IRRIGATION






SPRINKLER

Irrigation on the crop leaf, above ground (similar to rain).

Main Methods	Conception	Main Crops		Advantages	
Conventional Sprinkler	Basic irrigation system, using sprinklers and/or cannons through pipes manually distributed in the area.	Crops that require intense and uniform water application.	Pastures and gardening.	Suitable on different types of surface/topography and for many types of crops.	It is used in small area irrigations.
Mechanized Sprinkler - Self-Propelled Winder Reel	It has a structure with wheels and a high pressure hose with up to 500 m length on a reel with a cannon at the end. The operation will through hydraulic pressure.		Sugar cane, banana and citrus.		It is used in medium area irrigations.
Mechanized Sprinkler - Center Pivot	Center Pivot consists with sprinklers nozzles connected into a metallic structures, supported above ground by towers, that move on wheels along the area to be irrigated.		Potatoes, grains (soybean, corn and bean).		It is used in large area irrigations.

DRIP AND MICRO-IRRIGATION

Frequent irrigation directly applied to plant roots, with low volumes of water.

Main Methods	Conception	Main Crops	Advantages
Micro sprinkler	Irrigation through micro sprinklers installed near the plant roots.	Gardening, nebulization, crops that have superficial roots, orchards, nurseries, coconuts.	Suitable to a wide variety of soil types, low water and energy consumption, uniform soil humidification and less rigorous filtration (compared to drip) due to the larger water passage hole.
Drip	Irrigation through drippers/drip hoses over the surface or sub-surface (below ground).	Crops that do not tolerate water on their leaves, trunks or fruits (vegetables and coffee).	Suitable for a wide variety of soil types, low water and energy consumption (lower flows compared to micro-sprinkler); few evaporative losses. The wind and terrain slope do not limit irrigation.

HYDROPONICS

Irrigation/growing soilless plants with adequate nutrient solution.

Main Methods	Conception	Main Crops	Advantages
Passive	The hydroponic solution in a static way is conducted to the roots plants, through high capillary cultures.	Vegetables in general.	Greater efficiency per area, preservation of the environment and protection against climatic adversities.
Active	The hydroponic solution is pumped to the plant roots.		

FERTIGATION

Fertilizer application with irrigation water.

Main Methods	Conception	Main Crops	Advantages
Slurry Irrigation	Fertigation with animal slurry/manure (Pig and Cow).	Pastures, forages and grains.	Accelerate the nutrient cycle to improve crop efficiency, productivity and quality.
Fertilizer injection through irrigation	Fertigation with specific fertilizer mixtures for each crop.	Orchards and plants.	

SURFACE

Irrigation over the soil surface with a high volume of water, through pumping and gravity action.

Main Methods	Conception	Main Crops		Advantages
Furrows and Floods	Water is applied directly to the soil surface moved by it in furrows and/or flooded in basins/dikes.	Crops that need plenty of water to keep the soil surface wet.	Rice and watermelon.	Favors photosynthesis of lower leaves. The wind does not affect irrigation.

• CONVENTIONAL SPRINKLER IRRIGATION

MODELS:

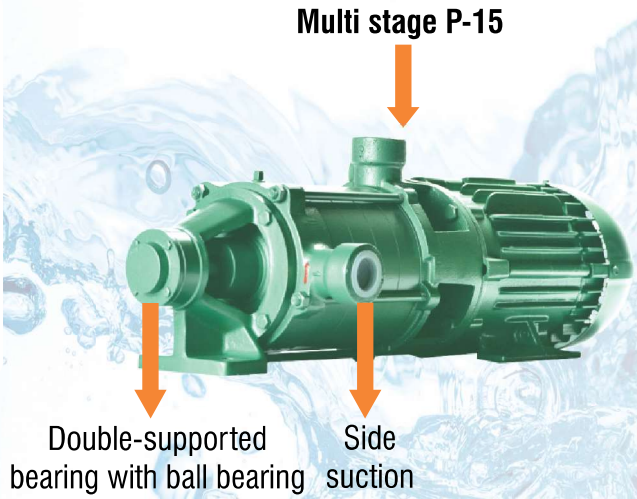
- TH-16
- R-20
- P-18
- P-11
- PX-15
- GS/GSD
- THS-18
- TH
- P-15
- RL-20B

P-11 THS-18 RL-20B GSD

ADVANTAGES:

EBARA has single stage and multi stages pumps that offer the best performance for conventional sprinkler irrigation applications.

The multi stage P-11 series (from 5 stages) and P-15/PX-15 series (from 4 stages), have as a great differential the double-supported bearing with ball bearing, resulting in a longer service life of the pump's components , as it maintains excellent shaft alignment and prevents premature wear compared to competitors.



• MECHANIZED SPRINKER – SELF–PROPELLED WINDER REEL

MODELS:

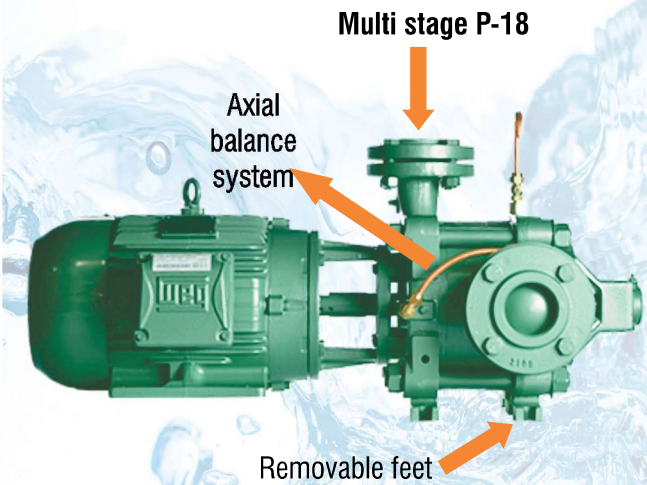
- P-18
- RL-33/2/3/4
- RL-33/2/3/4T
- TMDL-23

P-18 RL-33/2/3/4 RL-33/2/3/4T TMDL-23

ADVANTAGES:

The self-propelled winder reel irrigation method requires pumps with high pressures for the irrigation cannon/sprinkler gun placed at the end of the hose and also for the reel winding. EBARA has its own multistage pump series for this application, that can be assembled with engine driven/electric motors or by tractors driven with baseplate, gearbox and cardan.

The P-18 multi stage series has an axial balance system that provides longer life for the ball bearings due to reduce the axial thrust. It also includes ease/versatility of installation once its design containing removable support feet fixed to the suction and discharge casings, which are available to be assembled 90º apart from one another.



• MECHANIZED SPRINKLER – CENTER PIVOT

MODELS:

- TMDL-23
- TMDL-27
- TMDL-32
- TH
- GS/GSD
- GST

TMDL-23

TMDL-27

TH

GST

ADVANTAGES:

The Center Pivots have in their concept several sprinkler nozzles to be pressurized, thus, the pumps need to reach high flows with medium or high pressures. EBARA has the best solution through its end suction single stage and multi stage pumps.

Aiming at the best pump performance to obtain lower energy consumption, EBARA Corporation has a specific department in Japan, eDYNAMiQ, focused at developing more efficient pumps required by the highest standard markets in the world.

The GS (Global Standard) and GSD (Global Standard Direct Coupling) end suction series provide high levels of efficiency. The hydraulic project is made in Japan and in Brazil is manufactured (Cast, machining and assembly) through EBARA BOMBAS AMERICA DO SUL at the Vargem Grande do Sul-SP (Brazil) surface pumps unit.

We present below a case study of return on investment (Payback), using the GS 150/500 model, which offers the great advantage of 5.0% higher pump efficiency than the best competitor, resulting in considerable energy and financial savings (approximately R$45.062 in 3 years and R$75.103 in 5 years).

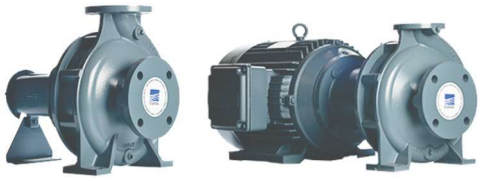
eDYNAMiQ

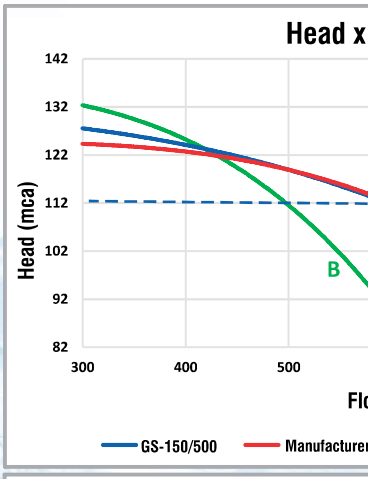
Eco, Dynamic and Inte rated Quality

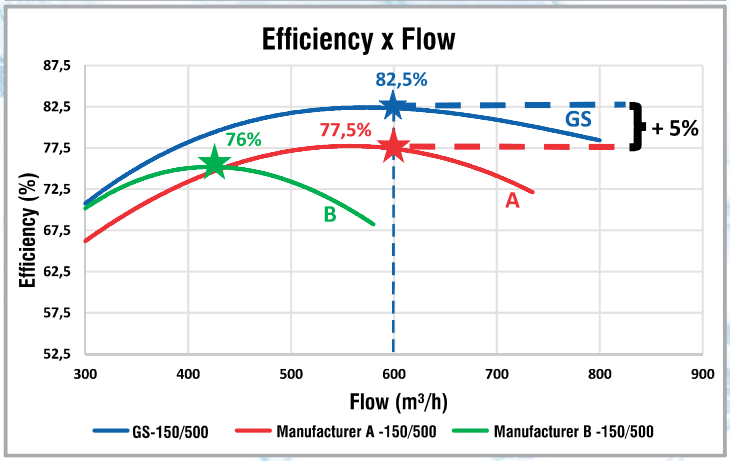
Greater efficiency

Lower energy consumption

End Suction GS/GSD

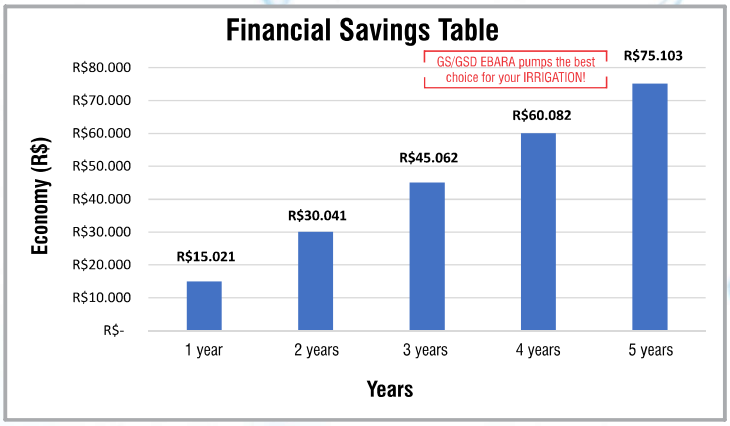






CASE STUDY

	EBARA	COMPETITOR A
Pump Efficiency	82,5%	77,5%
Motor Power (hp)	350	350
Head (mca)	112	112
Flow (m³/h)	600	600
Hours of Daily Operation	21	21
Days of Operation for Year	120	120
Years of Operation	3	3
Price Kw.h (R$)	0,4	0,4
Power Consumption (hp)	301	321
Motor Efficiency IR3	96%	96%
Motor Electrical Power (W)	230.972	245.873
Total Consumption (Kw.h)	1.746.145	1.858.799
Total Cost (R$)	698.458	743.520
Economy with EBARA Pump	R$ 45.062	



• MICRO SPRINKLER AND DRIP IRRIGATION

MODELS:

• **TH-16** • **TH-16P** • **P-11** • **P-15**

TH-16

P-11/3

P-11/5

P-15/2

ADVANTAGES:

Micro sprinkler/Drip irrigation requires low flow and low pressure for its operation compared to conventional sprinkler irrigation, therefore, pumps tend to be small size and with low powers. According to terrain topography, pump models can vary between single stage or multi stage (higher slope).

The TH-16 single stage series is an excellent choice for irrigation in low slope areas. Aiming at the best cost-benefit to the customer, EBARA offers the TH-16P model, built with an injected thermoplastic casing and impeller, in addition to having the option with a THEBE brand single-phase motor, built with a protective casing (IP-55), that allows installation in unsheltered places, and stainless steel shaft end, avoiding corrosion in the mechanical sealing region.

Single stage TH-16P

• HYDROPONICS IRRIGATION

MODELS:

• **THI-13** • **TH-16** • **TH-16P** • **THB-13**
• **THL-13**

TH-16

TH-16P

THB-13

THL-13

ADVANTAGES:

Hydroponics irrigation requires medium or high flows with low pressures.

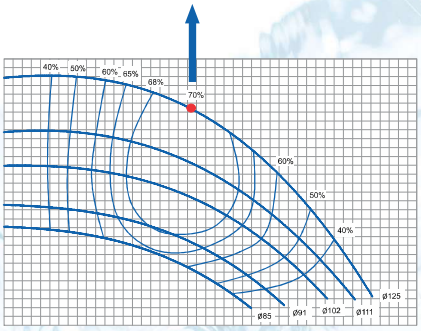
The THB-13, THL-13 and THI-13 series have characteristics that are very well suited to this application, especially the THI-13 pump built with 5 vanes impeller configuration, which has excellent pump performance compared to competitors.

In the hydroponics application, the pumped liquid may contain nutrients and/or chemical agents, which cause a low life of the motor's shaft end due to premature corrosion. EBARA offers the THEBE brand single-phase motor, with stainless steel shaft end, preventing corrosion in the mechanical sealing region.

Single stage THI-13

THEBE motor with stainless steel shaft tip

Greater efficiency



• FERTIRRIGATION: FERTILIZER INJECTION THROUGH IRRIGATION

MODELS WITH SEMI-OPEN IMPELLERS:

- **TSL 40-160**
- **TSL 40-160/2**
- **TSLT**
- **R-20**
- **AE-3**

TSL 40-160 | TSLT | R-20 | AE-3

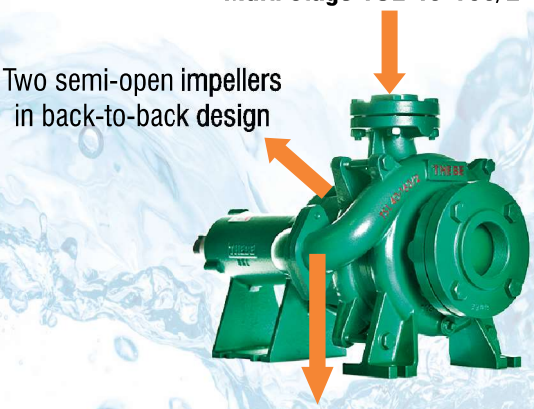
ADVANTAGES:

In slurry, manure and vinasse irrigation, the pumped liquid contains non-fibrous solids and requires semi-open impeller pumps.

The TSL (Thebe Slurry) and TSLT (Thebe Slurry Tractor Driven) models have high efficiency with suspended solids (non-fibrous) up to 18mm diameter. The TSL 40-160/2 model has adequate pressure for use in irrigation cannons/sprinkler gun, due to its concept with two semi-open impellers in the back-to-back design, and liquid passage through the outer tube between the suction and discharge casings, preventing clogging.

The model is available in bare shaft, close coupled and tractorized versions.

Multi stage TSL 40-160/2



• FERTIRRIGATION: INJECTION OF VARIOUS NUTRIENTS

MODELS:

- **EVMS**
- **P-11**
- **2CDX**
- **DWO**
- **TBO**

P-11/3 | TBO | EVMS

ADVANTAGES:

Fertigation applications consist in fertilizers Injection towards the irrigation system's pipeline by a pressurized pumping system.

For liquid mixtures free of solids, EBARA has in its product line, the multi stage pumps EVMS (vertical in-line) and 2CDX (horizontal) series, which are built in stainless steel that results in a longer life due to the material's high compatibility with fertilizers. Another option are the booster pump series with stainless steel housing and thermoplastic impellers.

EBARA also offers a solution for homogenizing and transfer of liquids with suspended solids, usually used in the fertilizer mixing tank. The DWO series built in stainless steel with semi-open impeller that prevents clogging, also has the differential of suction and discharge nozzles suitable for assembly with threaded pipes (BSP) or with clamps, in addition it is a compact pump.

EBARA line in stamped stainless steel

High compatibility with nutrients, manufactured at Ebara Pumps Europe (Italy).

2CDX Multi stage

DWO Single stage semi-open impeller

• FURROWS AND FLOODS IRRIGATION (SURFACE)

4 AND 6 POLES MODELS:

• TH • GS • GSD

TH

GS

GSD

ADVANTAGES:

In surface irrigation demands high water flow with low pressures, which requires pumps with motors at lower speeds, 4 poles (1750rpm/60Hz) or 6 poles (1150rpm/60Hz).

The end suction pump series TH, GS and GSD have models with performance and assembly suitable for this type of application, and the GS and GSD models with high pump efficiency as a differential, generating great energy saving.

End suction TH

Assembly with 4 or 6 pole motors

• VERSATILITY AND SOLUTIONS

EBARA has versatile products line up for different applications, aiming the customer's demands, such as:
Electric Motors Pump Set, Engine Driven Pump Set, Irrigation Trailers, Solar Pumping Systems and Tractor Driven Pumps.

PUMP SET x ENGINE x COUPLING x BASE ASSEMBLY

TH GS

IRRIGATION TRAILER

TMDL

ÉCAROS SOLAR SYSTEM

P-11/3

TRACTORIZED PUMPS

RL-33T

GST

TSLT
Semi-open impellers

www.ebara.com.br