RCx-xxxAS-1.05
(12-24 VDC; Modbus Control)
CSA/IECEX Rated*

USER MANUAL

Contents

***Only model numbers: RCx-BxxAS w/ ex-proof lid engraving (p.16)**

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INSTALLATION

Mounting

The holes indicated in the image are intended for a mounting bracket. They are threaded for ¼-20 and are 0.4” deep.

The other two visible holes are threaded 10-32, 0.50” deep, and are intended to be used to lock the lid in position with screws.

For detailed dimensions see p.17.

Wiring

Wiring for Explosion Proof Actuators

The **RCx-BxxAS** Explosion-Proof actuator does **not** come with a pre-installed cable, nor cable gland. A cable gland that meets site specifications for the appropriate hazardous location rating is required for installation. The cable gland and the cable for hazardous location should be installed by qualified personnel in accordance with site and local requirements.

The actuator comes standard with a ½” FNPT thread cable entry. See p.17 for location of ½” FNPT housing access. A cable with 5 wires is required; it is recommended to use 16-24 AWG for all wires.

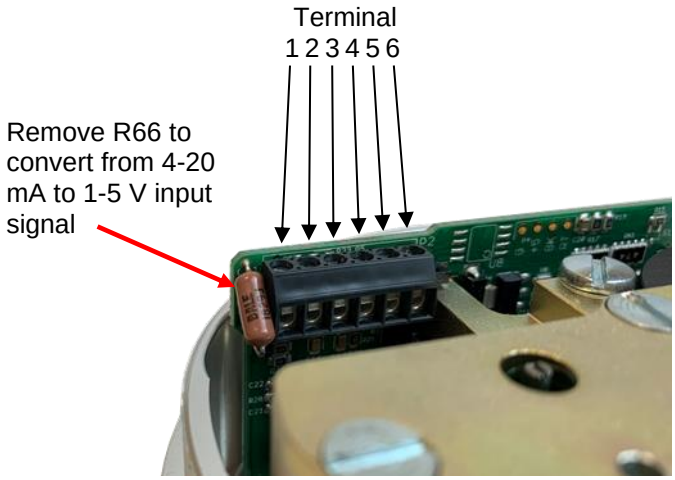
Standards for cable gland and cable in hazardous locations:

Compliance Standards Required to be Met	Cable Types Permitted in Class I Division 1 Hazardous Locations
ANSI / UL 514B, ANSI / UL 1203, ANSI / UL 2225, C22.2	Non-Armored Extra Hard Usage Cord & TC-ER-HL
ANSI / UL 514B, ANSI / UL 1203, ANSI / UL 2225	Armored IEEE 45 & IEEE 1580 Marine Shipboard Cable
ANSI / UL 514B, ANSI / UL 1203, ANSI / UL 2225	MC-HI, ITC-HL
ANSI / UL 514B, ANSI / UL 1203, C22.2	Teck 90 (Canada Only)

* In explosion-proof models, the FNPT thread is not intended for conduit connection. Cable gland only.

Once the cable and cable gland are installed, connect the wires to the pins on the terminal block as indicated here:

Pin	DC power supply only
6	+24VDC
5	Power gnd.
4	TD(A)
3	TD(B)
2	Isolated input signal gnd.
1	Isolated input signal (4-20 mA)



If the sensing resistor R66 is removed, we recommend placing a 10K resistor between signal and signal GND, or simply using shielded cables (for noise reduction).

Wiring for Non-Explosion Proof Actuators

The actuator comes standard with a Turck 6-position connector and a 20' cable (6x 22 AWG) with plug. Cut the cable to the length required, then connect according to the following wire color schematic.

Pins indicate the connection of the cables to the terminal block on the PCB board within the actuator. These are pre-wired at the factory for non-explosion proof actuators.

Wire color schematic for "Turck 6" cable:

Pin	Color	DC power supply only
6	White	+24VDC
5	Black	Power Gnd
4	Pink	TD(A)
3	Grey	TD(B)
2	Brown	Isolated input signal gnd.
1	Blue	Isolated input signal (4-20 mA)

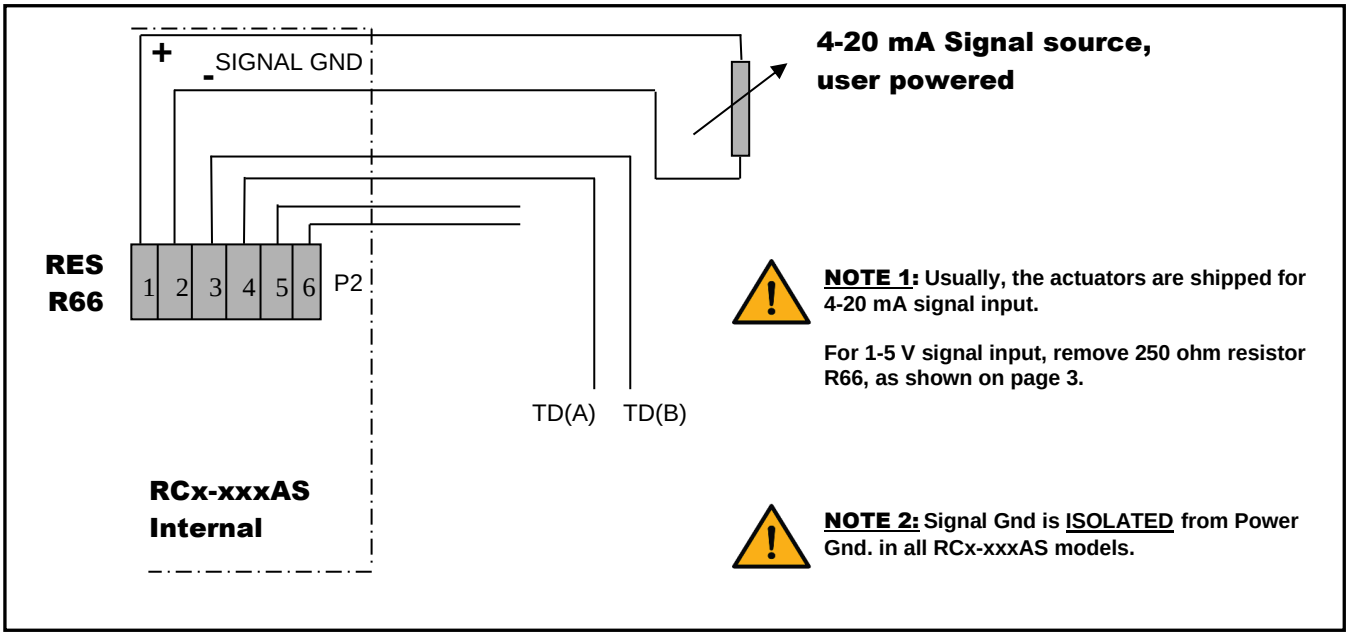
Power Supply and Current Draw

The **RCx-xxxAS** may be connected to voltages ranging within 12-24 VDC.

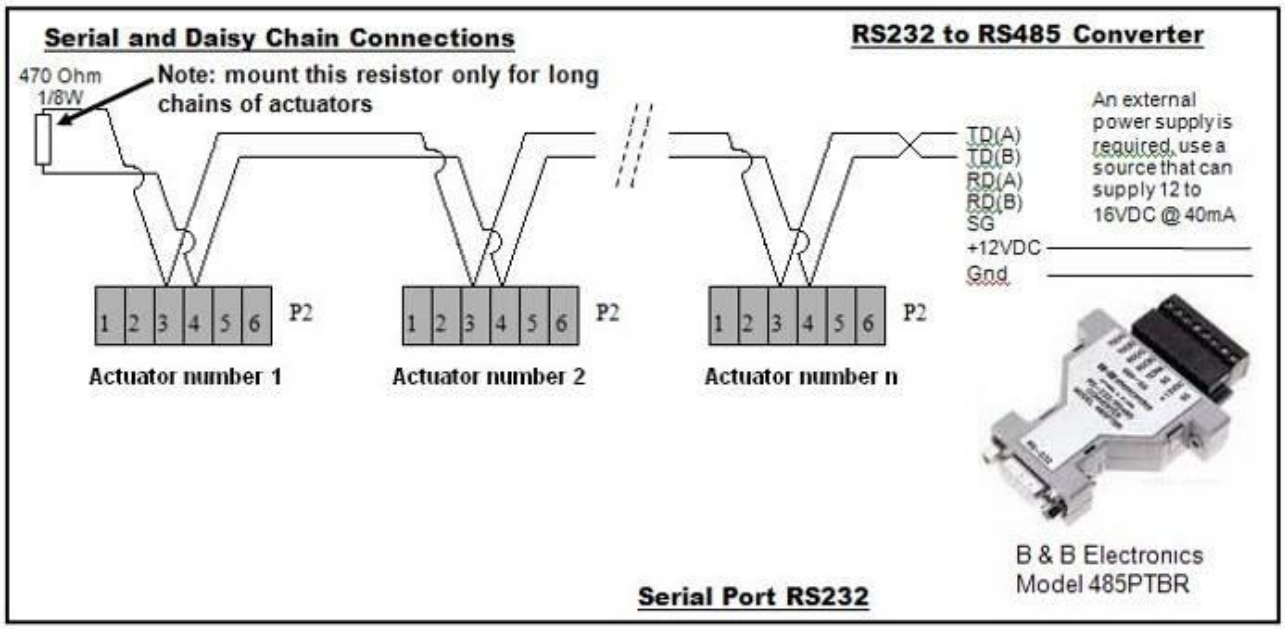
The current draw will range from minimum 100 mA to maximum 3 A while the actuator is active. When not moving, the actuator draws approx. 50 mA.

Control Signal and Feedback

Locate the correct connection terminals as shown in the picture on p.3, then connect your communication wires to PIN 3 and PIN 4 (grey and pink wires) as shown below.



Serial Port Connection

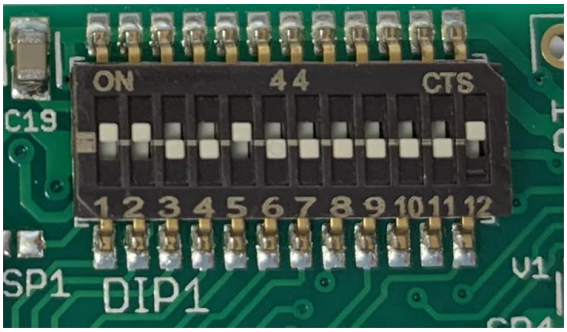


OPERATION

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 the table below for DIP switch functionality.



In this example DIPs 1, 2, 5 and 12 are on.

DIP	Function
1 **2**	**Baud Rate:** Choose the rate at which information is transferred. See p.5.
3 – 8	**Actuator Address:** See p.6.
9 – 11	**Deactivated**
12	**Direction/Calibration:** Toggle while powered to re-calibrate actuator (find valve seat). Also sets direction in which the actuator will open and close. See p.14. Example: The RCM model actuator turns clockwise when the signal is decreased with DIP 12 in the OFF position. Putting DIP 12 in the ON position will cause counter-clockwise turning for a decrease in signal. For changes in DIP 12 position to take effect, the power to the actuator must be cycled.

Set the communication parameters

Data bits: 8

Parity: None

Stop bits: 1

Baud Rate: The communication baud rate can be set by using the first two positions of the **DIP switch selector**. Check the table below for settings.
To change the baud rate, turn off the actuator, change the setting of DIP switches and power it up again.

DIP 1	DIP 2	Baud rate
OFF	OFF	2400 bps
OFF	ON	4800 bps
ON	OFF	9600 bps
ON	ON	19200 bps

Response time: The response time is between 8ms to 35ms. This means, after sending a frame, you have to wait at least 35ms for the answer coming back from the actuator.

Set the actuator address

With the **DIP switch selector**, you can set any address between 1 and 63. (1 = "On" 0 = "Off").
To change the address, turn off the actuator, change the setting of DIP switches and power it up again.

Actuator Address	Dip3	Dip4	Dip5	Dip6	Dip7	Dip8
reserved	0	0	0	0	0	0
1	0	0	0	0	0	1
2	0	0	0	0	1	0
3	0	0	0	0	1	1
4	0	0	0	1	0	0
5	0	0	0	1	0	1
6	0	0	0	1	1	0
7	0	0	0	1	1	1
8	0	0	1	0	0	0
9	0	0	1	0	0	1
10	0	0	1	0	1	0
11	0	0	1	0	1	1
12	0	0	1	1	0	0
13	0	0	1	1	0	1
14	0	0	1	1	1	0
15	0	0	1	1	1	1
16	0	1	0	0	0	0
17	0	1	0	0	0	1
18	0	1	0	0	1	0
19	0	1	0	0	1	1
20	0	1	0	1	0	0
21	0	1	0	1	0	1
22	0	1	0	1	1	0
23	0	1	0	1	1	1
24	0	1	1	0	0	0
25	0	1	1	0	0	1
26	0	1	1	0	1	0
27	0	1	1	0	1	1
28	0	1	1	1	0	0
29	0	1	1	1	0	1
30	0	1	1	1	1	0
31	0	1	1	1	1	1
32	1	0	0	0	0	0
33	1	0	0	0	0	1
34	1	0	0	0	1	0
35	1	0	0	0	1	1
36	1	0	0	1	0	0
37	1	0	0	1	0	1
38	1	0	0	1	1	0
39	1	0	0	1	1	1
40	1	0	1	0	0	0
41	1	0	1	0	0	1
42	1	0	1	0	1	0
43	1	0	1	0	1	1
44	1	0	1	1	0	0
45	1	0	1	1	0	1
46	1	0	1	1	1	0
47	1	0	1	1	1	1
48	1	1	0	0	0	0
49	1	1	0	0	0	1
50	1	1	0	0	1	0
51	1	1	0	0	1	1
52	1	1	0	1	0	0
53	1	1	0	1	0	1
54	1	1	0	1	1	0
55	1	1	0	1	1	1
56	1	1	1	0	0	0
57	1	1	1	0	0	1
58	1	1	1	0	1	0
59	1	1	1	0	1	1
60	1	1	1	1	0	0
61	1	1	1	1	0	1
62	1	1	1	1	1	0
63	1	1	1	1	1	1

Modbus Protocol

Actuator parameters can be set by using the MODBUS (RTU) protocol.

Standard supported function codes:
02 (0x02) Read Discrete Inputs
03 (0x03) Read Holding Registers.
04 (0x04) Read Input Registers.
06 (0x06) Write Single Register.

Hanbay function codes: (see p.14 for examples)
100 (0x64) Re-zero the actuator.
101 (0x65) Close the valve.
102 (0x66) Open the valve.

If you try to use any other function code, the actuator will answer with the exception code **0x01** indicating that the attempted function code is not supported.

Actuator memory map:

Address (DEC)	Address (HEX)	Offset	Register Name	Type
0	0x0000	4001	MaximumSpeed	Holding registers. **READ** and **WRITE**
1	0x0001	4002	MaximumPower	
2	0x0002	4003	NumberOfTurns	
3	0x0003	4004	TargetFromRS485Flag	
4	0x0004	4005	InputRangeLow	
5	0x0005	4006	InputRangeHigh	
6	0x0006	4007	OutputRangeLow	
7	0x0007	4008	OutputRangeHigh	
8	0x0008	4009	TargetPosition	
9	0x0009	4010	SignalLostPosition	
10	0x000A	4011	Reserved	
11	0x000B	4012	Reserved	
12	0x000C	4013	Reserved	
13	0x000D	4014	Reserved	
14	0x000E	4015	Reserved	
15	0x000F	4016	Reserved	
16	0x0010	4017	Reserved	
17	0x0011	4018	Reserved	
18	0x0012	4019	Reserved	
19	0x0013	4020	Reserved	
20	0x0014	4021	CurrentPosition	Input registers. **READ** only
21	0x0015	4022	StatusRegister	

IMPORTANT: All the values sent to the actuator are "HEX" values

Speed and Torque Settings

During normal operation, the actuator will try to reach the speed set by "**MaximumSpeed**". If the torque required to reach this speed exceeds the actuator model's capability, the actuator will automatically slow down. Please refer to the tables in the Speed and Torque Details section for each actuator model's torque capability.

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. Torque during normal operation is always 100% of the actuator's capability.

To deal with sticking valves, at the beginning of the first reversing movement after the seating ("zeroing") of the valve, the actuator will apply double the power set by "**MaximumPower"** (up to 100% power.)
This "pull out" function is always enabled.

Register name	Address	Max	Min	Default	Actuator address	Function code	Register address	Register new value	CRC
MaximumSpeed	**0x0000**	3	0	N/A					
Example: Set Maximum speed to 0 in actuator number 8					0x08	0x06	0x0000	0x0000	0x----
					1 byte	1 byte	2 bytes	2 bytes	2 bytes

Possible values for the "**MaximumSpeed**" register are shown in the following table. To see how these values relate to physical speed, see the Speed and Torque Details section.

Maximum speed value	Speed level
0	16%
1	33%
2	66%
3	100%

Register name	Address	Max	Min	Default	Actuator address	Function code	Register address	Register new value	CRC
MaximumPower	**0x0001**	3	0	N/A					
Example: Set Maximum power to 3 in actuator number 9					0x09	0x06	0x0001	0x0003	0x----
					1 byte	1 byte	2 bytes	2 bytes	2 bytes

Possible values for the "**MaximumPower**" register are shown in the following table. To see how these values relate to physical torque values, see the Speed and Torque Details section.

Maximum power value	Power level
0	16%
1	33%
2	66%
3	100%

WARNING: High power settings can supply enough torque to damage your valve.
Please be cautious, especially when using the 100% power setting.

Note: The 66% and 100% power settings have the following particularities:

- Supply voltage needs to be min. 14 VDC for 66% setting
- Supply voltage needs to be min. 16 VDC for 100% setting
- When operating above 20 VDC 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)

Speed and Torque Details

RC**L**-xxxAS Actuators

Speed:	
Maximum Speed Address 0x0000	**Time for 1 turn (sec)**
0	7
1	3
2	2
3	1

Torque:			
Torque Address 0x0001	**Seating Torque (in-lbs)**		Operating torque is 100%
	12VDC	**24VDC**	
0	6	12	
1	10	20	
2	19	38	
3	24	48	
NOTE: If actuator is RC**J**-xxxAS, divide torque values by 3. **To convert in-lbs to Nm, divide by 9.**			

RC**M**-xxxAS Actuators

Speed:	
Maximum Speed Address 0x0000	**Time for 1 turn (sec)**
0	23
1	11
2	7
3	4

Torque:			
Torque Address 0x0001	**Seating Torque (in-lbs)**		Operating torque is 100%
	12VDC	**24VDC**	
0	17	35	
1	30	60	
2	55	115	
3	70	145	
NOTE: If actuator is RC**K**-xxxAS, divide torque values by 3. **To convert in-lbs to Nm, divide by 9.**			

RC**H**-xxxAS Actuators

Speed:	
Maximum Speed Address 0x0000	**Time for 1 turn (sec)**
0	72
1	45
2	30
3	18

Torque:			
Torque Address 0x0001	**Seating Torque (in-lbs)**		Operating torque is 100%
	12VDC	**24VDC**	
0	60	120	
1	102	205	
2	200	400	
3	248	497	
To convert in-lbs to Nm, divide by 9.			

RC**F**-xxxAS Actuators

Speed:	
Maximum Speed Address 0x0000	**Time for 1 turn (sec)**
0	197
1	99
2	54
3	38

Torque:			
Torque Address 0x0001	**Seating Torque (in-lbs)**		Operating torque is 100%
	12VDC	**24VDC**	
0	115	230	
1	190	380	
2	360	720	
3	457	915	
To convert in-lbs to Nm, divide by 9.			

Writing to All Other Holding Registers

The "**NumberOfTurns**" register allows the user to set the number of turns the actuator performs in the full signal range.

Register name	Address	Max	Min	Default	Actuator address	Function code	Register address	Register new value	CRC
NumberOfTurns	**0x0002**	100	1	N/A					
Example: Set number of turns to 32 in actuator number 10					0x0A	0x06	0x0002	0x0020	0x----
					1 byte	1 byte	2 bytes	2 bytes	2 bytes

The "**TargetFromRS485Flag**" register tells the actuator where to read its target position from. If the flag is set to 1, the actuator will take the value from a 4-20 mA input as its target position. If the flag is set to 0, the actuator will take the value from the "**TargetPosition**" register as its target position.
Remember: all values sent to actuator are HEX values.

Register name	Address	Max	Min	Default	Actuator address	Fct. code	Register address	Register new value	CRC
TargetFromRS485Flag	**0x0003**	1	0	N/A					
Example: Make actuator number 11 take the target position from the "TargetPosition" register					0x0B	0x06	0x0003	0x0000	0x----
					1 byte	1 byte	2 bytes	2 bytes	2 bytes

The "**InputRangeLow**" register allows the user to set the lower limit of the input signal (i.e. the value of the input signal at which the actuator will move to the fully closed position).

Register name	Address	Max	Min	Default	Actuator address	Function code	Register address	Register new value	CRC
InputRangeLow	**0x0004**	64900	0	0					
Example: Set input range low to 4000 in actuator number 12					0x0C	0x06	0x0004	0x0FA0	0x----
					1 byte	1 byte	2 bytes	2 bytes	2bytes

The "**InputRangeHigh**" register allows the user to set the upper limit of the input signal (i.e. the value of the input signal at which the actuator will open the valve to the number of turns specified in the "**NumberOfTurns**" register – fully open).

Register name	Address	Max	Min	Default	Actuator address	Function code	Register address	Register new value	CRC
InputRangeHigh	**0x0005**	65000	100	10000					
Example: Set input range high to 65000 in actuator number 23					0x17	0x06	0x0005	0xFDE8	0x----
					1 byte	1 byte	2 bytes	2 bytes	2bytes

The value stored in the "**InputRangeLow**" register must always be lower than the value stored in the "**InputRangeHigh**" register. If you try to write an illogical range, the actuator will answer with exception code **0x03** indicating that the new value is not valid.
Remember: all values sent to actuator are HEX.

The "**OutputRangeLow**" register allows the user to set the lower limit of the feedback signal (i.e. the value of the feedback signal when the actuator is in the fully closed position).

Register name	Address	Max	Min	Default	Actuator address	Fct. code	Register address	Register new value	CRC
OutputRangeLow	**0x0006**	64900	0	0					
Example: Set input range low to 4000 in actuator number 12					0x0C	0x06	0x0006	0x0FA0	0x----
					1 byte	1 byte	2 bytes	2 bytes	2bytes

The "**OutputRangeHigh**" register allows the user to set the upper limit of the feedback signal (i.e. the value of the feedback signal when the actuator is opened to the number of turns specified in the "**NumberOfTurns**" register – fully open).

Register name	Address	Max	Min	Default	Actuator address	Fct. code	Register address	Register new value	CRC
OutputRangeHigh	**0x0007**	65000	100	10000					
Example: Set input range high to 65000 in actuator number 23					0x17	0x06	0x0007	0xFDE8	0x----
					1 byte	1 byte	2 bytes	2 bytes	2bytes

The value stored in the "**OutputRangeLow**" register must always be lower than the value stored in the "**OutputRangeHigh**" register. If you try to write an illogical range, the actuator will answer with exception code **0x03** indicating that the new value is not valid.
Remember: all values sent to actuator are HEX.

The "**TargetPosition**" is the input signal, which tells the actuator where to position the valve.

Register name	Address	Max	Min	Default	Actuator address	Fct. code	Register address	Register new value	CRC
TargetPosition	**0x0008**	Input Range Low	Input Range High	N/A					
Example: Set the target position to 3000 in actuator number 18					0x12	0x06	0x0008	0x0BB8	0x----
					1 byte	1byte	2 bytes	2 bytes	2bytes

If the value in "**TargetPosition**" is the same as the value in "**InputRangeLow**" the actuator will re-zero, finding the valve seat and closing the valve completely. This enables a new fully closed position to be established based on normal wear of the valve seat.
If the value in "**TargetPosition**" is the same as the value in "**InputRangeHigh**" the valve will be opened to the maximum number of turns, as set by the "**NumberOfTurns**" register.

Example:
The actuator parameters are set to (decimal representation for simplicity):
NumberOfTurns = 10
InputRangeLow = 500
InputRangeHigh = 2500

- To close the valve, the "TargetPosition" register has to be set to 500.
- To open the valve 5 turns, the TargetPosition" register has to be set to 1500.

To have the actuator use "**TargetPosition**" as its target position, "**TargetFromRS485Flag**" must be 0.
The value stored in the "**TargetPosition**" register must always be lower or equal to "**OutputRangeHigh**" and greater or equal to "**OutputRangeLow**". If you try to write a value out of the range, the actuator will answer with exception code **0x03** indicating that the new value is not valid.

Signal Loss

The "**SignalLostPosition**" register can be used (optional) to set the position of the actuator upon signal loss. Signal loss can only occur when controlling the actuator with 4-20 mA (or 1-5 V) input signals, i.e. when "**TargetFromRS485Flag**" is set to 1. The signal is considered lost when it falls below 2.80 mA (or 0.700 V).

Register name	Address	Max	Min	Default	Actuator address	Fct. code	Register address	Register new value	CRC
SignalLost Position	**0x0009**	Input Range Low	Input Range High	0xFFFF					
Example: Set the signal lost position to 3000 in actuator number 19					0x13	0x06	0x0009	0x0BB8	0x----
					1 byte	1byte	2 bytes	2 bytes	2bytes

1. **For actuators that are not connected to a UPS** (Uninterruptible Power Supply), the loss of signal will be simultaneous with power loss. Consequently, the actuator will not be able to move anywhere. In the shutdown process, the actual position is automatically saved to the internal EEPROM. [This saving of the position only happens for min. 18 VDC supplies] When power is restored, the actuator will "know" where it's at and will simply start to follow the signal as received.

   IF YOU HAVE TO turn the actuator manually when its power is turned off, it will lose its position, and it will need to be re-zeroed (as described in the Calibration section)

2. **For actuators that are connected to a UPS** the actuator will move to the position defined by the value in the "SignalLostPosition" register.

   The default value is 0xFFFF (DEC: 65535). The actuator will ignore the lost signal, and simply remain in its current position.
   If the value is between "InputRangeLow" and "InputRangeHigh", the actuator will move to the value in SignalLostPosition when the signal is lost

Reading the Input Registers

The physical meaning of the value in the "**CurrentPosition**" register depends on the values in the "**OutputRangeLow**" and "**OutputRangeHigh**" registers, as well as the "**NumberofTurns**" register.

Example:
The actuator parameters are set to (decimal representation for simplicity):
NumberOfTurns = 10
OutputRangeLow = 500
OutputRangeHigh = 2500

- If "CurrentPosition" equals to 500, that means the valve is closed
- If "CurrentPosition" equals to 1500, that means the valve is 5 turns opened

To read the value from the "**CurrentPosition**" register:

Register name	Address	Max	Min	Default	Actuator address	Function code	Register address	Qty of registers	CRC
CurrentPosition	**0x0014**	N/A	N/A	N/A					
Example: Read the current position in actuator number 31					0x1F	0x04	0x0014	0x0001	0x----
					1 byte	1 byte	2 bytes	2 bytes	2 bytes

The meaning of the value in the "**StatusRegister**" is described below. Only Bits 0-4 are associated with a physical meaning.

Bit 0	**Bit 1**	**Bit 2**	**Bit 3**	**Bit 4**	**Bits 5 to 15**
Discrete input 1	Discrete input 2	Discrete input 3	Discrete input 4	Discrete input 5	Discrete input 6 to 16
Opened	Closed	Stalled opening	Stalled closed	Signal lost	Reserved
This bit will be '1' if the actuator is in the completely open position.	This bit will be '1' if the actuator is in the completely closed position.	This bit will be '1' if the actuator gets stalled while moving in the opening direction.	This bit will be '1' if the actuator gets stalled while moving in the closing direction.	This bit will be '1' if the input signal falls below 2.80 mA or 0.700 V.	-

To read the value from the "**StatusRegister**" register:

Register name	Address	Max	Min	Default	Actuator address	Function code	Register address	Qty of registers	CRC
StatusRegister	**0x0015**	N/A	N/A	N/A					
Example: Read the status register in actuator number 32					0x20	0x04	0x0015	0x0001	0x----
					1 byte	1 byte	2 bytes	2 bytes	2 bytes

Alternatively, the Bits in "**StatusRegister**" can be read independently by using function code 2. In the PDU, Discrete Inputs are addressed starting at zero. Therefore, Discrete Inputs numbered 1-5 are addressed as 0-4.

Example 1
To read all discrete inputs in actuator number 33, the master needs to send:

Actuator address	Function code	Input address	Qty of inputs	CRC
0x21	0x02	0x0000	0x0005	0x----
1 byte	1 byte	2 bytes	2 bytes	2 bytes

Example 2
To read the discrete inputs 1 and 2 (opened and closed) in actuator number 33, the master needs to send:

Actuator address	Function code	Input address	Qty of inputs	CRC
0x21	0x02	0x0000	0x0002	0x----
1 byte	1 byte	2 bytes	2 bytes	2 bytes

Example 3
To read the discrete input 4 (stalled closed) in actuator number 33, the master needs to send:

Actuator address	Function code	Input address	Qty of inputs	CRC
0x21	0x02	0x0003	0x0001	0x----
1 byte	1 byte	2 bytes	2 bytes	2 bytes

Using Hanbay Function Codes

Register name	Address	Max	Min	Default	Actuator address	Function code	CRC
N/A	**0x0064**	N/A	N/A	N/A			
Example: Re-zero actuator number 1					0x01	0x64	0x----
					1 byte	1 byte	2 bytes

Register name	Address	Max	Min	Default	Actuator address	Function code	CRC
N/A	**0x0065**	N/A	N/A	N/A			
Example: Close the valve on actuator number 1					0x01	0x65	0x----
					1 byte	1 byte	2 bytes

Register name	Address	Max	Min	Default	Actuator address	Function code	CRC
N/A	**0x0066**	N/A	N/A	N/A			
Example: Open the valve on actuator number 1					0x01	0x66	0x----
					1 byte	1 byte	2 bytes

Calibration

If the actuator is being controlled via 4-20 mA (resp. 1-5 V) input, i.e. the "**TargetFromRS485Flag**" register contains value 1, the actuator will re-zero when the input signal is between 2.80 and 4.16 mA (resp. 0.700 and 1.04 V). It will turn clockwise until the actuator has reached the fully closed position of the valve.

If the actuator is being controlled via Modbus protocol, i.e. "**TargetFromRS485Flag**" register contains value 0, the actuator will re-zero when the value in the "**TargetPosition**" register is the same as the value in the "**InputRangeLow**" register.

If the valve is removed for any reason, the calibration routine must be initiated on the actuator manually after re-mounting the valve. This is done by toggling DIP 12 (switch position, then back to the original position) while the actuator is powered. Alternatively, use command code 0x64 (refer also to the Modbus Protocol section). The valve will close very slowly, finding the seat and preventing any damage.

If you need to re-zero in the opposite direction (i.e.: for pressure regulators, which typically go to the "top" fully open position at 4 mA) change the setting of DIP 12 and cycle power.

WARNING: It is VERY important that you put DIP 12 back to its original setting. Failing to do so will make the actuator turn in the opposite direction next time you power it up.

Troubleshooting

Upon noticing a problem, your first step should almost always be to recalibrate the actuator by toggling DIP 12, or using command code 0x64, while the actuator is powered. This alone can solve basic problems. See the Calibration section above 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.

Manual Override

The RCx-xxxAS actuator with manual override can also be certified for hazardous locations (CSA and/or IECEX). The additional manual override gear case and handle has no effective ignition sources and can therefore be used in all hazardous locations for which the actuator enclosure is certified.

Operation of the manual override when the actuator is powered will be difficult as the actuator will try to maintain the valve in the position it has been commanded to.

Power should be removed if the valve is to be moved manually. If the valve is moved with the manual override when its power is turned off, it will lose its position, and it will need to be re-zeroed (as described in the Calibration section).

EXPLOSION PROOF CERTIFICATIONS

Actuator model number: RCx-BxxAS

IECEX
Standards & Editions:

IEC 60079-0:2017, 7th Edition
IEC 60079-1:2014, 7th Edition

*Serial number will be engraved on the lid.

CSA
Standards:

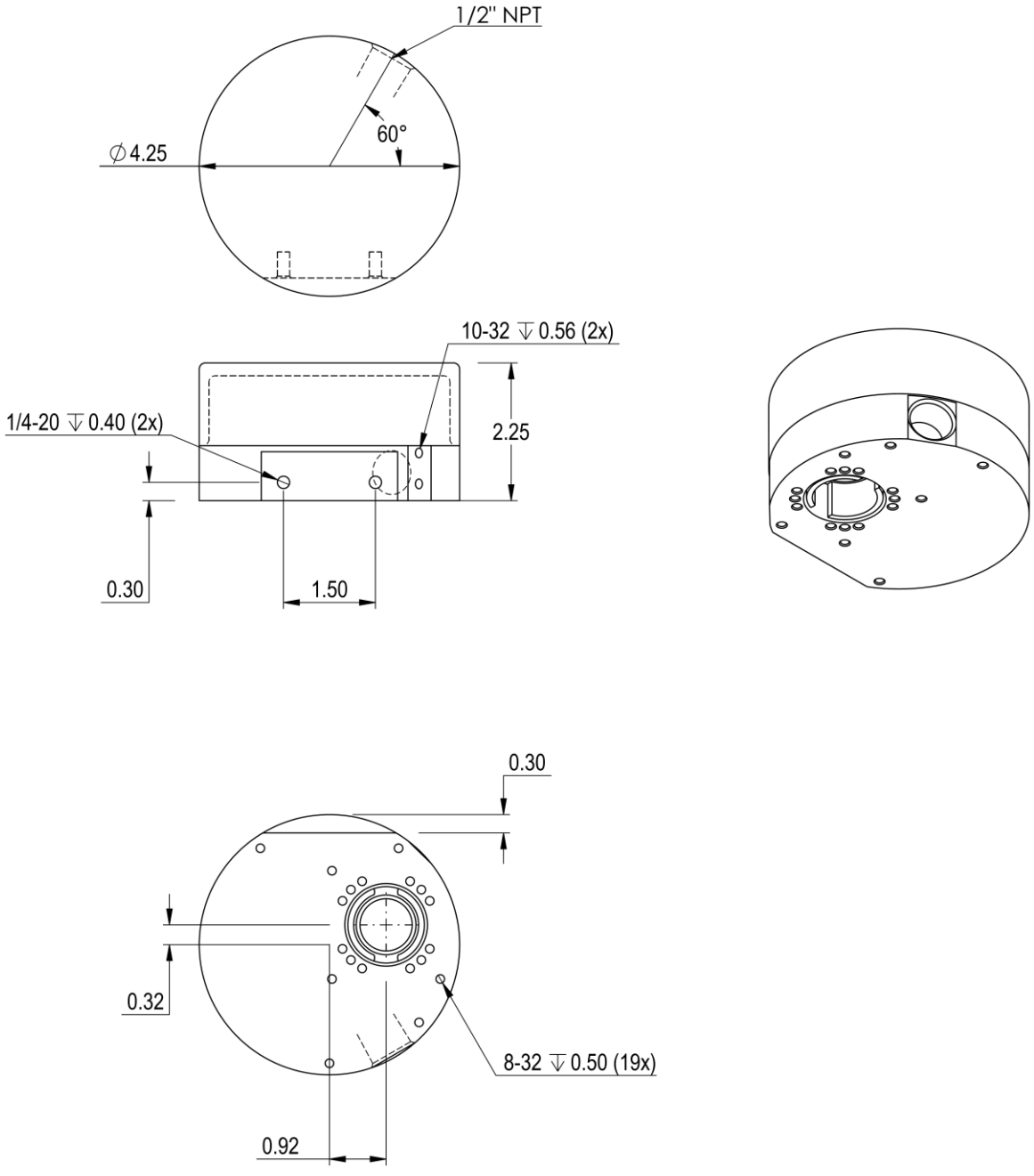
Class I, Div 1, Groups B, C, D (T6)
Class II, Groups E, F, G (T6)

CAN/CSA Std. C22.2 No. 0-M91 (R2001)
CSA Std C22.2 No. 25-1966 Locations
CSA Std C22.2 No. 30-M1986 Locations
UL 1203-2006

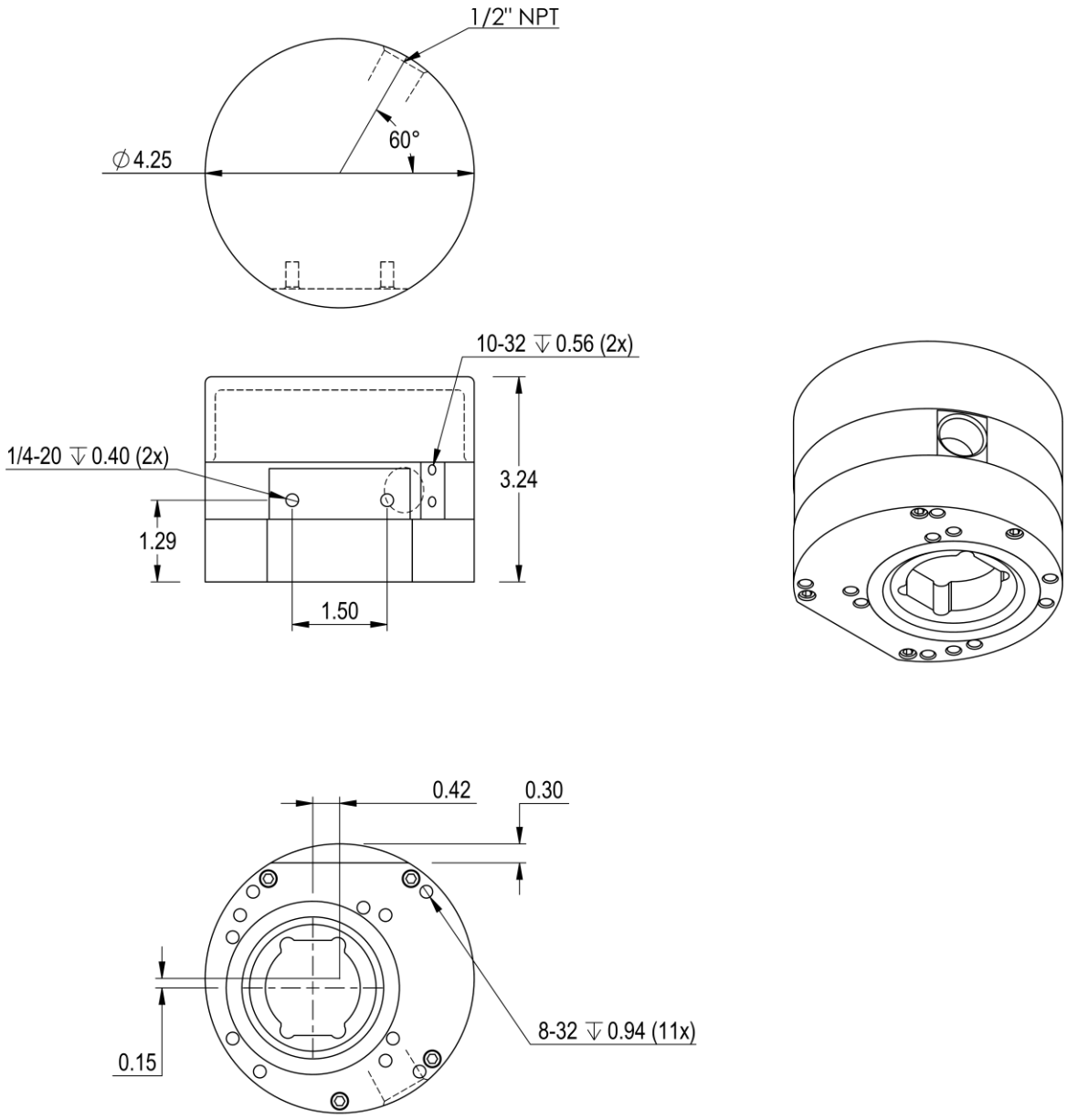
Lid engraving with CSA & IECEX certifications.

ACTUATOR DIMENSIONS

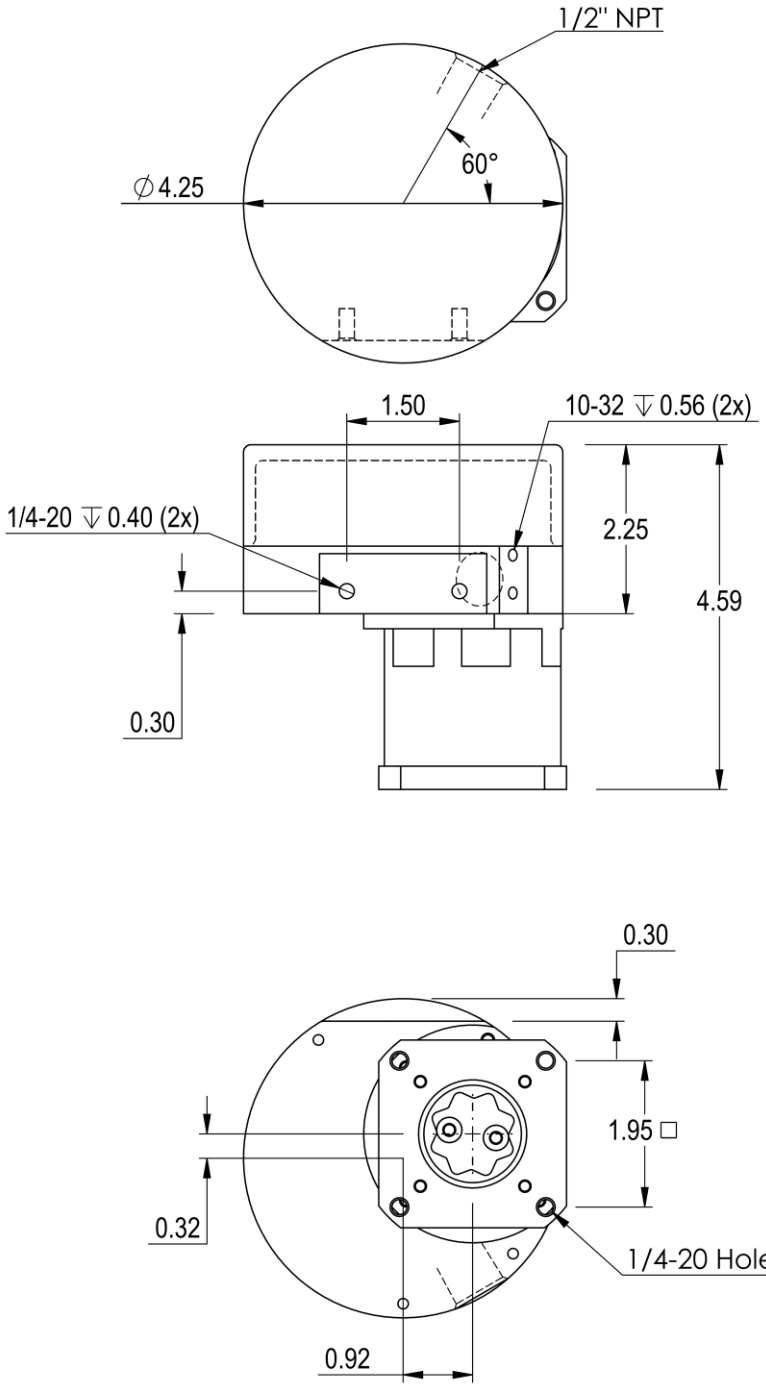
RCJ, RCL & RCM -xxxAS models

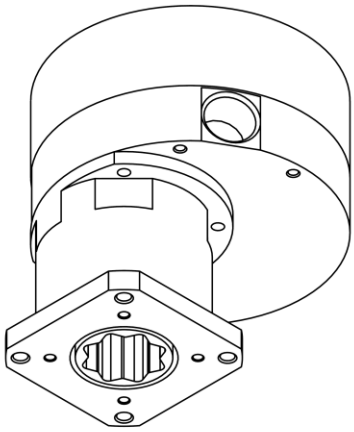


RCH-xxxAS models



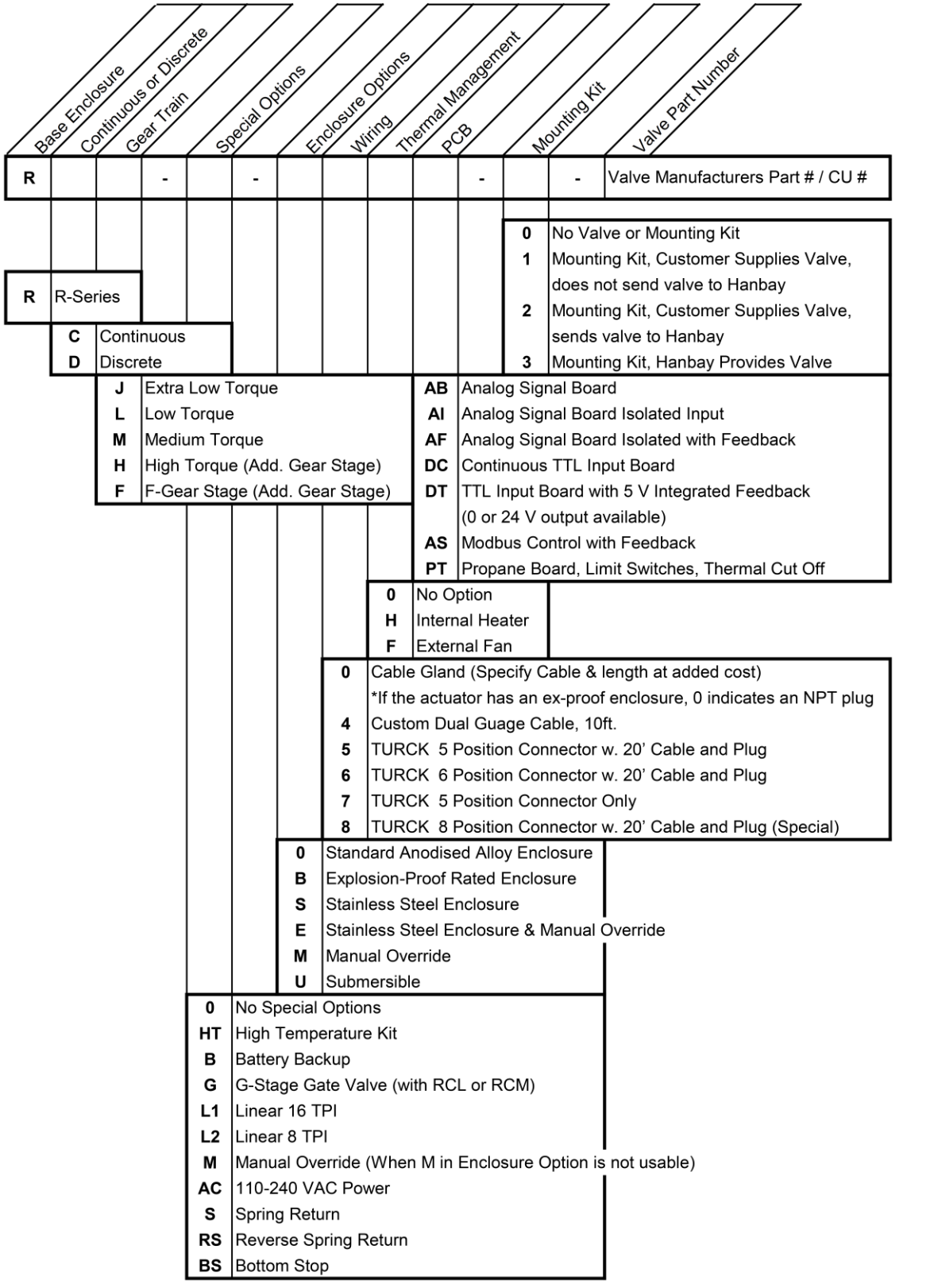
RCF-xxxAS models





PART NUMBER BREAKDOWN

Full Hanbay Part Number: R C [ ] - [ ] [ ] [ ] [ ] AS - [ ] - [ ]



LABEL BREAKDOWN

Firmware Version

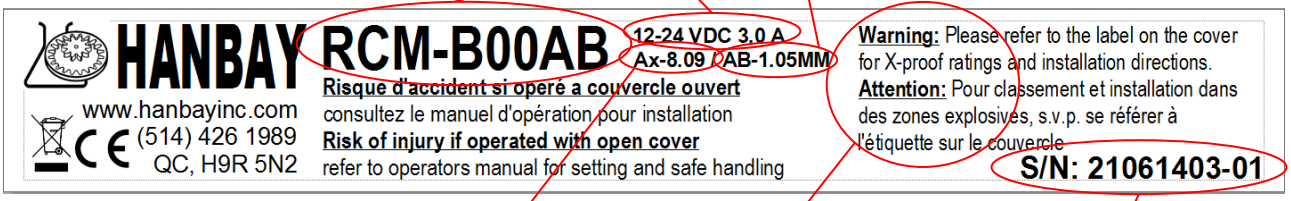
AF-1.05
AB-1.05
AS-1.05

- MM = Multiturn
- MML = Multiturn Low Torque
- MMUL = Multiturn Extra Low Torque
- QM = Quarter turn
- QM97 = Quarter turn 97°

DT-2.01
DC-2.01
DT-4.06 (Obsolete since 2019)
M-Dx V2.31

Actuator Supply Voltage
12-24 VDC @ 3.0 A or
110-240 VAC @ 1.5 A

Actuator Part Number
Refer to part number breakdown for available options.



Ex-proof Certification
Info on ex-proof ratings and installation instructions.

Circuit Board Version
Ax-8.09
Dx-10.31
Dx-4.10 (Obsolete since 2019)
Px-10.3

Actuator Serial Number
This serial number is unique for each individual unit and is directly tied to your order/invoice number.