AUTOFLAME®
Combustion Management Systems

www.fiammac.com
فیاماک، نماینده انحصاری
شرکت اتوفلیم
در ایران

AUTOFLAME SERVOMOTORS GUIDE

Fiammac

04.08.2020

1. AUTOFLAME SERVOMOTORS

Autoflame servomotor is a rotary type electric actuator, used with Autoflame's Mk8 MM and Mini Mk8 MM Micro Modulation systems to achieve ultimate positioning accuracy for boiler and burner applications which in turn guarantees unmatchable control precision, accuracy, efficiency, repeatability and reliability.

Autoflame offers three standard types of servomotors; small, large and industrial, which can be used for all control channels. Autoflame fuel and FGR valves require small or large servomotors only. All servomotors can be configured to drive clockwise or counter clockwise to open/close a valve or damper. The servomotors can be installed in any orientation.

The servomotors applications include:

- Main, primary or secondary air damper
- Forced draught damper
- Induced draught damper
- Gas and/or oil fuel control valves
- Fuel atomisation
- FGR valve/damper
- Feedwater valve
- Draught control damper
- TDS control valve
- Bottom Blowdown Valve
- NOx reduction systems

Autoflame servomotors offer the following feature:

- Ultra-high accuracy level
- Lightweight
- Compact design suitable for narrow spaces
- Simple structure maximises reliability
- Can be mounted straight into Autoflame gas or oil valves/dampers
- Mounting bracket available for use with third party valves/dampers
- Easy access to wiring terminals for installation, maintenance and testing
- Simple wiring connection using a terminal block integrated into the servomotor
- Optional flying lead connector for quick, trouble free installation and replacement
- 2 years limited warranty

1.1. Servo Motor Sizes

The following servomotors are available

Servo Type	Max. Torque Nm	Max. Torque ft.lb
Small	4	3
Large	25	18
UNIC05	40	30
UNIC10	98	72
UNIC20	196	145
UNIC40	392	289

The load that the servomotor is used to drive should not exceed the maximum torque rating of the servomotor. With Autoflame supplied valves, the correct servomotor size is already specified by Autoflame.

To correctly size an Autoflame servomotors for use with a third party valves or dampers, the torque required to drive that valve or damper should be checked, this in order to select a servomotor with sufficient torque to drive the damper reliably. Please check the manufacturer's specifications for that valve or damper to check the torque requirements.

If this is unknown or the data is not available, then it is necessary to check the torque required to drive the valve/damper using a torque meter. The torque should be measured when the valve/damper is fully loaded. For example, for an air damper, that will be when the fan motor / VSD is driven at maximum speed. It is recommended that a nominal 20% is added to the measured torque value to determine the type of servomotor required for the application. This nominal 20% takes into account any factors such as dust, rust, and lack of lubrication experienced between service intervals which can make the valve/damper require more torque.

$$Servomotor\ Torque = Measured\ torque\ at\ max.load\ x\ 1.2$$

For example if the measured torque to drive an air damper at full load is 19Nm;

$$Servomotor\ Torque = 19\ x\ 1.2 = 22.8Nm$$

Therefore a large servomotor may be selected for this damper.

2. SMALL SERVOMOTORS

Small servomotors provide a maximum torque of up to 4Nm, they are compact, lightweight, extremely durable and can be used for variety of applications including controlling air dampers, gas and oil fuel valves. The housing is made from high impact Acrylonitrile Butadiene Styrene (ABS) for lighter weight and easier installation.

ATEX approved version with metal housing is also available for use in hazardous environments where explosion proof equipment is necessary.

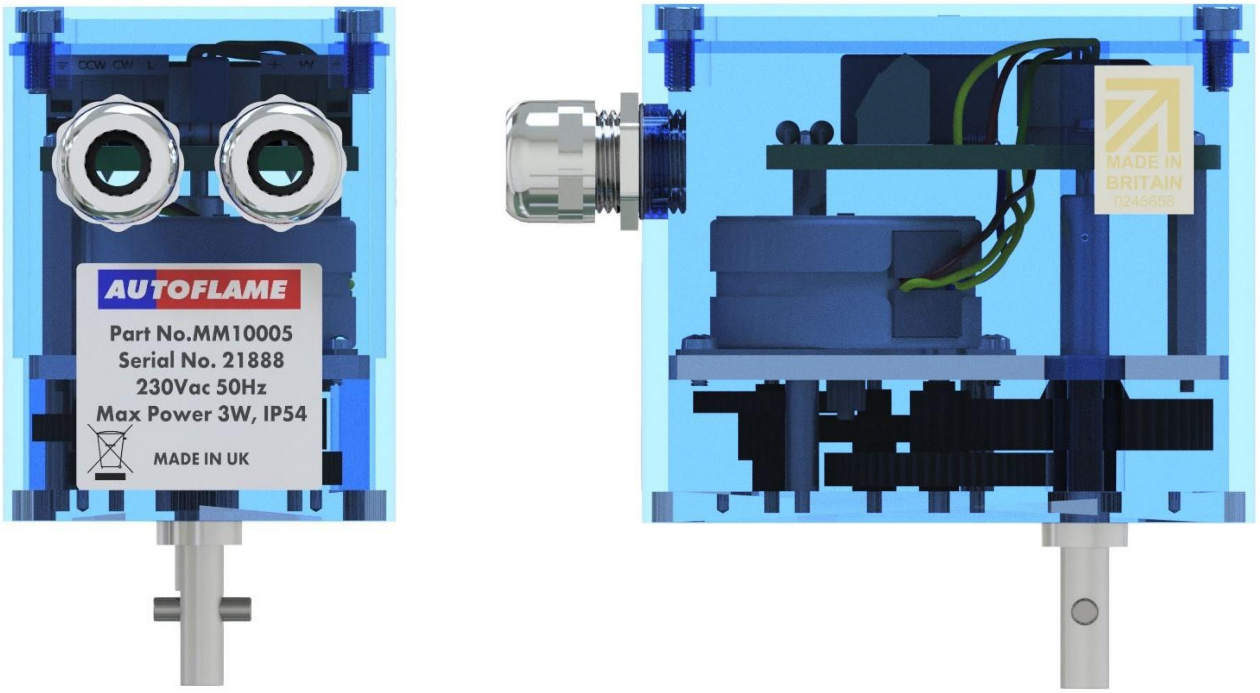
The following small servomotors are available:

Voltage – V AC	Frequency	Supplied Wiring Glands	Part #
230	50Hz	2x PG11 Metal Glands	MM10005
110	60Hz	2x M20 - 1/2" NPSM Adaptors	MM10005/A
24	50Hz	1x M20 - 1/2" NPSM and Blanking Plug	MM10005/C
24	60Hz	1x M20 - 1/2" NPSM and Blanking Plug	MM10005/D
110	50Hz	2x M20 - 1/2" NPSM Adaptors	MM10005/E

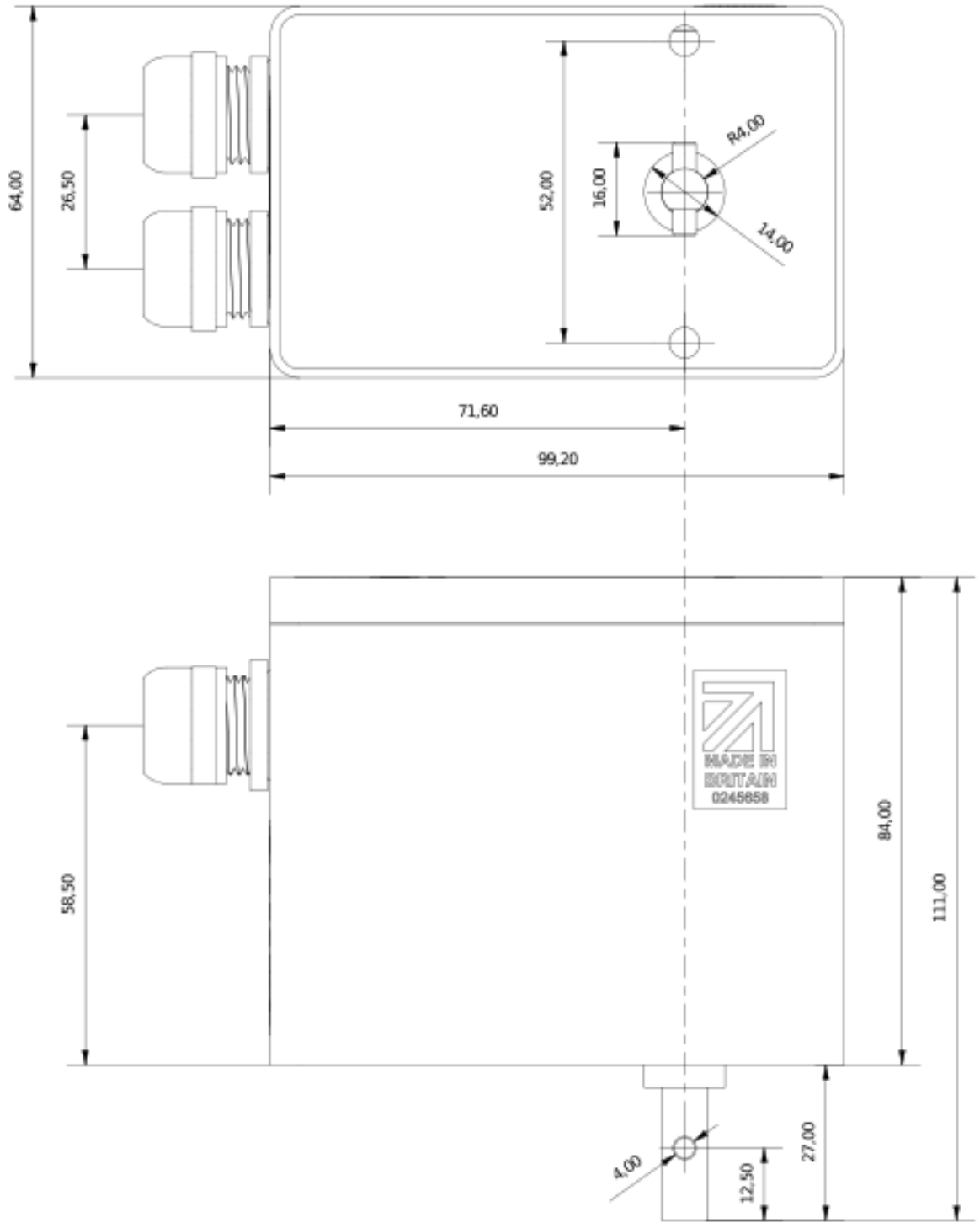
2.1. Specifications

Supply voltage	AC - Dependent on part number
Output torque at shaft	4Nm (3ft lbs.)
Rotation angle	360°
Operation angle	-6° to 96°
Accuracy	Up to 0.1°, 900 positions available
Max. rated power	3W
Min. operation temperature	0˚C (32° F)
Max. operation temperature	60° C (140° F)
Ingress Protection rating	IP54, NEMA3
Mounting angle	360°
Positioning	MM drive
Drive motor	Synchronous
Body material	High Impact Polycarbonate
Gear material	Polyoxymethylene
Plates material	Aluminum
Screws material	Stainless Steel
Dimension (LxWxH)	100 x 84 x 65.5 mm
Wiring connection (230V)	PG11 gland
Wiring connection (24V, 110V)	½” conduit adaptor and blanking plug
Lid screws	4 x M4 x10 Stainless steel socket head
Lid screw torque	0.2 to 0.4 Nm
Body mounting screws	2 x M5 x 25 Stainless socket head
Body mounting torque	1.2 – 2.6 Nm
Shipped Weight	0.55 kgs. (1.2 lbs)

2.2. External View



2.3. Dimensions



All dimension in millimetres: 1 inch = 25.4 mm

3. LARGE SERVOMOTOR

Large servomotors provide a maximum torque of up to 25Nm, they are extremely durable and can be used for variety of applications including controlling air dampers, gas and oil fuel valves, FGR, feedwater valves and many other applications.

Large servomotors are available in metal (powder coated mild steel) housing as well as an option for high impact Acrylonitrile Butadiene Styrene (ABS). ATEX approved version is also available for hazardous environments where the use of explosion proof equipment is required.

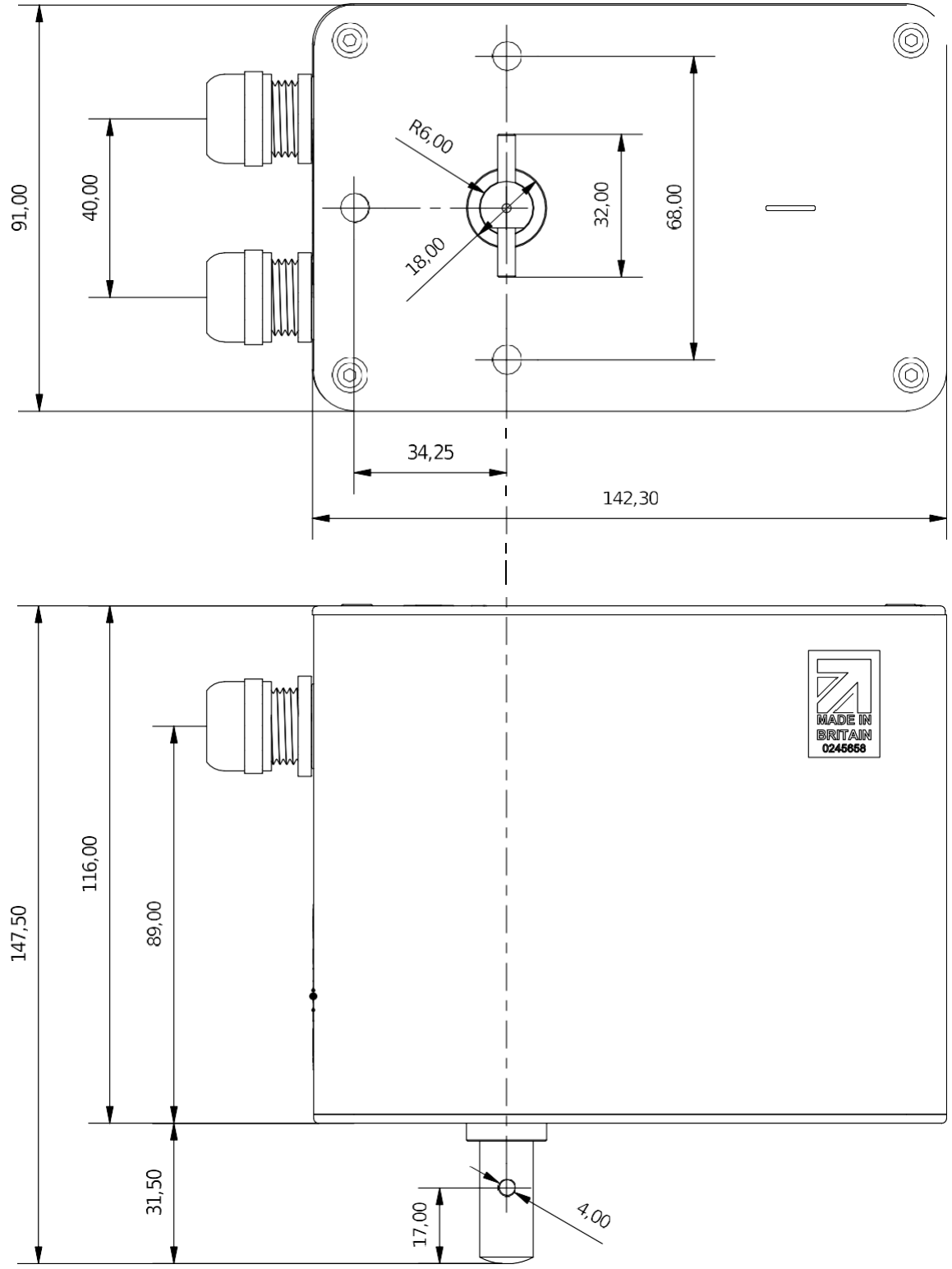
Housing	Voltage - AC	Frequency	Supplied Wiring Glands	Part #
Polycarbonate	230V	50/60Hz	2x PG11 Glands	MM10400
Polycarbonate	230V	50/60Hz	1x PG11 - 1/2" NPSM & 1x Blanking Plug	MM10400/NPSM
Polycarbonate	110V	50/60Hz	2x PG11 Glands	MM10400/A
Polycarbonate	24V	50/60Hz	1x PG11 - 1/2" NPSM & 1x Blanking Plug	MM10400/D
Metal	230V	50/60Hz	2x PG11 Glands	MM10004
Metal	230V	50/60Hz	1x PG11 - 1/2" NPSM & 1x Blanking Plug	MM10004/NPSM
Metal	110V	50/60Hz	2x PG11 Glands	MM10004/A
Metal	24V	50/60Hz	1x PG11 - 1/2" NPSM & 1xBlanking Plug	MM10004/D

3.1. Specifications

Supply voltage	AC - Dependent on part number
Output torque at shaft	25Nm (18ft lbs.)
Rotation angle	360°
Operation angle	-6° to 96°
Accuracy	Up to 0.1°, 900 positions available
Max. rated power	9W
Min. operation temperature	0˚C (32° F)
Max. operation temperature	60° C (140° F)
Ingress Protection rating	IP65, NEMA4
Mounting angle	360°
Positioning	MM drive
Drive motor	Synchronous
Housing material (polycarbonate)	High Impact Polycarbonate
Housing material (metal version)	Mild steel CR4 with Interpon 700 Industrial Powder Coat
Gear material	708M40T mild steel
Plates material	Aluminum
Screws material	Stainless Steel
Dimension (LxWxH)	See relevant drawing
Wiring connection (230V)	PG11 gland
Wiring connection (24V, 110V)	½" conduit adaptor and blanking plug
Lid screws	4 x M4x10 Stainless steel socket head
Lid screw torque	0.2 to 0.4 Nm
Body mounting screws	2 x M5x25 Stainless socket head
Body mounting torque	1.2 – 2.6Nm
Shipped Weight (Polycarbonate)	1.75 kgs. (3.85 lbs)
Shipped Weight (Metal version)	1.85 kgs. (4.1 lbs)

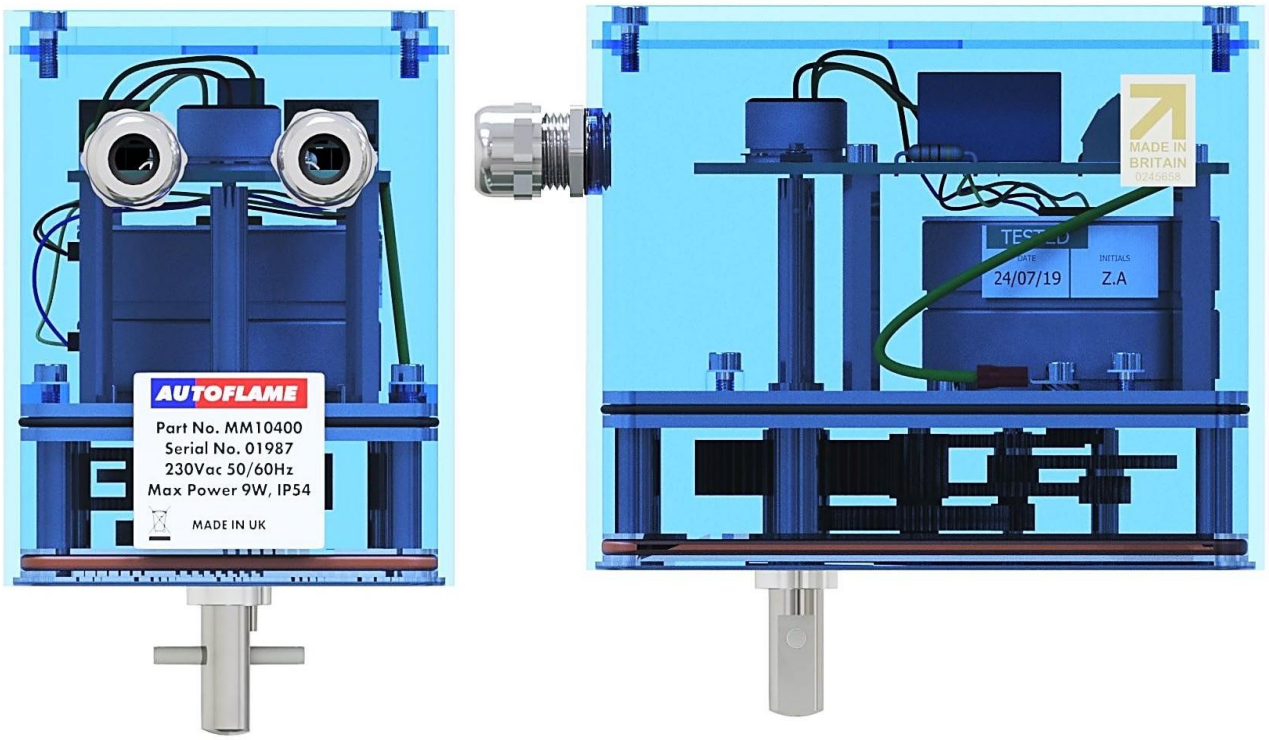
3.2. External View – Metal Housing

3.3. Dimensions – Metal Housing

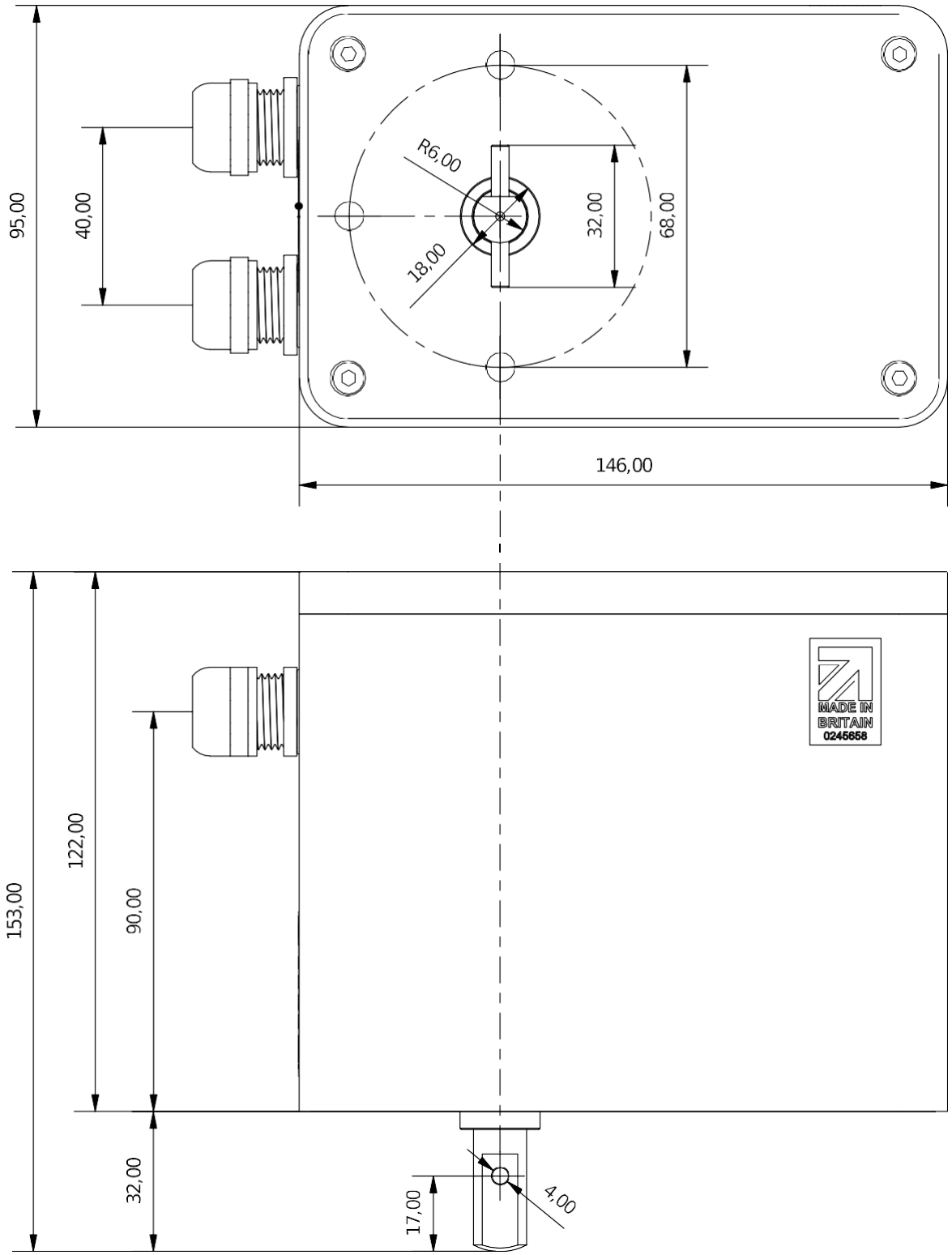


All dimension in millimetres: 1 inch = 25.4 mm

3.4. External View – Polycarbonate Housing



3.5. Dimensions – Polycarbonate Housing



All dimension in millimeters: 1 inch = 25.4 mm

4. INDUSTRIAL UNIC SERVOMOTORS

The industrial servomotor is a rotary type electric actuator for use with the MM systems. It is available in 4 sizes with torque output ranging from 40 to 400Nm. The UNIC servomotors can be used for air dampers and water valves.
A 4-20mA version of the UNIC servomotors is available for use on the analogue channels on the MMs as well as for controlling feedwater valves.

The industrial servomotors feature:

- Light, compact design.
- High torque output.
- Built-in thermal protector to prevent motor burnout by overloading.
- Easy to install and suitable for use in narrow spaces.
- Simple structure design.
- Mounting bracket and coupling available for direct mounting onto air dampers or valves.
- Manual operation is possible with the included manual crank handle.
- Simplified wiring using internal terminal block.
- Available in 230V, 110V AC for use with the Mk8 MM and Mini Mk8 MM.
- 24V DC version available for use with Autoflame Bottom Blowdown modules.
- ATEX approved version is available for hazardous environments.
- 4-20mA version for use with MM analogue output channels.

The following UNIC servomotors are available:

UNIC	Voltage V AC	Torque Nm	Torque ft lb	Part #
UNIC05	230	40	30	MM10070
UNIC05	110	40	30	MM10070/110
UNIC05	120	40	30	MM10070/120
UNIC10	230	98	72	MM10072
UNIC10	110	98	72	MM10072/110
UNIC10	120	98	72	MM10072/120
UNIC20	230	200	148	MM10074/B
UNIC20	120	200	148	MM10074/B/110
UNIC40	230	400	295	MM10078
UNIC40	110	400	295	MM10078/110

24V DC version is available for use with Autoflame Bottom Blowdown Modules:

UNIC	Voltage V DC	Torque Nm	Torque ft lb	Part #
UNIC05	24	40	30	BBA10070
UNIC10	24	98	72	BBA10072

4.1. Specifications

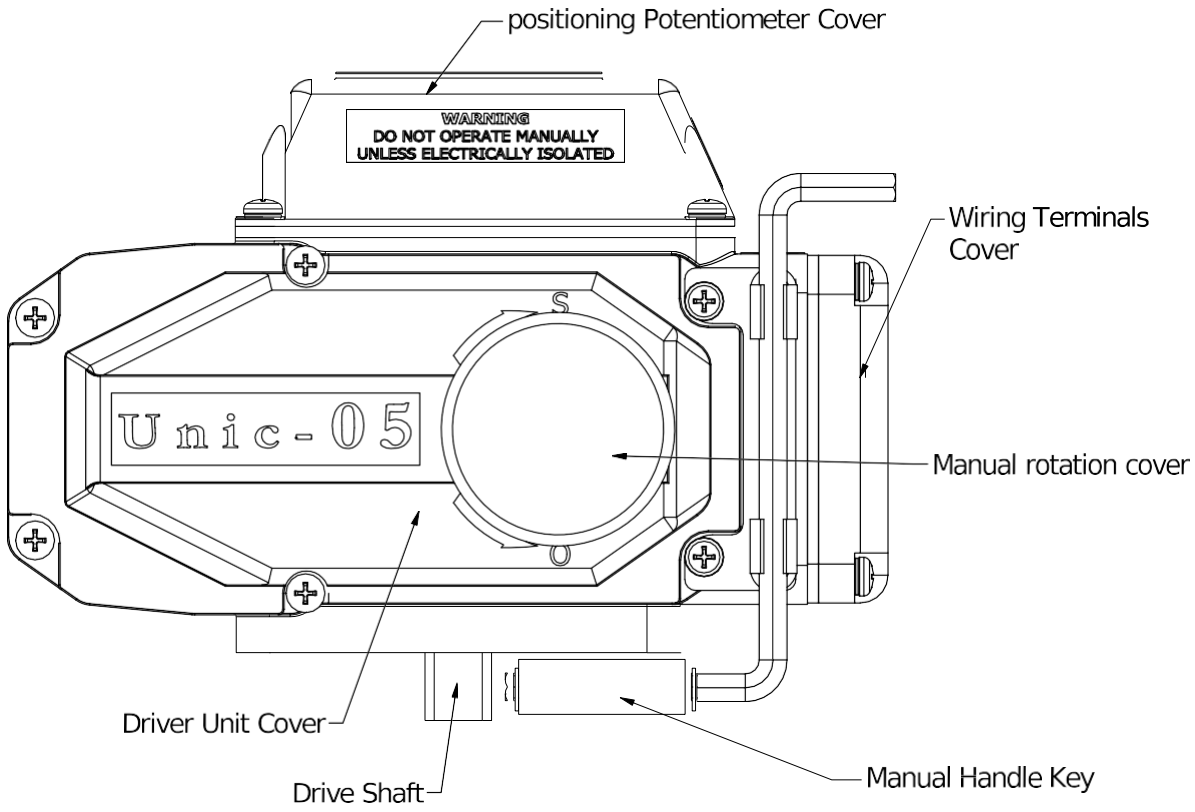
The following specifications are universal for all the UNIC servomotors:

Operation angle	0.0° to 90.0°
Drive Time (0° to 90°)	15 to 30 seconds @ 50Hz (nominal)
Accuracy	Up to 0.5°, 180 positions available
Max. rated power	9W
Min. operation temperature	-25˚C (-13° F)
Max. operation temperature	55° C (131° F)
Ingress Protection rating	IP65 (NEMA4X)
Protector	Thermal protector
Stop	Mechanical type (open/close)
Mounting angle	360°
Positioning	MM drive
Drive motor	Synchronous
Insulation Resistance	100mΩ/ 500VDC
Withstand Voltage	1500VAC/ minute
Manual Operation	Crank handle included
Housing material	Die cast aluminum ADC - 12
Finish	Industrial baking varnish
Dimension (LxWxH)	See relevant drawing
Wiring connection	2x ½" BSPP (male) to ½" NPSM (female)

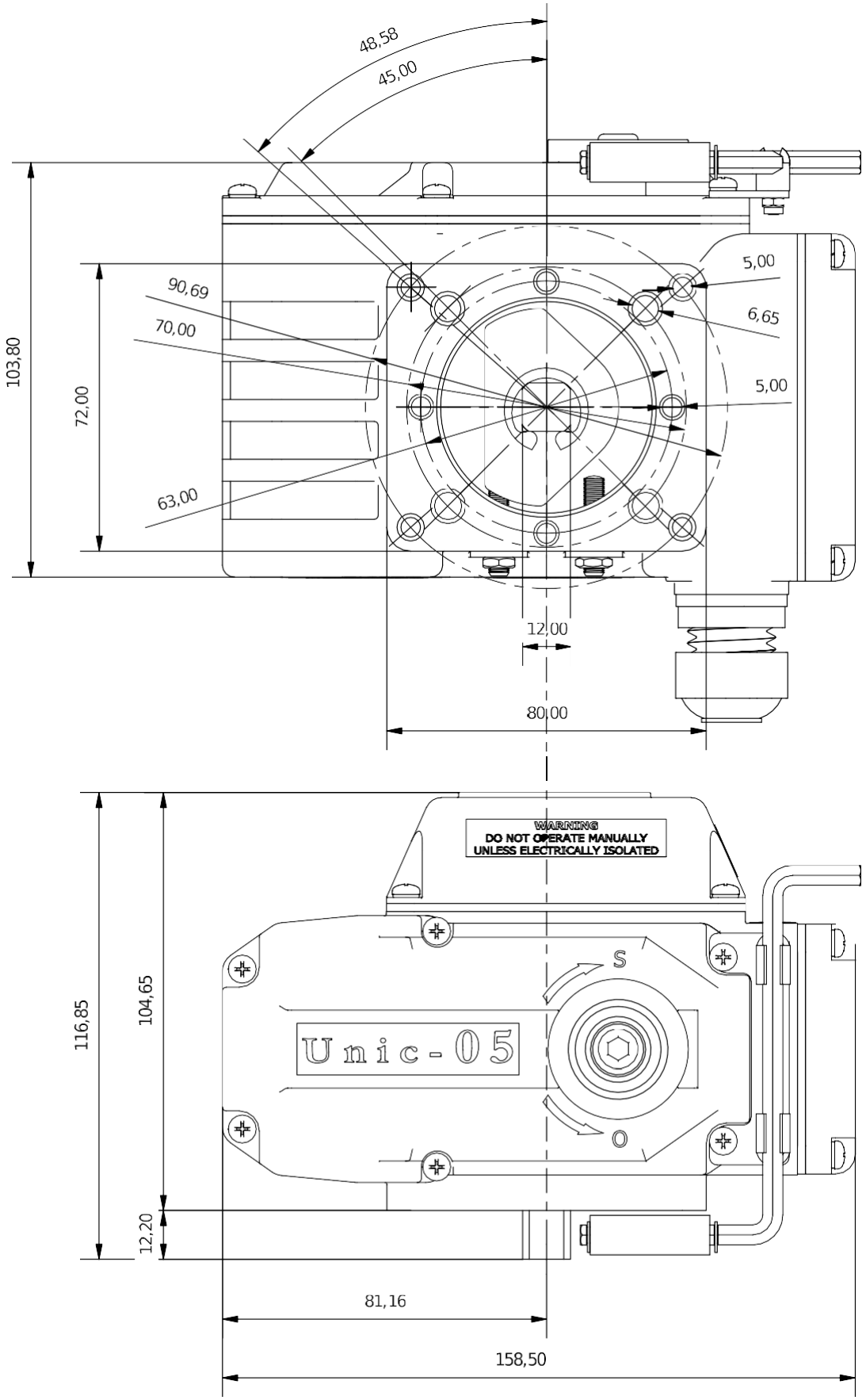
The following specifications are unique for each UNIC servomotor:

	UNIC05	UNIC10	UNIC20	UNIC40
Torque at shaft	39.2Nm (29 Lb.ft)	98Nm (72 Lb.ft)	196Nm (145 Lb.ft)	392Nm (289 Lb.ft)
Drive motor	8W	20W	30W	90W
Wight	2.3Kg	4.5Kg	7.8Kg	8.5Kg
Rotation angle	360	90	90	90
Mechanical stopper	-	Adjustable	Adjustable	Adjustable
Rated current (230V version)	0.25/0.30A	0.30/0.35A	0.50/0.55A	0.7/0.9A
Rated current (120V version)	0.6/0.7A	0.60/0.65A	1.0/1.1A	1.6/1.8A
Rated current (110V version)	0.7/0.9A	0.65/0.70A	1.1/1.2A	1.8/2.0A

4.2. External Drawings

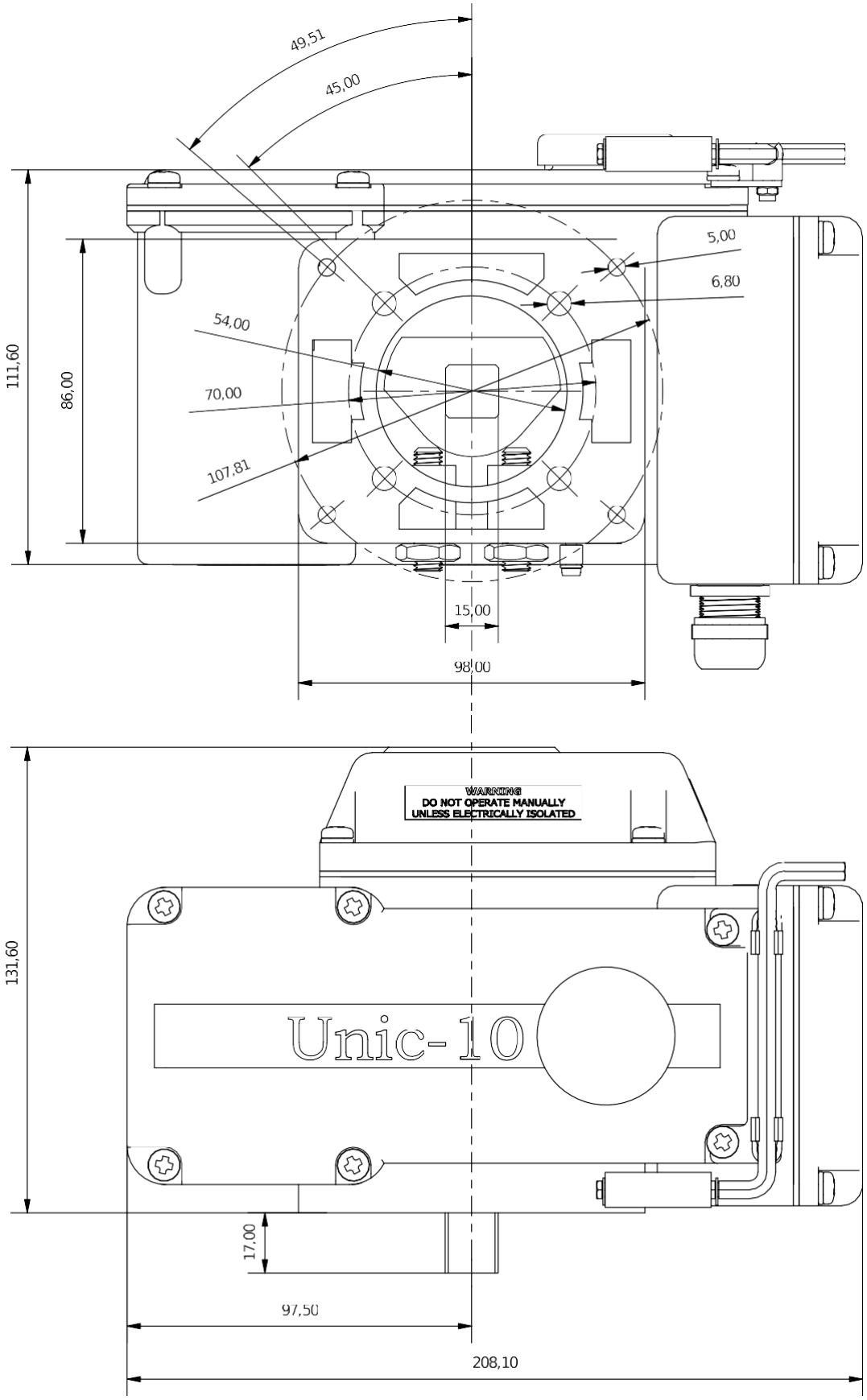


4.3. UNIC05



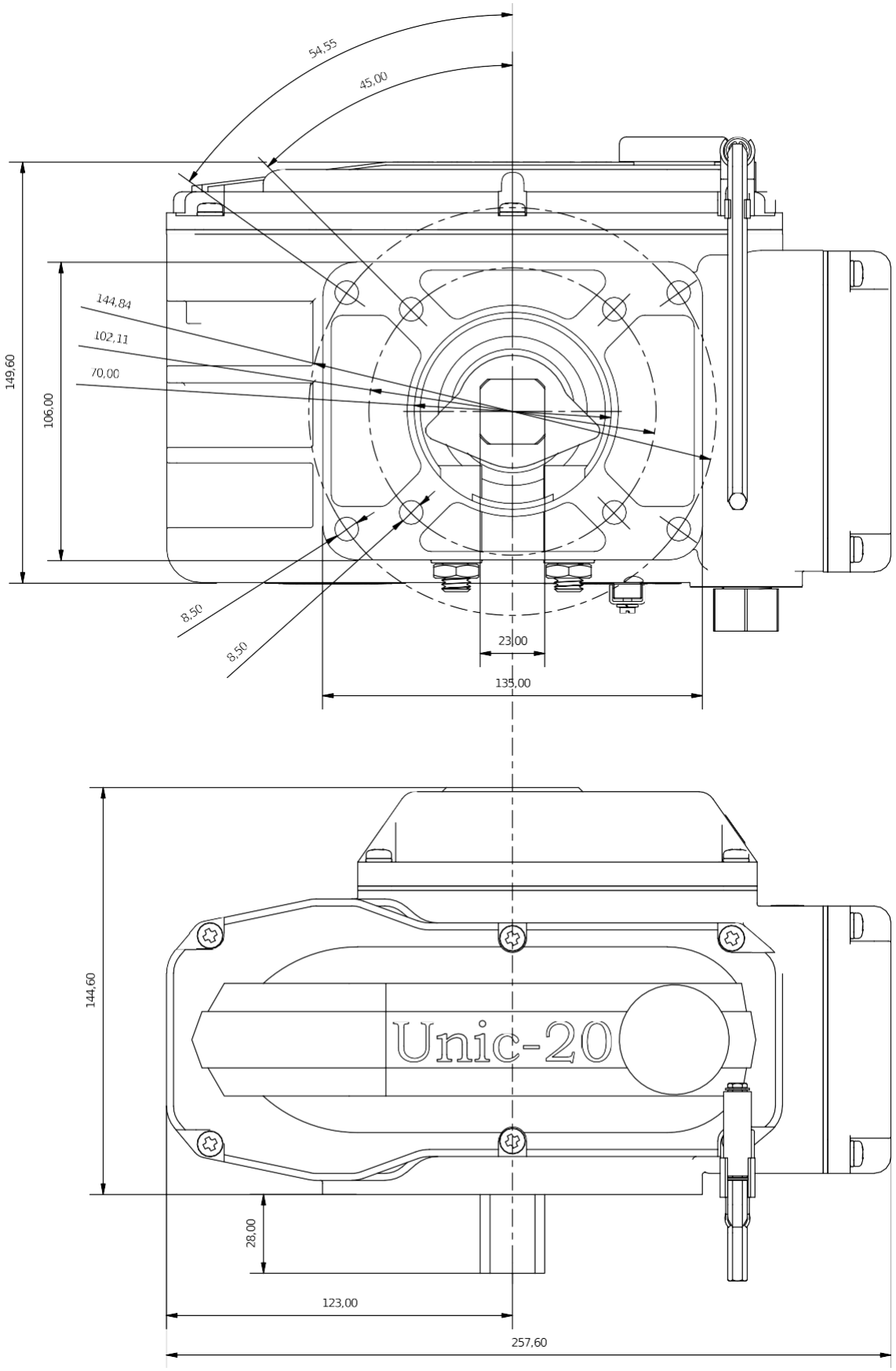
All dimension in millimetres: 1 inch = 25.4 mm

4.4. UNIC10



All dimension in millimetres: 1 inch = 25.4 mm

4.5. UNIC20 & UNIC40



All dimension in millimetres: 1 inch = 25.4 mm

4.6. Manual Operation

Autoflame UNIC servomotors can be turned manually. Before starting manual operation, the power to the servomotor must be isolated/ switched off, failing to do so can cause serious injury and will permanently damage the servomotor.

I. Remove rubber cap covering the manual drive port.
II. insert the manual handle key into the hexagonal port.
III. Turn the manual handle clockwise, the shaft moves in the CLOSE direction.
IV. Turn the manual handle counter clockwise, the shaft moves in the OPEN direction.

Important Notes:

- Do not over-turn the handle with excessive force or if the valve/damper is stuck/showing abnormal resistance; this will cause permanent damage to the servomotor and damper/valve.
- If power is not disconnected when driven manually, then the servomotor will try to automatically drive to its original position during manual operation. This will damage the servomotor and may cause physical injury.
- UNIC 10, 20 & 40 servomotors rotation is limited to 90°, overdriving the servomotors can cause permanent damage.

4.7. Industrial Servomotors 4-20mA

The UNIC industrial servomotors are available as special version that can be controlled using analogue 4-20mA signal, which enable the servomotors to be controlled via the analogue current signal from the MM.

The following channel outputs can be used on the MM to drive the 4-20mA UNIC servomotors:

MM system	Channel
Mk8 MM	Ch5, Ch6, Feedwater servomotor/VSD analogue output
Mini Mk8 MM	Ch4

The following 4-20mA UNIC servomotors are available:

UNIC Size	Voltage V AC	Torque Nm	Torque ft lb	Part #
UNIC10	230	98	72	MM10073
UNIC10	110	98	72	MM10073/110
UNIC20	230	200	148	MM10079
UNIC20	120	200	148	MM10079/110
UNIC40	230	400	295	MM10080
UNIC40	110	400	295	MM10080/110
UNIC40	110	400	295	MM10080/120

5. ATEX APPROVED SERVOMOTORS

Special versions of Autoflame servomotors are available with ATEX approval for use in hazardous environments where Explosion Proof equipment is required.

5.1. ATEX Certification

The following instructions are specific to hazardous area installations (in accordance with IEC 60079-0:2011 clause 30) The following instructions relevant to safe use in a hazardous area apply to equipment listed in section 5 of this manual; Positioning Motors covered by certificate number Sira 19ATEX4141X Issue 3.

- The certification marking is as follows:
- *(Servomotor's Part Number)* Positioning Motors
- II 3G
- Ex nA nL IIC T4
- Ta = - 20°C to + 40°C
- Entity parameters of the Motor terminal (J2):
- The equipment may be used in zone 2 with flammable gases and vapours with apparatus groups IIA, IIB & IIC and with temperature classes T1, T2, T3 & T4.
- The equipment is only certified for use in ambient temperatures in the range -20ºC to +40ºC and should not be used outside this range.
- Installation shall be carried out in accordance with the applicable code of practice by suitably-trained personnel
- There are no special checking or maintenance conditions other than a periodic check.
- With regard to explosion safety, it is not necessary to check for correct operation.
- The equipment contains no user-replaceable parts and is not intended to be repaired by the user. Repair of the equipment is to be carried out by the manufacturer, or their approved agents, in accordance with the applicable code of practice.
- Repair of this equipment shall be carried out in accordance with the applicable code of practice
- If the equipment is likely to come into contact with aggressive substances, e.g. acidic liquids or gases that may attack metals or solvents that may affect polymeric materials, then it is the responsibility of the user to take suitable precautions that prevent it from being adversely affected thus ensuring that the type of protection is not compromised.
- The certificate number has an 'X' suffix which indicates that special conditions of installation and use apply. Those installing or inspecting this equipment must have access to the contents of the certificate or these instructions. The conditions listed in the certificate are reproduced below:
    - Do not open, maintain or service in an area where an explosive atmosphere may be present.
    - All cable entry holes shall be fitted with either a certified cable gland or a certified stopping plug that is suitable for the application.
    - The area in which the equipment is to be used shall be a minimum of Pollution degree 2 as defined in IEC 60664-1.
    - "Transient protection shall be provided that is set at a level not exceeding 140% of the peak rated voltage value at the motor assembly supply terminals to the equipment".
    - The equipment must be mounted on a metallic frame that has earth bonding facility.

- To ensure IP65 rating servo must be installed using the provided servo to valve gasket and mounting screws tightened to a minimum torque of 2.6Nm and servo lid screws to a minimum 1.2Nm.
- Atex approved Cable glands must be used, the enclosure has M20 tapped holes for this purpose
- Atex certified cables must be used to comply with approval
- An Atex approved isometric safe opto-isolator must be used on the low voltage circuit between the servo and the MM.
- The terminals shall be fitted with wires that have cross sectional area falling within the following limitations:
- Conductor cross section area min. 0.25 mm^2 and max. 1.5 mm^2
- Conductor cross section AWG min. 26 and max. 14
- Tightening torque, min 0.5 Nm and max 0.6 Nm
- Insulated ferule type connectors or equivalent connectors shall be used for external connections.
- The potentiometer connections (+V, 0V and W) shall only be terminated to an Autoflame MM Controller.

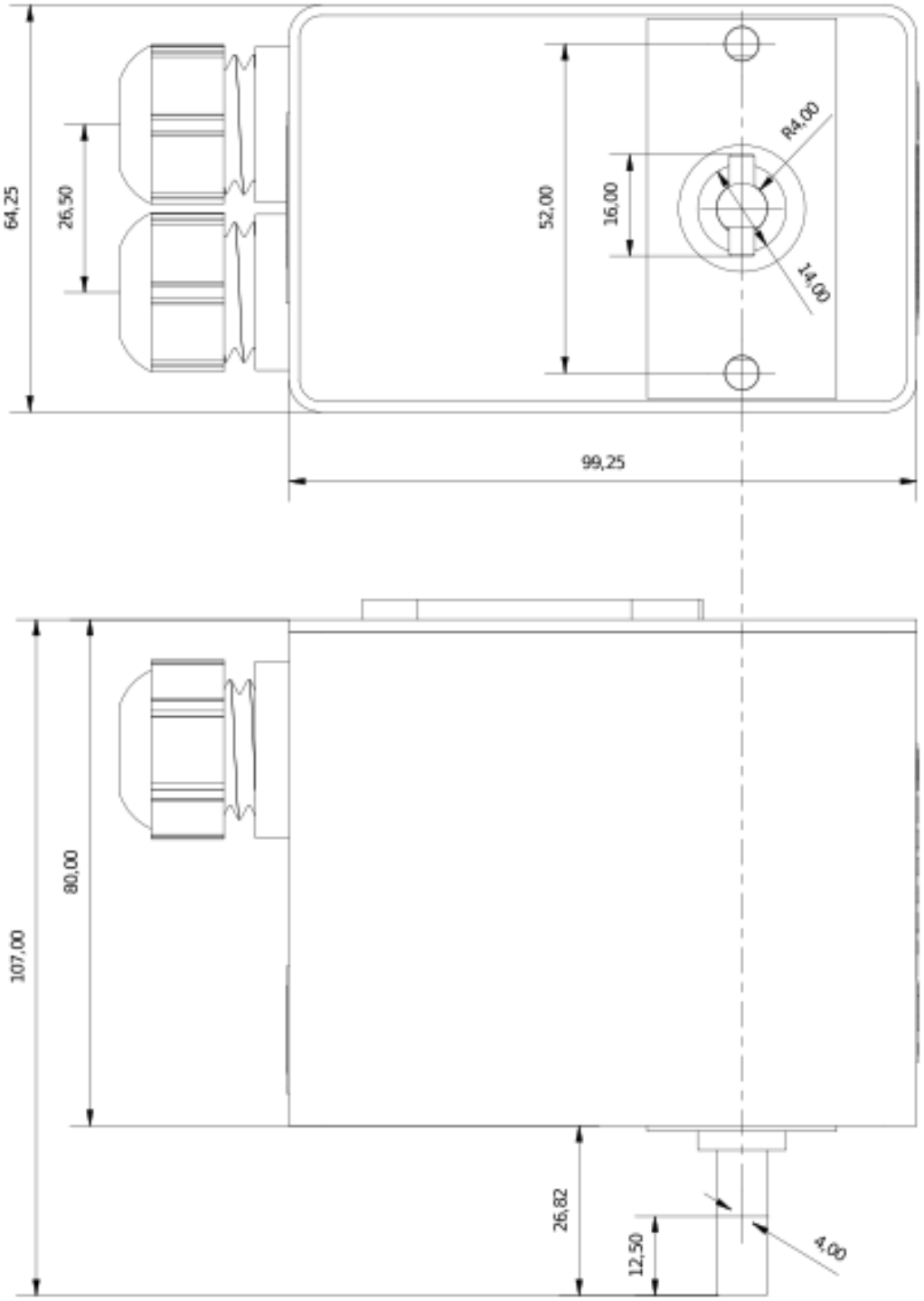
5.2. ATEX Approved Small Servomotors

The following ATEX approved small servomotors are available:

Voltage V AC	Frequency	Torque Nm	Supplied Wiring Glands	Part #
230	50Hz	4	-	MM10005/EXP
230	60Hz	4	-	MM10005/B/EXP
110	60Hz	4	-	MM10005/A/EXP
24	50Hz	4	-	MM10005/C/EXP
24	60Hz	4	-	MM10005/D/EXP

ATEX approved small servomotor

Note: Standard cable glands are supplied with the ATEX servomotor. The ATEX glands shown in the picture are not included. ATEX certified glands must be used for the ATEX approval to apply to the servomotor.



All dimension in millimetres: 1 inch = 25.4 mm

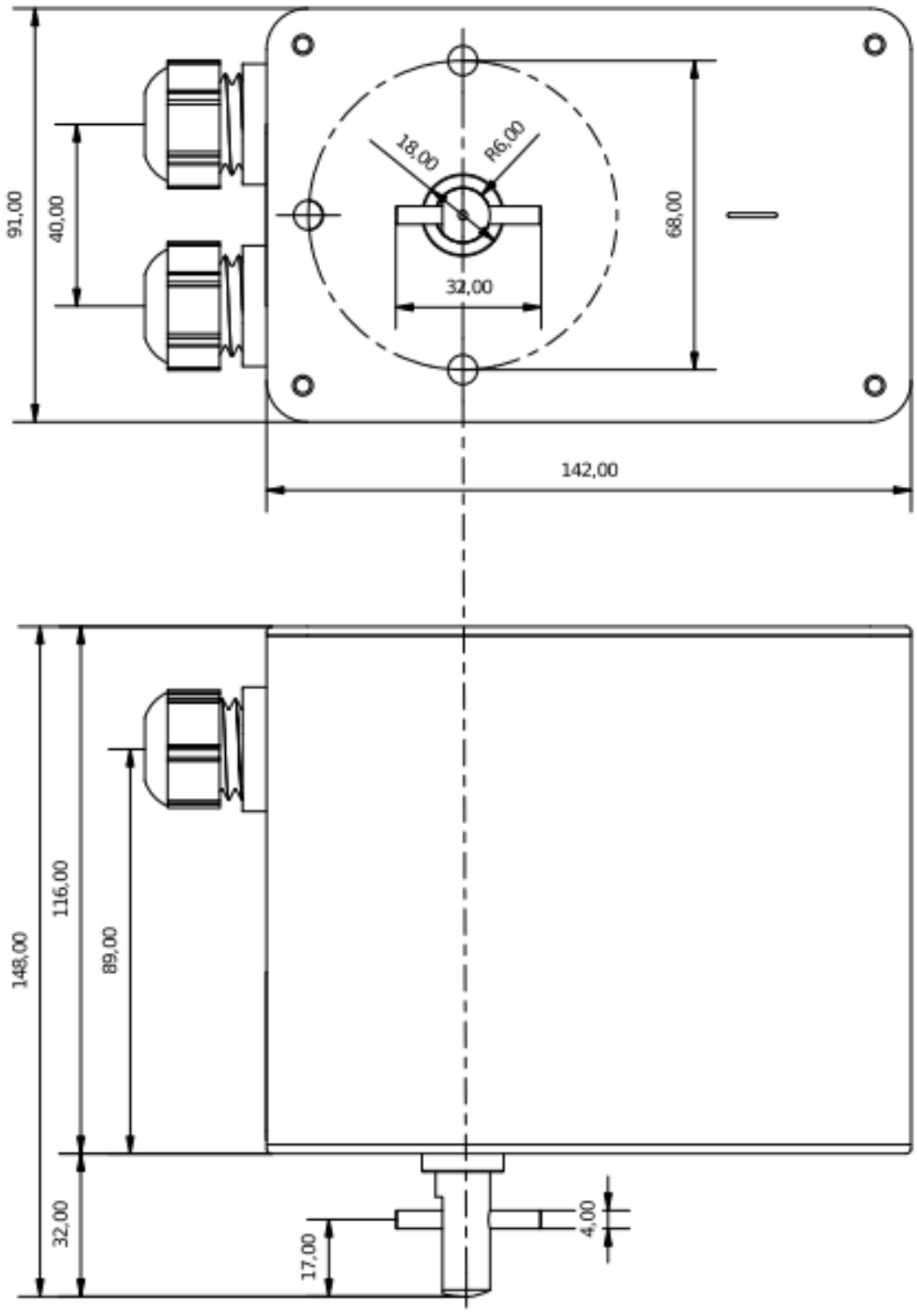
5.3. ATEX Approved Large Servomotors

The following ATEX approved large servomotors are available:

Voltage - AC	Frequency	Torque Nm	Supplied Wiring Glands	Part #
230V	50/60Hz	25	-	MM10004/EXP
110V	50/60Hz	25	-	MM10004/A/EXP
24V	50/60Hz	25	-	MM10004/D/EXP

ATEX approved large servomotor

Note: Standard cable glands are supplied with the ATEX servomotor. The ATEX glands shown in the picture are not included. ATEX certified glands must be used for the ATEX approval to apply to the servomotor.



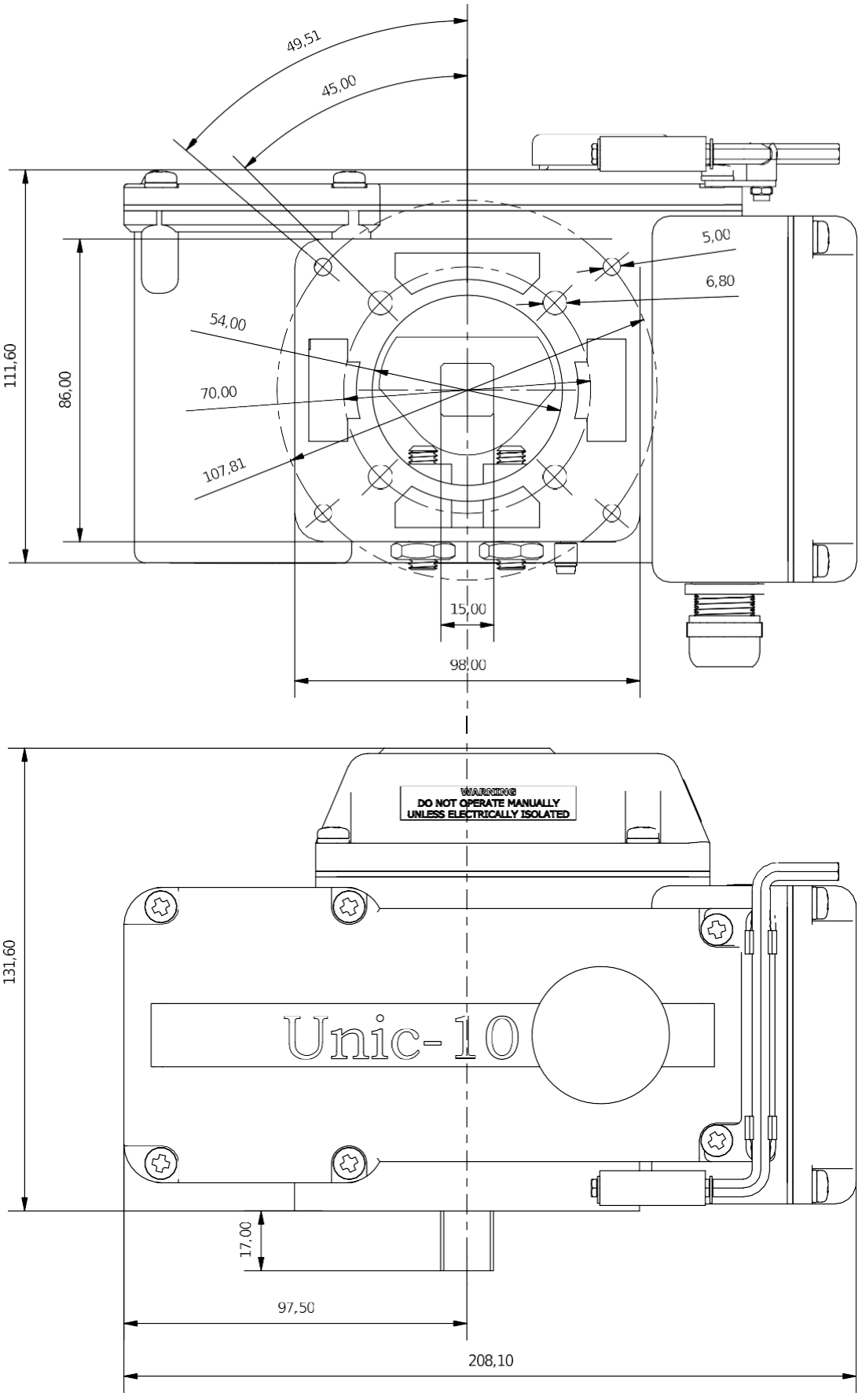
All dimension in millimetres: 1 inch = 25.4 mm

5.4. ATEX Approved Industrial Servomotors

An ATEX approved Industrial UNIC10 servomotor is available.

Voltage AC	Frequency	Torque	Supplied Wiring Glands	Part #
230V	50/60Hz	98	-	MM10072/EXP
120V	50/60Hz	98	-	MM10072/110/EXP

UNIC10 Servomotor – ATEX



All dimension in millimetres: 1 inch = 25.4 mm

6. SERVOMOTORS MOUNTING BRACKETS

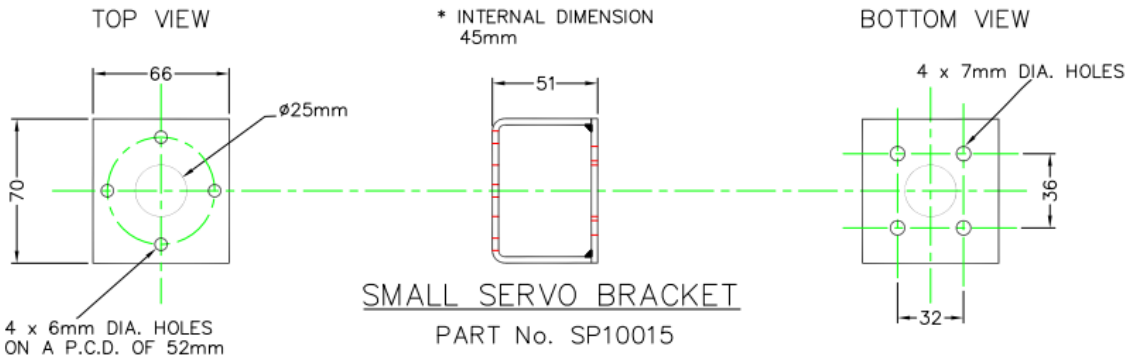
Servomotors mounting brackets and couplings are used to mount the Autoflame servomotor to third party valves or dampers.

The servomotor can be mounted directly and the supplied screws are used to fix the servomotor to the bracket. The coupling is used to connect the servomotor's shaft and pin to the valve or damper, this uses a circular connector, this can be easily drilled on site to suit the shaft of the damper or the valve using HSS drill bit.

Servomotor Size	Bracket and Coupling part #
Small Servo Motor	SP10015
Large Servo Motor	SP10016
Industrial Servo Motor UNIC05	SP10028/05
Industrial Servo Motor UNIC10	SP10028/10
Industrial Servo Motor UNIC20/40	SP10028/20

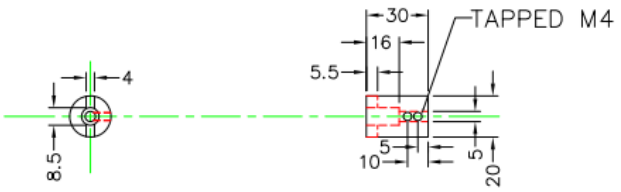
I. Ensure that the servomotor is not powered.
II. Move the damper/valve by hand and make sure that it is free to move.
III. Set the damper/valve at the closed position.
IV. Make sure that the shaft is smooth in motion and there is no decentring/ inclination
V. Mount the servomotor to the bracket and secure using the supplied screws.
VI. Mount this assembly to the damper/valve ensuring that the damper/valve is in the fully closed position and then tighten the bolts and make sure that the assembly is fully secure.

6.1. Small Servomotor Mounting Bracket and Coupling



SMALL SERVO BRACKET

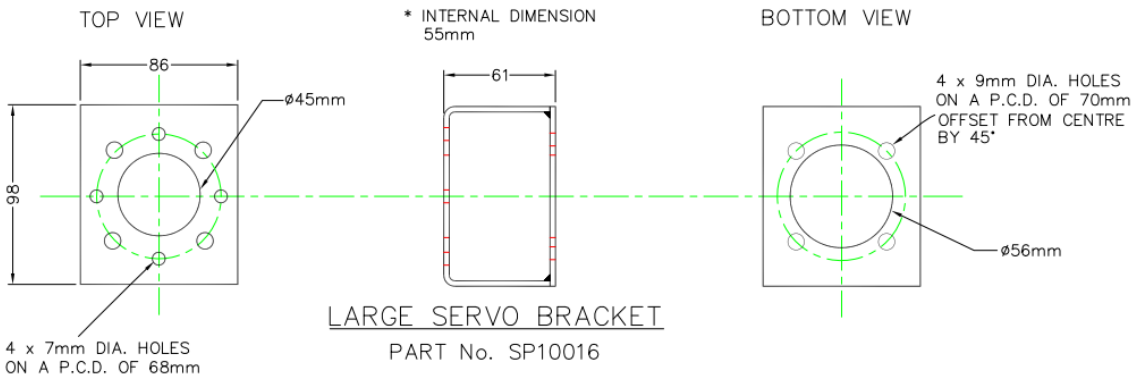
PART No. SP10015



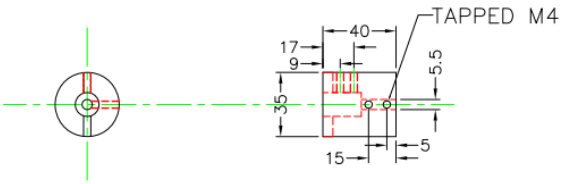
SMALL SERVO COUPLING

PART No. SP10015/C (COUPLING ONLY)

6.2. Large Servomotor Mounting Bracket and Coupling

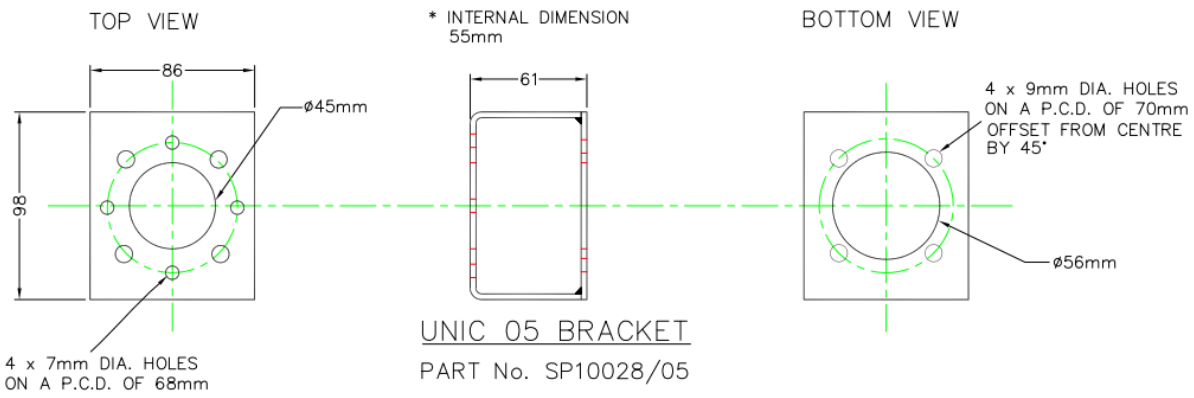


LARGE SERVO BRACKET
PART No. SP10016



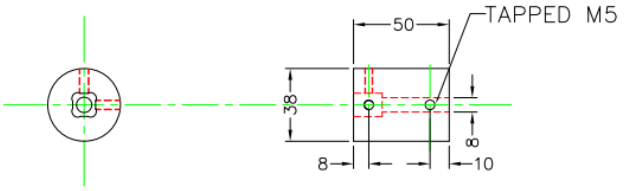
LARGE SERVO COUPLING
PART No. SP10016/C (COUPLING ONLY)

6.3. UNIC05 Mounting Bracket and Coupling



UNIC 05 BRACKET

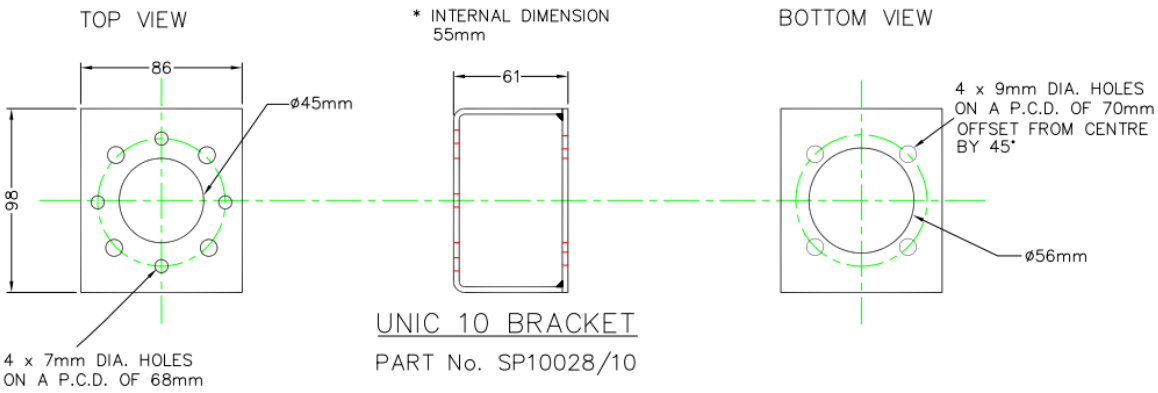
PART No. SP10028/05

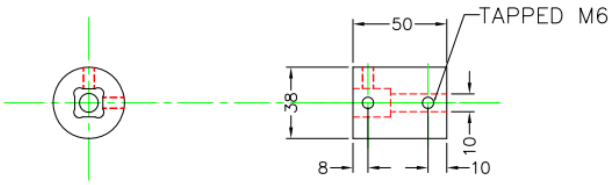


UNIC 05 COUPLING

PART No. SP10028/05/C (COUPLING ONLY)

6.4. UNIC10 Mounting Bracket and Coupling

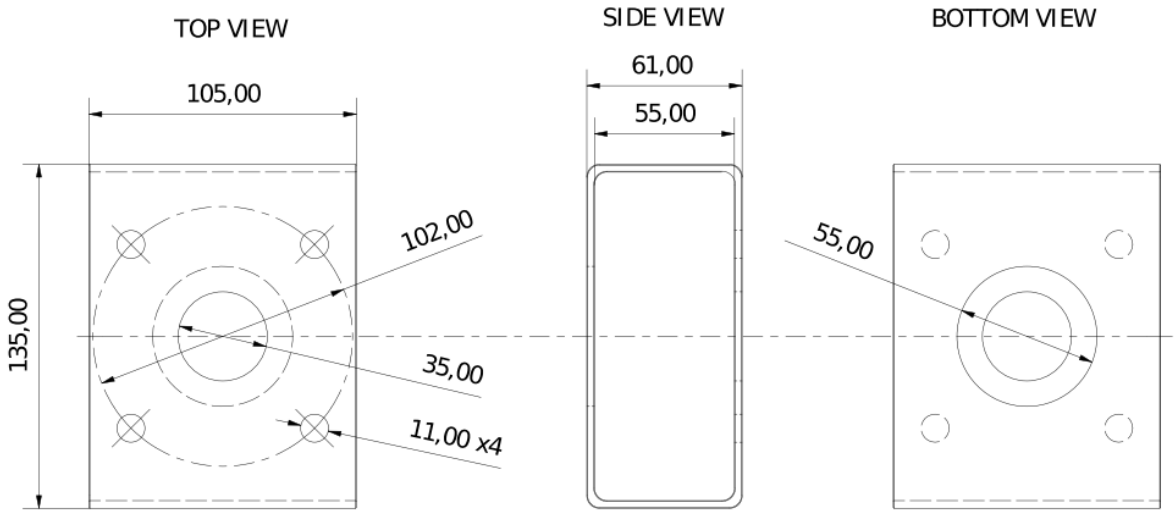


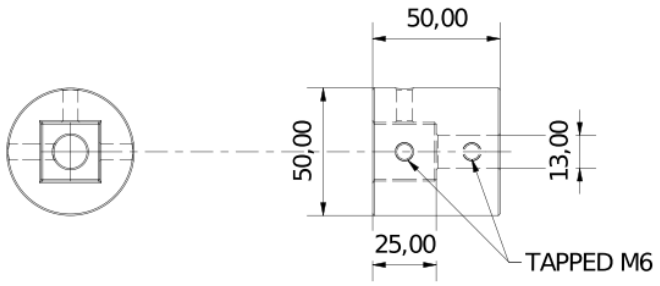


UNIC 10 COUPLING

PART No. SP10028/10/C (COUPLING ONLY)

6.5. UNIC20 / UNIC40 Mounting Bracket and Coupling





7. INSTALLATION

7.1. Overview

Autoflame servomotors are supplied set at 0.0° position as standard. It is crucial to remember that this position may not necessarily position the damper at 0.0° or a closed position automatically. This must be physically checked.

Viewing the shaft end-on from the potentiometer end, all servomotors drive in:

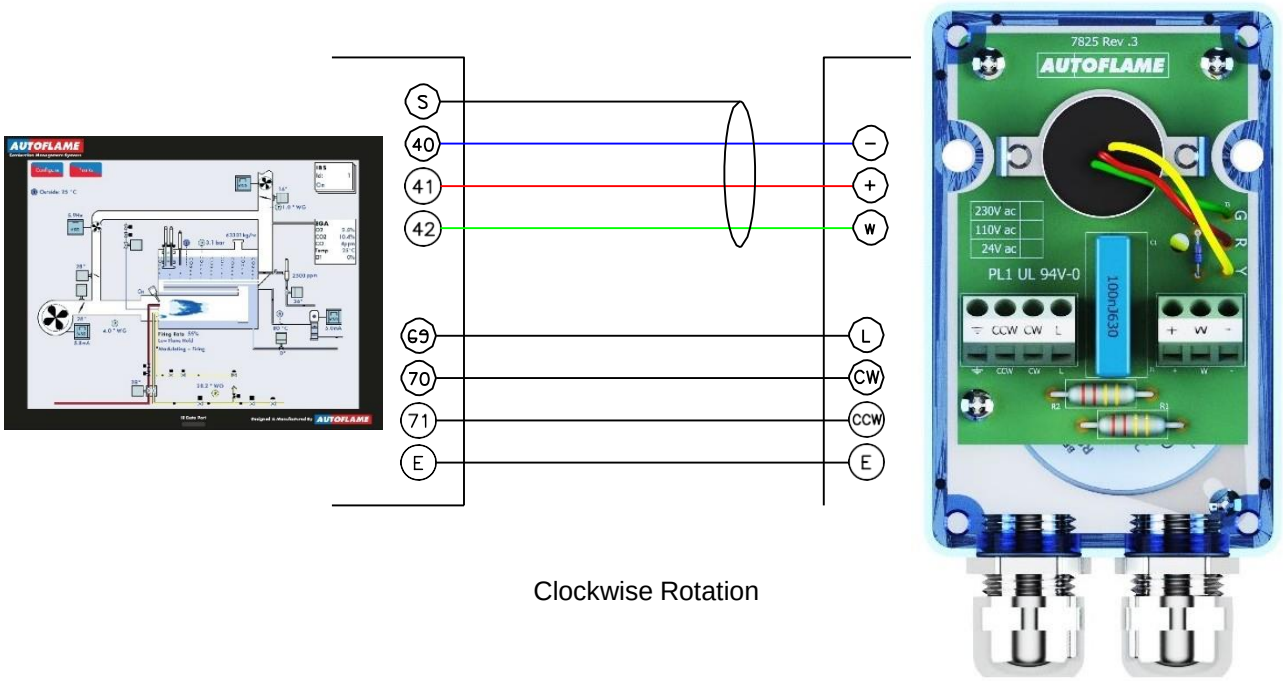
- Clockwise direction if power is applied between the LIVE and CW terminal.
- Counter clockwise if the power is applied between the LIVE and CCW terminal.

The operation of fuel valves and air dampers is often such that they open in a clockwise direction. If the operation needs to be reversed, it is necessary to swap various wiring connections between the MM and the servomotor.

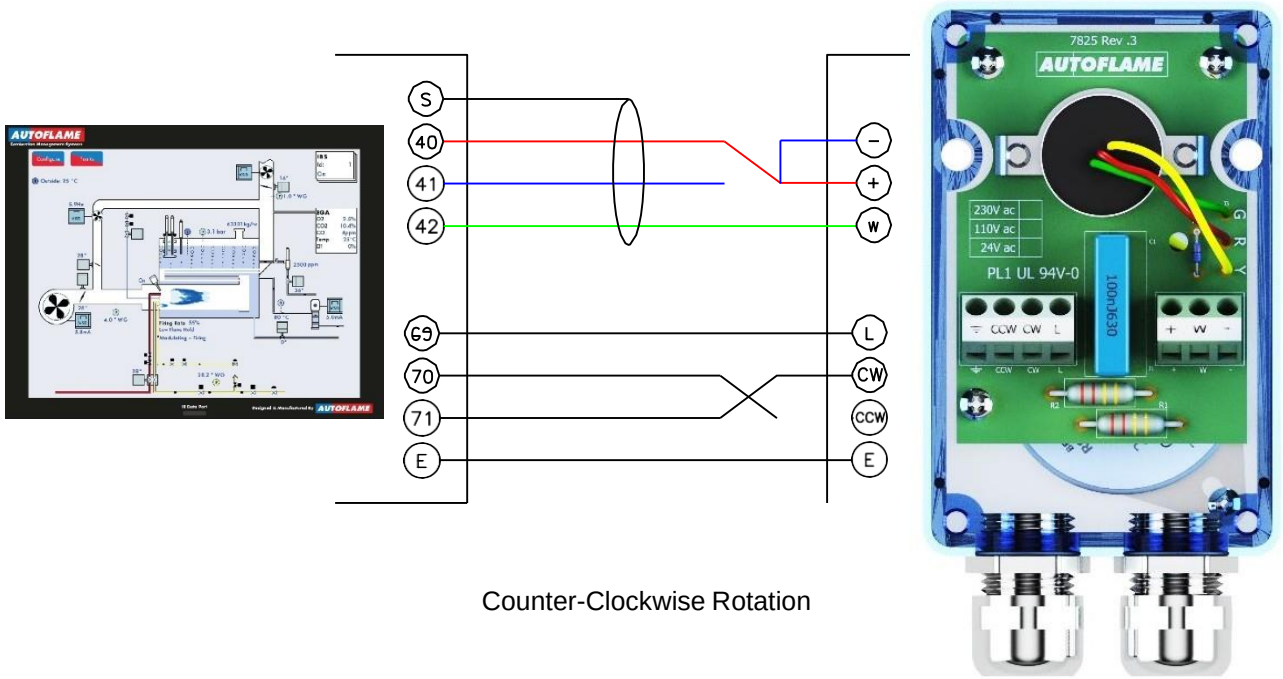
DO NOT ASSUME THAT THE SERVOMOTORS HAVE BEEN PREVIOUSLY SET CORRECTLY

7.2. Wiring

The servomotors can be configured to rotate in clockwise or counter- clockwise direction, please refer to the wiring diagram beow as an exmple for wiring a small servomotor to Channel 1 on a Mk8 MM.



Clockwise Rotation



Counter-Clockwise Rotation

7.3. Adjusting the Servomotor's Position

When commissioning a system, it is essential to set up each servomotor. A tamper proof screwdriver is required (Part # SP10002 – can be ordered directly from Autoflame).

Usual fuel control valves and air dampers operate from 0° to 90.0° angular degrees. The MM system can drive the servomotors through 360.0º degrees, but it will only display from -6.0° to 96.0° degrees.

All Channel readings displayed on the MM are in angular degrees. It is necessary to adjust the positioning potentiometer in the servomotor so that the MM reads 0.0° when the relevant valve/damper is at its fully closed position. The technician must physically check the mechanical position of the dampers and valves, whilst all servomotors are set to 0.0° before leaving the factory this may have changed during shipping.

Please see the relevant MM manual for the servomotors commissioning procedure.

I. Remove the servomotor's terminal cover by loosening the 4 screws holding the cover.

II. On Autoflame gas, oil and gas/oil piggy-back valves it is necessary to remove the servomotor. Manually position the oil/gas valve slot to its closed position. Observe the position of the drive pin on the servomotor.

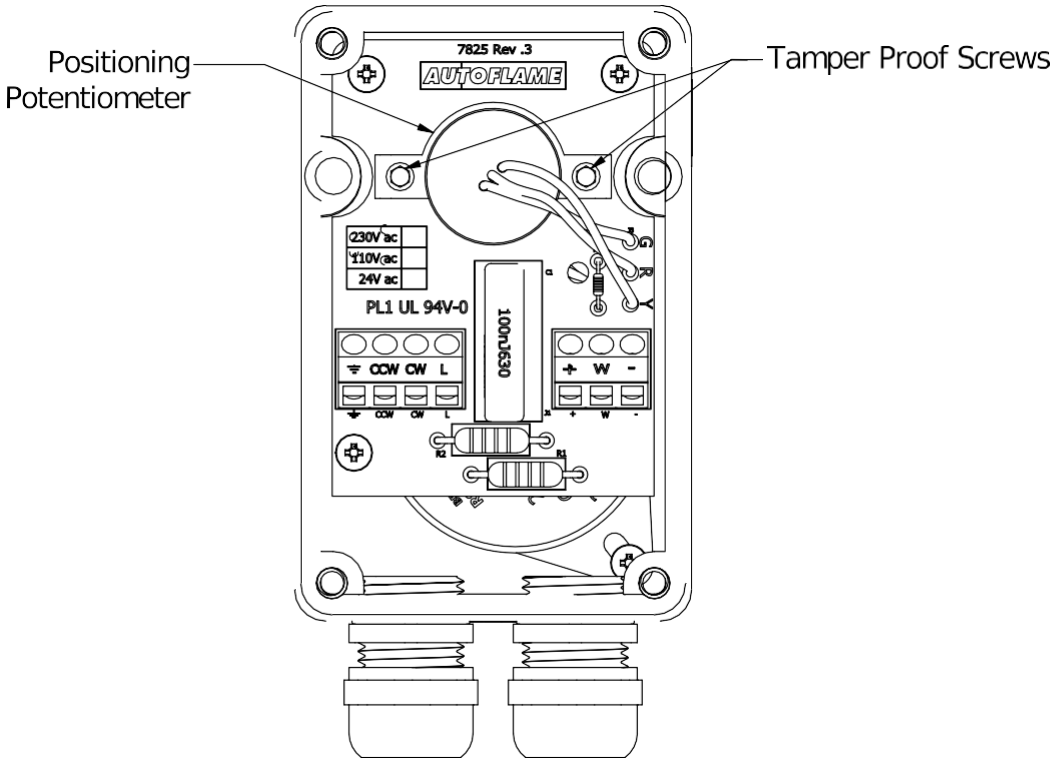
III. Use the relevant channel up/down buttons on the MM to position the pin so that when the servomotor is reassembled to the valve it is in line with the slot

IV. In the MM commission screen, use the relevant channel up/down buttons to position the channel to its physically closed position.

V. Reassemble the servomotor to the valve

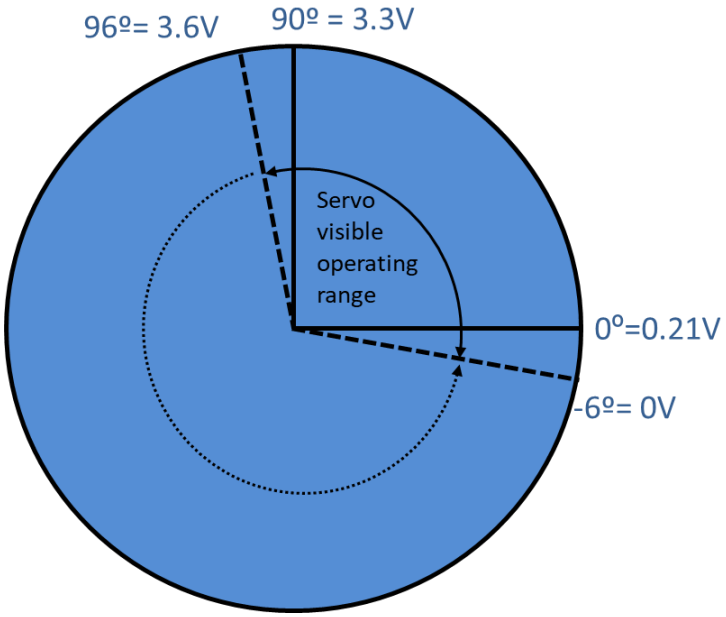
VI. Loosen the two tamper proof screws just enough to enable the potentiometer to rotate. Rotate the potentiometer clockwise or counter clockwise by hand until the relevant channel reads 0.0°. Tighten the two tamper proof screws gently until the potentiometer is secure. Do not over tighten the screws. Check that the display still reads 0.0. If incorrect repeat the adjustment process.

VII. Use the external position indicator to ensure the valve is in the fully closed position.



7.4. Servomotor Feedback Voltage

In applications where the servomotor is not positioned close to the display then it is possible to measure the feedback voltage from the servomotor in order to ensure that 0.0° is displayed. By testing the DC voltage between the blue and green wires (wiper and 0V) on the servomotor low voltage terminals this will read 0.21V DC when the reading on the display is 0°. The same can be done for when the servomotor is at 96.0° where the voltage will be 3.6V.

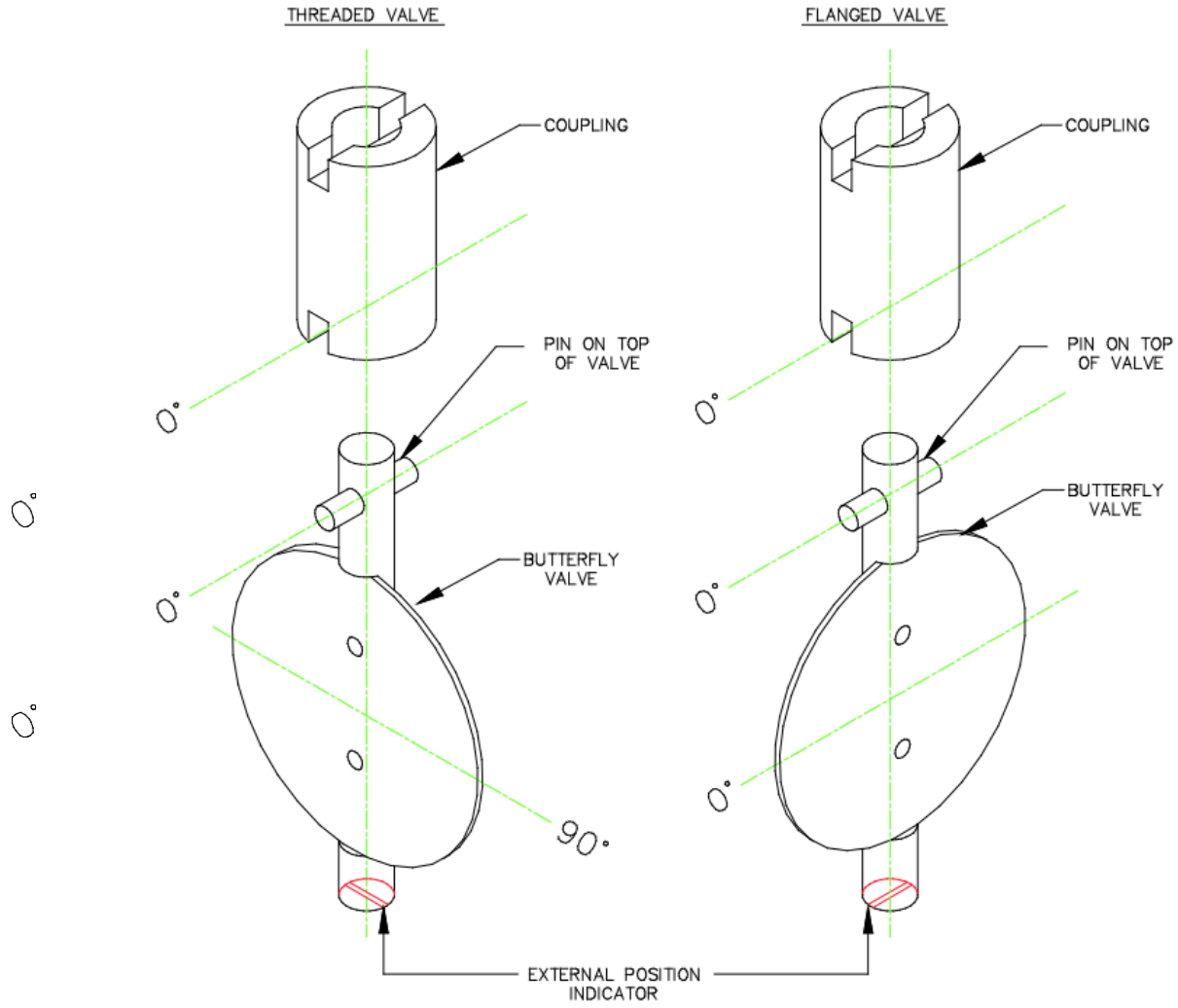


7.5. Servomotors with Autoflame Gas Valves

On threaded valves, the pin on the top of the valve is 90° opposite from the position of the butterfly valve.

On flanged valves, the pin on the top of the valve is in line with the position of the butterfly valve.

For both valves the external visual position indicator is in line with the position of the butterfly valve. Regardless of the type of valve being used, the servomotor is dispatched from the factory with the potentiometer in the zero position. The same servomotor will be correct for both types of valve, as the servomotor for the threaded valve is mounted at 90° different from the flanged valve.



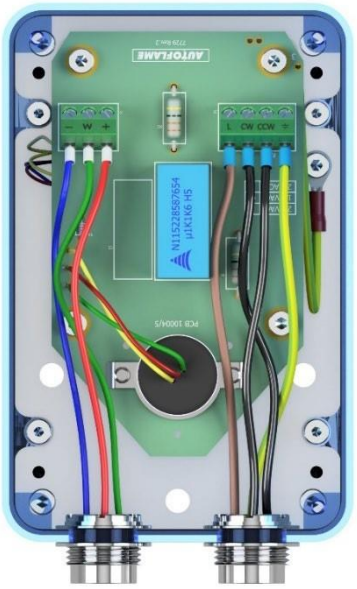
7.6. Servomotor Flying Leads and Connectors

An enclosure mounted connectors and flying leads kit is available for easy installation and replacement of the servomotors. This is available for small and large servomotors only. This kit provides IP65/NEMA4 ingress protection to the servomotors. the wires are screened and they provide protection for the servomotor's signal from electrical noise and interference.

The kit includes:

- 1x 3m (10ft) flying lead for position signal
- 1x 3m (10ft) flying lead for power and drive
- 1x servo enclosure mounted connector for position signal
- 1x servo enclosure mounted connector for power and drive

Kit for use with	Part #
Small servomotor	SP8305
Large servomotor	SP8304



8. MAINTENANCE AND TROUBLESHOOTING

It is good practice to check the Autoflame equipment periodically for the integrity of the installation. An important aspect of the system installation is the mechanical assemblies associated with the servomotors, i.e. mounting brackets and couplings. The servomotor checks could include:

- Overall mechanical soundness – check for corrosion or mechanical damage.
- Couplings and associated linkages should be tight.
- Any associated set screws and fixings should be securely fastened.
- Mechanical pins (roll pins, split pins) should not show signs of corrosion and fatigue.
- When the burner is off and power has been securely isolated, remove the servomotor from the damper/valve and ensure that the damper/valve does not require excessive torque to operate. Make sure the servomotor is working within its recommended torque rating.

When installing a servomotor, please pay attention to the following:

- Do not stand on the servomotors as this may cause internal damage to the servomotor's electrical components leading to a system failure.
- Do not disassemble or remove any of the components of the servomotors as this will affect the integrity of the servomotor. This will also void any warranty that may apply to the unit.
- Unless the servomotor has been supplied with NEMA4 (IP65) fixings, it is important that the servomotor is not subjected to an environmental condition exceeding the standard NEMA3 (IP54) rating.
- Make sure to tighten the servomotor's cover screws according to the torque specified in this manual, over tightening can damage the seals and the ingress protection rating may not apply.

The servomotors do not have a torque limiter, so it will continue to drive regardless of the load, make sure the damper/valve is not stuck, also make sure the servomotor is not driven beyond the angle that the damper/valve allow, otherwise a permanent damage can be cause to the damper, servomotor or both.

Troubleshooting

If the servomotor does not rotate electrically, one of the following could be the cause:

- Power is switched off – check live supply voltage.
- Wire/terminals are disconnected – replace wire or properly connect on terminals.
- Supply voltage is too low/high or incorrect – check the voltage with a meter.
- No switched neutral – remove switched neutral connection and wire link to earth for both directions.
- Effect of the terminal protector (due to a high/low ambient temperature or blocked damper) – lower/raise the ambient temperature or manually open/close the damper when power is removed from the motor

Maintenance

- Lubrication: The small servomotor gears do not require any lubrication. The large servomotors are lubricated using Mobil Mobilith SHC 220 Red Lithium Grease. The industrial UNIC servomotors are lubricated with di-sulfied molybdenum grease (MOS2) and are pressure proofed, no further lubrication is required for any of the servomotors.
- Periodical Test: In case the motor is very seldom rotated or after a long period of rest, it is recommended to test the servomotor periodically. Remove power to the servomotor and check manual operation as described in this manual.

Warranty

All servomotors are covered under 2 years limited warranty.

AUTOFLAME
SERVOMOTORS GUIDE
04.08.2020

Fiammac Group (Engineering & Procurement)

Tel: +98 913 007 4090 (Technical consultation)
+98 913 007 5090 (Commercial, Sales)
+98 913 007 8050 (Service, Installation)
+98 912 007 6045 (Supervisor)

Email: info@fiammac.com
Supporting Email: G.fiammac@gmail.com
Website: www.fiammac.com

AUTOFLAME®
Combustion Management Systems