

PURCHASE ORDER

Supplier No:
101486
Robuschi + C. S.p.a. (italy euro)
GARDNER DENVER SRL.DIVISIONE ROBUSC
Via S. Leonardo 71\la
Parma
43122
ITALY

Purchase Order No:

Date:

Requisitioned By:

Accounts Contact:

Payment Terms:

07-Nov-2025

60 Days from end of month

Currency:

Project ID:

Work Task No:

EUR

Our Part No:	Supplier Part No:	Part Description:	Qty:	Price:	Net Amount:
		Air Blower Package as per Quote	1.00 *	103,958.65	103,958.65
		-			
		Scope of Supply:			
		5No. blowers as per below			
		ES105-3.5-P Oil Free Blower Package +			
		Transmission Guard			
		Valve Setting			
		Transmission Belts & Pulley			
		Main Motor WEG IP55 - 55KW 4P			
		Motor Heater 230V			
		Stainless Steel Enclosure with Rain Hoods -			
		SUITABLE FOR OUTDOOR INSTALLATION			
		IFM Switch Kit			
		Packing / Freight to Site			

Additional Notes:

Total Price (ex. VAT):

103,958.65 EUR

QUOTATION

CLIENT:

PROJECT NAME:

Ingersoll Rand REF:

REV: 02

ISSUE DATE: 30 October 2025

ROBUSTECH®



		ROBUSCH[®]	
Project:		Project No:	
		Date:	30/10/2025
Quote Ref:		Page 2 of 20	

Further to your recent enquiry regarding Lobe Blower enquiry, Ingersoll Rand now has the pleasure in submitting the description summary and price quotation for your approval.

Ingersoll Rand delivers numerous blower systems to a wide variety of engineering applications for both standard machinery and bespoke packages, Ingersoll Rand deliver quality and consistency every time.

Ingersoll Rand's team of engineers design our blower packages to deliver the best system for your application. Engineers work within a consolidated team to allow a cohesive and consistent approach when specifying your solution.

We trust the proposal satisfactorily meets and exceed your expectation in terms of technical and commercial requirements.

Please do not hesitate to contact me should you require any further information or assistance - my details are given below.

Yours Sincerely,

Christopher White
Sales & Proposals Manager UK&I Process Flow Technologies

EMEIA Industrial Flow Technologies & Services

Mobile: +(44) 07980 892810
chris.white@irco.com

Website: www.robustchi.com



Project:		Project No:	
Quote Ref:		Date:	30/10/2025
			Page 3 of 20

1. TABLE OF CONTENTS

1.	TABLE OF CONTENTS	3
2.	AUTHORSHIP & AMENDMENT RECORD	4
3.	SCOPE OF SUPPLY	5
3.1	INTRODUCTION	5
3.2	SCOPE OF SUPPLY	5
3.3	DESIGN CONDITIONS.....	5
4.	ES105 OIL FREE LOBE BLOWER.....	6
4.1	GENERAL DESCRIPTION	6
4.2	AIREND	7
4.3	INLET FILTER SILENCER.....	8
4.4	DISCHARGE SILENCER & BASEFRAME	9
4.5	NOISE ENCLOSURE & COOLING FAN.....	10
4.6	NON RETURN VALVE	11
4.7	OVER PRESSURE RELIEF VALVE	12
4.8	MOTOR.....	13
4.9	BELTS AND PULLEY	14
4.10	INSTRUMENTATIONS	15
4.11	TECHNICAL PERFORMANCE DATA	16
5.	COMMERCIAL OFFER	17
6.	COMMERCIAL TERMS AND CONDITIONS	18
7.	ATTACHMENTS.....	20

Project:		Project No:	
		Date:	30/10/2025
Quote Ref:		Page 4 of 20	

2. AUTHORSHIP & AMENDMENT RECORD

Original Issue			
Issue Rev	Revision Details	Date	Issued By
00	Original Issue	17/10/25	C.White

Revision History			
Issue Rev	Revision Details	Date	Amended By
01	Price Update	20/10/25	C.White
02	Price Update	30/10/25	C.White

Project:		Project No:	
		Date:	30/10/2025
Quote Ref:		Page 5 of 20	

3. SCOPE OF SUPPLY

3.1 INTRODUCTION

Ingersoll Rand Ltd. (IR) (Supplier) has been invited to tender by for the supply blowers for . The package will be supplied by Ingersoll Rand will be in accordance with IR standard equipment.

Any concerns with any of the exceptions, deviations & comments made by the supplier must be voiced prior to the purchase order and the issues clearly documented with accepted resolution.

3.2 SCOPE OF SUPPLY

Ingersoll Rand is pleased to offer the following equipment in order to meet the project requirements.

5 x ES105/3.5-P Oil Free Lobe Blower

Please review the specific section for the equipment for detailed information for the scope of supply

3.3 DESIGN CONDITIONS

The application has provided the following design parameters to be met by IR as per the RFQ:

Duty Point 1 (3 SBR's at min level):	2150Nm ³ /h (per blower) @ 375mBar
Duty Point 2 (4 SBR's at min level):	1760Nm ³ /h (per blower) @ 375mBar
Duty Point 3 (3 SBR's at max level):	1460Nm ³ /h (per blower) @ 570mBar
Duty Point 4 (4 SBR's at max level):	1205Nm ³ /h (per blower) @ 570mBar

Project:		Project No:	
		Date:	30/10/2025
Quote Ref:		Page 6 of 20	

4. ES105 OIL FREE LOBE BLOWER



4.1 GENERAL DESCRIPTION

Robox is an integrated package designed to convey gas at low pressure. It is based on the RBS lobe positive displacement rotary lobe blower, operated by an electric motor through belt drive, including all accessories and noise enclosure. Robox Lobe can be supplied in pressure (up to 1,000 mbar (g)) and in vacuum operation (up to 500 mbar (a) with RBS and up to 100 mbar (a) with RB-DV air injection rotary lobe blower).

Globally, the Robox Lobe package means reliability, extreme sturdiness and compactness. We have taken this to a new level by improving the layout, reducing maintenance costs and increasing flexibility, to better meet the different plant requirements.

- ✓ **Silent** as a result of high-efficiency internal compression, silencers and a noise-reducing enclosure with progressive discharge (Patented)
- ✓ **Simple** installation and configuration
- ✓ **Flexible** to ensure the operation at the point of best efficiency
 - **Oil free** for a more environmentally-friendly operation
 - (Class 0 certification, according to ISO 8573-1)
- ✓ **Ease of maintenance** thanks to its simple and robust construction
- ✓ **Customised** with a wide range of options available

Project:		Project No:	
		Date:	30/10/2025
Quote Ref:		Page 7 of 20	

4.2 AIREND



Efficient

High quality 3 lobe profile rotors controlled by three-dimensional instruments for top volumetric efficiency. Dynamically balanced by robots to achieve low vibration operation and increased operational life.

Silent

RBS is the innovative positive displacement rotary blower with 3 special profile lobes that, combined with a new configuration of the LOW-PULSE system, reduces the residual pressure pulsation of the conveyed gas below 2% of the operating pressure

Robust

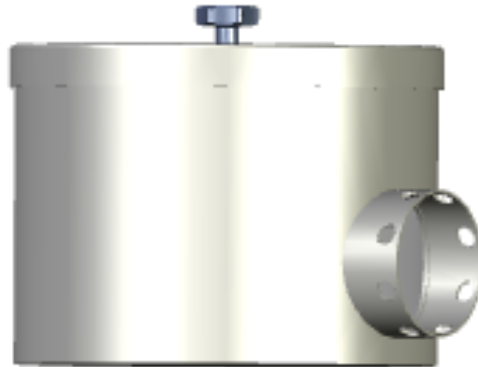
The rotors are designed with wide-diameter shafts to reduce the deformation caused by internal and external loads, thereby ensuring the compressor can work efficiently in even the harshest conditions. The bearings have an increased lifespan thanks to the reduced number of revolutions they have to make. 100,000 hours bearing design life ensure longevity of the blower.

Simple

The Robox features a traditional belt drive instead of a gear overdrive and, for applications with a reduced thermal speed, uses a simplified splash lubrication system.

Project:		Project No:	
		Date:	30/10/2025
Quote Ref:		Page 8 of 20	

4.3 INLET FILTER SILENCER



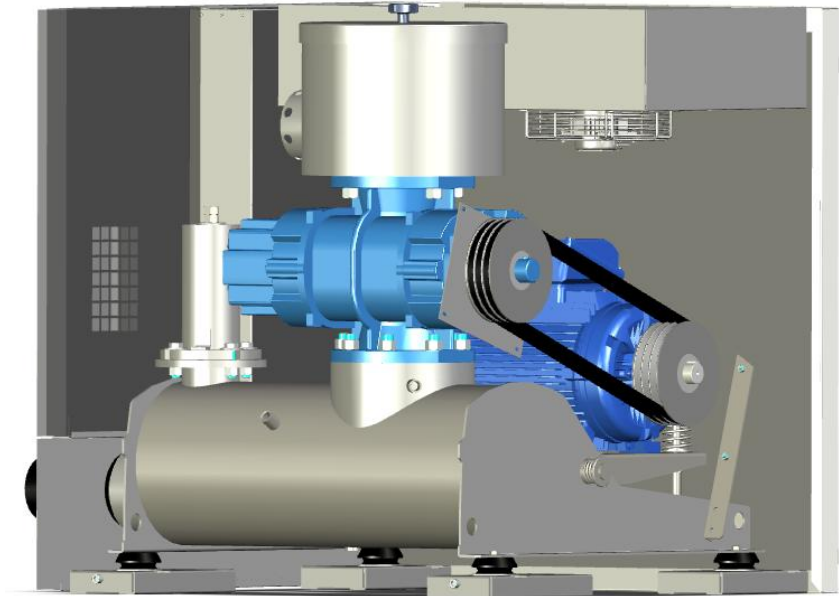
The blower package is fitted with Robuschi's patented absorptive-reactive suction silencer. This silencer is flange mounted and it's directly connected to the inlet so no piping is required. This simplified install and flow path to achieve optimum efficiency.

The inlet filter is design to achieve filtration class G4 in accordance to EN 779 (90% efficiency for particles size down to 3µm). This inlet filter is also has flame resistance to grade F1 in accordance to DIN 53438.

The special inlet silencer arrangement is design to achieve noise level of <80dBA.

Project:		Project No:	
		Date:	30/10/2025
Quote Ref:		Page 9 of 20	

4.4 DISCHARGE SILENCER & BASEFRAME



Reactive silencers on discharge side to drastically reduce residual pulsation that spreads through the system pipes and it is designed in accordance to PED 2014/68/EU guidelines.

The discharge silencer is designed with internal resonance sections to reduce the sound energy. Unique baffle sections built in increases and reduced flow velocity to further reduce noise level. The discharge silencer is directly flanged mounted to the airend discharge and therefore removing the need for pipework.

Similarly to the inlet silencer, the discharged silencer is designed to achieve sound pressure level of <80dBA. Made from S235JR carbon steel painted and manufactured in accordance to GD's stringent procedures, this means the component will have a very long operating life ZERO maintenance.

The discharge silencer is integrated to the baseframe of the package and thus achieving reduced footprint, reduced parts and simplify installation on site. The package is suitable for lift via forklift and ready to go once power and process connection is terminated.

The special unique design feature of the discharge silencer is the non-sparking certified element. This has been certified by third party (TUV) and provide an extra layer of protection for pneumatic conveyance applications where sparks can cause explosions.

On the discharge of the package, a rubber connector made from EPDM high temperature resistant plastic with textile reinforced inserts. It has rated operating temperature of up to 150°C and helps to prevent transfer of vibration to the process piping and adapt for any thermal expansion.

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Project:		Project No:	
Quote Ref:		Date:	30/10/2025
			Page 10 of 20

4.5 NOISE ENCLOSURE & COOLING FAN



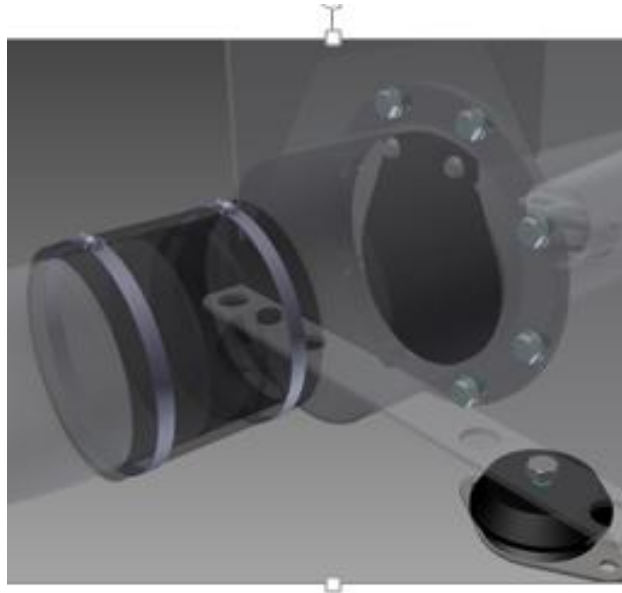
In order to meet health and safety requirements in regards to noise, a steel noise enclosure is provided to satisfy this requirement. Made from folded carbon steel sheets, these noise enclosures will achieve noise reduction between 14 – 23 dBA (dependent on version), but noise limits always within EU requirements. The enclosure is lined with sound absorbing insulation and are also fire retardant.

The design of the package is such that side by side installation is possible without compromising serviceability. The enclosure panels are powder coated to RAL 9003 and to 60 micron thickness with classification C2 high durability.

In order to achieve adequate cooling within the noise enclosure, a ventilation fan is supplied as standard on the ES packages. The integrated ventilation fan is suitable for 50 or 60 Hz and 415V. Terminal box is already fitted allowing easy installation of power by the customer.

Project:		Project No:	
		Date:	30/10/2025
Quote Ref:		Page 11 of 20	

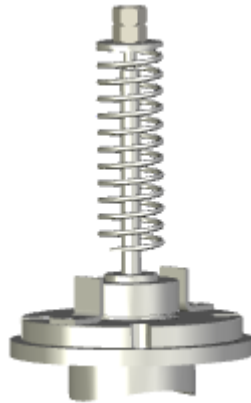
4.6 NON RETURN VALVE



The non-return valve is critical in order to prevent back flow from the system causing the rotors to rotate in the wrong direction. The non-return valve used is a clapet valve with elastomeric head, it has a central steel reinforcement core. It is designed to be suitable for operation up to 150°C. The valve is selected for durability and reduced pressure drop, and thus improving efficiency of the package.

Project:		Project No:	
		Date:	30/10/2025
Quote Ref:		Page 12 of 20	

4.7 OVER PRESSURE RELIEF VALVE



The over pressure relief valve is critical in order to prevent over pressure within the blower package. It is designed to protect the blower itself and not the system it is connected it. The pressure relief valve is typically set to 10% above the operating pressure of the system. When the relief valve is lifted, the air is vented within the enclosure itself to prevent the hot air being directly ejected and improve safety. The valve is made from galvanized steel and is of a robust design.

Project:		Project No:	
		Date:	30/10/2025
Quote Ref:		Page 13 of 20	

4.8 MOTOR



IR has selected WEG (internationally recognised brand for motors) to supply the motor for our packages. The motor used is an asynchronous electric motor which is in full compliance to IEC 60034. The cable terminal box is mounted to the top side of the motor for easy access.

Motors supplied will be IE3 Premium efficiency class. The 3 phase induction motor is of squirrel cage design with B3 mounting. Standard package will be suitable for 400VAC and 50Hz. Insulation class F allows a greater temperature rise and with IP55 TEFC means motor is well protected from the environment.

*Alternative motor brands can be used on request.

Project:		Project No:	
		Date:	30/10/2025
Quote Ref:		Page 14 of 20	

4.9 BELTS AND PULLEY



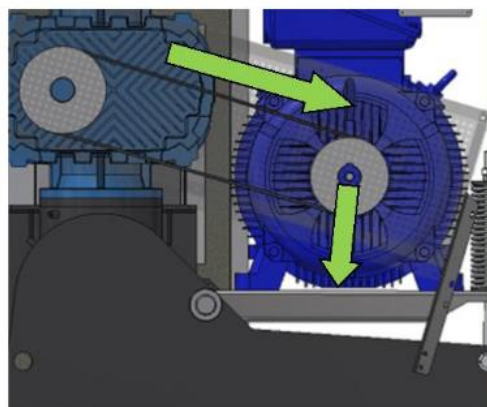
To transfer the motor power to the airend, belts and pulleys is used. The belts are special single toothed belt with high efficiency. The pulleys are sized in accordance to the duty required, matching the speed with the performance.

As standard the package is supplied with auto belt tensioning system on the motor side. The motor sits on pivoting side rails which has specific spring tensioning. This is achieved via a bespoke spring with set spring rate.

V-belts type XPA-B-C-Z, with toothed profile and high adhesion.

Service factor > 1.4 on the power installed

Special device for adjustment of the belt that allows for its replacement while keeping the pulleys aligned



Project:		Project No:	
		Date:	30/10/2025
Quote Ref:		Page 15 of 20	

4.10 INSTRUMENTATIONS



As standard the package comes with following instrumentation:

- ✓ Discharge pressure indicator
- ✓ Vacuum pressure indicator for filter

Additional instrumentation is available upon request and gauges can be replaced with controller to display the readings at inlet and discharge.

Project:		Project No:	
		Date:	30/10/2025
Quote Ref:		Page 16 of 20	

4.11 TECHNICAL PERFORMANCE DATA

MODEL : ES 105 /3.5 P

Quantity :

GENERAL DATA

Ref.	:	Plant	:
Customer	:	Item	:
		Service	: Waste water treatment

FLUID

Fluid	:	Atmospheric air			
Spec. W.ght (kg/m ³)	:	1.199	Spec. Heat Cp (kJ/kg°C)	:	1.010
Altitude (m)	:	0	Pressure (mbar)	:	1,013
Relative humidity (%)	:	50	Spec. Heat Cv (kJ/kg°C)	:	0.723
			Temperature (°C)	:	20

TECHNICAL DATA

Delivery (m ³ /h)	Q1 : 2,454 FAD	*Delivery (Nm ³ /h)	Q2 : 2,186	*Delivery (kg/h)	Q3 : 2,826
		***Delivery T (Nm ³ /h)	Q2T : 2,211	***Delivery T (kg/h)	Q3T : 2,847
Delivery (m ³ /h)	Q4 :	*Delivery (Nm ³ /h)	Q4 :	*Delivery (kg/h)	Q4 :
Speed (rpm)	n4 :	***Delivery T (Nm ³ /h)	Q4T :	***Delivery T (kg/h)	Q4T :
Dif.pressure (mbar)	DP : 570	Inlet press. (mbar a)	P1 : 1,013	Outlet pres.(mbar a)	P2 : 1,583
Temp.rise(°C)	DT : 58	Inlet temp.(°C)	T1 : 30	Outlet temp.(°C)	T2 : 88
		Spec.W.ght (kg/m ³)	SW : 1.160	H2O injection (lt/min)	ia : 0.00
Abs.ed Power (kW)	N : 49.9	**Sound Pressure Level (dBA)	: 76	Heat radiation (kW)	Wd : 3.6
Speed (rpm)	n : 2,199	n/nmax (%)	: 73		
Volumetric efficiency (%)	: 85.6	Adiabatic efficiency (%)	: 84.6	Total efficiency (%)	: 65.9

*The Nm³/h and kg/h capacity are referred to the dry part of the conveyed gas/vapour mixture according DIN 1343

**Estimated sound pressure level at 1 m, free field with soundproof piping

***The Nm³/h and kg/h capacity are referred to total conveyed gas/vapour mixture

Performances tolerances following the Robuschi procedure TE1.S.0015 (Q1 = ±5% * nm³/n ; N = ± 5%)

ELECTRIC MOTOR

IEC Motor	: 250M	Hz	: 50		
Power (kW)	: 55.0	Poles	: 4	V	: 380-420 D / 660-690 Y
Speed (rpm)	: 1,480	Size	:		

TRANSMISSION

Coupling type	:				
V-belt type	: XPB	Length (mm)	: 2,530	Shaft centres (mm)	: 848
Grooves	: 4	Mot.pulley Diam. (mm)	: 315	Blower pulley diam. (mm)	: 212
(Int.Code C527)		(Int.Code 153M)		(Int.Code S146)	

WARNING

No warning

Project:		Project No:	
		Date:	30/10/2025
Quote Ref:		Page 17 of 20	

5. COMMERCIAL OFFER

No	Description	Quantity	Unit Price (€)	Total Price (€)
1	ES105-3.5-P Oil Free Blower Package + Transmission Guard	5	Inc.	Inc.
2	Valve Setting	5	Inc.	Inc.
3	Transmission Belts & Pulley	5	Inc.	Inc.
4	Main Motor WEG IP55 - 55KW 4P	5	Inc.	Inc.
5	Motor Heater	5	Inc.	Inc.
6	Stainless Steel Enclosure with Rain Hoods	5	Inc.	Inc.
7	IFM Switch Kit	5	Inc.	Inc.
8	Packing / Freight to Site	1	Inc.	Inc.
9			TOTAL	€103,958.65

				ROBUSCH®	
Project:		Project No:			
		Date:	30/10/2025		
Quote Ref:					
				Page 18 of 20	

6. COMMERCIAL TERMS AND CONDITIONS

Payment Terms

Payment shall be made upon readiness for dispatch at point of ex works location in Parma, Italy.
Payment shall be made within 30 calendar days.

Stage Payments

Not Applicable for this offer.

Documentation

Ingersoll Rand will supply documentation as per the suppliers' standard document list. Additional documents other than those detailed above may incur additional charges. These charges will be agreed before any documentation is produced.

Tagging

Ingersoll Rand standard tagging and labelling has been offered only.

Testing

Compressor testing will be conducted at Ingersoll Rand manufacturing facilities routine testing at the Ingersoll Rand designated facility with final test procedure in accordance with IR's test procedures.

Packing

Ingersoll Rand standard packing is applicable on this project.

Delivery

Delivery is subject to confirmation following acceptance of a clean order signed and returned by Ingersoll Rand.

Lead time is currently 12-14 weeks (options may increase Lead time)

DAP to site

If a scope variation occurs post order the lead time will need to be revalidated.

Warranty

Ingersoll Rand equipment is warranted against defective workmanship and faulty material for 12 months from the date of commissioning or 18 months from shipment whichever is sooner.

Project:		Project No:	
		Date:	30/10/2025
Quote Ref:		Page 19 of 20	

Performance Guarantees

The equipment is fully factory tested in accordance to TE1.S.0015. Acceptable tolerance will be in accordance to Ingersoll Rand standards only.

Validity

30 days from quotation date

VAT

The prices shown within this quotation excludes VAT. Please note that prices may be subject to VAT at the current local rate if applicable.

Cancellation Policy

Available on request

Terms & Conditions

A copy is attached separately with the submission.

Order Placement

In event of order please ensure order is made out to:

Gardner Denver S.r.L – Divisione Robuschi
Via San Leonardo 71/A
43122 Parma
Italy

Exclusions

Any electrical work
Any civil work
Offloading of the equipment
Positioning
Installation of any equipment
Any other documentation that is not listed in the quote

Project:		Project No:	
		Date:	30/10/2025
Quote Ref:		Page 20 of 20	

7. ATTACHMENTS

- General arrangement
- Brochure
- Machine Selection
- Maintenance Schedule
- Terms and conditions of sale