



# Fireye<sup>®</sup> NEXUS NX04-1, -2 Servo Motor Installation

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## DESCRIPTION

This manual describes the installation and operating instructions for the NX04 4Nm 3lb.-ft. servo motor. Other servo motor manuals are:

NX2020 - 20Nm /15 lb.-ft. servo motor

NX2050 - 50Nm /37 lb.-ft. servo motor

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## SAFETY INFORMATION



**WARNING:** When this equipment is mounted onto an appliance, all external timers/controllers must be listed or component recognized by authorities who have jurisdiction for the specific purpose for which they are used.

Before attempting to install, commission or operate this equipment all relevant sections of this document must be read and fully understood, failure to follow them could damage the product or cause a hazardous condition. If in doubt about any requirements consult the supplier.

Check the ratings in the these instructions to ensure the product is suitable for your application.

Installation, commissioning or adjustment of this product **MUST** be carried out by suitably trained mechanical and electrical engineers or personnel qualified by training and experience.

After installation is complete, check the product operation is as described in these instructions.

The manufacturer of this equipment accepts no liability for any consequences resulting from inappropriate, negligent or incorrect installation, commissioning or adjustment of operating parameters of the equipment.

This equipment must only be mounted onto burners as detailed in the contract specification. The supplier must approve any change in the specification in writing.

Control covers must not be left off while power is on. If it is essential to do so while rectifying faults only personnel qualified by training and experience should be involved.

The time any covers are off must be kept to a minimum and warning notices must be posted.

Before attempting any work on this equipment, the electrical supplies must be isolated.



Safety devices must not be removed or over-ridden. Any faults once detected must be corrected before the unit is operated.

*Note: The manufacturer of this equipment has a policy of continual product improvement and reserves the right to change the specification of the equipment and the contents of this manual without*

These mounting and operating instructions are intended to give the knowledge which is necessary to carry out the mounting and adjustment of NX04 servo motor safely and correctly.

Please read these instructions through carefully and pay particular attention to the advice and warnings.

The NX04 servo motor has an output torque of 4Nm/3 lb.-ft. with an actuating time of 30 seconds for 90 degrees rotation. Two end travel limit microswitches with adjustment cams and a potentiometer directly coupled to the output shaft are enclosed within its housing.

The output drive shaft can execute a rotation angle of 270 degrees maximum.

Two types of servo motors, 115 and 230 Volt AC, are available.

The field of use of this servo motor is predominantly for fuel valve and air damper actuation on industrial burners.

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## **SAFETY ADVICE**

### **Device Safety**

The servo motor must be used only for purposes corresponding to its construction and within the values specified in the technical data.

If current is applied simultaneously, to the terminals for open and close (Fig 3), uncontrollable movement of the output drive shaft may occur, depending on the load on the shaft. This situation must be prevented by the user by an electric interlock in the drive controller.

The installer should be satisfied that, as a result of the mounting, the commissioning or as a result of the test adjustments on the actuator, no potential hazards will be produced for devices/machines/plant.

Before mounting the servo motor, check the free movement of the valve/device.

After completing the mounting and adjustment, check the correct functioning of the servo motor.

### **Safety advice for mounting and adjustments**

The Installer must be satisfied that, as a result of the commissioning or the test adjustments on the servo motor, no potential hazards will be produced for personnel or the environment.

After completing adjustments check the correct functioning of the servo motor.

Check the functioning of the end position switches.

Check the correct functioning of any safety devices.

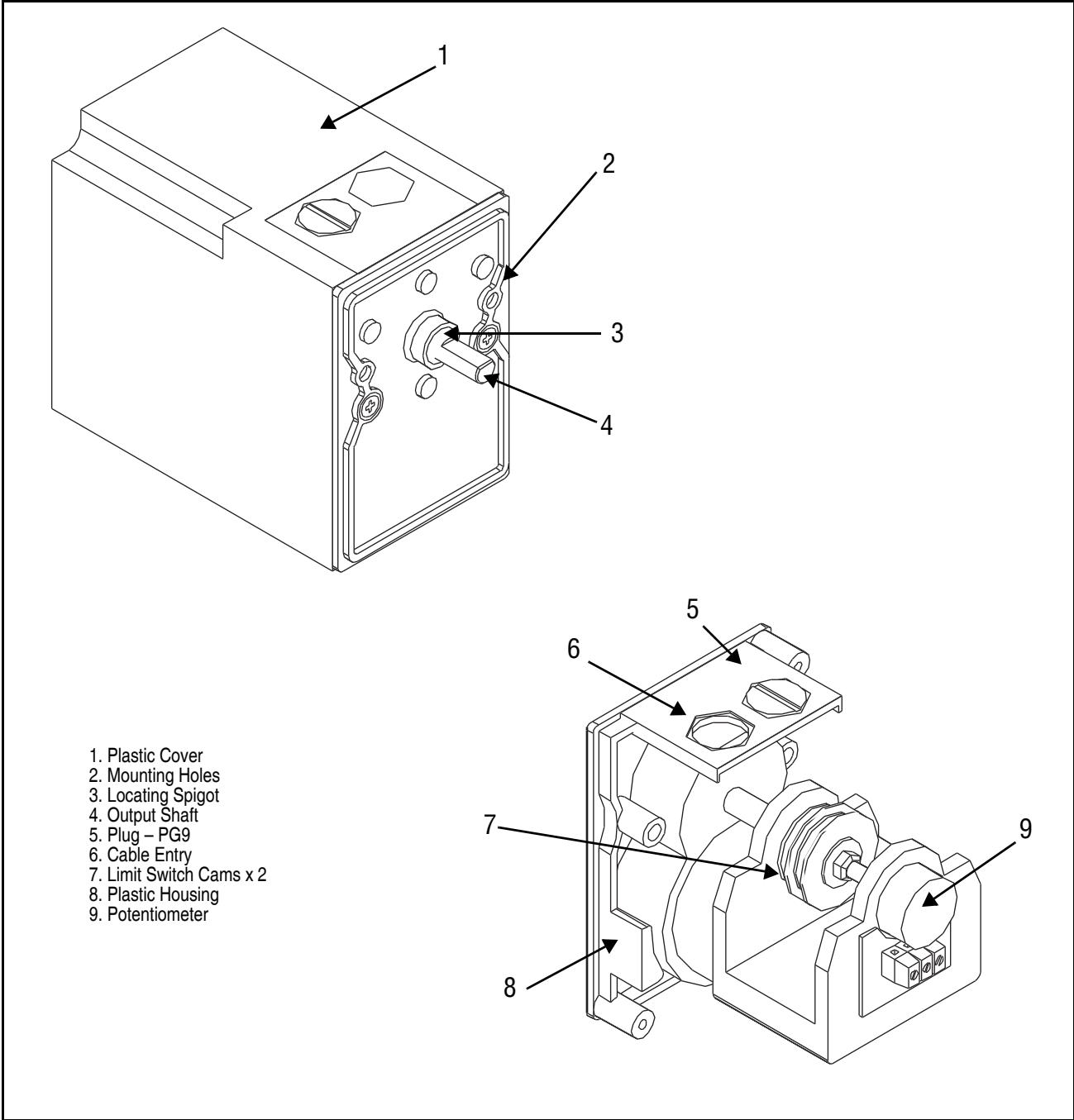
Carry out adjustments only in accordance with the instructions described in this documentation.

When adjustments are being carried out on an opened and switched-on servo motor there is the risk that live parts can be touched.

Adjustments must therefore be carried out only by an electrician or a person having adequate training, who is aware of potential hazards.

# SERVO MOTOR DESCRIPTION

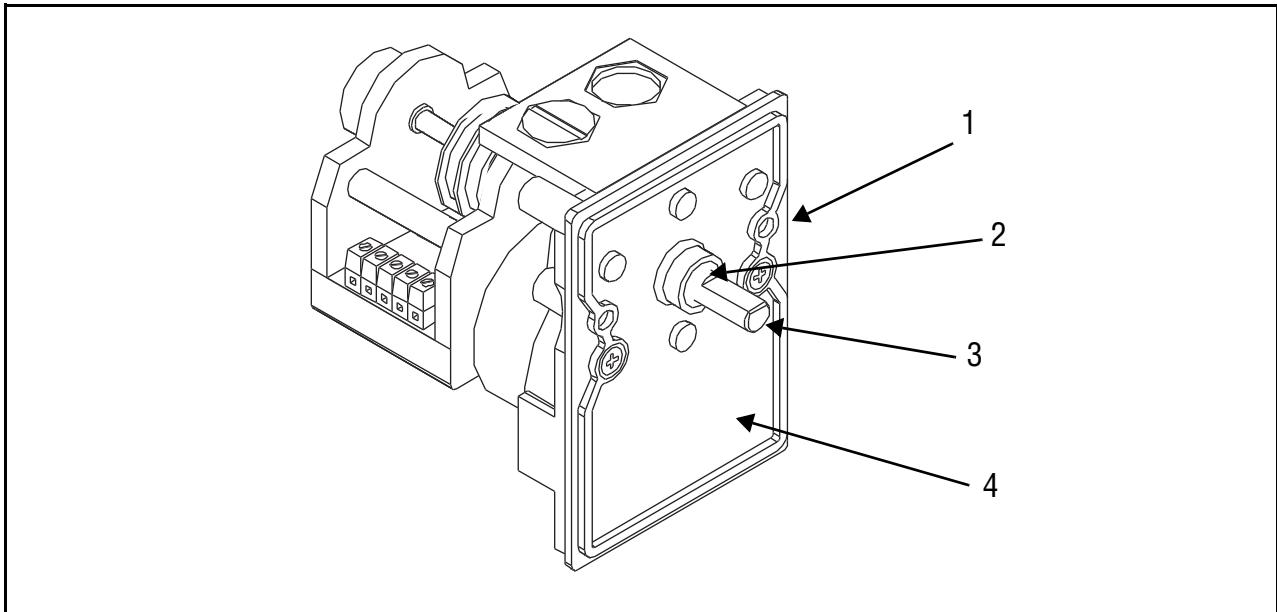
FIGURE 1.



- 1. Plastic Cover
- 2. Mounting Holes
- 3. Locating Spigot
- 4. Output Shaft
- 5. Plug – PG9
- 6. Cable Entry
- 7. Limit Switch Cams x 2
- 8. Plastic Housing
- 9. Potentiometer

## INSTALLATION

FIGURE 2. MECHANICAL MOUNTING



Fasten the NX04 servo motor using two bolts through a suitable mounting into the 5mm / 3/16 inch holes (1) using spigot (2) for location so that the mounting surface (4) rests flat.

The output drive shaft (3) should be connected using a suitable arm, link or flexible coupling.

The mounting position of the NX04 servo motor is arbitrary.

### Electrical installation

Loosen the two housing cover screws and pull the cover to remove it.

For the electrical installation of the NX04 servo motor, use the prescribed cable type (corresponding to the environmental conditions).

Prepare the power supply, potentiometer, protective earth and control cables by suitably removing sheaths and insulation.

Feed cables through screwed cable entry via suitable conduit and glands and place the stripped ends of the leads into screw connection terminals and terminate as shown in the wiring in Figure 3.

Ensure that no bare wires protrude from the terminals and thus produce the risk of a current surge or of a short circuit.

Store the cables such that they are not pinched when the housing cover is fitted or interfere with the end travel switch cam mechanism or potentiometer coupling shaft.

In the case of a servo motor which is open and ready to operate there is the risk that live parts may be touched and a shock received.

Switch on the power supply and check that the servo motor drives correctly.

Next carry out the adjustments/commissioning or otherwise replace the housing cover.

## ADJUSTMENTS/COMMISSIONING

### Adjustments

Before the servo motor is opened or commissioned the Safety Information on Page 2 and safety advice Section 2 must have been read.

The adjustment of the limit miscroswitches is carried out by turning the white adjusting discs to rotate black cams. S1 and S2 (Figure 1)

### Adjusting the end stops

In the case of a servo motor which has the cover removed and is ready to operate there is the risk that live parts may be touched and thus a shock received.

Apply power to terminal 2 – the servo motor will move as far as the stop position switch given by microswitch S1. If when adjusting stop positions, the servo motor runs up against a mechanical stop, the motor will stall and make a humming noise.

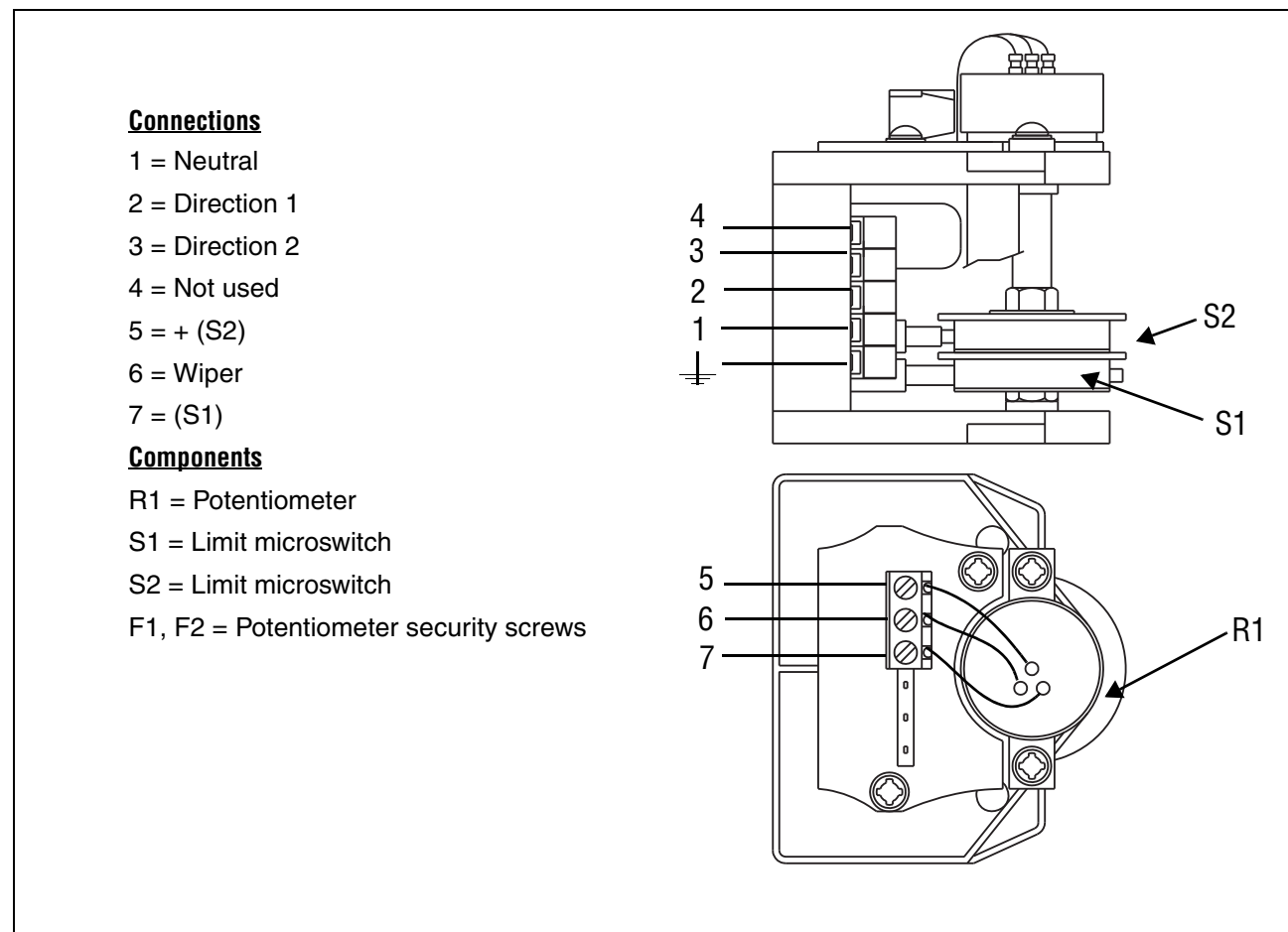
When this happens the power supply for this direction of operation should be switched off.

To change the stop position, rotate cam S1 until it actuates the microswitch. at the correct position, and the motor stops. The “direction 1” end stop is now adjusted. Apply power to terminal 3 – the servo motor will move as far as the stop position given by microswitch S2.

To change the stop position, rotate cam S2 until it actuates the microswitch. at the correct position, and the motor stops.

The open end stop is now adjusted.

FIGURE 3.



### Housing Cover

Before mounting the housing cover onto the servo motor, check that the cams of the end stop micro-switches have been correctly adjusted and the connecting leads are correctly screwed tightly in the terminals.

**Check whether the actuating element is totally cent closed when the controller signals the corresponding end stop.**

Ensure that the leads are not pinched between the housing and the housing cover and the circumferential rubber sealing ring in the housing is not damaged and is correctly seated in the groove.

Screw the housing cover tight using the two housing cover screws.

### Commissioning

**Before commissioning the servo motor the Safety Information on Page 2 and Safety advice in Section 2 must have been read.**

Switch on the power supply to the servo motor.

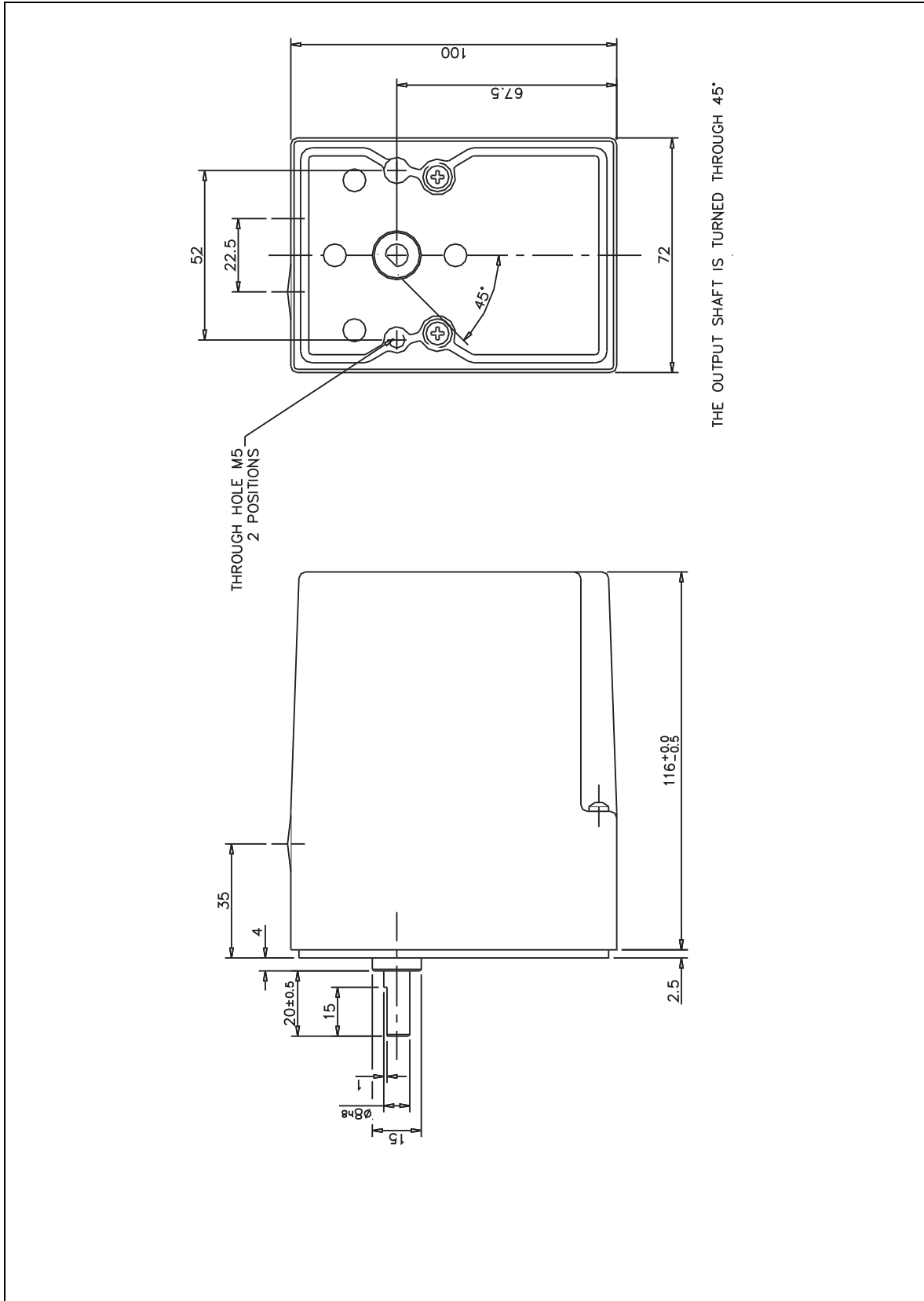
Drive the servo motor via the controller or by hand and check the correct functioning of the servo motor, the microswitches and of the actuating element.

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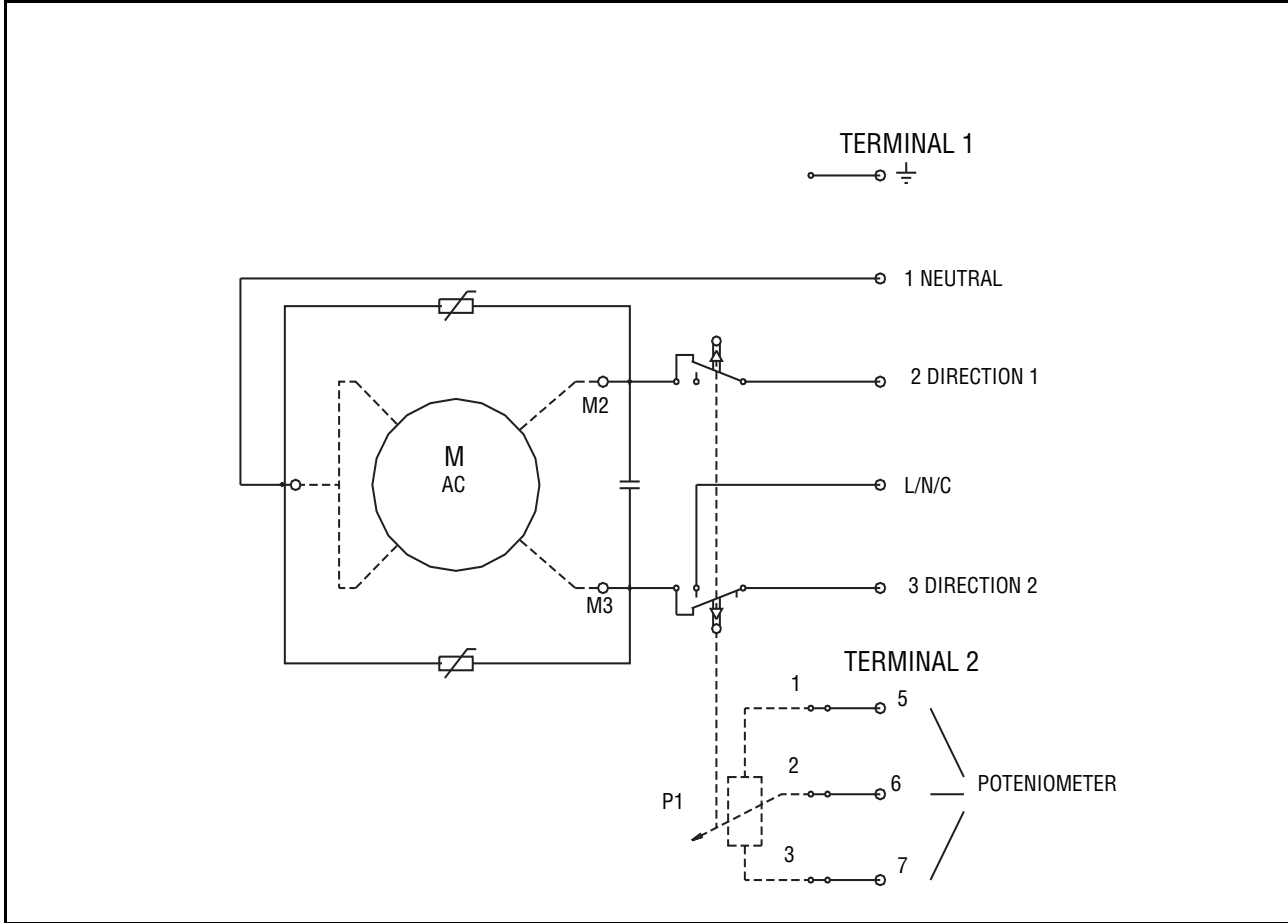
## TECHNICAL DATA

Actuating time for 90° angle of rotation:	30 s
Nominal torque:	4 Nm / 3 lb.-ft.
Holding torque:	2.5 Nm / 1.8 lb.-ft.
Max. revolutions on the output drive shaft:	270°
Nominal voltage	
Type NX04-1:	120 V AC~± 10%, 50/60 Hz
Type NX40-2:	230 V AC~± 10%, 50/60 Hz
Nominal power consumption:	5 VA
Angle of rotation limited by:	2 microswitches
Degree of protection:	IP 31 NEMA 2
Installation position:	Any
Working temperature range:	14°F - 140°F (- 10°C to + 60°C)
Duty cycle:	100%
Drive:	2-wire circuit
Potentiometer, single turn conductive plastic	5k ohm
Linearity	
	± 1%
Weight:	0.7 kg

**FIGURE 4. DIMENSIONS NX04 SERVO MOTOR**



**FIGURE 5. WIRING DIAGRAM NX04 SERVO MOTOR**



**NOTICE**

When Fireeye products are combined with equipment manufactured by others and/or integrated into systems designed or manufactured by others, the Fireeye warranty, as stated in its General Terms and Conditions of Sale, pertains only to the Fireeye products and not to any other equipment or to the combined system or its overall performance.

**WARRANTIES**

FIREYE guarantees for *one year from the date of installation or 18 months from date of manufacture* of its products to replace, or, at its option, to repair any product or part thereof (except lamps and photocells) which is found defective in material or workmanship or which otherwise fails to conform to the description of the product on the face of its sales order. **THE FOREGOING IS IN LIEU OF ALL OTHER WARRANTIES AND FIREYE MAKES NO WARRANTY OF MERCHANTABILITY OR ANY OTHER WARRANTY, EXPRESS OR IMPLIED.** Except as specifically stated in these general terms and conditions of sale, remedies with respect to any product or part number manufactured or sold by Fireeye shall be limited exclusively to the right to replacement or repair as above provided. In no event shall Fireeye be liable for consequential or special damages of any nature that may arise in connection with such product or part.