



RKD® HYDRAULIC PIVOT

AUTOMATIC IRRIGATION SYSTEM OPERATED WITH HYDRAULIC ENERGY



Aerial view of motor unit of MonoSpan Hydraulic.

The environmental concern and the existing competition in the agricultural market, promote the development of more efficient irrigation facilities, where a reasonable and responsible consumption of water and energy.

RKD's HYDRAULIC MONOSPAN is a central pivot type irrigation machine that works thanks to the energy of the irrigation water flow, without electric power.

OPERATING PRINCIPLE

The machine incorporates a hydraulic turbine and a number of components to carry out the conversion of the hydraulic power of the irrigation water flow into mechanical power in the motor wheels of the machine. This way, the electrical components of the machine (electrical cabinet, electric motors, cable hose, manifold, etc.) are suppressed.

The power conversion system is located on the motor unit of the machine. The water is conducted from the main pipeline to the hydraulic turbine, where the necessary energy for the movement of the machine is obtained and for the realization of the different automatisms during its operation (sectoral system and closing system). After passing through the turbine, water is conducted back to the main pipe to continue the irrigation with the overhang.

TECHNICAL FEATURES

The system developed by **RKD** is able to operate with an input pressure of the machine of only 4.5 bar, allowing the machine to move on slopes of up to 5°. However, if the pressure available at the entrance of the machine is greater, the **RKD's HYDRAULIC MONOSPAN** is capable of overcoming higher slopes.

The most standard configuration of the **HYDRAULIC MONOSPAN** consists of a section of 59.4 meters, an overhang of 24 or 30 meters, and a final cannon, being able to irrigate an area of up to 4 hectares in this way. However, other configurations are possible.

The minimum feed flow of the machine varies depending on whether the machine incorporates a final barrier or not, as well as the total irrigated area. For the standard configuration (59.4 meters tower and overhang 24 meters), and considering that there are not any final barrier, the optimum flow rate of the machine is 30 m³ / h. In case the machine has a final barrier, the corresponding flow of the barrier must be added to the previous value.

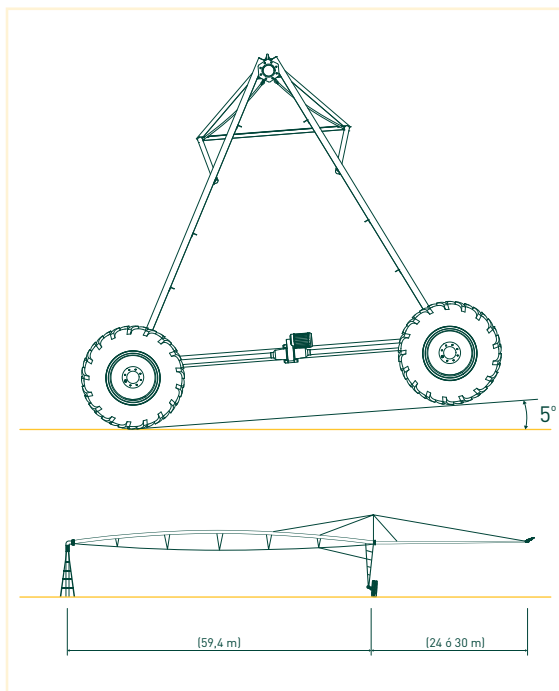
When available flow rate for turbine of 16 m³ / h is guaranteed, the speed of the machine is 1.4 m / minute. This way, the machine of standard dimension finishes a complete irrigation in 4 and a half hours (360° displacement - full circle), making a precipitation of 6.5 liters per square meter.

ecological...economic...autonomous...reliable

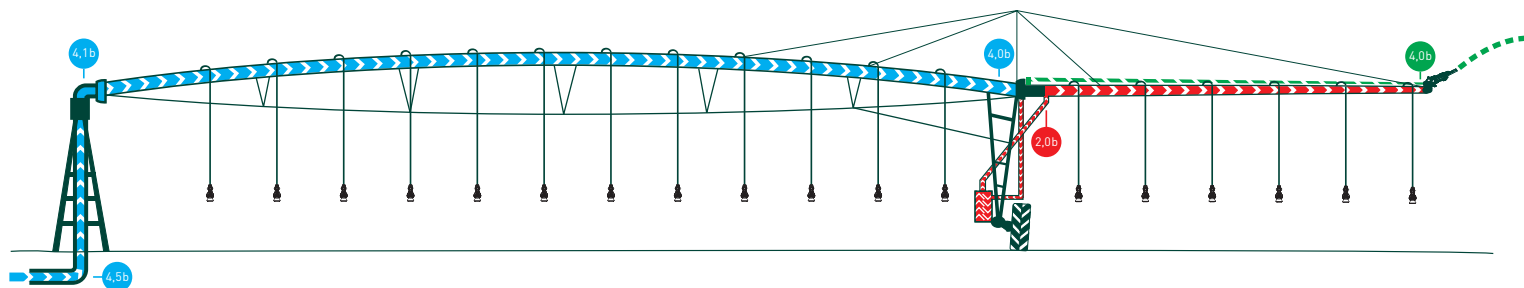
RKD's HYDRAULIC MONOSPAN, has a device to modify the speed of advance of the machine, which allows to adjust the amount of water provided to the land according to the requirement of the crops.

Optionally, **RKD's HYDRAULIC MONOSPAN** can be equipped with a sectoral system for the cases in which the geometry of the farm does not allow the machine to go through complete circles.

Also, as an option, **RKD's HYDRAULIC MONOSPAN** can be equipped with an automatic barrier closing system, to open or close which the water supply to the final barrier during the movement of the machine according to the needs, which allows make a more efficient use of water, and increase the total irrigated area.



Aerial view of overhang of 24 or 30m.



APPLICATIONS

The main motivation that drives **RKD** in the development of its **HYDRAULIC MONOSPAN** is the evidence of the existence of surplus energy in the available water flow in the irrigation hydrants on the distribution networks of the irrigation communities, which in many plots implies much higher pressure than the strictly necessary to have with guarantee an optimal irrigation with center pivot machines.

Thus, **RKD's HYDRAULIC MONOSPAN** is presented as the most efficient alternative to be installed in this type of farms, making use of the surplus energy of the irrigation water flow, eliminating all necessary electrical consumption to carry out the movement of the machine and its automatisms.

But, in addition, the fact that the machine can operate without electricity offers new scenarios of application, where an independence of the electricity supply is required.



Pivot central set, includes canon closing system



Detail of power unit with hydraulic power conversion system and sectorial system.

Here are a number of possible application scenarios:

- Farms belonging to the domain of a community of irrigators where water flow with adequate characteristics for the operation of the machine is guaranteed.
- Remote locations away from electricity supply networks, and where there is a hydraulic resource with appropriate characteristics for the operation of the machine.
- Adaptation of central pivot machines of one section of RKD to operate with the new hydraulic energy utilization system.
- Locations where the reliability of the machine is an absolute priority, as, for example, in developing countries, where skilled labor may be scarce to carry out maintenance tasks typical of conventional center pivot machines operated with electric power.

SUMMARY OF FEATURES

Standard Tower length:	59,4 m
Overhang length:	24 or 30 m
End gun:	Depend of costumer's requirements
Minimum Flow requirement (without End Gun):	30.000 l/h
Minimum pressure work:	4,5 bar
Minimum Pluviometry:	6,5 l/m2
Speed regulation system:	Manual
Sectorial System:	Automatic
Start/Stop system for End Gun:	Automatic
Sprinklers:	Depend of client's requirements. (obligatory use of pressure regulators)
Main Pipe:	Galvanized Steel, diameter 127mm. Thickness 3mm
Slopes:	Depend of available pressure
Moving without irrigation:	Towable gearboxes