

## RDx-xxxDT-10.31

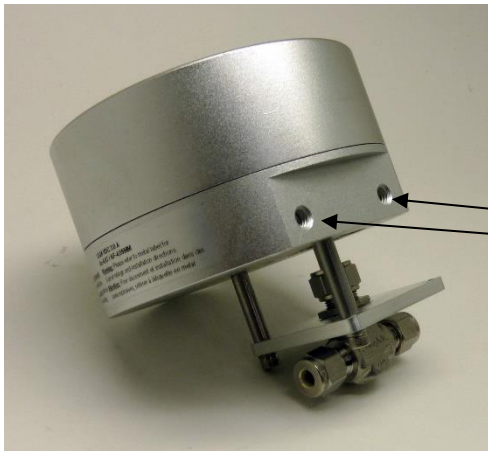
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### Installation

#### Mounting:



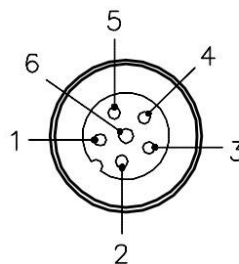
Holes for a mounting bracket.  
Holes are threaded for 1/4-20 and  
are approximately .275" deep.

For dimensions see below.

## Wiring:

### Wiring schematic for RDx-xxxDT-10.31:

Terminal #	DC Power Supply only
6-> White	+24VDC
5-> Black	Power Gnd
4-> Pink	Output TTL 2
3-> Grey	Output TTL 1
2-> Blue	Input TTL 2
1-> Brown	Input TTL 1



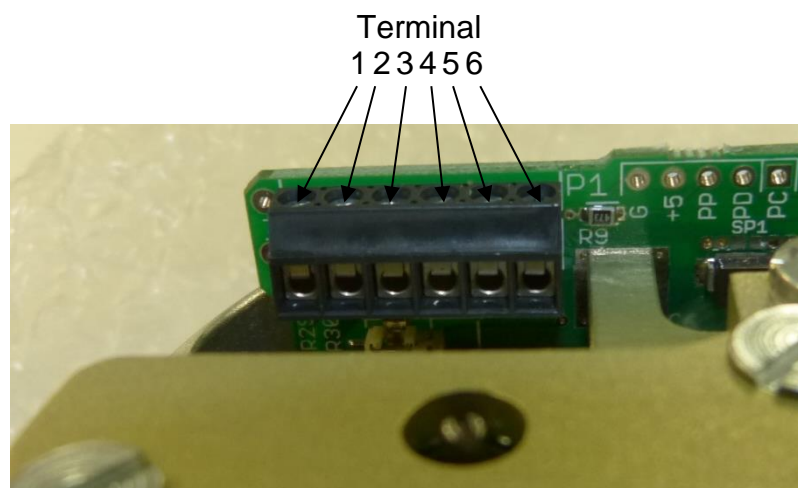
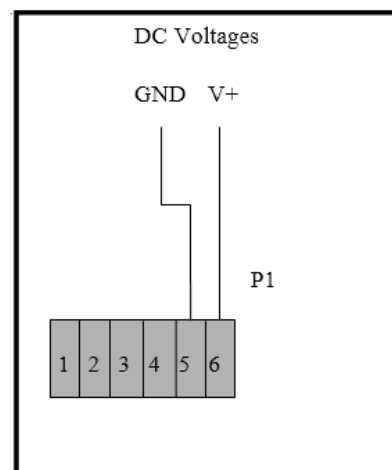
- 1 = BROWN
- 2 = WHITE
- 3 = BLUE
- 4 = BLACK
- 5 = GRAY
- 6 = PINK

For non-explosion proof R-series.

## Connect the power:

The **RDx-xxxDT** may be connected to voltages ranging from 12 – 24 VDC

The power consumption will range from max. 3.0A to approx min. 100mA when the actuator is active. When not moving, the actuator draws less than 30mA.

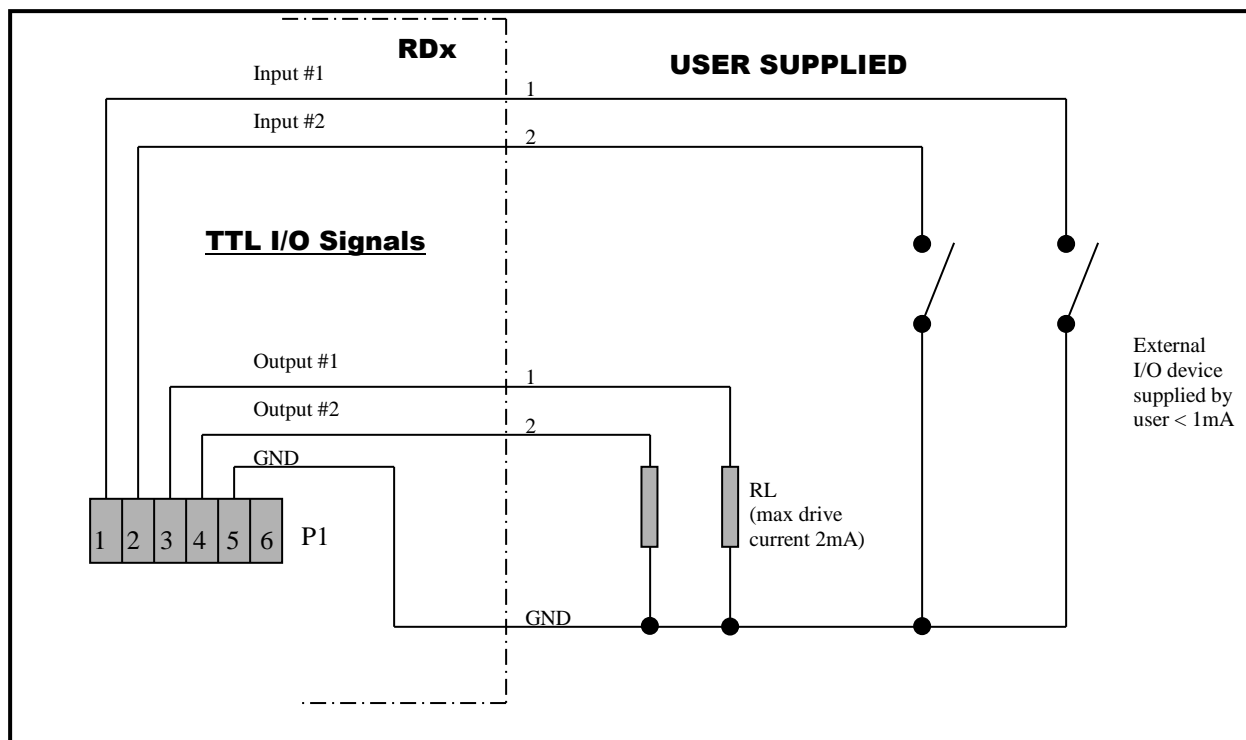


Locate the correct connection terminals as shown in the picture to the left then connect according to the connection schematics above.



## Connect the signal:

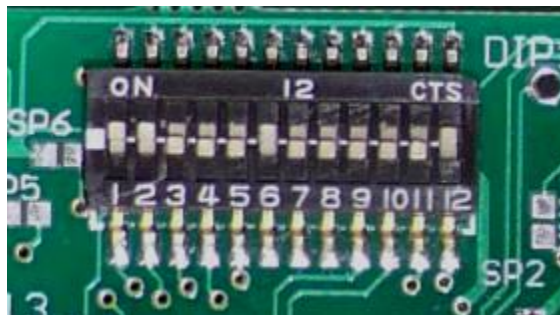
Locate the correct connection terminals as shown on the previous page then connect your input signal on pos. 1 and 2 and the output signals on 3 and 4 as shown below.



## Operation

### DIP switches:

The DIP switches allow you to change the settings on your actuator. To flip a switch, gently use a small flat-head screwdriver. See chart below for DIP switch functionality.



DIP switches. In this example DIPs 1, 2, 6 and 12 are on.

DIP 1	DIP 2		
Off	Off	Fastest settling	Use only for low torque valves
Off	On	Medium-fast	Typical setting
On	Off	Medium-slow	Typical setting
On	On	Slowest settling	Use for high torque valves

Switches 1 and 2 set the actuator position control parameters. High settling speed settings are suitable for fast positioning of light valves. Longer settling times will allow heavier valves to reach their target positions; trying to use a fast settling speed on a high torque valve will increase current consumption when holding position, and cause heating of the motor.

DIP 3	Reserved for custom function.					
DIP 4	Sets direction of offset. (Offset only available in RDH, RDF and RDU series)					
DIP 5	Sets the highest amount of offset, typically 12°. <b>NOTE:</b> To set maximum offset DIP's 5,6 and 7 will need to be high for a total of 21°. The max. offset can also be set differently upon customer request.					
DIP 6	Sets medium offset, typically 6°.					
DIP 7	Sets the lowest amount of offset, typically 3°.					
DIP 8	With DIP switch 8 in the ON position, the actuator will move to 4 positions. It will also alter the function of the output signals. In the OFF position, the actuator is limited to three positions.					
DIP 9	Run / Calibrate Putting DIP switch 9 into the OFF position will disable the actuator positioning control, and the motor will not move regardless of the input signals. When DIP 9 is moved back into the ON position, the actuator will perform its homing routine, and then move to the position commanded by the input signals.					
DIP 10	DIP 11	Description			Approximate stall current	
Off	Off	Low torque			0.75A	
Off	On	Medium-low			1A	
On	Off	Medium-high			2A	
On	On	High torque			3A	
Approximate stall torque						
DIP 10	DIP 11	RDL	RDM	RDH	RDF	RDU
Off	Off	40 in-lbs.	120 in-lbs.	405 in-lbs.	756 in-lbs.	3348 in-lbs.
Off	On	53 in-lbs.	160 in-lbs.	540 in-lbs.	1008 in-lbs.	4464 in-lbs.
On	Off	60 in-lbs.	180 in-lbs.	608 in-lbs.	1134 in-lbs.	5022 in-lbs.
On	On	66 in-lbs.	195 in-lbs.	657 in-lbs.	1241 in-lbs.	5440 in-lbs.
DIP 12	DIP 12 sets the direction of rotation					

## Functionality of the RDx-xxxDT:

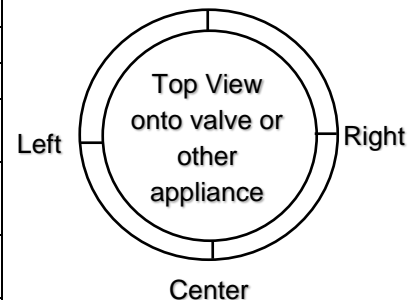
The RDx can operate as a 3-position or 4-position actuator. The 4<sup>th</sup> position is enabled by turning DIP 8 ON.

### 3-pos Functionality (Dip 8 OFF)

Input#1 (Pin 1)	Input#2 (Pin 2)	Action taken
High	High	Moves to or remains in center position
Low	High	Moves to or remains in right position
High	Low	Moves to or remains in left position
Low	Low	Moves to or remains in left position (Input#2 has precedence over Input #1)

### The feedback from the RDx-xxxDT is as follows:

Output#1 (Pin 3)	Output#2 (Pin 4)	Meaning
High	High	Actuator output is in center position
High	Low	In Right position
Low	High	In Left position
Low	Low	Actuator is moving, or has stalled and given up trying to reach a requested position. You may retry to reach any position by cycling alternate inputs and trying the original again. Repeated failures to reach the position will require troubleshooting.

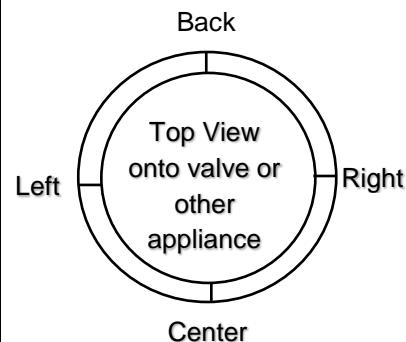


4-pos Functionality (Dip 8 ON)

Input#1 (Pin 1)	Input#2 (Pin 2)	Action taken
High	High	Moves to or remains in center position
Low	High	Moves to or remains in right position
High	Low	Moves to or remains in left position
Low	Low	Moves to or remains in back position

**The feedback from the RDx-xxxDT is as follows:**

Output#1 (Pin 3)	Output#2 (Pin 4)	Meaning
High = 4.5vDC Low = 0.8vDC		
Low	Low	Actuator is at requested position
High	Low	Actuator is moving
Low	High	Actuator has stalled. The stall can be cleared by making the actuator turn in the other direction.

**Direction of rotation and using Input 1**

To change the direction of rotation on the actuator change the setting on Dip12 and power up the actuator again.



**VERY IMPORTANT:** Input 1 must always be used if only one input is used to operate the valve. When the actuator is operated using input 1 an automatic calibration is done every time the valve is actuated. This does not happen on input 2.

**Torque Settings:****Effect of power settings and speed settings:**

To accommodate different valves and other applications with different torque requirements, the actuator can be set to apply different torque on the valve stem when in the seating mode. Please see table on pg. 4 to select the power setting that is right for your application.

The actuator will use 100% of available torque to try and reach maximum speed. Current drawn will be limited proportionally to the DiP setting applied actuator will automatically slow down and deliver the maximum available torque for a given "Permanent Power Setting".

**Note: 66% setting and 100% setting may alter duty cycle:**

Supply voltage needs to be min 14 VDC for 66% setting

- Supply voltage needs to be 16 VDC for 100% setting

- When operating above 20VDC and 66% power, Duty cycle is reduced to 50% - 25% maximum.

At these levels, the electronics produce more heat which must be dissipated (depending on environmental temperature)

## Appendix

### Calibration

The center position calibration routine can be initiated by switching Dip9 momentarily “on” then “off”. This will cause the actuator to go through a series of movements to determine the proper center position. This function is useful if the actuators output gear gets manually rotated while the actuator is powered down and can’t properly realign to the center by itself.

### Troubleshooting:

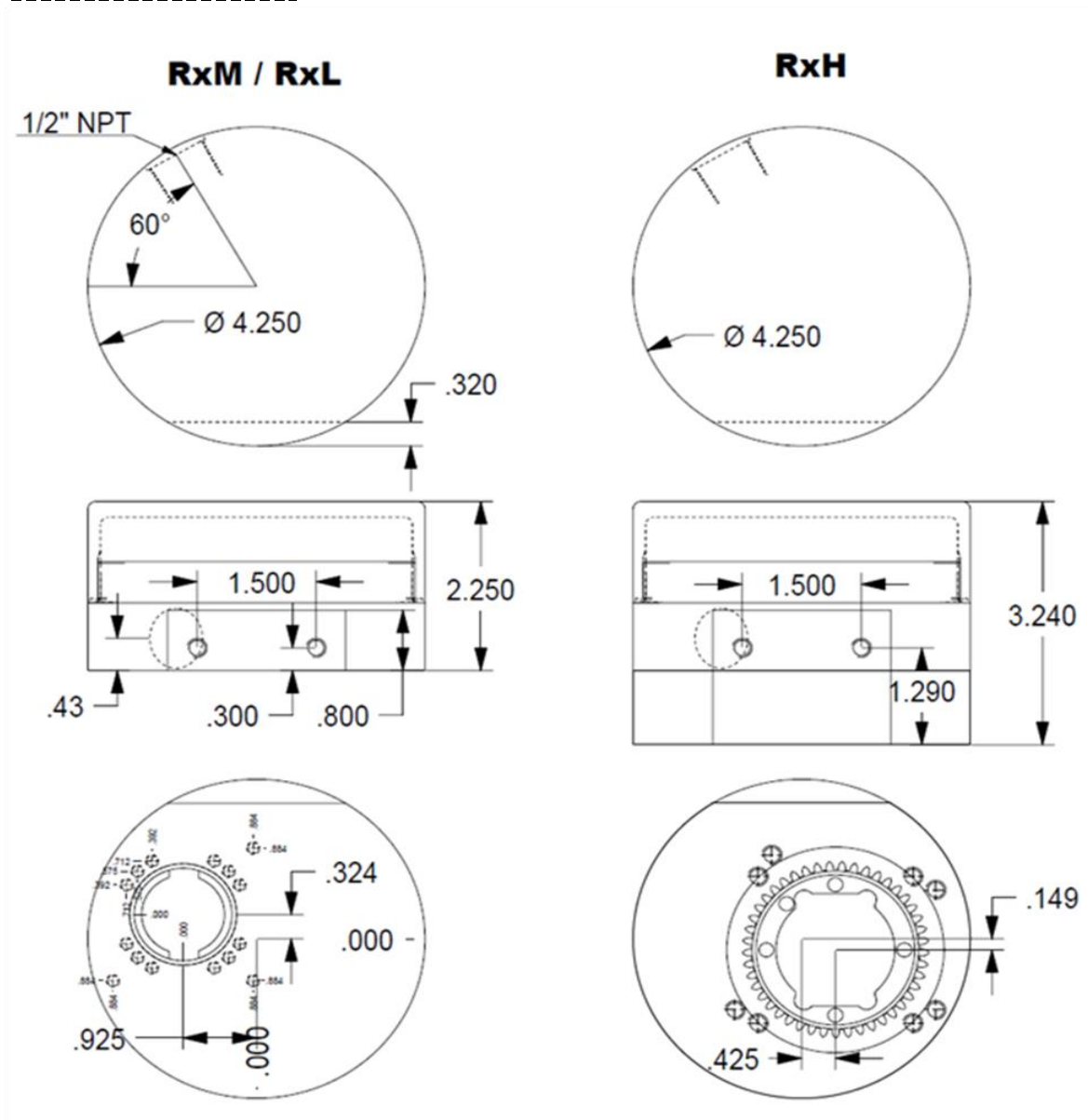
Upon noticing a problem, your first step should almost always be to recalibrate the actuator by switching DIP 9 on then off, all while the actuator is powered. This alone can solve basic problems. See section 3 on this page for more details.

**If the actuator does not move, try following these steps:**

- 1) Re-calibrate the actuator. This will move the actuator regardless of what signal it is receiving.
- 2) A sticking valve may be the problem. Remove the valve from the actuator, and re-test the actuator.
- 3) Remove power. Re-check the wiring and the power/signal apparatus. Power actuator, and re-calibrate. If the problem persists, please call Hanbay for technical support.



## Main Dimensions



### Desiccant sticks:

These sticks change colour when exposed to moisture. When they change from the original colour, blue, to pink, the actuator has been exposed to an excess of moisture.



## Part Number Breakdown

Serial Number:

Full Hanbay Part Number: R D   -   -       DT -   -  

