

HEAVY DUTY LINE  
**FORCE FOUR**  
ELECTRIC

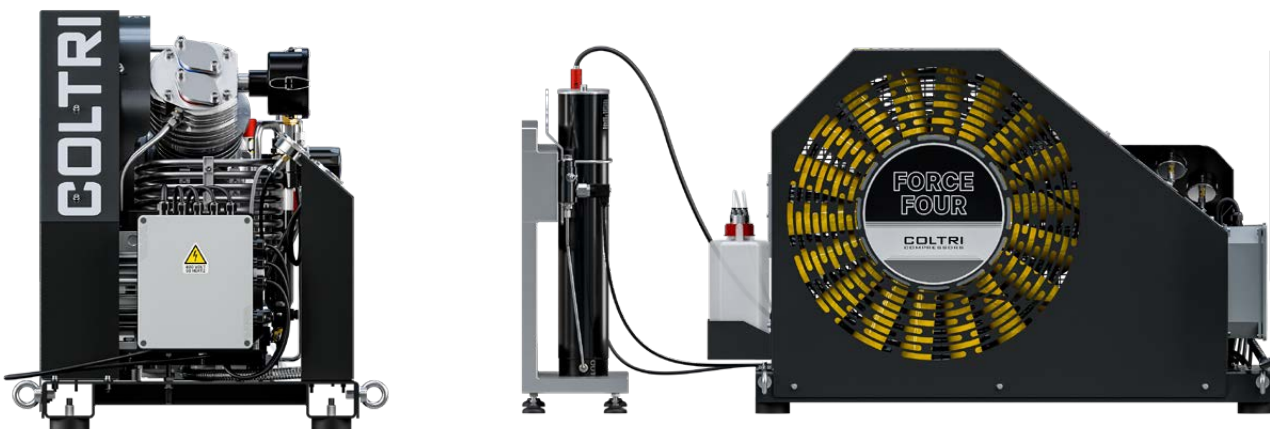


**AUTHORISED RESELLER**

**NORTHERN DIVER**  
COMMERCIAL SUITS & EQUIPMENT

# It goes out of its way to give you the best

The **FORCE FOUR** model meets professional needs that require large charging capacities in hot, poorly ventilated environments or tropical countries. It is equipped with an intuitive control panel and electric motor. The pumping unit, a choice of 4 most powerful, is exposed to ensure a better cooling cycle. It is equipped with the Hyperfilter purification system mounted on a stand-alone system, with automatic condensate drainage. For longer filter life, the Tornado high-pressure dryer is recommended. Available as options: the Presec system for filter saturation control, Megafilter oversized filter cartridges, and 2- or 4-outlet remote refill panel.



## Technical data

Type of gas	Breathing air EN 12021 - Nitrox 40% max O <sub>2</sub> - Helium - Nitrogen
Intake pressure	Atmospheric max 300 bar
Nominal pressure	250 bar / 330 bar / 360 bar
Working pressure	232 bar / 300 bar / 330 bar
Max working pressure	420 bar
Permissible ambient temperature range	-10° C ÷ +40° C
Permissible altitude	0 ÷ 1.500 m SLM
Max permissible tilt	15°
Design	Basic
Operating voltage	230 V, 60 Hz / 400 V, 50 Hz
Other operating voltage	230 V, 50 Hz / 440 V, 60 Hz
Oil	Synthetic Coltri Oil ST 755
Oil change interval	1 year / 1.000 h
Frame	Steel - Colour RAL 9005 - Powder coating painting - Scratch proof

## Compressor

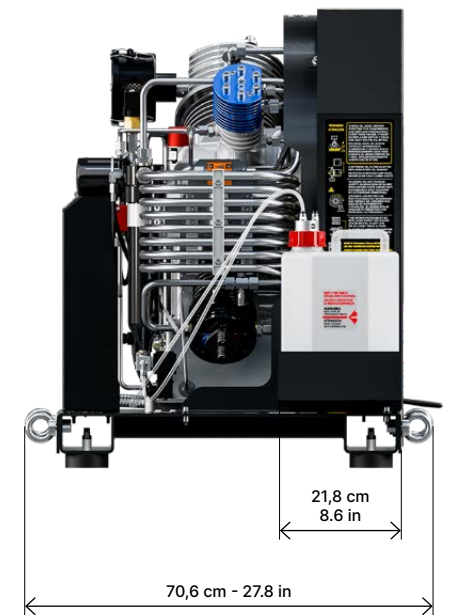
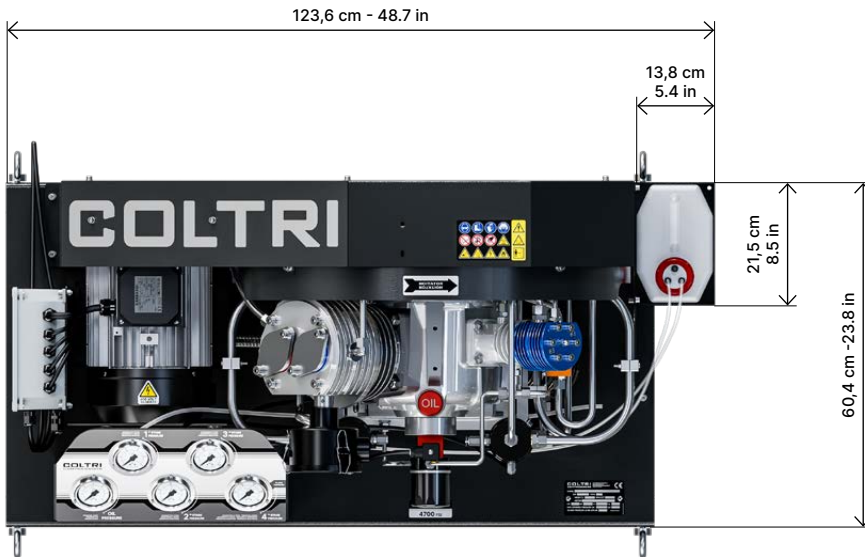
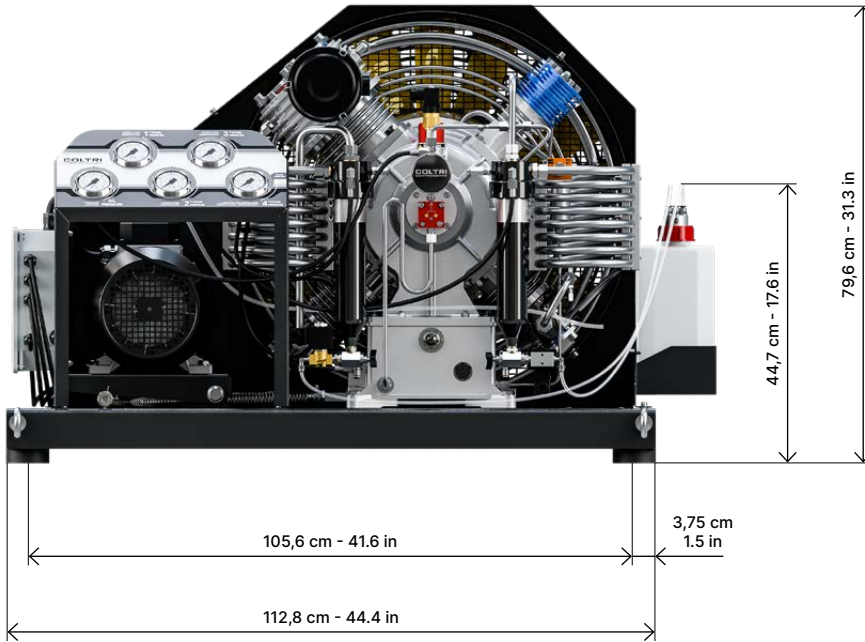
	400 EM	450 ET	650 ET
<b>Charging rate</b> Measured during 10 liters cylinder filling from 0-200 bar tolerance +/- 5% at + 20 ° C ambient temperature.	400 l/min 24 m <sup>3</sup> /h 14,1 cfm	450 l/m 27 m <sup>3</sup> /h 15,9 cfm	650 l/m 39 m <sup>3</sup> /h 23 cfm
<b>Purification System</b>	Hyperfilter x 2		
<b>Cooling air flow</b>	4.050 m <sup>3</sup> /h		4.820 m <sup>3</sup> /h
<b>Weight<sup>1</sup></b>	250 kg - 551 lb		260 kg - 573 lb
<b>Dimensions (W x D x H)<sup>1</sup></b>	123,6 × 70,6 × 79,6 cm - 48.7 × 27.8 × 31.3 in		
<b>Noise</b>	LpA 72 dB		

<sup>1</sup> Standard model. Dimensions may vary depending on accessories.

## Electric motor

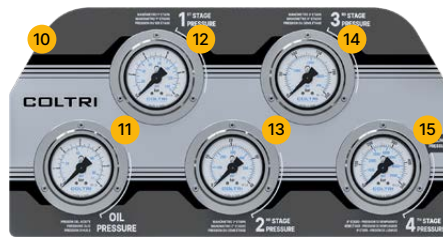
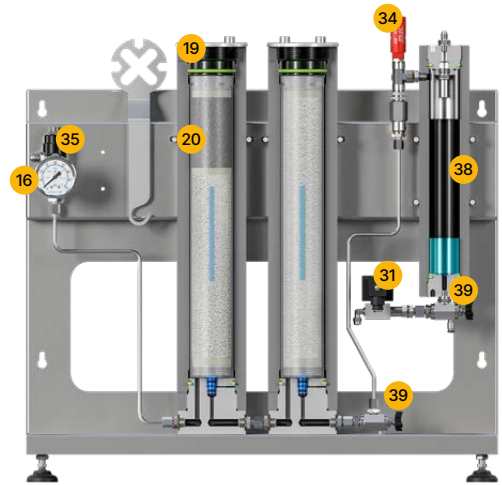
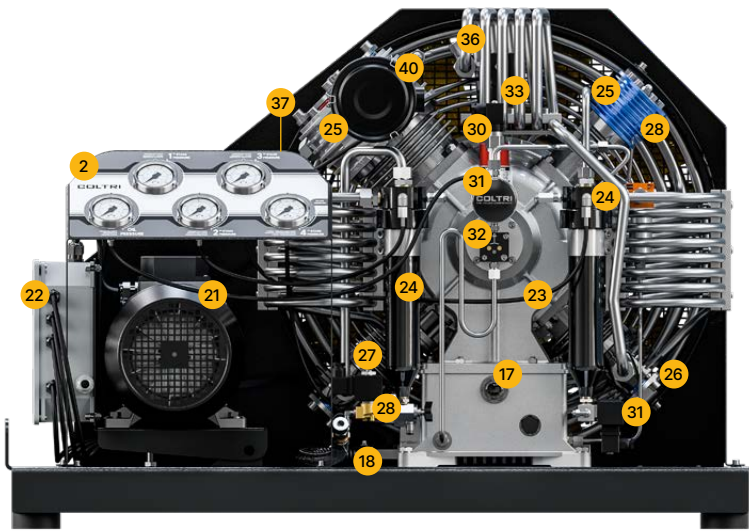
	400 EM	450 ET	650 ET
<b>Power</b>	7,5 kW - 10 hp		11 kW - 15 hp
<b>Type</b>	Single-phase electric	Three-phase electric	
<b>Operating voltage/frequency</b> Different voltage / frequency available on request.	230 V, 60 Hz	400 V, 50 Hz	
<b>Rated current</b>	41,3 A	15 A	23 A
<b>Speed (RPM)</b>	3.525	2.870	2.910
<b>Protection class</b>	IP55		

# Dimensions



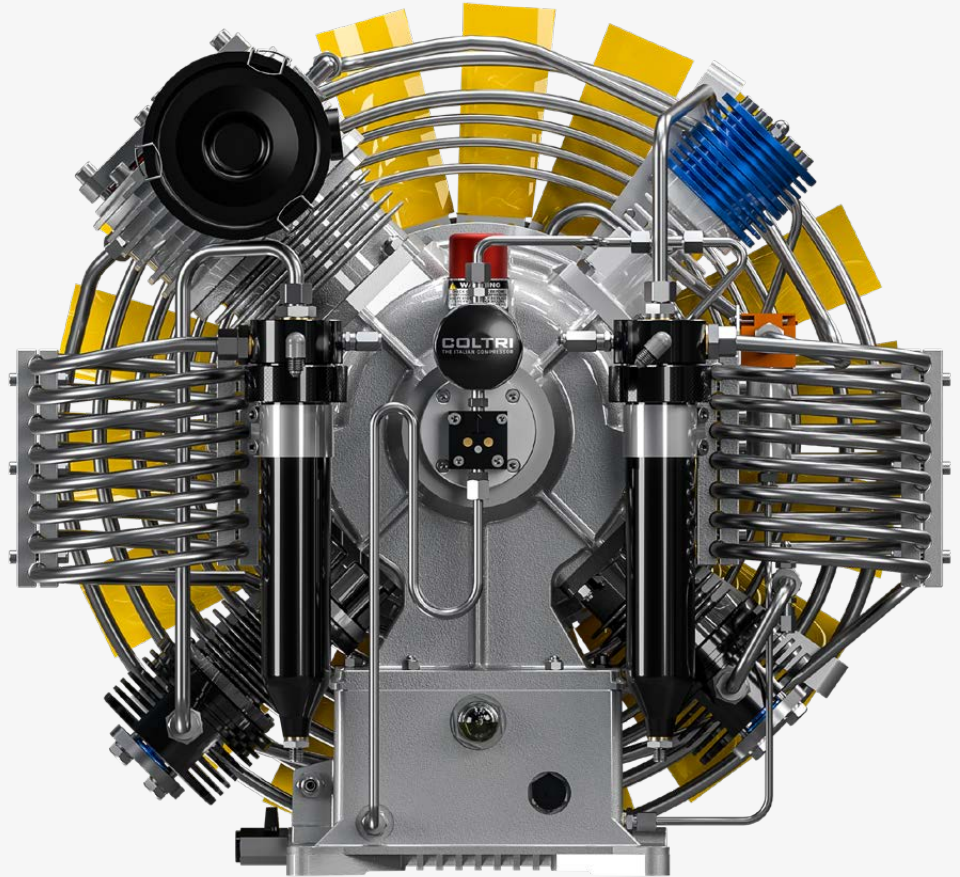


# Components



- 1 Control panel
- 2 Main switch
- 3 ON switch
- 4 Stop pushbutton
- 5 Condensate discharge pushbutton
- 6 Power indicator light
- 7 Direction of rotation indicator light
- 8 Oil level warning light
- 9 Hour meter
- 10 Control Panel
- 11 Oil pressure gauge
- 12 1st stage pressure gauge
- 13 2nd stage pressure gauge
- 14 3rd stage pressure gauge
- 15 4th stage pressure gauge
- 16 Pressure gas/air outlet
- 17 Oil level
- 18 Oil discharge valves
- 19 Purification system
- 20 Filter cartridge Hyperfilter
- 21 Electric motor
- 22 Electrical cabinet
- 23 Pumping unit
- 24 Condensate separator
- 25 1st stage
- 26 2nd stage
- 27 3rd stage
- 28 4th stage
- 29 Condensate discharge valve
- 30 Oil filler plug
- 31 Oil filter
- 32 Oil pump
- 33 Minimum oil pressure switch
- 34 Safety valve
- 35 Maintenance valve pressure
- 36 Cooling fan
- 37 Belt
- 38 Final condensate separator
- 39 Circuit pressure discharge valve
- 40 Suction filter

# Compressor block 400/450

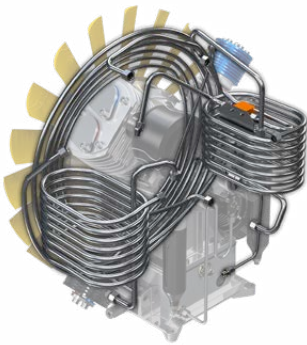


Forced lubrication with  
low pressure gear pump

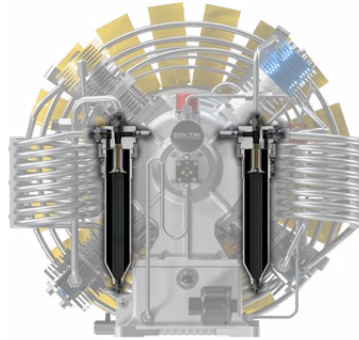
Suction filter:  
10  $\mu$  micron



Pipes, fitting and nuts in  
stainless steel AISI 316



Intermediate condensate  
separator after the second  
and third stage



Synthetic Oil Coltri ST 755  
with special formulation



Discover more on  
Coltri Oil ST 755





**Low oil pressure switch**

It ensures that the compressor only works if the oil pressure, downstream of the pump, is higher than 1.5 bar.



**Safety valves after each stage of compression**



**Special cast iron cylinders with low roughness lapping**

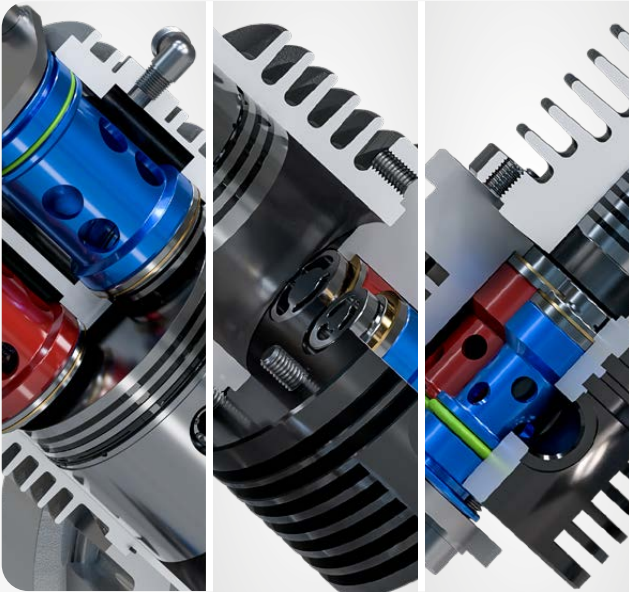


**Forged aluminum connecting rods**



**Forged steel crankshaft**

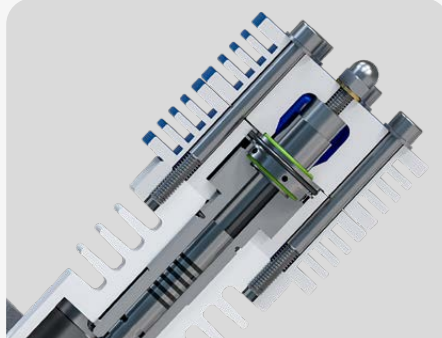




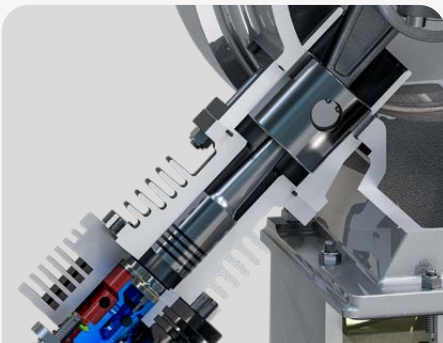
High-flow first, second and third stage valves



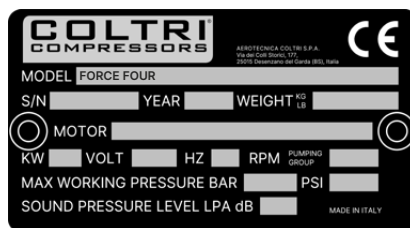
Roller Bearings for intensive work



Fourth stage in tempered steel with 6 piston rings in special cast iron

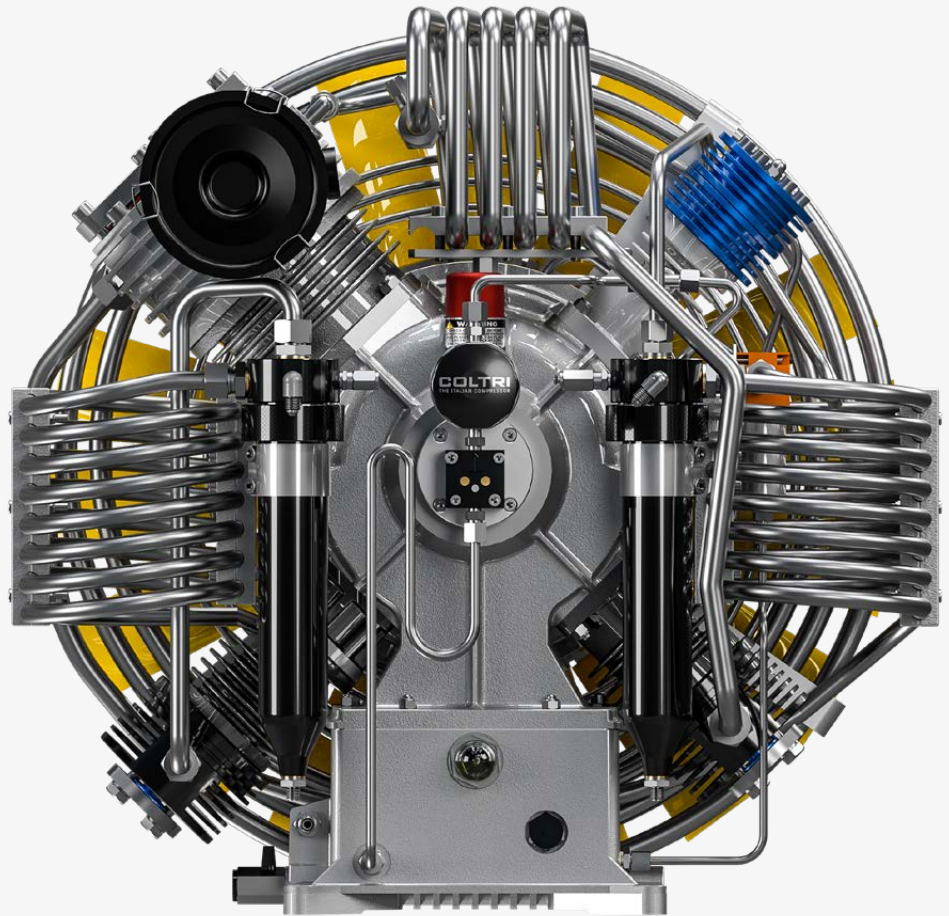


Second and third stage with pushing pistons to eliminate lateral forces on the pistons



CE certification

# Compressor block 650

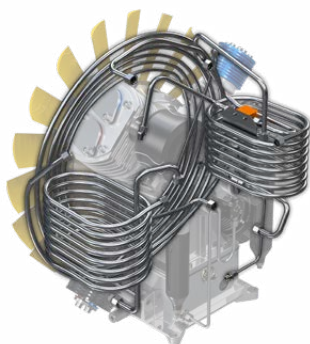


Forced lubrication with  
low pressure gear pump

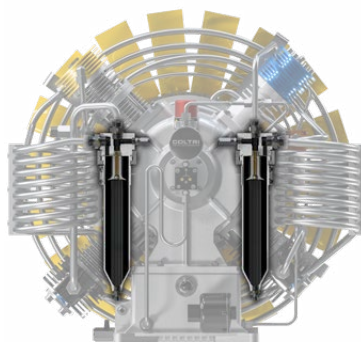
Suction filter:  
10  $\mu$  micron



Pipes, fitting and nuts in  
stainless steel AISI 316



Intermediate condensate  
separator after the second  
and third stage



Synthetic Oil Coltri ST 755  
with special formulation



Discover more on  
Coltri Oil ST 755





**Low oil pressure switch**

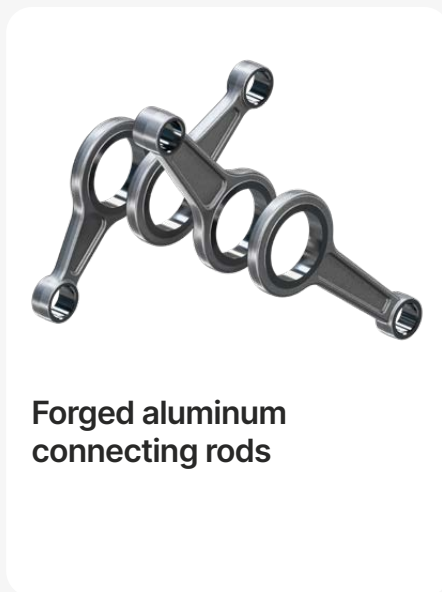
It ensures that the compressor only works if the oil pressure, downstream of the pump, is higher than 1.5 bar.



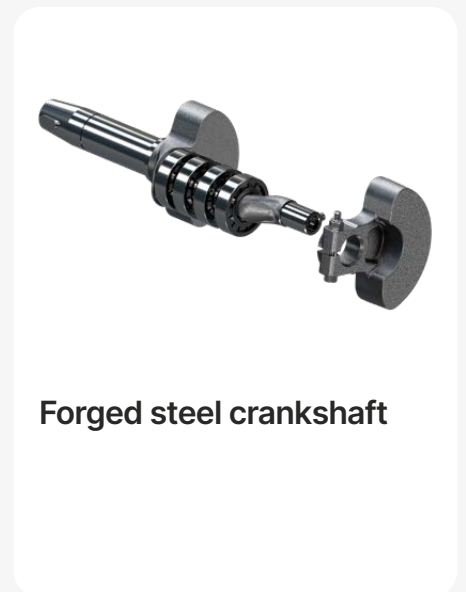
**Safety valves after each stage of compression**



**Special cast iron cylinders with low roughness lapping**

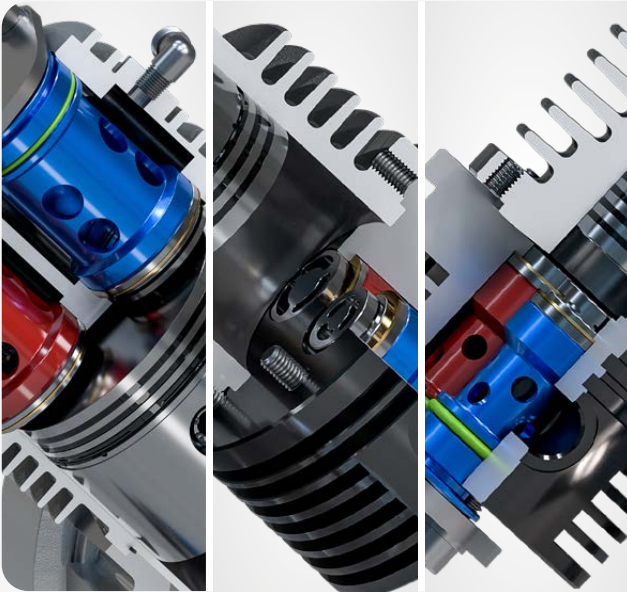


**Forged aluminum connecting rods**



**Forged steel crankshaft**

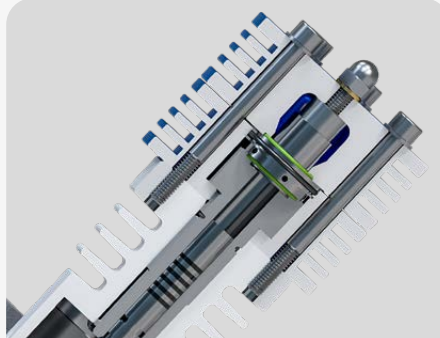




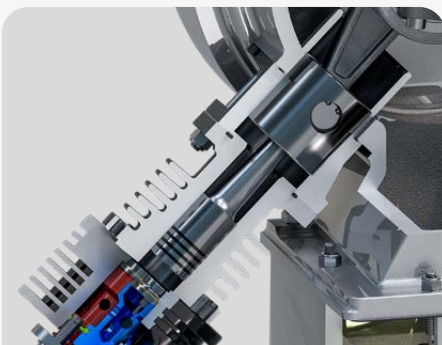
High-flow first, second and third stage valves



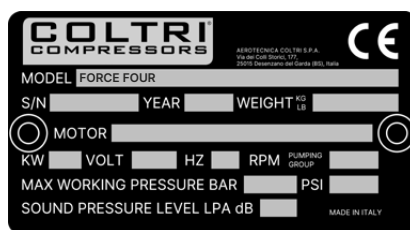
Roller Bearings for intensive work



Fourth stage in tempered steel with 6 piston rings in special cast iron



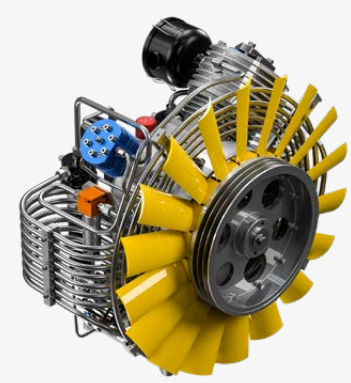
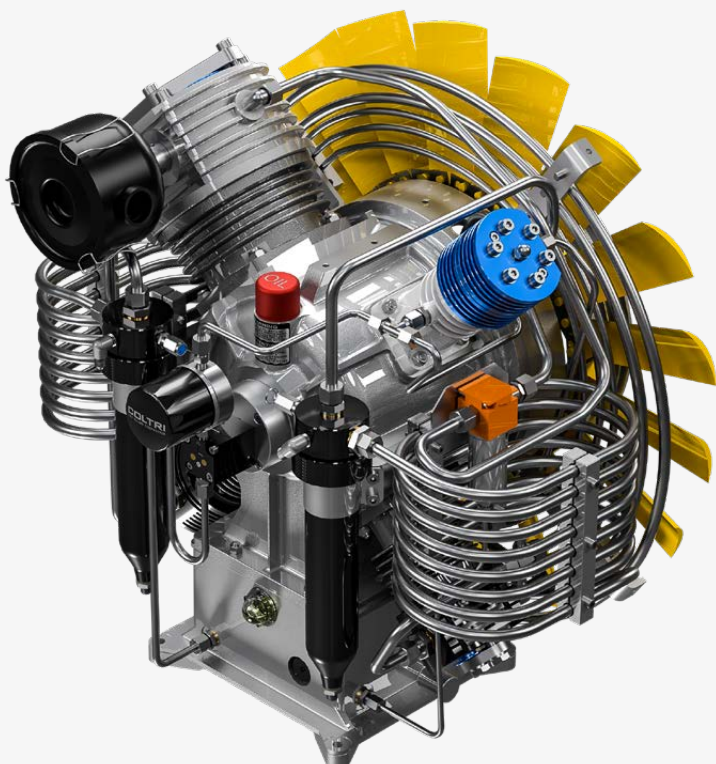
Second and third stage with pushing pistons to eliminate lateral forces on the pistons



CE certification

# Technical data Compressor block

	400 EM	450 ET	650 ET
<b>Charging rate</b> Measured during 10 liters cylinder filling from 0-200 bar tolerance +/- 5% at + 20 ° C ambient temperature.	400 l/min 24 m³/h 14,1 cfm	450 l/m 27 m³/h 15,9 cfm	650 l/m 39 m³/h 23 cfm
<b>Speed (RPM)</b>	950	1.050	1.250
<b>Number of stages</b>		4	
<b>Number of cylinders</b>		4	
<b>Cylinder bore 1st stage</b>	120 mm		130 mm
<b>Cylinder bore 2nd stage</b>		60 mm	
<b>Cylinder bore 3rd stage</b>		32 mm	
<b>Cylinder bore 4th stage</b>		15 mm	
<b>Stroke</b>		50 mm	
<b>Direction of rotation (from flywheel side)</b>		Counter clockwise (left)	
<b>Drive type</b>		V-belt A type	
<b>Intermediate pressure 1<sup>st</sup> stage</b>		~ 3,2 bar	
<b>Intermediate pressure 2<sup>nd</sup> stage</b>		~ 16 bar	
<b>Amount of oil</b>		4 liters	
<b>Max intake pressure</b>		1,3 bar <sub>a</sub> – 300 millibar	



# Standard equipment

## Purification system Hyperfilter

DOUBLE HYPERFILTER regenerable or disposable cartridge



- 1 Hyperfilter body
- 2 Upper cap
- 3 O-Ring
- 4 Cartridge spring
- 5 Hyperfilter cartridge
- 6 Fitting
- 7 Lower cap
- 8 Stainless hook
- 9 Upper cap
- 10 Felt disc
- 11 Network Disc

**Purification system**

**Hyperfilter x 2**

Operating pressure (Standard)

250 bar / 330 bar / 360 bar

Operating pressure max. (PS)

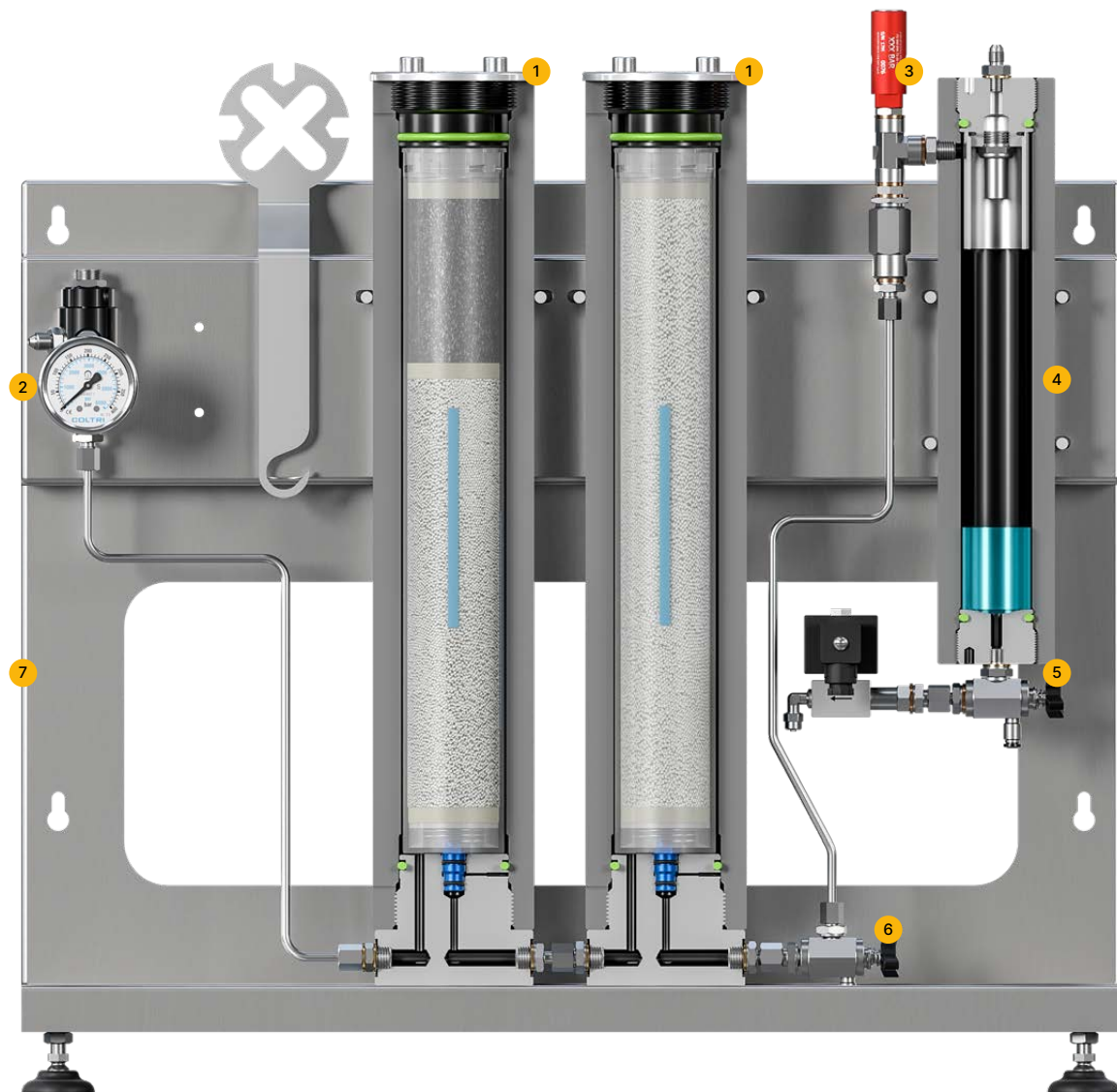
420 bar

Processable air capacity  
(air inlet temperature in the filter 20° C at 300 bar)<sup>1</sup>

3.050 m<sup>3</sup>

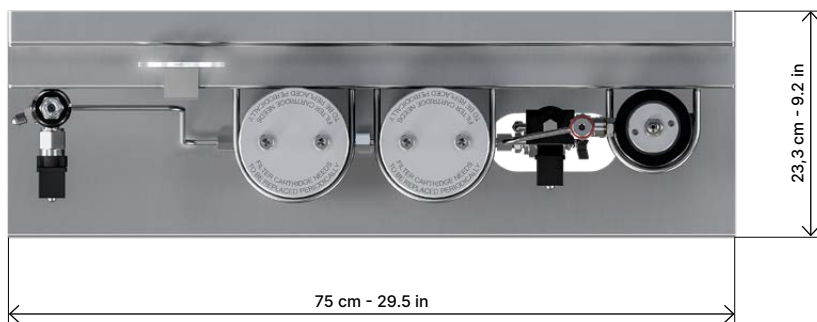
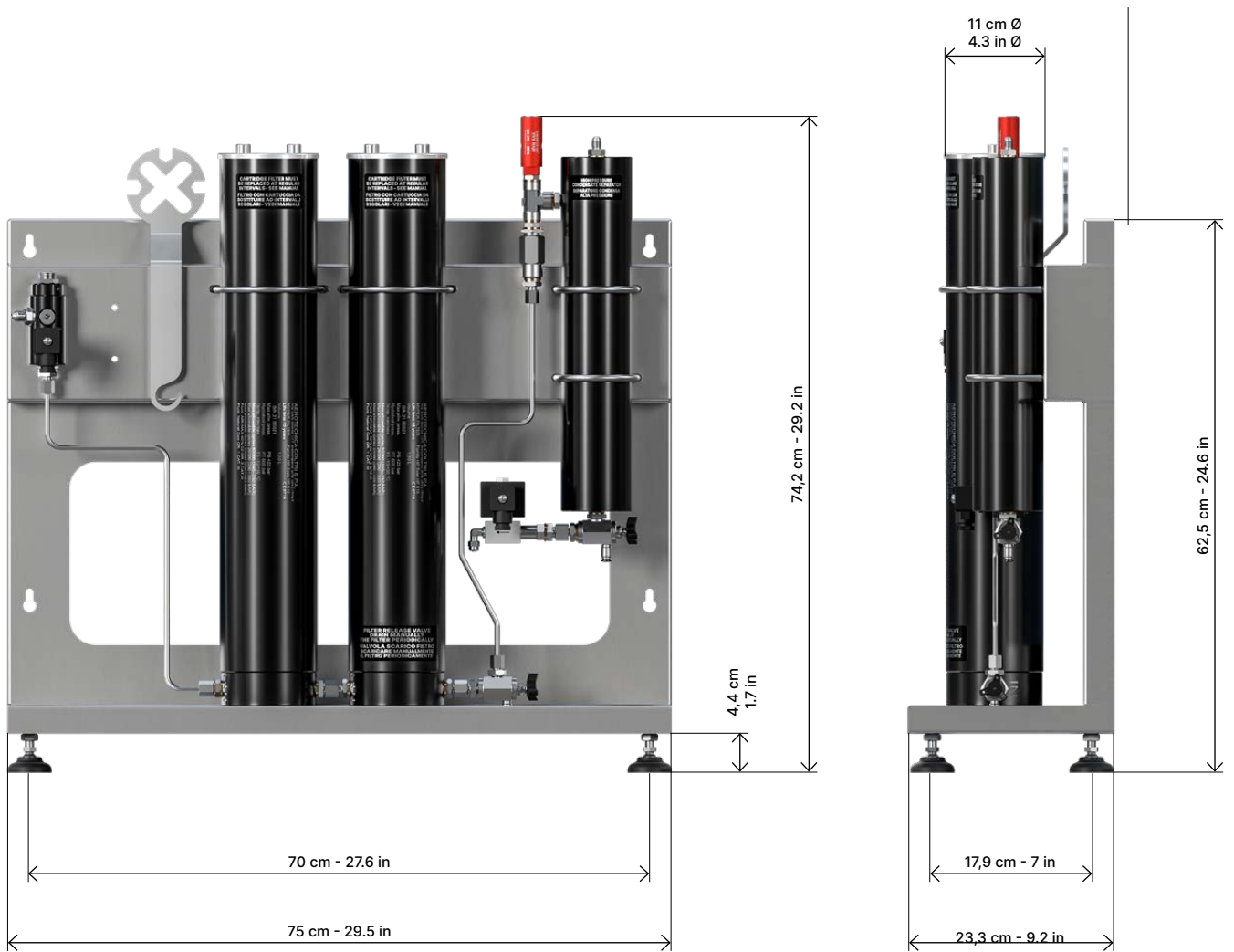
<sup>1</sup> When using a filter cartridge without HOPCALITE CO CATALYST.  
When using a cartridge with CO-removal, the processable air capacity is reduced by ca. 20%.

## Stand-alone kit with Hyperfilter



- 1 Purification system
- 2 Pressure gauge
- 3 Safety valve
- 4 Condensate separator
- 5 Automatic condensate drain for external separator\*
- 6 Manual filter discharge
- 7 Stainless steel frame with provision for wall mounting





## Additional purification system with Hyperfilter

### Safety valve

(variable according to customer request)

### Pressure maintenance valve

### External Hyperfilter separator and filters kit

### Ground or stand-alone stainless steel support



## Automatic condensate drain



## High pressure final condensate separator double effect

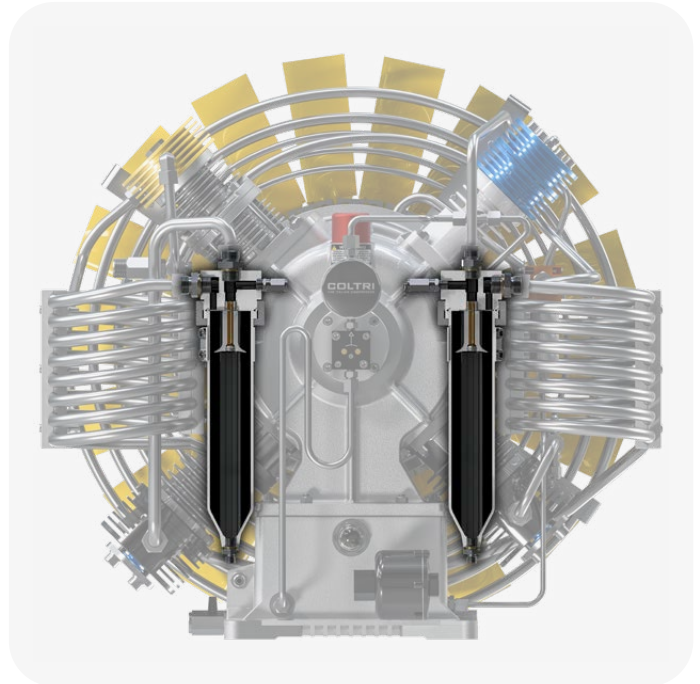
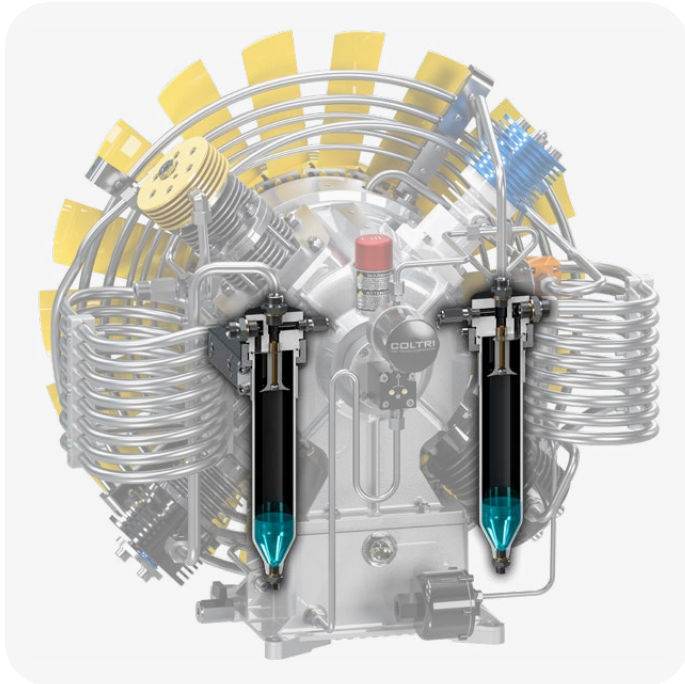


The automatic condensate drain removes water from the intermediate separator and the final separator automatically during operation (every 7 minutes).

Consists of: 1 x solenoid valve

## Separator system

- Interstage separator after 2nd stage, forged and anodized aluminum
- Double final separator for removal of oil/water condensate
- Final safety valve, mounted on the separator housing
- Pressure maintenance valve / non-return valve



Contamination	Maximum content as per DIN EN 12021:2014	Air quality*
H <sub>2</sub> O	25 mg/m <sup>3</sup>	≤ 10 mg/m <sup>3</sup>
CO	5 ppm(v)	≤ 4
CO <sub>2</sub>	500 ppm(v)	≤ 500
Oil	0,5 mg/m <sup>3</sup>	≤ 0,5 mg/m <sup>3</sup>

\* Measured at our facility using ASCO HORA 160 ANALYZER.

1 Only with special filter cartridge with HOPCALITE CO CATALYST, and up to a maximum concentration of 25 ppm CO in intake air. The compressed clean breathing air then contains a maximum of 5 ppm CO.

2 The level of CO<sub>2</sub> in the intake air must not exceed the maximum level of CO<sub>2</sub> as per EN 12021:2014

3 Reported values exceed ISO 8573-1 standards.



## Filling connection

2 Filling connection to choose from: DRV DIN 232 bar and DRV DIN 300 bar.



**Filling connection DRV  
DIN 232 bar**  
COD. DRV232



**Filling connection DRV  
DIN 300 bar**  
COD. DRV300

Filling device	DRV DIN 232	DRV DIN 300
Nominal pressure (PN)	250 bar	330 bar
Technical Specifications	Filling valve with integrated ventilation, with connection for G 5/8" cylinders to EN 144-2 and 477 PN232	Filling valve with integrated ventilation, with cylinder connector G 5/8" according to EN 144-2 and 477 PN300

## Filling hose

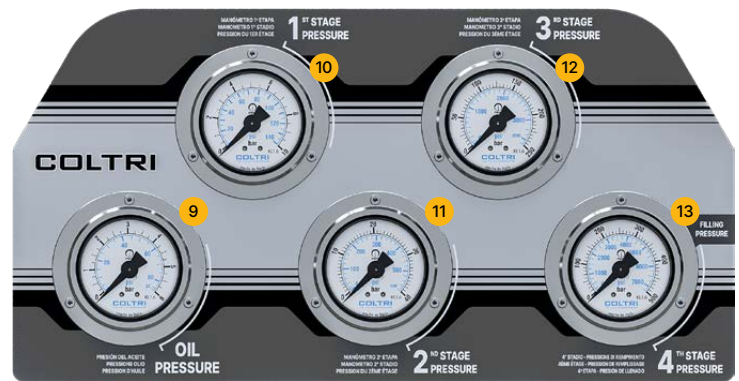
1200 mm stainless steel fittings - max working pressure 420 bar



# Compressor control and automatic condensate drain system

- Motor protection switch.
- Pressure switch with fixed setting 232 or 300 bar.
- Autostart with pressure differential 15 bar (optional).
- Transformer.
- Drainage of all separators between the individual stages and also of the final separator during compressor operation (standard drain interval every 15 minutes for a period of 6 seconds).
- Timer for automatic condensate drainage device.
- Interstage pressure gauges display the operating pressure for the individual compression stages. This pressure information allows you to check the tightness of the valves (inlet and outlet) of each stage and quickly identify potential sources of failure.

The interstage pressure gauges are mounted in the compressor frame.



- |                                  |                             |                             |
|----------------------------------|-----------------------------|-----------------------------|
| 1 Power button                   | 6 Condensate drain light    | 11 2nd stage pressure gauge |
| 2 Stop button                    | 7 Operating hours counter   | 12 3rd stage pressure gauge |
| 3 Voltage presence warning light | 8 Main switch               | 13 4th stage pressure gauge |
| 4 Oil level warning light        | 9 Oil pressure              |                             |
| 5 Fault motor light              | 10 1st stage pressure gauge |                             |

## Plugs available according to electric motor



### 230 V single-phase electric motor

6h/200 - 250V~

50÷60 Hz

32 A

2P+⏏



### 230 V three-phase electric motor

9h/200 - 250V~

50÷60 Hz

32 A

3P+⏏



### 400 V three-phase electric motor

6h/380 - 415V~

50÷60 Hz

16 A

3P+⏏



### 400 V three-phase electric motor

6h/200/346 - 240/415V~

50÷60 Hz

32 A

3P+N+⏏

# Data sheet mono-phase electric motor 7.5 kW



**DATA SHEET**


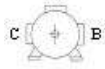
Single Phase Induction Motor - Squirrel Cage

Customer		: FERRARI SRL		
Product line		: IP55 - W22		
Frame	: 132M	Locked rotor time	: 8 s (hot)	
Output	: 7.5 kW (10 HP)	Duty cycle	: S1	
Poles	: 2	Ambient temperature	: -20 °C to +40 °C	
Frequency	: 60 Hz	Altitude	: 1000 m.a.s.l	
Rated voltage	: 230 V	Degree of protection	: IP55	
Rated current	: 41.3 A	Cooling method	: IC411 - TEFC	
L. R. Amperes	: 330 A	Mounting	: B3L(D)	
LRC (p.u.)	: 8.0	Direct of rotation <sup>1</sup>	: Both	
No load current	: 14.9 A	Noise level <sup>2</sup>	: 72.0 dB(A)	
Rated speed	: 3525 rpm	Starting method	: Direct On Line	
Slip	: 2.08 %	Approx. weight <sup>3</sup>	: 70.0 kg	
Rated torque	: 2.07 kgfm			
Locked rotor torque	: 220 %			
Pull up torque	: 185 %			
Breakdown torque	: 310 %			
Insulation class	: F			
Service factor	: 1.15			
Moment of inertia (J)	: 0.0223 kgm <sup>2</sup>			
Output	50%      75%      100%	Load type: -		
Efficiency (%)	79.9      82.4      83.9	Load torque: -		
Power factor	0.83      0.90      0.94	Load inertia (J=GD <sup>2</sup> /4): -		
	<u>Drive end</u> <u>Non drive end</u>	Foundation loads		
Bearing type	6308-ZZ      6206-ZZ	Maximum traction	: -	
Lubrication interval	-      -	Maximum compression	: -	
Lubricant amount	-      -			
Lubricant type	MOBIL POLYREX EM			
Notes:				
Standards	Specification	: IEC 60034-1	Vibration	: -
	Tests	: IEC 60034-2	Tolerance	: IEC 60034-1
	Noise	: IEC 60034-9		
This revision replaces and cancels the previous one, which must be eliminated.		These are average values based on tests with sinusoidal power supply, subject to the tolerances stipulated in IEC 60034-1.		
(1) When viewed from the drive end.				
(2) Measured at 1m and with tolerance of +3dB(A).				
(3) Approximate weight subject to changes after manufacturing process.				
(4) At the rated point.				
Rev.	Summary of changes	Performed	Checked	Date
Performed by	dferoldi	FD-530107/2018		
Checked by	abenedetti	Page	Revision	
Date	18/03/2021	1/1	1	


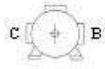
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## Data sheet three-phase electric motor 7.5 kW

		<b>SPECIFICA TECNICA MOTORE EL.</b> <i>Electric motor technical data sheet</i>			Potenza/ Power (kW)	Poli/ Poles
					7,5	2
		Data		25/06/2015	Rev. 0	
No	Descrizione/Description	Dati/Data			U.d.m.	
1	Codice Soga / ref.code	150778				
2	Modello / Motor type	MT1 132SB/2				
3	Descrizione / Description	Three-phase asynchronous motor 7,5kW 2 Poles 400/690V 50Hz				
4	Carcassa motore / Framesize	132S				
5	Poli / Poles	2				
6	Forma di costruzione / Mounting type	IM B3				
7	Potenza nominale / Rated output	7,5	7,5	9	[kW]	
8	Fattore di servizio / Service factor	1.0				
9	Tipo di servizio / Duty type	S3-75%				
10	Tensione / Rated voltage	400/690	400/690	Δ440-480	[V]	
11	Frequenza / Rated frequency	50	60	60	[Hz]	
12	Corrente nominale / Rated current	15/8,7	15/8,7	15	[A]	
13	Velocità nominale / Rated speed	2870	3440	3440	[min <sup>-1</sup> ]	
14	Fattore di potenza / Power factor	0,87	0,87	0,87		
15	Coppia nominale motore/ Rated motor torque	25	20,8	25	[Nm]	
17	Corrente avviamento / Corrente nominale Starting current / Rated current	6,9			Isp/In	
18	Coppia avviamento / Coppia nominale Starting torque/Rated torque	2,7			Msp/Mn	
19	Classe d'isolamento / Insulation class	F				
20	Grado di protezione / Enclosure	IP54				
21	Posizione scatola morsettiera (motore con piedini) Terminal box position (motor with feet)				A	
22	Terminali potenza / Power leads terminal	M6				
23	Peso / Weight	42			[kg]	
24	Cuscinetti /bearings	Drive end	6208			
		Non drive end	6208			
<b>Note/remarks:</b> Targa con logo Coltri Compressors.						

## Data sheet three-phase electric motor 11 kW

		<b>SPECIFICA TECNICA MOTORE EL.</b> <i>Electric motor technical data sheet</i>			Potenza/ Power (kW)	Poli/ Poles
					11	2
		Data		24/06/2015	Rev.	0
No	Descrizione/Description	Dati/Data			U.d.m.	
1	Codice Soga / ref.code	124545				
2	Modello / Motor type	MT1 132MC/2				
3	Descrizione / Description	Three-phase asynchronous motor 11kW 2 Poles 400/690V 50Hz				
4	Carcassa motore / Framesize	132M				
5	Poli / Poles	2				
6	Forma di costruzione / Mounting type	IM B3				
7	Potenza nominale / Rated output	11	11	13	[kW]	
8	Fattore di servizio / Service factor	1.0				
9	Tipo di servizio / Duty type	S3-75%				
10	Tensione / Rated voltage	400/690	400/690	Δ 440-480	[V]	
11	Frequenza / Rated frequency	50	60	60	[Hz]	
12	Corrente nominale / Rated current	23/13,3	23/13,3	23	[A]	
13	Velocità nominale / Rated speed	2910	3500	3500	[min <sup>-1</sup> ]	
14	Fattore di potenza / Power factor	0,87	0,91	0,87		
15	Coppia nominale motore/ Rated motor torque	36	30	35,5	[Nm]	
17	Corrente avviamento / Corrente nominale Starting current / Rated current	6,8			Isp/In	
18	Coppia avviamento / Coppia nominale Starting torque/Rated torque	2,7			Msp/Mn	
19	Classe d'isolamento / Insulation class	F				
20	Grado di protezione / Enclosure	IP55				
21	Posizione scatola morsettiera (motore con piedini) Terminal box position (motor with feet)				A	
22	Terminali potenza / Power leads terminal	M6				
23	Peso / Weight	52			[kg]	
24	Cuscinetti /bearings	Drive end	6308			
		Non drive end	6308			
<b>Note/remarks:</b> Targa con logo Coltri Compressors.						

# Optional

## Presec. Filter control system

**Includes:**

Filter cap with sensor + control unit + cartridge.

To be installed with the Hyperfilter filter system filter system on the compressor.

If you choose the Presec system, you cannot also install the the SAM Multigas Analysis System.

The Presec system is connected through a probe with the first filter cartridge and detects its saturation status transmitting to the indicator the relevant switching signals according to the status. If the filter cartridge is exhausted, the compressor is switched off and cannot be started until the cartridge is replaced. The presec system displays 4 levels of cartridge saturation through 3 relays connected to 3 leds:

**Stable green light (a):**

- The system is operational; OK cartridge

**Yellow light button (b):**

- Pre-alarm; cartridge is running low and must be replaced soon.

**Red light button (c):**

- Alarm; remove cartridge, replace immediately.

**Red light button (c):**

- Alarm; filter cartridge is missing or filter system is interrupted; compressor shuts down and cannot be turned back on without inserting a new cartridge or discovering the source of the alarm.

While the yellow light is pulsing (b), the steady green light (a) will still be on because the filter cartridge will not be fully saturated. If no LED lights up, it means that the PRESEC lacks power or that the electrical system is faulty.

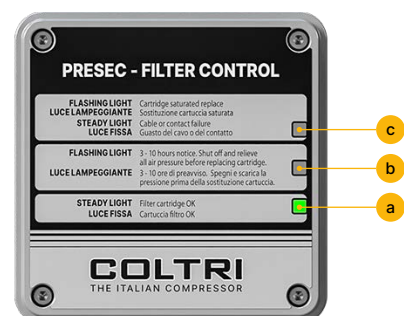


PRESEC SENSOR

COD. SC000550











## Filter saturation values

Light	Humidity (mg/m <sup>3</sup> )
Green	15 - 20
Yellow	20 - 25
Red	> 25



## C - Monitor

Final filter monitoring system, oil change and technical interface.

The interface consists of an LCD display, a button  and two indicators (, ). The decimal points next to the digits are indicator lights to indicate alarms or warnings in progress. Each dot is associated with an explanatory icon (, , , ). The icon  indicates an alarm condition while the symbol  indicates normal operation. Press the button  to scroll through the different functions of the menu. When pressed, the function is displayed the function and after two 2 seconds the related data.



- 1 Display
- 2 Cartridge saturation
- 3 Service indication
- 4 Battery charge level
- 5 Operation indicator

## Tornado refrigerator - Dryer



Used on Prime line (Mark III Silent, Super Silent) e Heavy Duty line (Silent, Open).  
Dryer for high pressure compressed air.

Up to 3 times longer filter service life.

- Higher air quality
- Less corrosion of mechanical parts
- Refilling of cylinders with constant percentage of humidity

The **TORNADO** refrigerator is an accessory for our recharge stations dedicated to professional use that operates between the separators and the filtering system. **Available in 350 or 420 bar versions.**

### How Tornado works

The incoming warm, moist air passes into the evaporator of this machine, inside which it cools. This allows the moisture to condense. Condensation is then easily removed from the separator, ensuring an overall improvement in the operation of the charging station over time and the longevity of its filters.



## Remote charging panels with lever



COD. SC000327/N

### Single pressure

- 4 Lever taps
- 1 Gauge
- 4 HP hoses 1.20 m - 3.9 ft DIN 232 bar or DIN 300 bar or INT/YOKE
- 1 HP hose 3 m - 9.8 ft from compressor



COD. SC000331/N

### Double pressure

- 4 Lever taps
- 2 Gauges
- 1 Pressure regulator
- 2 HP hoses 1.20 m - 3.9 ft DIN 232 bar or INT/YOKE
- 2 HP hoses 1.20 m - 3.9 ft DIN 300 bar
- 1 HP hose 3 m - 9.8 ft from compressor



Filling connection 232 bar for lever tap with safety pin

COD. SC000936



Filling connection 300 bar for lever tap with safety pin

COD. SC000937



Filling connection INT/YOKE for lever tap with safety pin

COD. SC000935

## Remote charging panels



COD. SC000325/N

### Single pressure Charging panel

- 4 DRV DIN 232 bar or DRV DIN 300 bar
- 1 Gauge
- 4 HP hoses 1.20 m - 3.9 ft
- 1 HP hose 3 m - 9.8 ft from compressor



COD. SC000329/N

### Double pressure Charging panel

- 2 DRV DIN 232 bar
- 2 DRV DIN 300 bar
- 2 Gauges
- 1 Pressure regulator
- 4 HP hoses 1.20 m - 3.9 ft
- 1 HP hose 3 m - 9.8 ft from compressor



Filling connection DRV  
DIN 232 bar

COD. DRV232



Filling connection DRV  
DIN 300 bar

COD. DRV300