

Datasheet - J4C 55

GENERAL CHARACTERISTICS

MATERIAL:

Body: Anticorrosive Polyamide, Grey colour / **Optional:** Polypropilene V0, Black colour.
Cover: Anticorrosive Polyamide, Red colour / **Optional:** Polypropilene V0, Natural colour.
Output drive: Zamak, Zinc plated / **Optional:** Zamak, TEFLON coated
Flange: Aluminum and Cataphoresis / **Optional:** Aluminum and TEFLON coated.
Main external shaft: Stainless Steel
External screws: Stainless Steel
Gears: Steel and Polyamide
Visual position indicator: Polyamide
Dome: Polycarbonate
Adjustable internal cams: Polyamide



Electronic Torque Limiter function
Electric motor: 24VDC Brushless motor
Insulation: Class B
(IEC 60034) Service: S4

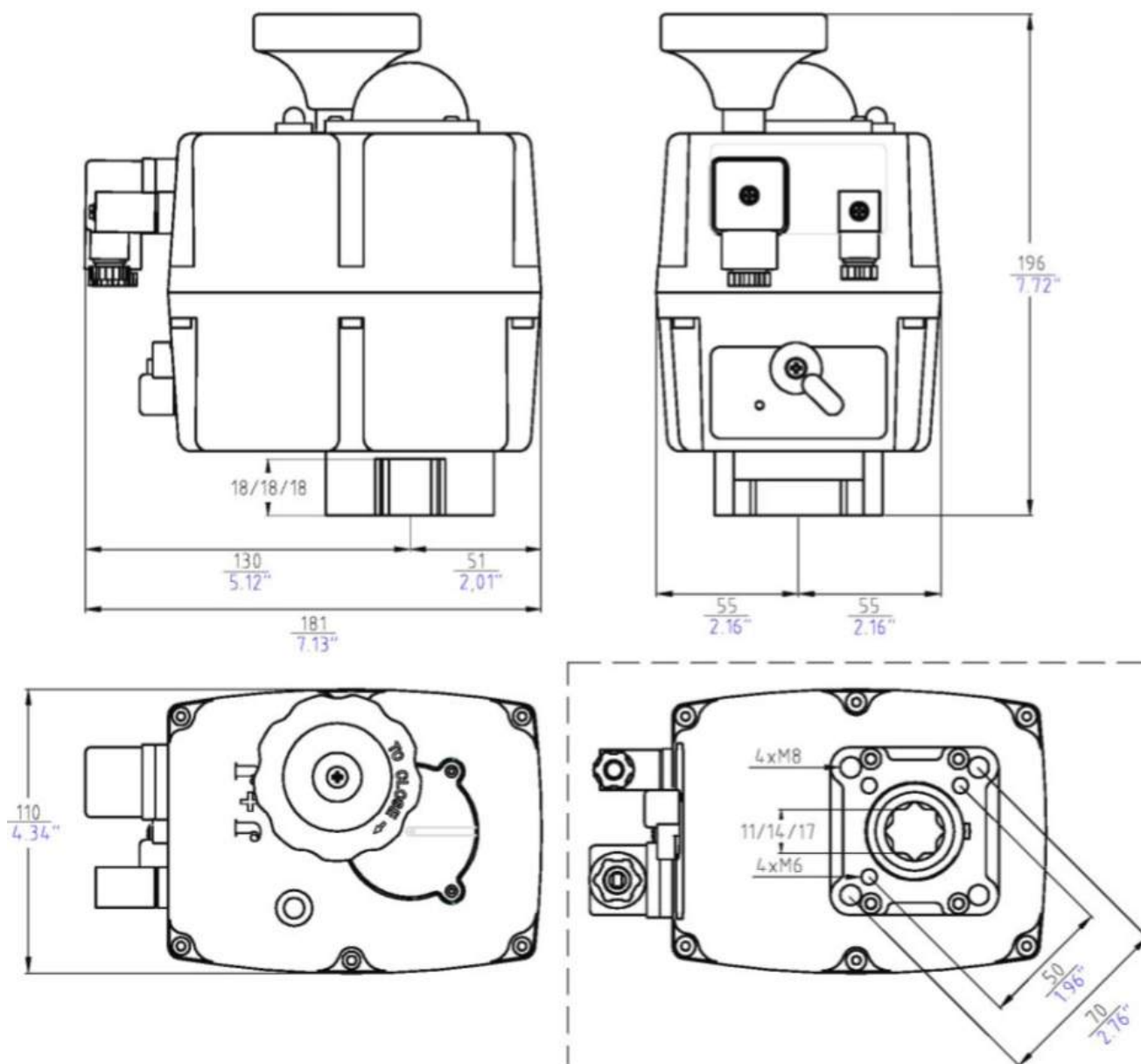
Modelo	S55	B55
Voltage VDC/VAC 50/60Hz-0/+5%	24-240 VDC/VAC	12 VDC/VAC ONLY

Model	S55/B55
Operation time unload	13 Sec./90°
Maximum torque break	60 Nm / 530 lb/in
Maximum operational torque	55 Nm / 486 lb/in
Duty rating	75 %
Max. Working angle	0° to 270°
Limit switch	4 SPST NO micro (2 motor stop and 2 confirmations)
Automatic heater	3,5 W
Big Plug	EN175301-803 FORM A
Small Plug	DIN43650/C
Protection IEC 60529 rating	IP67
Temperature	-20°C +70°C / -4°F +158°F
ISO 5211 Plate	Standard: F05/F07
DIN 3337 Female output drive	Standard: *17 Optional: *11, *14mm
Weight	2,4 Kg

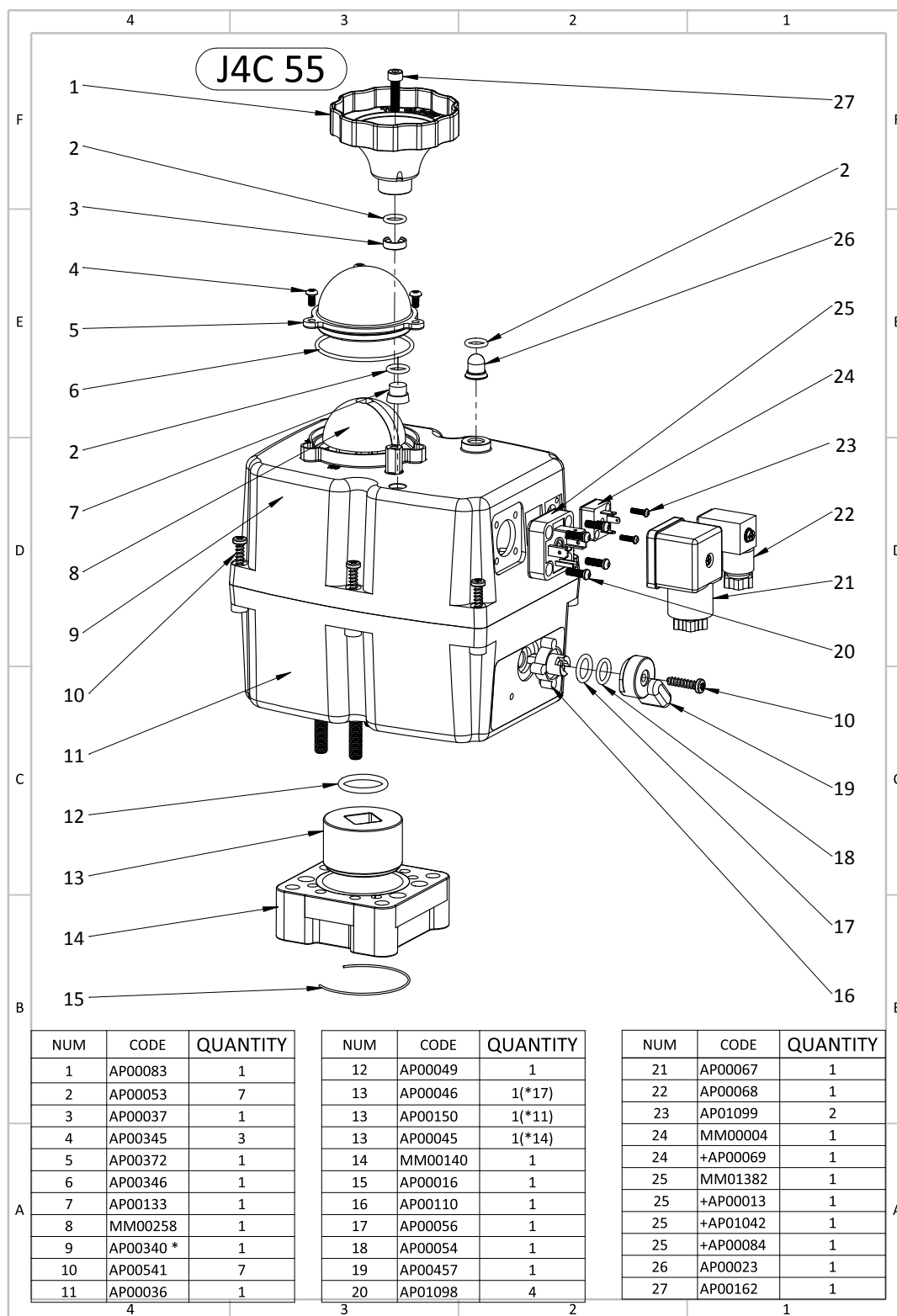
Options

J4C 20/85 KIT DPS digital positioner:	4-20mA, 0-20mA, 0-10V or 1-10V
J4C 20/85 KIT BSR emergency fail safe kit system by battery	NC- NO
Potentiometer	1K, 5K or 10K
3 position actuator	0°-45°-90° or 0°-90°-180°

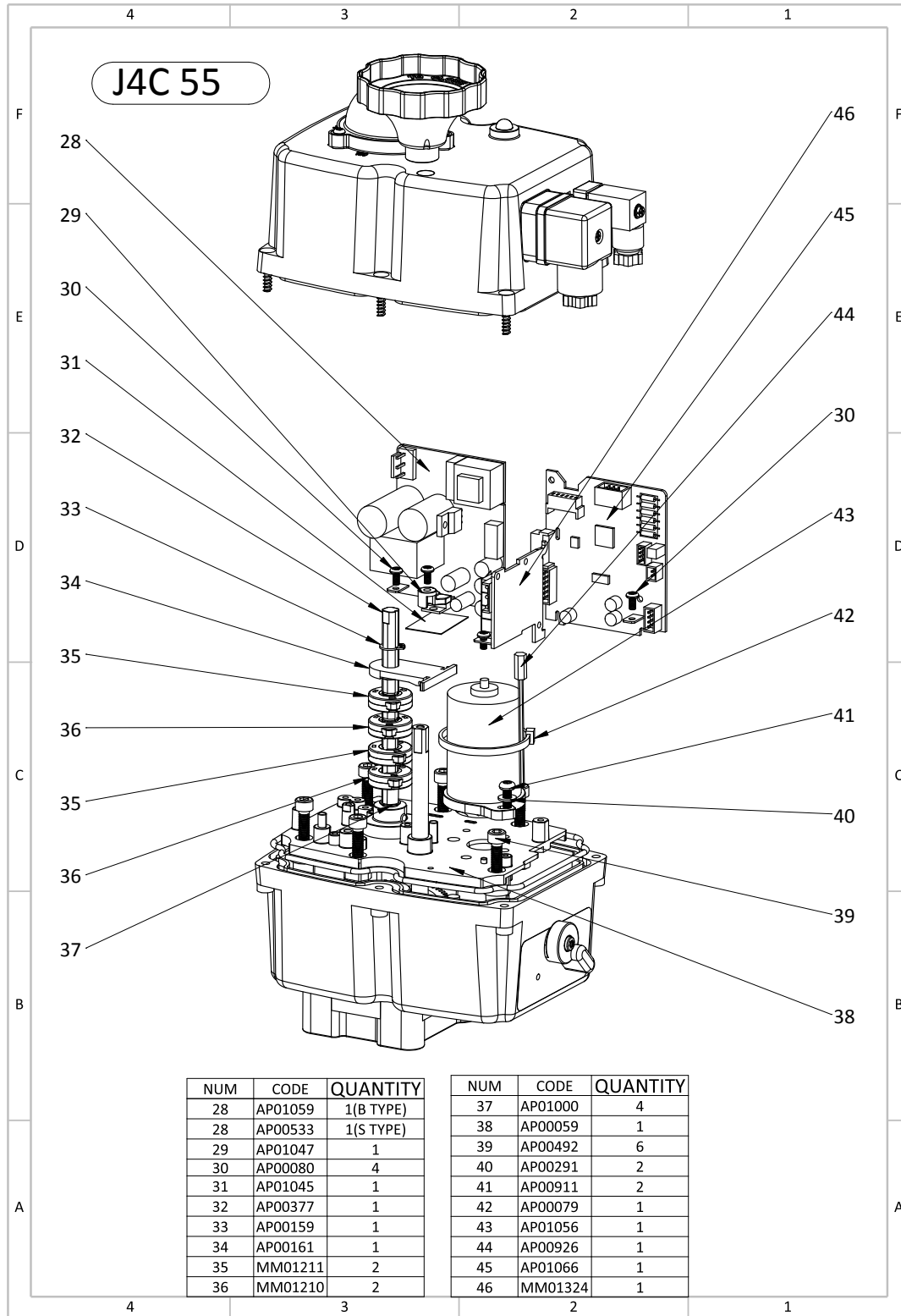
J4C 55 SIZES



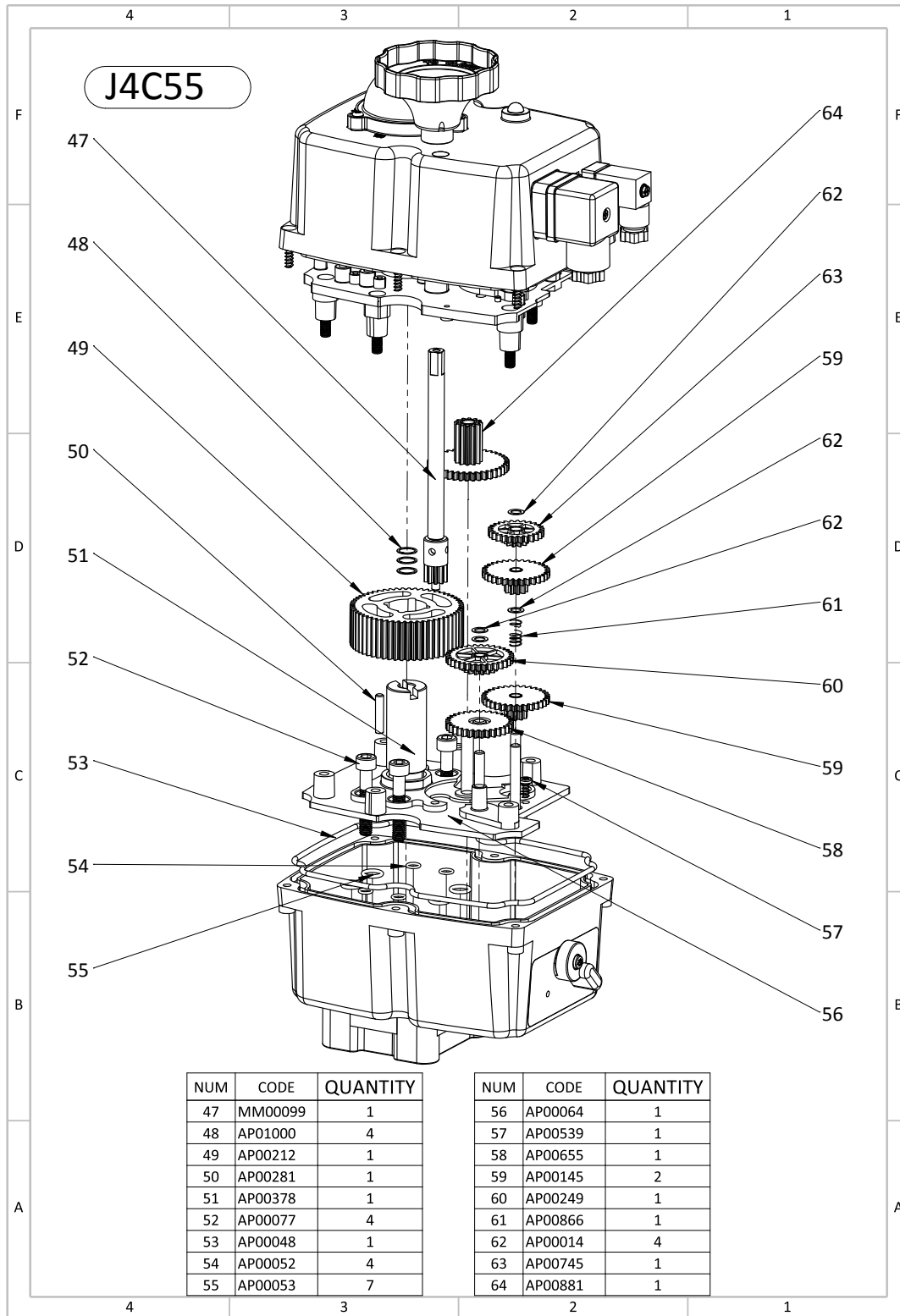
Exploded View



Exploded View



Exploded View



READ THESE INSTRUCTIONS BEFORE CONNECTING THE ACTUATOR. DAMAGE CAUSED BY NON COMPLIANCE OF THESE INSTRUCTIONS IS NOT COVERED BY OUR WARRANTY.

J4C Electric actuators operate with the use of live electricity. It is recommended that only qualified electrical engineers be allowed to connect or adjust these actuators.

1. VOLTAGE

- All our actuators model **S20** to **S300** are ready to work from **24 to 240 VDC/VAC**.
- All our actuators model **B20** to **B300** are ready to work at **12 VDC/VAC**.

2. ELECTRICAL CONNECTORS

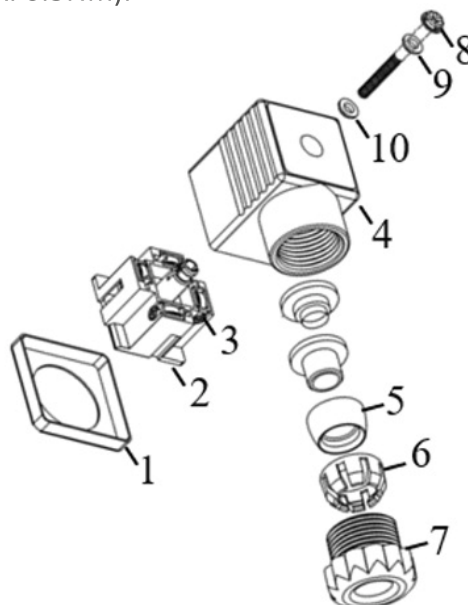
Warning: Before connecting ensure that the voltage to be applied to the actuator is within the range shown on the identification label. The supplied electrical connectors, used to connect to the actuator are DIN plugs. Ensure the diameter of cable to be used conforms to the maximum and minimum requirements of the DIN plugs to maintain water tightness (Fig.1).

CONNECTOR	SMALL BLACK		BIG GREY or BLACK	
	DIN43650/C		EN175301-803 FORMA A	
MODEL	min Ø	máx. Ø	min Ø	máx. Ø
J4C 20 a 300	5mm	6mm	8mm	10,5mm

(Fig.1)

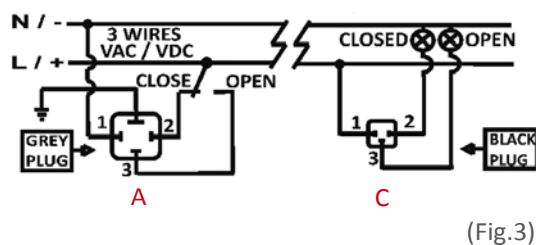
Warning: Ensure that the square rubber seal is in place when fixing each DIN plug to the actuator. Failure to do so could allow water ingress and damage caused by this installation error will invalidate any warranty. The DIN plugs are fixed to their respective bases on the actuator housing with a screw. Do not over tight the screw when assembling (Max. 0.5Nm).

- | | |
|-------------------------------|------------------------|
| 1. Gasket | 6. Grommet |
| 2. Terminal strip | 7. Gland - nut |
| 3. Cable fixing screws | 8. Fixing screw |
| 4. Housing | 9. Washer |
| 5. Washer | 10. Gasket |



(Fig.2)

Electrical connection: All models.



ON - OFF VAC

The power supply is connected to the grey "A" DIN plug (Fig.3).

Neutral PIN 1 + Phase PIN 2 = Close actuator

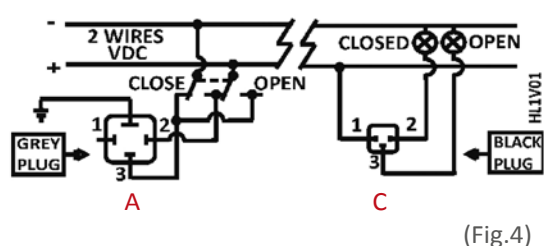
Neutral PIN 1 + Phase PIN 3 = Open actuator

Earth/ground connection - Flat PIN ⏏ on top.

The volt free connection (conf. of position) black "C" DIN plug (Fig.3)

Common PIN 1 + PIN 2 = Close confirmation of position

Common PIN 1 + PIN 3 = Open confirmation of position



ON - OFF VDC

The power supply is connected to the grey "A" DIN plug (Fig.4).

Negative PIN 3 + Positive PIN 2 = Close actuator

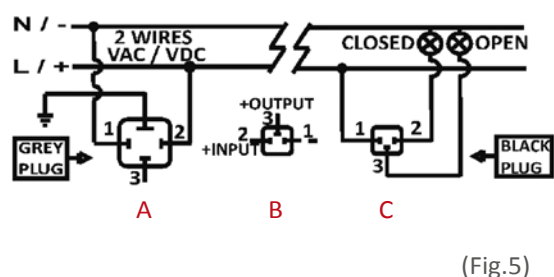
Negative PIN 2 + Positive PIN 3 = Open actuator

Earth/ground connection - Flat PIN ⏏ on top.

The volt free connection (conf. of position) black "C" DIN plug (Fig.4)

Common PIN 1 + PIN 2 = Close confirmation of position

Common PIN 1 + PIN 3 = Open confirmation of position



POSITIONER VAC VDC

The power supply is connected to the grey "A" DIN plug (Fig.5).

Neutral/negative PIN 1 + Phase/positive PIN 2 - Power supply

Earth/ground connection - Flat PIN ⏏ on top.

Input/output signal is connected to the black "B" DIN plug (Fig.5).

Negative PIN 1 + positive PIN 2 = Input signal

Negative PIN 1 + positive PIN 3 = Output signal

The volt free connection - black "C" DIN plug (Fig.5).

Common PIN 1 + PIN 2 = Close confirmation of position

Common PIN 1 + PIN 3 = Open confirmation of position

3. LOCAL VISUAL POSITION INDICATOR

All J4C actuators are supplied with a local visual position indicator comprises a black base with a yellow insert that shows, both the position and direction of rotation (Fig.6).

The open and close positions have the following logos molded into the top cover OPEN 90 and CLOSE 0. Opening = $\curvearrowright$ Closing = $\curvearrowleft$



Fig. 6 0 = CLOSE



Fig. 6 90 = OPEN

4. EMERGENCY MANUAL OVERRIDE FACILITY

The **J4C** has 2 operating modes, automatic and manual, the required mode is selected by using a lever on the lower half of the actuator housing (Fig 7).

The 2 positions are marked:

AUTO = Automatic operation

MAN = Manual operation

Warning: Do not remove the selector lever securing screw, as this will allow its internal mechanism to become loose and will cause irreparable damage to the actuator's gearbox.

Removing this screw will invalidate the warranty.

When "AUTO" position is selected:

The hand wheel, of models 20,35,55, and 85 rotates automatically, it is very important not to block it, otherwise the actuator could suffer unrepairable damages.



Fig. 7 J4C 20 TO 85



Fig. 7 J4C 140 TO 300

When "MAN" function is selected:

- 1 - The electronic system cuts the power to the motor after a few seconds.
- 2 - The mechanical connection between the motor and the output shaft is disconnected.
- 3 - The desired position can be achieved by using the manual override lever or the hand wheel.
- 4 - There are two ways to reactive the motor after being isolated whilst in **"MAN"** position:
 - a) With the actuator in **"MAN"** function, turn the hand wheel to the open or close position. The motor will start working. Now change the manual override from **"MAN"** to **"AUTO"**, and the actuator is ready to operate automatically again.
 - b) Change from **"MAN"** mode to **"AUTO"**. Deactivate the supply voltage for a few seconds which resets the actuator and it could operate automatically again.

5. EXTERNAL LED LIGHT STATUS

The **LED** status light provides visual communication between the actuator and the user. The current operational status of the actuator is shown by either solid lit, or different flashing sequences of the **LED** light:



Fig.8

ACTUATOR ON-OFF OPERATIONAL STATUS**LED STATUS**

Actuator without power being supplied	
Open Actuator	
Close Actuator	
Stop Actuator. PIN1 (N) or (-) + PIN2+3 (F) or (+) Connection (Standard mode only)	
Actuator opening	
Actuator closing	
Actuator limiter function on, open direction	
Actuator limiter function on, close direction.	
Motor off, after fixed time.	
Actuator in middle position. For 3 position actuator only.	
Actuator without power and working with the NO BSR system. MAX 3 min.	
Actuator without power and working with the NC BSR system. MAX 3 min.	

ACTUATOR WITH POSITIONER OPERATIONAL STATUS**LED STATUS**

Actuator without power supply.	
Actuator in the correct position.	
Actuator opening	
Actuator closing	
Actuator with positioner, in self-adjustment mode.	
Actuator with limiter function on, open direction.	
Actuator with limiter function on, close direction.	
Motor off, after fixed time.	
Higher instrumentation signal. Blocked actuator. Need RESET.	
No instrumentation signal detected or with 0mA when 0-20mA or 0V when 0-10V.	
Actuator without power supply. Working with BSR NO. For 3 min Max.	
Actuator without power supply. Working with BSR NC. For 3 min Max.	

6. BSR - NC/NO SET-UP

In case of an electrical failure, the actuator which is fitted with the **BSR** plug-in failsafe system, will go to the predetermined position: **NO (Normally Open)** or **NC (Normally Close)**.

Set up by using the **SELDIR Jumper** (Fig.9): **NC: jumper on / NO: jumper off**.



Fig. 9

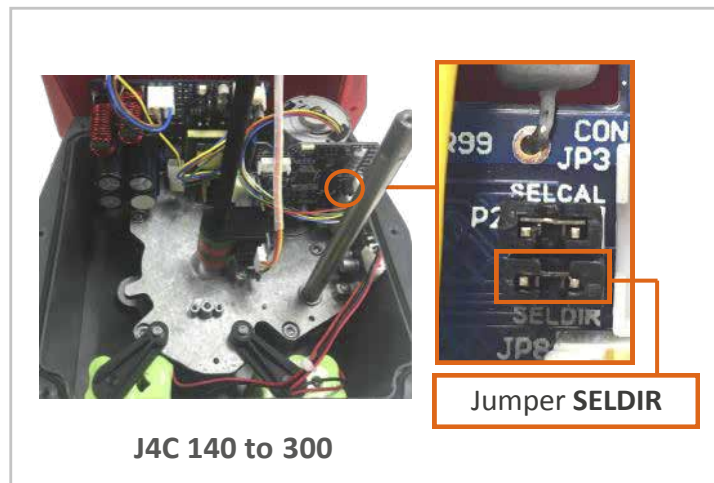


Fig. 9

7. DPS

Use the configuration you need by moving the DIPs:

Place the DIPs (Fig. 10) according to the signal you need to work with.

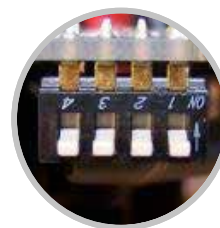
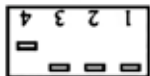
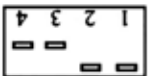
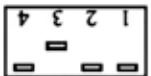
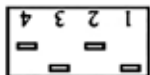
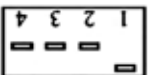
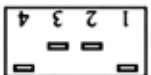


Fig.10

	4/20 mA NC		0/10 V NC		1/10 V NC
	4/20mA NO		0/10 V NO		1/10 V NO

External adjustment

B. plug - Connect a cable between PIN 1 (on the right side) and PIN Earth (on the bottom) (Fig. 11).

A. plug - Connect voltage to the actuator in the following way:

VAC: PIN1 (neutral) and PIN2 (phase).

VDC: PIN1 (negative) and PIN2 (positive).

***VERY IMPORTANT:** BEFORE CONNECTING “A” PLUG TO THE ACTUATOR, CHECK THAT THE VOLTAGE IS THE SAME AS THE ONE SPECIFIED ON THE ID LABEL (CARTER).

B. plug - Disconnect the cable between PIN 1 (on the left side) and PIN Earth (on the bottom). The actuator will make a complete maneuver.

The actuator is ready to connect the (4/20mA or 0/10V) signal to the **B** plug

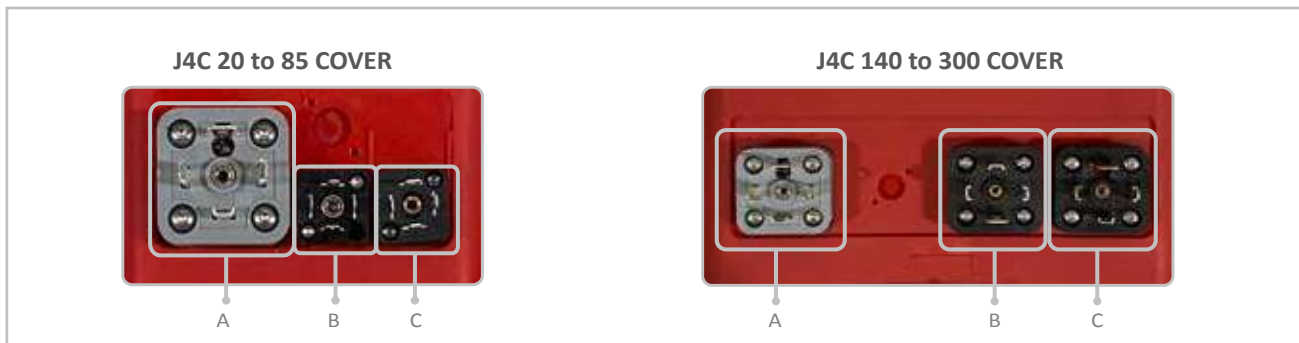


Fig.11

8. KITS BSR / KIT DPS

To make the KITS assembly, follow the steps on the instruction manual enclosed inside each kit.

9. HEATER

ATC is in charge of the automatic control of inner temperature. It is ON while the actuator is connected to the power supply. Therefore, we strongly recommend to maintain the power supply connected to the actuator, otherwise the ATC system would remain disconnected.

10. MOUNTING TO COMPONENT BEING ACTUATED (EX:1/4 TURN VALVE)

It is vital that the mounting kit used to connect the electric actuator to the component (ex: valve) is correctly manufactured and assembled. The mounting bracket's holes must be drilled to ensure that the centerline of the actuator's drive is perfectly in line with the component's drive-centerline, and that the drive coupling/ adaptor rotates around this centerline. The mounting holes of the actuator conform to ISO 5211, and the female output drive conforms to DIN 3337.

We strongly recommend that valves/components to be actuated that have ISO 5211 compliant top works are used wherever possible as it greatly assists in ensuring the concentricity of mounting the actuator to the valve.

The male square end of the drive coupling **MUST NOT** be longer than the maximum depth of the actuator female output drive when the assembly is bolted together.

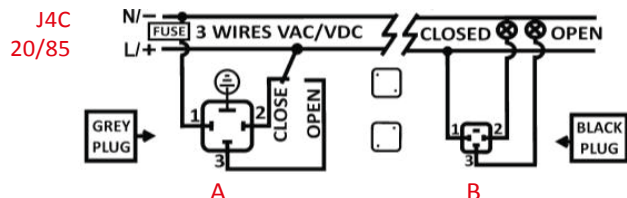
Failure to comply with these instructions will cause uneven wear and dramatically reduce the working life of the valve and actuator.

In case of a power supply failure, the actuator would stop in the position it were at this moment. When the power supply is reestablished, the actuator would keep on working following the prior direction.

VERY IMPORTANT:

Check that any object are blocking the valve (damper, etc.). Connect the actuator, following the connection diagram on the label of the actuator. We recommend that the actuator has an independent system of fuses, which could protect the actuator against other electrical devices.

EXTERNAL CONNECTING DIAGRAM (STANDARD)



STANDARD MODE · 3 WIRES ON - OFF

A = Power supply plug

A: VAC 3 WIRES (Grey plug)

PIN 1 = Neutral + PIN 2 = Phase = Close

PIN 1 = Neutral + PIN 3 = Phase = Open

A: VDC 3 WIRES (Grey plug)

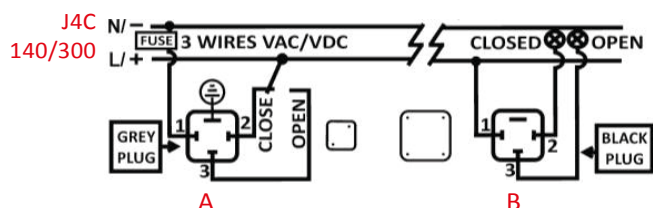
PIN 1 = (-) Negative + PIN 2 = (+) Positive = Close

PIN 1 = (-) Negative + PIN 3 = (+) Positive = Open

B = Volt free contact, plug

PIN 1 / PIN 2 = Close

PIN 1 / PIN 3 = Open



STANDARD MODE · 2 WIRES ON - OFF

A = Power supply plug

A: VDC 2 WIRES (Grey plug)

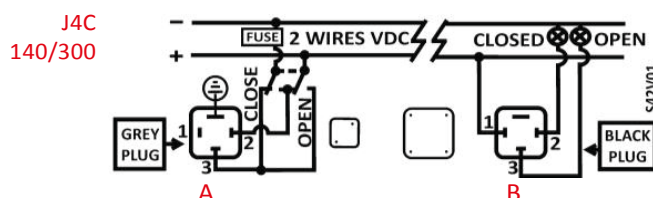
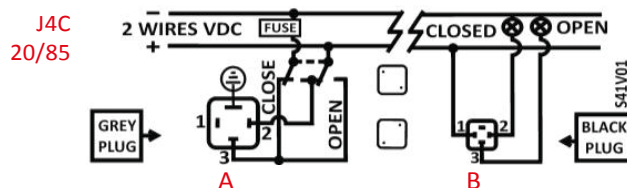
PIN 2 = (+) Positive + PIN 3 = (-) Negative = Close

PIN 2 = (-) Negative + PIN 3 = (+) Positive = Open

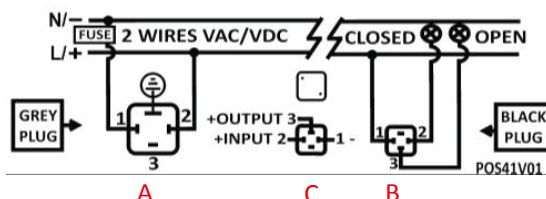
B = Volt free contact plug

PIN 1 / PIN 2 = Close

PIN 1 / PIN 3 = Open



J4C 20/85



POSITIONER

A = Power supply plug

A: VAC 2 WIRES (Grey plug)

PIN 1 = Neutral + PIN 2 = Phase = Power supply plug

A: VDC 2 WIRES (Grey plug)

PIN1=(-) Negative + PIN 2=(+) Positive = Power supply plug

B = Volt free contact plug

PIN 1 / PIN 2 = Closed

PIN 1 / PIN 3 = Open

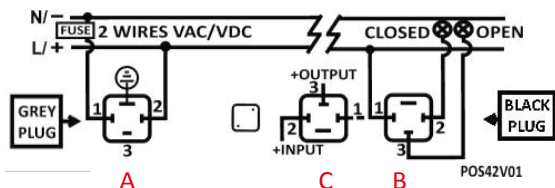
C = Instrumentation Signal

C: Input signal : 4/20mA or 0/10V

PIN 1 = (-) Negative + PIN 2 = (+) Positive = Input signal

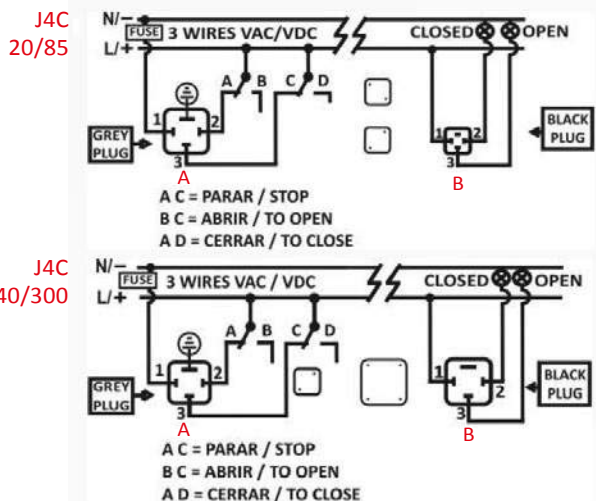
PIN 1 = (-) Negative + PIN 3 = (+) Positive = Output signal

J4C 140/300



INSTRUMENTATION SIGNAL
NO VOLTAGE

EXTERNAL CONNECTING DIAGRAM (OPTIONAL)



STANDARD MODE · 3 WIRES ON - OFF

A = Power supply plug

A: VAC 3 WIRES (Grey plug)

PIN 1 = Neutral + PIN 2 = Phase = Close

PIN 1 = Neutral + PIN 3 = Phase = Open

PIN 1 = Neutral + PIN 2+3 = Phase = Stop

A: VDC 3 WIRES (Grey plug)

PIN 1 = (-) Negative + PIN 2 = (+) Positive = Close

PIN 1 = (-) Negative + PIN 3 = (+) Positive = Open

PIN 1 = (-) Negative + PIN 2+3 = (+) Positive = Stop

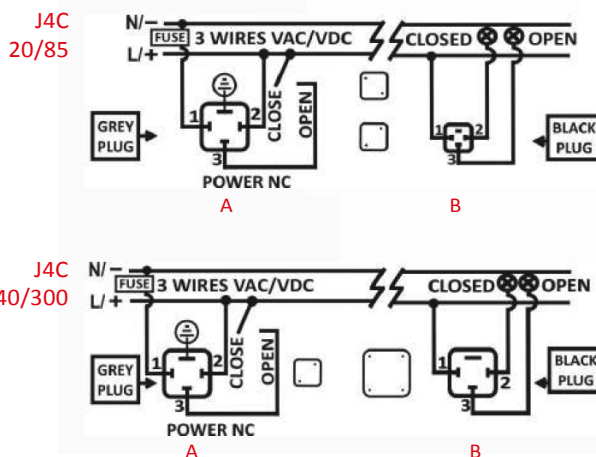
B = Volt free contact, plug

PIN 1 / PIN 2 = Close

PIN 1 / PIN 3 = Open

Other options for external connection diagrams:

These options can be configured by the manufacturer or can be configured by the customer, using our J4C interface kit.



2 MODE ON - OFF

A = Power supply plug

A: VAC 3 WIRES (Grey plug)

PIN 1 = Neutral + PIN 2 = Phase = Close

PIN 1 = Neutral + PIN 2+3 = Phase = Open

A: VDC 3 WIRES (Grey plug)

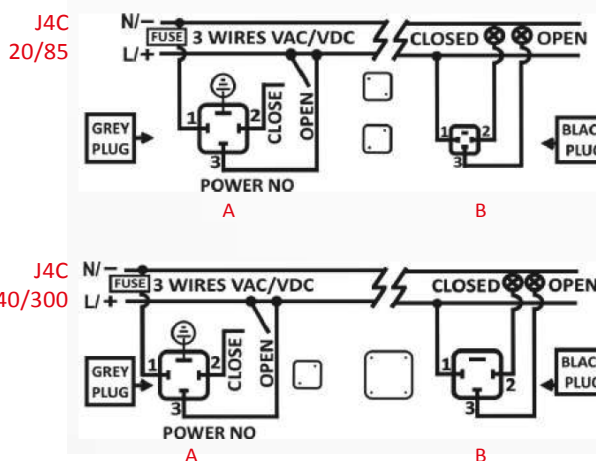
PIN 1 = (-) Negative + PIN 2 = (+) Positive = Close

PIN 1 = (-) Negative + PIN 2+3 = (+) Positive = Open

B = Volt free contact plug

PIN 1 / PIN 2 = Close

PIN 1 / PIN 3 = Open



3 MODE ON - OFF

A = Power supply plug

A: VAC 3 WIRES (Grey plug)

PIN 1 = Neutral + PIN 2+3 = Phase = Close

PIN 1 = Neutral + PIN 3 = Phase = Open

A: VDC 3 WIRES (Grey plug)

PIN 1 = (-) Negative + PIN 2+3 = (+) Positive = Close

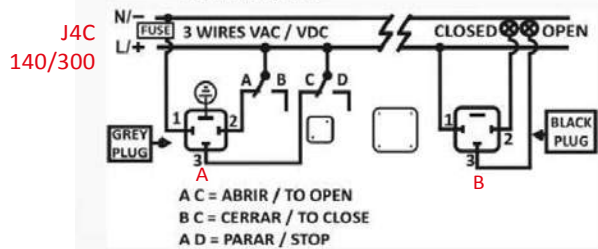
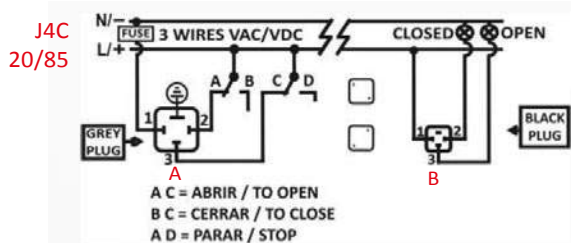
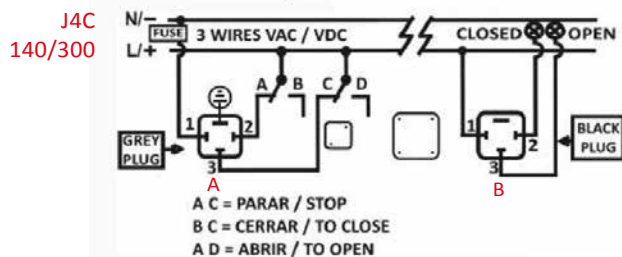
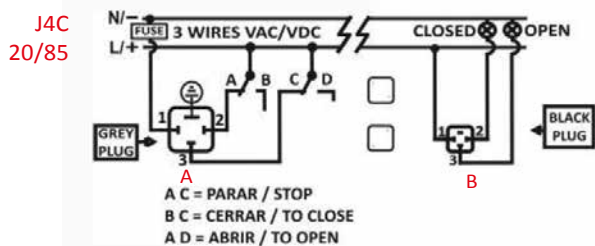
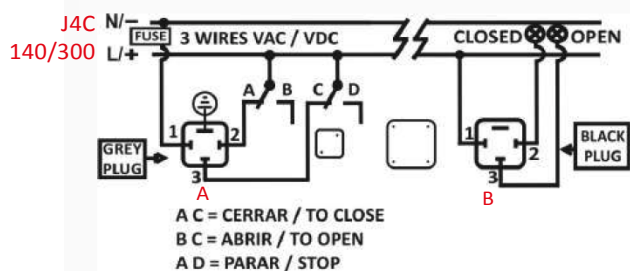
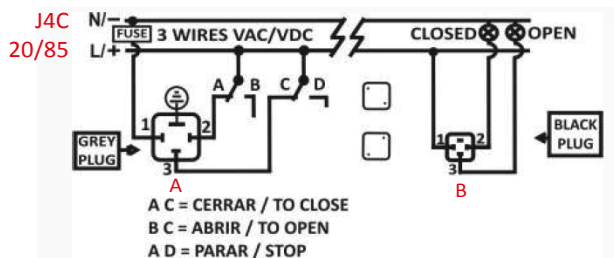
PIN 1 = (-) Negative + PIN 3 = (+) Positive = Open

B = Volt free contact plug

PIN 1 / PIN 2 = Closed

PIN 1 / PIN 3 = Open

EXTERNAL CONNECTING DIAGRAM (OPTIONAL)



ADJUSTMENT OF THE CAMS

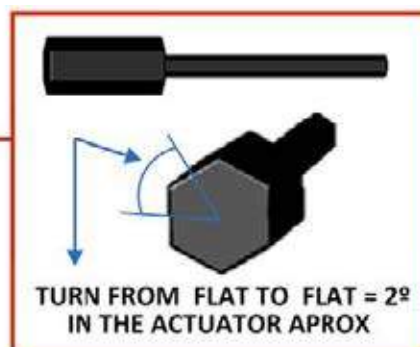


!WARNING! RISK OF ELECTRIC SHOCK INSIDE THE ACTUATOR. AUTHORIZED PERSONNEL ONLY

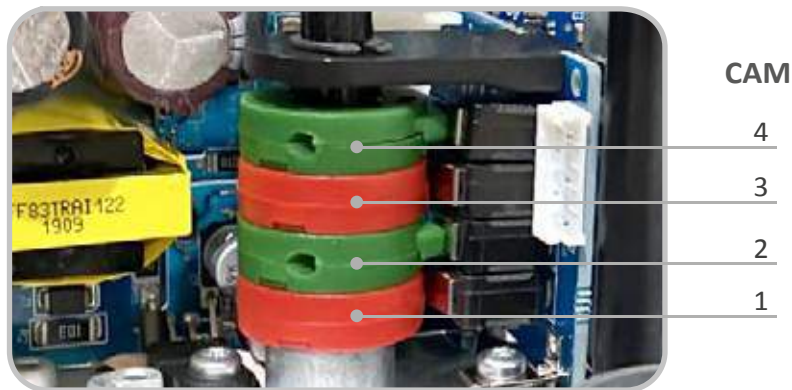
Under normal conditions, the actuator may only be operated with the closed cover. If work is performed on the actuator with the removed cover, the supply and control voltage must first be disconnected. Adjustments, which need to be done in the energized state, should be carried out with special insulated tools.

How to do it: Tolling: One special plastic wrench (is supplied together with the actuator). The wrench is tied together with the motor by using one plastic clamp.

To move the cams, introduce the special plastic wrench in the hole of the cam and turn it round (see both options on the enclosed pictures).



POSITION OF THE CAMS



Cams 1 and 3



Cams 2 and 4

- 1) Cam 1 is to adjust the close position.
- 2) Cam 2 is to adjust the open position.
- 3) Cam 3 is to adjust the close position confirmation.
- 4) Cam 4 is to adjust the open position confirmation.

To ensure that the position confirmation works, adjust the confirmation cams (3 & 4) 3° ($\pm 1^\circ$) before the motor stop. The standard actuators are always adjusted at 0° (close) and 90° (open).



1) To adjust the close position at less than 0°.

Turn the wrench to clockwise direction - cams 1 and 3.

The cam 3 (confirmation) should press the lever of the micro switch a bit earlier than the cam 1.

cams 1 / 3



2) To adjust the close position at more than 0°.

Turn the wrench to anti-clockwise direction - cams 1 and 3.

The cam 3 (confirmation) should press the lever of the micro switch a bit earlier than the cam 1.

cams 1 / 3



3) To adjust the open position to more than 90°.

Turn the wrench to anti-clockwise direction - cams 2 and 4.

The cam 4 (confirmation) should press the lever of the micro switch a bit earlier than the cam 2.

cams 2 / 4



4) To adjust the open position to less than 90°.

Turn the wrench to clockwise direction - cams 2 and 4.

The cam 4 (confirmation) must press the lever of the micro switch a bit earlier than the cam 2.

cams 2 / 4





opciones de fábrica / factory options

- Posicionador digital **DPS**: 4-20mA, 0-20mA, 0-10V o 1-10V
DPS digital positioner: 4-20mA, 0-20mA, 0-10V or 1-10V
- Sistema **BSR** retorno emergencia por batería / **BSR** Battery system returns
- Potenciómetro digital: 1K, 5K o 10K / Digital potentiometer: 1K, 5K or 10K
- Actuador con 3 posiciones: 0°-45°-90° o 0°-90°-180° / 3 position actuator: 0°-45°-90° or 0°-90°-180°
- Conector Interface / Interface plug
- Comunicación  **Modbus** vía cable o Wifi /  **Modbus** interface module wired or Wifi
- Comunicación  **Bluetooth** /  **Bluetooth** module
- Para otras opciones, consultar / Other options on request



kits automontaje / self-mounting kits



Interface System

A través del cable del KIT INTERFACE establecemos comunicación con el actuador, leemos parámetros y cambiamos la configuración del actuador.

Using the Interface Kit cable we communicate with the actuator, read parameters and change the actuators configuration.



Battery System Returns

Sistema BSR para nuestros modelos desde 20Nm a 85Nm. Se trata de un sistema de retorno por batería que es común a los modelos S y B. El mismo sistema BSR se ha desarrollado para nuestros modelos de 140Nm y 300Nm pero con una batería de mayor capacidad.

BSR system for our 20Nm to 85Nm models. It is an emergency fail safe kit system by battery which is common to both S and B models. The BSR system for our models 140Nm and 300Nm is the same but with a bigger capacity battery.



Digital Positioner System 20-85

Posicionador digital para nuestros modelos desde 20Nm a 85Nm. Señal de instrumentación 4-20mA, 0-20mA, 0-10V o 1-10V. Este posicionador es adecuado para los modelos S y B.

Digital positioner for our models from 20Nm to 85Nm. Instrumentation signal 4-20mA, 0-20mA, 0-10V or 1-10V signal. This DPS digital positioner is suitable for S and B models.



Digital Positioner System 140-300

Posicionador digital para nuestros modelos 140Nm y 300Nm. Señal de instrumentación 4-20mA, 0-20mA, 0-10V o 1-10V. Este posicionador es adecuado para los modelos S y B.

Digital positioner for our models 140Nm and 300Nm. Instrumentation signal 4-20mA, 0-20mA, 0-10V or 1-10V signal. This DPS digital positioner is suitable for S and B models.



infographic bluetooth technology

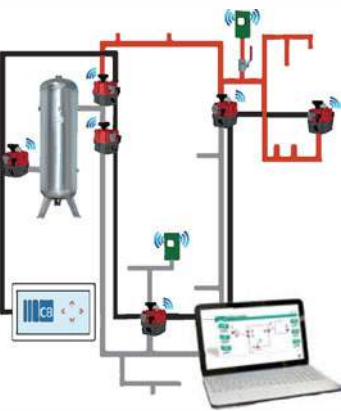


Hemos incorporado el sistema de comunicación BLUETOOTH, para poder comunicarnos con nuestros actuadores, desde cualquier dispositivo IOS o ANDROID. Dicho sistema aparece como una opción de fábrica en nuestro catálogo. Desde nuestro móvil o tablet podemos ordenar al actuador que abra/cierre o se pare en un punto, podemos informarnos de su estado actual, leer parámetros, conocer errores o incidencias, etc. La comunicación con nuestros dispositivos permanece protegida con una contraseña. Via BLUETOOTH detectamos hasta un máximo de 50 actuadores a una distancia máxima de 20 m.

We have introduced the BLUETOOTH communication system in our actuators, in order to communicate with our actuators, from any IOS or ANDROID devices. This system appears in our catalogue as a factory option. From our mobile phone or tablet we could order our actuator to open/close or stop, we could be informed about its status, read parameters, know about errors or incidences, etc. The communication between our devices is protected by a password. Via BLUETOOTH we could identify and communicate with up to 50 devices within a max distance of 20m.



Modbus technology



Sectorización MODBUS

- Conecta y listo.
- Se puede actuar manualmente sobre el equipo
- Visible desde el cuadro de control, tablet, móvil, PC, dentro y fuera de la planta.
- Rápido y flexible, podemos empezar con 3 actuadores y ampliar hasta 32.
- Alcance hasta 1.200m.
- Puede alimentar localmente los equipos y comunicarlos con cable de datos.
- Puede nombrar equipos, hacer un sinóptico de planta, mandar mails de alarma.

Sectorización INALÁMBRICA

- Conecta y listo, tan solo alimentar el equipo.
- Se puede actuar manualmente sobre el equipo.
- Visible desde el cuadro de control, tablet, móvil, PC, dentro y fuera de la planta.
- Rápido y flexible, podemos empezar con 3 actuadores y ampliar hasta 32.
- Desde 50m hasta 1.600m sin repetidores.
- Los equipos son emisores y receptores a la vez, creando una malla de comunicación, que permite evitar obstáculos como paredes o interferencias.

- Bajo el protocolo 802.15.4
- Hasta 12 bandas de comunicación, con la posibilidad de cambio de banda en caso de saturación.

MODBUS system

- Plug and Play.
- Each device could be operated manually.
- Could be seen from the control panel, tablet, mobile, PC, either inside or outside of the plant.
- Fast and flexible, starting by 3 actuators up to 32.
- Up to 1.200 m distance range.
- Locally connect the device and communicate with a data cable.
- Could name the devices, make a plant synoptic, send alarm mails.

Wireless system

- Plug and Play.
- Each device could be operated manually.
- Could be seen from the control panel, tablet, mobile, PC, either inside or outside of the plant.
- Fast and flexible, starting by 3 actuators up to 32.
- From 50m up to 1.600 m distance range without repeaters.
- Each device is emitting and receiving at the same time, creating a communication mesh, which enables the device to avoid walls or interferences.
- Under 802.15.4 protocol.
- Up to 12 bands of communication, which allow a change of band in case of saturation.



certificaciones / certifications

ENSAYOS / TESTS	NORMAS / STANDARD	DIRECTIVAS / DIRECTIVES
Seguridad Eléctrica Electric Safety	2014/35/UE (LVD) Low Voltage Directive	UNE-EN 60204-1:2007+Corr:2010
Compatibilidad Electromagnética, Emisiones Electromagnetic Compatibility, Emissions	2014/30/UE (EMC) Electromagnetic Compatibility	UNE-EN 61000-6-2:2006+E:2009
Compatibilidad Electromagnética, Inmunidad Electromagnetic Compatibility, Immunity	2006/42/CE	UNE-EN 61000-6-4:2007+E:2008+A1:2011
Declaración Original de Incorporación para Quasi Máquinas Original Declaration of Incorporation of Partly Completed Machinery	IEC 60 529:2001 (Ed.2.1) UNE 20324:1993 + 1M:2000 + ERR: 2004	Artículos / Articles 1.2, 1.1.3, 1.1.5, 1.2.1, 1.2.6, 1.3.1, 1.3.7, 1.5.1, 1.6.3, 1.7.1, 1.7.3, 1.7.4
Grados de protección proporcionados por las envolventes Degrees of protection provided by enclosures	IEC 60 529:2001 (Ed.2.1) UNE 20324:1993 + 1M:2000 + ERR: 2004	2006/95/CE (Electric Safety, Low Voltage Directive, LVD)
Ensayos vibración Vibration test	UNE-EN 60068-2-6:2008	2001/95/CE (Products General Safety)
		UNE-EN 60068-2-6:2008