RDx-S-xxxPx-10.3 Fail-Safe

(12-24 VDC; Spring Return; Limit Switch Feedback; For Internal & Ball Valves)

CSA/IECEX Rated*

USER MANUAL

Contents

***Only model numbers:**
RDx-S-BxxPx w/ ex-proof lid engraving (p.7)

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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.8.

Wiring

Wiring for Explosion Proof Actuators

The **RDx-S-BxxPx** 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.8 for location of ½” FNPT housing access. A cable with 6 wires is required; it is recommended to use 16-24 AWG for all wires.

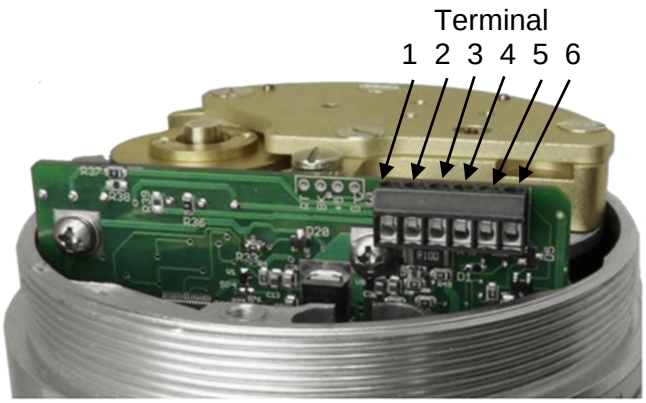
Standards for cable gland and cable in hazardous locations:

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:

Terminal #	Description
6	+24 VDC (± 20%)
5	Power gnd.
4	Signal (provide 24 V)
3	Limit Switch Common
2	Limit Switch - Valve Closed
1	Limit Switch - Valve Open



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	Colour	Description
6	White	+24 VDC (± 20%)
5	Black	Power gnd.
4	Blue	Signal (provide 24 V)
3	Brown	Limit Switch Common
2	Grey	Limit Switch - Valve Closed
1	Pink	Limit Switch - Valve Open

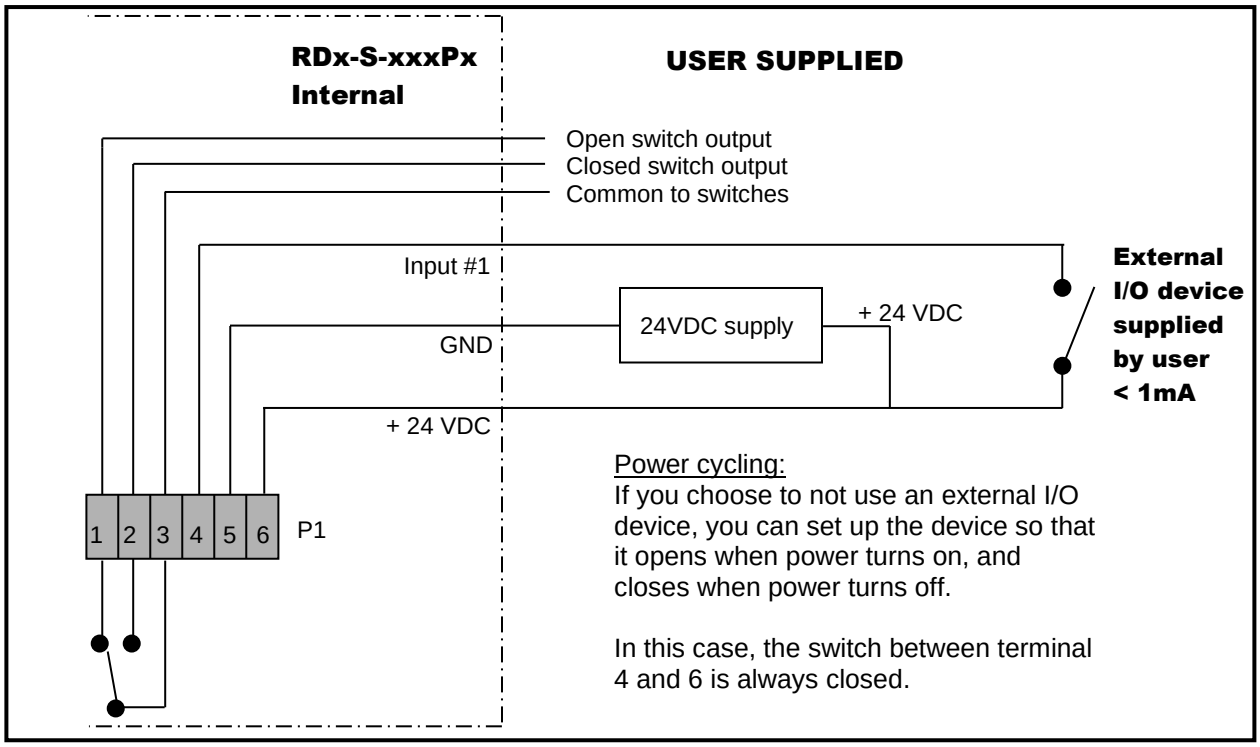
Power Supply and Current Draw

The **RDx-S-xxxPx** 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

Locate the correct connection terminals/wires as shown on the previous page, then connect your input signal on terminal 4 (blue wire for non-explosion proof models), as shown below.



OPERATION

Functionality

Input #1 (Terminal 4)	Action taken
Low (gnd.)	Moves to or remains in closed position
High (+24 VDC)	Moves to or remains in open position

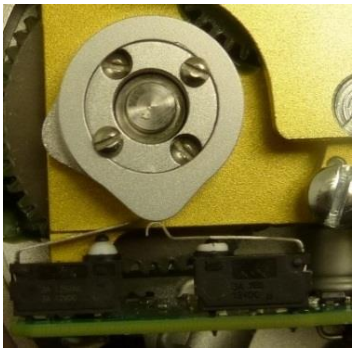
Spring Return

The spring-return add-on closes the attached valve whenever power is turned off or lost for any reason.

Feedback via Limit Switches

Actuator Position	Action taken
Open	Terminal 1 is connected to Terminal 3
Closed	Terminal 2 is connected to Terminal 3
In between	Nothing is connected to Terminal 3

Limit switches are triggered mechanically when the actuator is fully closed or fully open.



IMPORTANT: The limit switches are rated for 3 A @ 125 VAC and @ 12 VDC. Exceeding this will lead to damage, preventing the actuator from working properly.

Torque and Speed

Model	Torque [in-lbs]	Speed Range [time to open]	Speed Range [time to close]
RDM (internal valves)	140	4	2 (2 sec power loss)
RDM (ball valves)	40	4	2 (time upon power loss depends on valve)

Note: Opening and closing times are for the actuator. The valve may be fully open or closed before the actuator reaches these limits.

Safety features

Fusible Link

This part is used only in combination with internal valves. It is UL approved and will fail mechanically at 100 °C (212 °F).

Upon failure, the valve becomes de-coupled from the actuator, allowing the valve to be shut by its own spring.

Thermal Cutoff

This part is used with all valves. It is UL approved and found on the PCB board within the actuator enclosure, as shown below. When a temperature of 128 °C (262 °F) is reached, it severs the electrical connection, making the actuator close itself via spring-return.

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EXPLOSION PROOF CERTIFICATIONS

Actuator model number: RDx-S-**B**xxPx

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:

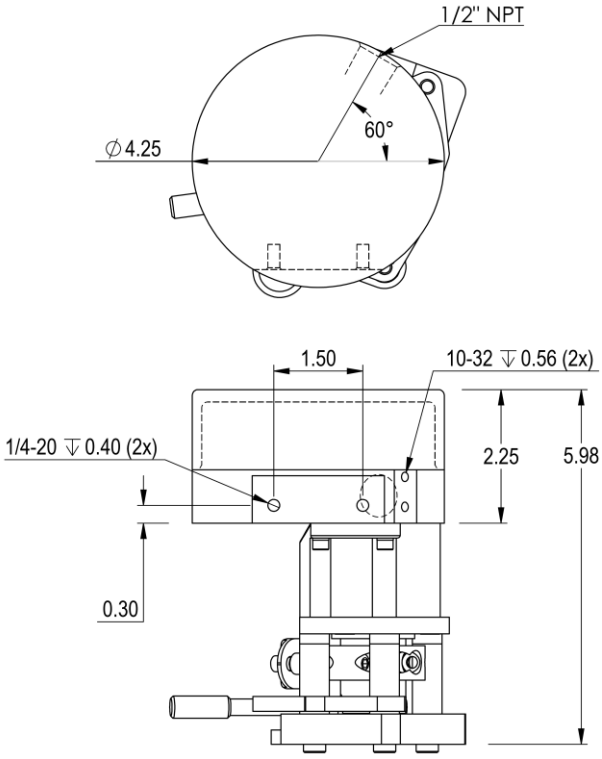
Class I, Div 1, Groups B, C, D (T6)
Class II, Groups E, F, G (T6)

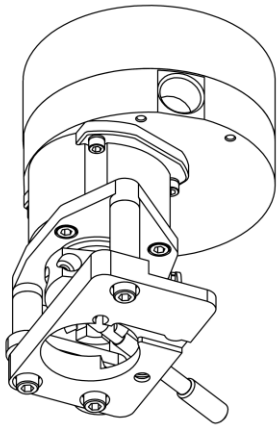
CAN/CSA Std. C22.2 No. 0-M91 (R2001)
CSA Std C22.2 No. 25-1966 Locations
CSA Std C22.2 No. 30-M1986 Locations
UL 1203-2006

Lid engraving with CSA & IECEX certifications.

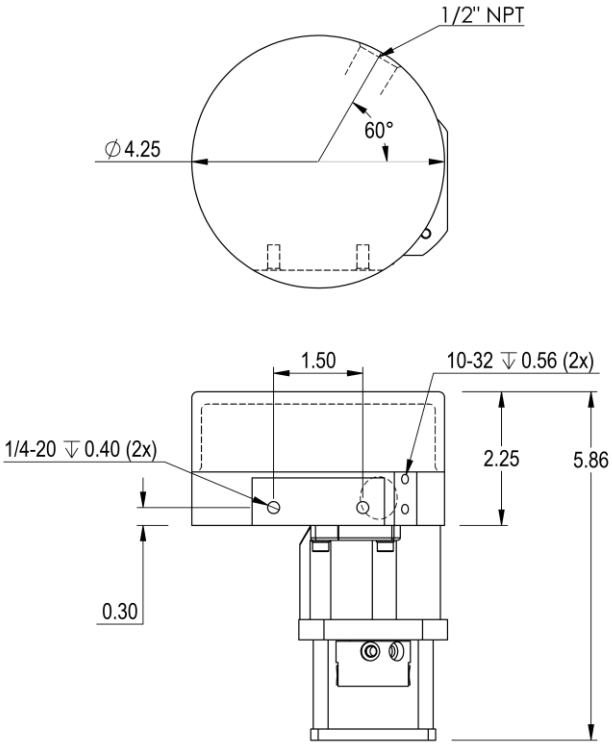
ACTUATOR DIMENSIONS

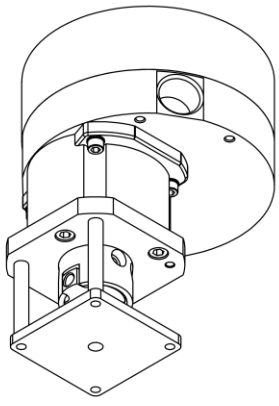
RDM-S-xxxPx models (internal valves)





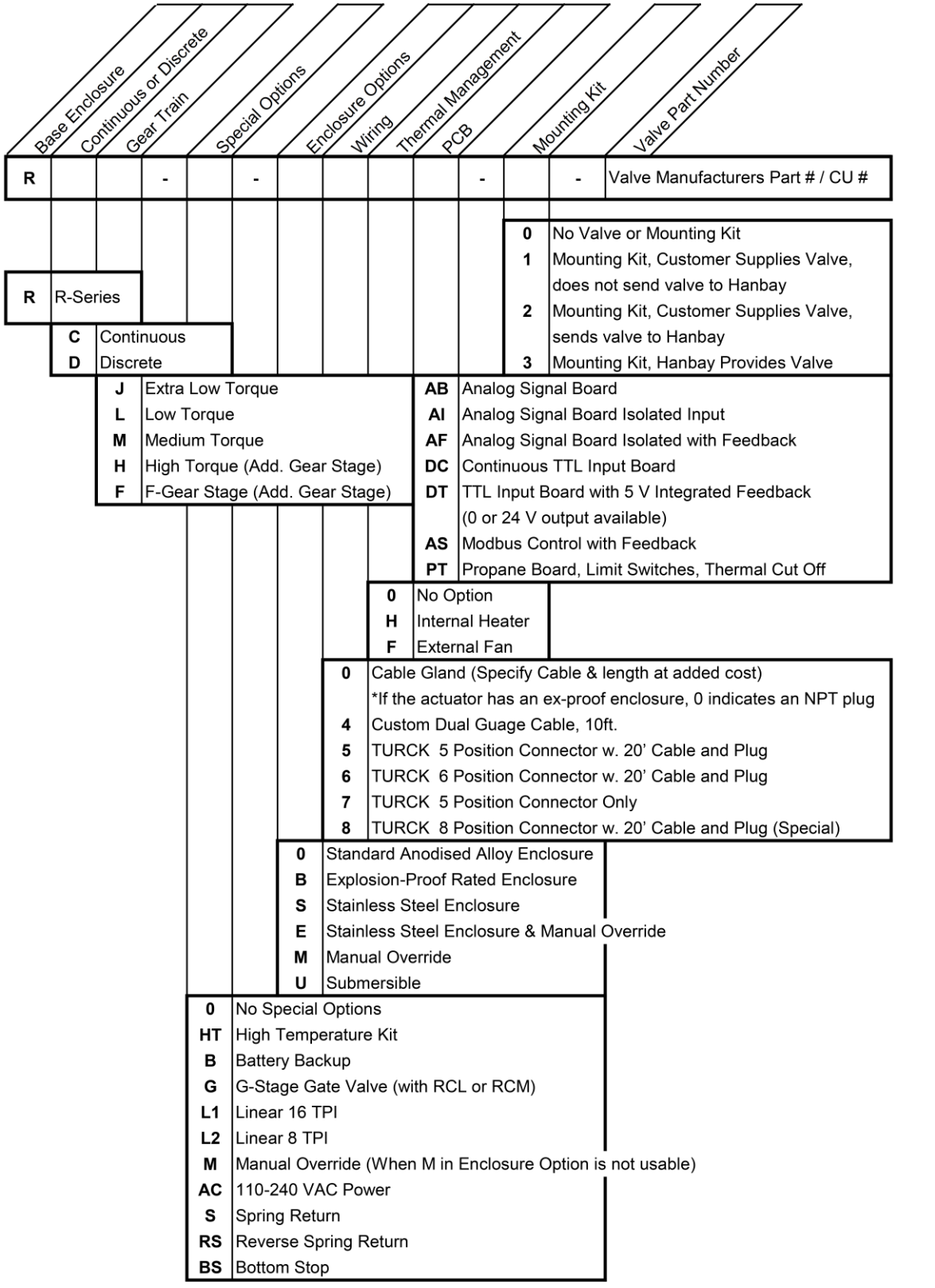
RDM-S-xxxPx models (ball valves)





PART NUMBER BREAKDOWN

Full Hanbay Part Number: **R D [ ] - S - [ ] [ ] [ ] Px - [ ] - [ ]**



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LABEL BREAKDOWN

Firmware Version

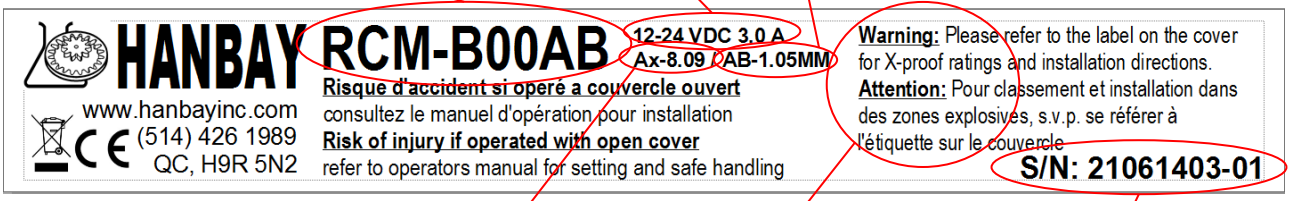
AF-1.05
AB-1.05
AS-1.05

- 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.