



OPERATING INSTRUCTIONS

EN

Translation of the original instructions

ISV 16 - ISV 25 - ISV 40

Isolation valve

ISV 16 - ISV 25 - ISV 40

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ISV 16 - ISV 25 - ISV 40

I. ISOLATING VALVE

II.1. DESCRIPTION

The isolating valves ISV 16, ISV 25 and ISV 40 are used at the inlet of roughing pumps from 5 to 21m³/h and dry pumps ACP Series, as isolating safety valves.

The isolating valves ISV prevents oil from backstreaming into pumped chamber.

In the event of a power failure, they isolate the vacuum chamber, protect the upstream turbomolecular pump and ensure the primary pumping unit venting.

Due to their electro-pneumatic operation, they have a very low energy consumption.

CAUTION

We do not recommend the use of these isolating valves:

- for microelectronic and chemical applications,
- when pumping gases could change the membrane quality (elastomer),
- or when pumping gases could produce deposits involving sticking of the moving parts.

Correct and proper use:

- The ISV isolating valve is used for neutral or not very corrosive gases pumping installations.
- The ISV isolating valve is used only -
 - for Pascal series rotary vane pumps with which it is compatible (see the primary pumps Operation instruction's manual)
 - for ACP dry pumps with which it is compatible (see the primary dry pumps ACP Operation instruction's manual)

Non conformity of use:

If used improperly, any liability claims and warranty will be rejected. Is considered as not meeting any use for purposes that are different from that specified, including:

- Connection to primary pumps Pascal series, C1, C2 models.
- Connection to pumps and devices for which they are not intended.
- The connection of not electrically isolated devices.
- The use on the applications of pumping of
 - corrosive products
 - flammable products such as oxygen, silane
 - condensable vapors
 - gases which are charged in particles.

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II.2. TECHNICAL CHARACTERISTICS

- Dimensions: see figures C and D
- Operating temperature: from 12 to 45 °C
- Storage temperature : mini: -10°C - Max: 65 °C
- Materials : see table page 12
- Power : < 8 watts
- Leakage rate (towards outside): < $1 \cdot 10^{-6}$ hPa·l/s
- Electrovalve type: NC (Normally Closed)

MODEL	ISV 16			ISV 25			ISV 40		
Inlet pressure (hPa)	10 ⁻²	10 ⁻¹	10 ⁰	10 ⁻²	10 ⁻¹	10 ⁰	10 ⁻²	10 ⁻¹	10 ⁰
Conductance (l/s)	5	11	31	6	15	66	6	15	66
Air backstreaming on closing (hPa·l/s)	7·10 ⁻²								
Weight (kg)	0.660			0.660			0.750		

		ISV 16	ISV 25	ISV 40
Equipped with	Reference *	Part number		
1 centering ring	C	See products of catalog		
1 O-ring	B			
1 quick connect clamp	D			

* See Figures A and B

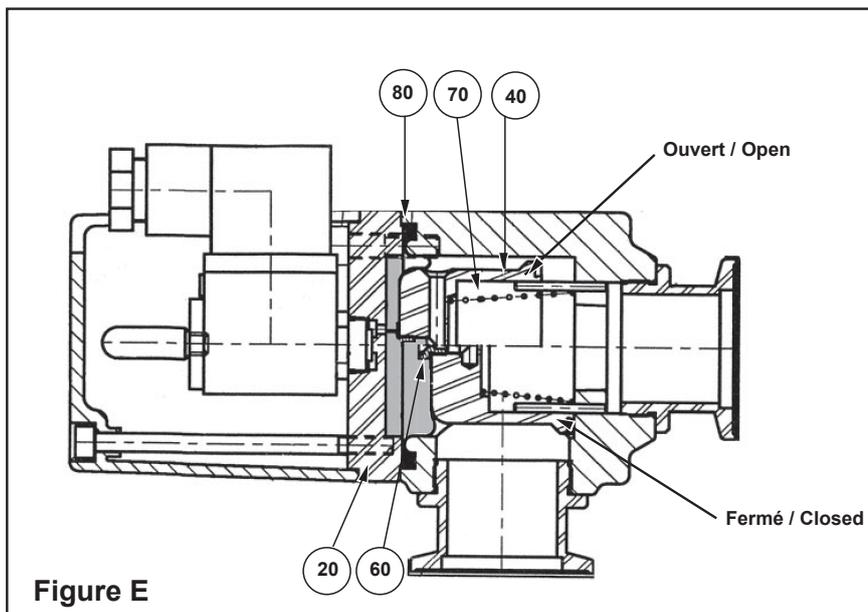
Products P/N						
Power voltage	240 V 50/60 Hz	220 V 50/60 Hz	200 V 50/60 Hz	110 V 50/60 Hz	100 V 50/60 Hz	24 V DC
ISV 16	115894	115893	115892	115896	115895	-
ISV 25	115899	115898	115897	115901	115900	115902
ISV 40	118815	118814	118813	118812	118811	118816

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II.3. OPERATING FUNCTIONING

a) Starting conditions

- The various valve parts are at atmospheric pressure.
- The electric coil is not powered
- The piston (40) opens under pressure from return spring (70).



b) Operating conditions

- The electric coil is powered.
- The electrovalve closes, isolating the upper chamber of the valve from external air.
- The pumping is performed in the arrow direction "PUMP ↓" (see figures A and B)
- The pressure in the chamber situated between the membrane (80) and the lid (20) decreases gradually (lowering the pressure through the nozzle (60)). All valve parts are at pump inlet pressure. The piston (40) is stable in open position.
- Further to the pumping restarts, the valve opens only if the inlet pressure of the pump is lower than the pressure into the vacuum chamber

c) Stop, during power failure

- The electric coil is no longer powered and therefore immediately allows air at atmospheric pressure to enter the chamber situated between the membrane (80) and the lid (20).
- The piston (40) is therefore pushed back, compressing the spring (70) and the valve closes.
- The pumping unit gradually returns to atmospheric pressure via the open electrovalve and the nozzle (60).

Important: on closing, a slight flow of air (approx. $7 \cdot 10^{-2}$ hPa·l/s) enters the vacuum chamber.

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II.4. ASSEMBLY INSTRUCTIONS

The performance and operational safety of this product are guaranteed provided it is used normally in the operating conditions defined in this operating manual.

It is the customer's responsibility to:

- train operators to use the product if they do not speak the language the operating manual is written in,
- ensure operators know the safe practices to apply when using the product.

CAUTION

These manipulations are performed pump off.

WARNING

All maintenance must be performed by a skilled maintenance operator trained in the relevant health and safety aspects (EMC, electrical hazards, chemical pollution, etc.). Isolate the product from all energy sources (mains electricity, compressed air, etc.) before starting work.

DANGER



During pump removal, disconnection, draining or maintenance operator could be in contact with process residues which could cause severe injury or death. Apply instructions according to the local regulations. Informations are available at your safety department.

a) Mechanical connection to the pump (see figures A and B)

Protect the valve from shocks : risk of light leak to the lid.

The valve can operate in all pumping axes.

Two cases of assembly can be envisaged depending on the location of the pump and nipple accessibility:

Case 1: The valve is mounted on the inlet port located vertically of the pump.

Proceed as follows:

- Assemble according to figure A using the connection accessories provided with the valve (B, C, D).

Case 2: The valve is mounted on the inlet port located on the lateral side of the pump.

Proceed as follows:

- Remove the lateral flange (13, 14, 110).
- Reverse the positions of the inlet nipple (11) and the lateral flange (14). Reinstall screws (110).
- Assemble according to figure B using the connection accessories provided with the valve (B, C, D).

It belongs to the customer to test the tightness of the assembly with a helium leak detection.

In all cases, the "Pump ↓" label should point to the side of the nipple connected to the pump.
When pumping deposit-laden products, the valve should be mounted only vertically.

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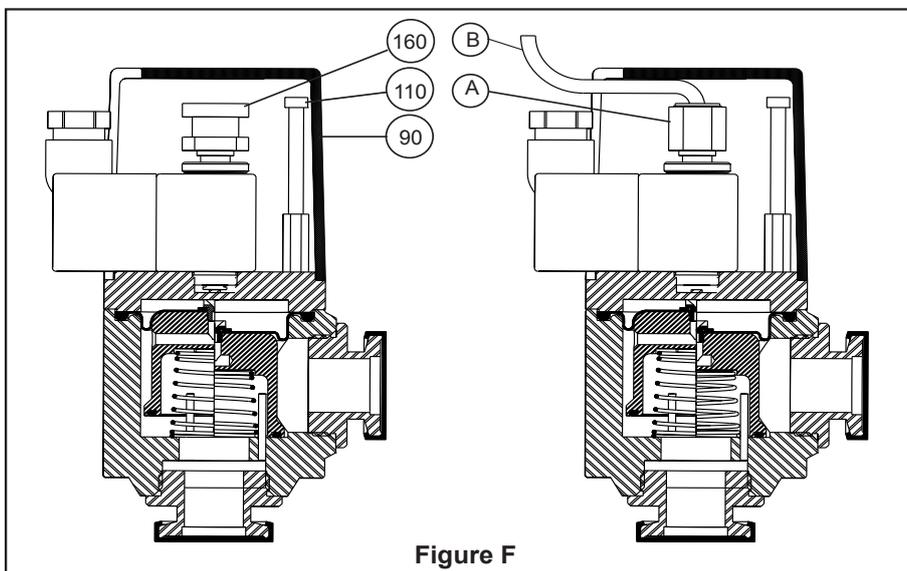
b) Nitrogen supply connection

It consists in handing the pump to atmospheric pressure, while keeping the vacuum into the chamber, by injecting some dry nitrogen or another neutral gas. For that purpose, it is necessary to equip the valve the following way:

- Remove the screws (110) and withdraw cover (90).
- Unscrew the silencer (160), dispose off.
- Replace the silencer by screwing a hose coupling threaded M5 (A) (customer's supply).
- Connect to the hose coupling a flexible tube out. diam. 4 mm (B).
- Put the cover (90) back and tighten the screws (110).
- Inject dry nitrogen (or any other neutral gas) by means of flexible tube (B).

It is necessary to have a filtered dry air supply or a neutral gas supply having the following characteristics :

- Dew point < 22 °C
- Dust < 1 µm
- Suitable pressure: 1000 hPa (absolute pressure)
- H₂O Concentration < 10 ppm v
- O₂ Concentration < 5 ppm v



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c) Electric connection

- Three-phase motor wiring is at customer's charge.
- Connect a mains cable using wire section of 3 x 0.75 mm² to the 3-pole connector (200). Ensure that the electrical supply cable is suitably protected against earth defects and that the earth wire is longer than the 2 conducting wires.
- Check that the electrovalve (voltage and frequency) is compatible with the mains supply (see section II.2).
 - 1 - In case of a rotary vane pump**, connect the valve power supply wires parallel to the motor power supply wires. **This is necessary to ensure the joint operation of the pump and the valve during a power failure.** Depending on the type of motor, refer to electric wiring diagram located inside the pump terminal box, or in the roughing pumps series 5/21 m³/h operating instructions.
 - 2 - In case of a dry primary pump**, connect the valve power supply wires to the same supply as the pump. If needed, refer to the ACP Series dry pumps operating instructions manual.
- Connect the valve to the pump. Start the pump and test the valve functioning before the final connection of the vacuum circuit.

II.5. VALVE MAINTENANCE

We recommend to:

- Purge the pumping installation with dry nitrogen.
- Wear gloves, protective glasses, breathing mask or any appropriated safety equipment.
- Premises must be well ventilated.
- Do not eliminate maintenance waste via public disposal channels. Have it destroyed by a qualified company if necessary.
- Do not eliminate used membrane via public disposal channels.
- Install the inlet and exhaust blanking plates, these accessories are delivered with the pump.

a) Disassembly (see figure H)

- Stop the pump and check that the electrovalve is not powered.
- Remove the 3-pole connector (200) of the electrovalve.
- Remove the valve from the pumping circuit.
- Unscrew the 2 mounting screws (160 + 150) and remove the cover (90).
- Remove the coil (11) and its silencer (110).
- Unscrew the 2 mounting screws (140 + 150) and remove the cap (20).
- Unscrew the nozzle (60), remove the membrane (80) and the piston (40).
- Remove the spring (70) and the o-ring (120) of the piston (40).

b) Cleaning

WARNING

Never clean a used membrane: it must always be replaced by a new one.

Clean the parts with a dry cloth, and if necessary, with solvent such as AXAREL® (Registered trademark DUPONT DE NEMOURS).

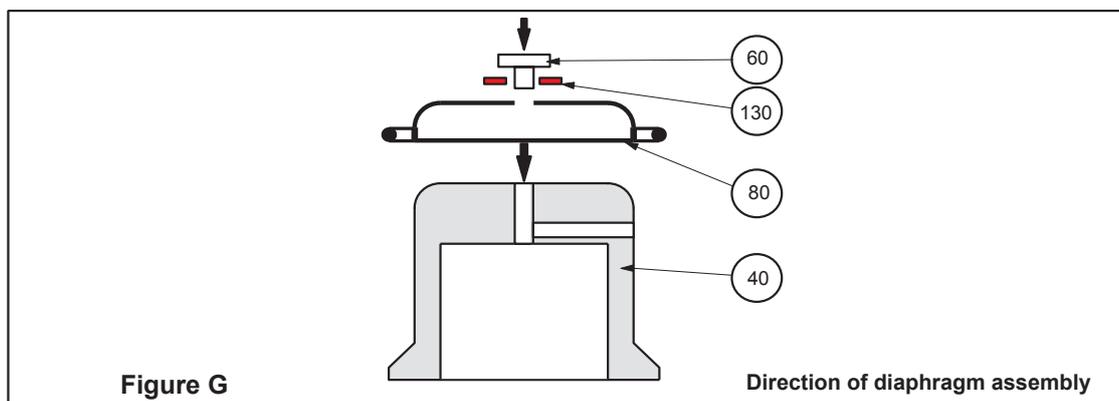
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c) Reassembly (see figure G)

⚠ WARNING

Prior to assembly : check that the new membrane is clean. If necessary, remove traces of paint or marks which could be on the membrane (80) (using a solvent or alcohol). Leave to dry thoroughly. Lightly lubricate the centre and edge of the membrane on the chamber side with vacuum grease.

- The O-ring (120) must be replaced systematically by a new one. Take care not to roll this seal during assembly!
- Insert the spring (70) in the body of the valve (10).
- Reassemble the membrane (80) and the nozzle (60) on the piston (40). Attention ! **Install the diaphragm as shown in figure G.**



- Assemble the set «diaphragm and piston» in the body (10) and push the set with force.
- Position the cap (20) and assemble with 2 screws (140 + 150).
- Position the coil (11) in its housing.
- Position the cover (90) and screw with (150 + 160).
- Perform a helium leak detection test.

II.6. SPARE PARTS (see figure H)

Pos..	Description	P/N
70	Spring	066837
80	Diaphragm	066838
110	Silencer	A459866
120	O-ring C 2 D 30	108845
11	Coil 220 V - 50/60 Hz	038121
11	Coil 100 V - 50/60 Hz	038126
11	Coil 110 V - 60 Hz	038122
11	Coil 200 V - 50/60 Hz	038125
11	Coil 240 V - 50/60 Hz	038124
11	Coil 24 V - DC	038066

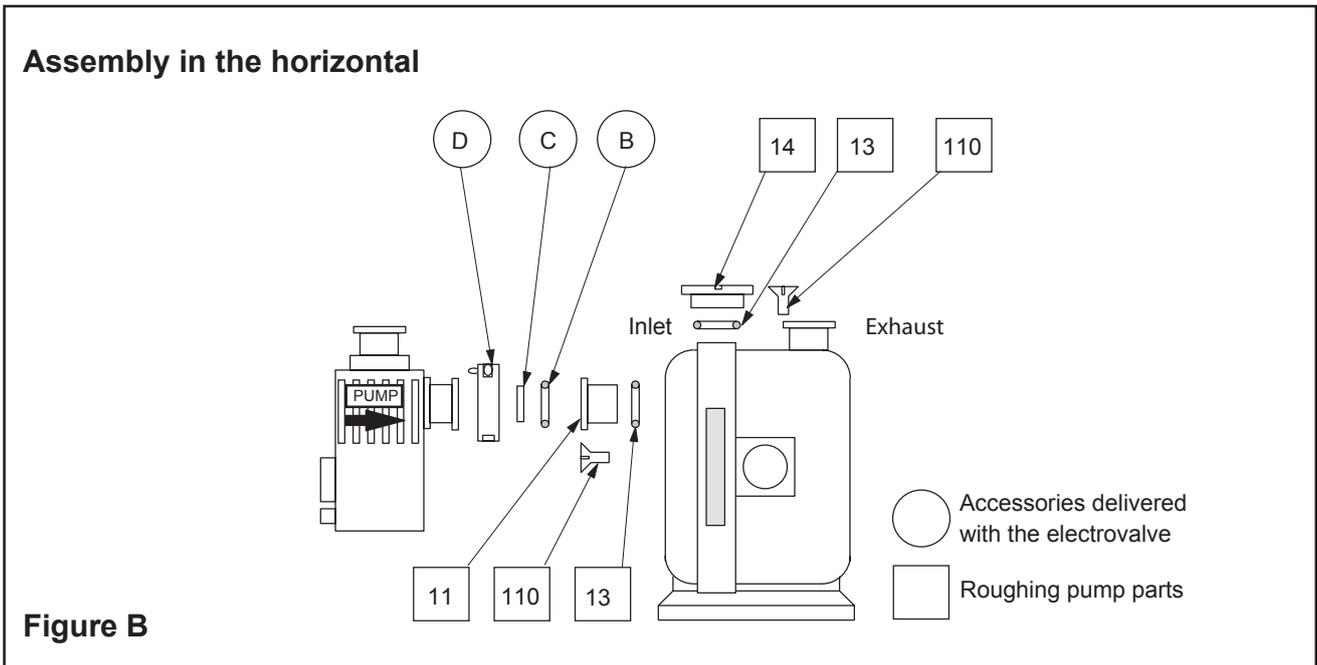
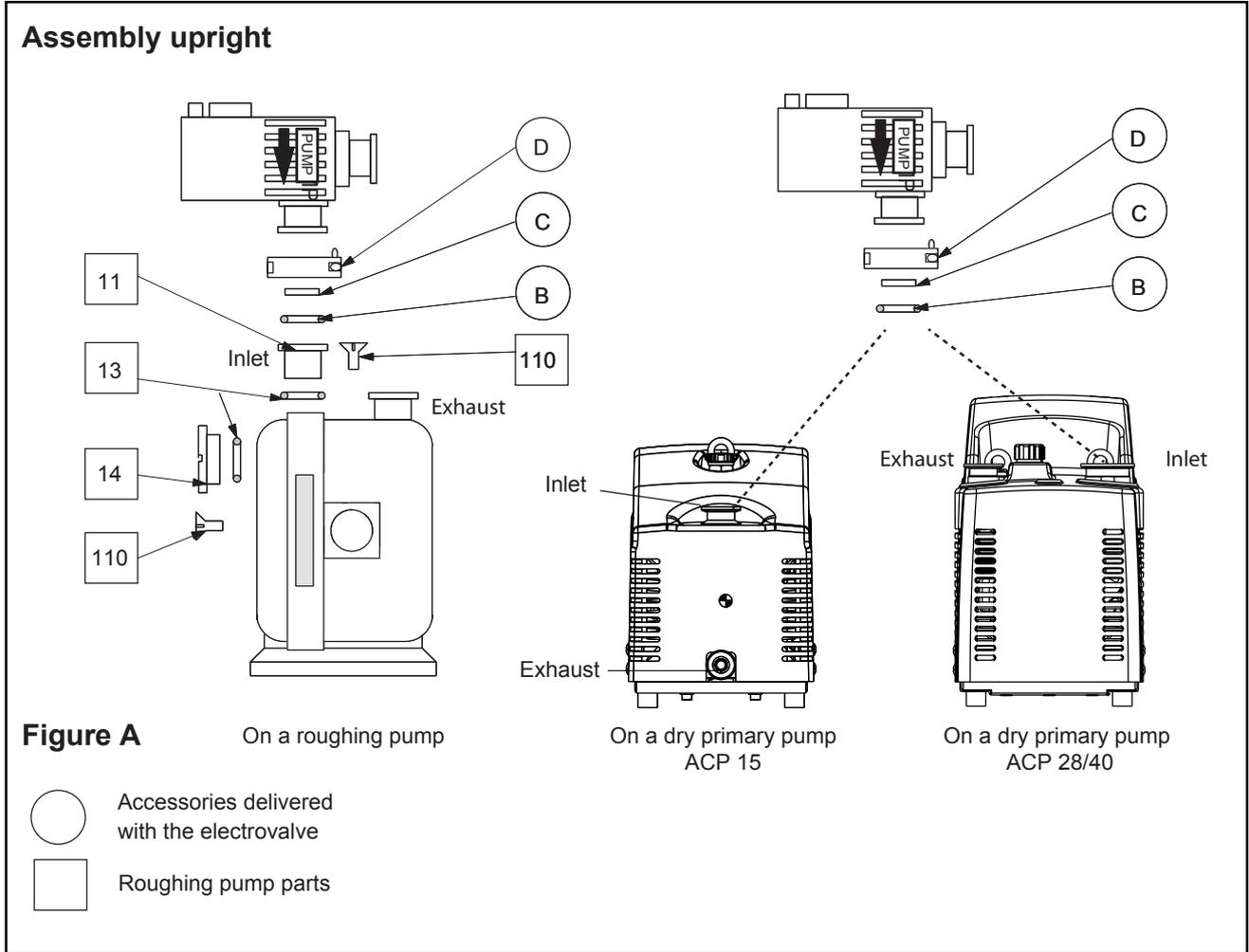
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II.7. MAIN CAUSES OF MALFUNCTION

MALFUNCTION	CAUSES	REMEDIES
A - PUMP DOES NOT DECREASE UNDER VACUUM	1- Leak: electrovalve incorrectly assembled	Disassemble and reassemble carefully
	2- Perforated diaphragm (80)	Disassemble electrovalve and replace diaphragm (80)
	3- Electrovalve not operating	Check wiring Clean the coil (11) with compressed air Replace the coil (11)
	4- Broken spring (70)	Disassemble the electrovalve and replace spring (70)
B - PRESSURE INCREASES WHEN SWITCHED OFF	1- Diaphragm (80) upside-down	Disassemble and reassemble it correctly
	2- Electrovalve incorrectly assembled	See incident A1
	3- Perforated diaphragm (80)	See incident A2
	4- Broken spring (70)	See incident A4
	5- Incorrect tightness	Disassemble the electrovalve and clean the cap (20)
	6- Electrovalve does not close	See incident C
C - VALVE DOES NOT CLOSE	1- Nozzle (60) clogged	Disassemble electrovalve and clean nozzle (60) with compressed air
	2- Perforated diaphragm (80)	See incident A2
	3- Coil (11) not operating	See incident A3
	4- Contaminated electrovalve	Disassemble it, clean it, reassemble it carefully
	5- Broken spring (70)	See incident A4
D - VALVE DOES NOT OPEN	1- Contaminated valve	See incident C4
	2- Pump doesn't work	Check wiring and pump vacuum circuit
	3- Broken spring (70)	See incident A4.

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II.8. FIGURES



ISV 16 - ISV 25 - ISV 40

Dimensions ISV 16 (mm/Inch)

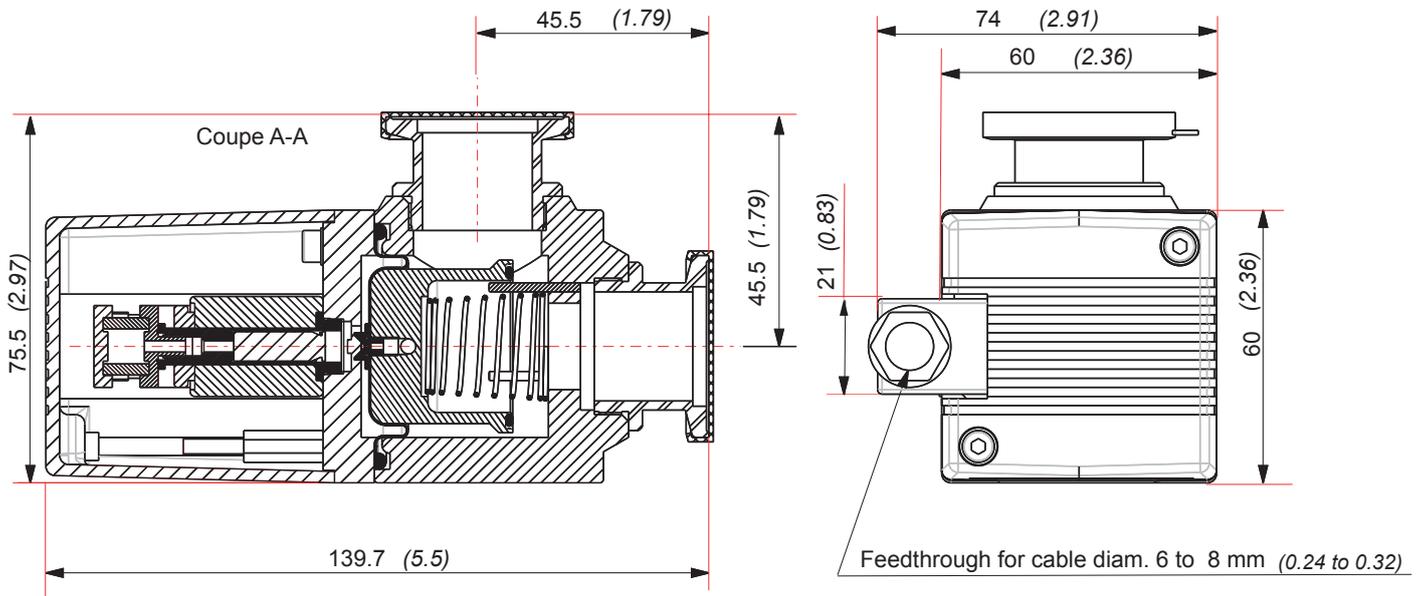


Figure C

Dimensions ISV 25 - ISV 40 (mm/Inch)

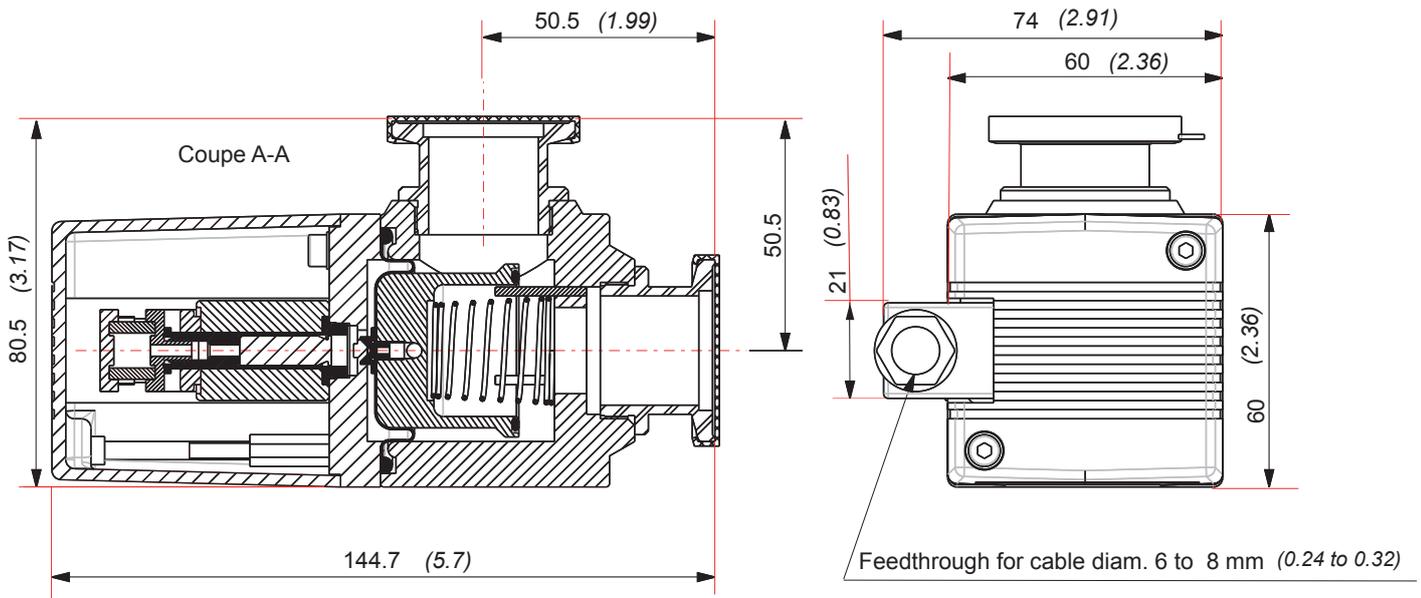
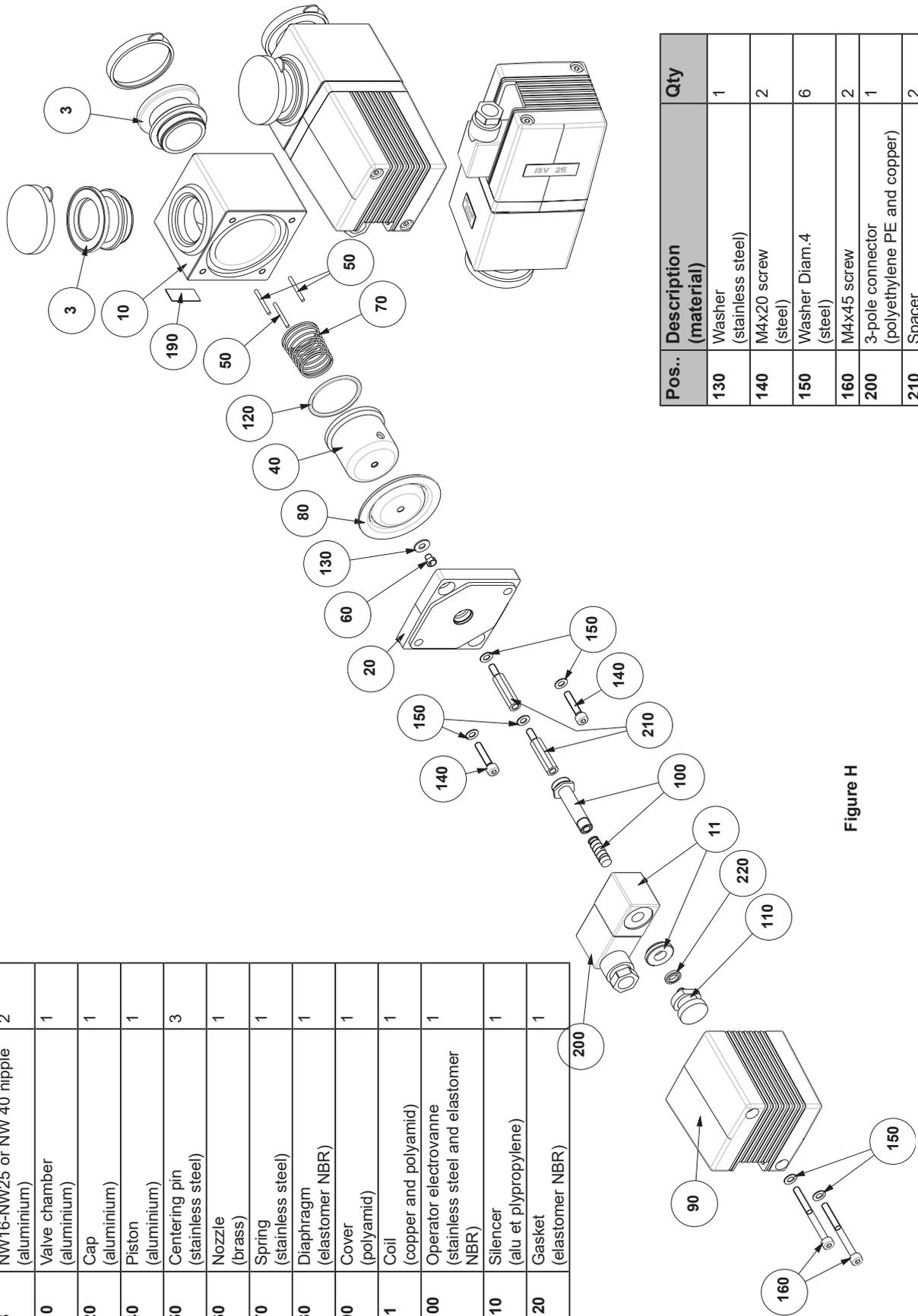


Figure D

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Pos.	Description (material)	Qty
3	NW16-NW25 or NW 40 nipple (aluminium)	2
10	Valve chamber (aluminium)	1
20	Cap (aluminium)	1
40	Piston (aluminium)	1
50	Centering pin (stainless steel)	3
60	Nozzle (brass)	1
70	Spring (stainless steel)	1
80	Diaphragm (elastomer NBR)	1
90	Cover (polyamid)	1
11	Coil (copper and polyamid)	1
100	Operator electrovanne (stainless steel and elastomer NBR)	1
110	Silencer (alu et polypropylene)	1
120	Gasket (elastomer NBR)	1



Pos..	Description (material)	Qty
130	Washer (stainless steel)	1
140	M4x20 screw (steel)	2
150	Washer Diam.4 (steel)	6
160	M4x45 screw	2
200	3-pole connector (polyethylene PE and copper)	1
210	Spacer	2
220	BS washer	1

Figure H

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II.9. DECLARATION OF INCORPORATION OF PARTLY COMPLETED MACHINERY



DECLARATION OF INCORPORATION OF PARTLY COMPLETED MACHINERY

We hereby declare that the product cited below satisfies all relevant provisions according to the following **EC directives** :

- **Low-voltage 2014/35/EU**
- **Electromagnetic Compatibility 2014/30/EU**
- **Restriction of Hazardous Substances 2011/65/EU**

The technical file is drawn up by Mr Frédéric Rouveyre, Pfeiffer Vacuum, Société par Actions Simplifiées [simplified joint stock company], 98, avenue de Brogny B.P. 2069, 74009 Annecy cedex, France.

Isolation valve : ISV 16 - ISV 25 - ISV 40

Harmonised standards and national standards and specifications which have been applied:

Standards NF EN-61010-1 : 2011

The relevant operating instructions are in compliance with appendix VII, part B.

This partly completed machinery must not be put into operation until the machinery into which it is to be incorporated has been declared in conformity with the provisions of the 2006/42/EC Directive.

We, authorized representatives undertake to transmit, in response to a reasoned request by national authorities, relevant information on the partly completed machinery

Signatures :

Pfeiffer Vacuum SAS
98, avenue de Brogny
B.P. 2069
74009 Annecy
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(M.Taberlet)
Président

(M.Rouveyre)
Responsable Recherche et Développement

Date : 20/07/16

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