

# J3

## Modulating Conversion Kit No:3

To convert **J3** on-off actuator to modulating function.

Contains Plug & play conversion kit -  
Digital Positioning System DPS2005-V6



## Installation, Operation & Maintenance Instructions

SUITS MODELS **J3** - 20 to **J3** - 85



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Damage caused by non-compliance to these instructions will not be covered by our warranty. Read these instructions BEFORE installing or connecting the DPS2005 conversion kit. The sequence these instructions show **MUST** be followed for correct operation of the installed kit.



### **SAFETY INSTRUCTIONS**

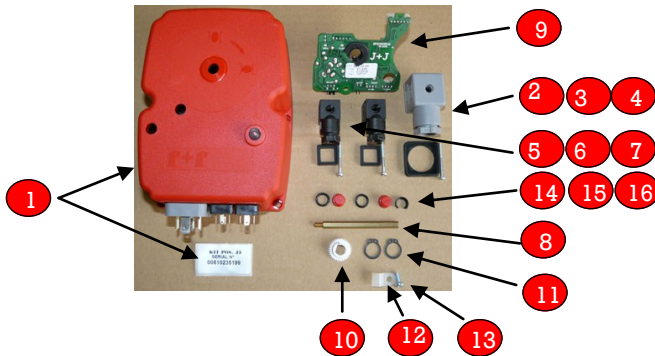
J3 Electric actuators operate with the use of live electricity. It is recommended that only qualified electricians or people instructed in accordance with electrical engineering, and familiar with local health and safety directives, or trained by the manufacturer, be in-

## OVERVIEW

This Digital Positioning System (DPS) conversion kit contains all the parts required to change the function of a J3 on-off electric actuator to a modulating actuator. The kit provides a choice of 4-20mA or 0-10VDC control and a choice between closing on signal failure, or opening. Once installed, the auto-calibrating DPS will run through a short set up procedure when first powered up. Once this is completed, the actuator has been converted to a fully automatic modulating unit and is ready for use.

## PARTS LIST

This photo shows all the parts supplied in the kit, which corresponds to the list below. Please check the parts you have received against the list below and in the unlikely event that any of the parts be missing, contact your reseller and do not attempt to fit the kit until you have received the missing part.



Item	Part description	Qty	Item	Part description	Qty
1	Cover assembly with label	1	9	DPS:2005.V6 Circuit board assembly	1
2	Power Din plug	1	10	White plastic feedback gear wheel	1
3	Power Din plug seal	1	11	Circlip	2
4	Power Din plug securing screw	1	12	Plastic P clip	1
5	Small black DIN plug	2	13	BZP cross head screw M4 x 8	1
6	Small DIN plug seal	2	14	O Ring	1
7	Small DIN plug securing screw	2	15	Plastic split clip	1
8	Hexagonal support column	1	16	Black plastic blanking plug	1

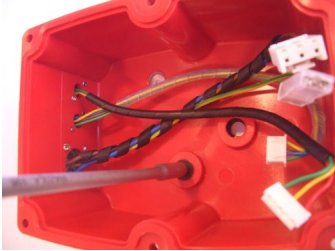




BEFORE STARTING TO CONVERT THE ACTUATOR,

**SEND THE ACTUATOR TO THE CLOSED POSITION**

THEN ISOLATE ALL POWER AND DISCONNECT ANY DIN PLUGS

#### PREPARING THE NEW COVER ASSEMBLY


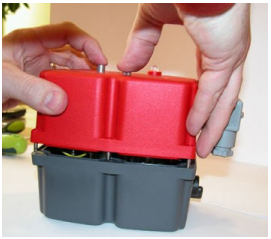

Cover preparation for Model J3-20	Cover preparation for Models J3-35, J3-55 & J3-85
<p>The Model J3-20 has only 1 shaft protruding through the top of the cover. This shaft is both the output drive shaft and manual override handle.</p>	<p>Models J3-35 thro J3-85 have 2 shafts protruding through the top of the cover, a manual override drive shaft and the output drive shaft, which also takes the local visual position indicator</p>
	
<p>The cover supplied in the conversion kit is universal and as such, has 3 holes. The hole common to all models is supplied with the shaft seal and clip already assembled. The other 2 holes need to be plugged.</p>	<p>Depending on the model, fit an O ring ( 14 ) to the bottom of the hole to be plugged, and plug ( 16 ) , and tap the plug home firmly to ensure water-tightness.</p>
<p>Insert the O ring ( 14 ) from the inside of the cover into the bottom of the shaft hole that does not already have the seal fitted, followed by the tapered blanking plug ( 16 ) . Tap the plug home firmly to ensure water-tightness.</p>	<p>Insert the O ring ( 14 ) from the inside of the cover into the shaft hole that does not already have the seal fitted, followed by the tapered plastic split clip ( 15 ) . Push the thick end against the O ring.</p>
<p> Correct fitting of these cover seals is essential. Failure to correctly install these cover seals will allow water ingress and resulting damage caused will NOT be covered by our warranty.</p>	

**REMOVE THE EXISTING COVER**

<p><b>Model J3-20</b></p>	<p><b>Models J3-35, J3-55 &amp; J3-85</b></p>
<p>The long flat plastic position indicator push fits over a pin through the shaft. Lift the plastic indicator off the pinned shaft and remove the pin. Retain the indicator and pin as they will be re-used.</p> 	<p>The manual override hand wheel is secured to the shaft with a socket head cap screw. Remove this cap screw and pull the hand wheel off the shaft. The local visual position indicator is a push fit over the output shaft and can be simply pulled up and off the shaft. Retain all these parts as they are re-used.</p> 

The rest of the instructions are common to all models from J3-20 thro J3-85.

Remove the 6 cover socket head cap screws, and lift the cover clear of the shafts.

	
	<p>Disconnect the cables from the actuator, consisting of 2 white plugs on the circuit board ( 1 for power and the other for the end of travel switches ), and a clear earth spade fitting from the gearbox cover plate.</p> <p>Discard the cover as it is no longer required.</p>

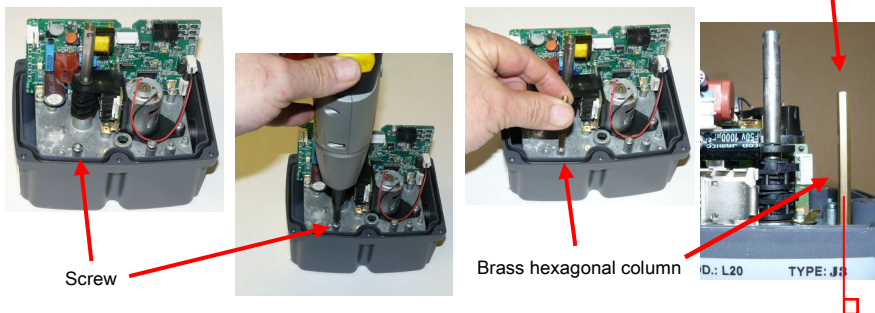


## INSTALL THE POSITIONER

The positioner comprises of a feedback gear wheel, a support column, and the positioner printed circuit board. The feedback gear wheel is held in position on the output shaft with 2 circlips ( seeger rings ). The circuit board is supported by the column at the front and the multi-pin plugs at the back which locate into sockets on the existing actuator circuit board. These instructions are the same for all models from J3-20 thro J3-85. If you require reverse acting ( fails open on loss of control signal ) , see page 9 *before* you start assembly.

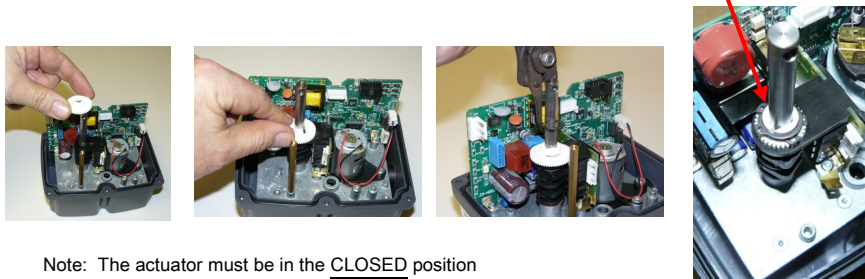
### Install the support column for the DPS circuit board

The support column replaces an existing screw in the gearbox upper plate. Remove this screw and screw in the brass hexagonal column ( 8 ). Ensure the column is vertical otherwise the DPS circuit board can become misaligned which will prevent the positioner from functioning correctly.



### Install the feedback gear wheel

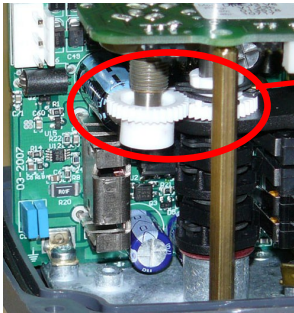
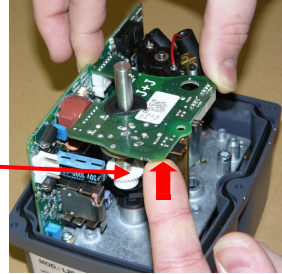
The feedback gear wheel ( 10 ) transmits the physical position of the actuator 's output shaft to the digital processor on the printed circuit board. Slide the gear wheel down the output shaft with the flat face downwards and collar upwards. When the flat moulded into the gear wheel collar is mated with the milled flat on the round output shaft, secure it in place with 2 circlips ( 11 ) around the collar. Install the circlips as shown here - this will prevent them interfering with the DPS circuit board gear wheel.



**Install the positioner circuit board**

The positioner circuit board is orientated as per the photo below, and connects physically to the actuator's vertical circuit board by the white plug and socket connection.

The DPS circuit board needs to be tilted slightly to assist in meshing the gears, using a finger at the front of the PCB helps.



Once the gears have meshed (left), fit the cables as shown below, the P clip ('P' facing down) and screw (12 & 13) hold the power cable in the orientation shown, but do not tighten screw (13) fully as there needs to be a small amount of movement in the PCB to assist in locating the DPS gears during the SETUP procedure.

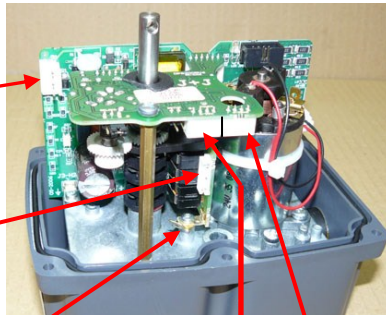


**Connect the cables**

Power plug

End of travel limit switches plug

Earth - spade connection. You may need to move this slightly to push the spade on if the brass column obstructs it.



4-20mA plug  
Control signal  
0-10V plug



End of travel

Control signal

Power & Earth

Trace the cables (not shown - inside the cover) to these plugs & connect to DPS PCB.



Make electrical connections and 'SETUP'



**WARNING:** the following steps are carried out with power connected to the actuator's circuitry. **DO NOT** touch the vertical circuit board. The rear of the vertical board has a shaded area to show where the high voltage is present.

It is vitally important to follow this sequence otherwise the final calibration will not be accurate.

Connect the power supply only. The main J3's red LED, and the red POWER light on the DPS circuit board will be illuminated.

The next stage is to set the gear wheel on the DPS circuit board such that the green OPEN and red CLOSE lights on the DPS circuit board are both illuminated solidly (not flashing). This is achieved by lifting the front left edge of the DPS circuit board slightly so that the gear can be moved with your finger. Rotate until both lights are solidly lit. This setting is very sensitive and may take a few attempts (see tips on following page).

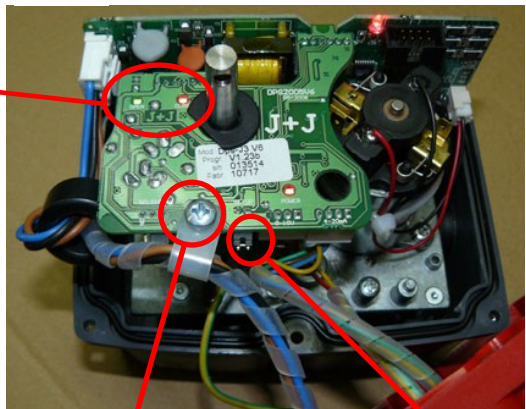
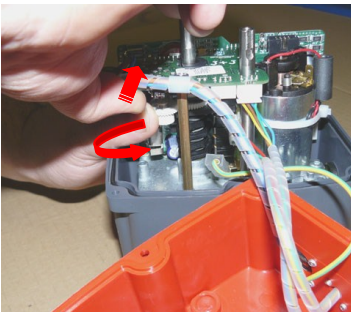
When you have both lit (see photo below right), lower the DPC circuit board until it rests on the brass column. Tighten the DPS circuit board retaining screw. If one of the lights flash, loosen the screw and reset the gear until both lights are solid, then tighten.

Only when the PCB is secured tightly, remove the jumper from SETUP - the actuator will run through its auto-calibrate routine, confirming the closed position, then travelling to the open position to auto set the span, then back to the closed position if the NO/ NC jumper is in the 'NC' position (see next page)



**These circuit boards are LIVE - be very careful !**

Adjusting the gears to illuminate the OPEN and CLOSE lights



Tighten screw **FIRST**, then remove & discard this SETUP jumper to start self calibration

**Tips on SETUP procedure.**

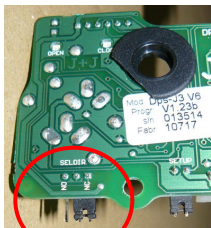
If you are experiencing difficulties with lighting both the OPEN and CLOSE lights ahead of the SETUP, and either the OPEN or the CLOSE light is flashing, rotate the DPS gear a full turn and try again, moving the gear forward and backwards at the point where the lights change from OPEN to CLOSE, repeating this until you get both lights solidly lit.

When you have both lights on, as you drop the DPS circuit board back onto the support column, if one of the lights starts to flash this is not OK - running the SETUP with a light flashing will affect the quality of the feed-back signal.

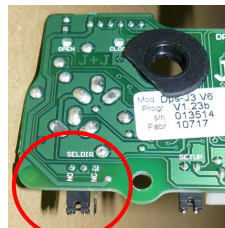
**Normally Open / Reverse Acting configuration**

Standard:	4mA = CLOSED	20mA = OPEN	Closes on loss of control signal (N.C.)
	0 V = CLOSED	10V = OPEN	Closes on loss of control signal (N.C.)
Reverse acting	4mA = OPEN	20mA = CLOSED	Opens on loss of control signal (N.O.)
	0 V = OPEN	10V = CLOSED	Opens on loss of control signal (N.O.)

The J3 DPS is supplied Normally Closed from the factory - if you require normally OPEN or reverse acting, change the jumper shown below from NC to NO before you install the DPS into the J3 actuator:



Factory setting 'N.C.'



Setting for 'N.O.'

**Testing & confirming settings**

Apply the control signal using the same signal as selected when connecting the cables. If you apply an incorrect control signal the positioner should not be damaged, but it will not operate.

Test the modulation by changing the control input signal, and to check that the function is as expected (standard or reverse acting), remove the signal to confirm the position on loss of signal.

Re-apply the signal and the unit is fully functional and ready for service.



## FINAL RE-ASSEMBLY



**Warning.** Damage caused by incorrect re-assembly is not covered by our warranty.

Replace the cover carefully, ensuring that no internal cables are trapped when pushing the cover down. Do not allow any cables to run over the top of the DPS circuit board.

### Model J3-20

Ensure the cover seal, and blanking plug are in place as described on page 3

Push the cover down, insert and tighten the 6 cover screws

Insert the pin through the shaft



Push fit the black position indicator over the pin. Ensure the yellow indicator travels between the open & closed logos



### Models J3-35, J3-55 & J3-85

Ensure the cover seals are in place as described on page 3.

Push the cover down, insert and tighten the 6 cover screws

Push fit the black position indicator, lining up the flat on the shaft with the flat on the inside of the indicator.

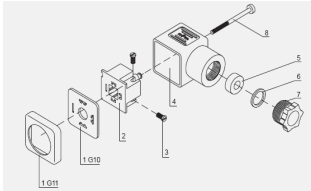


Push fit the manual override hand wheel, lining up the 3 flats on the shaft with the flats on the inside of the hand wheel. Insert the cap screw and tighten.



## DIN PLUGS

All electrical connections are made by external DIN plugs:

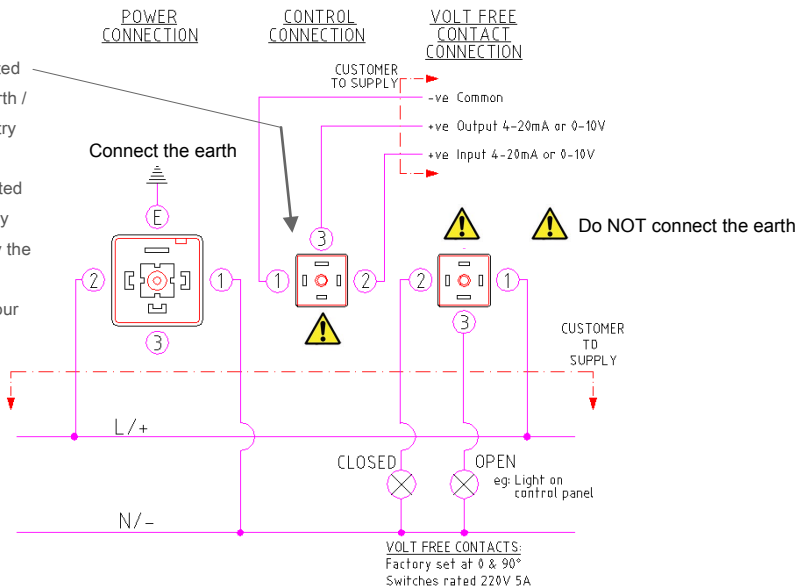


Parts (2) through (7) supplied with the kit make the 3 DIN plug assemblies.

## WIRING DIAGRAM

Note:

This DIN plug base is rotated through 180 degrees (earth / ground at the bottom) to try and prevent the volt free contact plug being connected to the control connection by mistake as this will destroy the DPS circuitry. Damage so caused is not covered by our warranty.



Above wiring showing same supply as motor is only a suggestion.



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### MAINTENANCE INSTRUCTIONS

The J3 actuators are generally maintenance free. There are no internal parts that require maintenance. The gearbox is lubricated for life when built at the factory. The housing may be cleaned with a cloth covered in warm soapy water to keep it clean. Do not use solvents.



**DO NOT PRESSURE WASH.** Pressure washing will invalidate any warranty



### DISPOSAL AT END OF LIFE - RECYCLING

J+J Automation UK Ltd, is committed to the protection of the environment. Please remember at end of life to dispose of responsibly and if the facilities are available recycle.



Notes: