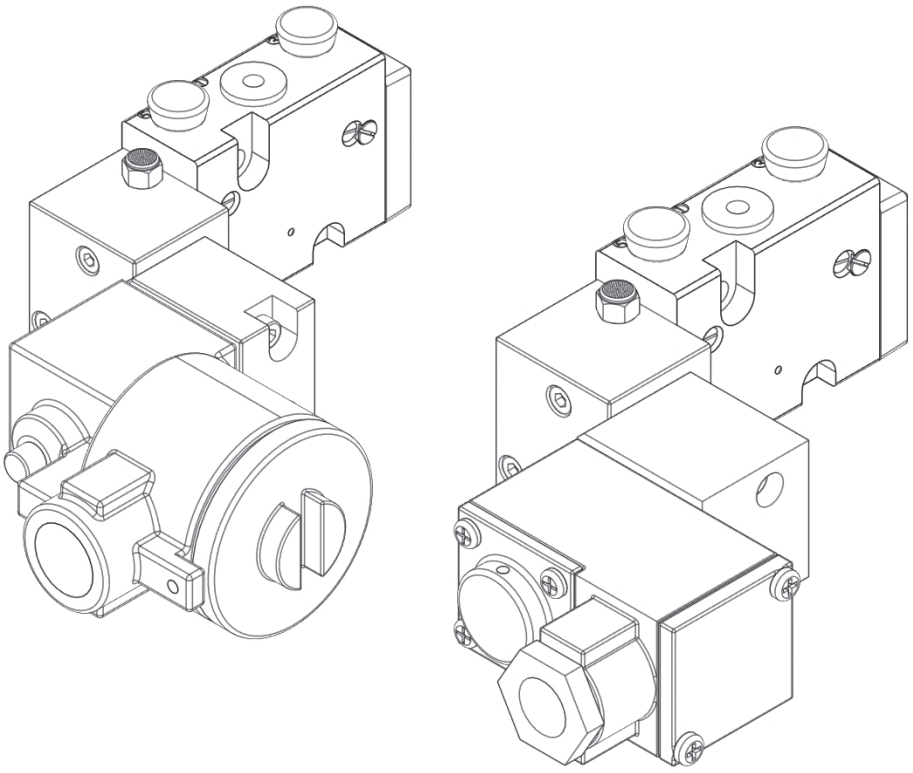
# Neles Easyflow™ Spool valve VAQNCFC113/VAQNCFC213 with Pneumatrol Coil

Installation, maintenance and operating instructions



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**READ THESE INSTRUCTIONS FIRST!**

These instructions provide information about safe handling and operation of the valve.

If you require additional assistance, please contact the manufacturer or manufacturer's representative.

**SAVE THESE INSTRUCTIONS!**

Addresses and phone numbers are printed on the back cover.

# 1. INTRODUCTION

Thank you for choosing Valmet product. Each product is fully inspected after the production to offer you the highest quality. In order to fully utilize the product, we strongly recommend users to read this manual carefully and understood.

This manual provides information on installation; operation and maintenance procedures and related instructions for the Valmet brand VAQNCFC213 SPOOL VALVE.

The aim of this literature is to support the use of products in correct manner, and all the technical information provided in the catalogue.

The manual should be given to the end user.

The manual can be changed or revised without any prior notice.

Any changes in product's specification, structure, and/or any components may not result immediate revised version of the manual.

The manual should not be duplicated or reproduced for any purpose without any consent of Valmet Flow Control INDIA PVT. LTD., INDIA.

## MANUFACTURER WARRANTY

For the safety, it is vital to follow instructions in the manual. It is not Valmet liability for any damages which caused by users' negligence.

It is not Valmet liability for any damages or accidents which resulted by any alteration or modification of the product and parts. If alteration or modification is necessary, please contact the Valmet directly.

Valmet warrants the product from the date of original retail purchase of the product for one (1) year, except as otherwise stated.

Valmet warranty will not cover the products that the product have been subjected to abuse, accident, alteration, modification, tampering, negligence, misuse, faulty installation, lack of reasonable care, repair or service in any way that is not contemplated in the documentation for the product, or if the model or serial number has been altered, tampered with, defaced or removed; damages that occurs in shipment, failure due to power surge, and cosmetic damage. Improper or incorrectly performed maintenance or report voids this Limited Warranty.

For detailed warranty information, please contact:

Valmet Flow Control INDIA PVT. LTD., Manapada road, Dombivli (E), Maharashtra, India, Pin - 421204

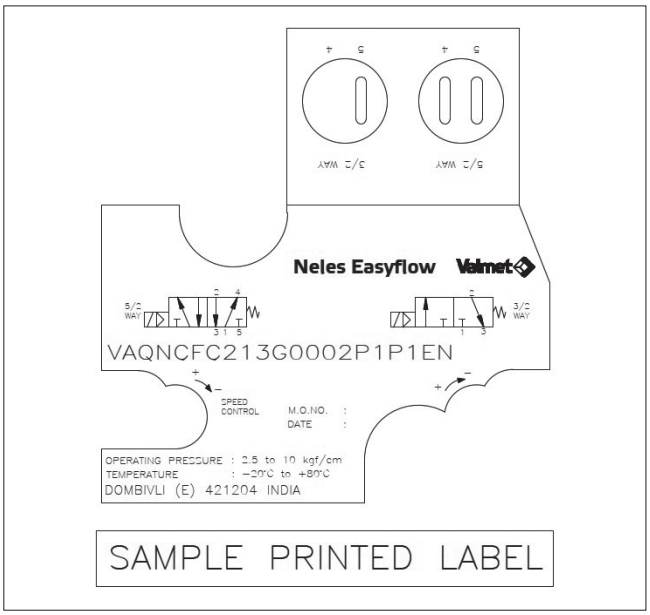
# 1.1 DEFINITIONS

**WARNING:**
IF NOT OBSERVED, USER INCURS A HIGH RISK OF SEVERE DAMAGE TO PRODUCT AND/OR FATAL INJURY TO PERSONNEL.

**CAUTION:**
IF NOT OBSERVED, USER MAY INCUR DAMAGE TO PRODUCT AND/OR INJURY TO PERSONNEL.

**NOTE:**
ADVISORY AND INFORMATION COMMENTS PROVIDED TO ASSIST MAINTENANCE PERSONNEL TO CARRY OUT MAINTENANCE PROCEDURES.

# 2. LABEL DESCRIPTION




SAMPLE PRINTED LABEL

Label of the VAQNCFC213G0002P1P1EN define the precise feature. This description is written below the company logo and is as follows.

| | |
|---|---|
| Model No.: | VAQNCFC: Spool Valve 5/2-Way & 3/2-Way Convertible Namur with Flow Control |
| | 213: Single Coil |
| | G: BSP |
| | 0: Aluminum |
| | 0: NBR |
| | 02P1: 24 VDC Pneumatrol Coil |
| | P1: IP66 |
| | EN: Exd Coil |
| Operating Pressure: | 2.5 to 10 Bar |
| Temperature: | -10°C to 50°C |
| S.O. No.: | Sales order number |
| Date: | Date of Manufacturing |

Dombivli – 421204 INDIA

# 3. INSTALLATION PROCEDURE

# 3.1 EXIA INTRINISCALLY SAFE COIL ASSEMBLY

## INTRINSIC SAFETY

Intrinsic safety is the safest form of protection for electrical equipment operating in potentially hazardous atmospheres. Intrinsic safety (IS) is based on the principle of restricting the electrical energy available in hazardous area circuits such that any sparks or hot surfaces that may occur as a result of electrical faults are too weak to cause ignition.

An intrinsically safe system consists of a certified IS interface which passes signals to and from the process (hazardous area) but limits the energy (that is voltage and current) that can reach the hazardous area under fault conditions.

The interface is usually mounted in the safe area and can be either a shunt diode safety barrier or a galvanic isolator.

In the hazardous area 'simple' or 'non-energy storing devices' (switches thermocouples & LED's) can be used without certification but 'Energy-storing' equipment such as solenoid valves must be designed to prevent this energy escaping and of necessity need to be of sufficiently low power to operate within the constraints of the power of the IS signal.

## HAZARDOUS AREA SOLENOID VALVE

The Pneumatrol EP000/ia solenoid coil is approved for this duty and is certified safe for all classified areas of hazard and gases when installed in accordance with an approved system. The coil is protected by diodes which suppress the inductance, effectively to zero, and there is no capacitive characteristics in the coil either.

The coil assembly, which is encapsulated, forms a compact solenoid actuator to interchange with the standard (non-hazardous duty) coil fitted to the 3 and 4-way spool valves.

The IS coil because of its low wattage requires that the spring load and travel of the armature be closely controlled and for this reason each solenoid has an inbuilt adjustable jet which is factory set so as to control the operating characteristics of the coil. Where the IS solenoid actuator is fitted to the spool valve, the jet in the end cap, which is required for the normal coil, is removed.

## SOLENOID SPECIFICATIONS

| | |
|---|---|
| Coil Type | DC Solenoid Coil |
| Nominal Voltage | 24 |
| Voltage Tolerance | ± 10% |
| Ambient Temperature | -20 to +65°C (-40 to +65°C Low Temp) |
| Duty Cycle | 100% |
| Degree of Protection | IP65 |
| Electrical Connection | Junction Box with Conduit Entry (M20 or 1/2" NPT) |
| Power Consumption | 0.4W or 0.27W |
| Pressure Range | 0 - 10 Bar |
| Resistance | 370 Ohms or 2100 Ohms |
| Inductance (Apparent) | Zero |
| Capacitance | Zero |
| Temperature Rating | T6 |
| Max. Ambient Temp | 65°C |

## INTRINSICALLY SAFE SUPPLY SPECIFICATION

**Maximum Input Parameters:**

| | |
|---|---|
| Umax : in | 31 Vdc |
| Imax : | 0.67 A |
| Wmax : in | 2.98 W |

Table 1

| GROUP | CAPACITANCE (pF) | INDUCTANCE (mH) | L/R RATIO (pH/ohm) |
|---|---|---|---|
| IIC | 0.083 | 1.4 | 39 |
| IIB | 0.65 | 7.2 | 155 |
| IIA | 2.1 | 14.4 | 283 |

## INTRINSICALLY SAFE SUPPLY SPECIFICATION

**NOTE 1**: This apparatus is unspecified except that it must not contain under normal or abnormal conditions a source of potential with respect to earth in excess of 250V R.M.S. or 250V DC.

**NOTE 2:** The electrical circuit in the Hazardous area must be capable of withstanding an AC test voltage of SOOV R.M.S. to earth of frame of the apparatus for one minute.

**NOTE 3:** Any single channel or single channel of a multiple channel Shunt Zener Diode Safety Barrier, Solenoid Driver or supply certified by any EU notified certification body to [Exia] IIC, whose output voltage (Uz, Umax:out or U0) does not exceed 28V and whose output current (Imax:out or Io ) is limited by resistance 'R' such that the output voltage divided by 'R' does not exceed 110rnA, or whose output voltage (Uz,Umax:out or Uo) does not exceed 25.5V and whose output current (ip. or I,) is limited by resistance 'R' such that the output voltage divided by 'R' does not exceed 147mA.

**NOTE 4:** Pneumatrol solenoid valve covered by Certificates CML 17ATEX2046X & IECEx CML17.0030X.

**NOTE 5:** Switch must be selected and installed to meet the requirements of clauses 5.4 of EN60079-11.

**NOTE 6:** The cable maybe twin pair, or a pair contained in a type A, or type B multicore cable ( as defined in clause 5.3 of EN60079-25), provided that the peak voltage of any circuit contained within the multicœre does not exceed 60 volts.

**NOTE 7:** The capacitance and inductance to resistance ratio of the hazardous area cables must not exceed the values shown in table 1.

# 3.2 INSTALLATION PROCEDURE OF SPOOL VALVE

**CAUTION:** Blow out air lines and fittings before installation. Use dry and oil free air. Do not dismantle the VAQNCFC213 while operation is in line. Do not allow dirty air or fluids to get into the VAQNCFC213. Use filter unit (filter size 40µm, 3°C) for dust and moisture removal.

**NOTE:** Ensure the installation meets the legal and regulatory requirements of the country and state of use. The VAQNCFC213 assembly should be left in the original packing until it is required for the use.

1. Hemp filaments, jute or even Teflon ribbons are normally not required, As the part connections are accurately threaded. By chance, if any of these or any other tightening medium get into the operational area inside the VAQNCFC213, possible damage of the VAQNCFC213 could not be ruled out.
2. Clean all pipes and tube fittings thoroughly with suitable means. As even when brand new pipes are fitted, unclean interior are quite covered with dirt and dust.
3. Avoid impact on the VAQNCFC213. These may happen during transportation/ erection/ mishandling.

# 4. TECHNICAL SPECIFICATION

| Model | VAQNCFC113/VAQNCFC213 |
|---|---|
| Operation type | Internal Pilot operated |
| Type | 5/2 and 3/2 single solenoid |
| Port | 1/8" BSP/ 1/8" NPT/ 1/4" BSP/ 1/4" NPT |
| Operating Pressure | 2 to 10 kg/cm$^2$ |
| IP Rating : | IP 66 (Spool Valve with Exd Coil)<br>IP 65 (Spool Valve with Exia Coil) |

# 5. MAINTENANCE

**NOTE:**

- THE VAQ213NC-FC MUST BE REMOVED FROM INSTALLATION PRIOR TO MAINTENANCE.
- ALL THE CONNECTIONS/PORTS HAVE TO BE DISCONNECTED PRIOR TO DISASSEMBLY.
- ALL THE MOUNTINGS, ACCESSORIES AND SPARE PARTS USED OR REPLACED MUST BE ORIGINAL FROM VALMET.

Valmet recommends “NELES M 55” grease for greasing.

- Apply the grease with soft brush or similar.
- In case of any difficulty consult Valmet distributor.

1. Install, operate and maintain as per the instructions and recommendations of this manual.
2. Any deviation from the above will cease the responsibilities of Valmet.

# 6. DISASSEMBLY

**WARNING:**
ALL ELECTRIC AND PNEUMATIC CONNECTIONS SHOULD BE REMOVED BEFORE STARTING DISASSEMBLY.

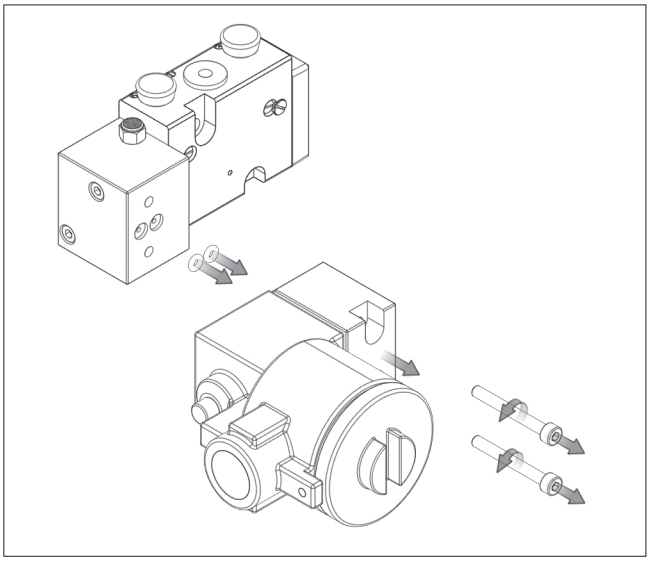
**CAUTION:**
IF NOT ODO NOT PLACE DISMANTLED PART ON ANY DIARY/WORK BENCH BUT KEEP IT ON CLEAN PAPER/CLOTH IN SAME SEQUENCE AS YOU HAVE DISMANTLED IT.

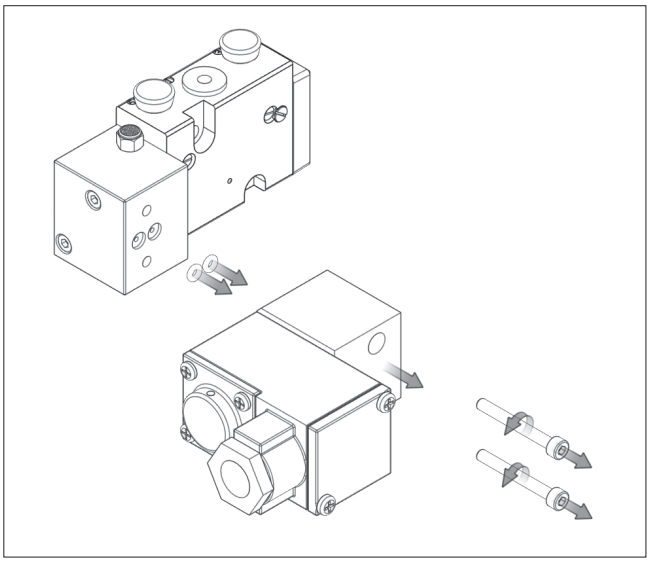
**NOTE:**

- IT IS ADVISABLE TO REPLACE ALL THE RUBBER PARTS USING GENUINE NELES SPARE KIT.
- NUMBERS IN PARENTHESES, ( ) INDICATE THE BUBBLE NUMBER (REFERENCE NUMBER) USED ON THE NELES ASSEMBLY DETAILS AND PART LIST.

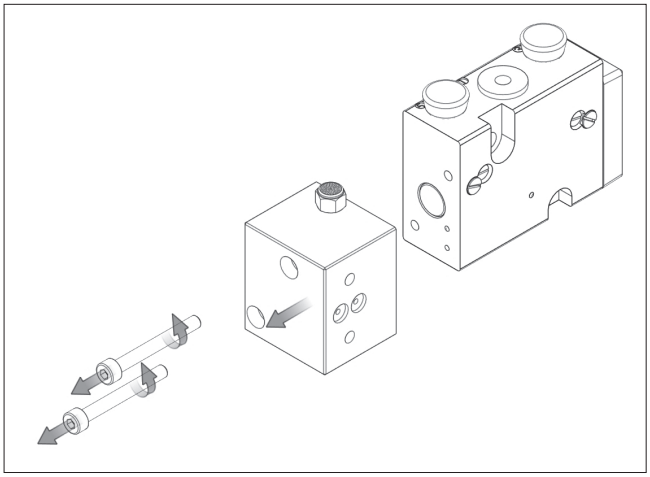
## 6.1 DISASSEMBLY OF VAQNCFC 113/213 SPOOL VALVE WITH PNEUMATROL COIL (EXD & EXIA)

1. Remove the 2 Nos. M4 screw (26) for removing the Exd or Exia Pneumatrol Coil with Pilot Cover Assembly (24) from the Spool Valve Assembly. Parallel remove 2 Nos. of O-Ring (41). The above procedure is same for Spool Valve with Exd Pneumatrol Coil & Spool Valve with Exia Pneumatrol Coil.

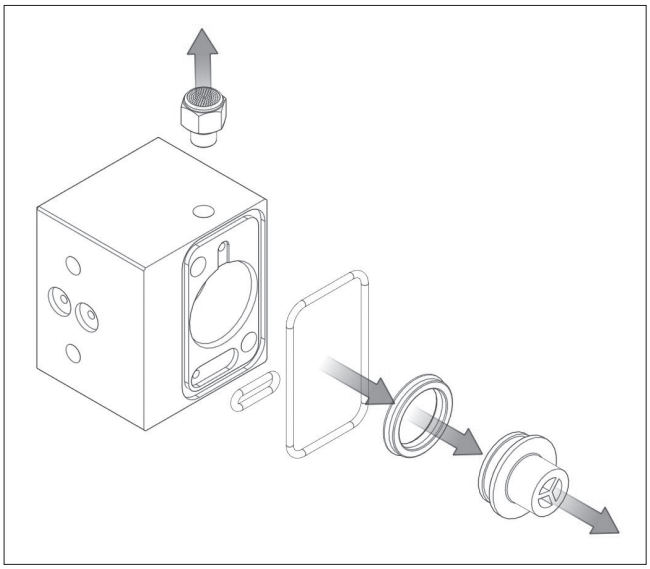




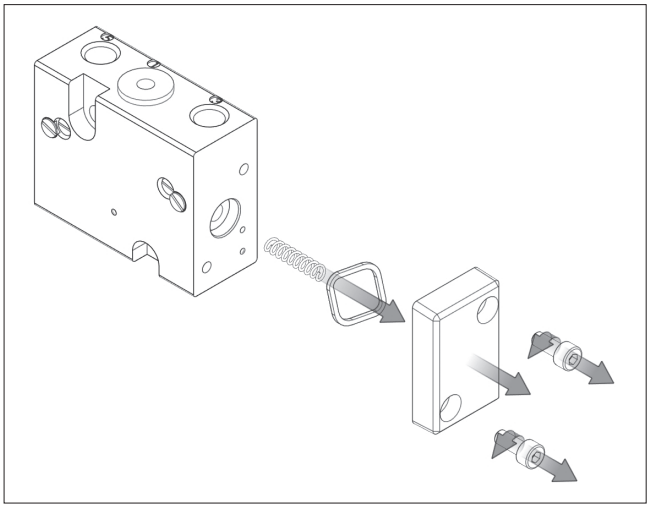
2. Remove the 2 Screws (19) by loosening them from Cover-1 (2) and simultaneously remove the Cover-1 (2) afterwards.



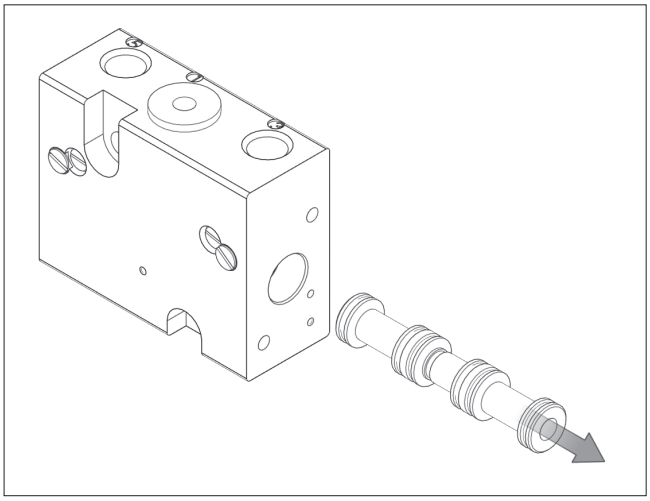
3. Afterwards remove Seal (38), O-ring (39), Helping Piston (4), Lip Seal (14) & Silencer (22).



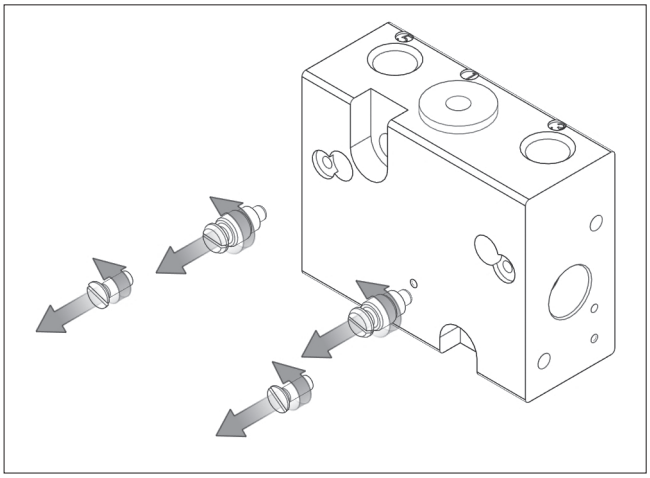
4. Separate out spring cover (10), Gasket (13) and spring (12) by removing 2 screws (20).



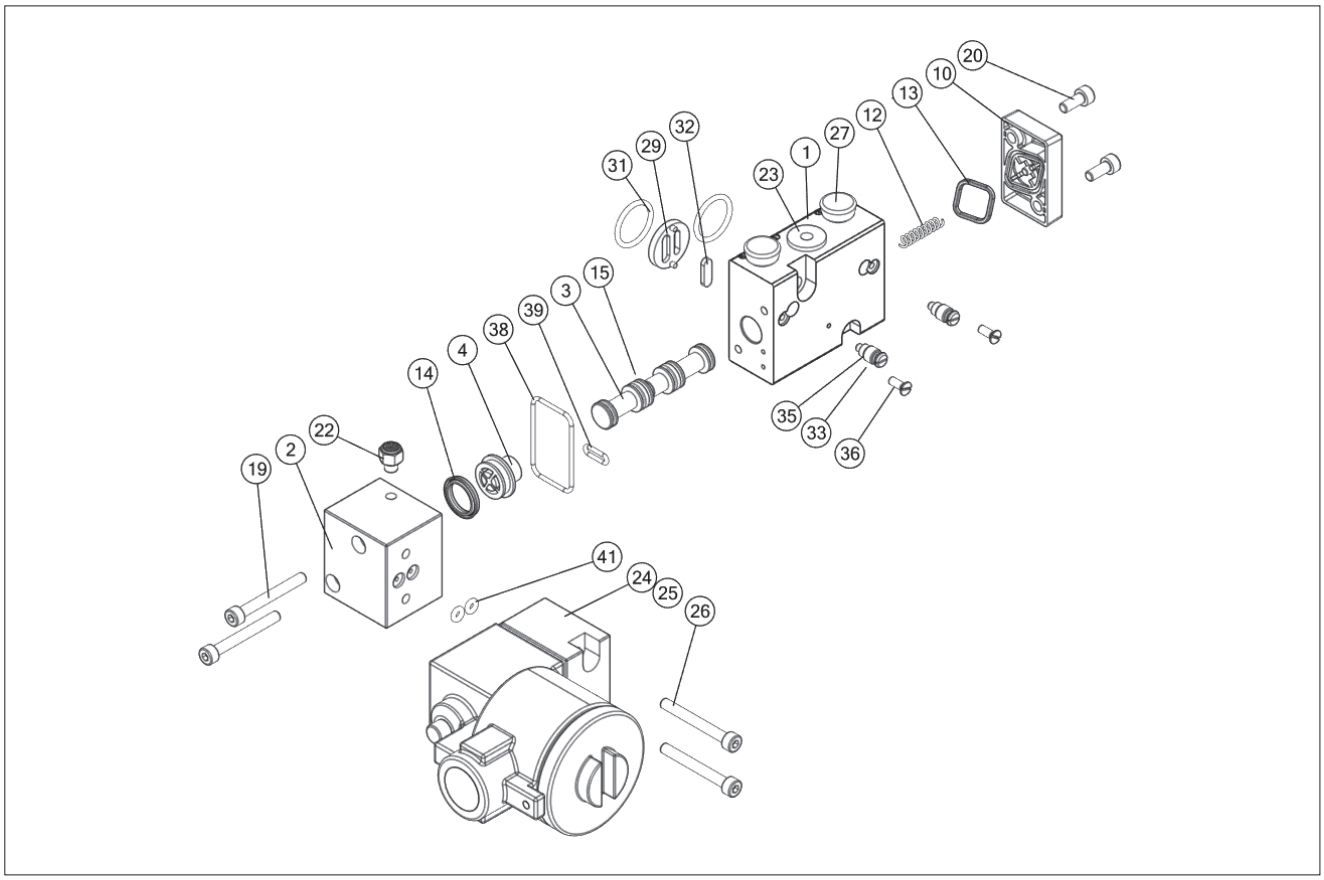
5. To disengage the Spool Kit, pull the Spool Kit gently out of the Valve Body.
**NOTE:** Remove spool kit gently with nonmetallic hammer, do not hammer heavily on the spool, by this spool may get jammed in bore during this operation.

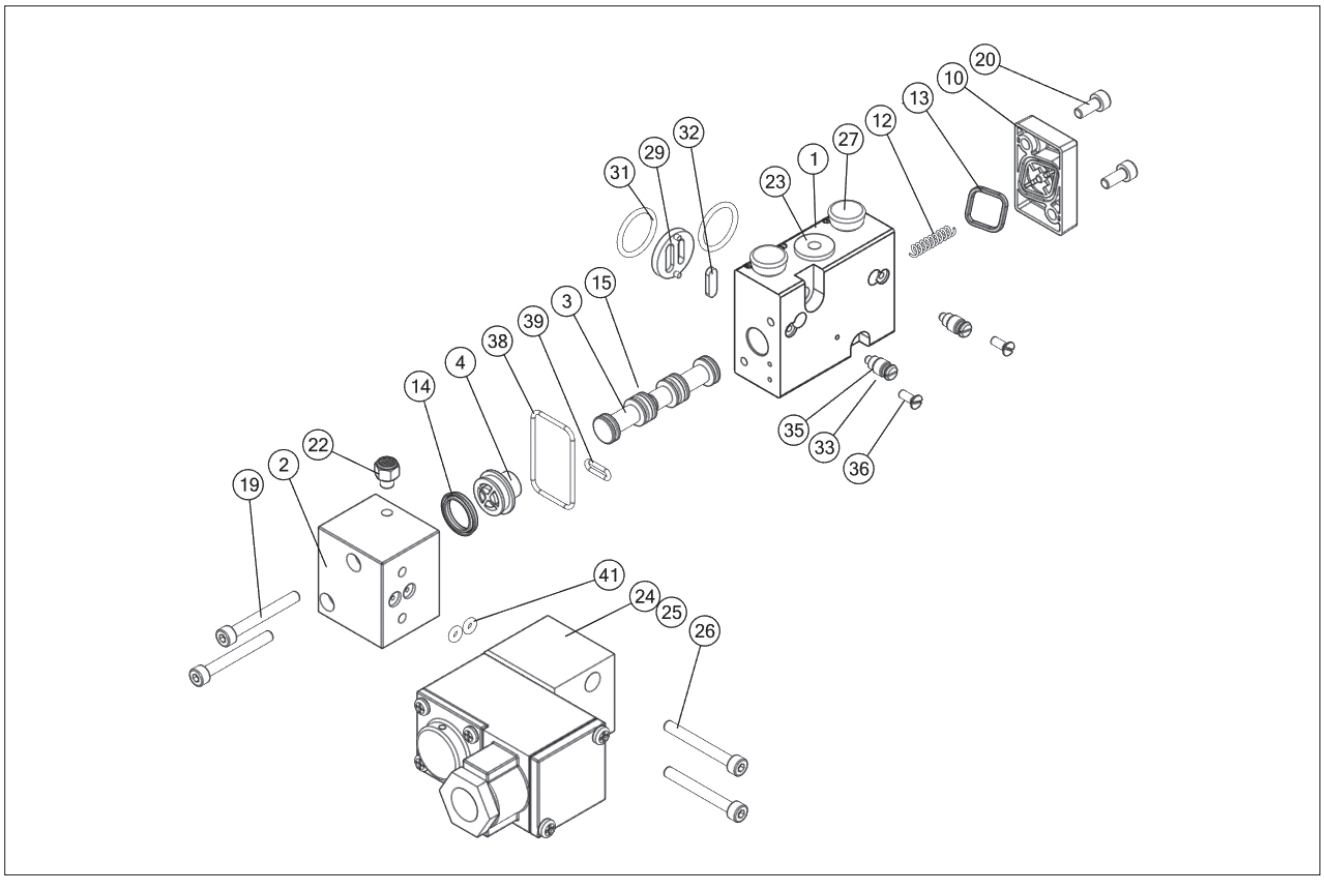


6. For removing the Flow Control Screw Assembly (35 & 33), first remove the M3 Screw (36) as shown in the fig.



# 6.2 EXPLODED VIEW

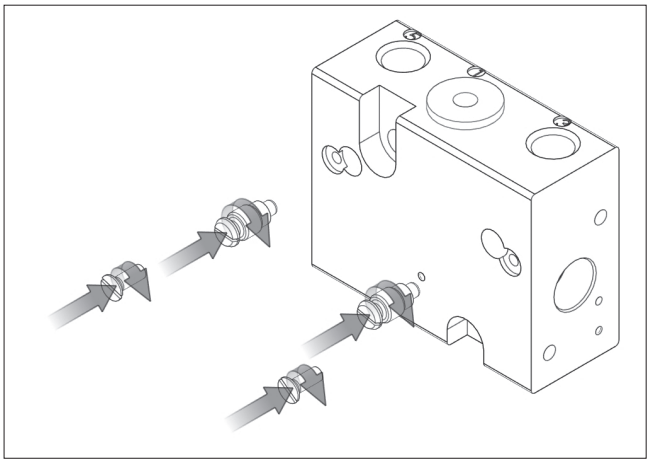


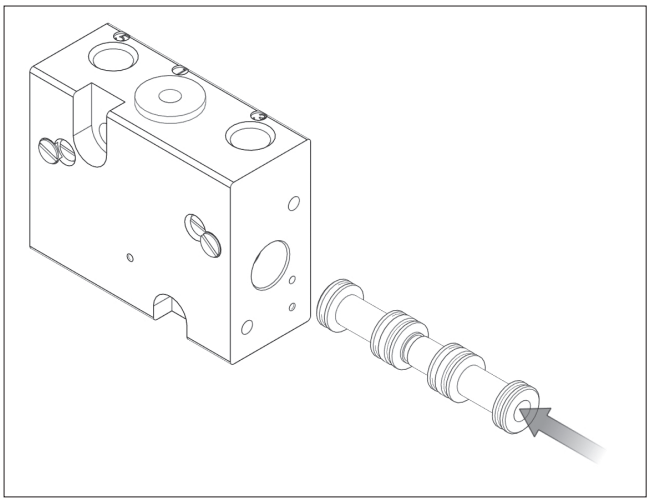
# 7. ASSEMBLY OF VAQNCFC 113/213 SPOOL VALVE WITH PNEUMATROL COIL (EXD & EXIA)

**NOTE:** Follow the sequence as given below to ensure proper assembly.

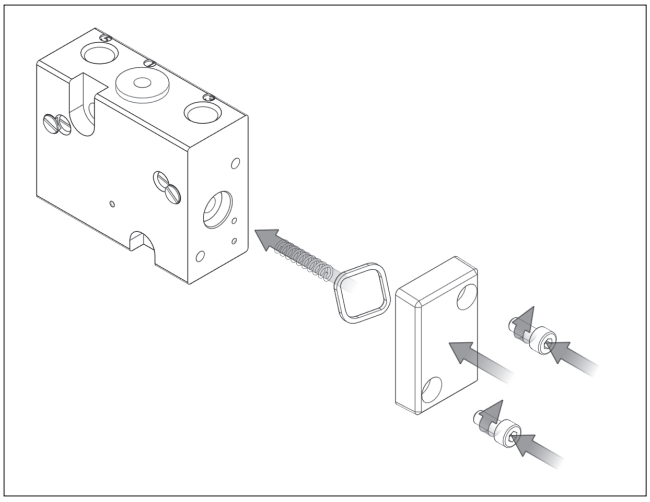
1. Clean all parts with soap water and dry.
2. Apply a layer of Valmet recommended grease to the inner face of the body (1). (Grease: NELES m 55).
3. Insert seal (15) on the spool (3).
4. Screw the Flow Control Screw assembly (35 & 33) inside the Body and afterward on top of it screw it with M3 screw (36) so during unscrewing the Flow Control Assembly for full exhaust flow it does get disassemble from the Body (1).



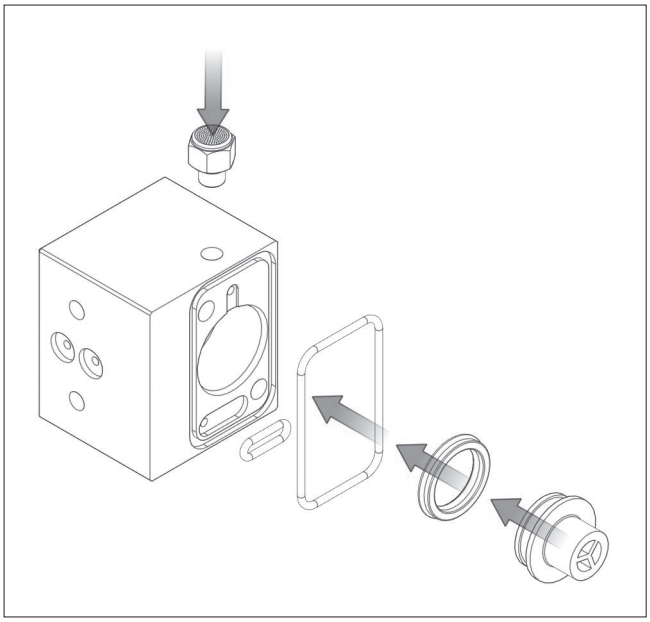
5. While inserting spool into the body applies a thin layer of grease on the seal.
6. Insert the spool kit (3) inside the valve Body.



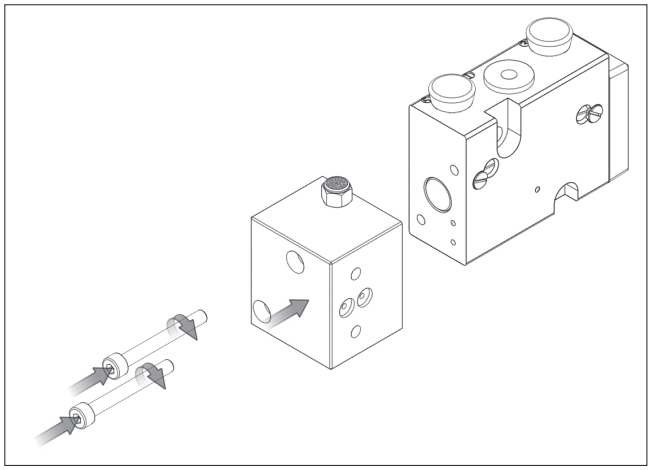
7. Then insert the spring (12) inside the Spool Kit, Cover Seal (13), Cover (10) and screw it using 2 Screws (20).



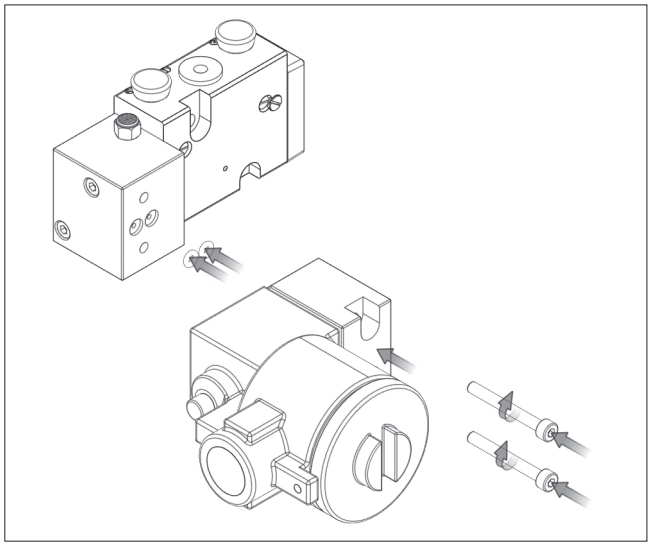
8. Insert the Lip Seal (14) on the piston (4), apply a thin layer of grease on the lip seal.
9. Insert the Assembly of Piston (4) & Lip Seal (14) into the Cover-1 (2). And Place the Seal (38) & O-Ring (39) in respective groove of Cover-1 (2). And finally screw the Silencer (22) on the Cover-1 (2).

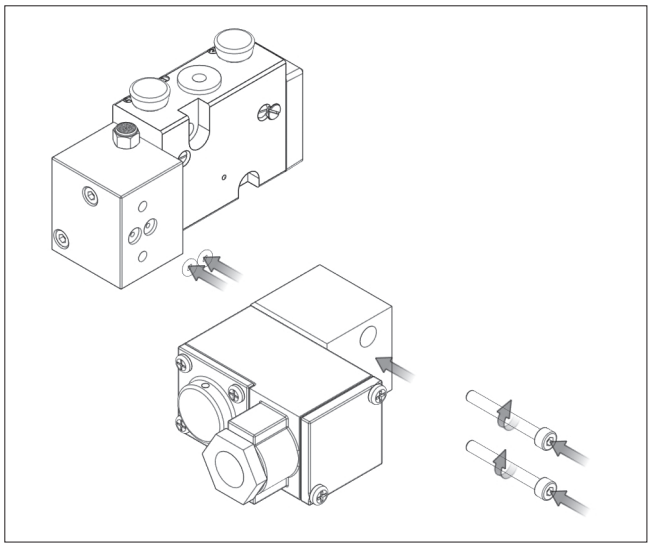


10. Place Cover-1 (2) on the Body (1) and screw it with the help of 2 Screws (19).



11. Place 2 Nos of O-Ring (41) in the respective groove on the Cover-1 (2). And assemble the Exd/Exia Pneumatrol Coil with Pilot Cover (24) on the Spool Valve Assembly with 2 Nos. of M4 Allen Screw (26). The above procedure is same for Spool Valve with Exd Pneumatrol Coil & Spool Valve with Exia Pneumatrol Coil.





## 7.1 PART LIST

| Sr.No.: | Name | Quantity |
|---|---|---|
| 1 | BODY | 1 |
| 2 | COVER-1 | 1 |
| 3 | SPOOL | 1 |
| 4 | HELPING PISTON | 1 |
| 10 | SPRING COVER | 1 |
| 12 | SPRING | 1 |
| 13 | COVER SEAL | 1 |
| 14 | PISTON LIP SEAL | 1 |
| 15 | SEAL | 6 |
| 19 | DIN 912 M4 x 30 | 2 |
| 20 | DIN 912 M4 x 10 | 2 |
| 21 | BALL DIA 2 IS 2898 | 6 |
| 22 | SILENCER M5 x 0.5 THRD. | 1 |
| 23 | DUST CAP | 1 |
| 24 | PILOT COVER | 1 |
| 25 | EXD/EXIA COIL | 1 |
| 26 | DIN 912 M5 x 30 | 2 |
| 27 | MUFFLER | 2 |
| 28 | DIN M5 x 30 | 2 |
| 29 | CONVERSION PLUG | 1 |
| 30 | SOCKET SET SCREW M5 x 8 | 1 |
| 31 | O-RING 16.3 x 1.78 | 2 |
| 32 | SEAL (CONVERSION PLUG) | 1 |
| 33 | O-RING 2.90 x 1.78 | 2 |
| 34 | BALL DIA 3 | 2 |
| 35 | SCREW CYL 32 | 2 |
| 36 | M3 x 8 SCREW | 2 |
| 38 | SEAL | 1 |
| 39 | O-RING 7.2 x 1.40 | 1 |
| 41 | O-RING 2.78 x 1.78 | 2 |

# 8. PACKAGING & STORE

1. When not in use, VAQNCFC213 ASSEMBLY should be kept in a sealed plastic bag in a cardboard box to prevent moisture or dust from contacting product.
2. VAQNCFC213 should be stored in a dry place free from water and dust.
3. Store at temperature between 40°F and 120°F (4°C and 49°C).
4. Locate in an area to avoid damage by impact.

# 9. ASSISTANCE

For technical questions or assistance, contact any authorized distributor of Valmet or:

For technical questions or assistance, contact any authorized distributor of Valmet Flow Control India Private limited. or:

**Valmet Flow Control Oy**
Vanha Porvoontie 229, 01380 Vantaa, Finland.
Tel. +358 10 417 5000.
www.valmet.com/flowcontrol

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