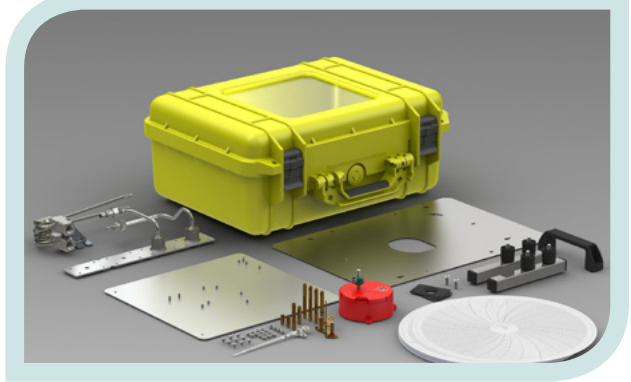


RPX-463 / RPP-500 Chart Recorder



Product manual

RPX -463 / RPP -500



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1 Introduction

1.1 Product description

The RPX/RPP is a stand-alone or ready to built-in chart recorder built with the highest standards. The RPX/RPP is (depending on the configuration) capable of measuring and recording pressure and/or temperature.

1.2 Schematics

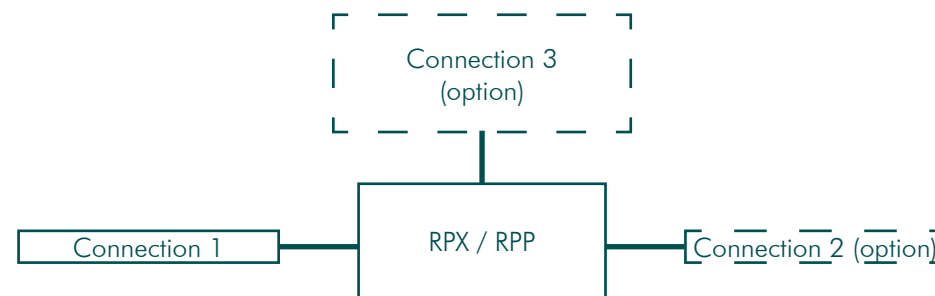


Figure 1. Schematic overview of an RPX/RPP system

1.3 Specifications

Type	RPX-463	RPP-500
Dimensions	463 x 335 x 150	n/a
(stand-alone)	550 x 335 x 150	
Medium	Fluid and gas	
Connection	9/16"-18 UNF (options available)	
Drive	Battery / Spring wound	
Casing	AISI-316L, PC	GFRP, PC
Gaskets	Viton - Standard	Viton - Standard

Table 1. RPX-463 & RPP-500 specifications

2 Product outline

2.1 RPX-463

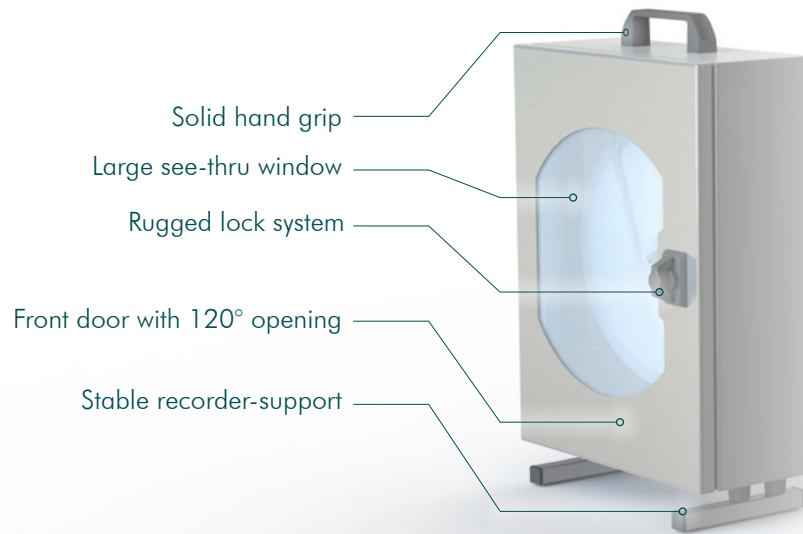


Figure 2. Parts overview RPX-463

2.1.2 Spare parts of the RPX-463

Part	Qty	Remarks
Front door	1	087-440-71
Face plate	1	082-440-82
Recorder support-set	1	Please contact support
Hand grip	1	086-200-45
Lock system (complete)	1	Contact support
Lock system lever	1	036-200-21 / Material: PA
Charts	100	Please contact support for ordering information
Chart pen	1	095-268-xx: xx = 16(Black), 17(Red), 18(Blue)
Pen arm	1	095-340-01 (for duplex: contact support)
Pressure elements	1	Please contact support

2.2 RPP-500



Figure 3. Parts overview RPP-500

2.2.2 Spare parts of the RPP-500

Part	Qty	Part no. / Remarks
Face plate	1	082-440-56
Recorder support	2	086-300-56
Hand grip	1	086-200-45
Charts	100	Please contact support for ordering information
Chart pen	1	095-268-xx: xx = 16(Black), 17(Red), 18(Blue)
Pen arm	1	095-340-01 (for duplex: contact support)
Pressure elements	1	Please contact support

3 Assembly / Disassembly

3.1 Factory assembled and installed

By default both RPX-463 and RPP-500 are out-of-the-box ready for use and configured according to the customers specifications.

Connector adapters are installed by default when ordered.

To install or replace a pressure element proceed to chapter 3.2.1.

3.2 Disassembly / Replacing parts

PRECAUTIONS !!!

- When disassembling the chart recorder take all the necessary actions to prevent personal injuries or injuries to the people around you.
- Make sure no pressure is applied to the system when replacing parts other than the charts or the chart-pen.
- Read the instructions completely and make sure you understand these instructions. If in any doubt, call for advise with Technical Support.
- Disassembly is only to be carried out by qualified professionals.

For complete disassembly the following tools are required:

- Allen key; M4
- Socket wrench; M4
- Phillips screwdriver; size 2
- Screwdriver; size 0
- Pointer lifter / penarm removal tool
- Wrench; size 19mm
- Wrench; size 22mm

3.2.1 Replace a pressure element

Steps for disassembling the RPX-463 or RPP-500 pressure elements to be taken in the following order:

(Figures 4 & 5 represent the RPX-463. Procedure for the RPP-500 is the same)

1. Disconnect the chart recorder from the process equipment to prevent pressure build-up.
2. Place the RPX on its back and open the door.
3. Loosen the pen arm screw by turning it counter clockwise. Remove the pen arm.

4. Remove the face plate:
 - (a) For the RPX-463, loosen the 4 bolts and slide the faceplate upwards. Pull the faceplate towards you. *Do not hit the pen-arm connector !!*
 - (b) For the RPP-500, Remove all bolts from the face plate and lift the face plate.
5. Disconnect the pressure element from the movement using a screwdriver size 0.
6. Disconnect the pressure element using wrenches, sizes 19mm and 22mm. Make sure you hold the square connectorblock in position using wrench size 22mm while unscrewing the high pressure connector (size 19mm).
7. Remove the two bolts per element using an Allen key.
8. Carefully remove the pressure element from the chart recorder.
9. Install the new pressure element by reversing step 3 to 8.

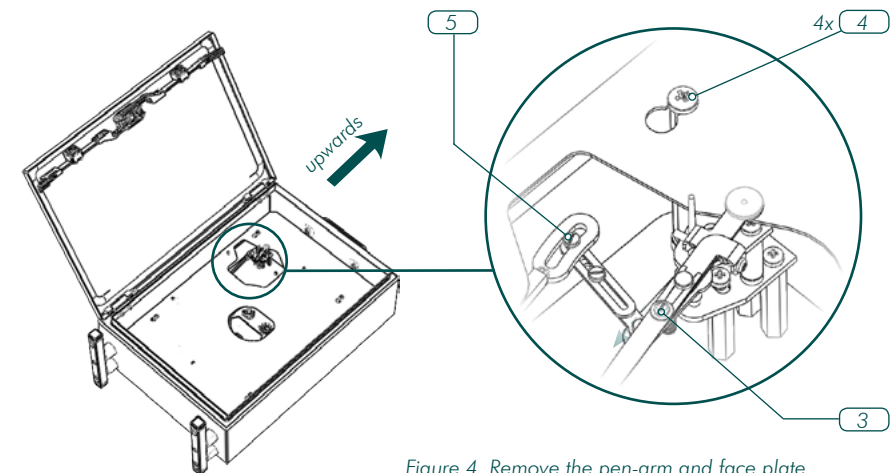


Figure 4. Remove the pen-arm and face plate

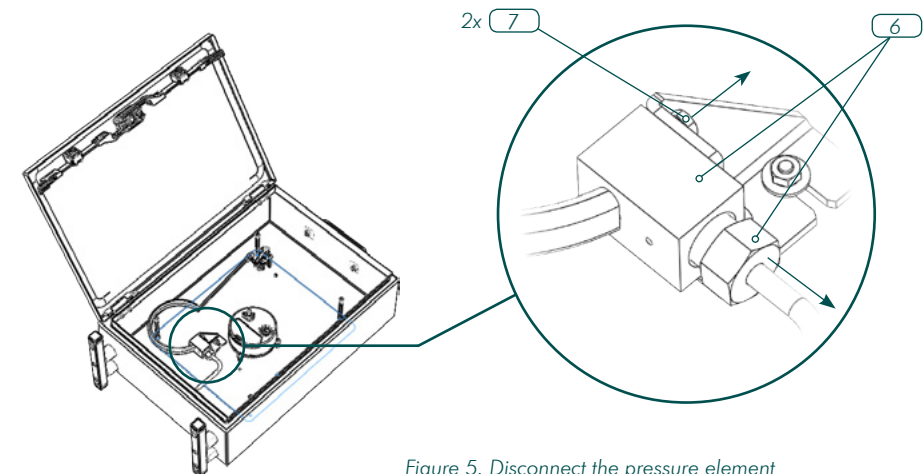


Figure 5. Disconnect the pressure element

3.2.2 Removal of duplex pressure elements

When removing the lower pressure it is advised to remove the upper pressure element before to gain some extra space for the tools to be used.

Procedures for the removal of the secondary pressure element are equal to the first pressure element.

3.2.3 Replace the chart drive

1. Remove the face plate according to §3.2.1 (step 3 & 4)
2. Remove the chart drive by removing 3 screws (figure 6).
3. Install a new chart drive by tightening 3 mounting screws.
4. Install the face plate
5. (a) For battery operated chart drives: Adjust the height of the chart plug so that surface A is flush with the faceplate using an Allen key.
(b) For mechanical operated chart drives: No additional actions are required.

Figure 6 shows a battery operated chart drive. Procedure for replacing a mechanical chart drive is equal to battery operated drives.

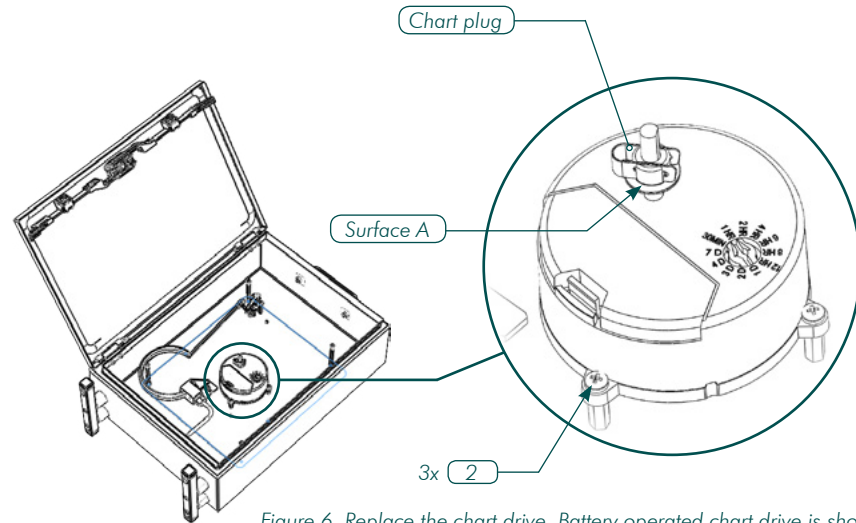


Figure 6. Replace the chart drive. Battery operated chart drive is shown.

3.2.4 Replace the pen arm

Replacing pen arms for single, duplex or triple systems is done by following the same procedure.

Tools required for replacing the pen arm:

- Pointer puller
- Set of reamers
- Punch

Removal

Remove the pen arm by the following procedure:

1. Disconnect the chart recorder from any pressurized system.
2. Place the chart recorder on its back and open the door.
3. Slide the the pointer puller around the pen arm axis.
4. Turn the knob of the pointer puller clockwise until the pen arm is lifted from the axis. Make sure the axis of the pointer puller and the axis of the pen arm are aligned (Figure 7).
5. The force to turn the knob is reduced when the pen arm is released from the axis. Pull the pointer puller with the pen arm gently towards you.
6. The pen arm is now removed from the axis. Turn the knob of the pointer puller counter clockwise to release the pen arm from the pointer puller.

Installation

For the installation of pen arms reaming of the bore is required. The red marked reamer is used for single pen recorders or the upper pen arm in multi channel chart recorders. The white marked reamer is used for the middle (triplex recorder) and lower (duplex and triplex recorder) pen arms. Installation instructions are given for the single pen arm recorder (red marked reamer) but are equal for the secondary or tertiary pen arm.

THE PEN ARM IS A VERY DELICATE PART. INSTALL WITH CAUTION !

Install the pen arm by the following procedure:

1. If not already done, install the face plate according to §3.2.1.
2. Ream the pen arm until the black mark.
3. Place the pen arm on the axis. **DO NOT USE ANY FORCE YET !!!**
4. If the pen is not touching the face plate goto step 2 and ream a little further.
5. Replace the pen arm on the axis with the pen pointing at zero reading.
6. Fix the pen arm by pushing it slightly.
7. Use the Punch to fix the pen arm. Only use very little force !!!
8. Try to remove the pointer by pulling it with your fingers. If the pointer can be removed, perform steps 5 to 8 again.

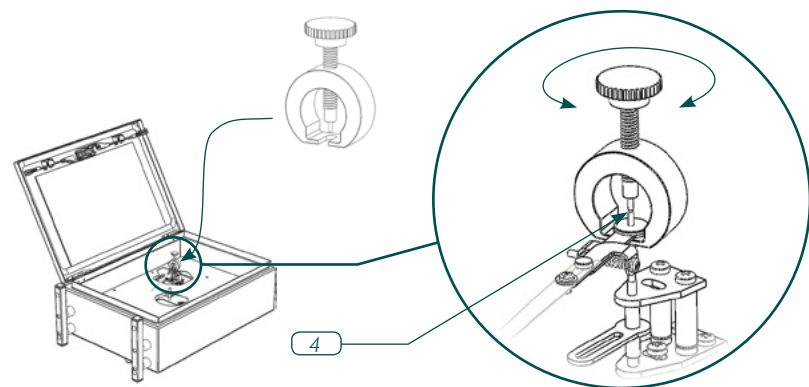


Figure 7. Removing the pen arm using the pointer puller.

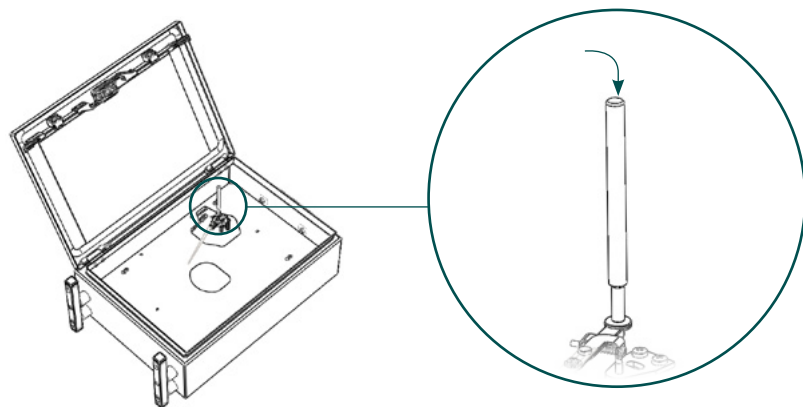


Figure 8. Fixing the pen arm to the axis.

3.2.5 Replace the lock system (RPX-only)

The lock system is a modular design that can be replaced without disassembling any other parts.

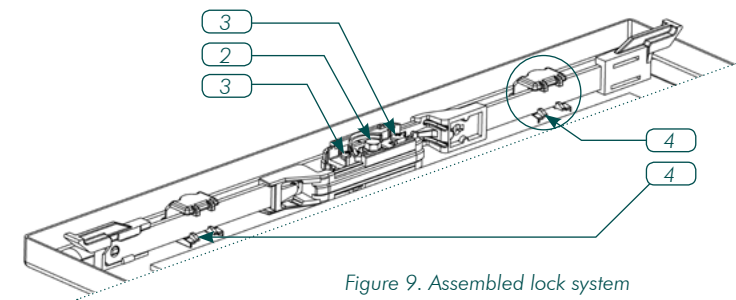


Figure 9. Assembled lock system

For replacement of individual parts other than the door handle, the complete lock system has to be removed. Please follow the procedure as described:

Removal of the lock system

1. Put the RPX on its back and fully open the door.
2. Remove the door knob by unscrewing the center bolt from the door knob. (make sure you pick the teflon washer when the bolt is removed).
3. Remove the lock system cover by unscrewing the 2 fixing screws.
4. (a) Pull down the 2 lips (one side at a time) and (b) rotate the complete lock system out of the guide clip (Figure 10-a). Do the same for the other guide clip.
5. Remove the guide clips from the door by lifting the thread flange slightly with a small screwdriver. (Figure 10-b)

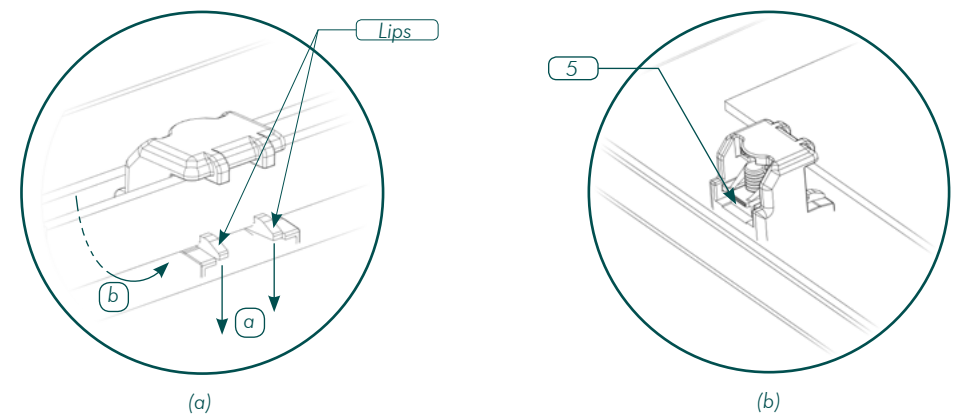


Figure 10. Detail of removing the lock system from its guides.

Replace the O-ring

To maintain watertightness the lock system contains one O-ring in the door knob. If the O-ring needs to be replaced proceed as follows:

1. Perform step 1 and 2 of the removal of the lock system.
2. Remove the door knob from the system. The O-ring should be visible now.
3. Replace the O-ring. O-ring size: $\text{Ø}15\text{mm} \times \text{Ø}3.5\text{mm}$ (70° Shore). Material might differ according to the environment the chart recorder is used in.
4. Re-install the knob.
5. Tighten the center bolt to your requirements. The knob turns more difficult as you tighten the center bolt more.

Installing the lock system

Installing the lock system is done by performing the removal steps in the following order: 4, 5, 3, 2, 1.

3.2.6 Install connector adapters

For the RPX and RPP chart recorders a wide variety of connection adapters is available. The default connection of the chart recorders is a 9/16-18 UNF internal thread with an 1/4" Autoclave High Pressure standard. Therefore no sealing is required if original equipment is used. To ensure that the connection is closed 100% please follow the values in the table to install the adapters.

Pressure [bar]	Pressure [psi]	Torque [N.m]
0 - 2.069	0 - 30.000	27
2.070 - 4.137	30.001 - 60.000	34
4.138 - 7.000	60.001 - 100.000	68

Table 2. Torque values related to applied pressure

4 Operating the RPX-463 / RPP-500

4.1 Battery operated chart recorders

Figure 11 represents a battery operated chart drive. Various types of battery operated chart drives can be used. Please note the following:

820R001: Drive can be switched off

820R029: Drive can NOT be switched off. To turn off the drive the battery has to be removed. The drive type can be found above the chart drive axis.

4.1.1 Replace / Install a chart

Before installing a chart make sure that the surface (a) is flush with the face plate. Use hex. set screw (b) to adapt the height of the chart plug to the face plate if necessary. To install or remove a chart:

- slide and lift the chart clip (c),
- remove and/or put the chart from/over the chart plug
- return the chart clip to its original position.
- Make sure that the chart is under the chart clips (6x) at the edge of the chart. (Figure 12)

4.1.2 Start/stop recording

To start recording:

1. Open the recorder door
2. If a chart is in place, lift the chart at the right side.
3. Select the appropriate recording time-index at the chart drive using a screwdriver. The chart drive starts immediately. For type 820R029 a battery has to be inserted to start.
4. Release the chart or place a new chart.
5. Remove the protective cover from the pen.
6. Make sure the pen has enough pressure to write to the chart.
7. Close the chart recorder.
8. The chart recorder is now recording.

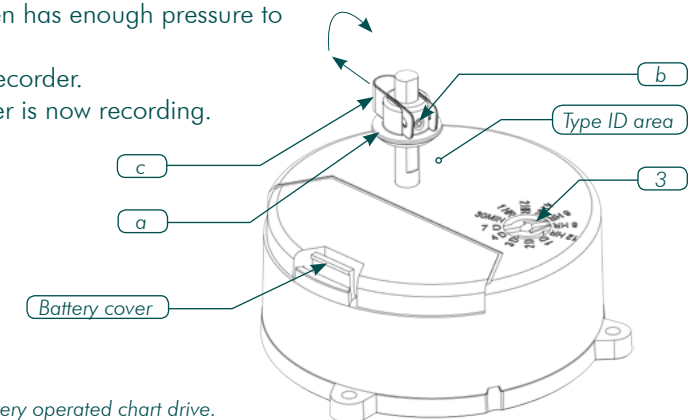


Figure 11. Battery operated chart drive.

To stop recording:

1. Open the recorder door.
2. Lift the chart at the right side.
3. Switch the chart drive to "Off" (820R001) or remove the battery (820R029).
4. Place the protective cover over the pen to prevent ink leakage.
5. Close the recorder door.

4.1.3 Replacing / Installing the chart drive battery

Both types of chart drives use a "C"-cell type battery of 1.5V. To replace the battery remove the battery cover from the chart drive and (re)place the battery. No further requirements apply.

4.2 Mechanical operated chart recorders

4.2.1 Replace / Install a chart

- Open the recorder door and remove the drive knob (a) by turning it clockwise.
- Insert / replace a chart.
- Make sure the chart is under the chart clips at the edge of the chart.(Figure 12)
- Return the drive knob (a) by turning it counter clockwise.

4.2.2 Start / Stop recording

To start recording:

1. Open the recorder case.
2. If a chart is in place lift the right side of the chart to access to the chart drive.
3. For switchable chart drive: select the appropriate recording time (b)
4. Put the chart back. Make sure the chart is beneath the chart clips
5. Remove the protective cover of the pen

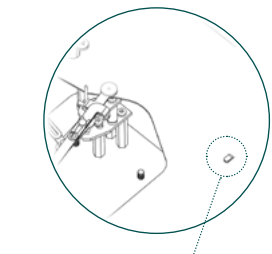


Figure 12. Chart clip location

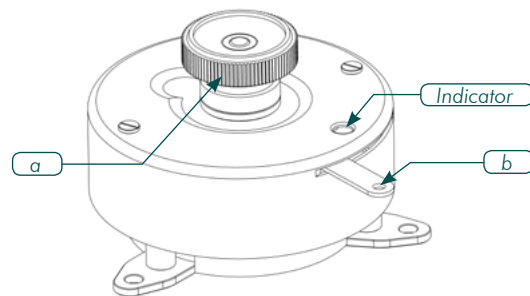


Figure 13. Switchable, mechanical chart drive

6. Wound the spring by turning the knob of the chart drive clockwise.
Wind up the chart drive max. 5 turns !!
7. Depending on the model of the mechanical chart drive switch the "On/Off" switch to "On". If there is no switch the chart drive starts automatically.

To stop recording:

- Place the protective cover over the pen.
- If the chart drive is equipped with an On/Off switch, put this switch to off.
- If the chart drive is NOT equipped with an On/Off switch, remove the chart from the recorder. The chart drive keeps running until the spring is unwound.

4.3 Pen replacement

CAUTION: The pen arm can be sharp because of the thickness.

Replace the pen according to the following procedure.

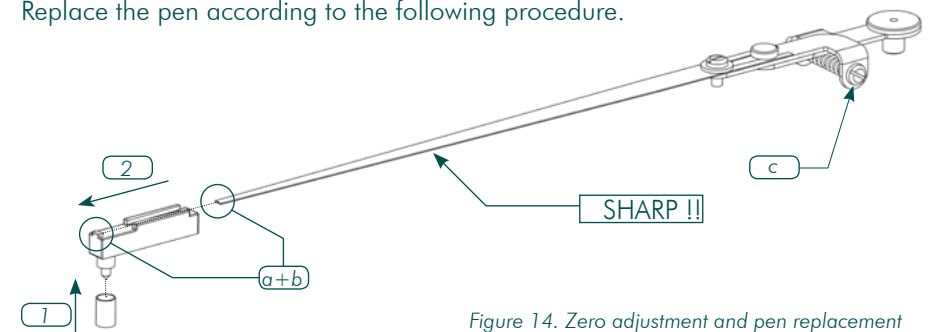


Figure 14. Zero adjustment and pen replacement

1. Make sure the protective cover is placed over the felt tip.
2. Pull the pen away from the pen arm.
3. Slide a new pen over the pen arm. Make sure the top notch (a) of the pen makes contact with pen arm (location b)

4.4 Zero adjustment

If necessary the pen arm can be adjusted by turning the screw (c) near the pen arm axis.



Figure 15. RPP-500 Transportable.

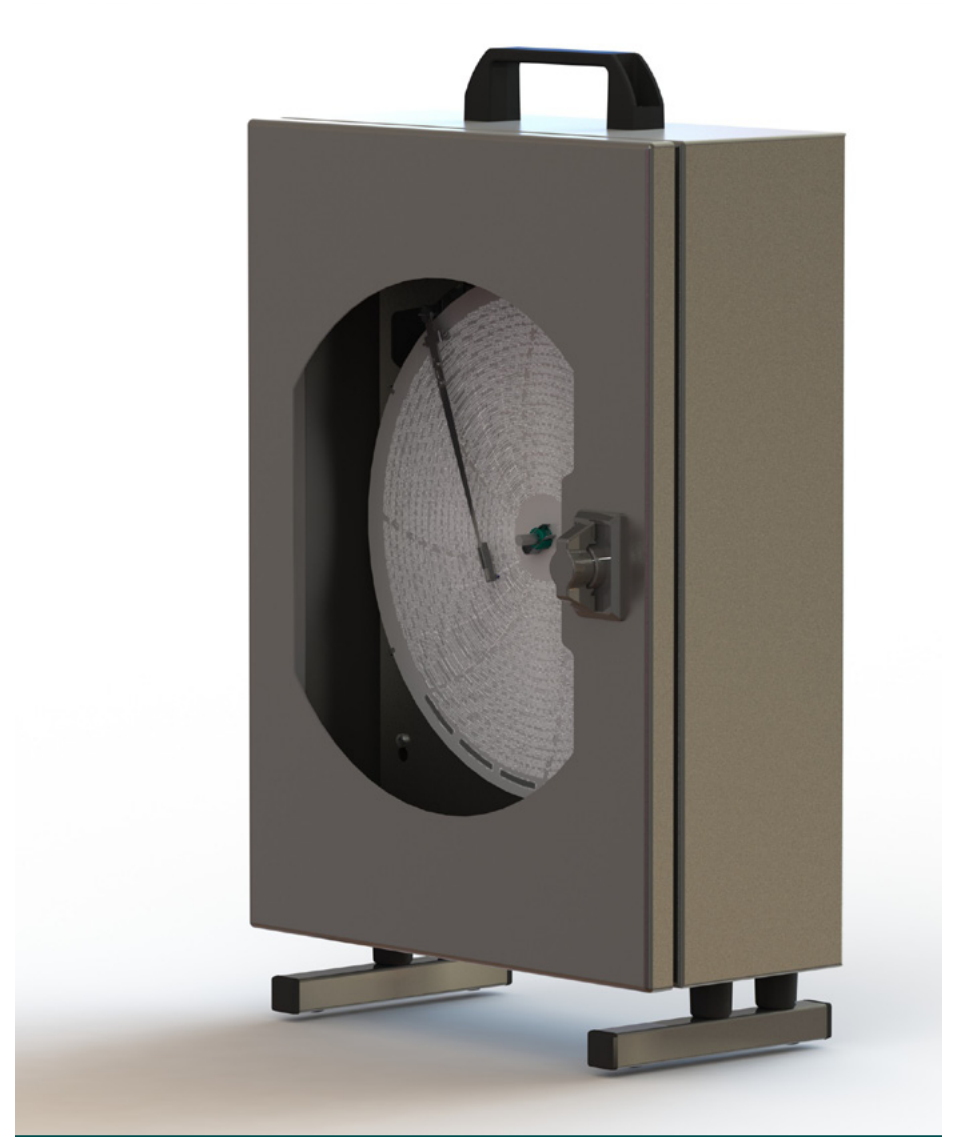


Figure 16. RPX-463 Transportable.



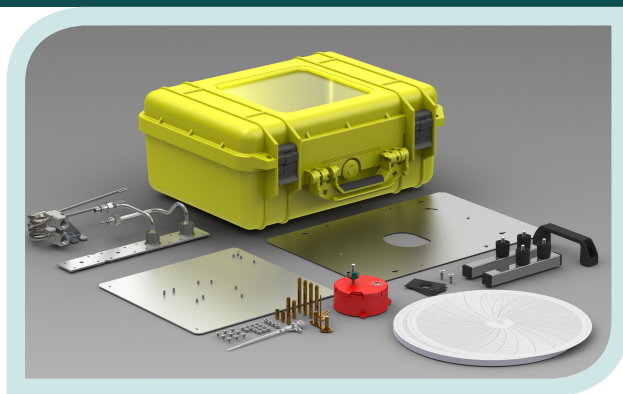
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Certified ATEX manufacturer

RPX/RPP recorder



Calibration instructions



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Rev.	Date	Remark
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1. Introduction

This document describes a manner of calibrating the RPX- and RPP-series recorders. By adjusting the correct settings a correct characteristic can be achieved. At the end of the manufacturing proces the recorders are calibrated and ready for use. However, it might be necessary to recalibrate or to calibrate the recorders when the pressure element hasbeen exchanged.

2. Overview of affected parts

Figure 1 shows the parts that can be modified to improve characteristics of the recorders.

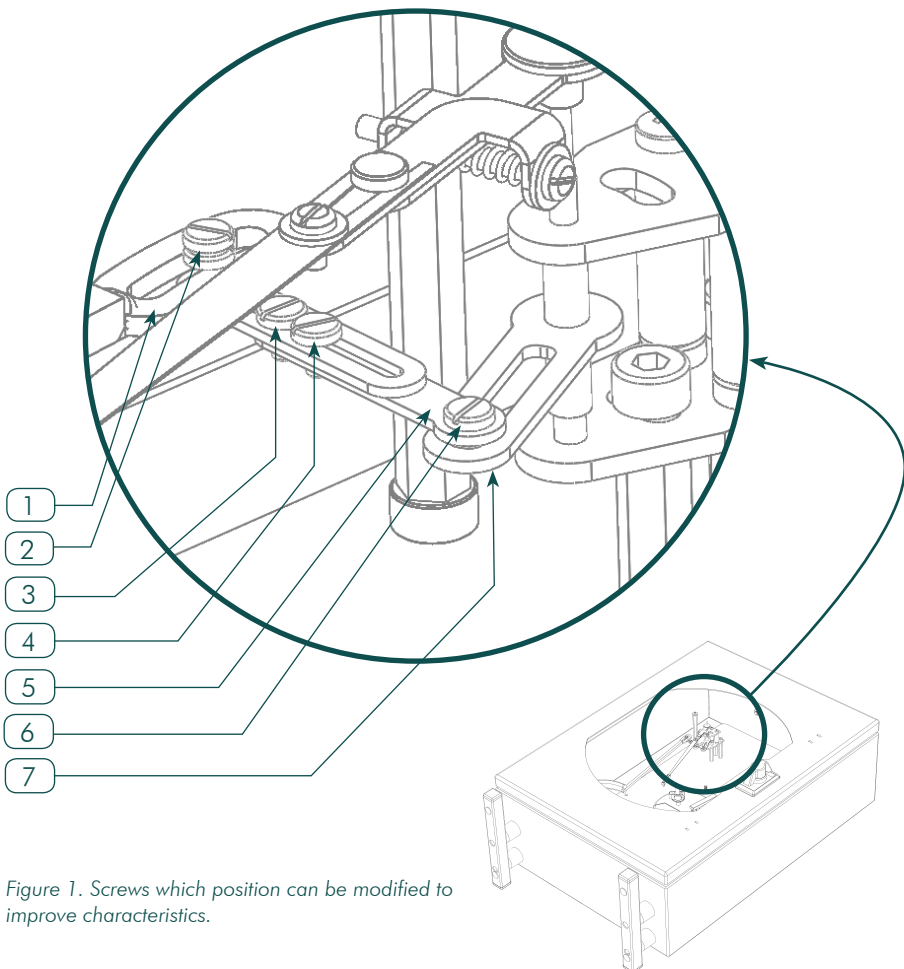


Figure 1. Screws which position can be modified to improve characteristics.

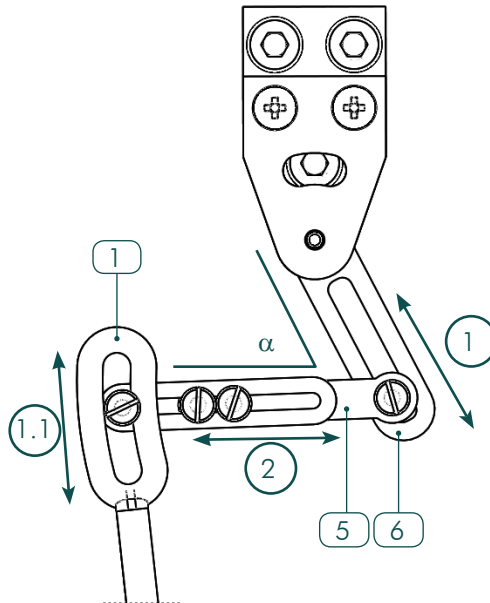


Figure 2. Top view of the movement. (pointer is hidden to increase readability)

3. Calibrating the recorder

When recording the pressure or temperature the ideal situation is that item 1 and item 6 are always parallel to each other and item 5 and item 6 are perpendicular ($\alpha=90^\circ$) to each other. In a real situation this happens only at one place in the measuring location. During manufacturing the calibration is done in such a manner that the ideal situation is occurring at 50% of the range.

In general:

Balloon 1 & 1.1

Change if required measuring range is out of range. Move downward to reduce pointer range or move upwards to increase pointer range.

Balloon 2

Change if linearity is out of range. Extending item 5 will increase speed towards the end of range.

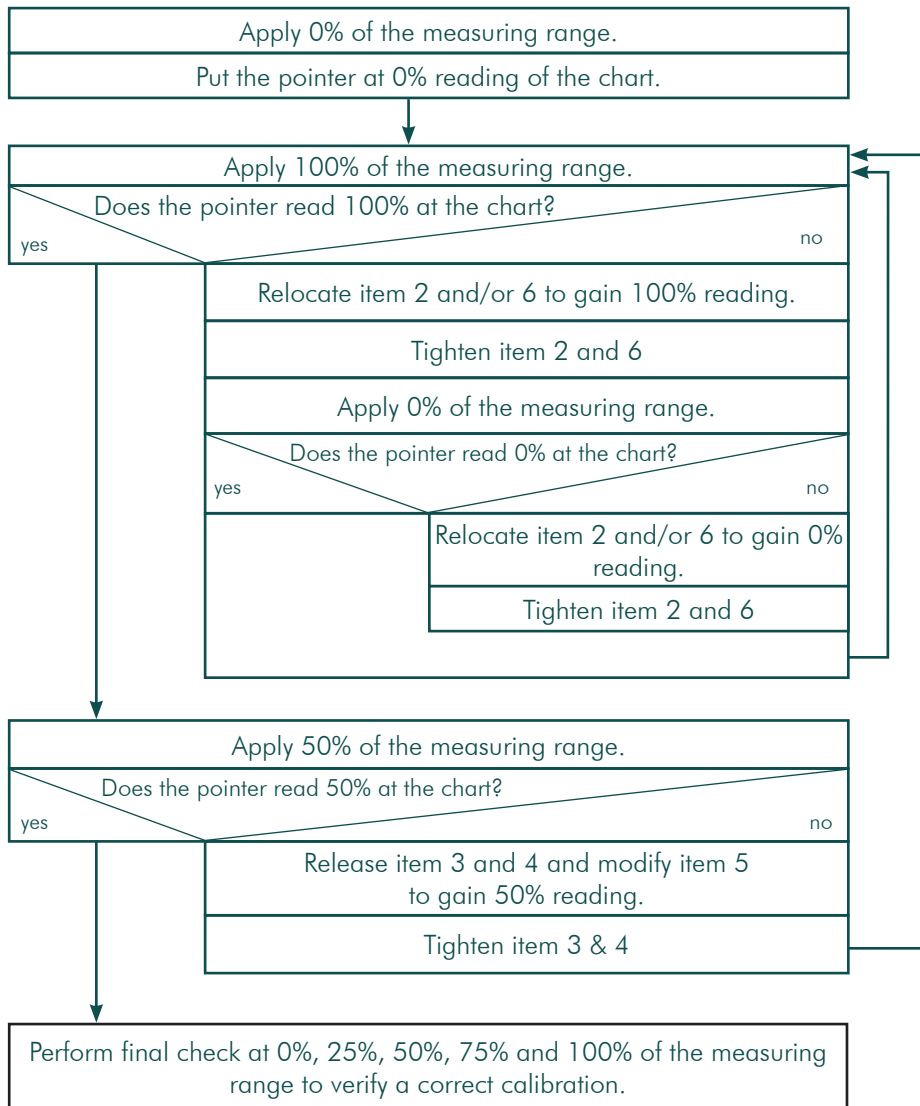


Figure 3. Flowchart of calibrating an RPX/RPP chart recorder.

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