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# HERZ

## Hochdruck- gebläse

### HD

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<b>D A CH</b>	<b>Herz Hochdruckgebläse – Betriebsanleitung</b>
<b>GB IRL</b>	<b>Herz high-pressure blowers – Operating instructions</b>
<b>F B L</b>	<b>Ventilateurs haute pression Herz – Notice d'utilisation</b>
<b>I</b>	<b>Ventilatori ad alta pressione Herz – Istruzioni per l'uso</b>
<b>NL</b>	<b>Herz hogedruk ventilatoren – Bedieningshandleiding</b>
<b>PL</b>	<b>Herz dmuchawy wysokiego ciśnienia - Instrukcja obsługi</b>
<b>HU</b>	<b>Herz Nagynyomású légeklátó – Használati útmutató</b>
<b>BG</b>	<b>Herz Високо налягане вентилатор - инструкции за работа</b>

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# HD 140

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These Operating Instructions must be available to operating personnel at all times. Read these Operating and Assembly Instructions carefully before installing and putting the side channel blower into service.

Subject to change without prior notice. If in any doubt, the manufacturer should be consulted. This document is protected by copyright. It must not be disclosed to third parties without our express written consent. Any form of duplication or recording and storage in electronic equipment is forbidden.

## 1. MACHINE SPECIFICATIONS

Please refer to the cover sheet for our address.

For the area of validity of these Operating and Assembly Instructions, please refer to the Declaration of Installation Conformity contained in Annex C.

The technical specifications on page 11 apply to the standard version. Your side channel blower's specifications may differ from these specifications (refer to nameplate). If this is the case, please refer to the enclosed, additionally applicable documents or your own applicable Operating and Assembly Instructions.

### Nameplate

The data on the rating plate is applicable to connection, maintenance and ordering of spare parts.

Also refer to the nameplate for the serial number of the appliance and its year of manufacture.

<b>HERZ</b>		HERZ GmbH 56566 Neuwied		<b>CE</b>	
Typ		Nr.			
Mot EN 60034-1		IP	W.-Kl.		
kW cos φ		min <sup>-1</sup>		kW cos φ	
Hz	⊕	min <sup>-1</sup>		⊕	Hz
		V		V	
		A		A	

### 1.1 Designated use

Operation of the side channel blower is only permissible within the limits specified on the nameplate. The information in the following sections must be noted and observed.

The side channel blowers are designed for delivering clean air only.

Use of the blowers for

- aggressive,
- abrasive,
- sticky,
- toxic,
- potentially explosive or
- very moist

media is not permissible.

The permissible conveyed medium temperature for the standard version is -20 °C to +40 °C. Solid particles or contaminants must be removed by a filter unit before entering the side channel blower.

The ambient temperature must not exceed +40 °C or undershoot a minimum of -20 °C.

The side channel blower is not suitable for installation in the open air or in potentially explosive atmospheres.

Nor is it suitable for switched-mode operation. Remodelling and modification of the side channel blower are not permitted.

### Special versions

For applications not mentioned above are available on request. Remodelling and modification of the blower are not permitted. In the case of special equipment, the enclosed supplementary Operating and Assembly Instructions must be observed and adhered to. The supplementary instructions differ in certain respects from these Operating and Assembly Instructions.

HERZ blowers offer a high level of operational reliability. As the blowers are high-powered machines, the safety instructions must be strictly observed in order to avoid injuries, damage to objects and to the machine itself.

### Special designs:

Can be provided upon request for applications in conditions beyond those described in these instructions. In the case of special equipment, the enclosed supplementary Operating and Assembly Instructions must be observed and adhered to. The supplementary instructions differ in certain respects from these Operating and Assembly Instructions, or are outside their area of applicability.

HERZ side channel blowers offer a high level of operational reliability. As the side channel blowers are high-powered machines, the safety instructions must be strictly observed in order to avoid injuries, damage to objects and to the machine itself.

### 1.2 Mechanical hazards

The mechanical hazards in HERZ side channel blowers have been minimised in accordance with the current state of the art, as well as the requirements for safety and health protection. To eliminate any further risk on the part of the operator, we recommend that suitable protective gear be used and worn during all lifecycle phases of the appliance (please refer to the instructions below).

### 1.3 Danger of hand injury

The rotating parts inside the appliance pose a high risk of injury during operation. Before opening, reaching in or inserting tools into the appliance, always shut it down and wait until all moving parts come to a standstill. Make sure the appliance is reliably protected against restarting while work is in progress.

Also make sure that no hazardous situation can occur as a consequence of restarting after shutdown, e.g. as a result of a power cut or blockage.

### 1.4 Weight and stability

Beware of falling hazards during transportation and installation in particular. Refer to 2.1 – Transportation and handling, as well as 3.2 – Installation and assembly.

### 1.5 Speeds

**Warning!**  
*The max. permitted blower speed specified in the table on page 11 must not be exceeded under any circumstances.*

### 1.6 Suction effect

The side channel blowers produce a powerful suction effect.

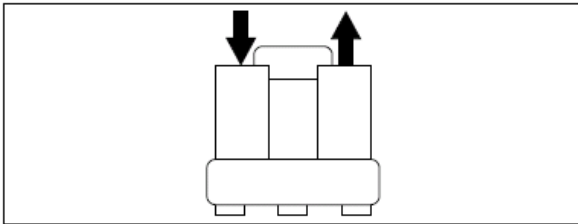


**Warning!**  
**Objects, items of clothing and also hair can be sucked into the intake port. Risk of injury!**  
**Do not stand near the intake opening during operation.**  
**The side channel blower must not be operated with an open intake opening. The intake opening must be covered with protective grating according to DIN EN ISO 13857.**  
**Never place your hands in the intake opening.**

### 1.7 Blowing effect



**Warning!**  
**The blowing effect is very powerful on the exhaust side. Sucked in objects may be ejected at very high speed (danger of injury).**  
**The side channel blowers are designed for delivery of clean air only. To reliably prevent the sucking-in of foreign objects or contaminants, which might be discharged, these objects have to be removed before entering into the side channel blower by installing a filter. Do not reach into the exhaust.**



### 1.8 Temperature



**Warning!**  
**The blower housing heats up during operation. If the temperature rises above +50 °C, the side channel blower must be protected by the operating company against direct contact (risk of burning!).**

### 1.9 Motor circuit breaker

Before putting the side channel blower into operation, be sure to safeguard the drive motor with a motor circuit-breaker (this does not apply to frequency-converter-operated appliances).

Where appliances are frequency-converter-operated, the existing temperature sensor (PTC resistor sensor) must be connected to the converter and evaluated.

### 1.10 Noise emission

The noise generated by a side channel blower is not constant throughout the performance range. For details of radiated noise level, please refer to the table on page 11.

In some cases, sound insulation may be necessary (it is recommended that emission levels be measured by the operator). Sound insulation must be provided by the operator to avoid exceeding the statutory maximum levels at the workplace and in the immediate vicinity of the side channel blower.

No sound insulation of any kind whatsoever should cause the ambient temperature to exceed +60°C at the drive motor (this is not permissible).

### 1.11 V-belt drive (only applies to side channel blower without motor)

**Note!**  
**The side channel blowers are equipped as standard with V-belt pulleys for narrow V-belts according to DIN 7753.**  
**\* To avoid premature damage to the deep-groove ball bearings, the V-belt drives must be correctly pretensioned. The V-belt drive must be rated using the calculation method specified by the belt manufacturer.**

The blower belt pulley must not be modified.

- The max. permissible compressor speed must not be exceeded (see table on page 11).
- The belt drive and freely rotating parts must be covered with belt guard according to DIN EN ISO 13857.
- The belt tension should be checked after the blower has been running for approx. 2 hours. The belts must be retensioned if necessary.
- Belt tension: see table on page 11.
- Never put the side channel blower into operation if the protective grating is not installed and firmly screwed on (risk of injury).

### 1.12 Electrical hazards

Before carrying out electrical work, the appliance must always be switched off and protected against accidental restarting. Check that no voltage is present.

## 2. INFORMATION ON TRANSPORTATION AND HANDLING OF THE MACHINE

### 2.1 Transportation and handling

- Before installation and putting into service, check all parts for transit damage. A damaged side channel blower is a potential safety hazard and, therefore, should not be put into service.
- Do not leave the side channel blower unprotected in the open (protect against ingress of moisture).
- Attach hoist securely. Only use hoists and load suspension devices with sufficient load-carrying capacity. Secure the route of transportation.

## 3. INFORMATION ON COMMISSIONING THE MACHINE

### 3.1 Basic information

- Prior to the first start-up and before any other start-up, the proper operating status of the unit must be inspected. Units that, for example, are found to be defective upon delivery or during installation, must be examined by qualified technicians.
- Installation, assembly and operation must only be performed by properly trained and qualified specialists. Operation following incorrect installation, maintenance or unapproved replacement of components constitutes non-designated use and renders the warranty void. The resultant risk shall be borne solely by the customer or owner.

**3.2 Installation and assembly**

- Install the side channel blower so it is protected against weather and sun exposure. Refer also to the information on installation under 1.1, Designated use .
- Do not expose to vibrations or shocks. Permissible vibrational load on side channel blower: refer to ISO 14694, BV-3.
- Standard side channel blowers with base: Bolt securely to a level and firm surface at the place of use, making sure that the surface has adequate load-bearing capacity and avoiding vibration transmission or vibrational load.
- Side channel blowers placed on the rubber elements provided must be secured against turning.
- Blowers with motor (drive), belt drive and belt guard: The buyer (plant manufacturer, operating company or other customer) is solely responsible for safe, stable installation and fastening in conjunction with the motor, belt drive and belt guard to be provided by the customer, and for compliance with applicable standards and specifications.
- Cover open intakes or outlets with protective grating according to DIN EN ISO 13857.
- The belt drive and rotating parts must be covered with a belt guard according to DIN EN ISO 13857.
- Ensure adequate motor ventilation. Permissible ambient temperatures:
- Series version with a rated voltage (max. +/-10% voltage tolerance) and a rated frequency of 50 Hz or 60 Hz:
- Ambient temperature -20°C to +60°C
- Special voltages, multi-voltage motors, FU compatible versions, FUK versions, UL certified appliances:
- Ambient temperature -20°C to +40°C
- The performance of the drive motor's ventilation system must not be impaired by the installation situation.

**3.3 Electrical connection**

**Note!**  
*The work described in this section may only be performed by a qualified electrician. Connect the appliance to the power supply in the terminal box as per the wiring diagram and in compliance with the applicable local regulations.*

Three-phase or a.c. motors can be used as drive motors. In the appliance designation, the letter D stands for three-phase a.c. and the letter E for single-phase a.c.

- The drive motor must be protected using a motor overload switch (this does not apply to frequency converter operated appliances). Where appliances are frequencyconverter- operated, the existing temperature sensor (PTC resistor sensor) or temperature switch (normally closed contact) must be connected to the converter and evaluated.
- Check that the mains voltage matches the ratings on the nameplate.
- The safety earth terminal can be found in the terminal box.

**Note!**

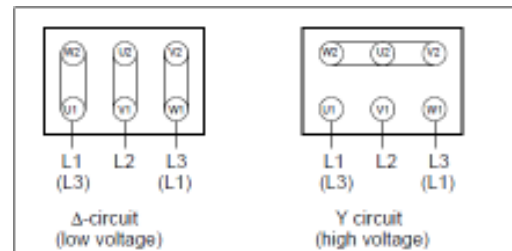
- *For operation of the drive motor with a frequency converter, the following points should also be noted:*
- *Motors may only be operated on a frequency converter if they have "FU" (which denotes "frequency converter compatible") marked on the nameplate, or if they have been ordered as "frequency converter compatible" motors and confirmed.*

\*

- *The maximum supply voltage of the frequency converter is 400 V without a motor filter. If longer wires and higher converter supply voltages are used and/or the max. pulse voltage (1300 Vpp) at the motor terminals is exceeded, suitable precautions, e.g. a motor filter, must be taken to protect the motor. Please consult the converter supplier in this matter. If the motor filter is supplied with the blower, it must be installed between the converter and the motor. Please make sure that there is sufficient reserve space in the switch cabinet and adhere to the guidelines for installation and assembly in the operating instructions issued by the frequency converter/motor filter manufacturer.*
- *The wire running between the motor and the frequency converter must not exceed a length of 20 m, configured as a suitable, shielded cable and laid by as direct a route as possible, without any additional plug/clamp connections.*
- *The braided screen in the connecting cable must cover the full length of the cable on both sides, i.e. be connected to the earthing system at the frequency converter and to the motor using a low electrical resistance. For this purpose, suitable EMC cable couplings must be used on the motor side. They must contact the cable shield around its full circumference and have a low resistance.*

For further information about EMC compliant installation and assembly, refer to the Operating and Assembly Instructions issued by the frequency converter manufacturer.

**3.3.1 Configuration for three-phase current side channel blowers**



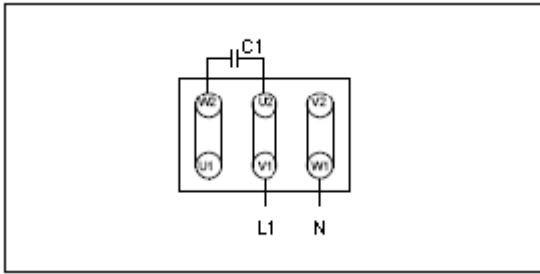
**Checking the direction of rotation**

Switch on the side channel blower. The running direction of the impeller should correspond to the direction arrow on the housing. The direction of the air flow must also match the directional arrows on the silencer housing. If the impeller rotates in the wrong direction, then interchange L1 and L3.

**Star-delta start-up**

Motors with an output above 3.0 kW are provided at the supply mains for star-delta start-up. For direct on-line starting (high short circuit current at the instant the motor is energised), please contact your local utility for details of conditions.

**3.3.2 Configuration for single-phase a.c. side channel blowers**



**3.3.3 Special configurations and additional clamps**

Terminal diagrams can be found in the motor terminal box for voltage interchangeable motors, pole-changeable motors, FU motors and other special configurations of three-phase a.c. and a.c. motors. This also applies to the optional thermal winding protection and the space heater.

**3.3.4 Configuration for units with attached frequency converter**

The mains connection with earthing conductor connection and potential equalisation must be carried out in a professional manner in accordance with the specifications in the enclosed frequency converter assembly instructions.

**4. INSTRUCTIONS FOR OPERATION AND USE**

**4.1 Basic information**

Please observe the notes on designated use in section 1.1, as well as the safety guidelines in sections 1.2 to 1.12.

If electrical current drops below the rated current of the drive motor during operation, check to see if the mains voltage and frequency match the appliance ratings (nameplate).

After protective shutdowns, e.g. tripping of the motor circuitbreaker, activation of the PTC evaluation unit by motors with a PTC resistor sensor, or after a protective shutdown of the frequency converter during FU applications, the appliance must not be restarted until the problem has been identified and eliminated.

If the side channel blower cannot be operated over the whole range of the characteristic curve, the motor may overload if the system resistance is too low (excessive current consumption). If the possibility of overload due to system resistance cannot be excluded, a pressure limiting valve must be provided on the intake or pressure side.

The side channel blower must not be subjected to vibration or impact loads.

**4.2 Frequency converter operation**

A frequency converter is used, allowing a wide range of speed adjustments. There is only a small, load-related difference in rpm between idle state and the max. load of the side channel blowers.

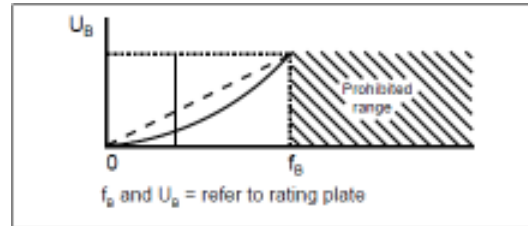
**To ensure trouble-free operation of the side channel blowers, it is important that the converter meet the following requirements:**

- Converter output equal to or greater than motor power output \*)
- Converter current equal to or greater than motor current \*)
- Converter output voltage equal to rated motor voltage
- The pulse frequency of the converter should be 8 kHz, since a lower pulse frequency can cause very noisy motor operation.
- The converter should have a connection for a temperature sensor (PTC resistor sensor) or a temperature switch (normally-closed contact)

\*) Refer to the rating plate for data

The motor can be operated in a delta or star-point configuration, depending on the input voltage of the converter.

The following U/f assignments must be configured at the converter.



If this is ignored, the motor current will increase disproportionately and the drive motor will fail to achieve its rated speed.

**Note!**  
 Do not set the converter to a higher frequency (rpm) than the frequency (f<sub>B</sub>) specified on the nameplate, because this can overload the motor or irreparably damage the side channel blower due to overspeeding. Similarly, a so-called "boost" must never be set at the converter because this would result in excessive heating of the drive motor. The temperature sensors must be connected to the relevant converter inputs in order to protect the drive motor. Single-phase a.c. motors are unsuitable for converter operation.

\* To ensure safe and trouble-free operation, the installation and safety instructions provided by the frequency converter supplier in the operating or application manuals must be strictly adhered to.

Please note also that, in certain ambient conditions, heavy soiling of the cooling fins can occur in FUK-compliant appliances. If the cooling capacity of the cooling fins is insufficient, the frequency converter will shut down. Appliances which are operated in these environments must be inspected on a regular basis.

**Protection by residual-current-operated circuit breaker (FI circuit-breaker):**

IGBT frequency converters produce discharge currents of >=3.5 mA due to their design principle. These discharge currents can lead to unwanted tripping in systems protected by a 30 mA-FI circuit-breaker.

If a fault occurs, fault currents can also discharge through the PE conductor as direct current. If protection is needed on the supply side by means of an FI circuit-breaker, then an ACDC sensitive (type B) FI circuit-breaker must be used. Use of an FI circuit-breaker other than type B can cause death or serious injury if a fault occurs.

To meet the EN 61800-5-1 standard, the PE conductor must be duplexed and routed through separate terminals or have a cross-section of at least 10 mm<sup>2</sup> Cu.

**Operation and connection to public grids:**

Most frequency converters are designed to operate on industrial grids. If the converter is connected directly to and operated on a public grid, then additional interference suppression measures, such as a mains choke, must be built into the mains feeder. For further information, refer to the converter manufacturer's specifications.

## 5. INSTRUCTIONS FOR MAINTENANCE

Wear parts are subject to the recommended maintenance intervals and are an element of valid warranty claims (see 5.1 to 5.6). The service life of wearing parts (ball bearings and filters) depends on the operating hours, the load and other influences, such as temperature, etc.

Maintenance and servicing may only be performed by persons with the necessary expertise and regular training. In addition to the appliance's operating instructions and the regulations and recommendations for the system as a whole, the following points should be observed:

### Inspection and maintenance intervals:

The operator must set the cleaning, inspection and maintenance intervals himself according to operating hours, load and operating conditions.

### Immediate inspection and maintenance

The blower must be inspected immediately if vibrations or reduced air flow are observed.

**Note!**



**Repairs must be carried out by the manufacturer. We cannot accept any liability for modifications or the replacement of components carried out by third parties.**

### 5.1 Ball bearings

The side channel is equipped with enclosed deep groove ball bearings, which do not have to be re-greased and have a minimum service life of approx. 22,000 hours. We recommend exchanging the ball bearings before the end of their service life (at least 22,000 hours).

A service period of 30 months must not be exceeded if the blower runs continuously for 24 hours a day.

### 5.2 Seals and radial shaft sealing rings

Sealing elements and shaft sealing rings must, for safety reasons, always be replaced after maintenance work involving opening, removing or otherwise modifying sealing elements.

### 5.3 Micro-filters

The degree of clogging of the filter elements should be checked at regular intervals, depending on the ambient conditions / conditions of use. This means that the user is responsible for ensuring that the filters are permeable. The micro-filter must be positioned horizontally to prevent contamination entering the side channel blower during maintenance work. With vertical micro-filter installation, the complete filter must be removed from the unit before starting cleaning/maintenance.

### 5.4 Pressure limiting valve

The pressure limiting valve is a safety valve and its operation must therefore be checked at regular intervals depending on application conditions. The operating side must be closed during inspection. The pressure limiting valve must respond at the maximum pressure value.

**Note!**



**Repairs must be carried out by the manufacturer. We cannot accept liability for repairs carried out by third parties.**

### 5.5 V-belt: Information on units without drive motor intended for operation with a V-belt drive

We recommend that you check the V-belt tension approx. every 5,000 operating hours. New V-belts must be checked after a running-in time of 2 hours and re-tensioned if necessary.

For data relevant to the V-belt drive of your unit, please refer to the specifications in the table in Chap. 8 of these Operating and Assembly instructions.

## 5.6 Cleaning

Cleaning or maintenance must not damage or alter the appliance and its component parts to the detriment of health and safety protection, and must not, for instance, affect the balancing of the impeller.

## 6. SAFETY RELATED INFORMATION ON TAKING OUT OF OPERATION AND REMOVAL

The disconnecting of all electrical connections and all other electrical engineering work in connection with taking the blower out of operation must be referred to a qualified electrician.

The blower may only be dismantled after all rotating parts have come to a standstill and a safeguard has been provided to prevent restarting. Dismantling and removal must be performed in accordance with the guidelines set out in section 2.1, Transportation and handling. Dispose of in the appropriate manner.

## 7. LIABILITY AND EXCLUSION OF LIABILITY

The owner bears responsibility for the designated use of the unit. HERZ GmbH shall not be liable in any case of damage resulting from non-designated use of its units and components.

This also applies, in particular, to special usages and application conditions, which have not been expressly co-ordinated with HERZ GmbH.

Furthermore, HERZ GmbH shall not be liable for damage resulting from modifications or conversions to the delivered equipment or accessories, in particular, if such changes can impair the explosion protection.

Similarly, HERZ GmbH shall assume no liability for maintenance work and repairs, and the possible consequences thereof, that have been performed incorrectly, with delay, by technicians not qualified by HERZ GmbH, or which have not been carried out at all.

## 8. TECHNICAL SPECIFICATIONS

Type: Blower

Volumetric flow rate	Total pressure-difference	Voltage	Frequency	Power-consumption
m <sup>3</sup> /min	Pa	V	Hz	A
1,45	14000	200 - 277 345 - 480	50	2,10 - 2,85 1,20 - 1,65
1,7	14500	200 - 277 345 - 480	60	2,40 - 2,70 1,35 - 1,55

Max. perm. Blower speed	Motor output	Sound pressure level	Weight
rpm	KW	LpA(db)	KG
2810	0,46	65	11,3
3390	0,62	70	11,3

**Suction opening** : Ø 38 mm (aussen)  
**Outlet opening** : Ø 38 mm (aussen)  
**Dimension (lxbxh)** : 283 x 244 x 266,5  
**Ambient temperature.** : -20°C bis +60°C  
**Protection type** : IP 54  
**Optional 1 x 230V** : Kondensator 230 V; 40 µF / V