

# COMPRESSOR PACKAGE FOR NGV REFUELING STATIONS

C-Series (50-150 hp)



*Atlas Copco*

Compressed Natural Gas

Compressed Natural Gas





## ***YOUR WORLDWIDE COMPRESSOR SPECIALIST***

Atlas Copco is a globally leading company in air and gas compression. It has built an enviable reputation as a master in compression technology with extensive experience in the compression of natural gas for vehicle refueling stations.

### **Wide experience**

Take advantage of Atlas Copco's extensive knowledge and experience in the fields of Compressed Natural Gas (CNG) boosting and Natural Gas Vehicle (NGV) refueling. Our solutions help to reduce your environmental impact due to low methane and CO<sub>2</sub> emissions, and deliver an economically viable business opportunity.

### **Dedicated to excellence**

At Atlas Copco we are committed to meet all your requirements from quotation to after-sales service. We stress loyalty and long customer relationships, and strive for operational excellence in all we do. We comply with the international standards ISO 9001, ISO 14001 and OHAS 18001. Our production methods employ lean engineering and agile manufacturing, with the goal of delivering the best quality products. This includes '0 defect' certificates for high-pressure safety joints.

### **Local presence**

Close to you, our expert teams are available at any time to serve you best.



### **Plug & play for quick installation**

The C-Series compressor package consists of an efficient multi-stage air-cooled gas compressor with all of the equipment necessary for safe, low cost operation. The complete package forms a “gas expert in a box”. Compact and fixed on a baseplate, the C-Series compressor package is ready-made for easy and quick installation in an NGV refueling station.

### **Ideal for severe climates**

For extra protection in the harshest outdoor conditions, your compressor package is equipped with a low-noise, weather-proof enclosure. This saves the installation of an expensive protection roof.

### **Safe for gas applications**

The Atlas Copco C-Series compressor has a pressure gas-tight crankcase. The crankshaft’s dynamic, mechanical seal prevents the escape or ingress of oil or gas. The crankcase is vented to the compressor’s suction side, providing gas-tight operations:

- No gas leakage to the atmosphere from worn crosshead-type packing seals.
- Safe, ecological and economical.
- No gas contamination to the atmosphere.

### **Designed for economical operation**

With its low operating temperatures and reduced number of valves, the Atlas Copco C-Series compressor package is energy efficient. By eliminating packing seal losses, it will reduce your gas costs. Operating and maintenance costs are kept to a minimum, to give you the lowest life cycle costs on the market.

# RELIABLE, EFFICIENT AND SAFE

Proven heavy-duty trunk piston technology incorporates the cylinders directly mounted on the frame, avoiding the need for a distance piece. The reduced number of components and wearing parts increases reliability and safety for high-pressure gas applications.

- Certified for hazardous area Class 1 Group D Division 2.
- Compliant with NFPA 52 Fuel stations standard.



## Safe, economical and sustainable

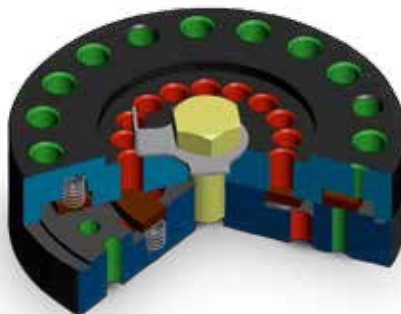
- Pressurized crankcase for high inlet pressures up to 261 psig.
- The crankcase is vented to the compressor suction side, providing gas-tight operations.
- Increased safety and reduced costs thanks to gas-tight crankcase.

## Combination of blow-down and condensate recovery vessel

- Expansion vessel recovers the gas trapped in the inter-stages when the compressor stops.
- No gas loss to atmosphere: reduced operating cost and improved environmental benefits.
- Condensates are separated: package is equipped with automatic inter-stage drains and easily accessible inter-stage manual drain valves.
- Gases contained in condensates are recovered and not flushed out by drains.
- Grouped functions means a smaller footprint, reducing installation space.

## Outstanding efficiency

- A single concentric valve is used for both gas inlet and outlet.
- Fewer valves are needed.
- Cylinder clearance volume is small, resulting in high efficiency.



## Safe electric motor

- NEMA "Premium Efficiency" motor.
- 460 V/480 V - 3 phases - 60 Hz (USA); 575 V - 3 phases - 60 Hz (Canada).
- UL/CSA approval.
- IP 55 protection - insulation class F (with temperature rise to Class B by resistance).





## Easy installation cuts costs

- Common baseplate.
- All interconnections are factory mounted, complete package is fully factory tested.
- All actuators from the inlet train, compressor and outlet train are wired to the terminal boxes.
- Simple installation on industrial floor.
- Slots for transport and handling by forklift: easy to relocate to another location.



## Efficient air cooling

- Fans are fitted directly on the crankshaft.
- Multi-stage, multi-pass finned type forced induction coolers with separator and sub-micronic filters.
- Airbox allows for two direct air inlets.



## Low power consumption

- Multi-stage compression combined with a low pressure ratio per stage results in no overload in the inter-stages.
- Low adiabatic temperatures which contributes to higher volumetric efficiency and lower power consumption.

## Heavy-duty use

- Oil pump is directly driven by the compressor crankshaft (no need for separate pump).
- Oil cooler and replaceable spin-on oil filter.

## Low maintenance costs

- No heavy parts ease workload for maintenance engineer.
- Pressure gauges are easily accessible.
- Doors can be removed easily.
- Lockable to restrict access to authorized personnel.

## Low vibration and low noise

- Baseplate absorbs vibrations for increased reliability and reduced sound.
- Low noise levels.

# ADVANCED CONTROL AND MONITORING

The control command is placed in a non-hazardous area, in a housing according to NEMA 3-3S (IP54). It includes the star/delta starter and the control and monitoring system. This HMI controller is extremely easy to use in daily operations and for programmed maintenance. The controller conforms to UL/CSA standards.



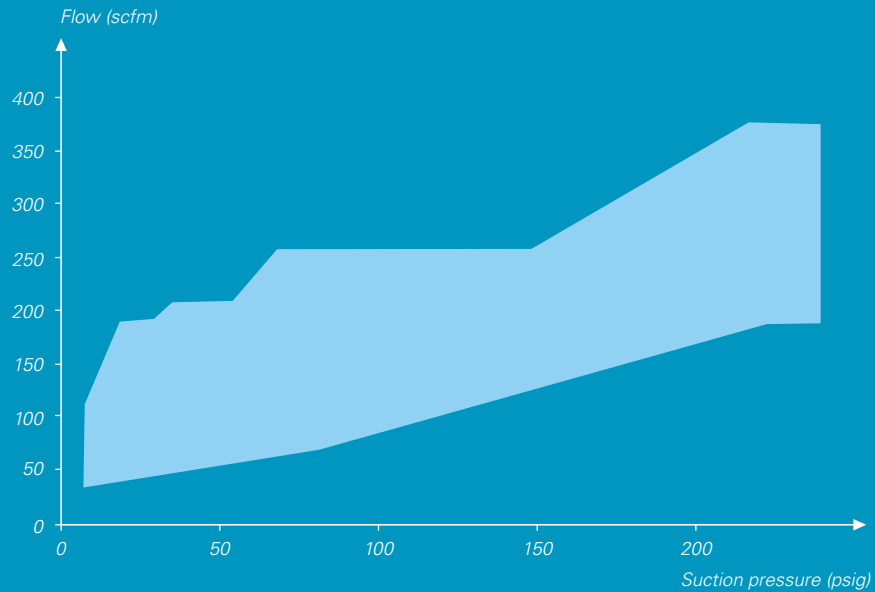
## SCOPE OF SUPPLY

	Multi-stage air-cooled gas tight compressor - Class 1 - Group D Div.2 in accordance with NEC compliant with NFPA 52 Fuel stations standard	✓
	Blow-down vessel	✓
	Pressure gauge panel	✓
	Interconnecting pipings at skid limit (stainless steel interstage pipings)	✓
	Efficient inlet gas filter	✓
	Discharge gas filter (guarantee max 5 ppm-m oil carry-over)	✓
	Complete gas circuit (inlet and outlet trains) with instruments/safety instrumentation safety valves and pressure vessels according to ASME Section VIII Div 1 (with U /UV stamps respectively) - Instrumentation 24 V AC/DC, class 1, Div2.	✓
	Membrane valve on each separator	✓
	Canopy (weatherproof and soundproof)	•
	Flame proof lighting in case of canopy	•
	Gas detector (included in case of canopy option)	•
	Flame detector	•
	Pressure reduction valve at inlet (protection against too high inlet pressure)	•
Gas circuit	Crankcase heater for ambient temp below +50°F	•
	Separator after each cooler	✓
	Cooling fans (or airbox in case of canopy)	✓
Cooling circuit	Condensate drain combined with blow down vessel (automatic in the interstages, manual at final outlet)	✓
Oil circuit	Complete oil circuit with oil pump and oil filter	✓
	Electrical equipment according to CSA/UL or FM	✓
	"Nema premium efficiency" electric motor (TEFC) 60 Hz - class 1 - Group D, Div.2 575 V - IP 55 protection - insulation class F with temperature rise to class B by resistance - 460V/480V for USA - 575 V for Canada - 3 phases.	✓
	Drive system with V-belts	✓
Electrical components	V-belt guard (provided in basic scope when no canopy)	•
Common base	Concrete base with slots for forklift truck	✓
	Control cabinet with star-delta starter in NEMA 3-3S (IP54) housing [NEMA 4x (IP66) optional]	✓
	HMI panel	✓
	Colored screen for HMI panel	•
In safe area	Adaptation of the cabinet to outdoor installation	•

✓ : Standard • : Optional

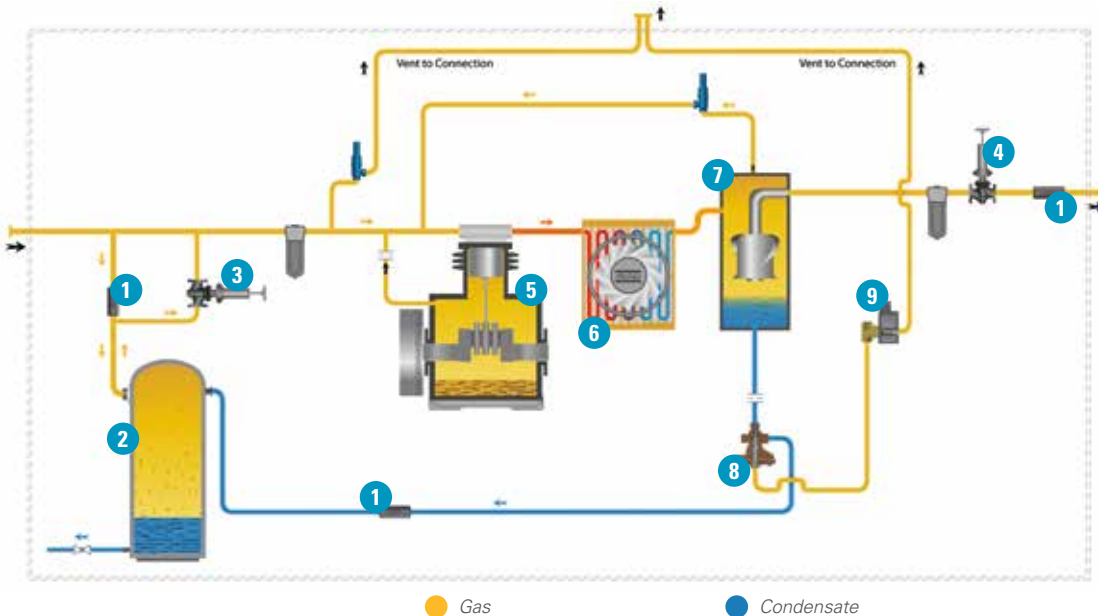
# TECHNICAL SPECIFICATIONS

Global range (for NGV at discharge pressure of 4500 psig)



	Pr. (psig)		Flow (scfm)		Gasoline Gallon Equivalent (GGE / min.)	
	Min.	Max.	590 rpm - 1230 rpm		590 rpm - 1230 rpm	
			Min.	Max.	Min.	Max.
5-stage	1.3	36	45	231	0.4	1.8
4-stage	15	70	72	179	0.6	1.4
3-stage	151	227	123	255	1	2

## Flow chart



● Gas

● Condensate

- 1 Non return valve
- 2 Blow down vessel & condensate receiving tank
- 3 Pressure reduction valve
- 4 Minimum pressure valve
- 5 Compressor
- 6 Cooler
- 7 Separator
- 8 Diaphragm valve
- 9 3-way solenoid valve

	Length	Width	Height	Weight	Specific load
	in	in	in	lb	lb/ft <sup>2</sup>
Up to 50 hp	99	71	65	9920	203
Up to 150 hp	138	77	89	21500	293

## ***COMMITTED TO SUSTAINABLE PRODUCTIVITY***

We stand by our responsibilities towards our customers,  
towards the environment and the people around us.  
We make performance stand the test of time.  
This is what we call — Sustainable Productivity.

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