

BD12

INDUSTRIAL DEHUMIDIFIER

OWNER'S MANUAL

BD12 PRODUCT RANGE

1026500	1ph 110/230v	50Hz	UK
1026600	1ph 230v	50Hz	UK
1026700	1ph 230v	50 Hz	Germany
1026800	1ph 230v	50Hz	France
1026900	1ph 115v	60 Hz	North America



www.eipl.co.uk

UNPACKING

Carefully remove the BD12 dehumidifier from its transit packing and visually check for signs of transit damage. If there is evidence of damage DO NOT attempt to operate the unit call you supplier for advice.

INTRODUCTION

Dehumidifiers remove moisture from the air that is circulating through the unit. The resulting reduction of relative humidity helps prevent rust, rot, mould, mildew and condensation within the room, or other enclosed spaces where the dehumidifier is used.

A dehumidifier consists of a motor-compressor unit, a refrigerant condenser, an air circulating fan, a refrigerated surface, a means of collecting and disposing of the condensed moisture and a cabinet to house these components.

The fan draws moist air over the refrigerated surface and cools it below its dew point, removing the moisture which is collected and lead away. The cool air then passes the hot condenser, where it is reheated. With the addition of other radiated heat the air is discharged into the room at a higher temperature but lower relative humidity than when the air entered the unit. Continuous circulation of the room air through the dehumidifier unit gradually reduces the relative humidity in the room.

The BD12 dehumidifier is a robust, unit designed to control the humidity in the enclosed space in which it is placed.

The unit is thermal protected and will switch off for a period of time if the maximum operating temperature of 35°C is exceeded.

The BD12 dehumidifier unit is normally supplied, with a trolley, which is to aid its mobility from room to room. It is possible, by removing the four M8 bolts which fix the unit to the trolley, to have a freestanding unit for longer term applications, or by mounting the unit on the wall, by means a suitable bracket for permanent applications.

The gas which is used inside the hermetically sealed refrigeration circuit is R22, which has been passed as a non ozone depletion factor by the Montreal Protocol.

BUT under no circumstances should this gas be released into the atmosphere, the unit should be serviced by trained personnel who will reclaim any of the unwanted gas.

BD12 DEHUMIDIFIER SPECIFICATION

HEIGHT:	900 mm
WIDTH:	575 mm
DEPTH:	632 mm
WEIGHT:	80 kg
AIRFLOW:	700 m ³ /hr
POWER:	1500 w
	110/230v 1ph
POWER SUPPLY:	50hz; 115v 1ph
	60hz
FINISH:	Epoxy powder
MOBILITY:	Two wheeled trolley
EFFECTIVE VOLUME:	572 cfm
REFRIGERANT TYPE:	R22
REFRIGERANT CHARGE:	0.700 kg

"This product contains fluorinated greenhouse gases covered by the Kyoto Protocol. The refrigeration system is hermetically sealed.

The Global Warming Potential (GWP) of refrigerants used in products manufactured by Ebac Industrial Products Ltd is as follows

*R134a – 1300
R407c – 1610*

For type and weight of refrigerant contained in this unit, please refer to the product data label"

INSTALLATION

POSITIONING

Position the dehumidifier unit in the centre of the room, or area to be conditioned if it all possible. However, if a damp patch is particularly apparent the outlet grille should be directed towards it.

Note: Both the inlet and outlet grille of the dehumidifier unit must have clear space around them and not be obstructed in anyway.

WIRING

Connect the power mains cable/plug of the dehumidifier to a 15 amp power supply. As follows:

110/230 Volt supply

Brown	Live
Blue	Neutral
Green/Yellow	Earth (Ground)

115 Volt Supply

White	Live
Black	Neutral
Green/Yellow	Earth (Ground)

STARTING PROCEDURE

With the dehumidifier unit connected to the correct power supply, move the switch (on the front of the unit) to ON position, both the compressor and the fan motor will start.

Note: For units fitted with “Low voltage protection” see under the Standard features section

DRAINAGE

Connect a 10mm inside diameter hose to the condensate outlet pipe (positioned beneath the air inlet grille). Secure the hose (with the clip provided). The hose should at no point be raised higher than the outlet pipe in the condensate drainage tray. The hose should be ran to a permanent drain. Failure to observe this requirement will result in flooding of the dehumidifier unit.

OPERATION

GENERAL OPERATION

The operation of the dehumidifier is to remove moisture from the air by having it condense on the cold tubes of the evaporator coil. The air then passes over the hot condenser coil and returns to the conditioned space slightly warmer and dryer than when it entered the dehumidifier unit.

AIR MOVING SYSTEM

Air is drawn in through the inlet grille of the dehumidifier unit and over the two heat exchanges (Evaporator/Condenser coils) under the influence of the axial fan which is driven by the motor. The operation of the fan motor is to run continuously whenever power is supplied to the dehumidifier unit. The fan motor used in the dehumidifier unit is induction protected i.e. the motor is able to take stalled current without burning out the motor windings.

REFRIGERATION CIRCUIT

CONDITIONING OPERATION

The basic operation of a refrigeration system is to boil liquid refrigerant in the evaporator coil, and re-condense it into a liquid in the condenser coil. Liquid refrigerant is metered out from the capillary tubes into the evaporator coil and under the influence of the suction port of the compressor; it boils or evaporates into gas. In order to change its state from liquid into gas the refrigerant requires a large amount of heat. This is gained by the tubes of the evaporator coil which thereby become sufficiently cold to fall below the dew point of the air which is passing over them. The refrigerant gas is taken into the compressor and discharges into the condenser coil as high pressure gas. The heat which was used to evaporate the refrigerant at low pressure is still present and is shown by a rise in temperature of the gas as it leaves the compressor. As heat is removed from the hot condenser coil by the air flowing over it, the refrigerant gas is condensed back into liquid. It then leaves the condenser coil and passes through the filter dryers before continuing the cycle via the capillary tubes. In this way heat which is taken from the air as it passes over the evaporator coils is re-introduced into the same air flow as it passes over the condenser coil. However, since the temperature of the evaporator coil is below the dew point of the air. Its moisture content is reduced and thereby the air passing out to the conditioned space is reduced in relative humidity (dryer air).

DEFROST OPERATION

If the ambient temperature of the room, or space in which the dehumidifier unit is conditioning falls below 25°C, ice will form on the evaporator coil as the air is passed over it, after a time this build up of ice on the evaporator coil will effect the efficiency of the dehumidifier unit, on its ability to maintain the required conditions for the room.

The BD12 is therefore fitted with a defrost control device. This defrost control device is timed to operate every 50 minutes, at which time, for approximately 4 minutes the high pressure gas is diverted by means of a by-pass valve to enter the evaporator coil. The effect of this high pressure gas entering the evaporator coil is to melt any build up of ice on this coil; this melted ice is collected and disposed of by means of the condensate tube.

When the temperature falls below 15°C, even with the defrost operation, it is possible that some ice will remain on the evaporator coil. To ensure that all the ice is removed from the evaporator coil during the defrost mode, the BD12 dehumidifier unit is fitted with a temperature sensitive device (thermo-stat).

When the dehumidifier unit, is required to go into the defrost mode by the timing device and the temperature has fallen below 15°C, the fan motor will stop. With the fan motor stopped the refrigeration gas temperature will increase because of the rise in pressures.

Because the heat now within the refrigeration circuit is not being removed from the condenser coil, this heat will ensure that all the ice is removed from the evaporator coil.

WARNING

- Due to high pressures that are within the sealed refrigeration circuit, under no circumstance must direct heat be applied to the evaporator coil in an attempt to remove the build up of ice.
- Neither should any attempt be made to cut open, any part of the refrigeration circuit for the same reason.

HIGH TEMPERATURE CUT OUT

The BD12 dehumidifier unit has been designed to work in ambient conditions of between 0°C and +35°C. Should the temperature in the room or space become excessive a thermo-stat (winding protector) within the compressor casing will open and dehumidifying will stop until such time as the thermo-stat automatically resets.

WARNING

If the dehumidifier unit is switched off at the mains power supply for any reason, it must be allowed to stand and rest for at least three minutes before restarting. Failure to do this may cause the unit to blow the fuses owing to the compressor starting current occasioned by the imbalance of the refrigerant pressures.

STANDARD FEATURES

BY PRODUCT RANGE

EBAC Part No. 1026500

DUAL VOLTAGE

The dehumidifier unit is fitted with a transformer which will allow the unit to operate at either 110 volts or 230 volts 1ph 50 Hz power supply. All the electrical components in this dehumidifier are rated at 110v, for safety reasons, and by the removal of the cover access will be gained to a switch, mounted on the transformer which will allow the choice of voltage to be selected.

EBAC Part No. 1026600

SINGLE VOLTAGE

The dehumidifier unit is fitted with electrical components which are rated at 230 volts and therefore can be used, only when a 230 voltage is available.

EBAC Part No. 1026700

SINGLE VOLTAGE

The dehumidifier unit is fitted with electrical components which are rated at 230 volts and therefore can be used, only when a 230 voltage is available.

LOW VOLTAGE PROTECTION

The dehumidifier unit is fitted with a PCB, which is designed to protect the compressor from stalled starting, if the power supply to the unit falls below 208 volts. Indicators on the unit will display, if the power is still available but is measured at less than 208 volts at the dehumidifier unit.

TEMPERATURE CONTROLLED DEFROST

The dehumidifier unit is fitted with a temperature sensitive device which will operate in conjunction with the defrost control. In normal operation the defrost control will come into operation every 50 minutes, this is to ensure that there will be no build up of ice at lower temperatures, but where year round conditions need to be maintained the dehumidifier unit will have to operate across a wider range of temperatures. To ensure that the dehumidifier unit operates at its most efficient this temperature sensitive device will restrict the defrost operation to the times when the ambient temperature is below 25°C.

HOUR METER

The dehumidifier unit is fitted with a meter, which is positioned on the front of the unit. This meter will measure the length of time in hours that the dehumidifier unit has run.

EBAC Part No. 1026800

SINGLE VOLTAGE

The dehumidifier unit is fitted with electrical components which are rated at 230 volts, and therefore can be used, only when a 230 voltage is available.

EBAC Part No. 1026900

SINGLE VOLTAGE

The dehumidifier unit is fitted with electrical components which are rated 115 volts, 60Hz, and therefore can only be used when a 115 voltage and 60 Hz are available.

HOUR METER

The dehumidifier unit is fitted with a meter, which is positioned on the front of the unit. This meter will measure the length of time in hours the dehumidifier has run.

OPTIONAL FEATURES

ALL MODELS

CONDENSATE PUMP

The dehumidifier unit can be fitted, either in the factory, or as a retro-fit, with a condensate pump Ebac part number 3160116. This condensate pump will allow:-

- 1) The unit to run unattended, with the condensate run off to a permanent drain.
- 2) The unit to be used up to 150 feet, (150 meters) below the level of a permanent condensate drainage point.

HUMIDISTAT

The dehumidifier unit can be electrically wired through a wall mounted humidistat Ebac part number 3031529. The humidistat incorporates a point and scale which can be adjusted and set to a relative humidity level which is acceptable to maintain the required conditions within the room or space. The humidistat controls the ON/OFF function of the dehumidifier unit. When the relative humidity of the air in the room or space falls below the set point of the humidistat the dehumidifier unit will switch off, but when the relative humidity of the air within the room or space, rises above the set point of the humidistat the dehumidifier will switch on.

The function of the humidistat to control the OFF/ON operation of the dehumidifier unit ensures that power is used only when dehumidifying is required, this makes the use of dehumidifiers a cost effective way of maintaining the relative humidity level of the air within the room or space.

ROUTINE SERVICE

WARNING:
ENSURE THAT THE POWER CORD TO THE MACHINE HAS BEEN DISCONNECTED BEFORE CARRYING OUT ROUTINE SERVICE. THE SERVICING AND REPAIR OF THIS UNIT SHOULD ONLY BE CARRIED OUT BY A SUITABLY QUALIFIED PERSON..

To ensure continued full efficiency of the dehumidifier, maintenance procedures should be performed as follows:

1. Clean the surface of the evaporator and condenser coils by blowing the dirt out from behind the fins with compressed air. Hold the nozzle of the air hose away from the coil (approx 6") to avoid damaging the fins. Alternatively, vacuum clean the coils.

WARNING:
DO NOT STEAM CLEAN REFRIGERATION COILS

2. Check that the fan is firmly secured to the motor shaft and that the fan rotates freely. **The fan motor is sealed for life and therefore does not need oiling.**
3. To check the refrigerant charge, run the unit for 15 minutes and briefly remove the cover. The evaporator coil should be evenly frost coated across its surface. At temperatures above 25°C, the coil may be covered with droplets of water rather than frost. Partial frosting accompanied by frosting of the thin capillary tubes, indicates loss of refrigerant gas or low charge.
4. Check all wiring connections.
5. To check the operation of the defrost system, switch the machine on and leave it running for approximately 45 minutes. The machine will then enter "Hot Gas" defrost mode for approximately 4 minutes before returning to normal operation. If the unit will not defrost, the printed circuit timer board may be defective or the by-pass valve may be inoperable.

IF ANY OF THE PRECEDING PROBLEMS OCCUR, CONTACT THE EBAC SERVICE CENTER PRIOR TO CONTINUED OPERATION OF THE UNIT TO PREVENT PERMANENT DAMAGE.

REPAIRS

1. Should an electrical component fail, consult the Factory Service Center to obtain the proper replacement part.
2. If refrigerant gas is lost from the machine, it will be necessary to use a refrigeration technician to correct the fault. Contact the Factory Service Center prior to initiating this action.

Any competent refrigeration technician will be able to service the equipment. The following procedure must be used:

- a. The source of the leak must be determined and corrected.
- b. The machine should be thoroughly evacuated before recharging.
- c. The unit must be recharged with refrigerant measured accurately by weight.
- d. For evacuation and recharging of the machine, use the crimped and brazed charging stub attached to the side of the refrigerant compressor.

The charging stub should be crimped and rebrazed after servicing. **NEVER** allow permanent service valves to be fitted to any part of the circuit. Service valves may leak causing further loss of refrigerant gas.

3. The refrigerant compressor fitted to the dehumidifier is a durable unit that should give many years of service. Compressor failure can result from the machine losing its refrigerant gas. The compressor can be replaced by a competent refrigeration technician.

Failure of the compressor can be confirmed by the following procedure:

- a. Establish that power is present at the compressor terminals using a voltmeter.
- b. With the power disconnected, check the continuity of the internal winding by using meter across the compressor terminals. An open circuit indicates that the compressor should be replaced.
- c. Check that the compressor is not grounded by establishing that a circuit does not exist between the compressor terminals and the shell of the compressor.

TROUBLESHOOTING

<u>SYMPTOM</u>	<u>CAUSE</u>	<u>REMEDY</u>
Little or no airflow	1. Loose fan on shaft 2. Fan motor burnt out 3. Dirty refrigeration coils 4. Loose electrical wiring	1. Tighten fan 2. Replace the fan motor 3. See <i>Routine Maintenance</i> Section 4. Check the wiring diagram to find fault and repair
Little or no dehumidifying effect	1. Insufficient air flow 2. Compressor fault 3. Loss of refrigerant gas	1. Check all of the above 2. Contact the Factory Service Center 3. Contact the Factory Service Center
Little or no defrost when required	1. Faulty Timer 2. Faulty bypass timer	1. Contact the Factory Service Center 2. Contact the Factory Service Center

BD12 SPARE PARTS LIST

DESCRIPTION	Part Numbers				
	1026500	1026600	1026700	1026800	1026900
Compressor	3020116	3020128	3020128	3020128	N/A
Comp O/H protector	3031724	3031725	3031725	3031725	N/A
Comp Capacitor	3036337	3036338	3036338	3036338	N/A
Condenser Coil	2026502	2026502	2026502	2026502	2026502
Evaporator Coil	2026501	2026501	2026501	2026501	2026501
Filter Dryer	3020904	3020904	3020904	3020904	3020904
Fan Motor/Blade	3035755	3035756	3035756	3035756	N/A
By-pass Valve	3020814	3020814	3020814	3020814	3020814
PCB Timer	N/A	N/A	1617700	N/A	N/A
Mech Timer	3030781	3030780	N/A	3030780	3030781
Hour Meter	N/A	N/A	3030778	N/A	3030779
Toggle Switch	3032301	N/A	N/A	N/A	N/A
Rocker Switch	3035914	N/A	N/A	N/A	N/A
Terminal Block	3031460	3031460	3031460	3031460	3031460
Terminal Block	3036813	N/A	N/A	N/A	N/A
Transformer	3031001	N/A	N/A	N/A	N/A
Solenoid Coil	3030421	3030422	3030422	3030422	3030421
Relay	3030270	N/A	3030270	N/A	N/A
Mains Cable	3031202	3031231	3031270	3031270	3031202
Drain Tray	2026519	2026519	2026519	2026519	2026519
Condensate Tube	3014368	3014368	3014368	3014368	3014368
Drain Tube Clip	3086135	3086135	3086135	3086135	3086135
Rotary Switch	N/A	3030557	3030557	3030557	3030557
Thermostat	2026543	2026543	2026543	2026543	2026543
Indicator Lamp	N/A	N/A	3034527	N/A	N/A
Indicator Lamp	N/A	N/A	3034526	N/A	N/A
Indicator Lamp	N/A	N/A	3034525	N/A	N/A
Wheel	3050101	3050101	3050101	3050101	3050101

Spare parts available online

www.EIPLDIRECT.com

WARNINGS

This appliance can be used by children from 8 years and above and persons with reduced physical, sensory or mental capabilities or lack of experience and knowledge if they have been given supervision or instruction concerning use of the application in a safe way and understand the hazards involved.

Children shall not play with the appliance.

Cleaning and user maintenance shall not be made by children without supervision.

If the SUPPLY CORD is damaged, it must be replaced by the manufacturer, its service agent or similarly qualified person in order to avoid hazard.

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R134a – 1300

R407c – 1610

For type and weight of refrigerant contained in this unit, please refer to the product data label

Due to the high pressures within the refrigeration circuit, under no circumstances must direct heat be applied to the evaporator coil in an attempt to remove the build-up of ice.

No attempt should be made to cut open any part of the refrigeration circuit due to high pressures and gas involved.

If the unit is switched off at the mains power supply for any reason, the unit must be allowed to stand at rest for at least three minutes before restarting.



Drawing	: - TPC142
Issue	: - 4
Date	: - 24/11/16



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