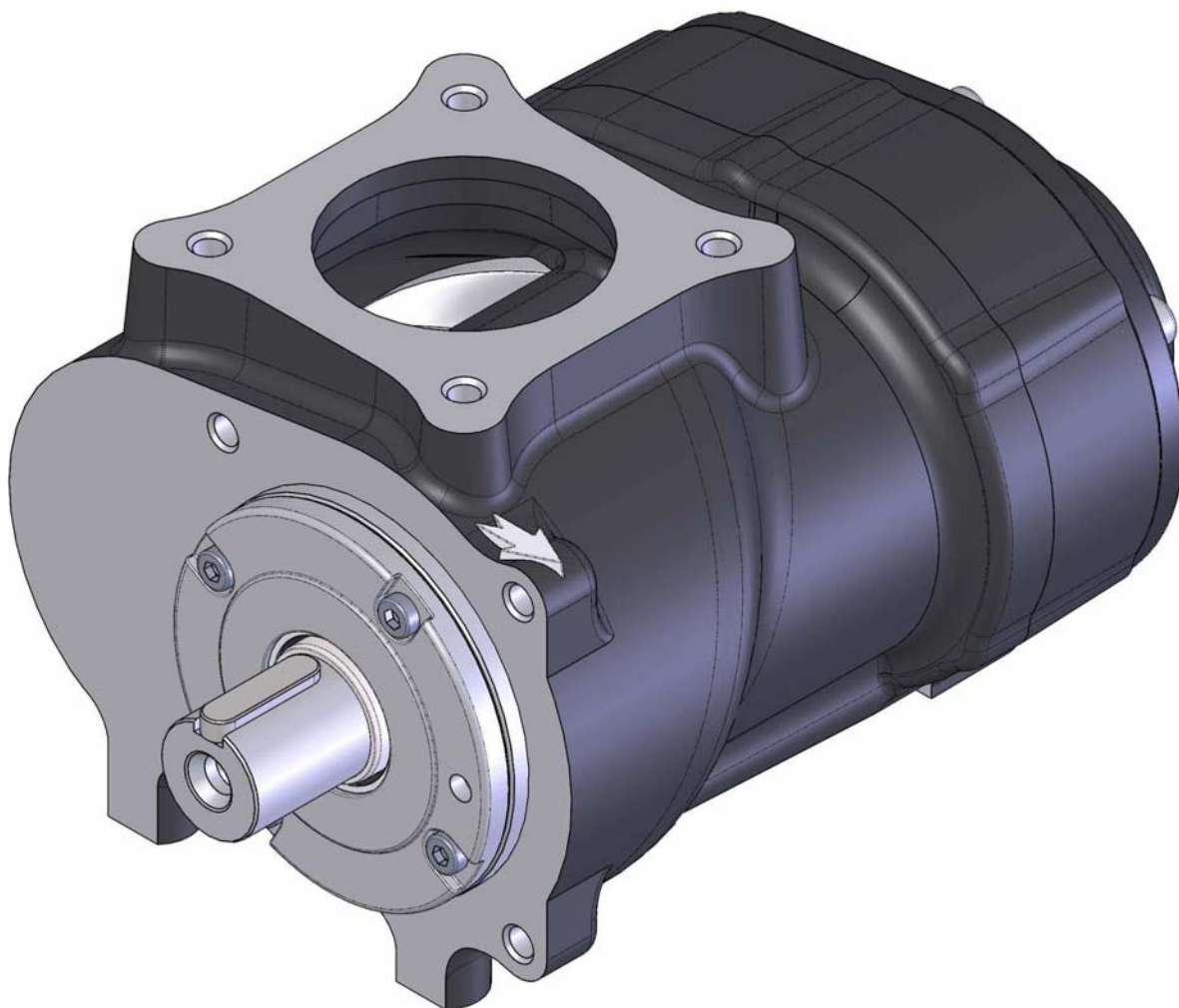




## V110 SCREW AIR-END



**ENGLISH VERSION**

**V.M.C. s.p.a.**

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TIPO TYPE	DC	REVISIONE REVISION	03	DATA DATE	09/2010	GRUPPO LINE	920	ARTICOLO ARTICLE	.10	MODELLO MODEL	00
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", +7 (383) 292-1-898, info@compressor-pk.ru

**DECLARATION OF INCORPORATION OF PARTLY COMPLETED MACHINERY ANNEX II B  
Machine Directive 2006/42/EC**

With the present **VMC S.p.A.** headquartered in Via Palazzon 35 Creazzo (VI) ITALY declares that the oil-injected air-end screw compressors, with item:

V60, V75, V90, V90/VTDM, V110, V110/VTDM, V130, V130/VTD2M, V140, V140/VTD2M, V150,  
V150/VTD2M, V180

composed of screw compressor, intake valve, tank separator, minimum pressure valve and thermostatic valve are supplied to be installed inside a machine or assembled with other machines, as being part of a bigger machinery.

The mentioned products do not have to be operated until the machines where they have been installed are declared to comply with the provisions of Directive **2006/42/EC**.

With reference to **Directive 97/23/CE, VMC S.p.A.** certifies that the air-end screw compressors, with item:

V60, V75, V90, V90/VTDM, V110, V110/VTDM, V130, V130/VTD2M, V140, V140/VTD2M, V150,  
V150/VTD2M, V180

are excluded from such Ruling pursuant to article 1.3.6, in that they belong to the I category at the most, and indicated in Directive 2006/42/EC replacing the Machine Ruling 98/37/EC (EX 89/392/EC).

**The manufacturing technical file is available at the manufacturer's premises.**

Name: *Virgilio Mietto*

Office: *President*

Date: 05/02/2008

Signature: \_\_\_\_\_

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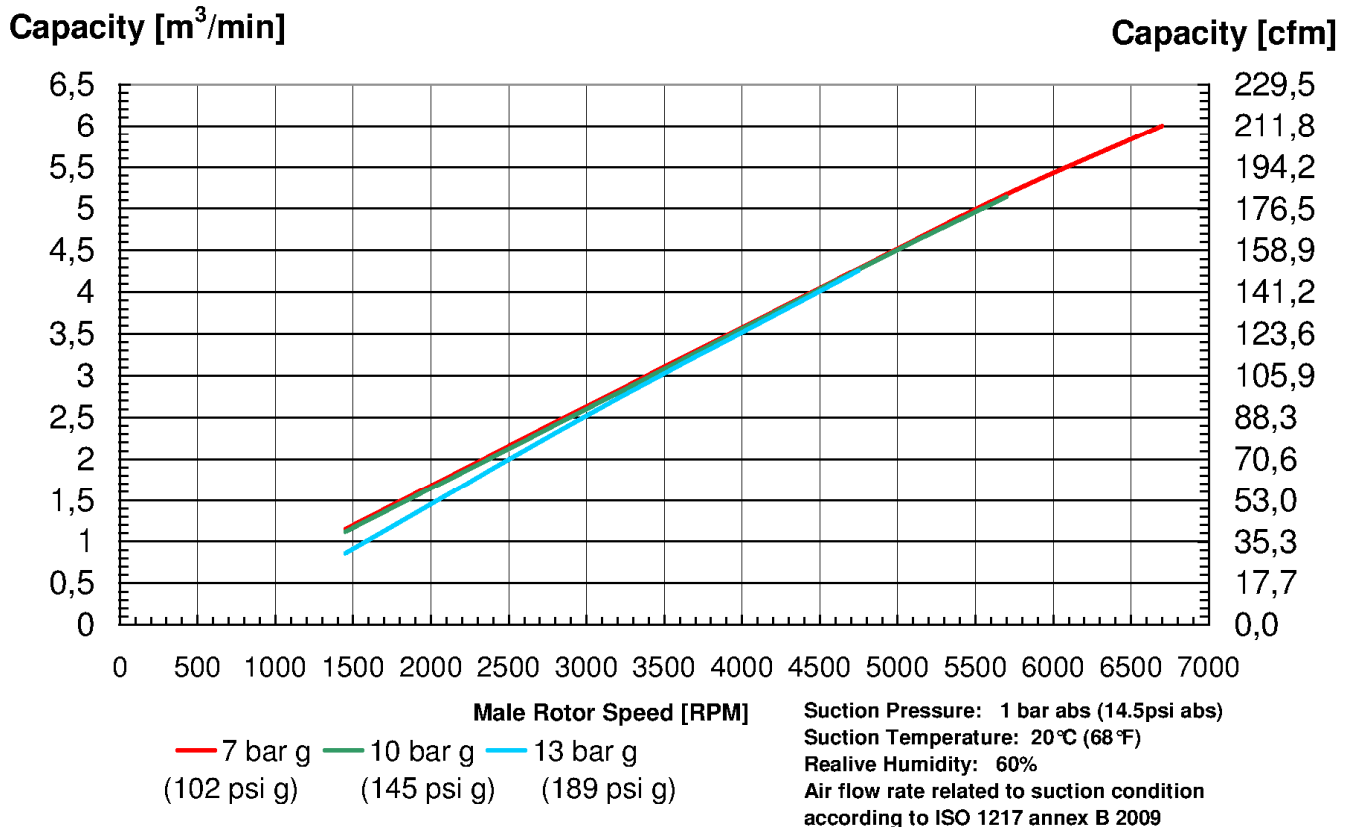
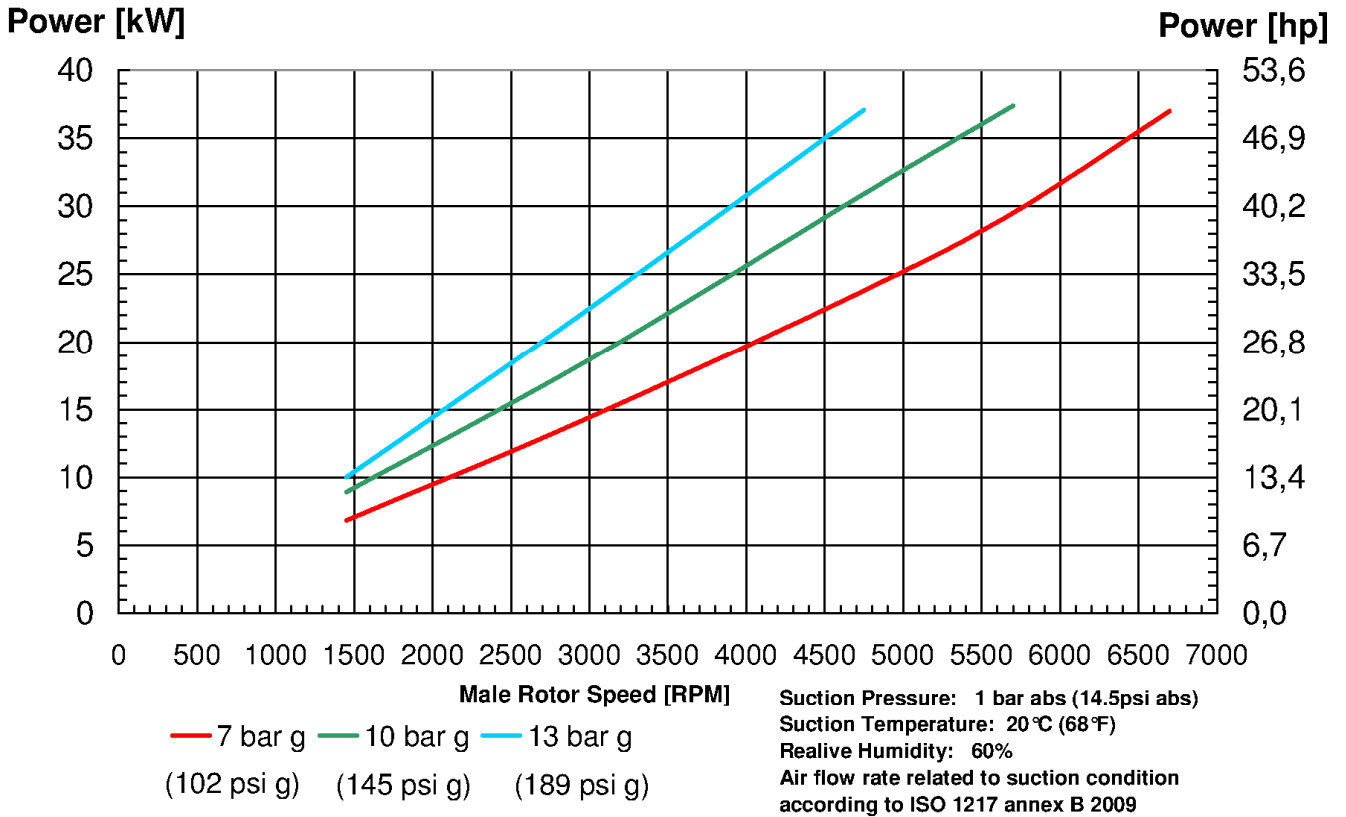
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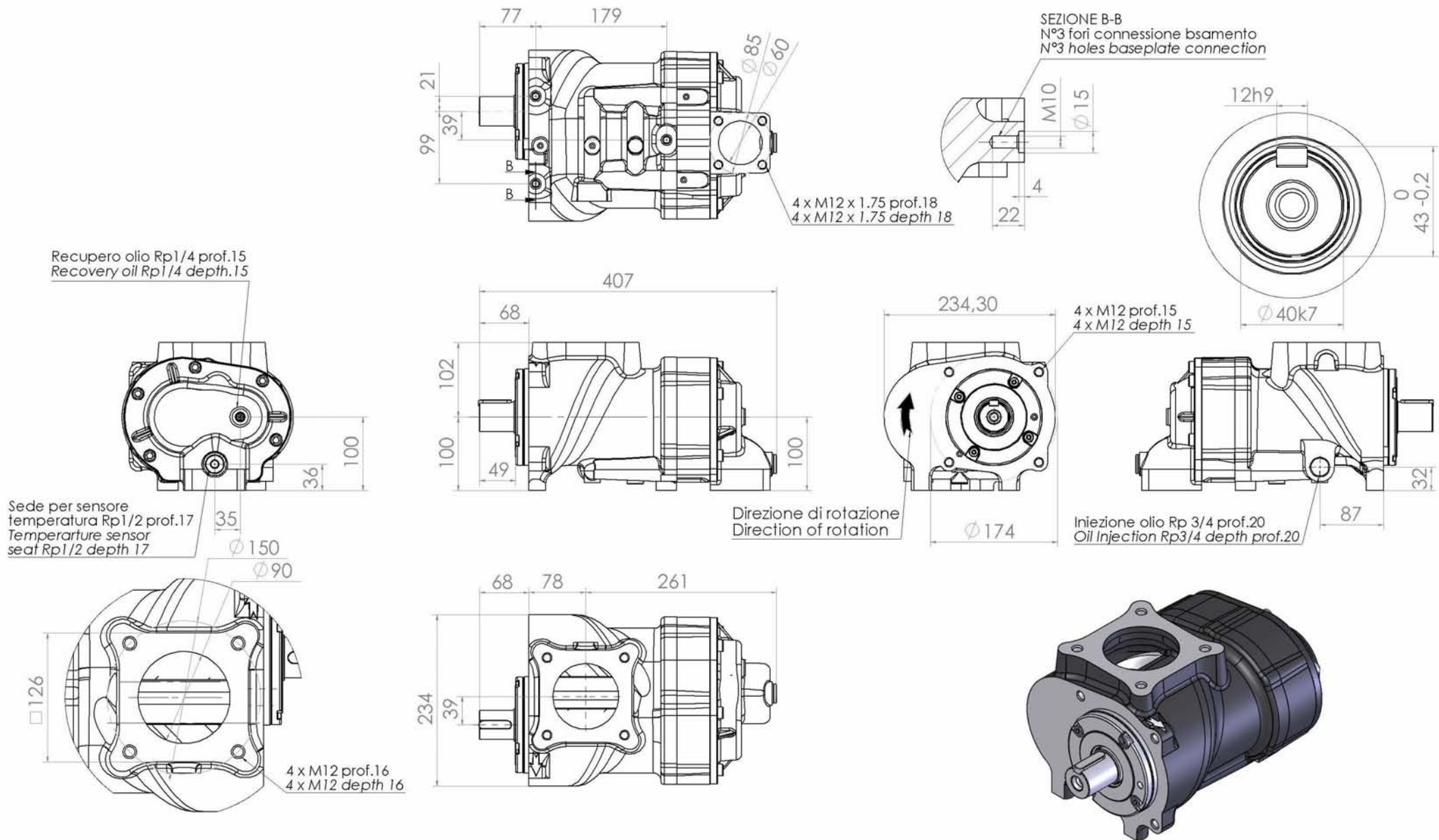
## 1 ENGINEERING DATA

Type of machine	Oil-injected rotary screw compressor			
Drive	Direct or belt			
Rotor dimension (Outside main diameter)	111.3	mm	4.4	in
Rotor dimension L/D	1.55			
Air capacity (ISO 1217 annex B 2009)	0.86-6	m <sup>3</sup> /min	38.8 - 211.8	cfm
Max Working Pressure	13	bar g	188.5	psi
Min Working Pressure	5	bar g	72.5	psi
Oil injected quantity	50 - 70	l/min	13.2 - 18.5	gal/min
Max input Power	37	kW	50	hp
Max main rotor speed	6700	rpm	6700	rpm
Min main rotor speed	1500	rpm	1500	rpm
Max outlet air/oil temperature	105	°C	221	°F
Environment max. Temperature	45	°C	113	°F
Environment min. Temperature *	0	°C	32	°F
Weight	45	kg	99	lb

\* When temperature ambient is lower than 59°F it is necessary to choose ISO VG 32 oil



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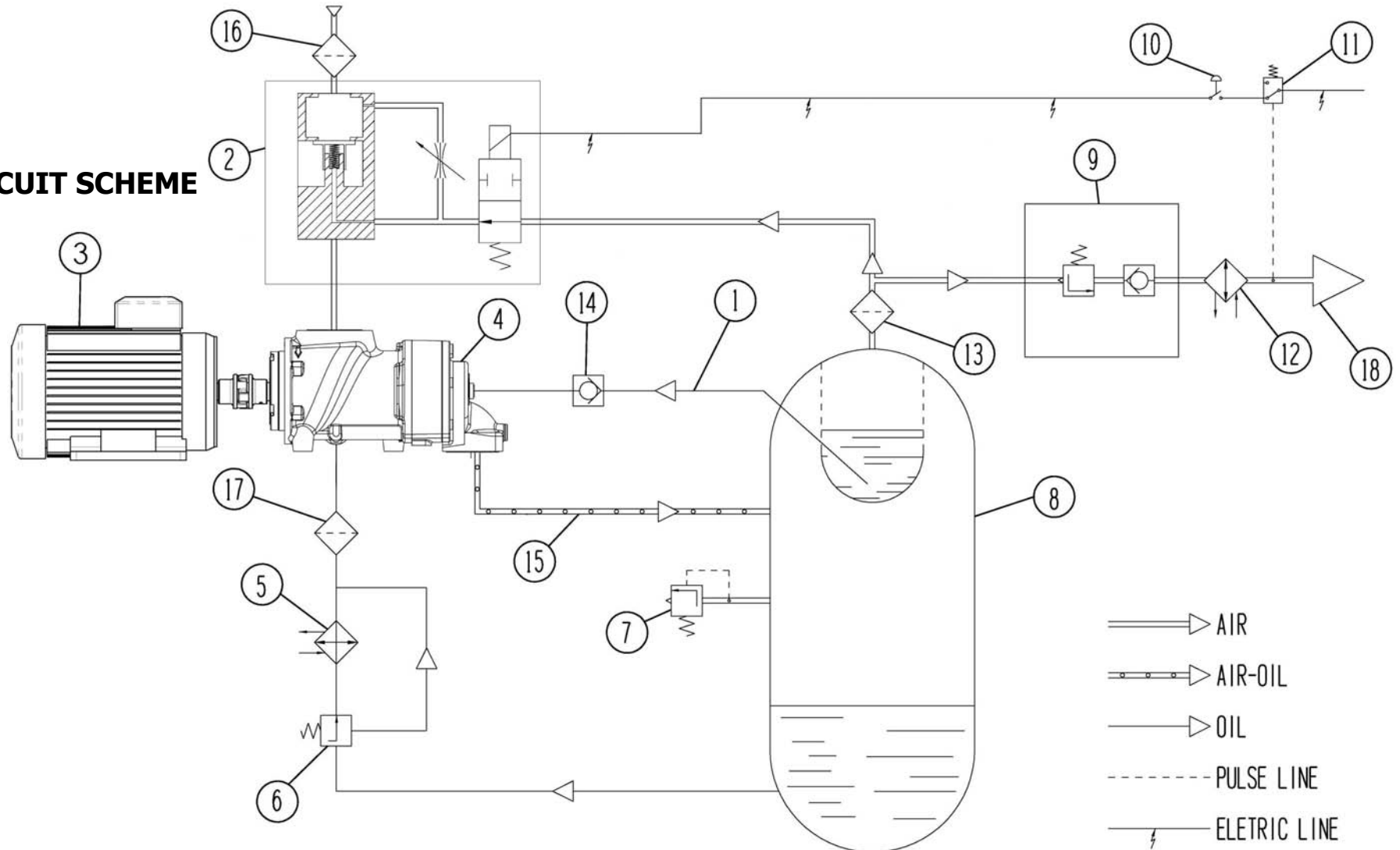


## 2 OVERALL DIMENSION

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### 3 CIRCUIT SCHEME



- 1- Oil return from separator
- 2- Intake valve
- 3- Electric motor
- 4- Screw compressor V110
- 5- Oil cooler
- 6- Thermostatic valve

- 7- Safety valve
- 8- Air-oil tank separator
- 9- Minimum pressure valve
- 10- Switch load/no load
- 11- Pressure switch controller
- 12- Air cooler

- 13- Separator filter
- 14- VMC oil recovery viewer
- 15- Air/oil pipe from screw to separator tank
- 16- Air filter
- 17- Oil filter
- 18- Air tank

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## 4 GENERAL INFORMATION

- Maximum permissible discharge temperature: 221°F. It is necessary monitoring the temperature with temperature probe.
- The minimum discharge temperature must be above the dew point temperature.
- Minimum permissible discharge pressure: 87 psi (abs) during loading phase
- Maximum permissible discharge pressure: 203 psi (abs)
- It is necessary to rig the air-end with intake valve that is supplied of check valve and venting valve .
- Making sure that the motor torque is above to the that demand of compressor, even during the run-up time when the electric connection is still in star configuration

### 4.1 CHOICE OF LUBRICANTS

VMC recommends using hydraulic oils with additives for the oxidation reducing, foaming formation, emulsion. It must have a low pour point and high flash point.

Besides the mineral oils often used, synthetic lubricant can also be employed.

The recommendations of the following table are valid depending on the injection temperatures:

Injection temperature °C	Up to 50	Up to 60	Up to 70
ISO viscosity class	VG 32	VG 46	VG 68
Viscosity at 40°C mm <sup>2</sup> /s	28.8-35.2	41.4-50.6	61.2-74.8

### 4.2 CONDENSE WATER IN THE OIL

Whether the oil temperature during function conditions is lower than the air dew point, water can mix with the oil. In such case water in the oil can lead to discontinuance of lubricating film and thus to severe bearing damages.

Example:

Inlet conditions		Dew point a 145 psi g
68 °F	60 %	132.8 °F
95 °F	70 %	175.1 °F





### 4.3 OIL FILTERING

Pay attention the oil filtration in order to avoid risks of damaging the bearing or reduce their life.

We suggest filter-meshing  $\beta_{25} = 75$  accordance to DIN ISO 4572

Example:

$\beta_{25} = 75$  :

Particle size: 25  $\mu\text{m}$

Retention degree is:  $100 - (100/75) = 98.667\%$

$\beta_{10} = 100$  :

Particle size: 10  $\mu\text{m}$

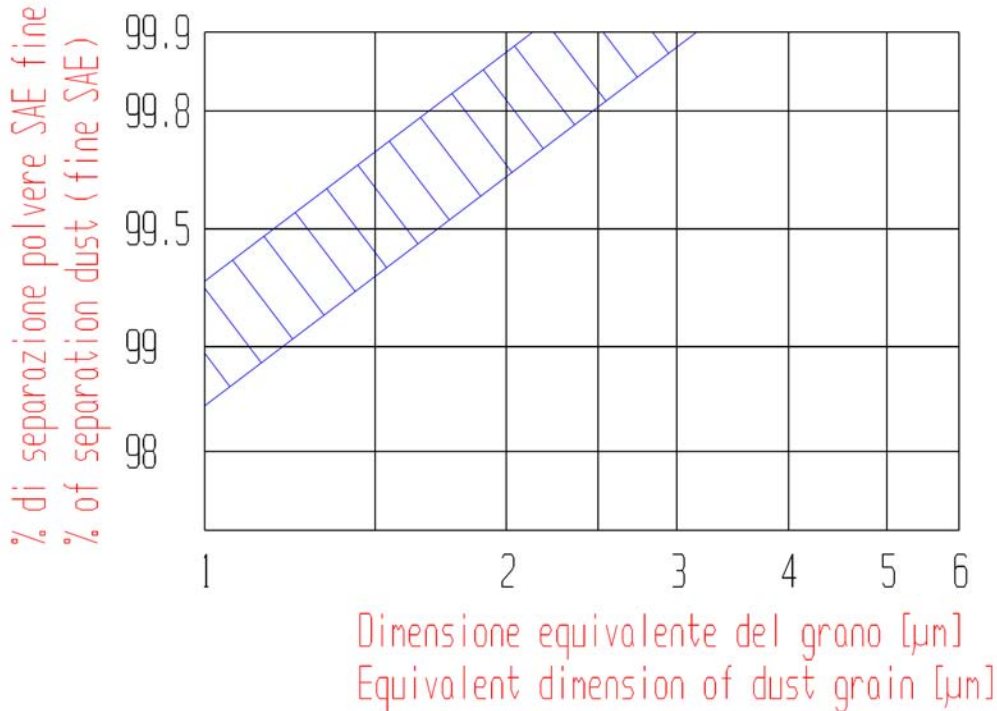
Retention degree is:  $100 - (100/100) = 99\%$

### 4.4 SUCTION AIR FILTERING

We suggest using mesh width referring to the following diagram.

The air intake life period depend on ambient air quality and the height above floor of air inlet

In order to preserve compressor energy efficiency we suggest to design the inlet channel so that the pressure drop will be lower than 0.58 psi including air filter, duct and suction valve.





## 5 UMPACKING

Disimballare con molta cura il gruppo vite, evitando sollecitazioni e capovolgimenti. Porre molta attenzione all'albero vite.

Estrarre la vite dall'imballo con l'ausilio di apposite attrezzature (**figura 1**) e secondo gli accorgimenti di sicurezza. Smaltire l'imballaggio secondo le norme ecologiche vigenti.



Picture 1

### 5.1 AIR-END INSTALLATION

When you install air-end, please check that the intake valve is not clogged by unknown particles. Whenever necessary, clean and lubricate the tip of the air-end shaft. Do not include the separator in this operation, otherwise you may damage it.

Make sure that the compressor is accurately fixed to the machine base through the use of special fixing holes.

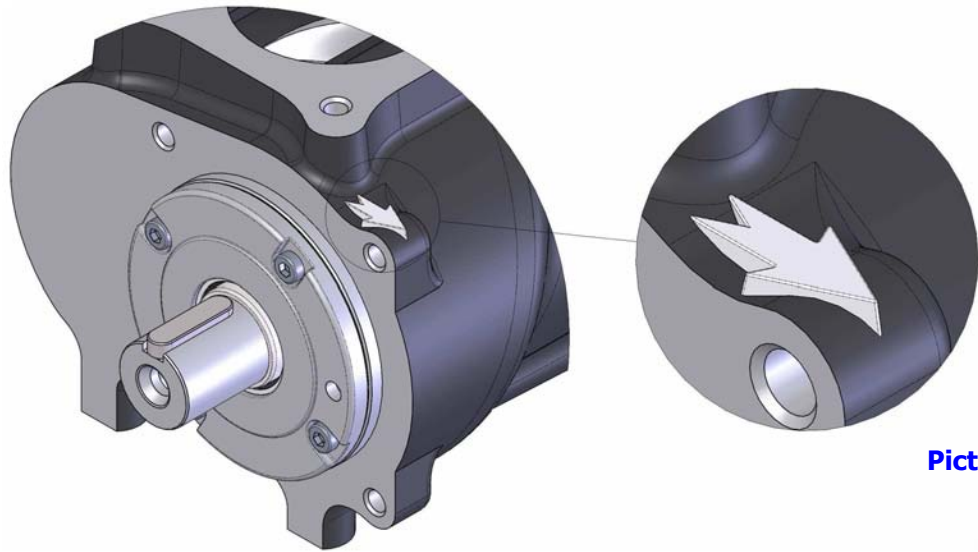
In case the integrated system has to be varnished, please avoid any contact with solvents or varnishes, protecting nameplate, gaskets, intake holes, external threads and all seal surfaces.

**WARNING:** Use fittings with a cylinder GAS threading. The use of fittings with a taper GAS threading may damage the Pack Smart.





## 5.2 SCREW AIR-END – MOTOR CONNECTION



**Picture 2**

After connecting the electrical motor to the air-end, please check that the direction of its rotation corresponds to the one indicated by the arrow on the body of the air-end (see the **picture 2**).



### **WARNING!**

The rotation of the shaft the other way round from the one indicated can damage the air-end.

## 5.3 BELT DRIVE

If the air-end shaft and its engine are belt-driven, make sure that the pulleys assembled on shafts are lined up and belts are properly tightened.

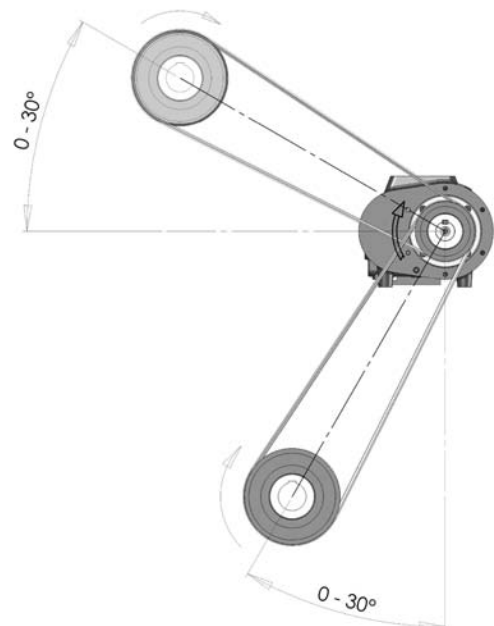
For a belt drive, you are recommended to use the model “POLY V” with a tension up to and not exceeding **1500N**.

As to the pulley fitted to the air-end shaft, diameter should not be smaller than **2.76inches**.



### **WARNING!**

An excessive belt tension causes a shorter life of the air-end bearings. Once the machine is started, the transmission must be protected to avoid staff accidents.



MODEL	MAX TENSION FORCE
<b>V110</b>	<b>2000N</b>



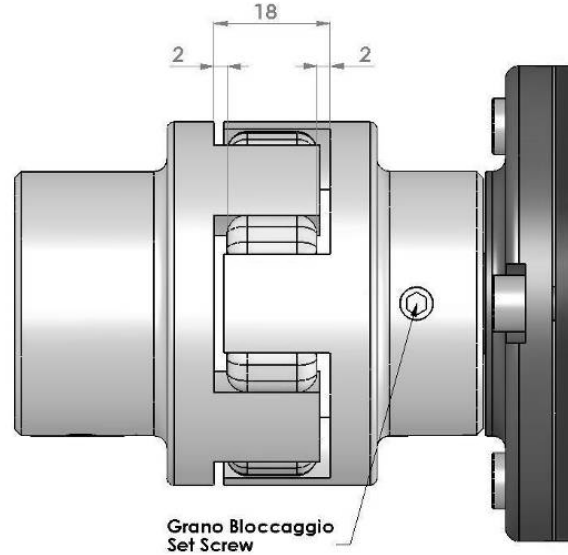
### 5.4 DIRECT DRIVE WITH COUPLING

If the transmission between air-end and motor shaft is direct driven, the two shafts must be connected with each other with a flexible coupling.



#### WARNING!

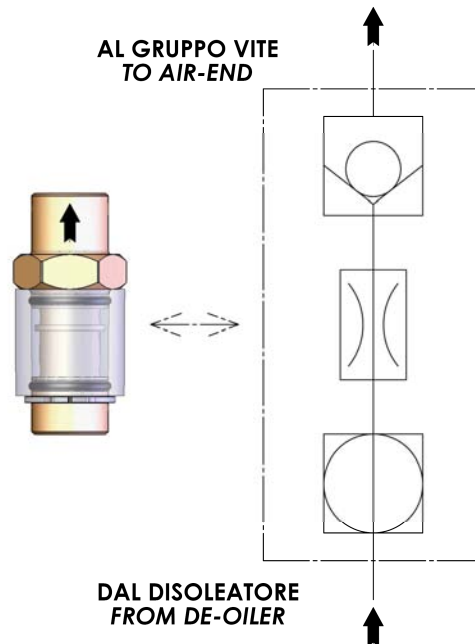
The flexible coupling must not be lubricated. Make sure that motor shaft and air-end shaft are correctly lined up. Once the machine is started, the flexible coupling must be protected so as to avoid staff accidents.



### 5.5 AIR-END –OIL RECOVERY VIEWER CONNECTION

The oil recovery line from de-oiler to Air-end, must have the non-return valve with calibrated nozzle. The no-return function is necessary for preventing the oil return in the de-oiler filter during the off machine phaser. The calibrate nozzle is necessary for reducing air capacity from the de-oiler to the air-end, during the phase of recovery oil. It is advise to use a VMC’s oil recovery viewer **picture 4**, which allows:

1. Check passage of the lubricate of recovery
2. The no-return valve
3. The fixed restriction



Picture 4



#### WARNING!

Calibrated nozzle’ size too large determines high reduction of the air flow produced by the air-end. **We recommend using a calibrated nozzle size Ø 0.8÷1.6**

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## 6 FIRST STARTING

After following the tips for the air-end installation, as indicated in **chapter 4 and 5**, you can proceed with the preparation of the machine for its first start.



### **WARNING!**

The air-end must not be operated until the machine where it is assembled complies with Directive 2006/42/CE.

Before starting the air-end and making it work, inject about 0,18 gal of lubricating oil into the air inlet of the intake valve, pressing down the throttle and, at the same time, rotate the rotors manually in the right direction. The air-end could already contain some residual oil inside its circuit due to some previous tests. You are recommended to use lubricating oil compatible with the one used during a test:

**VALVOLINE ETC 46** (mineral oil)

To use incompatible lubricating oils, follow the instructions described in point **6.1 point**.



### **WARNING!**

Before any oil extraction or oil fill-up operations, switch off the machine and wait until the pressure of the system reaches the environment pressure. Handle the lubricant with proper protection. Use the lubricant with suitable protection.

### 6.1 PACK SMART USE WITH SYNTHETIC OIL

The air-end is tested with mineral oil. This involves the presence of mineral oil residual in the air-end. If lubricating oil used is synthetic oil, it will be necessary effecting a washing cycle for air-end group.

Operator will follow this procedure:

- Remove the stoppers protected of packing.
- Rotate the screw shaft to correct sense (for compression) by manual motion, in the same time, inject synthetic oil into air inlet of air-end, in quantities about 0,33 gal.
- This synthetic oil it will be expelled from air-end outlet.
- Continue manually rotating the screw shaft until the complete expulsion of the introduced synthetic oil.
- The "washing" of air-end is completed.



### **WARNING!**

If "washing" cycle described in the procedure isn't carrying out, you can find lubricating problem. This problem can be caused from the mix incompatibility between two kinds of lubricating oils. Use the lubricant with suitable protection.

Dispose of the mineral oil in compliance with the current waste disposal regulations.

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**WARNING!**

The machine where this product is assembled must comply with Directive **2006/42/CE**.  
The manufacturer is not liable for damages to people and/or objects caused by a misuse of the PACKSMART, non-compliance or partial compliance with safety standards mentioned in this document, changes (even small ones), tampering and use of non-original spare parts.



**WARNING!**

- 1) Before starting any operations, read this document carefully. The disregard of the information herein contained can damage and injure people and things.
- 2) Use cylinder thread connections, unless otherwise indicated. If you do not, malfunctioning of the product can be caused.
- 3) Installation and maintenance must be carried out only by qualified staff. Always comply with current safety and accident prevention regulation.
- 4) Use suitable protective clothes during installation and maintenance (for example: overalls, gloves, protective glasses, ear plugs and caps, etc ).
- 5) All installation and maintenance operations must be carried out both when the machine is switched-off (environment pressure) and when the electrical circuit is off.
- 6) Transmission parts like couplings and pulleys must be safe. Check air/oil pipe seals. Do not touch the mobile elements of the product when the machine is on.
- 7) Equipment and/or other systems used for motion, installation and maintenance will have to be adequately gauged in terms of weight and geometry. Protruding parts must be sheltered when the machine is on.
- 8) The manufacturer is not liable for damages to people and/or objects that may be caused by product misuse, non-compliance or partial compliance with safety standards mentioned in this document, changes even small ones, as well as tampering and use of non-original spare parts.
- 9) The **warranty period**, unless otherwise stated in written form, is **15 (fifteen) months** from production date, based on the **lot no.** reported on the item. Anyhow, it cannot be earlier than 12 months from dispatch date. Commodities and wear-and-tear materials are not eligible to warranty. The warranty **is not valid** if VMC products turn out to be:
  - tampered or modified by people who have not been **directly authorized in written form** by VMC Spa Technical Support.
  - damaged by bad use or carelessness in setting-up and/or management by the Customer.
  - returns with **NON-ORIGINAL and/or UNSUITABLE** packaging that does not guarantee their initial conditions.
- 10) At the end of its lifetime, a product will have to be disposed of, complying with current law rules regarding industrial waste disposal.

**V.M.C. s.p.a. reserves the right to modify  
the installation procedure and runbook without prior notice.**

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