

# A new standard in compressed air performance and efficiency

Atlas Copco's GA 7-37 VSD+ is a true game changer for your operational environment. It reduces energy consumption by on average 50% and assures performance even in the harshest conditions. The GA 7-37 VSD+ comes with Variable Speed Drive as standard, our in-house designed iPM motor technology, and advanced connectivity. The result is a compact compressor that fits in the smallest room and that sets a new standard in efficiency and performance for years to come.





#### **Innovative**

Atlas Copco has revolutionized compressor build and performance. Instead of the normal spacetaking horizontal design, the new GA 7-37 VSD+ has an upright, compact layout. This saves valuable floor and work space, eases maintenance access, and reduces the total cost of ownership for all customers.

#### **Efficient**

- Reduced energy consumption by 50% on average compared to the current idling models.
- Free Air Delivery (FAD) increase of up to 12%.



#### Meeting and exceeding efficiency benchmarks:

- The iPM motor of the GA 7-37 VSD+ equals IE5 standards.
- The inverter and iPM motor exceed IES2 (EN 50598) requirements for power drive efficiency.





#### Reliable

- Low maintenance: fewer components, increased uptime.
- Based on the unique combination of proven technologies and existing components, optimally brought together by Atlas Copco's experience and know-how.

#### Smart

- Easy monitoring and maintenance thanks to the Elektronikon° Touch controller.
- Maintenance notifications and machine status are available via SMARTLINK e-mail or text messages.
- Customized reports on the energy performance of your machine, in compliance with ISO 50001.



# Inside the innovative GA 7-37 VSD+



# 4

# Innovative fan

- Based on the newest technologies.
- In compliance with ERP2015 efficiency.
- Low noise levels.

#### 5 Del

## Robust oil filter/separator

- Integrated bypass valve with the oil filter.
- Easy maintenance.



## Electronic no-loss water drain

- Included as standard.
- Efficient removal of condensate without loss of compressed air.
- Manual integrated bypass for effective condensate removal in case of power failure.



# 7

### **Elektronikon**° **Touch controller**

- High-tech controller with warning indications, compressor shut-down and maintenance scheduling.
- Easy to use and designed to perform in the toughest conditions.
- Standard SMARTLINK remote monitoring to maximize air system performance and energy savings.
- Optional multiple compressor control (2, 4 or 6 compressors).



#### VSD<sup>+</sup> cubicle

- VSD+ is superior to idling machines.
- Electrical components remain cool, enhancing their lifetime.
- Dedicated drive for iPM technology motors.
- 5% DC choke as standard.
- Heat dissipation of inverter in separate compartment.



# Meeting and exceeding efficiency benchmarks:

- The iPM motor of the GA 7-37 VSD+ equals IE5 standards.
- Inverter and iPM motor exceed IES2 (EN 50598) requirements for power drive efficiency.



# **Interior Permanent Magnet** (iPM) motor

- Compact, customized design for optimal cooling by oil.
- Designed in-house in Belgium.
- IP66 protection rating.
- No cooling air flow required.
- Oil-lubricated motor bearing: no (re)grease(ing), increased uptime.



#### **Element**

- Made by Atlas Copco.
- Robust and silent.



### **Direct drive**



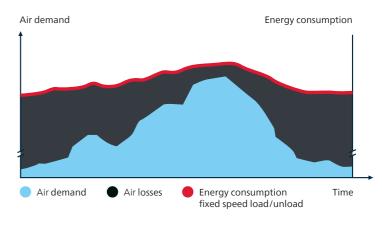


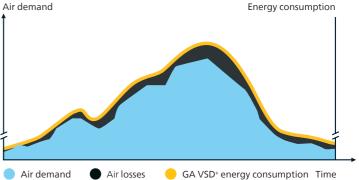
# 8 Sentinel valve

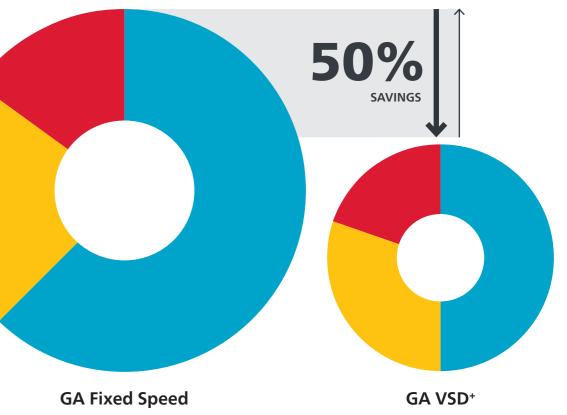




In almost every production environment, air demand fluctuates depending on different factors such as the time of the day, week or even month. Extensive measurements and studies of compressed air demand profiles show that many compressors have substantial variations in air demand.







EnergyInvestmentMaintenance

# VSD+ for 50% average energy savings

Atlas Copco's GA Variable Speed Drive+ (VSD+) technology closely matches the air demand by automatically adjusting the motor speed. Combined with the innovative design of the iPM (Permanent Magnet) motor, this results in average energy savings of 50% and an average reduction of 37% in the lifecycle cost of a compressor.

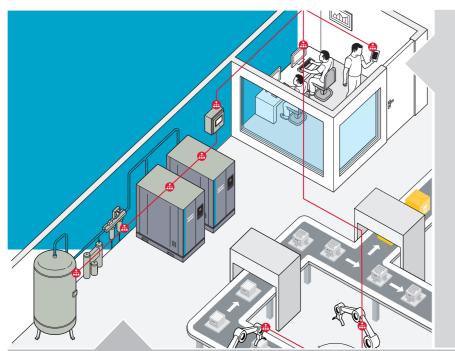
# Why Atlas Copco Variable Speed Drive technology?

- On average 50% energy savings with an extensive flow range (20-100%).
- Integrated Elektronikon\* Touch controller controls the motor speed and high-efficiency frequency inverter.
- No wasted idling times or blow-off losses during operation.
- Compressor can start/stop under full system pressure without the need to unload.
- Eliminates peak current penalty during start-up.
- Minimizes system leakage due to a lower system pressure.
- EMC compliance to directives (2004/108/EG).

<sup>\*</sup>Compared to fixed speed compressors, based on measurement performed by an independent energy audit agency.

# Advanced monitoring, control & connectivity

Whether you call it Industry 4.0 or the Internet of Things (IoT), interconnectivity is the future. The GA 7-37 VSD+ comes fully prepared. Its advanced monitoring, control and connectivity features allow you to optimize compressor performance, resources, efficiency and productivity.



# **CONNECT SMART**LINK\*: **Data Monitoring Program**

- Remote monitoring that helps you optimize your compressed air system and save energy and costs.
- Provides a complete insight in your compressed air network.
- Anticipates potential problems by warning you upfront.
- \* Please contact your local sales representative for more information

## Control

To maximize energy efficiency, the Elektronikon\* controls the main drive motor and regulates system pressure within a predefined and narrow pressure band.

# State-of-the-art Elektronikon<sup>®</sup> Touch controller

- ✓ Improved user-friendliness: 4.3-inch high-definition color display with clear pictograms and service indicator.
- ✓ Built-in SMARTLINK online monitoring.
- ✓ Increased reliability: new, user-friendly, multilingual user interface and durable touch screen.



### **Key features:**

- Automatic restart after voltage failure.
- Internet-based compressor visualization using a simple Ethernet connection.
- Dual Pressure Set Point.
- More flexibility: four different week schedules that can be programmed for a period of 10 consecutive weeks.
- On-screen Delayed Second Stop function and VSD+ savings indication.
- Graphical service plan indication.
- Remote control and connectivity functions.
- Control up to 6 compressors by installing the optional equalizer central controller software.

# **Excellence in integrated** air quality

Untreated compressed air contains moisture and aerosols which increase the risk of corrosion and compressed air system leaks. This can result in a damaged air system and contaminated end products. Maintenance costs can far exceed air treatment costs. The GA 7-37 VSD+ provides the clean, dry air that improves your system's reliability, avoids costly downtime and production delays, and safeguards the quality of your products.

# On average 50% energy savings with newly designed integrated dryers

- Pressure dewpoint of 3°C/37.4°F (100% relative humidity at 20°C/68°F).
- Heat exchanger cross-flow technology with low pressure drop.
- Zero waste of compressed air thanks to no-loss condensate drain.
- Reduced operating costs.
- Environmentally-friendly characteristics: zero ozone depletion.
- Global warming potential has been lowered by an average of 50% by reducing the amount of refrigerant in the new dryer.



# Meet your specific requirements

Thanks to its integrated dryer, the Atlas Copco GA 7-37 VSD+ offers the right air quality for your application.

### Compressed air purity classification ISO 8573-1:2010

		Solid particles		Wa	ter	Total oil*						
Purity	Nu	mber of particles per	· m³	Pressure (	Concentration							
class	0.1 < d ≤ 0.5 μm**	0.5 < d ≤ 1.0 μm**	1.0 < d ≤ 5.0 μm**	°C	°F	mg/m³						
0	As specified by the equipment user or supplier and more stringent than Class 1.											
1	≤ 20000	≤ 400	≤ 10	≤ -70	≤-94	≤ 0.01						
2	≤ 400000	≤ 6000	≤ 100	≤ -40	≤ -40	≤ 0.1						
3	-	≤ 90000	≤ 1000	≤ -20	≤-4	≤ 1						
4	-	-	≤ 10000	≤3	≤ 37.4	≤ 5						
5	-	-	≤ 100000	≤ 7	≤ 44.6	-						
6		≤ 5 mg/m³		≤ 10	≤ 50	-						

<sup>\*</sup> Liquid, aerosol and vapor.

<sup>\*\*</sup> d= diameter of the particle

# **Technical specifications GA 7-37 VSD**<sup>+</sup>

Compressor type	Max. worki	ing pressure	Сара	acity FAD* (min-	max)	Installed m	otor power	Noise level**	Weight WorkPlace	Weight WorkPlace Full Feature
	bar(e)	psig	l/s	m³/h	cfm	kW	hp	dB(A)	kg	kg
	5.5	80	7.2-21.9	25.9-78.8	15.2-46.4	7.5	10	62	193	277
GA 7 VSD⁺	7	102	7.0-21.7	25.2-78.1	14.8-46.0	7.5	10	62	193	277
GA / VSD*	9.5	138	6.8-18.0	24.5-64.8	14.4-38.1	7.5	10	62	193	277
	12.5	181	7.3-14.2	26.3-51.1	15.5-30.1	7.5	10	62	193	277
	5.5	80	7.3-32.9	26.3-118.4	15.5-69.7	11	15	63	196	280
GA 11 VSD⁺	7	102	7.3-32.5	26.3-117.0	15.5-68.8	11	15	63	196	280
GA II VSD	9.5	138	7.0-27.2	25.2-97.9	14.8-57.6	11	15	63	196	280
	12.5	181	7.6-23.5	27.4-84.6	16.1-49.8	11	15	63	196	280
	5.5	80	7.2-42.3	25.9-152.3	15.2-89.6	15	20	64	199	288
GA 15 VSD⁺	7	102	7.1-41.8	25.6-150.5	15.0-88.6	15	20	64	199	288
GA 15 V3D	9.5	138	6.8-35.5	24.5-127.8	14.4-75.2	15	20	64	199	288
	12.5	181	7.3-27.9	26.3-100.4	15.5-59.1	15	20	64	199	288
	4	58	15.1-63.9	54.4-230.0	32.0-135.4	18	25	67	367	480
GA 18 VSD⁺	7	102	14.9-62.5	53.6-225.0	31.6-132.4	18	25	67	367	480
GA 18 VSD*	9.5	138	17.1-53.6	61.6-193.0	36.2-113.6	18	25	67	367	480
	12.5	181	16.4-43.5	59.0-156.6	34.7-92.2	18	25	67	367	480
	4	58	15.3-76.9	55.1-276.8	32.4-162.9	22	30	67	363	485
GA 22 VSD⁺	7	102	15.0-75.1	54.0-270.4	31.8-159.1	22	30	67	363	485
GA 22 V3D	9.5	138	17.3-65.2	62.3-234.7	36.7-138.2	22	30	67	363	485
	12.5	181	17.1-54.1	61.6-194.8	36.2-114.6	22	30	67	363	485
	4	58	14.9-86.3	53.6-310.7	31.6-182.9	26	35	67	373	490
GA 26 VSD⁺	7	102	14.5-85.5	52.2-307.8	30.7-181.2	26	35	67	373	490
GA 20 V3D	9.5	138	17.0-78.4	61.2-282.2	36.0-166.1	26	35	67	373	490
	12.5	181	16.4-64.5	59.0-232.2	34.7-136.7	26	35	67	373	490
	4	58	15.1-98.0	54.4-352.8	32.0-207.7	30	40	67	376	500
GA 30 VSD⁺	7	102	15.0-97.4	54.0-350.6	31.8-206.4	30	40	67	376	500
GA 30 V3D	9.5	138	17.1-85.6	61.6-308.2	36.2-181.4	30	40	67	376	500
	12.5	181	16.7-72.0	60.1-259.2	35.4-152.6	30	40	67	376	500
	4	58	15.3-116.5	55.1-419.4	32.4-246.8	37	50	67	376	500
GA 37 VSD⁺	7	102	14.8-115.0	53.3-414.0	31.4-243.7	37	50	67	376	500
GA 37 V3D	9.5	138	17.1-102.3	61.6-368.3	36. 2-216.8	37	50	67	376	500
	12.5	181	16.4-86.7	59.0-312.1	34.7-183.7	37	50	67	376	500
	4	58	26.2-132.9	94.2-478.6	55.5-81.7	37	50	67	860	1060
GA 37L VSD+ ***	7	102	25.8-131.9	92.9-474.7	54.7-279.4	37	50	67	860	1060
GM 37 L V3D	9.5	138	24.8-116.0	89.2-417.7	52.5-245.8	37	50	67	860	1060
	12.5	181	38.2-98.7	137.5-355.2	80.9-209.1	37	50	67	860	1060

- Unit performance measured according ISO 1217 ed. 4 2009, annex E, latest edition.
- \*\* Mean noise level measured at a distance of 1 m at max. working pressure according to ISO 2151: 2004 using ISO 9614/2 (sound intensity method); tolerance 3 dB(A).
- "L = larger drive train. This model is part of a different series with different specifications and additional benefits: more energy savings, higher FAD, and a lower noise level.

#### FAD is measured at the following

- effective working pressures:
   4 bar(e) (GA 18-37L VSD+)
- 4 bar(e) (GA 7-15 VSD+)
   5.5 bar(e) (GA 7-15 VSD+)
   7 bar(e)
   9.5 bar(e)
   12.5 bar(e)

#### Maximum working pressure:

13 bar(e) (188 psig)

## Reference conditions:

Absolute inlet pressure 1 bar (14.5 psi).
Intake air temperature 20°C/68°F.

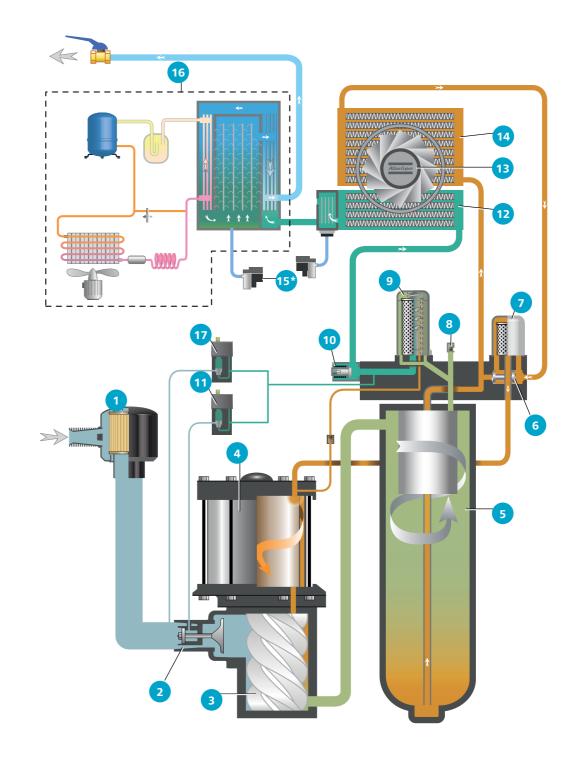
# **Options**

Energy recovery
Dryer bypass
Main switch
Freeze protection
Heavy duty inlet filter
Pre-filter Pre-filter
Tropical thermostat
IT ancillaries
DD+ filter
FoodGrade oil
UD+ filter
Roto Synthetic Xtend oil
EQ2i, EQ4i, EQ6i
Transformer sales kit 200-230V / 500-575V



Dimensions	Standard							Full Feature						
	D (mm)	W (mm)	H (mm)	D (in)	W (in)	H (in)	D (mm)	W (mm)	H (mm)	D (in)	W (in)	H (in)		
GA 7-15 VSD+	630	610	1420	24.80	24.02	55.91	630	985	1420	24.80	38.78	55.91		
GA 18-37 VSD+	780	811	1590	30.71	31.93	62.60	780	1273	1590	30.71	50.12	62.60		
GA 37L VSD⁺	1100	1153	1968	43.31	45.39	77.48	1100	1656	1968	43.31	65.20	77.48		

# Flow chart GA 7-37 VSD+



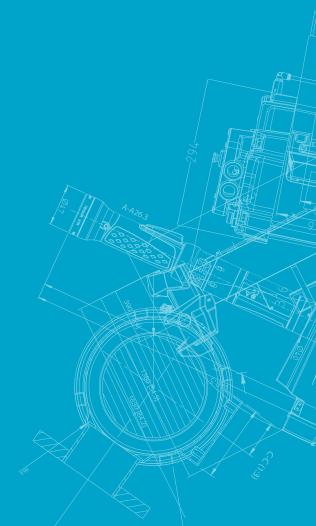
- 1 Inlet filter
- 2 Sentinel valve
- 3 Screw element
- 4 Interior permanent magnet motor (iPM)
- 5 Air/oil vessel separator
- 6 Thermostatic bypass valve
- 7 Oil filter
- 8 Safety valve
- Oil separator

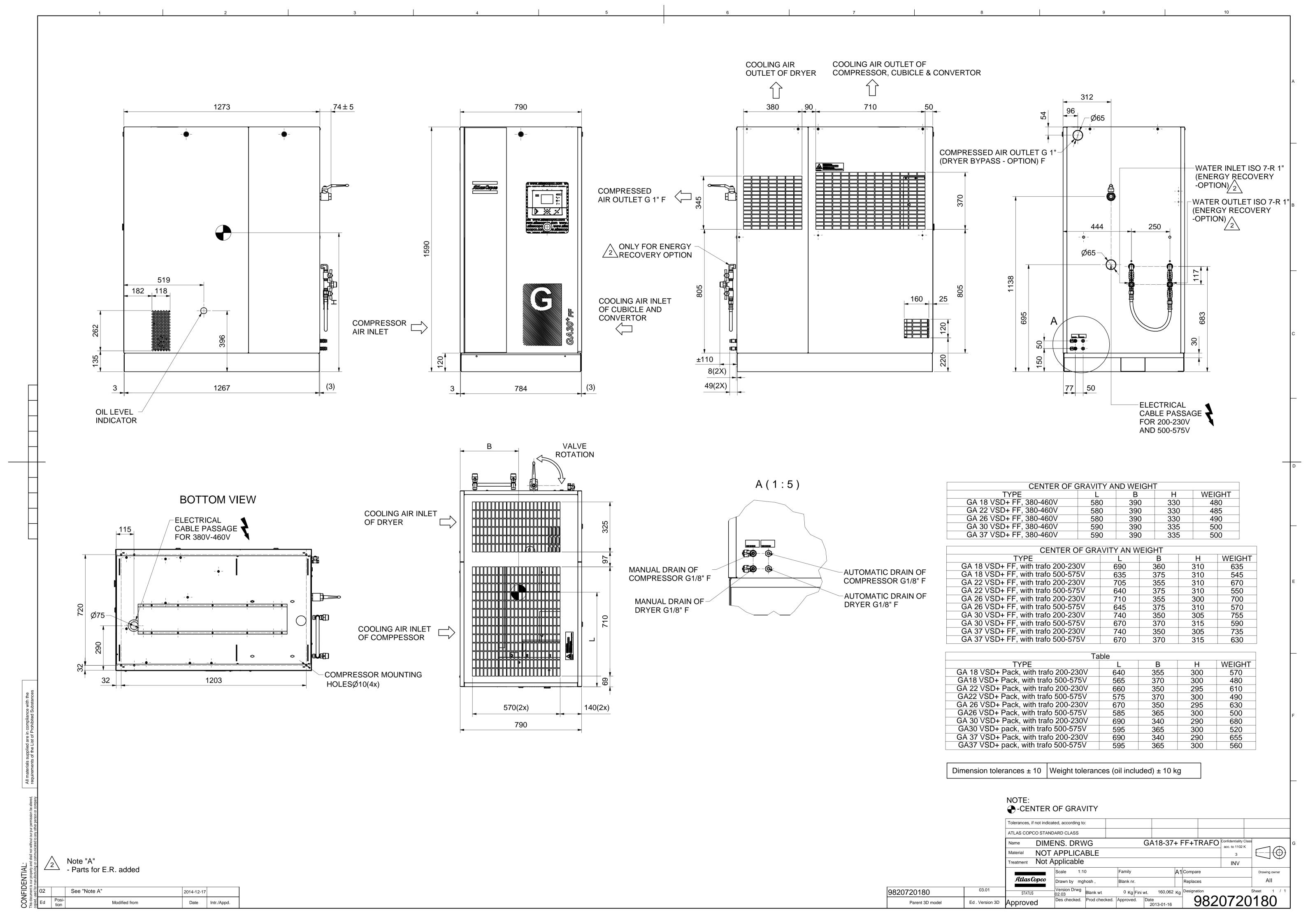
- 10 Minimum pressure valve
- 11 Solenoid valve
- 12 Aftercooler
- 13 Fan 14 Oil cooler
- 15 Electronic drain (\* mounted on
- aftercooler on models without dryer) 16 Dryer (Full Feature option)
- 7 Condensate prevention cycle

- Wet compressed air Condensate
- Dry compressed air
- Intake air
- Air/oil mixture
- Oil











Compressed air filters

# Committed to superior productivity

Untreated compressed air can be contaminated by dust, water and oil. This makes filtration a crucial component of your air system. Atlas Copco has developed filtration solutions that protect your air-powered tools, your processes, and your final products. Our extensive offer includes different filter types and a range of purity grades to meet your specific Coronavirus requirements. Oil droplet Smoke particle Human hair Dust particle Atlas Copco filters remove the smallest contaminants, including sand, salt and sugar grains; black carbon; rust; cement and paint particles; asbestos; and bacteria and viruses. Grain of salt Fine beach sand

# **Unsurpassed filtration quality**

## In-house expertise

Because filtration is so important, Atlas Copco's dedicated engineering team works in close collaboration with universities, regulatory authorities and premium filter material suppliers. Our scientists and engineers are therefore knowledgeable on the latest advances and innovations in the industry. Every step of the engineering process is meticulously executed, from basic research to prototype designs and end-of-life analysis.



# **Rigorous quality control**

To ensure top performance and reliability, all Atlas Copco filters are subjected to rigorous internal and external certification and quality control. Thanks to our testing facility, we conduct all certification inhouse, including testing witnessed by independent parties. Capable of testing filters according to all relevant standards and under real-life conditions, our competence continues to grow with every new development in the filtration business.

#### Certified peace of mind



## **Engineered and built in Europe**

Our entire filter range is designed and produced in Atlas Copco's European facilities, using state-of-the art production lines and quality controls. This geographic proximity allows us to keep R&D, engineering, production, and testing close together and streamline their collaboration.



At las Copco's filters are certified to meet the following ISO standards:

- ISO 8573-1:2010: Compressed air Contaminants and purity classes
- ISO 8573-2:2018: Compressed air Test method for oil aerosol content
- ISO 8573-4:2019: Compressed air Test method for particles
- ISO 8573-5: 2001: Compressed air Test method for oil vapor and organic solvent content
- ISO 12500-1:2007: Filters for compressed air Test methods Oil aerosols
- ISO 12500-2:2007: Filters for compressed air Test methods Oil vapors
- ISO 12500-3:2009: Filters for compressed air Test methods Particulates

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# Advanced filtration technology

Filtration technology matters if you need constant air quality with low maintenance requirements. Over the years, Atlas Copco has innovated filter types, design, processes and media to give you best-in-class performance, reliability and lifetime.



# Element bottom cap (UD+, PD+ & DD+)

A patented drainage system facilitates the removal of oil from the filter element, eliminating the "wet band" at the bottom of the element that can compromise filter performance and lifetime.



#### Service indicator

To ensure constant air quality, the service indicator allows for an easy check of the filter's running hours, differential pressure, and maintenance status. It can even send a remote alert.

#### Element top cap

The top cap guides the air flow optimally into the cartridge and to the outlet to reduce pressure drop and the overall energy use of the filter.

## inPASS™ bypass



Atlas Copco's revolutionary built-in bypass can be used to reroute the air during filter service to ensure an uninterrupted air flow. It's an invisible invention that will give you big investment and operational savings:

- Service your filters at any time, even during working hours
- Secured air flow for your production during maintenance.
- Reduced maintenance time as your air system doesn't need to be shut down.
- Eliminates the huge cost of an external piping bypass.
- Lowers the risk of leakages, resulting in lower energy costs.

Strong and durable stainless-steel cylinders

Differently colored end caps to easily recognize the filtration grade

## **Easy-service float drain**

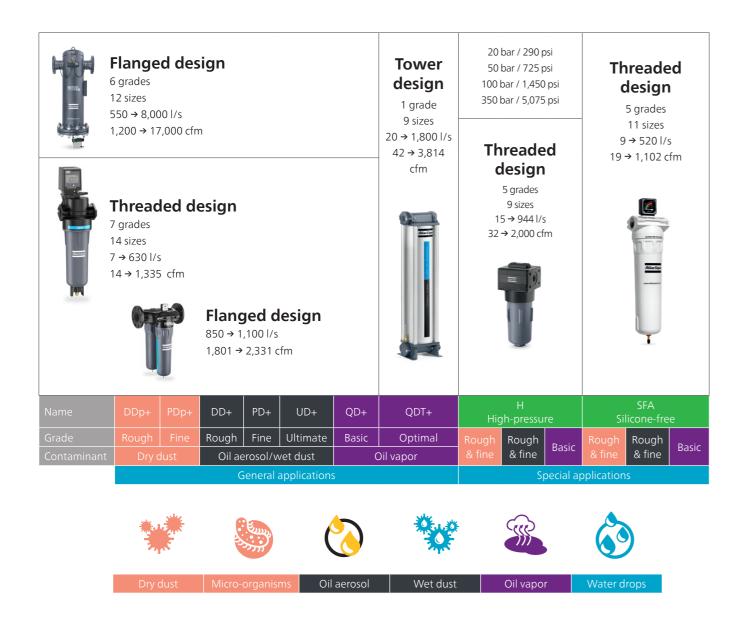
Our non-stick float drain automatically expels all captured oil and water. To save you time and money, our drains can easily be serviced without removing the filter bowl. The threaded drain connection to the bowl also makes it easy to replace the float drain with an external manual or automatic drain.

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# **Complete filtration**

Dirt, water and oil are no match for Atlas Copco's filters. They are designed to remove one or more of the following contaminants:

- DIRT: dust, solid particles, rust particles, micro-organisms.
- WATER: condensed liquid water, water aerosols, acidic condensates.
- OIL: liquid oil, oil aerosol, hydrocarbon vapor.



# A solution for every application

Depending on point of use and application, different compressed air purities might be needed. The table below shows the various ISO 8573-1:2010 air purity classes and the Atlas Copco filter and dryer-combinations that meet these classes.

ISO 8573-1:2010	Solid p	articles	Water	Oil (aerosol, liquid, vapor)				
class	Wet conditions	Dry conditions	vvater					
0		As specified by the	e customer*	Oil-free compressor				
1	DD+ & PD+	DDp+&PDp+	Desiccant dryer	DD+&PD+	& QD+/QDT			
	UD+	υυρ+α ευρ+	Desiccant dryer	UD+	& QD+/QDT			
2	DD+	DDp+	Desiccant dryer, rotary drum dryer	DD+ & PD+				
	DUT		Desiccant dryer, rotary drum dryer	UD+				
3	DD+	DDp+	Desiccant dryer, membrane dryer, rotary drum dryer		DD+			
4	DD+	DDp+	Membrane dryer, refrigerant dryer		DD+			
5	DD+	DDp+	Membrane dryer, refrigerant dryer	frigerant dryer -				
6	-	-	Membrane dryer, refrigerant dryer		-			

Air purity class ISO 8573-1:2010 [1:-:2]

A Compressor - UD+

# **Examples of typical installations**

В	Compressor - UD+ - Refrigerant dryer	Air purity class ISO 8573-1:2010 [1:4:2]*	
С	Compressor - UD+ - Refrigerant dryer - QDT - DDp+	Air purity class ISO 8573-1:2010 [2:4:1]	
D	Compressor - UD+ - Desiccant dryer - DDp+	Air purity class ISO 8573-1:2010 [2:2:2]	
E	Compressor - UD+ - Desiccant dryer - QDT - DDp+ - PDp+	Air purity class ISO 8573-1:2010 [1:2:1]	
	A B B	C C	5—
1. Comp 2. UD+ f		<ul><li>5. DDp+ filter</li><li>6. PDp+ filter</li></ul>	7. QDT filter

\*Particle class 1 is reached directly after UD+. As downstream piping & vessels can add particles, it is advised to install particle filters DDp+ and PDp+ just before the application to reach particle class 1 at point of use.

The compressor should be equipped with a liquid water separation system such as an aftercooler including a drain or a water separator (WSD). If this is not the case, install a water separator in front of a coalescence filter. For critical applications, install extra air treatment products at the point of use for the removal of pipeline contamination and condensation.

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<sup>\*</sup> Please contact your Atlas Copco sales representative.

# DD+/PD+/UD+ Series

# Oil coalescence filters with patented Nautilus technology

Compressor element lubrication and your compressor installation itself can release oil aerosols and wet dust in your air system. DD+, PD+ and UD+ filters efficiently remove these contaminants to protect your equipment and your processes. These innovative filtration solutions are engineered to cost-effectively provide the best air purity and meet today's increasingly stringent quality requirements.







#### Your benefits:

- Maximum oil aerosol, wet dust and water droplet filtration and drainage - Highefficiency glass fiber Nautilus technology ensures a low pressure drop.
- Patented drainage technology A coarse 3D-structured layer/barrier provides efficient oil drainage and prevents re-entry of oil droplets into the air stream.
- Minimal operating costs Optimal design and filter technology allow for low pressure
- Cost-saving maintenance Ribbed housing ensures easy removal of the filter bowl. The push-in element and drain connection were designed for effortless replacement. The service indicator shows (preventive) maintenance alerts.



# Certification

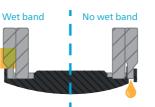
- ISO 8573-2:2018
- ISO 12500-1:2007

## 3 patented innovations



#### 1. Nautilus technology for energy savings

The Nautilus multi-wrap technology was specifically developed to improve the oil aerosol coalescing process. That means you get optimal filtration results at a lower pressure drop to minimize your operational costs.

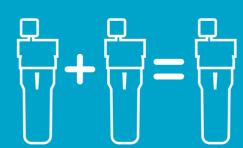


#### 2. Enhanced drainage channels for pure air

The bottom cap of the filter is designed to increase the drainage rate of the oil from the barrier by optimizing the contact between the barrier and drainage routes. This ensures no wet band is formed in the barrier and the re-entrainment risk is significantly diminished, resulting in cleaner air.

# 3. Superior drainage technology for a strong performance & long lifetime

A unique coarse 3D-structured layer/barrier ensures efficient oil drainage and prevents re-entry of oil droplets into the air flow. The 3D structure also offers a service life of 8,000 hours.



## UD+ 2-in-1 concept saves money and space

The UD+ combines two filtration steps (DD+ and PD+) into one, a unique technology to meet the quality requirements of diverse applications and offer superior energy savings. The UD+ filter provides the same air purity as a DD+-PD+ filter train with a lower pressure drop.

- Save up to 50% in space: The 2-in-1 concept is ideal for applications where space is at a premium, reducing your environmental footprint, system complexity, and installation space.
- Save money: Install UD+ filters to enjoy significant installation and maintenance (cost) savings compared to conventional filters.

#### **Performance**

	DD+	PD+	UD+						
Contaminant		Oil aerosol/wet dust							
Filtration technology		Wrapped							
Test method		ISO 8573-2:2018, ISO 12500-1:20	07						
Maximum oil carry-over (mg/m³)*	0.08*	0.008*	0.001						
ISO class 8573-1	[2:-:3]	[1::2]	[1:-:2]						
Average wet pressure drop (mbar)	119	132	220						
Element service	After 8,000 operating hours or 1 year For flanged filters: after 4,000 operating hours or 1 year or 350 mbar pressure drop								
Precede with	Water separation	Water separation & DD+	Water separation						

 $<sup>^*</sup>$  Inlet oil concentration = 10 mg/m $^3$ . Oil = oil aerosol and liquid

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# DDp+/PDp+ Series

# **Optimal dry dust filtration**

DDp+ and PDp+ filters efficiently prevent dust, corrosion particles, micro-organisms, dirt and adsorption material from entering your compressed air stream. These innovative filtration solutions are engineered to cost-effectively provide the best air purity and meet today's strict quality demands.





#### Your benefits:

- Maximum dirt, solid particle, microorganism and rust particle removal
   High-efficiency pleated glass fiber media with coarse pre-filter fleece ensure a high dust-holding capacity.
- Minimal operating costs Optimal pleated design and filter technology allow for low pressure losses.
- Cost-saving maintenance Ribbed housing ensures easy removal of the filter bowl. The push-in element and drain connection were designed for effortless replacement. The service indicator shows (preventive) maintenance alerts.



## **Performance**

	DDp+	PDp+							
Contaminant	Dry dust								
Filtration technology	Ple	eated							
Test method	ISO 8573-4:2001, ISO 12500-3:2009								
Particle removal efficiency (% at MPPS)	99.92	99.98							
ISO class 8573-1	[2:-:3]	[1::2]							
Element service	After 8,000 operating hours or 1 year or 350 mbar pressure drop For flanged filters: after 4,000 operating hours or 1 year or 350 mbar pressure								
Precede with	Dryer	Dryer & DDp+							

#### Certification

- ISO 8573-4:2019
- ISO 12500-3:2009

# **QD+ Series**

## **High-performance oil vapor filters**

QD+ filters efficiently reduce hydrocarbons, odors and oil vapor in your compressed air to protect your investment, equipment and processes. The macro-structured activated carbon will reduce the residual oil content through adsorption to less than 0.003 mg/m³. The pressure drop is low and remains constant during the lifetime of the filter.



#### Your benefits:

- Maximum oil vapor removal
   The macro-structured activated carbon is specifically designed to efficiently and completely remove oil vapors from compressed air with minimal dust release.
- Minimal operating costs Low pressure losses thanks to an optimal flow design.
- Low-cost maintenance Ribbed housing ensures easy removal of the filter bowl. The push-in element and drain connection were designed for effortless replacement. The service indicator shows (preventive) maintenance alerts.





#### **Performance**

QD+
Oil vapor
Macro-structured activated carbon
ISO 8573-5:2001
0.003*
[2::1]
75
After 2,000 operating hours or 1 year For flanged filters: after 1,000 operating hours or 1 year
Water separation UD+ or DD+/PD+ Dryer

 $<sup>^{\</sup>star}\,$  In a typical installation with refrigerant dryer and UD+ filter.

# Options DD+/PD+/UD+/DDp+/PDp+/QD+

- Potential-free alarm contact for gauge.
- Smart indicator.
- External wiring kit for smart indicator (alarm/power supply).
- Interconnection kit.
- Wall mounting kit.
- EWD including connection kit.



		DD+/PI	D+/UD+	DDp+	/PDp+	Q	D+
		Standard	inPASS™	Standard	inPASS™	Standard	inPASS™
	Standard						
Drain	Floater drain	Х	Х				
Drain	Manual drain			Х	Х	Х	Х
	Sliding indicator	size 7-25		size 7-25			
Indicator	Gauge	> size 25		> size 25			
	Smart indicator		Х		Х		
	Bypass		X		Х		x
	Options						
	Smart indicator	Х		Х		Х	Х
	External wiring kit (for smart indicator)	х	Х	х	Х	х	Х
	Potential-free alarm for gauge	Х		Х			
	Filter connection kit	Х	Х	Х	Х	Х	Х
	Wall mounting kit	Х	Х	Х	Х	Х	Х
	EWD drain with connection kit	Х	Х				

### **Correction factors**

When working with other pressures than the nominal pressure, the actual FAD capacity is calculated by multiplying the correction factor with the rated AML capacity. The calculated actual flow capacity corresponds to the AML-stated pressure drop.

Working pressure in bar(g)	1	2	3	4	5	6	7	8	10	12	14	16
Correction factor	0.38	0.53	0.65	0.75	0.83	0.92	1	1.06	1.20	1.31	1.41	1.50

# Sizing & dimensions DD+/PD+/UD+/DDp+/PDp+/QD+

						Connections		Dimensions					for cartridg replacemer				
						ļ.,,			A		B	C	: I	D			
l/s	cfm	bar(e)	psig	bar(e)	psig	G	NPT	mm	inch	mm	inch	mm	inch	mm	inch	kg	lbs
7	15	7	102	16	232	G 1/2	NPT 1/2	106	4.17	90	3.54	362.6	14.3	90	3.54	1.18	2.60
15	32	7	102	16	232	G 1/2	NPT 1/2	106	4.17	90	3.54	362.6	14.3	90	3.54	1.24	2.73
25	53	7	102	16	232	G 1/2	NPT 1/2	106	4.17	90	3.54	415.1	16.3	90.5	3.56	1.45	3.20
45	95	7	102	16	232	G 3/4	NPT 3/4	135	5.31	110	4.33	442.6	17.4	110	4.33	2.35	5.18
75	159	7	102	16	232	G 1	NPT 1	135	5.31	110	4.33	527.6	20.8	110	4.33	2.8	6.17
110	233	7	102	16	232	G 1 1/2	NPT 1 1/2	175	6.89	143	5.63	559.1	22.0	130.5	5.14	5.4	11.91
145	307	7	102	16	232	G 1 1/2	NPT 1 1/2	175	6.89	143	5.63	629.1	24.8	130.5	5.14	5.93	13.08
180	381	7	102	16	232	G 1 1/2	NPT 1 1/2	175	6.89	143	5.63	699.1	27.5	130.5	5.14	6.45	14.22
240	509	7	102	16	232	G 2	NPT 2	222	8.74	171	6.73	729.6	28.7	175	6.89	9.54	21.04
200	626	7	102	16	222	G 2	NPT 2	าวา	07/	171	6 72	0226	22.4	175	6 90	10.71	23.62
300	030	,	102	10	232	G 2 1/2	NPT 2 1/2	222	ō./4	171	0.73	022.0	32.4	1/5	0.89	10.43	23.00
	7 15 25 45 75 110 145 180	7 15 15 32 25 53 45 95 75 159 110 233 145 307 180 381 240 509	Capacity press  I/s cfm bar(e)  7 15 7  15 32 7  25 53 7  45 95 7  75 159 7  110 233 7  145 307 7  180 381 7  240 509 7	I/s         cfm         bar(e)         psig           7         15         7         102           15         32         7         102           25         53         7         102           45         95         7         102           75         159         7         102           110         233         7         102           145         307         7         102           180         381         7         102           240         509         7         102	I/s         cfm         bar(e)         psig         bar(e)           7         15         7         102         16           15         32         7         102         16           25         53         7         102         16           45         95         7         102         16           75         159         7         102         16           110         233         7         102         16           145         307         7         102         16           180         381         7         102         16           240         509         7         102         16	I/s         cfm         bar(e)         psig         bar(e)         psig           7         15         7         102         16         232           15         32         7         102         16         232           25         53         7         102         16         232           45         95         7         102         16         232           75         159         7         102         16         232           110         233         7         102         16         232           145         307         7         102         16         232           180         381         7         102         16         232           240         509         7         102         16         232	I/s         cfm         bar(e)         psig         bar(e)         psig         G           7         15         7         102         16         232         G 1/2           15         32         7         102         16         232         G 1/2           25         53         7         102         16         232         G 1/2           45         95         7         102         16         232         G 3/4           75         159         7         102         16         232         G 1           110         233         7         102         16         232         G 11/2           145         307         7         102         16         232         G 11/2           180         381         7         102         16         232         G 11/2           240         509         7         102         16         232         G 2           300         636         7         102         16         232         G 2	I/s         cfm         bar(e)         psig         bar(e)         psig         bar(e)         psig         G         NPT           7         15         7         102         16         232         G 1/2         NPT 1/2           15         32         7         102         16         232         G 1/2         NPT 1/2           25         53         7         102         16         232         G 1/2         NPT 1/2           45         95         7         102         16         232         G 3/4         NPT 3/4           75         159         7         102         16         232         G 1         NPT 1           110         233         7         102         16         232         G 11/2         NPT 1 1/2           145         307         7         102         16         232         G 11/2         NPT 1 1/2           180         381         7         102         16         232         G 11/2         NPT 1 1/2           240         509         7         102         16         232         G 2         NPT 2           300         636         7         102         1	I/s         cfm         bar(e)         psig         bar(e)         psig         G         NPT         mm           7         15         7         102         16         232         G 1/2         NPT 1/2         106           15         32         7         102         16         232         G 1/2         NPT 1/2         106           25         53         7         102         16         232         G 1/2         NPT 1/2         106           45         95         7         102         16         232         G 3/4         NPT 3/4         135           75         159         7         102         16         232         G 1         NPT 1         135           110         233         7         102         16         232         G 11/2         NPT 1 1/2         175           145         307         7         102         16         232         G 11/2         NPT 1 1/2         175           180         381         7         102         16         232         G 11/2         NPT 1 1/2         175           240         509         7         102         16         232         G 2<	I/s         cfm         bar(e)         psig         bar(e)         psig         G         NPT         mm         inch           7         15         7         102         16         232         G 1/2         NPT 1/2         106         4.17           15         32         7         102         16         232         G 1/2         NPT 1/2         106         4.17           25         53         7         102         16         232         G 1/2         NPT 1/2         106         4.17           45         95         7         102         16         232         G 3/4         NPT 3/4         135         5.31           75         159         7         102         16         232         G 1         NPT 1         135         5.31           110         233         7         102         16         232         G 11/2         NPT 1 1/2         175         6.89           145         307         7         102         16         232         G 11/2         NPT 1 1/2         175         6.89           180         381         7         102         16         232         G 2         NPT 2         <	Connections   Connections	Connections   Connections	Connections   Connections	Connections   Connections	Nominal capacity   Pressure   Maximum pressure   Pre	Connections   Pressure   Pressu	Nominal capacity   Pressure   Maximum pressure   Maximum pressure   Pressur

Non-inPASS  $^{\rm m}$  variant: height "C" decreases by 51 mm (2") for sizes 7-25 and by 10 mm (0.4") for sizes 45-300.

	and by 10 min (0.4 ) for sizes 43-500.																	
With inPASS™																		
380+	380	805	7	102	16	232	G 3	NPT 3	250	9.84	191	7.52	927.1	36.5	200.5	7.89	13.6	29.99
425+	425	901	7	102	16	232	G 3	NPT 3	250	9.84	191	7.52	1043.1	41.1	200.5	7.89	14.95	32.96
510+	630	1081	7	102	16	232	G 3	NPT 3	250	9.84	191	7.52	1281.1	50.4	200.5	7.89	19.6	43.22
Without inPASS™	и																	
360+	360	763	7	102	16	232	G 2 1/2	NPT 2 1/2	222	8.74	171	6.73	812.7	32.0	175	6.89	10.2	22.49
430+	430	911	7	102	16	232	G 3	NPT 3	250	9.84	191	7.52	917.2	36.1	200.5	7.89	13.98	30.83
525+	525	1112	7	102	16	232	G 3	NPT 3	250	9.84	191	7.52	1033.2	40.7	200.5	7.89	15.32	33.78
630+	630	1335	7	102	16	232	G 3	NPT 3	250	9.84	191	7.52	1271.2	50.0	200.5	7.89	19.24	42.42
Flanged							Flange	d connection										
550+F/630+F	550	1165	7	102	16	232		DN 80	370	14.6	280	11.0	1295	51.0	1375	54.1	76.0	167.6
850+F/970+F	850	1801	7	102	16	232	[	ON 100	510	20.1	410	16.1	1360	53.5	1500	59.1	141.0	310.9
850+T	850	1801	7	102	16	232	0	ON 100	510	20.1	418	16.5	796	31.3	200	7.9	35.2	77.6
1100+F/1260+F	1100	2331	7	102	16	232	0	ON 100	510	20.1	410	16.1	1360	53.5	1500	59.1	143.0	315.3
1100+T	1100	2331	7	102	16	232	0	ON 100	510	20.1	418	16.5	966	38.0	200	7.9	37.4	82.4
1400+F/1600+F	1400	2967	7	102	16	232	0	ON 150	620	24.4	485	19.1	1480	58.3	1560	61.4	210.0	463.0
1800+F/2200+F	1800	3814	7	102	16	232	0	ON 150	640	25.2	490	19.3	1555	61.2	1640	64.6	176.0	388.0
2200+F/2400+F	2200	4662	7	102	16	232		ON 150	640	25.2	490	19.3	1555	61.2	1640	64.6	178.0	392.4
3000+F/3600+F	3000	6357	7	102	16	232	0	ON 200	820	32.3	650	17.7	1745	68.7	1710	67.3	420.0	925.9
4000+F	4000	8476	7	102	16	232		ON 200	820	32.3	650	17.7	1745	68.7	1710	67.3	428.0	943.6
5000+F	5000	10595	7	102	16	232		ON 200	820	32.3	650	17.7	1745	68.7	1710	67.3	432.0	952.4
6000+F	6000	12714	7	102	16	232		ON 250	920	36.2	815	32.1	2085	82.1	1625	64.0	671.0	1479.3
7000+F	7000	14833	7	102	16	232		ON 250	920	36.2	815	32.1	2085	82.1	1625	64.0	675.0	1488.1
8000+F	8000	16952	7	102	16	232		ON 300	1040	40.9	930	36.6	2070	81.5	1625	64.0	900.0	1984.2

# Temperature correction factors QD+

At higher temperatures, more compressor oil evaporates. When the actual working air inlet temperature differs from the reference, divide the filter capacity by the corresponding correction factors to obtain the correct capacity.

Inlet temperature °C	20	25	30	35	40	45	50	55	60
Inlet temperature °F	68	77	96	95	104	113	122	131	140
Correction factor oil-free	1	1	1	1	1	1	1	1	1
Correction factor oil-lubricated	1	1	1	1.2	1.5	1.7	2.1	2.4	2.6

Some environmental or process aspects could cause a higher amount of hydrocarbons or other volatile organic compounds in the compressed air. Contact Atlas Copco when higher concentrations can be expected.

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# **QDT Series**

# Activated carbon towers for optimal oil vapor filtration

The high-efficiency activated carbon tower is capable of removing hydrocarbons, odors and oil vapor from compressed air. The activated carbon will, through adsorption, reduce the residual oil content to lower than 0.003 mg/m³. The pressure drop is low and stays minimal during the filter's lifetime.



## Your benefits:

- Maximum oil vapor removal Superb activated carbon material.
- Low pressure drop Optimal internal flow path.
- **High reliability** The QDT's robust design and rigorous quality control of the activated carbon optimize filter reliability.
- Long service intervals The high volume of activated carbon material ensures a long lifetime, even in very harsh working conditions.

# **Options**

- Oil indicator ensures pure air.
- Wall mounting kit for easy installation (20-185 l/s).

#### **Performance**

	QDT
Contaminant	Oil vapor
Test method	ISO 8573-5:2001, ISO 12500-2:2007
Maximum oil carry-over (mg/m³)*	0.003
Average dry pressure drop (mbar)	125 (QDT 20-310) 72 (QDT 425-1800)
Element service	After 4,000 operating hours or 1 year (up to QDT 310) After 8,000 operating hours or 1 year (from QDT 425)
Precede with	Water separation UD+ or DD+/PD+ Dryer

<sup>\*</sup> After UD+ or DD+/PD+.



QDT 20-310



QDT 425-1800

# Certification

ISO 8573-5:2001

# Sizing & dimensions

			Connections				Weight				
Filter size	Nomina	capacity	G or NPT	A			В	(	2	vve	gnt
	l/s	cfm	in	mm	in	mm	in	mm	in	kg	lbs
20	20	42	1/2	490	19	223	9	190	7	7	22
45	45	95	1	715	28	223	9	190	7	15	33
60	60	127	1	840	33	223	9	190	7	18	40
95	95	210	1	715	28	387	15	190	7	29	64
125	125	265	1 1/2	840	33	387	15	190	7	34	75
150	150	318	1 1/2	715	28	551	22	190	7	42	93
185	185	392	1 1/2	840	33	551	22	190	7	50	110
245	245	519	1 1/2	840	33	715	28	190	7	67	148
310	310	657	1 1/2	840	33	879	35	190	7	84	185
425	425	901	DN 80 3"	2148	85	710	28	600	24	264	581
550	550	1165	DN 80 3"	2190	86	710	28	670	26	302	664
850	850	1801	DN 100/4"	2320	91	724	29	805	32	391	860
1100	1100	2331	DN 100/4"	2450	97	934	37	820	32	602	1324
1800	1800	3814	DN 150/6"	2612	103	1046	41	980	39	882	1940

#### **Correction factors**

For other compressed air inlet temperatures, divide the filter capacity by the following correction factor (Kt):

Inlet temperature °C	10	15	20	25	30	35	40	45	50	55	60	65	70*	75*	80*
Inlet temperature °F	50	59	68	77	96	95	104	113	122	131	140	149	158	167	176
Correction factor oil-free	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Correction factor oil-lubricated	1	1	1	1	1	1	1.2	1.5	1.7	2.1	2.4	3	3.5	4.1	4.9

<sup>\*</sup> For QDT flanged only

For other compressed air inlet pressures, multiply the filter capacity by the following correction factor (Kp):

Inlet pressure bar	3	4	5	6	7	8	9	10	11	12	13
Inlet pressure psi	44	58	73	87	102	116	131	145	160	174	193
Correction factor	0.57	0.77	0.83	1	1	1	1	1.05	1.05	1.11	1.18

### **UD+ & QDT: the winning combination**

The Atlas Copco UD+ - QDT filter train meets the requirements of air purity class 1 for total oil, according to ISO 8573-1:2010, in a typical compressed air installation:

UD+	QDT
Liquid oil & oil aerosol removal	Oil vapor removal
Guaranteed 0.0009 mg/m³ aerosol and liquid	Guaranteed 0.003 mg/m³ vapor
40% pressure drop reduction compared to DD+/PD+	65% pressure drop reduction compared to previous QDT
50% footprint reduction	Extremely compact compared to vessel designs

#### **Certified filter trains**

Filter train	Purity class according to ISO 8573-1:2010	Certified
UD+ - QDT - DDp+	[2:-:1]	yes
UD+ - QDT - DDp+ PDp+	[1::1]	yes
UD+-QD+	[2::1]	yes

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# **SFA Series**

## Silicone-free removal of oil aerosol, dust and oil vapor

Superb air purity is a prerequisite to safeguard your instruments and end products. Our silicone-free SFA filters efficiently prevent dry and wet dust, particulates, oil aerosol and water droplets from entering your compressed air system. The SFA series is manufactured and treated according to the high standards of silicone-free equipment, and certified by the Fraunhofer Institute as guaranteed silicone-free.











## Your benefits:

- Maximum contaminant removal Removal of dry and wet dust, particulates, oil aerosol and water droplets with highefficiency glass fiber and fleece media.
- Significant energy savings & limited system operating costs - Optimal design and filter media allow for a low pressure drop.
- **High reliability** Stainless-steel cores, double O-rings, epoxy-sealed caps and filter housing with anti-corrosive coating.
- Easy maintenance External ribbing on the threaded housing and push-on elements.
- Monitoring of energy use Differential pressure indication (indicator for sizes 9-32 l/s, gauge for sizes 44-520 l/s optional).



### **Options**

Filter connection kit (9-520 l/s). Wall mounting kit (9-520 l/s). Quick coupling (DD+ & PD+ only). EWD no-loss electronic drain (DD+ & PD+ only). Voltage-free contact mounted in the differential gauge (not for QD+).

#### Certification

Paint compatibility certificate (Fraunhofer Institute)

# Sizing & dimensions

Filter size		ninal acity*	Maximal capacity*		Connections G or NPT	Dimensions							space rtridge ement	Weight	
	cape	,	Сара	,		А		В		С		D			
DD+, DDp+, PD+, PDp+, QD+	l/s	cfm	l/s	cfm	in	mm	in	mm	in	mm	in	mm	in	kg	lbs
9	9	19	11	23	3/8	90	3.54	61	2.40	268	10.55	75	2.95	1	2.2
17	17	36	21	45	1/2	90	3.54	61	2.40	268	10.55	75	2.95	1.1	2.4
32	32	68	40	85	1/2	90	3.54	61	2.40	323	12.72	75	2.95	1.3	2.9
44	44	93	55	117	3/4 & 1	110	4.33	98.5	3.88	374	14.72	75	2.95	1.9	4.2
60	60	127	75	159	1	110	4.33	98.5	3.88	414	16.3	75	2.95	2.1	4.6
120	120	254	150	318	1-1/2	140	5.51	105	4.13	520	20.47	100	3.94	4.2	9.3
150	150	318	188	399	1-1/2	140	5.51	105	4.13	603	23.47	100	3.94	4.5	9.9
175	175	371	219	464	1-1/2	140	5.51	105	4.13	603	23.47	100	3.94	4.6	10.1
280	280	594	350	742	2 & 2-1/2	179	7.05	121	4.76	689	27.13	150	5.91	6.9	15.2
390	390	827	488	1035	3	210	8.27	128	5.04	791	31.14	200	7.87	11	24.2
520	520	1102	650	1378	3	210	8.27	128	5.04	961	37.83	200	7.87	12.6	27.8



# **WSD Series**

## **High-performance water separators**

Atlas Copco's WSD prevents condensed water from building up in your air system. The water separator comes as standard with Atlas Copco's aftercoolers and can also be installed at any point in your system. Made entirely of corrosion-proof material, these cyclone-based separators remove water aerosols to protect system components such as dryers and filters. Maintenance-free and without moving parts, they come with an automatic or a manual drain.



### Your benefits:

- A reliable air system The corrosion-proof drain prevents condensed water from building up in your air system.
- **Minimal maintenance** The water separator does not have moving parts and is thus maintenance-free. It comes with an automatic and a manual drain.
- Energy savings The intelligent drain function monitors condensate build-up with liquid level sensors. It drains the condensate only when required to avoid using compressed air inefficiently.
- Flexible installation WSD water separators can be installed at any point in your air net.



# Sizing & dimensions

	Capacit	y range		n working sure	Connections			Weight					
Туре	l/s	cfm	bar(e)	psi	inlet/outlet	mm	inch	mm	inch	mm	inch	kg	lbs
WSD 25	7-60	15-127	20	290	G 1	332	13.0	130	5.1	185	7.3	1.1	2.4
WSD 80	50-150	106-318	20	290	G 1½	432	17.0	130	5.1	185	7.3	3.5	7.7
WSD 250	125-350	265-742	20	290	G 2½	532	20.9	160	6.3	230	9.0	12.5	27.6
WSD 750	300-800	636-1695	20	290	83 mm*	532	20.9	160	6.3	230	9.0	14.0	30.9

<sup>\*</sup> Blind flange to be machined up to this diameter.

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<sup>\*</sup> Nominal pressure: 7 bar(e)/102 psig; temperature: 20°C/68°F.

# **H** Series

## Guaranteed air purity up to 350 bar

High-pressure filters efficiently reduce oil aerosol, dust and wet dust, particulates, water droplets and oil vapor in your compressed air stream to protect your investment, equipment and processes. Our innovative high-pressure filtration solutions are engineered to cost-effectively provide the best air purity and meet today's increasing quality demands for working pressures of up to 350 bar. All high-pressure filter housings are hydraulically tested to ensure safe and reliable operation at all times. A pressure test certificate accompanies each filter.















#### Your benefits:

- Maximum contaminant removal (dry & wet dust, particulates, oil aerosol and water droplets) - High-efficiency glass fiber and fleece media.
- Significant energy savings & limited system operation costs Optimal design and filter media allow for low pressure losses.
- **High reliability** Strong and durable stainless-steel cores, double O-rings, epoxy-sealed caps and filter housing with anti-corrosive coating.

# **Applications**

- Chemical
- Food & beverage
- Manufacturing
- Military
- Oil & gas

#### **Performance**

	DDHp+	PDHp+	DDH+	PDH+	QDH+
Contaminant	Dry	dust	Oil aeroso	I/wet dust	Oil vapor
Test method	ISO 8573 ISO 1250		ISO 8573 ISO 1250		ISO 8573-5:2001
Maximum oil carry-over (mg/m³)	-	-	0.08*	0.007*	0.003**
Particle removal efficiency (% at MPPS)	99.92 (0.1)	99.98 (0.06)	N/A	N/A	N/A
ISO class 8573-1	[2:-:-]	[1::-]	[2:-:3]	[1:-:2]	[3:-:1]
Dry pressure drop (mbar)	85	100	N/A	N/A	140
Wet pressure drop (mbar)	N/A	N/A	180	215	N/A
Element service	After 4,000 operatir 350 mbar pr		After 4,000 operat	ing hours or 1 year	After 1,000 operating hours or 1 year
Precede with	N/A	DDHp+	N/A	DDH+	DDH+/PDH+

Always install a liquid water separation system in front of a filter. Water separation is not needed in the high-pressure line if there is a sufficiently low PDP in the low-pressure line (e.g. nitrogen skid, low-pressure line with adsorption dryer).

# Sizing & dimensions

Filter size			:4	Cammantiana	Dimensions							Weight	
	N.	ominal capac	ity	Connections		A		В		С	We	ignt	
DDH, DDHp, PDH, PDHp, QDH	m³/h	l/s	cfm	in	mm	in	mm	in	mm	in	kg	lbs	
20 bar aluminum													
15+	54	15	32	3/8	90	3.5	80	3.1	185	7.3	1.0	2.2	
32+	115	32	68	1/2	90	3.5	80	3.1	185	7.3	1.1	2.4	
55+	198	55	117	1/2	90	3.5	80	3.1	240	9.4	1.3	2.9	
80+	288	80	170	3/4 & 1	110	4.3	100	3.9	260	10.2	1.6	3.5	
110+	396	110	233	1	110	4.3	100	3.9	300	11.8	2.1	4.6	
200+	720	200	424	1 1/2	140	5.5	131	5.2	410	16.1	4.2	9.3	
270+	972	270	572	1 1/2	140	5.5	131	5.2	490	19.3	4.5	9.9	
330+	1188	330	699	1 1/2	140	5.5	131	5.2	490	19.3	4.6	10.1	
490+	1764	490	1038	2 & 2 1/2	179	7	166	6.5	575	22.6	6.9	15.2	
50 bar aluminum													
160+	160	44	94	1/4	63	2.5	63	2.5	150	5.9	0.3	0.7	
250+	250	69	147	3/8	63	2.5	63	2.5	190	7.5	0.3	0.7	
450+	450	125	265	1/2	114	4.5	114	4.5	305	12.0	2.6	5.7	
550+	550	153	324	3/4	114	4.5	114	4.5	305	12.0	2.6	5.7	
835+	835	232	491	1	114	4.5	114	4.5	395	15.6	3.3	7.3	
1250+	1250	347	736	1 1/2	146	5.8	146	5.8	435	17.1	7.5	16.5	
1725+	1725	479	1015	1 1/2	146	5.8	146	5.8	435	17.1	7.5	16.5	
1925+	1925	535	1133	2	146	5.8	146	5.8	435	17.1	7.5	16.5	
3200+	3200	889	1883	2	146	5.8	146	5.8	635	25.0	10	22.0	
50 bar stainless ste	el												
100+	100	28	59	1/4	85	3.4	85	3.4	202	8.0	1.7	3.7	
200+	200	56	118	3/8	85	3.4	85	3.4	227	8.9	2	4.4	
340+	340	94	200	1/2	85	3.4	85	3.4	257	10.1	2.2	4.8	
500+	500	139	294	3/4	110	4.3	110	4.3	270	10.6	4	8.8	
1000+	1000	278	589	1	110	4.3	110	4.3	422	16.6	5	11.0	
1700+	1700	472	1000	1 1/2	150	5.9	150	5.9	517	20.4	15	33.1	
2040+	2040	567	1200	2	150	5.9	150	5.9	517	20.4	15	33.1	
3400+	3400	944	2000	2	150	5.9	150	5.9	817	32.2	21	46.3	
100 bar stainless st													
100+	100	28	59	1/4	65	2.6	65	2.6	135	5.3	3.2	7.1	
315+	315	88	185	1/2	65	2.6	65	2.6	250	9.8	5.6	12.3	
460+	460	128	271	3/4	88	3.5	88	3.5	275	10.8	6.1	13.4	
680+	680	189	400	1	135	5.3	135	5.3	265	10.4	10.5	23.1	
1200+	1200	333	706	1	135	5.3	135	5.3	480	18.9	14.7	32.4	
1700+	1700	472	1000	1 1/2	150	5.9	150	5.9	525	20.7	22	48.5	
3400+	3400	944	2000	2	150	5.9	150	5.9	815	32.1	28	61.7	
350 bar stainless st													
48+	48	13	28	1/4	41	1.6	41	1.6	103	4.0	1.6	3.5	
111+	111	31	65	1/4	65	2.6	65	2.6	135	5.3	3.2	7.1	
255+	255	71	150	1/2	88.5	3.5	88.5	3.5	210	8.2	5.6	12.3	
510+	510	142	300	3/4	88.5	3.5	88.5	3.5	280	10.9	6.1	13.4	
750+	750	208	441	1	150	5.9	150	5.9	330	12.9	14.5	32.0	
1330+	1330	369	783	1	150	5.9	150	5.9	480	18.7	17.4	38.3	

#### **Correction factors**

20 bar aluminum										
Operating pressure	barg	-	-	-	-	-	14	16	18	20
	psig	-	-	-	-	-	203	232	261	290
Correction factor							0.9	0.95	1	1.05
50 bar aluminum & stainless steel										
Operating pressure	barg	4	6	8	10	15	20	30	40	50
	psig	58	87	116	145	218	290	435	581	726
Correction factor		0.14	0.22	0.28	0.34	0.47	0.56	0.7	0.85	1
100 bar stainless steel										
Operating pressure	barg	20	30	40	50	60	70	80	90	100
	psig	290	435	581	726	871	1016	1161	1306	1451
Correction factor		0.45	0.57	0.68	8.0	0.84	0.88	0.92	0.96	1
350 bar stainless steel										
Operating pressure	barg	-	-	50	100	150	200	250	300	350
	psig	-	-	726	1451	2177	2903	3628	4354	5080
Correction factor				0.73	0.78	0.82	0.87	0.91	0.96	1

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<sup>\*</sup> Inlet oil concentration = 10 mg/m $^3$ . Oil = oil aerosol and liquid. \*\* After DD+/PD+ with inlet oil concentration of 10 mg/m $^3$ .





