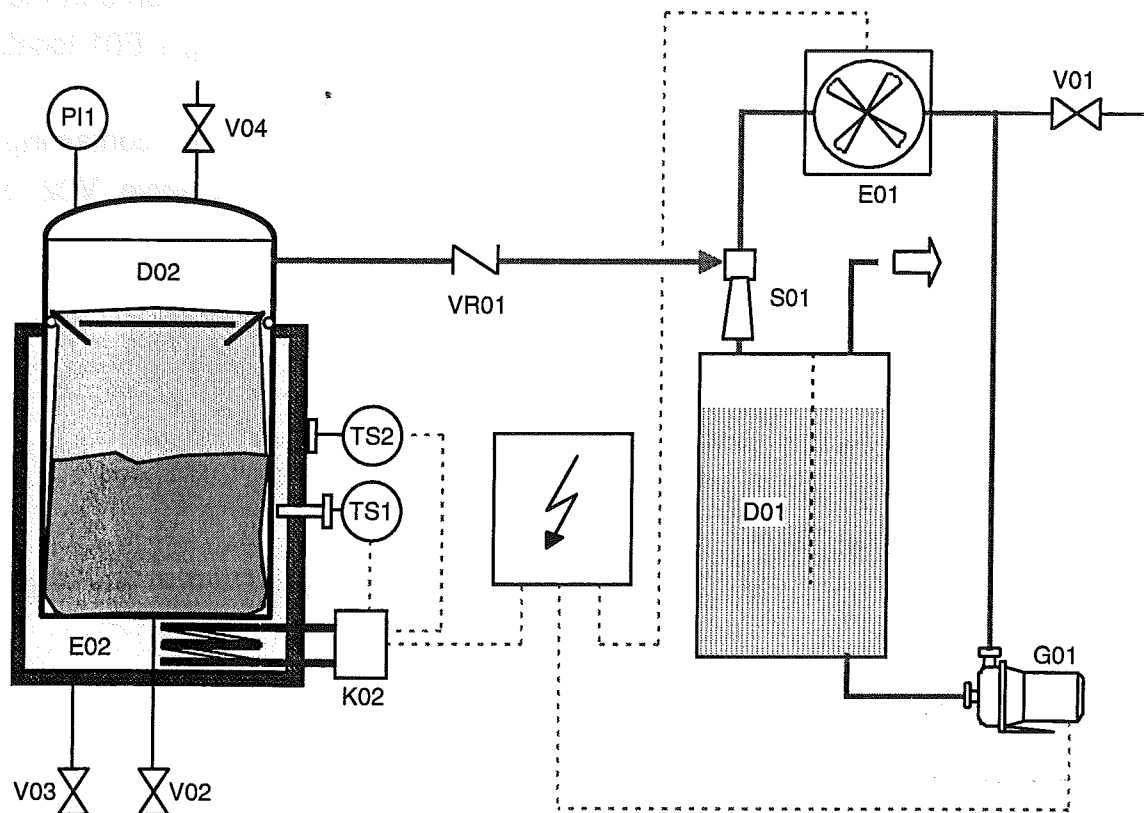


## 2.1 THE SYSTEM

### PROCESS DESCRIPTION

Dry 20 is an evaporator/concentrator which exploits vacuum technology to obtain a low-temperature distillation of liquids.

The working scheme is as follows:



The unit consists of a cylindrical chamber D02 equipped with an heating jacket E02 filled with diathermic oil.

The oil, which is heated by the electric resistance K02, flows by natural convection in the heating jacket.

The temperature of the bath is set by the thermostat TS1. TS2 is a safety thermostat. The unit is feeded manually, through the upper cover; liquid may be poured directly into the boiler or into a special thermoresistant plastic bag which will contain the final dry product.

Evaporation takes place at a temperature ranging from 45 to 50°C (113-122°F) and at a relating residual pressure of 13-20 kPa.

Vacuum is created by a circuit, which consists of the following parts:

- G01 centrifugal pump;
- S01 ejector;
- D01 distillate storage tank.

The pump G01 pumps the distillate from the storage tank D01 through the ejector S01, to create vacuum. The pressure variation allows to extract all the generated steam from the boiling chamber D02.

Steam is then condensed when it comes in contact with the liquid stored in the tank D01; condensation heat is dissipated through the air heat-exchanger E01 located in the delivery side of the pump G01.

The distillate over-flows from tank D01. The dry concentrate, containing the pollutants, is discharged by the manual opening of the foot valve V02 or by extracting the bag containing it.

## MAIN PARTS DESCRIPTION

The standard unit consists of the following parts:

### Evaporation chamber D02

The shape of the chamber is a vertical cylinder with a heating bottom and walls and with an upper cover.

The chamber is complete of demister for drop separation.

Dimensions:

- width                      600 mm - 23.64 inches
- deep                        500 mm - 19.70 inches
- height                     1300 mm - 51.22 inches
- capacity                    15 l     - 3.96 gal.

### Heat-exchanger E02

Double-walled heat-exchanger with parts in contact with process fluids

Electric power              1.5 kW

Approximate dimensions:

- diameter                    280 mm - 11.03 inches
- lenght                      615 mm - 24.23 inches

Distillate storage tank D01

Parallelepiped horizontal tank with the following dimensions:

- 350x80x300 mm
- 13.79x3.152x11.82 inches

Vacuum pump G01

Centrifugal pump with closed biimpeller.

Power of motor	1.1 kW approximately.
Flow rate	6 m <sup>3</sup> /h - 26.41 gpm approximately
Head	31.5 m - 103.35 Feet

Ejector S01

Ejector for vacuum generation.

Construction material: polypropylene.

Heat-exchanger E01

Air cooling system for the distillate, which consists of an exchanger with multirank finned tubes and a fan.

Fan speed	1400 rpm
Thermal exchange capacity	3 kW
Air flow rate:	1100 Nm <sup>3</sup> /h - 4844 gpm

Casing and piping

The unit is assembled on an metallic casing, closed by coated aluminium panels.

Onboard piping, tubes and line components are made either of austenitic steel or thermoplastic material.

**i**

The evaporation concentration plant building materials could change on the basis of the technical modifications that LED ITALIA may judge necessary.

INSTRUMENTATION\*

The instruments supplied measure:

- Relative pressure in the evaporation chamber
- Temperature of the oil bath
- Timing of the duty cycle

**i** \*During the executive project the instrumentation may be subject to changes to make the plant more suitable for the process requirements

A safety control stops the unit if the temperature of the oil bath exceeds the operating range.

### ELECTRICAL COMPONENTS

Centralized IP 55 electrical board.

## 2.2 TECHNICAL DATA

TECHNICAL FEATURES		dry 20	
Distillate output with bag	l/h	1.0	1.0
	gal/h	0.264	0.264
Distillate output without bag	l/h	1.4	1.4
	gal/h	0.37	0.37
Max absorbed power	W	2200	2200
Voltage	V	220	230
Frequency	Hz	50	60
Requested air flow-rate	m <sup>3</sup> /h	1100	1100
	gpm	4844	4844
Empty weight	kg	100	100
	pounds	220.46	220.46
Width	mm	600	600
	inches	23.64	23.64
Deep	mm	500	500
	inches	19.7	19.7
Height	mm	1300	1300
	inches	51.22	51.22
Noise	dB(A)	<70	<70

## 2.3 UNITS RANGE

Dry 20 models are available in the following versions:

MODEL	220 V/50Hz monophase	230 V/60 Hz monophase
	Code	Code
D20AA1	10.4069.1	
D20AA2		10.4071.0

## 2.4 CONSTRUCTION MATERIALS

BOILER D02	AISI 316L DIN 1.4435
E02 DOUBLE-WALLED HEAT-EXCHANGER	AISI 316Ti DIN 1.4571
D02 DISTILLATE STORAGE TANK	AISI 316L DIN 1.4435
E01 AIR COOLING SYSTEM WITH MULTI-RANK FINNED TUBES	AISI 304 DIN 1.4301

## 2.5 PROCESS CHEMICALS

<i>Product</i>	<i>Description</i>	<i>Packaging</i>	<i>Code</i>
<i>Siliconic antifoam</i>	AS 1-D	1x20 l	1900020
	AS 1-C	1x20 l	1900050
	AS 1-C	1x50 l	1900740
	AS 1-C	1x200 l	1900750
<i>Water-based antifoam</i>	WA 1	1x20 l	1900080
<i>Bactericide</i>	LED 1	1x10 l	1900160
<i>Chemical solutions</i>	CLEANER	2x8 l	1900230
	CLEANER	1x60 Kg	1900250
	NEUTRALIZER	1x10 l	1900240
	NEUTRALIZER	1x60 Kg	1900260
	SULPHURIC ACID 15%	1x50 l	1900270
	CAUSTIC SODA 30%	1x50 l	1900280



### **DANGER**

For the correct use of the chemicals, see the technical data sheets or call the authorized service centers or LED ITALIA Customer Technical Service.

### 3.1 DIMENSIONS AND WEIGHTS

The overall dimensions and weights of dry 20 are reported on the pre-installation sheet, see enclosure 1 sect. 12 "Enclosures".

### 3.2 PACKAGING

The unit can be delivered in two different kinds of packaging:

- protection with thermoretractable film and pallet for easy handling by means of a fork lift truck
- palletized wood box lined with nylon sheets.

The dimensions and weights for transport are:

- packaging without box	mm 1000x700x1400h	120 kg
	inches 39.4x27.58x55.16h	264.5 pounds
- packaging with box	mm 1000x700x1500h	140 kg
	inches 39.4x27.58x59.1	308.6 pounds
Approximate weight in operation :		120 kg
		264.5 pounds

### 3.3 STOCKAGE

Before final installation, the unit must be placed in a sheltered place with room temperature ranging from +5°C (41°F) to +50°C (122°F).

Do not place loads nor any object on the unit or on its packaging.

### 3.4 DISPLACEMENT

The unit may be displaced by means of the following:

- lift truck with 800 mm (31.52 inches) forks and minimum load capacity of 200 kg (441 pounds)
- electrical or manual transpallet with 800 mm forks (31.52 inches) and minimum load capacity of 200 kg (441 pounds)