- The surface to which the actuator is attached must be able to withstand the force applied by the actuator.
- Ensure that the applied force on the attachments is always centered on the actuator. (↳ **fig. 2**).

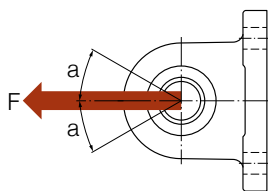
⚠ WARNING

Do not exceed the actuator's rated load limits. Doing so can result in serious injury and/or property damage. For technical data on load limits, see section 5 below.

⚠ CAUTION

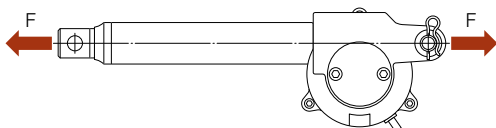
Avoid running the actuator into the mechanical end position. Repeatedly running into the mechanical end position may damage the actuator or shorten its lifespan.

Fig. 1



Angle $\alpha = \max 30^\circ$

Fig. 2



4.0 Available versions

CAT 32B, 33 and 33H are available in the following versions:

- 12/24 V DC
- 120/230/400 V AC
- Five types of front attachments and four types of rear attachments.
- Encoder for digital feedback signal.

5.0 Optional equipment

- Control unit
- Limit switches
- Encoder E2 (↳ **section 8**)

More information is available on ewellix.com

6.0 Technical data

All values for standard actuators are tested under the following conditions:

- Temperature + 20 °C (68 °F)
- Stabilized voltage
- Compression load

CAT 33

AC versions			
Description	Unit	–	
Rated push load	N	800 to 3 000	
Rated pull load	N	800 to 3 000	
Speed (at full load)	mm/s	5 to 24 ¹⁾	
Stroke	mm	100 to 400	
Retracted length	mm	S+150/158/189 ²⁾	
Voltage	V AC	120, 230, 400	
	120 V AC	W	98 (brake 133,2 W)
	230 V AC	W	92 (brake 117,3 W)
Power consumption	400 V AC	W	80
	120 V AC	A	0,82 (brake +0,29 A)
	230 V AC	A	0,4 (brake +0,11 A)
Current consumption	400 V AC	A	0,2
	Duty cycle		
	Ambient temperature		
Type of protection			
Weight			

CAT 32B

AC versions			
Description	Unit	–	
Rated push load	N	1 500 to 3 500	
Rated pull load	N	1 500 to 3 500	
Speed (at full load)	mm/s	6,5 to 32 ¹⁾	
Stroke	mm	50 to 700	
Retracted length	mm	S+167/175/206 ²⁾	
Voltage	V AC	120, 230, 400	
	120 V AC	W	98 (brake 133,2 W)
	230 V AC	W	92 (brake 117,3 W)
Power consumption	400 V AC	W	80
	120 V AC	A	0,82 (brake +0,29 A)
	230 V AC	A	0,4 (brake +0,11 A)
Current consumption	400 V AC	A	0,2
	Duty cycle		
	Ambient temperature		
Type of protection			
Weight			

CAT 33H

AC versions			
Description	Unit	–	
Rated push load	N	500 to 1 200	
Rated pull load	N	500 to 1 200	
Speed (at full load)	mm/s	20 to 901)	
Stroke	mm	100 to 400	
Retracted length	mm	S+150/158/189 ²⁾	
Voltage	V AC	120, 230, 400	
	120 V AC	W	98 (brake 133,2 W)
	230 V AC	W	92 (brake 117,3 W)
Power consumption	400 V AC	W	80
	120 V AC	A	0,82 (brake +0,29 A)
	230 V AC	A	0,4 (brake +0,11 A)
Current consumption	400 V AC	A	0,2
	Duty cycle		
	Ambient temperature		
Type of protection			
Weight			

¹⁾ Depending on selected motor.

²⁾ Dimension depends on selected front attachment.

CAT 33

DC versions			
Description	Unit	–	
Rated push load	N	800 to 3 000	
Rated pull load	N	800 to 3 000	
Speed (at full load)	mm/s	5 to 52 ¹⁾	
Stroke	mm	100 to 400	
Retracted length	mm	S+150/158/189 ²⁾	
Voltage	V DC	12 or 24	
	Power consumption		
	Current consumption		
Current consumption	12 V DC	A	18
	24 V DC	A	9
	24 V DC	A	5 (for motors C24CW and D24CW)
Duty cycle			
Ambient temperature			
Type of protection			
Weight			

CAT 32B

DC versions			
Description	Unit	–	
Rated push load	N	1 000 to 4 000	
Rated pull load	N	1 000 to 4 000	
Speed (at full load)	mm/s	5 to 52 ¹⁾	
Stroke	mm	50 to 700	
Retracted length	mm	S+167/175/206 ²⁾	
Voltage	V DC	12 or 24	
	Power consumption		
	Current consumption		
Current consumption	12 V DC	A	18
	24 V DC	A	9
	24 V DC	A	5 (for motors C24CW and D24CW)
Duty cycle			
Ambient temperature			
Type of protection			
Weight			

CAT 33H

DC versions			
Description	Unit	–	
Rated push load	N	400 to 1 200	
Rated pull load	N	400 to 1 200	
Speed (at full load)	mm/s	17 to 1931)	
Stroke	mm	100 to 400	
Retracted length	mm	S+150/158/189 ²⁾	
Voltage	V DC	12 or 24	
	Power consumption		
	Current consumption		
Current consumption	12 V DC	A	18
	24 V DC	A	9
	24 V DC	A	5 (for motors C24CW and D24CW)
Duty cycle			
Ambient temperature			
Type of protection			
Weight			

7.0 Installation

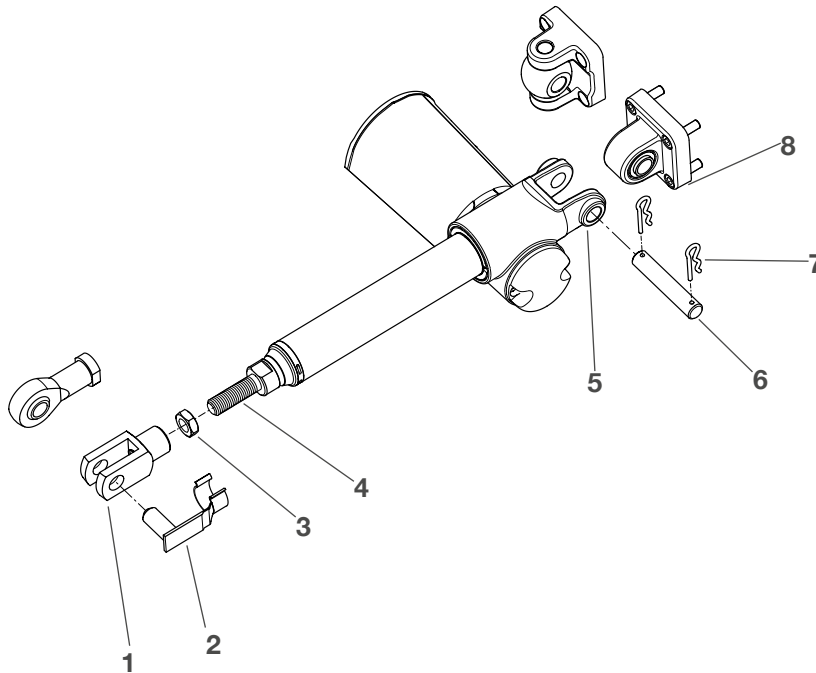
Only qualified personnel are allowed to install this equipment. Contact Ewellix for further information.

⚠ WARNING

Do not exceed the actuator's load limits. Doing so can result in serious injury and/or property damage. For technical data on load limits, see **section 6, page 9**.

7.1 Actuator assembly

Fig. 1



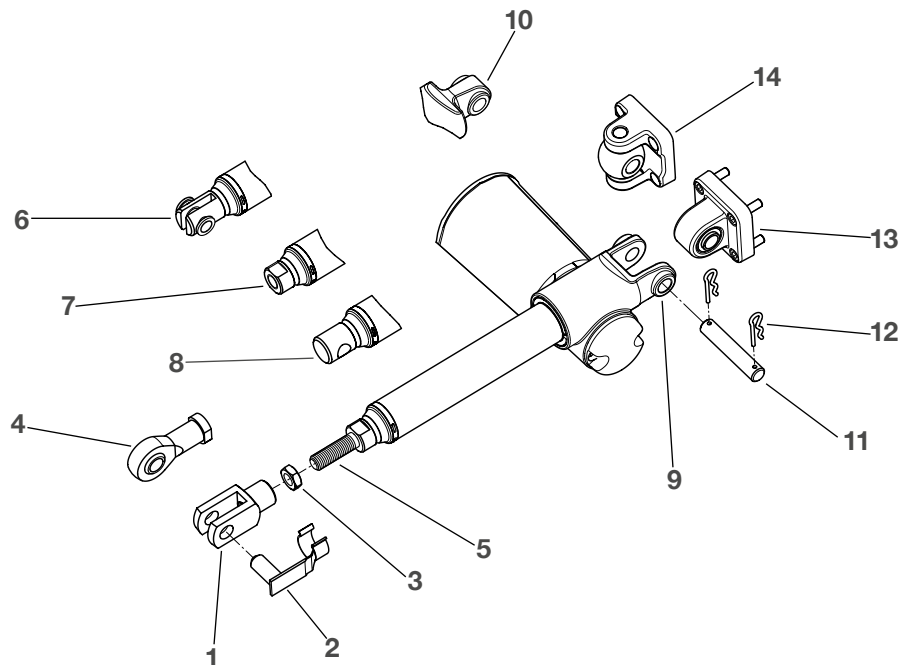
Description of the mechanical installation procedure.

1. Screw counter nut (3) onto the actuator front attachment (4)
2. Screw the front attachment (1, 2) onto the actuator's front attachment (4), making sure that the engaged thread length is, at a minimum, the diameter of the thread which is 12 mm.
3. Tighten the counter nut (3) onto the front attachment (1) with 20 Nm.
4. Disassemble pin (2) from front attachment (1).
5. Install the actuator onto the front and rear attachments. Mount the pin (2) onto the front attachment (1). Mount rod (7) with safety pins (6) onto the rear attachments (5) and (8).

While dismantling follow the steps in the order from (6) to (1).

7.2 Overview of front and rear attachment options

Fig. 2



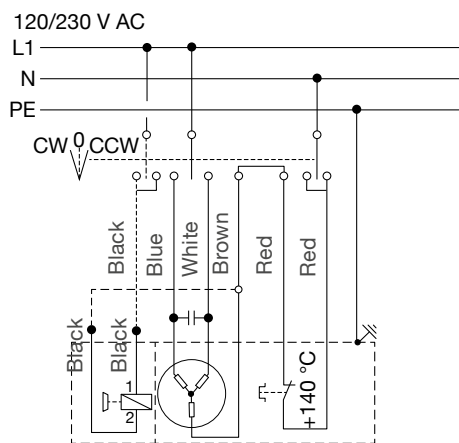
1. Front attachment (accessories) 576-32
2. Safety pin (part of 576-32)
3. Nut M12
4. Front attachment (accessories) 575-32
5. Actuator front attachment option G3
6. Actuator front attachment option G5
7. Actuator front attachment option G4
8. Actuator front attachment option G1/G2
9. Actuator rear attachment A1/A2
10. Actuator rear attachment K1/K2
11. Mounting rod (supplied with rear attachment A1/A2)
12. Safety pin (supplied with rear attachment A1/A2)
13. Attachment rear (accessories) 580-32
14. Attachment rear (accessories) 582-32

8.0 Wiring Diagrams

Fig. 3

Connecting diagram - AC version

Single phase



3 phase

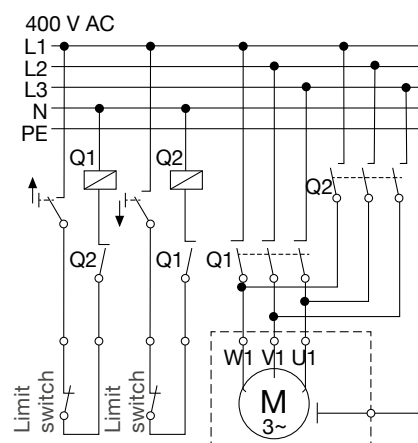
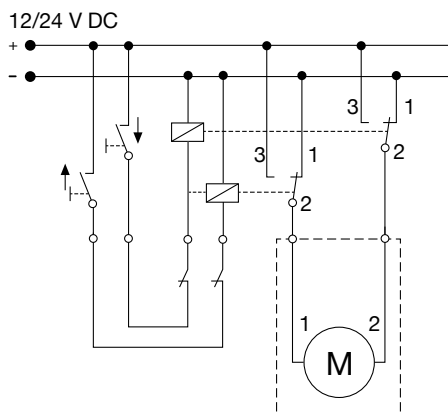


Fig. 4

Connecting diagram - DC version



⚠ WARNING

- All electrical installation/maintenance should be carried out by qualified personnel.
- Isolate the power before installation or maintenance. Use the appropriate safety equipment when installing/repairing the equipment.
- When connecting this equipment to the electrical supply, make sure that it corresponds to the one described in the technical specifications.
- For complete installation instructions regarding Ewellix limit switch, see separate installation instructions.

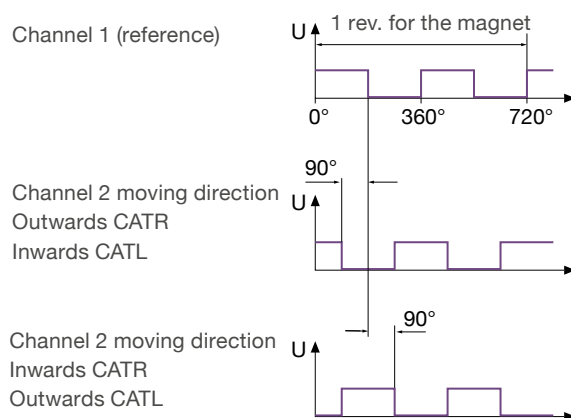
9.0 Encoder E2

9.1 Two-channel quadrature encoder for CATR/L 32 and 33

- The encoder is available for all motor types and screw pitches in the CAT-modular range
- The encoder consists of two parts; one rotating magnet on the motor drive shaft, and one circuit board (PCB) assembled on the motor's opposite side.
- The rotating permanent magnet has four poles (2N and 2S) and during one motor revolution, two pulses are generated in each channel.
- The output signals, channel 1 and 2, are phase-shifted $\pm 90^\circ$
- Supply voltage range is from 5 to 24 V DC
- Temperature range is from -20 to $+50^\circ$

9.2 Technical information

Fig. 5



(1) Output signals when the actuator is moving either outwards or inwards.

Table 2

Movement resolution

Actuator	Gear option	Pulse at 1 mm stroke	Resolution per pulse [mm]
CAT 33	1	16,67	0,06
CAT 33	2	8,33	0,12
CAT 33	4	4,17	0,24
CAT 33H	1	4,00	0,25
CAT 33H	2	2,00	0,50
CAT 33H	4	1,00	1,00
CAT 32B	1	12,50	0,08
CAT 32B	2	6,25	0,16
CAT 32B	4	3,13	0,32

Table 3

Recommended operating ratings

Parameter	Value
Temperature range	-20 to +50 °C
Supply voltage range	+5 to +24 V DC $\pm 5\%$
Current sink capability	Max 20 mA

Table 4

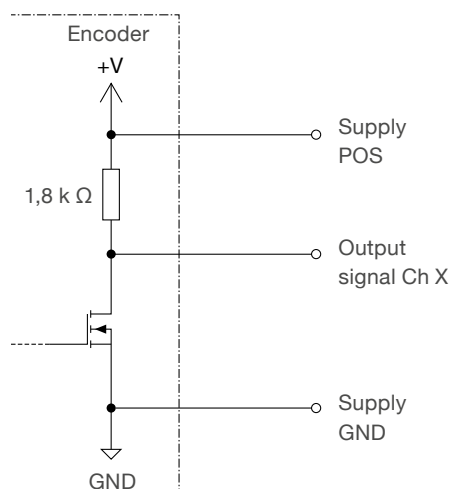
Wire color coding (colors according to DIN 47100)

Parameter	Value
Brown	Supply voltage GND (-)
White	Supply voltage POS (+)
Green (L) ¹⁾ alt. Yellow (R) ¹⁾	Output signal channel 1
Yellow (R) ¹⁾ alt. Green (L) ¹⁾	Output signal channel 2

¹⁾The alternatives in wire color for output signals channel 1 and 2 mean that the actuator has been assembled as CATR (right) or CATL (left). The wire is delivered with stripped ends (no connector).

Fig. 6

Encoder output circuitry – open drain with pull-up



10.0 Maintenance

Table 5

Interval	Maintenance work
Daily	Check actuator for visible damage Clean off dust and dirt if necessary
Monthly	Check attachments and tighten if necessary Check that cables are not damaged, replace if necessary Check optional equipment for visible damage, replace if necessary Functional check of operation
Every 6 months	A few drops of oil should be applied to the adjustment tube
Annually	Check labels Check electrical connections

11.0 Remaining risks

Regardless if the actuator has been installed according to this instruction some remaining risk exist.

Take note of these points during the lifespan of the actuator:

If any unnormal noise occure stop the actuator directly.

If the actuator has been subjected to excessive load, even for a short time, be aware of unnormal noise or "wobbling movement".

Do not operate the brake on its own when actuator is under load.

12.0 Destruction/waste

As majority of the actuator is made of steel and stainless steel some amount of grease/oil can be found inside. The motor and some accessories, like limit switch and encoder is considered electrical waste.

Check for local rules and information on how to dispose the actuator and its parts.

Keep this information for future reference. Please contact your local Ewellix sales office if you need more information or spare parts.

Please check ewellix.com for relevant addresses.



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