

BERMAD Solutions for Mechanized Irrigation



Balancing & Managing Systems with Irrigation Machines

Mechanized irrigation was developed during the 1940's to include Center Pivot, Lateral Move and Linear Move irrigation machines in cultivated fields using minimum labor and infrastructures.

These machines often need to move over diverse terrain types, including sloped areas and muddy fields. They represent relatively large irrigation units, both from a hydraulic and irrigation perspective.

6" x 200m; 1/8 mile line = 30Ha; 75 acre = 100m³/h; 450gpm

8" x 400m; 1/4 mile line = 50Ha; 125 acre = 170m³/h; 750gpm

These factors, together with the need to irrigate different crops growing in variable soil types, make the water supply and distribution management challenging .

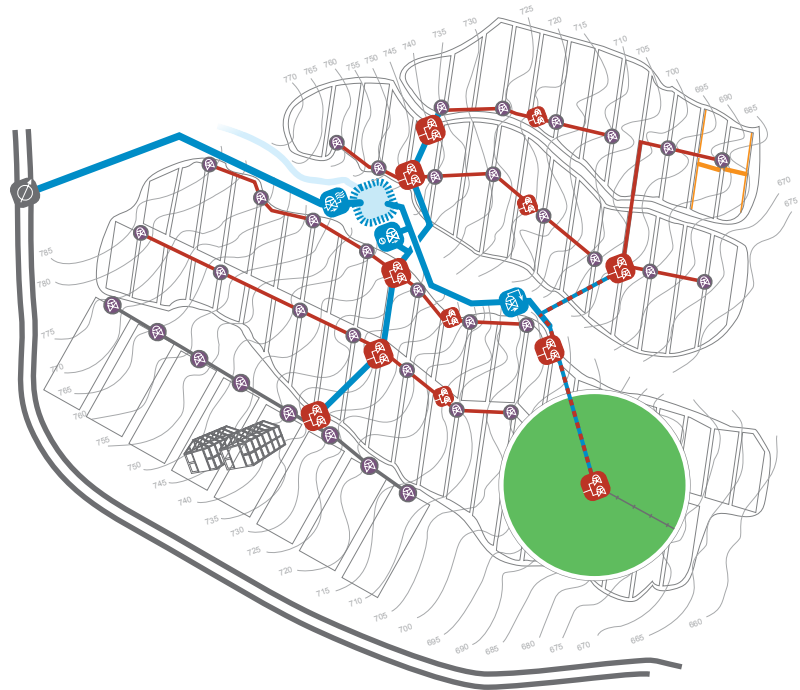
BERMAD Leads the Way in Answering these Challenges

With its proven track record and global presence, BERMAD offers ongoing support in integrated irrigation solutions required for mechanized irrigation; providing protected, efficient, and reliable hydraulic systems for long-term, accurate, and uniform irrigation control.

Main Water Supply System, with Multiple Consumers and Pivots

As a recognized world leader in water flow management, BERMAD delivers protection and efficiency. Its proven water and control management solutions include state-of-the-art hydraulic control valves, air valves, and advanced water meters.

Whether for bulk water supply systems, water distribution network grids, or pumping stations and delivery lines, BERMAD offers robust and reliable solutions that help optimize water usage, maximize energy efficiency, reduce costs, and protect water supply and distribution systems.

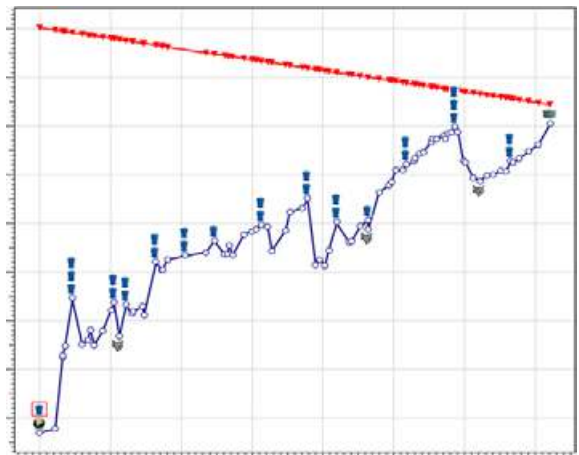


Surge Analysis and Protection

The surge phenomenon is mainly associated with pumping stations, but can also occur at any point along the water supply system where sudden changes in flow velocity occur. For example:

- Pumping stations (start-up, shutdown, pump trip)
- Sudden closing of valves or end of line fill-up
- Opening and closing of large irrigation blocks

With the support of professionals, the selection and integration of anti-surge solutions such as Active Check Valves, Surge Anticipating Valves, Anti-Surge Air Valves, Surge Vessels and ect.; can be optimized to meet the level of protection required and overall cost efficiency.



Main Water Supply System, with Multiple Consumers and Pivots



Pressure and Flow Control

Achieving continuous, stable, reliable, and efficient water supply in areas with elevation differences is a known requirement. However, effective pressure and flow control can also be challenging in relatively flat planes for the following reasons:

- Accumulating distance of irrigation units from the pressure source
- Differences of unit sizes in terms of flow and required operational pressure
- Variety of irrigation methods (e.g. flood, drip, sprinklers, pivots) and of crops with different schedules and water requirements

These challenges can be overcome through the accurate planning, sizing, application, and locating of solenoid-controlled pressure reducing valves, pressure sustaining valves, flow control valves, flow meters, and air valves. Such integrated pressure and flow control solutions protect irrigation machines and systems, and ensure long-term durability and efficiency.



From Design to Execution

Main Water Supply System, with Multiple Consumers and Pivots

Main Products



BERMAD-EuroMag Electromagnetic Flow-Meter:

- Polymeric: 1100J 2"-6"; Metal: 1000EL 8"-12"
- Cost Effective, Wafer type
- Accurate and simple, battery operated
- Suitable to all water qualities
- No moving parts



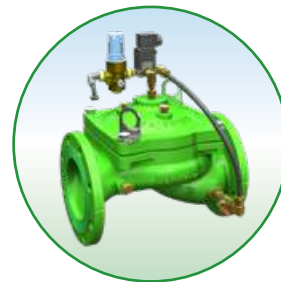
BERMAD Mechanical / Turbine Flow Meters:

- TurboBar Woltman Type: 2" through 20", Accurate and provide easy in-line maintenance
- Turbo-IR Tangential Type: 1½" through 16", Accurate to irrigation control requirements and suitable to water containing up to 30% solids



BERMAD Fill-Up Flow Limiting & Pressure Reducing, Main Pivot Valve:

- Polymeric: 172-55, 2"-6"; Metal: 472-55, 2"-12"
- 3-Way Control: Zero added ΔP ; Suits all water qualities
- Balanced & supported diaphragm
- Simple in-line maintenance and easy setting
- Suitable to all the controllers in the market



BERMAD Fill-Up Control, Main Pivot Valve:

- Polymeric: 110-02-X, 2"-6"; Metal: 410-02-X, 2"-12"
- Easy opening-speed setting
- Balanced & supported diaphragm
- Simple in-line maintenance
- Complies with all the controllers in the market



BERMAD Hydraulic Quick Relief Valve:

- Polymeric: 13Q, 1½"-6"; Metal: 43Q, 1½"-12"
- High Relief Flow with Safe Non-Slam closing
- Accurate, repeatable with Easy setting
- Balanced & supported diaphragm



BERMAD Combination Air Valves:

- Polymeric: C10; C15 & C30, 1"-3"; Metal: C30 & C70, 2"-12"
- Higher flow rates
- Low pressure sealing
- Minimal spray effect
- Built-in surge protection

Inlet of Center Pivot

As Center Pivots serve large irrigation units, they require that all standard monitoring and control solutions facilitate hydraulic secured operations with precise and uniform irrigation.



The following challenges also arise because they act as moving distribution lines:

- The line gets empty whenever Pivots main valve shuts and fills up when it opens.
- The line slope may vary from uphill to downhill during irrigation.
- They comprise multiple joints and carry tons of water, and the line is driven 6-9m; 20-30ft above ground. This creates mechanical and hydraulic tensions.

BERMAD's offering for the Center Pivot inlet includes:

- Range of water meters: Electromagnetic, Woltman, or Tangential
- Range of high-capacity polymeric or metal main control valves:
 - Simple on-off solenoid-controlled
 - Solenoid-controlled and pressure reducing
 - Fill-up rate control, pressure reducing and solenoid-controlled valve
- Range of polymeric or metal hydraulic quick relief valves
- Range of polymeric or metal combination air valves

End of Center Pivot

Located furthest from the controller, the end tower of a center pivot represents the peak of required performance: Fastest motion, highest nozzle flow, lowest pressure and flow velocity (sedimentation), and various plot borders (end guns & corners).



End-Gun Valves – “Squaring the Circle”

Center Pivots rarely irrigate round fields. This leaves the corners out of the irrigation circle. A common and effective solution for adding up to 30% to the irrigated area at the corners is installing a sprinkler at the end of the Center Pivot (End-Gun), and activating it at the right time and place.



BERMAD offers the following products to ensure that this solution works effectively:

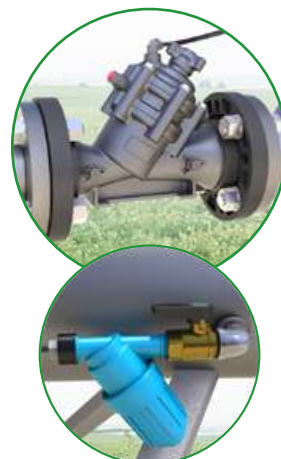
- When a booster pump is applied, BERMAD offers a pressure sustaining and optional reducing control valve to open with the booster start (no command is required) and provide constant pressure to the End-Gun.
- When only the valve is used, BERMAD offers a solenoid-controlled valve and an optional reducing control valve.
- In cases where the control system allows for analog control, BERMAD offers a pressure reducing valve with dynamic remote setting.

End of Center Pivot

Regularly Flushing Sand & Dirt

The relatively slower flow velocity at the end of the Center Pivot results in sand and dirt sedimentation that accumulates towards the water source. This might clog more and more sprinklers while also adding extra weight over the end tower and span. The installation of a flushing valve at the end of the line, allows for regular flush out to help prevent this sedimentation from accumulating.

BERMAD offers a range of automatic fail safe closed flush valves with a self-contained hydraulic or battery-powered timer control (with BT setting) to define a desired flushing cycle.



Corner System & Variable Rate Irrigation (VRI) Valve



Precise irrigation or Variable Rate Irrigation (VRI) was developed to provide uniform and highly-efficient irrigation where variable factors such as soil types, crops, terrains, and topography may result in the inefficient usage of water and chemicals.

Solenoid control valves are installed at the inlets of each nozzle. Based on a mapping of fields, the definition of management zones, and integration with a GPS system, the VRI system operates these valves to open or close so that sprinklers along the Center Pivot will “pulse” or close during pivot irrigation.

Located 5m (15ft) above ground, pulsing up to 120,000 times a season, and operating with unfiltered water, these 150 VRI solenoid valves must be highly efficient, maintenance-free, and extremely reliable.

BERMAD’s corner system and VRI valves with a self-flush control filter and 3-way control are proven to have performed more than one million cycles and **offer the reliability required for these applications.**





Irrigation



About BERMAD

BERMAD is a leading, privately-owned global company that designs, develops and manufactures tailor-made water & flow management solutions that include state-of-the-art hydraulic control valves, air valves and advanced metering solutions.

Founded in 1965, we have spent over 55 years interacting with the world's major end users, and accumulating knowledge and experience in multiple markets and industries. Today, we are recognized as a pioneer and established world-leading provider of water & flow management solutions that give our customers the unprecedented operational efficiency, and superior quality, durability and performance they need to meet the demanding challenges of the 21st century.



www.bermad.com

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