

Submersible Pumps and Motors

CASE

STUDY

Comunidad de Regantes del Pantano Estrecho de Peñarroya
Peñarroya Irrigation Project: Modernization Works



Figure 1. Peñarroya Reservoir

Irrigation

Irrigation is the watering of land to make it ready for agriculture. Irrigation is the application of controlled amounts of water to plants at needed intervals. Irrigation helps to grow agricultural crops, maintain landscapes, and revegetate disturbed soils in dry areas and during periods of less than average rainfall. Irrigation also has other uses in crop production, including frost protection, suppressing weed growth in grain fields and preventing soil consolidation.

Irrigation uses 70% of the world's water resources, so the quality, delivery and management of water are critical to any project success.

Irrigation water can come from groundwater (extracted from springs or by using wells), from surface water (withdrawn from rivers, lakes or reservoirs) or from non-conventional sources like treated wastewater, desalinated water, drainage water, etc.

For the Peñarroya Irrigation Project, water comes from surface: Peñarroya reservoir (Argamasilla de Alba – Ciudad Real)

Irrigation Pumps are used to pump water from these water reserves to the fields requiring irrigation (lifting pumps).



Figure 2. Intake Pumps / Delivery to Filtration

The Water Authority

The Peñarroya Irrigation Association was established in 1963.

It covers 7456 Hectares of watered lands, clusters approximately 2000 land co-proprietor, and belongs to the Gadiana Hydrographic Confederation and to the Oriental Exploitation Board CHG.

The Peñarroya Irrigation Association includes also the municipal districts of Argamasilla de Alba, Campo de Criptana and Tomelloso.

The type of irrigation used mostly is by sprinkling and by location (dripping).

The main crops are: Corn, Cereals, Vineyard, Melons, Watermelons, Garlic, Onions, Alfalfa, Peppers, etc.

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Modernization Works

The modernization of the Peñarroya watered lands, concluded by the end of 2008, consisted of the change of the traditional gravity irrigation system (via concrete ditches) to a more modern irrigation system with closed pipes (pressure irrigation).

Distribution was divided equally in between sprinkling (underground total coverage) and dripping.

In addition to the irrigation modernization, it resulted an improvement of the agricultural operations and significant cost savings for farmers in terms of water, energy and labor forces, as there was a shift towards fully automated irrigation systems.

The irrigation modernization entails an annual saving of approximately 15.36 cubic hectometers, highlighting its social return since the mentioned watered area was located within the perimeter of the La Mancha Occidental aquifer (previously known as number 23) previously declared as overexploited.

Indar Installed 2 Axial Flow Pumps and 63 Mixed Flow Multistage Submersible Pumps

Intake and Discharge to the pool

Water Intake was projected by a derivation to a concrete tank. For the water pumping to the regulation pool, a pumping system with two (2) Indar submersible pumps was defined. H-385-385 + ML-28A-4/100.

Pump	Motor	Flow (USgpm)	Head (feet)	Motor Output (HP)	Voltage (V)	Diameter (in)
H-385-385	ML-28-A-4/100	7926	26.2	100	400	24

Delivery to Filtration

For the water pumping, from the regulation pool to the filtration system, submersible pumps were installed.

The sixty three (63) submersible pumps (UGP-1325-02+ML-25-3/100) in standard configuration, due to the slim design, was the ideal solution for installation onto the casings (water traps).

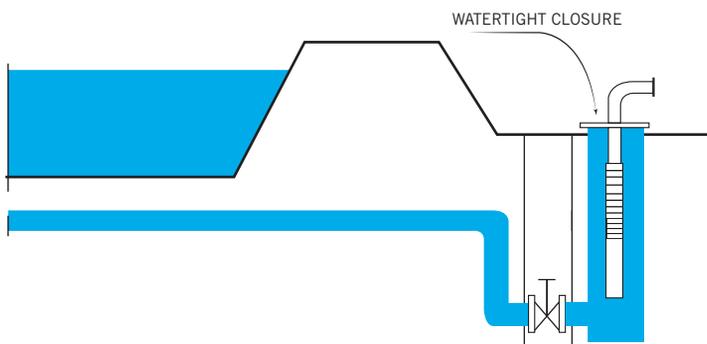


Figure 3. Reservoir Lifting. Watertight without cooling shroud.

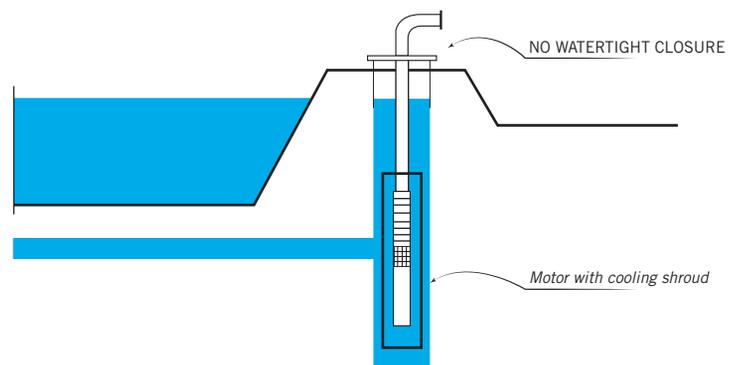


Figure 4. Reservoir Lifting. NO watertight with cooling shroud.

UGP-1325-02+ML-25-3/100 Submersible Motorpump sets were made of a multistage (two (2) stages) centrifugal pump directly coupled a submersible type water filled electric Motor.

Pump	Motor	Flow (USgpm)	Head (feet)	Motor Output (HP)	Voltage (V)	Diameter (in)
UGP-1325-02	ML-25-3/100	2377.8	216.4	240	400	14.5

INDAR submersible pump sets for irrigation were a technically and environmentally friendly alternative due to the efficient use of water.