# High pressure CNG compressors and refueling solutions

Intermech BBR/FBR/VIP CNG compressors









# **Dedicated to CNG/NGV**

All around the world, companies rely on Atlas Copco's expertise and innovations to contribute to their business growth. We help our customers cut costs and boost productivity while delivering sustainable solutions.

Whether you are a CNG fueling station owner, developing a NGV fueling solution for a mass transportation or setting up a virtual pipeline system to power a remote industrial process, Atlas Copco has the right CNG/NGV solution for the job.

Atlas Copco was founded in 1873 and is based in Stockholm, Sweden. Through our global reach we now support customers in more than 180 countries.

Based on our company roots in compression technology, and strengthened by acquisitions of leading manufacturers for high-pressure vehicle refueling systems, we have built upon our expertise and expanded our product portfolio.

These advancements are continued through R&D investments ensuring that the latest technology is available to our customers.

One of our key acquisitions in the CNG industry was compressor specialist Intermech. Started in 1978, Intermech grew rapidly, launching several new CNG model designs and developing pressurized crankcases for CNG applications.

Intermech also pioneered mother/daughter systems for CNG refueling stations.

Intermech joined the Atlas Copco Group in 2006.

The Atlas Copco CNG portfolio was further augmented through acquisitions of Crépelle (1997) and Greenfield (2007).

Through our accumulated experience, comprehensive product offering, Atlas Copco established itself as a premier, reliable end-to-end partner for the dynamic CNG/NGV industry.

# The three pillars of productivity

Efficiency, safety and reliability are crucial factors at every CNG/ NGV installation. They are the cornerstones of our entire natural gas product line. Our compressors are loaded with features that deliver benefits at every step of the CNG/NGV delivery cycle.



Smart Energy



When you think about CNG, you might as well think of energy. Not only is energy in the form of compressed natural gas the product that is being delivered, for most refueling applications energy is also the largest factor in the cost equation. Energy costs typically account for around 80% of the total cost of ownership of an NGV refueling station.

That's one important reason why we put an emphasis on smart, energy-efficient technology.

Atlas Copco Intermech CNG compressors are unmatched in providing guaranteed energy efficiency. Through direct drive technology, the compressors save around 5-7% of total energy costs versus a belt transmission compressor. Their leakproof pressurized crankcase also prevents gas loss.

This result is a gas savings of 3-6% and a noticeable reduction in energy costs.

When it comes to safety, we don't compromise either. Our CNG compressors have an enviable track record of safe operation extending over millions of hours of runtime.

All CNG machines meet major international safety codes. They include control systems to monitor critical points and provide fast emergency shutoff. In addition, each compressor is also fully tested with natural gas at its designed capacity at a stateof-the-art facility before it is installed in field.

Our CNG compressors not only consume less energy, they deliver reliable performance that also reduces ownership costs. One example is our direct drive system, which avoids the regular replacement intervals that belt-driven compressors require. Direct drive minimizes loads on the crankshaft and bearings, keeping your compressor up and running longer and relieving maintenance worries.



# The Atlas Copco total CNG solution

Besides supplying compressors and expanders employed along the entire natural gas value chain, we deliver highly efficient, safe and reliable equipment for a host of CNG/NGV applications. Our offering extends from CNG compressors for initial gas compression through fill and decant panels at the end point.







# **Covering CNG from start to finish**

Our products for the CNG/NGV stream begin with our BBR/FBR-series machines that compress natural gas or biomethane to high pressures for transportation and storage. BBR/FBR compressors deliver high efficiency and exceptional flexibility.

They can be employed at either "fastfill" NGV fill stations or grouped together in mother stations to fill CNG trucks employed in a virtual pipeline.

Further down the line, a number of CNG accessories, ranging from pressure reduction stations to decant posts, reduce fill times at stations and limit stress on CNG compressors. These accessories include our Pressure Reduction and Metering Station (PRMS) that is engineered to reduce gas pressure from trailer storage so that the gas can be used in industrial, heating and power generation processes.

Finally, variable inlet pressure (VIP) compressors make use of the pressure in CNG trailers to reduce daughter stations' requirements and save you energy.

VIP compressors not only lower energy needs, when combined with a Variable Speed Drive, they can unload about 8% more natural gas from a standard trailer than competing compressors types.

From start to finish, Atlas Copco has your CNG delivery chain covered with efficient, reliable and safe solutions.

# Intermech BBR/FBR compressor

A favorite at fueling stations and in CNG transportation networks around the world, the Intermech BBR/FBR compressor is an ideal solution for reliable and energy-efficient CNG and NGV refueling that makes no compromises on safety. The compressor is equipped with a zero-leakage pressured crankcase, direct drive and thoroughly referenced and tested technology.

# **Smooth direct drive**

- No lateral loads on crankshaft and bearings, requiring less maintenance
- Avoids belt-related servicing; belts typically have to be replaced every six months
- Up to 1800-rpm compressor running speed for direct coupling to gas or electric motor

## Long-life mini lube design

- Metered drop lubrication of cylinders through separate lubricator divider system reduces ring wear
- Restricted piston speeds for longer ring and valve life
- · Synthetic rings also lessen friction and wear

## **Efficient cooling**

- Air-cooled machines for trouble-free operation; avoids stoppages due to scaling, pump and cooling tower failures
- Low discharge temperatures thanks to proper staging and large, efficient intercoolers

### Soft starter technology

- Reduces electrical shock loads resulting in longer operational life
- Part-load power consumption is reduced by a combination of integrated blowdown vessel, soft starter
- Compressor can be programed to load/unload, start/stop according to consumption levels

# Control systems and other safety features

- · Control systems monitor critical points
- · Meets all major international codes and standards
- Fully performance and safety tested with natural gas at designed capacity prior to installation
- Extensive track record of safe operation extending over millions of hours of runtime
- Optional independent third-party design verification of all pressure vessels, welding procedures and hydrostatic pressure tests

### **Pressurized crankcase**

- Pressurized crankcase up to 25 bar(a) results in zero gas loss to atmosphere
- Gas savings of up to 3% versus unsealed compressors at first startup.
- Compressor pays for itself within a few months of operation

## **Technical specifications**

#### Effective flow range

420–6808 Nm<sup>3</sup>/h (241–4 007 scfm) **Max. discharge pressure** up to 312 bar(g) (4525 psig) **Inlet pressure** 0.5–60 bar(g) (7.25–870 psig) **Compression Technology** Oil-lubricated reciprocating

## **Customer benefits**

- Energy savings Lower power costs and operating expenses pay off initial investment within a few months of operation
- High reliability Low piston speeds and interstage temperatures maintain internal parts
- Safety References all international standards and designed for zoned area application using explosion proof motors and suitable instruments
- Pressurized crankcase Up to 25 bar(a) crankcase pressure results in zero gas loss and offers gas savings of 3–6% versus unsealed compressors



# Intermech BBR/FBR compressor package and options

BBR/FBR compressors are used widely across CNG/NGV filling stations around the world. They are available as either packaged, read-to-install units or custom loaded with optional features.

## Package scope

- · Inlet filter to compressor block
- Pressurized crankcase BBR up to 25 bar(g), FBR 10 bar(g).
- · Electric motor/gas engine drive
- Flexible direct coupling with coupling guard
- Air cooled intercooler/aftercooler and air cooled oil cooler
- Piping/stainless steel tubing
- Integrated moisture separator/pulsation dampener
- Duplex final filtration using coalescing filters to remove aerosols to less than 5 ppm
- · Integrated blowdown vessel
- Lubricating system including gear pump, oil filter
- Necessary instrumentation as per area classification

# **Standard features**

- Standalone PLC based control panel
- Soft starter above 110 kW
- Star delta starter 110 kW and below

# **Optional features**

- Acoustic canopy suitable for 75 dBA/meter.
- Weatherproof canopy
- · 3rd-party certification gas detector
- Flame detector
- · Bleed and block valves for instruments
- Flameproof lighting
- Remote monitoring
- · VSD soft starter
- · Chain hoist system

Typical servicing intervals:					
Lubrication	Top up daily				
Valves	6000 h				
Overhaul	15000 h				
Main bearings	35000 h				



# Advanced solutions through custom design

We offer customized CNG/NGV compressor solutions to meet your specific application requirements. Our full range of tailor-made solutions fulfill specific national or regional requirements and protect your investment from particularly harsh climatic conditions.

## **Our advanced solutions include**

- Weatherproof acoustic enclosure for outdoor duty
- Conditioning for operation in sub-zero temperatures
- Peak performance in very high ambient temperatures and in dusty environments
- Corrosion resistance for application in windy, coastal and offshore locations

## Mobile Refueling Unit (MRU) an example of our custom solutions

Remote locations may require a compact and mobile solution such as the Mobile Refueling Unit, which mounts a complete gas station onto a movable trailer.

The MRU may be employed as a temporary station to check the feasibility of a site or as a stop-gap solution prior to installation of a permanent daughter station. The Atlas Copco Mobile Refuelling Unit is a self-contained, skidmounted unit for CNG compression, cooling, storage and dispensing. Mounted on a semitrailer truck, it is quickly transportable and can be used as a mother, daughter or conventional station.

Housed in its acoustic canopy the MRU creates minimal sound disturbance.

# **The MRU features**

- An onboard CNG dispenser
- Priority control system
- Flexible hose for connection to CNG trailer or gas mains
- · Pressure reduction system for trailer operation
- · Metering and regulating system
- Onboard storage cascade

The MRU offers a compact and lightweight design. It is easy to install and operate.



# Variable inlet pressure (VIP) compressor

The Atlas Copco Intermech VIP is a two-stage compressor package specially designed for efficient daughter-station service. The compressor enables quick trailer unloading, while making full use of the gas pressure already available to save on energy costs.

# Save energy and costs in gas regulation and recompression

A specialist for CNG unloading, our variable inlet pressure (VIP) compressor makes full use of the pressure already available in CNG trailers to reduce daughter stations requirements.

The VIP not only lowers energy requirements, thanks to its innovative Variable Speed Drive, the

## Why choose an efficient VSD daughter station?

#### Variable inlet pressure

- Fully utilize trailer pressure
- No pressure reduction valve required
- Lowest energy cost

#### Inverter VSD drive

- Runs at different speeds depending on suction pressure
- · Maximum capacity at lower pressure
- Fastest unloading times

#### Largest operation band

- Can work to minimumal 15 bar(g) trailer
   suction pressure
- 8% more gas unloaded compared to other compressor types

# How it works

The Intermech VIP uses a combination of innovative valve switching and a variable speed drive to accept the variable inlet pressure.

VIP compressor can unload about 8% more gas from a trailer than other compressors types.

The VIP is compatible with trailers with pressures from 190 - 15 bar(g).

- More gas available / less gas left unused on return trip
- Reduce tranportion costs
   quicker turnaround

#### Integrated oil tank

- Cylinder lubrication from gravity fed integrated oil tank
- Simplifies daily maintenance (no separate reservoir)

#### Footprint

· Extremely compact



# Representative INTERMECH VIP 2715 D Performance Chart

Average flow rate: 1590 Sm<sup>3</sup> /h\* considering reference conditions and correct installation as per Atlas Copco guidelines

\* Typical average flow between 190–15 bar(g) suction pressure actual performance depends upon pressure range, trailer volume, installation, gas properties and ambient conditions.



# **CNG** accessories

Atlas Copco CNG accessories are a result of over 30 years of design philosophy crafted to deliver equipment that is highly functional and robust, with full flow and minimal restricting points. Our accessories are at work in numerous installations offering trouble-free service to gas station owners, day after day.

# **Priority fill panel**

Designed for applications such as public gas stations where demand fluctuates, our three-bank bank priority fill panel helps to decant more gas than a single bank system. The priority fill panel also help spped up NGV fill times and limit stress on a single CNG compressor.



### **Key benefits**

#### Generously sized connections and piping

#### Atlas Copco non-return valves

- · Proven for non-jamming technology
- Incorporates cleanable SS mesh filters

#### Large bore emergency air-actuated ball valves

 Isolate forecourt dispensers from high pressure gas flow sources

#### **Mechanical prioritization**

Specially-designed springs for excellent memory and consistent and efficient sequencing

- Hand adjustable
- Prevent lower than set pressure in storage vessel

#### **Electronic prioritisation**

 air-actuated normally closed ball valves enrue high flow rate and safe shutoff in the event of air failure

Model	Prioritization	Number of lines	Capacity up to Sm³/h	Dimensions (m)
FPA 17 A	mechanical	4	2500	0.3 x 0.6 x 1.1
FPA 19 A	mechanical	3	2500	0.3 x 0.6 x 1.1
FPA 23 A	electronic	3	5000	0.26 x 0.85 x 1.15
FPA 31 A	electronic	4	10000	0.4 x 1.45 x 1.45



# Three-bank cascade filling system

• 30 mm air gap between all cylinders.

• Burst disks on all valves to slowly relieve gas pressure in the event of an emergency

• Feature at least 3/8 inch (9.525 mm) SS Pigtail connection for thermal and shipping allowance

Our corrosion-resistant three-bank buffer storage system is designed to meet the most stringent international standards and forms an integral part of the total CNG fueling station solution package.



# **Key benefits**

# Meets industry standards

- DOT 3AA standard cylinders
- Compliant with NZS5425 which requires
   access to all valves at less than 1.5m of height

Model	Low bank	Medium and high bank	Dimensions (m)	
CAS 2054 A/B	20 x 50 WL	12 x 50 WL + 8 x 50 WL	1.94 x 1.64 x 1.2	
CAS 3054 A/B	30 x 50 WL	18 x 50 WL + 12 x 50 WL	1.94 x 1.64 x 1.5	
CAS 4054 A/B	40 x 50 WL	24 x 50 WL + 16 x 50 WL	1.94 x 1.64 x 1.7	

# Gas flow systems

Atlas Copco offers a large range of gas flow systems that deliveres excellent energy efficiency, reliability and safety. Our engineered solutions provides the highest flow rates available through large-bore fitting, tubing and hoses.



Trailer decant post DM-TD2
Twin hose trailer decanting 70 kg/min and designed to ISO 7241-1AS



# Trailer fill panel DIN-100 M1W

• Single hose metered cabinet dispenser for 100 kg/min

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# **Pressure Reduction and Metering** Station (PRMS)

The Atlas Copco PRMS reduces gas pressure from as high as 310 bar(g) to an exact output pressure 2.2 bar(g) without icing. At the same time, the PRMS drains a trailer to an extremely low pressure – maintaining a steady flow rate – and heats CNG before regulation with hot water.

## Standard components, features and benefits

- TEMA design water-in-tube shell and tube heat

   Includes electrical heater (loose supply exchangers
- 2 Full-bore spring or dome-loaded regulator valves for regulating first-stage pressure i
- 3 Accurate high-flow final regulator
- Non-return valves offer proven non-jamming operation
- 9 Pressure gauges and relief valves on both stages and discharge
- Galvanized frame and feet, pre-drilled for concrete anchoring to minimize corrosion

## **PRMS+ components, features** and benefits

- suitable for safe area) with inbuilt water pump and temperature controller
- · Onboard PLC system monitors flow, pressure and temperature and controls actuated valves for automated control of the PRMS
- · Inlet filter to remove particles and protect equipment

#### **Performance:**

Model	Capadity
PRS 1000+	Up to 1000 Sm <sup>3</sup> /h
PRS 3000+	Up to 3000 Sm³/h

## **Customer benefits**

- Maintains consistent flow rate even under low trailer pressure
- Maximal system efficiency First-stage regulation and heating is cut when trailer pressure reaches critical level
- Safe operation Should water temperature drop, the PRMS automatically shuts down, preventing damage to tubes
- Complete compatibility with trailer decant panels
- Optional trailer pressure monitoring
- Seamless transition from empty to full trailers





# **Our Aftermarket parts and services**

# **Global presence – local service**

At Atlas Copco, our services do not stop when our products are delivered. Guaranteed Atlas Copco serviceability ensures the optimal availability and utmost reliability of your CNG system while keeping operating costs to a minimum.

Our Aftermarket specialists are here to make sure that your machinery delivers top performance throughout its long lifetime. And, our Aftermarket Service plans offer full price transparency, fast maintenance and a forward-looking time-saving approach designed for your products' long life.

Performance checks by Atlas Copco technicians, who adhere to original factory standards, minimize the risk of breakdowns and production downtime.

Through an audit of your production process, we can help optimize equipment operation. All the while, our Aftermarket service specialists keep a keen eye on maximum equipment availability at the lowest possible cost.

We deliver this complete service guarantee through our extensive service network established in over 180 countries around the world.

# The value of Aftermarket Services:

- Cost-effective, transparent pricing
- Longer operational life for your compressor
- Global presence, local service, never more than a phone call away
- Assured quality and productivity
- Dedicated local support in your language
- Around-the-clock support
- World-class logistics
- Complete diagnostic reports after every inspection
- Proactive planning that takes your scheduled maintenance routine into account
- Guaranteed Atlas Copco replacement parts
- Service by committed service personnel, who know your machinery inside and out

# **Technical specifications US**

	Electric Motor Drive					
Model	Inlet Pressure	Inlet Pressure Range (psig) Nominal SCFM at 1780 rpm (60Hz)			Nominal GGE/min at 1780 rpm (60Hz)	
4 stage	min	max	min	max	min	max
INTERMECH BBR 107 series	8	21	326	522	2.6	4.1
INTERMECH BBR 100 series	11	29	322	556	2.5	4.4
INTERMECH BBR 90 series	33	66	498	854	3.9	6.7
INTERMECH BBR 80 series	42	77	529	819	4.2	6.5
INTERMECH BBR 60 series	63	132	408	785	3.2	6.2
3 stage	min	max	min	max	min	max
INTERMECH BBR 42 series	97	204	405	848	3.2	6.7
INTERMECH BBR 40 series	109	232	405	865	3.2	6.8
INTERMECH BBR 35 series	122	272	405	900	3.2	7.1
INTERMECH BBR 32 series	141	315	403	907	3.2	7.2
INTERMECH BBR 30 series	156	355	405	926	3.2	7.3
2 stage	min	max	min	max	min	max
INTERMECH BBR 32	343	736	807	1913	6.4	15.1
INTERMECH BBR 27	398	735	638	1300	5	10.3

	Gas Engine Drive					
Model	Inlet Pressure	e Range (psig)	Nominal SCFM at 1650 rpm		Nominal GGE/min at 1650 rpm	
4 stage	min	max	min	max	min	max
INTERMECH BBR 107 series	7.5	22	298	504	2.4	4
INTERMECH BBR 100 series	10	28	288	508	2.3	4
INTERMECH BBR 90 series	31	65	445	788	3.5	6.2
INTERMECH BBR 80 series	33	73	391	730	3.1	5.8
INTERMECH BBR 60 series	60	132	365	733	2.9	5.8
3 stage	min	max	min	max	min	max
INTERMECH BBR 42 series	94	205	370	809	2.9	6.4
INTERMECH BBR 40 series	105	230	368	814	2.9	6.4
INTERMECH BBR 35 series	117	279	365	874	2.9	6.9
INTERMECH BBR 32 series	136	322	366	878	2.9	6.9
INTERMECH BBR 30 series	151	361	368	890	2.9	7
2 stage	min	max	min	max	min	max
INTERMECH BBR 32	332	735	740	1844	5.8	14.6
INTERMECH BBR 27	389	736	591	1 256	4.7	9.9

\* Reference conditions:

Heterence conditions:
1. Standard Reference conditions: Pressure: 14.5 PSIA, Ambient temperature: 60 F, Gas temperature: 60 F
2. Gas specific gravity: 0.6
3. Nominal discharge pressure: 4500 PSIG.
4. Capacities given above are for standard models. Please contact Atlas Copco for other capacities.
5. Due to continuous improvements, we reserve the right to change above technical specifications.

# **Technical specifications Asia**

	Electric Motor Drive					
Model	Inlet Pressure	Range (bar(g))	Nominal Sm³/h at 1485 rpm (50Hz)			
4 stage	min	max	min	max		
INTERMECH BBR 107 series	0.5	1	468	628		
INTERMECH BBR 100 series	1	2.8	515	996		
INTERMECH BBR 90 series	2	4.5	645	1 204		
INTERMECH BBR 80 series	2	7	529	1 452		
INTERMECH BBR 60 series	4.5	12	598	1 452		
3 stage	min	max	min	max		
INTERMECH BBR 50 series	5	12.5	632	1472		
INTERMECH BBR 42 series	5	18	445	1600		
INTERMECH BBR 40 series	6	20	457	1 5 5 5		
INTERMECH BBR 35 series	6	22	423	1548		
INTERMECH BBR 32 series	7	25	435	1566		
INTERMECH BBR 30 series	8	29	422	1569		
2 stage	min	max	min	max		
INTERMECH BBR 37	20	43	1316	3227		
INTERMECH BBR 32	20	52	990	3011		
INTERMECH BBR 27	22	70	745	2961		

	Gas Engine Drive				
Model	Inlet Pressure	Range (bar(g))	Sm³/h at 1650 rpm (gas engine)		
4 stage	min	max	min	max	
INTERMECH BBR 107 series	0.5	1	517	694	
INTERMECH BBR 100 series	1	2.8	567	1 0 9 7	
INTERMECH BBR 90 series	2	4	713	1 206	
INTERMECH BBR 80 series	2	5.1	584	1213	
INTERMECH BBR 60 series	4.5	11.5	661	1541	
3 stage	min	max	min	max	
INTERMECH BBR 50 series	5	11.5	574	1 3 3 0	
INTERMECH BBR 42 series	5	18	491	1769	
INTERMECH BBR 40 series	6	20	505	1721	
INTERMECH BBR 35 series	6	22	468	1713	
INTERMECH BBR 32 series	7	25	481	1734	
INTERMECH BBR 30 series	8	29	467	1737	
2 stage	min	max	min	max	
INTERMECH BBR 37	20	43	1 459	3581	
INTERMECH BBR 32	20	50	1 098	3 192	
INTERMECH BBR 27	22	70	827	3287	

VIP	Inlet Pressure	Range (bar(g))	Nominal Sm³/h a	t 1485 rpm (50Hz)	
	Low	High	Low	High	
VIP 2715	15	190	550	3650	
Average Flow			1 590		

	Electric Motor Drive					
Model	Inlet Pressure	Range (bar(g))	Nominal Sm³/h at 1485 rpm (50Hz)			
4 stage	min	max	min	max		
INTERMECH FBR 107 series	1	5.2	556	2075		
INTERMECH FBR 90 series	3.5	12	933	3034		
3 stage	min	max	min	max		
INTERMECH FBR 62 series	5	12.8	916	2 5 4 7		
INTERMECH FBR 60 series	6	16.8	969	3016		
INTERMECH FBR 55 series	7	25	834	3525		
INTERMECH FBR 50 series	8	28	893	3638		
INTERMECH FBR 45 series	9	32	797	3 3 6 5		
2 stage	min	max	min	max		
INTERMECH FBR 52 series	17	39	1831	5346		
INTERMECH FBR 50 series	20	50	2002	6464		
INTERMECH FBR 45 series	23	63	1816	6696		
INTERMECH FBR 42 series	24	70	1 707	6808		

	Gas Engine Drive				
Model	Inlet Pressure	Range (bar(g))	Sm³/h at 1650 rpm (gas engine)		
4 stage	min	max	min	max	
INTERMECH FBR 107 series	1	4.5	556	2027	
INTERMECH FBR 90 series	3.5	8.7	1 0 3 3	2 4 8 4	
3 stage	min	max	min	max	
INTERMECH FBR 62 series	5	12.7	1006	2786	
INTERMECH FBR 60 series	6	15.2	1073	3009	
INTERMECH FBR 55 series	7	22	919	3 389	
INTERMECH FBR 50 series	8	24	984	3402	
INTERMECH FBR 45 series	9	30	881	3472	
2 stage	min	max	min	max	
INTERMECH FBR 52 series	17	26	2016	3666	
INTERMECH FBR 50 series	20	30	2 207	3912	
INTERMECH FBR 45 series	23	48	2006	5086	
INTERMECH FBR 42 series	24	58	1 887	6028	

- \* Reference conditions:
  1. Standard Reference conditions: Pressure: 101 325 Pa, Ambient temperature: 15 °C, Gas temperature: 15 °C
  2. Gas specific gravity: 0.6
  3. Nominal discharge pressure: 250 bar(g), higher discharge pressure possible on request.
  4. Capacities given above are for standard models. Please contact Atlas Copco for other capacities.
  5. Due to continuous improvements, we reserve the right to change above technical specifications.



# 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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