

# POWER TOWER

## Druckluftaufbereiter IN339-IN346

Montage- und Betriebsanleitung  
Installation and Maintenance Instructions



 **Thermotechnik**

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**1.0 Statement of EU-Conformity, CE-Labeling**

All refrigerating compressed air dryers POWERTOWER model IN339 - IN346 are designed, developed and manufactured by

Alfa Laval Thermotechnik GmbH,  
Richard-Lucas-Str. 6,  
41812 Erkelenz,  
Germany

in accordance with EU regulations

- Machines 89/392/EEC
- Low Voltage 73/23/EEC.

The following harmonized standards are applied:

- DIN EN 292, (safety of machines, instruments and systems)
- DIN EN 387, refrigeration systems and heat pumps (safety and environmental regulations since 1996; EU regulations from VGB 20).

The following national standards, regulations and specifications apply:

- IEC 335-2-34 (safety of household appliances)
- DIN 4361 (accidental-contact protection for compressors)
- DIN EN 60204.1 (electrical equipment for industrial machines)

Regulations concerning electrical equipment:

- VDE 0700, Part 24, or IEC 335-2-24 respectively
  - Safety protection of machines of August 13, 1980
  - Regulations on compressed-air vessels of February 1990
  - VBG 20, refrigeration systems
- This instruction manual includes all technical specifications.

## 2.0 Important Information

### 2.1 Safety Instructions

This manual contains information and instructions on the operation and maintenance of our air dryers in accordance with current safety regulations. The air dryer operates at pressure dew-point temperatures between 3 and 7° centigrade, depending on air flow, inlet pressure and inlet temperature.

The air dryer are manufactured in accordance with current and generally accepted technical standards. In particular, the air dryer fully complies with regulations listed in section 1.0.

Do not operate the air dryer without first checking the safety instructions published by officially recognised and relevant professional organisations.

The air dryer must always be installed after the safety pressure valve. Operators should also observe the first-aid instructions for handling CFCs (instruction code ZH1/409) and the regulations on condensate disposal (Water Management Law) (WHG).

Disclaimer: Manufacturer will not accept responsibility due to non-compliance of safety instructions. This applies to operation, maintenance and repairs of the air dryer, even if not explicitly stated in this manual.

Do not tamper with any of the air dryer's protection and safety devices. During the warranty period, only the appoint manufacturer's specialists are allowed to work on the refrigeration cycle. After the warranty period, such work should be performed only by specialists as defined by DIN 8975, Part 3, Section 11.3 (German Official Standards Committee).

The air dryer must be used only for drying compressed air. Non-compliance with this stipulation will automatically render the warranty null and void.

Models IN339-346 are „inherently safe“ as defined by VBG 20. In case of an overload, the combined thermal and over-current circuit-breaker will automatically switch off the refrigeration compressor.

If a FAILURE warning is displayed anywhere, use the TROUBLESHOOTING CHECKLIST for that particular monitoring unit. Once the cause of trouble has been removed, the air dryer will automatically restart.

## 2.2 Transportation and Storage

**IMPORTANT:** Always move air dryer in a vertical position.

Using the shipping documents, customer must, immediately after delivery, check if shipment is complete and without damage. In the case of loss or damage, carrier must immediately write a damage report so it can later be filed with the insurance company, together with the claim for damages.

During transportation and storage the air dryer must not be exposed to temperatures lower than 2° and higher than 50° centigrade. The humidity in the air must not exceed 90%.

## 3.0 Setup and Installation

### 3.1 Setup

The main measurements and weights, as well as the necessary clearance between air dryer and walls or ceilings, are stated on the diagram. This specifications must be observed if the air dryer is to function properly.

It is absolutely necessary to observe the clearance requirements for checking the condensate drain as well as for inlet and air cooled air dryers. The air dryer must be set up in a weather-protected spot, where the surrounding temperature is neither lower than 2° centigrade, nor higher than 43° centigrade.

**IMPORTANT:** Piping must not be supported by the air dryer.

The pipework must be fully supported near the inlet and outlet connections and fitted to avoid any vibrations. If the air dryer is to be suspended, walls and mounting gear must be strong enough to hold the air dryer's weight. There are two keyholes in a reinforced carrying frame at the rear of the air dryer. These holes can hold, for example, hooked bolts with a minimum diameter of 10 mm (see diagram).

These air dryers should not be mounted on the floor, because there might be problems with draining condensates.

If possible, the air dryer is installed with a bypass so that it can be depressurized for maintenance while in operation. A bypass kit including all parts is available as an option.

**IMPORTANT:** The bypass must be attached to the main line in such a way that it is free of strain or vibration. When line entries or exits need to be worked on, adequate tools must be used to hold the connection to the air dryer steady in order to prevent connections from being twisted out of their proper positions.

The lines are laid out for the specified maximum pressure as stated on the air dryer's plate.

If the compressed-air entering the dryer is contaminated it will be necessary to install a preliminary filter.

## 3.2 Electrical Installation

The air dryer must be installed as shown in the circuit diagram. Wire cross section and local fuse protection must conform to the maximum power consumption stated on the plate. Power is supplied via cord and plug (230V / 50 Hz / 1 Ph.). All air dryers are equipped with power switch (ON/OFF). Customer must protect them by fuse (10A). When the air dryer is plugged in, and the power is switched on (switch is in ON position), the green signal lamp lights up.

## 4.0 Operational Instructions

### 4.1 Starting Operation

**IMPORTANT: It is absolutely imperative that the air dryer be pressurized slowly. The bypass valves must be operated slowly in order to avoid pressure shocks. Air-entry and air-exit valves must be closed at first. The bypass, if installed, is open.**

The starting procedure:

Plug in the cord to a mains outlet in order to supply the air dryer with electricity. Then turn the power switch ON. Operate air dryer for approximately 10 minutes. Models with monitoring unit S7: Without pressure, the trend indicator S7 will move from red to yellow, and on to green after approximately 10 minutes. Now the air dryer is ready to be properly pressurized.

**IMPORTANT: Check the whole unit, if everything is properly sealed, and there are no leaks, the operation of the air dryer has been started successfully.**

### 4.2 Removing for Operation

**IMPORTANT: It is absolutely imperative that the air dryer be depressurized slowly. The bypass valves must be operated slowly in order to avoid pressure shocks. Even after this, the air dryer will still be under pressure.**

First, the bypass, if installed, must be opened slowly. Then, the air inlet and air outlet valves must be closed. Switch the air dryer OFF and disconnect the plug from the outlet. Depressurize the air dryer through the condensate drain.

**IMPORTANT: If non-standard condensate drains are used, a mechanically operated method to evacuate air and another way to drain condensate must be provided for.**

## 4.3 E-Package (ESA-Energy Saving Automatic) (Optional)

The new generation of wall-mounted cold-air power air dryers offer an optional load-dependent ESA-Energy Saving Automatic.

That is, the air dryer automatically stops and restarts again when operating at partial or zero capacity. This is made possible by constantly measuring the cooling-down temperature  $t_3$ , and by saving the unused refrigeration energy in the plate heat exchanger. When the air dryer has been switched off automatically, the required refrigeration energy is supplied by the refrigeration-storage unit of the plate heat exchanger until the air dryer is switched on again by increasing of temperature  $t_3$ . This is an active contribution to the conservation of our natural resources, and helps to protect the environment.

## 5.0 Maintenance

### 5.1 Refrigerant Condenser

**IMPORTANT: Turn the unit off before servicing the air dryer**

The performance of the air cooled dryers decreases as dirt accumulates on the condenser. The refrigerant compressor must be turned off (so that the whole unit is dead). Use soft brush to clean air-cooled condenser. Remove the unit's cover for this purpose. Repeat this procedure regularly, depending on the degree of pollution.

### 5.2 Condensate Drain

The condensate drain must be cleaned regularly if it is to function properly. The quantity and condition of the condensate determine how often this is necessary. Procedures differ according to type of condensate drain. See Section 7.1 for maintenance instructions for standard condensate drains. If another collector is used, the instruction manual for that collector should be consulted.

## 6.0 Monitoring Units

### 6.1 Monitoring Unit S7

The monitoring unit S7 is located on the right side of the metal front panel. Unit S7 is a trend indicator that indicates the temperature t3 of the cooled down compressed-air on a three-color scale (red, yellow, green):

**Green area:**

The color green indicates that the air dryer is working properly

**Yellow area:**

The yellow area lights up to indicate brief periods of overload

**Red area:**

Red means that the temperature t3 of the compressed air exceeds 10° centigrade.

### 6.2 Monitoring unit S7 DIGI

The monitoring unit S7 DIGI is a digital display, located on the right side of the metal front panel.

**Values lower than 7° centigrade:**

The display of values in this range indicates that the air dryer is working properly

**Values between 7 and 10° centigrade:**

This range indicates brief periods of overload

**Values higher than 10° centigrade:**

Readings for temperature t3 in this range mean that the compressed air is not cooled down properly. 10° centigrade is also the switching point for the change-over contacts of the zero-voltage failure and operation indicators.

The zero-voltage change-over contact can carry maximum loads of 250 V, 50 Hz, 40 VA.

### 6.3 Troubleshooting with the Monitoring Units S7 and S7 DIGI

Problem	Solution
condenser dirty	remove dirt
fan failure	replace fan or call maintenance service
overload due to excessive stream volume	check operating data
failure of refrigeration-medium compressor, protective motor switch is OFF	call manufacturer's customer service
lack of refrigeration medium	call manufacturer's customer service
room temperature too high	ventilate room
monitoring units S7, S7 DIGI	call manufacturer's customer service

## 7.0 Components

### 7.1 Condensate Discharge

This instruction manual covers the standard condensate drain type FCD that comes with the air dryer. The FCD is a reliable, floating condensate drain suitable for collecting emulsions consisting of water, oil and dirt.

**IMPORTANT: During installation, make sure no force is applied to the condensate drain in order to avoid damaging any interior parts. If necessary, prop up condensate drain during installation.**

The standard condensate drain type FCD must be assembled outside the casing. The connection point is marked on the air dryer diagram.

In order to facilitate transportation, the collectors are enclosed with the shipment in order to be hooked up at the place of installation. If other collectors are used, the instruction manuals for those collectors must be consulted.

**Maintenance**

**IMPORTANT: Depressurize air dryer before working on condensate drain.**

The condensate drain must be cleaned regularly if it is to function properly. The quantity and condition of the condensate determine how often this will be necessary.

At the beginning, the condensate drain should be removed and cleaned for the first time after approximately 8 to 10 days. If the condensate is relatively clean, and the collector not very dirty, the periods between cleanings can be extended accordingly.

In order to depressurize the air dryer, turn manual drain plug so as to drain the residual condensate and to depressurize the air dryer. Use the following directions in order to:

Open:                               turn counterclockwise  
Close:                               turn clockwise

## 7.2 Condensate Discharge

**IMPORTANT: Do not apply any pressure to the condensate drain. Otherwise, interior parts might be damaged.**

The condensate drain must be installed so as to slope downwards. There must be enough space and no back-pressure. Unnecessary pipe bends and level differences should be avoided.

**IMPORTANT: Do not drain untreated condensate into sewer!**

Oil-laden/contaminated compressed-air condensate requires special treatment and must not be drained into public sewers or bodies of water. Do not violate the regulations on condensate disposal as stipulated by the Water Management Law (WHG).

## 7.3 Bypass

The bypass makes it easier to service and repair the air dryer, while the compressor unit continues to operate without interruption.

**IMPORTANT: The bypass must be attached to the main line in such a way that it is free of strain or vibration. When line entries or exits need to be worked on, adequate tools must be used to hold the connection to the air dryer steady in order to prevent connections from being twisted out of their proper positions.**

Installation procedure (see also diagram of bypass):

- Install positions 1 - 6 as shown in diagram. Positions 1 - 3 and position 5 or 6 must be sealed with appropriate sealing material at the point of contact with air dryer.
- Check position of symbols on ballvalve. If necessary adjust according to bypass diagram.
- Choose mode of operation: for air dryer operation move lever into position A; for bypass operation choose position B.

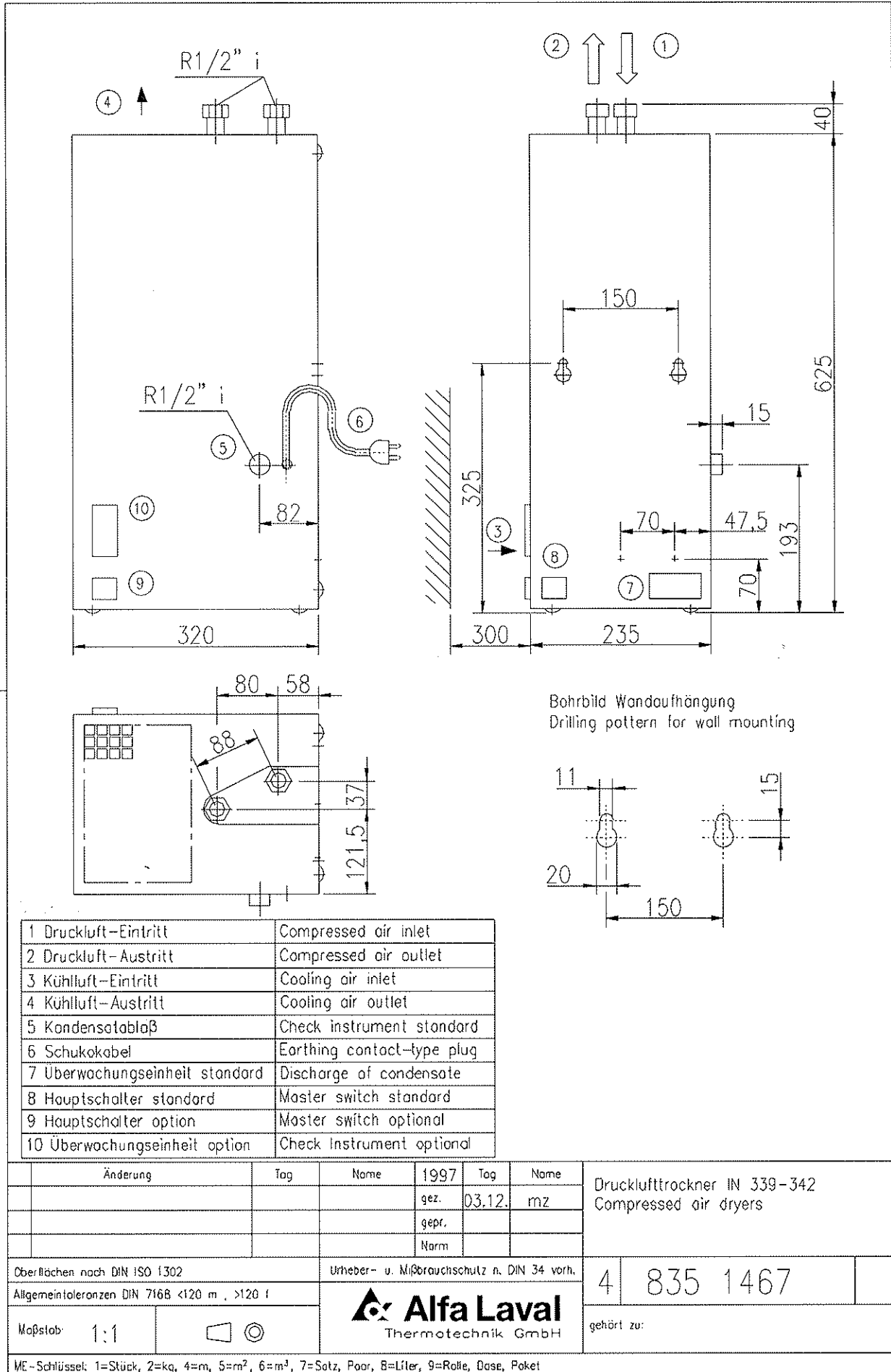
## 8.0 Warranty Specifications

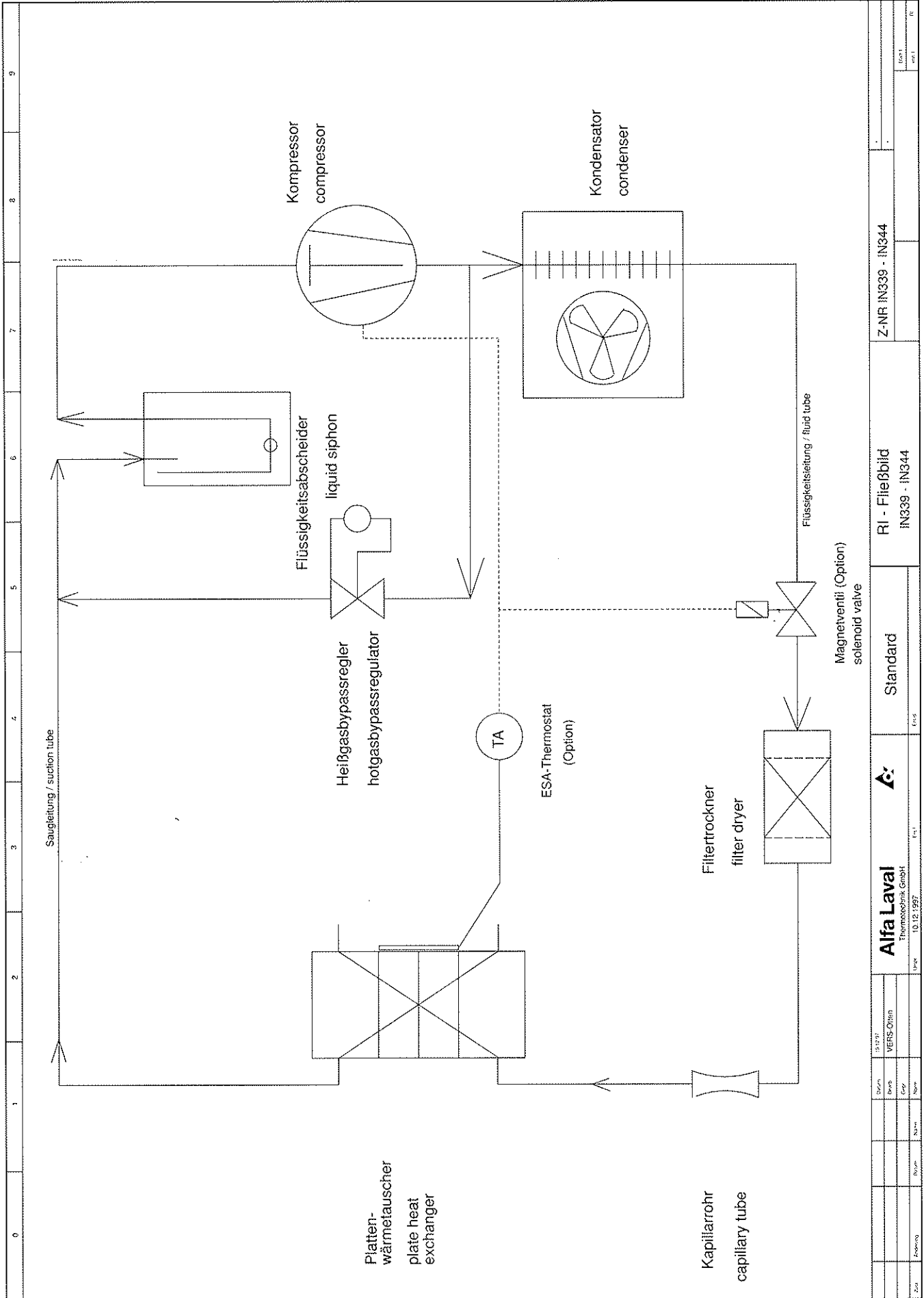
Base for the warranty is either the warranty card which must be filled in completely or the invoice. This warranty does not cover any damage caused by improper handling of the air dryer. In all communications to us, the full details of the air dryer's name and model number should be supplied (see plate on air dryer).

This warranty does not cover the following items:

- working parts subject to normal wear and tear
- failure caused by subjecting the air dryer to excessive strain
- failure caused by improper electrical connections
- failure caused by improper handling
- failure caused by improper maintenance
- failure caused by improper installation

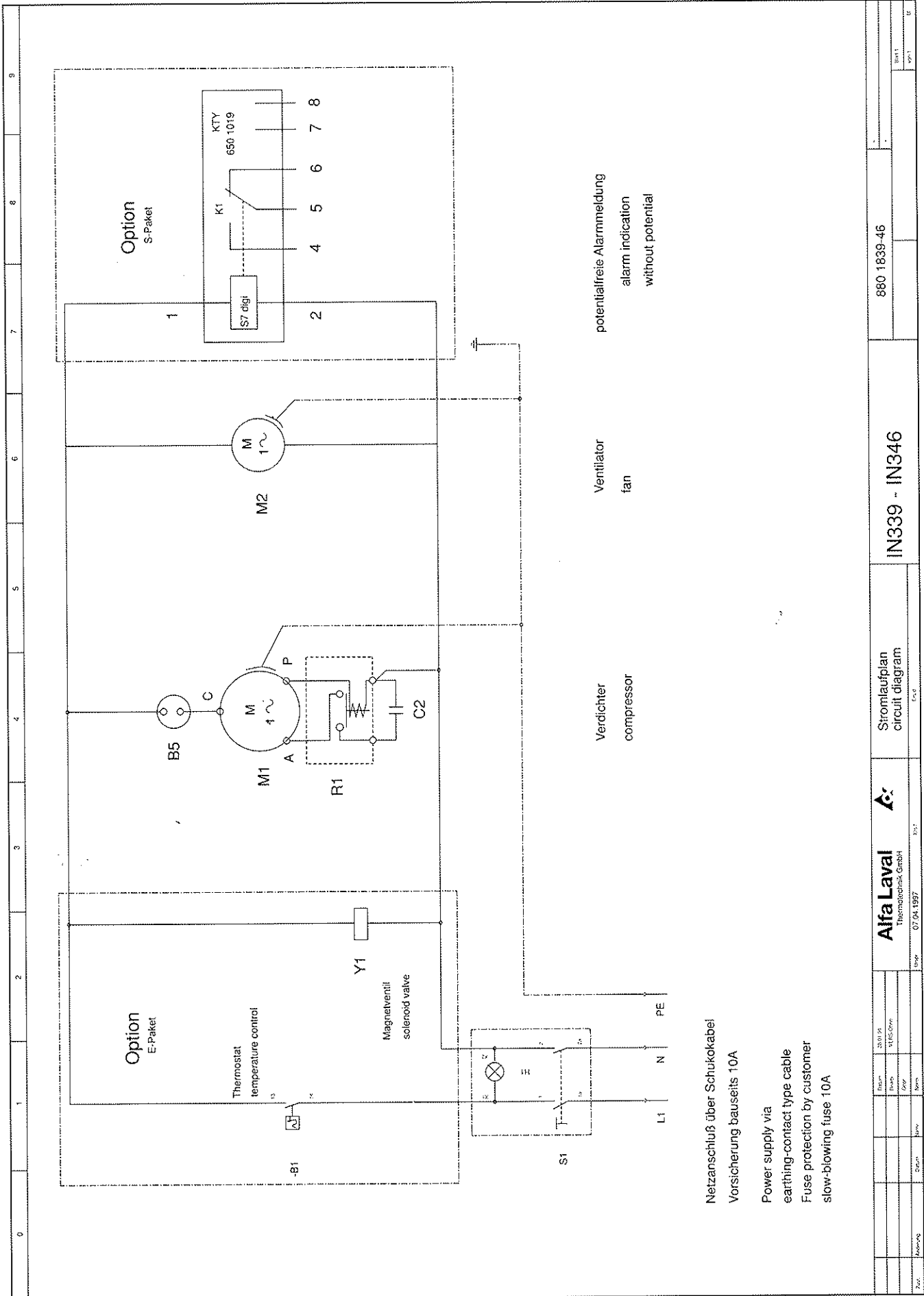
During the specified period, only the manufacturer's specialists are allowed to work on the refrigeration cycle. Claims under this warranty will be accepted only if the air dryer is still in its original condition.





Z-NR IN339 - IN344		RI - Fließbild IN339 - IN344		Standard		Alfa Laval		Thermotechnik GmbH		10.12.1997		User		Date		Page		Total	
13 1972		VERS-Option																	
Date		Rev		Name		Status		Author		Check		Date		Page		Total		Total	





Netzanschluß über Schukokabel  
 Vorsicherung bauseits 10A  
 Power supply via  
 earthing-contact type cable  
 Fuse protection by customer  
 slow-blowing fuse 10A

880 1839-46		IN339 - IN346		Stromlaufplan circuit diagram		Alfa Laval ThermoTech GmbH		Date: 07.04.1997	
Blatt	von	Blatt	von	Eckz.		Eckz.		Eckz.	
1	1	1	1						

Materialliste		List of parts									
Nr	Bezug	Bezeichnung Designation	Bestell-Nr Order-Nr.	IN 339	IN 340	IN 341	IN 342	IN 343	IN 344	IN 345	IN 346
1		Schukokabel Earthing contact tip plug	843 0507	X	X	X	X	X	X	X	X
2	M 1	Verdichter compressor	660 0701	X	X						
			660 0704			X	X				
			660 0708					X	X		
			660 0718							X	X
3	M 2	Ventilator fan	660 0116	X	X	X					
			660 0118					X	X		
			660 0148				X		X	X	
4	R 1	Anlaufrelais start relay	580 1043	X	X						
			580 1004			X	X				
			580 1006					X	X	X	X
5	B 5	Externer Schutz external overload protector	580 2002	X	X						
			580 2035			X	X				
			580 2006					X	X		
			580 2064							X	X
6	C 1	Anlaufkondensator start capacitor	580 1041	X	X						
			580 1071						X	X	
7	S 1	Steuerschalter control switch	666 3108	X	X	X	X	X	X	X	
8	B 1	Temperatur- überwachung temperaturecontrol	654 0034	O P T I O N							
9	Y 1	Magnetventil solenoid valve	551 0248	O P T I O N							
10	S 7 digi	potentialfreie Alarmmeldung alarm indication without potential	881 7001	O P T I O N							
11		Fühler sensor	650 1019	O P T I O N							

Alfa Laval  
Thermatech GmbH  
09.04.1997



Stückliste  
List of parts

IN339 - IN346

880 1839-46

# POWER TOWER

## Druckluftaufbereiter IN339-IN346

Modell	Luftvolumenstrom bei Drucktaupunkt 3°C		Leistungsaufnahme		Druckverlust $\Delta p$ bar	Luftanschluß Ein/Aus	Elektrischer Anschluß			Abmessungen			Gewicht kg
	m³/h	m³/min	luftgekühlt kW	wassergekühlt kW			V	Hz	Ph	Breite mm	Tiefe mm	Höhe mm	
IN 339	25	0,3	0,17	-	0,15	1/2" i	230	50	1	235	320	625	26
IN 340	43	0,7	0,22	-	0,18	1/2" i	230	50	1	235	320	625	27
IN 341	60	1,0	0,26	-	0,21	1/2" i	230	50	1	235	320	625	28
IN 342	75	1,3	0,32	-	0,24	1/2" i	230	50	1	235	320	625	30
IN 343	115	1,9	0,34	-	0,18	3/4" i	230	50	1	425	320	625	45
IN 344	145	2,4	0,39	-	0,21	3/4" i	230	50	1	425	320	625	47
IN 345	180	3,0	0,49	-	0,20	1 1/4" a	230	50	1	425	320	625	54
IN 346	260	4,3	0,68	-	0,22	1 1/4" a	230	50	1	425	320	625	59
IN 347	310	5,2	0,77	0,69	0,19	1 1/2" a	230	50	1	680	530	1455	94
IN 348	390	6,5	0,93	0,84	0,20	1 1/2" a	230	50	1	680	530	1455	99
IN 349	510	8,5	1,10	1,00	0,22	1 1/2" a	230	50	1	680	530	1455	110
IN 350	640	10,7	1,50	1,40	0,18	2" a	230	50	1	680	530	1455	145
IN 351	800	13,3	1,70	1,60	0,19	2" a	230	50	1	680	530	1455	163
IN 352	960	16,0	2,10	2,00	0,21	2" a	230	50	1	680	530	1455	175
IN 353	1300	21,7	2,70	2,00	0,19	3" a	400	50	3	1000	890	1750	295
IN 354	1650	27,5	3,50	2,90	0,20	3" a	400	50	3	1000	890	1750	337
IN 355	2100	35,0	4,60	4,00	0,20	3" a	400	50	3	1000	890	1750	412
IN 356	2500	41,7	5,30	4,70	0,22	3" a	400	50	3	1000	890	1750	478
IN 357	3000	50,0	6,50	5,90	0,18	DN100	400	50	3	1150	1600	2050	580
IN 358	3900	65,0	7,70	6,40	0,19	DN100	400	50	3	1150	1600	2050	660
IN 359	4800	80,0	9,50	8,20	0,20	DN150	400	50	3	1150	1600	2050	785
IN 360	5800	96,7	11,30	10,00	0,21	DN150	400	50	3	1150	1600	2050	850

Bei anderen Betriebsdrücken  $p_1$  den Volumenstrom multiplizieren mit Faktor ( $f_1$ ):

$p_1$ (bar)	2	3	4	5	6	7	8	9	10	11	12	14	16
( $f_1$ )	0,60	0,70	0,80	0,87	0,94	1,00	1,05	1,08	1,11	1,14	1,16	1,21	1,24

Bei anderen Kühlmediumtemperaturen  $t_c$  den Volumenstrom V multiplizieren mit Faktor ( $f_2$ ):

$t_c$ (°C)	25	30	35	40	43
( $f_2$ )	1,00	0,98	0,95	0,90	0,86

Für andere Drucktaupunkte  $t_{pd}$  den Volumenstrom V multiplizieren mit Faktor ( $f_3$ ):

$t_{pd}$	2	3	5	7	10
( $f_3$ )	0,96	1,00	1,11	1,19	1,28

Bei anderen Drucklufttemperaturtemperaturen  $t_1$  den Volumenstrom V multiplizieren mit Faktor ( $f_4$ ):

$t_1$ (°C)	25	30	35	40	45	50
( $f_4$ )	1,38	1,12	1,00	0,85	0,70	0,55

### Referenzbedingungen nach DIN/ISO 7183

Drucktaupunkt $t_{pd}$ :	3°C
Volumenstrom in m³/h bezogen auf:	20°C, 1 bar
Drucklufttemperatur $t_1$ :	35°C
Betriebsüberdruck $p_1$ :	7 bar
Kühllufttemperatur $t_c$ :	25°C

### Betriebsbedingungen

Maximale Drucklufttemperatur $t_1$ :	50°C
Maximaler Betriebsüberdruck $p_1$ :	16 bar
Umgebungstemperatur $t_a$ :	2-43°C

Änderungen vorbehalten



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