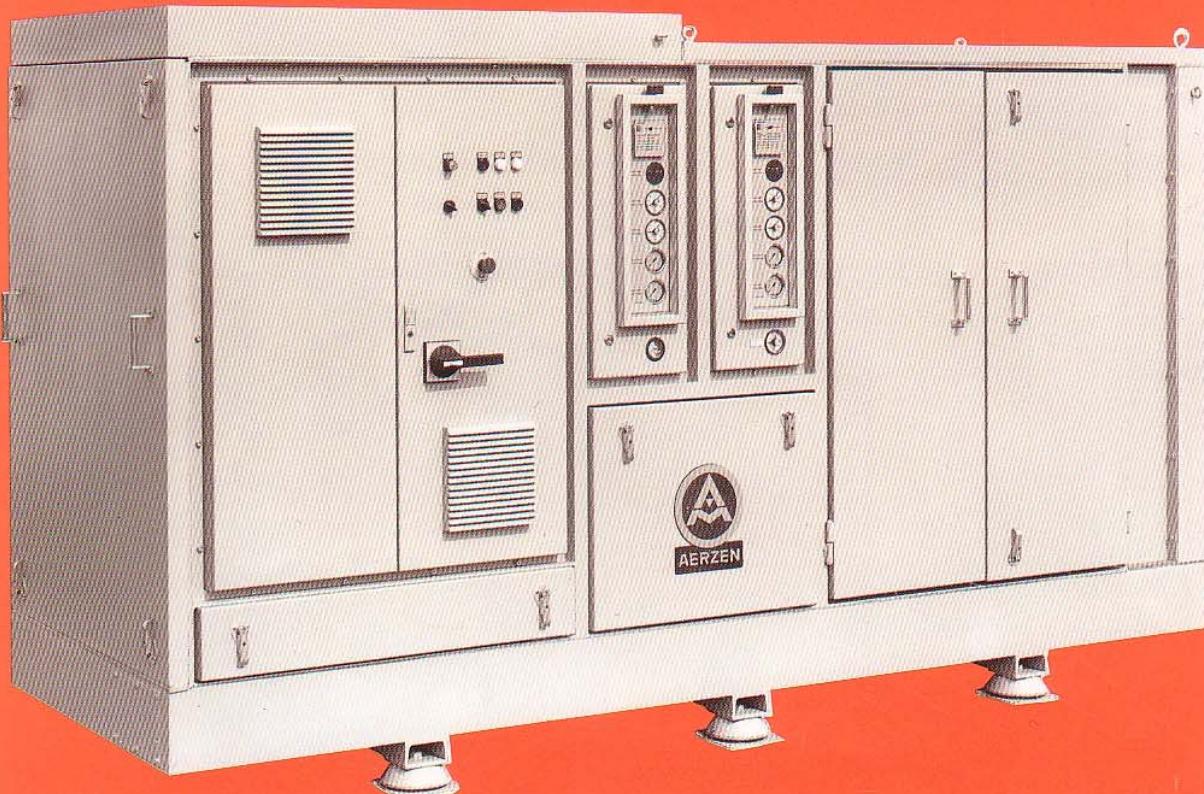


Aerzen Air Screw Compressor VMT 1/2/3



two-stage, for dry compression,
Capacities from 640 bis 3300 m³/h
Discharge pressure up to 10,5 bar gauge



It is since 1943

that the Aerzener Maschinenfabrik has been manufacturing screw compressors. Ever since, it has played a significant role in the development of dry as well as oil injected compressors.

Experience, technical know-how, and state of the art manufacturing underlie the broad spectrum of applications for Aerzen screw compressors.

Standard and special screw compressors are available to fulfill many requirements of air and gas compression.

The newest development in the area of compressed air is our

VMT compressor series

for economical compressed air supply in industry of the present and the future.

While the demand for compressed air constantly increases, its quality requirements are becoming more stringent. Compressed air must be **oil free, clean and dry**.

The compression systems must be **economical, reliable, nearly maintenance free and environmentally safe**.

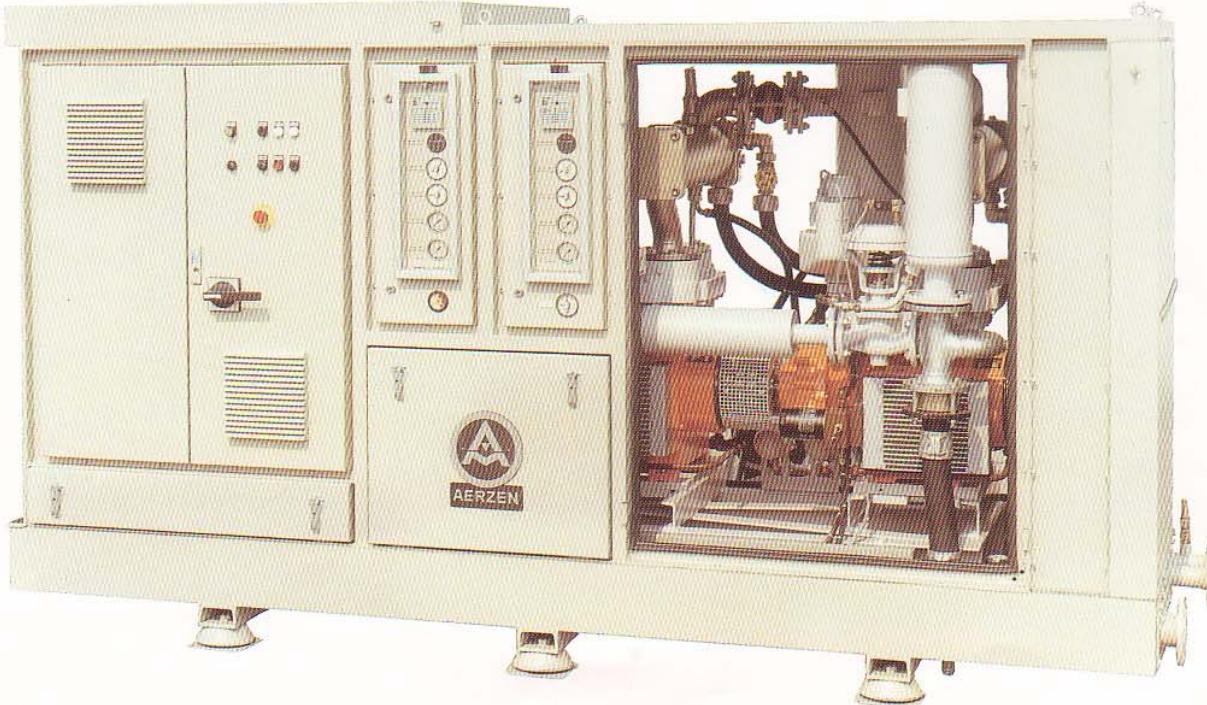
Some possible applications are:

Instrument air for pneumatic control systems, air for chemical and physical processes, plant air for pneumatic tools and paint spray installations, air for pneumatic conveying, plant air for textile processing machinery, process air for breweries and in the food industry.

Operating for many years in a multitude of applications, the VMT screw compressors have been modified, combining all the operating experience with the latest plant requirements.

The VMT air compressors are available for capacities from 640 to 3300 Nm³/h at pressures up to 10.5 bar gauge.

For performance information, see table on page 8.



Technical description

The design of our VMT compressor is based on our field proven single stage VM.37 compressor series.

A low pressure and a high pressure stage constitute the core of the VMT compressor. Each compressor stage is an independently functioning compressor unit. Therefore, the most efficient solution can be selected from a wide range of possible combinations.

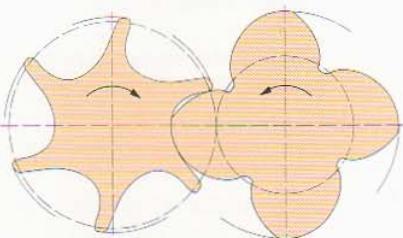
(For more details, see bulletin V1-006.)

Rotors

Material: Steel C45N

Helical timing gears ensure that the rotors convolute without making contact. The rotors are manufactured on special state-of-the-art machine tools to achieve the highest accuracy, therefore minimizing air slippage.

The resulting high volumetric efficiency is maintained throughout the machinery operating life.



Compressor housing

Material: grey cast iron GG25

The gear housing is flange mounted to the barrel type cylinder. Designed for sufficient surface cooling and does not require water cooling.

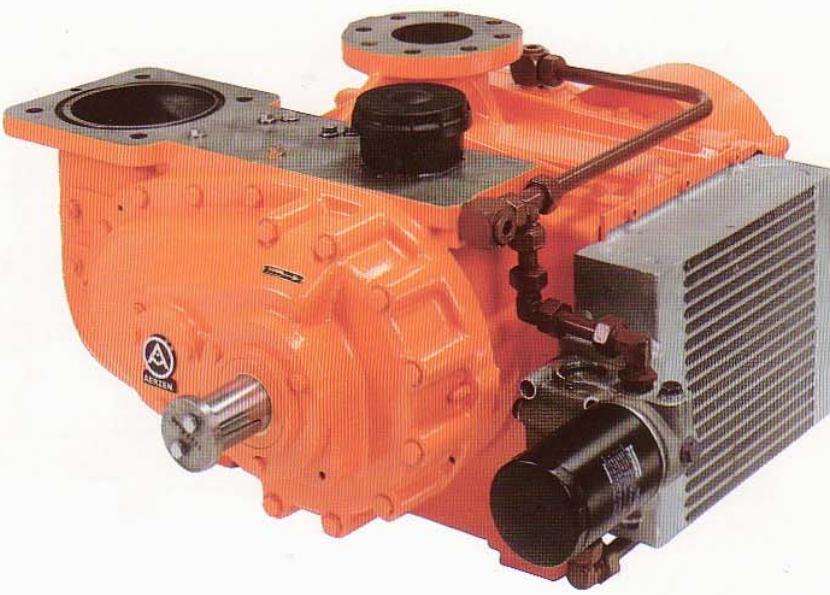
Step-up gear

Each compressor stage features its own independent train of gears. Therefore, flow volumes can be selected and, for a specific compressor discharge pressure, the optimum interstage pressure can be achieved. This is normally not possible with the commonly used bull gears with their limited flexibility, which can result in higher energy consumption. Substitution of the existing gears with others to achieve different speeds is possible to adapt the machine to a range of air requirements.

Timing gears

Material: surface hardened steel

Accurately machined, hardened and ground timing gears ensure that the rotors convolute without making contact, while maintaining smallest clearances. The rotors are not directly subject to wear, since they do not contact each other.



Bearings

All compressors and gear rotors are supported on anti-friction bearings.

Long bearing life is achieved by lowering the rotating speed of the second compressor stage, subject to the higher pressure differential.

Forced-feed oil lubrication system

Each compressor stage features its own independent lubrication system. Each system contains an integrated oil sump, shaft driven oil pump, oil pressure control valve, oil temperature control valve, oil filter, and oil cooler.

The oil temperature control valve assures that the oil reaches its operating temperature soon after start-up.

Oil cooling

The lubrication oil is air cooled in an aluminium, honey comb type, heat exchanger. The cooling air is forced over the heat exchanger by a fan mounted on the compressor shaft.

Sealing

Material: labyrinth type seal, graphite rings and steel retainer

The compression chamber is sealed from the oil chambers by means of triple carbon ring labyrinth seals, with intermediate vent chambers vented to atmosphere.

Water cooled design

Compressed air inter- and after-coolers have the cooling water through the tubes (air on the shell side) for least maintenance and ease of cleaning. The tubes of the heat exchangers can be selected from various materials to best suit the cooling water quality. Corrosion protected and highly efficient centrifugal type separators guarantee optimal condensate removal.

Air cooled design

When cooled with ambient air, the compressed air coolers feature aluminum fin tubes for highly efficient heat transfer and lowest pressure losses.

Condensate drain

All the standard machines feature completely automatic BEKOMATEN type condensate drains.



Drive

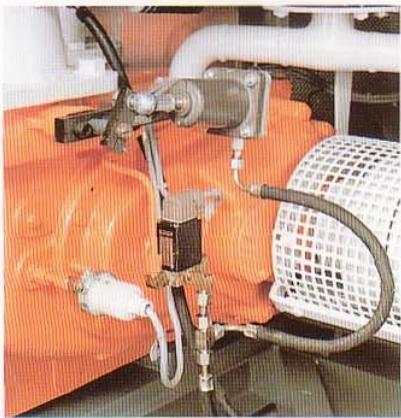
Electric motor (Standard are motors per IEC standards with IP 54 enclosure, insulation class F, temperature rise corresponding to insulation class F, "B3" configuration). For motors built to other standards, please consult factory.

Automatic controls

An instrument- and control cabinet is equipped with all necessary control instruments which ensure fully automatic operation.

A "wye/delta" motor starter is provided as well as the necessary first stage inlet throttling and second stage discharge unloading valves.

Two electronic first out failure indicators (one per stage) with shut down function,



inlet air filter restriction indicator, illuminated push buttons, key switch, emergency stop push button, operation selector switch, hour meters for full load and for idle operation are provided in addition to the extensive instrumentation for each individual compressor stage as listed in the schematic.

The control cabinet features a main circuit breaker, wye/delta combination motor starter, contactors for main and auxiliary drives.



Advantages

The VMT series air screw compressors have been developed based on the specific compressed air quality requirements of modern industry. The VMT compressor series is the ideal complement to the Aerzen process gas screw compressors which, for many decades, have been in service worldwide throughout the chemical industry.

Economical

Adjustment to any required capacity is possible. Optimal selection of the operating point is therefore possible within the entire operating range. Where compressed air flow requirements fluctuate, the inlet throttle and discharge unloading device maintain energy consumption to a minimum.

Easy maintenance

The sound enclosure features hinged doors for best accessibility and ease of maintenance.

Sound enclosure for silent operation

VMT compressors do not require any machine room. Each standard compressor package is equipped with an acoustic enclosure.

Consisting of hinged doors and removable panels, the sound enclosure allows for easy maintenance and guarantees quiet operation.

Sound enclosure cooling is achieved by means of a cooling fan mounted onto the compressor drive shaft extension.

Sound enclosure design: outer surface is 1.5 mm thick galvanized and painted steel sheet; noise absorbing internal lining is non flammable (mineral wool) and is supported by a 1.5 mm thick perforated sheet and a felt barrier. Flame retardant foam material is used in the sound enclosure silencer baffles.

A sound pressure level < 80 dB(A) is guaranteed at 1 m and free field, per DIN 45635. This also fulfills also the CAGI-Pneurop noise measurement standards.

No foundation required

Dynamical balancing of the rotors guarantees smooth and quiet operation, eliminating the need for special foundations. A supporting surface sized for handling the static load is sufficient for installing the package on its standard vibration isolating mounts.



Compact

The package components are located for easy maintenance and accessibility within the smallest space.

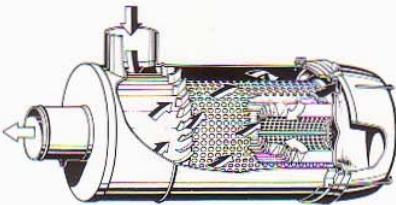
Simple installation

Easy to transport and to connect. The entire package including sound enclosure can be transported using a fork lift truck.

Oil free and clean compressed air

The standard two-stage filter with integral pre-separator is suitable for operation in dusty environments and provides clean compressed air.

The vented carbon ring labyrinth sealing the rotor chambers from the lubricated



areas prevent air from being contaminated within the compressor

Any condensation of moisture within the air coolers is removed from the compressed air in the generously sized moisture separators.

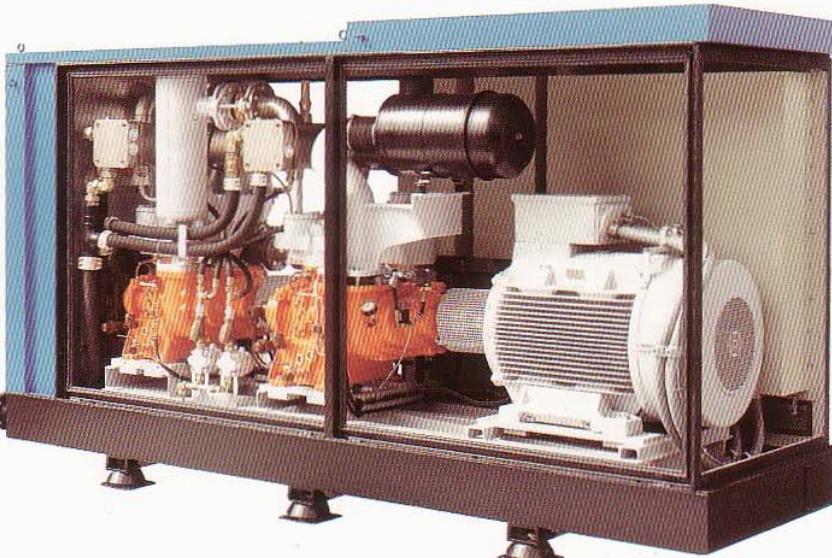
Fully tested and ready for operation

Prior to shipment, every single completely assembled compressor package is subjected to a test run lasting several hours. All functions are tested and logged, following a check list. The compressors may not leave our factory until successful test completion.

On arrival at site, the package merely requires connecting to the compressed air network, and, if applicable, to the cooling water and condensate drain piping and, after connecting to the electrical power supply, the package is ready for operation.

Heat recovery

Up to 90 % the rejected heat can be recovered when using air cooled air coolers, providing highest energy savings. Connections for warm air outlet ducting are provided on the package.



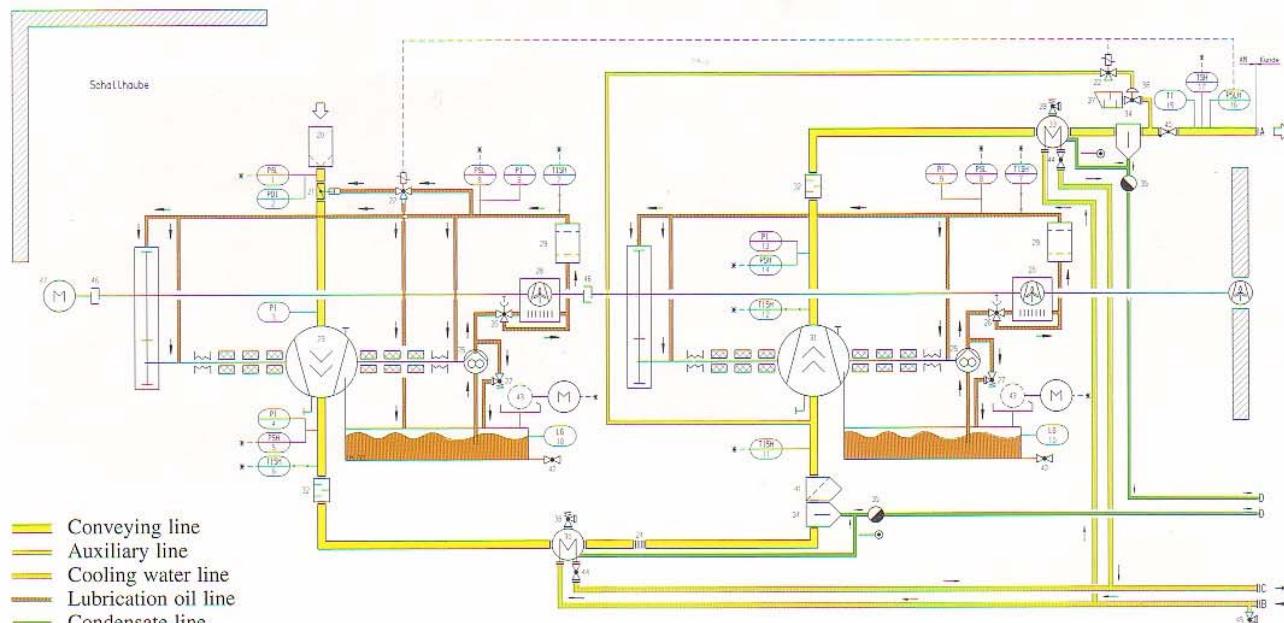
Scope of supply

Screw compressor stages with integrated gears, forced feed lubrication including oil pumps, air cooled oil coolers, oil filters, oil temperature control valves and oil overflow valves.

Accessories

- Air inlet filter, two-stage
- Discharge silencers
- Inter- and after-cooler
- Separator with drain
- Pressure safety valves
- Check valves
- Expansion joints
- Flexible couplings with guards
- Common base frame on vibration isolating mounts, for compressor and motor
- Full load-idle control system with blow-off silencer
- Motor
- Instrument panel with protection functions and readouts.
- Control panel and motor starters
- Sound enclosure

Flow diagram



A Discharge connection
 B Cooling water inlet
 C Cooling water outlet
 D Condensate outlet

- 1 Inlet pressure switch
- 2 Air filter monitoring
- 3 Inlet pressure gauge
- 4 First stage discharge pressure gauge
- 5 First stage discharge pressure switch
- 6 First stage discharge temp. gauge/switch
- 7 Oil temperature gauge/switch
- 8 Oil pressure switch
- 9 Oil pressure gauge
- 10 Oil sight glass
- 11 Second stage inlet temp. gauge
- 12 Second stage disch. temp. gauge/switch
- 13 Second stage discharge pressure gauge
- 14 Second stage discharge pressure switch
- 15 Discharge temperature gauge
- 16 Pressure switch for inlet throttle control

- 17 Discharge temperature switch
- 20 Inlet air filter
- 21 Throttle valve control
- 22 3-way solenoid valve
- 23 First stage compressor with gear
- 24 Expansion joint
- 25 Oil pump
- 26 Oil temperature control valve
- 27 Oil overflow valve
- 28 Air cooled oil cooler
- 29 Oil filter
- 30 Interstage cooler*
- 31 Second stage compressor with gear
- 32 Discharge silencer
- 33 Air aftercooler*
- 34 Water separator

- 35 Condensate drain
- 36 Unloading valve
- 37 Blow-off silencer
- 38 Pressure safety valve first stage
- 39 Pressure safety valve second stage
- 40 Check valve
- 41 Starting strainer
- 42 Oil drain valve
- 43 Centrifugal oil mist separator with motor
- 44 Cooling water flow adjusting valve
- 45 Cooling water pressure safety valve
- 46 Coupling
- 47 Motor

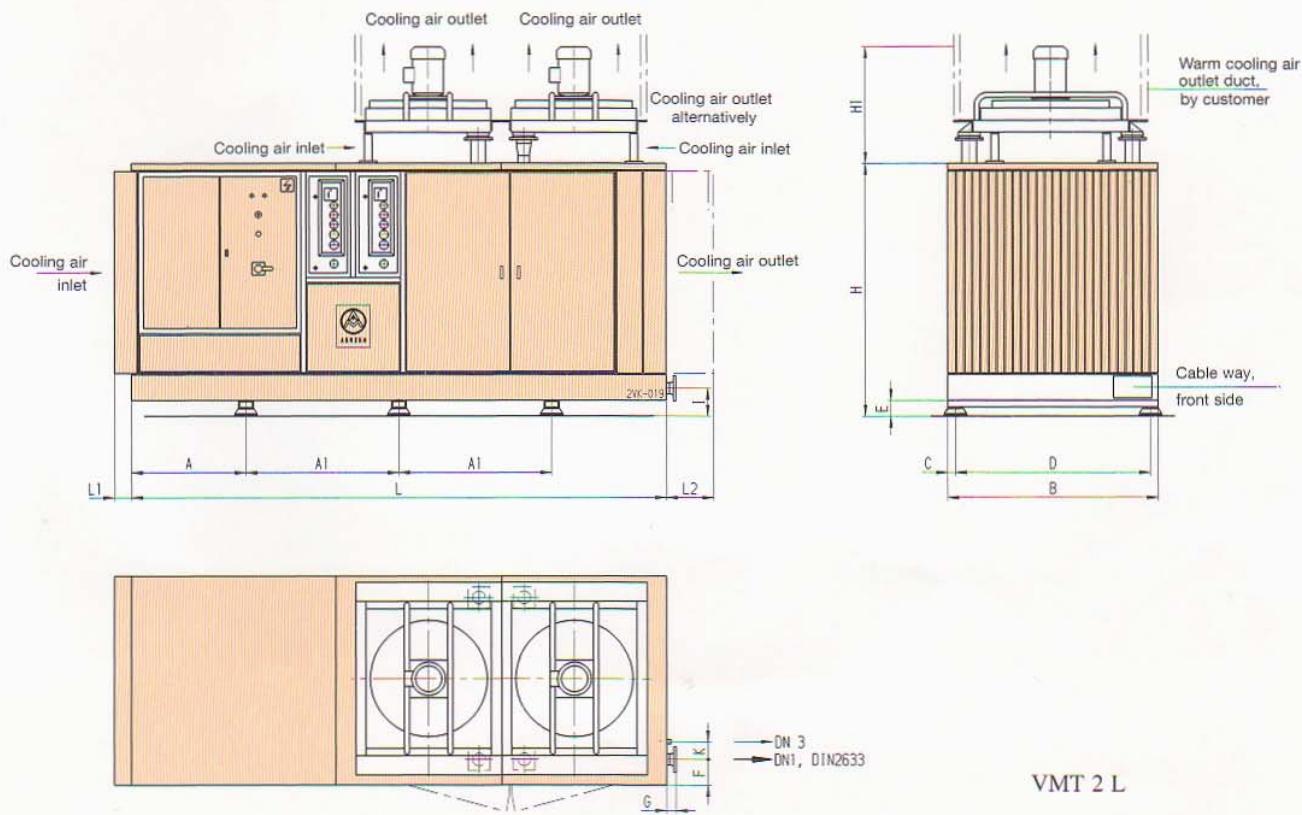
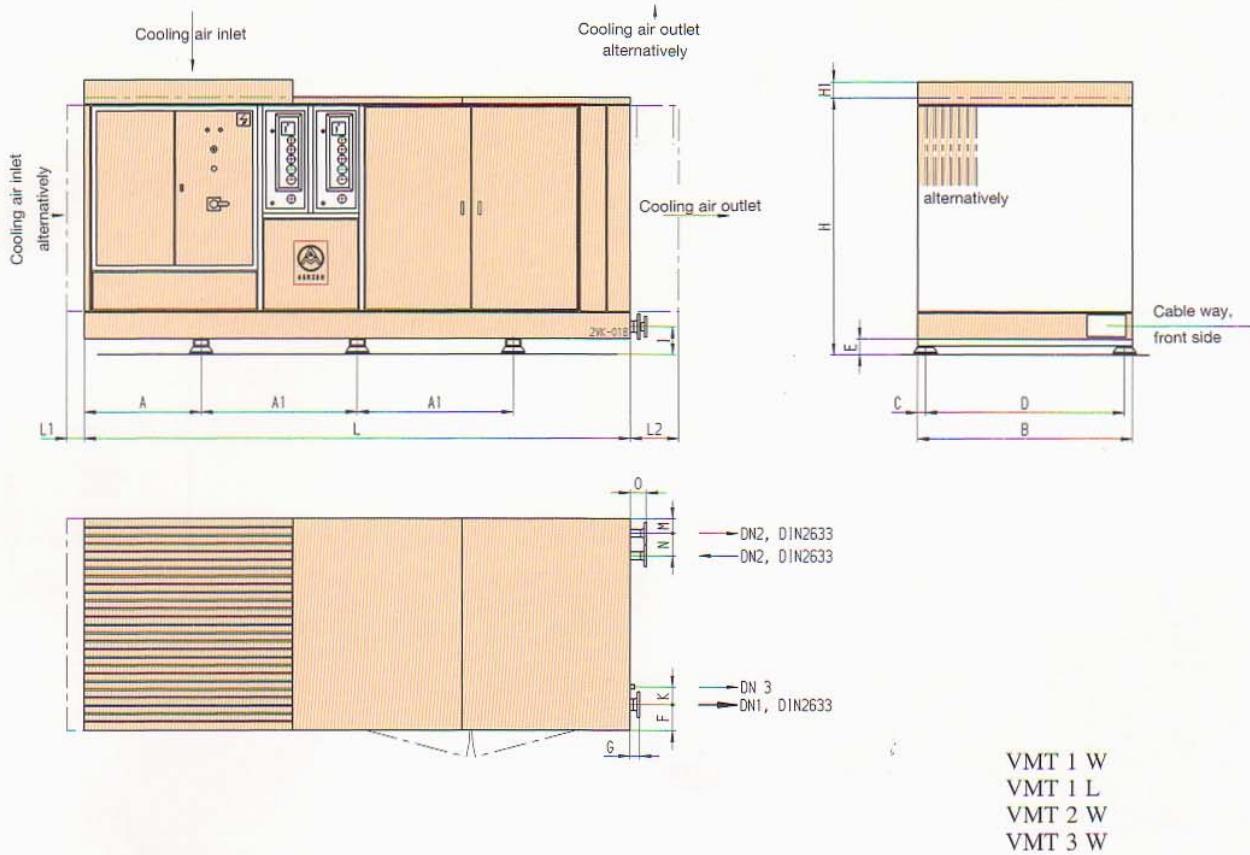
* VMT 1 and VMT 2 also available with air cooled air coolers

The binding scope of supply is as established in the purchase order.

Dimensions

Dimensions without engagement

Size	Dimensions of acoustic hood			Cooling air inlet selection		Cooling air outlet		Distance between vibration isolating mounts				Compressed air outlet DN 1, PN 16				Cooling water In-/outlet DN 2, PN 16				Condensate drain DN 3		Weight with motor	Door swing space
	L	B	H	lateral	on top	+ L ₁	+ H ₁	+ L ₂	A	A ₁	C	D	E	DN	F	G	I	DN	O	M	N	DN	K
VMT 1 W	3400	1150	1870	80	80	500	700	1000	60	1030	125	65	150	75	220	50	125	112	175	G½	125		600
VMT 1 L	3400	1150	1870	280	280	950	700	1000	60	1030	125	65	150	75	220					G½	125		600
VMT 2 W	4200	1650	2000	130	125	375	900	1200	60	1530	125	80	200	75	220	50	125	112	175	G½	140		900
VMT 2 L	4200	1650	2000	130		375	900	1200	60	1530	125	80	200	75	220					G½	140		900
VMT 3 W	4775	1900	2350	130	125	490	925	1000	60	1780	125	100	300	150	250	65	125	125	200	G1	150		1000



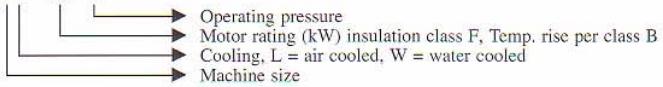
Performance data

Size	Type (1)	P _{Mot} kW	Operating pressure	Performance data	Compressed air cooling			Weight
					Water cooling		Air cooling	
					Water flow (total) (2)	Cooling air	Cooling air	
Flow at inlet conditions m ³ /h	Inter- and after-cooler m ³ /h	Flow m ³ /h	Flow m ³ /h	kg				
VMT 1 W	- 90	- 8		642	6,8	10400	-	3510
	- 110	- 8		887	8,3	10400	-	3690
	- 132	- 8		1122	9,6	10400	-	3750
	- 90	- 10						
	- 110	- 10		735	8,3	10400	-	3690
	- 132	- 10		1020	9,6	10400	-	3750
VMT 2 W	- 160	- 8		1330	11,7	14400	-	5220
	- 200	- 8		1805	14,6	14400	-	5330
	- 250	- 8		2015	17,5	20160	-	5700
	- 160	- 10		1120	11,7	14400	-	5220
	- 200	- 10		1510	14,6	14400	-	5330
	- 250	- 10		1885	17,5	20160	-	5700
VMT 3 W	- 250	- 8		2160	22,4	21600	-	9000
	- 315	- 8		2850	28,0	21600	-	9180
	- 355	- 8		3310	32,4	21600	-	9650
	- 315	- 10		2435	28,0	21600	-	9000
	- 355	- 10		2804	32,4	21600	-	9180
	- 400	- 10		3303	36,6	21600	-	9650
VMT 1 L	- 90	- 8		612	-	-	14400	3480
	- 110	- 8		842	-	-	20160	3660
	- 132	- 8		1080	-	-	20160	3720
	- 90	- 10		-	-	-	14400	3480
	- 110	- 10		-	-	-	20160	3660
	- 132	- 10		826	-	-	20160	3720
VMT 2 L	- 160	- 8		1315	-	14400	28800	5180
	- 200	- 8		1774	-	14400	28800	5290
	- 250	- 8		1996	-	20160	28800	5660
	- 160	- 10		1107	-	14400	28800	5180
	- 200	- 10		1377	-	14400	28800	5290
	- 250	- 10		1852	-	20160	28800	5660

Performance data for water cooling with $t_3 = 35^\circ\text{C}$, for air cooling, $t_3 = 40^\circ\text{C}$, motor with winding insulation class F, temperature rise corresponding to class B, $p_1 = 1 \text{ bar}$, $t_1 = 20^\circ\text{C}$, 0% relative humidity

(1) Explanation of model number:

For example VMT1W · 132 · 8



(2) Cooling water flows given for:
t water supply = 30°C
t water return = 40°C



5 VMT 2 W in a car manufacturing plant



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