



ICID•CIID

International Commission on Irrigation and Drainage (ICID)



Mr Dhiraj Sharma
Electrosteel Castings Limited, India

Smart Flow Control Valves for Efficient Irrigation Projects

2nd Indo Global Irrigation Summit
24-25 June 2026, New Delhi India

Smart Flow Control Valves for Efficient Irrigation Projects

A technical presentation by **Electrosteel Castings Limited**

Enhancing Irrigation with Advanced Valve Technology

DHIRAJ SHARMA

NETWORK ARCHITECTURE

COMPLEX IRRIGATION NETWORK



2nd Indo-Global Irrigation Summit
24-25 June 2026, New Delhi, India



ICID • CIID

NETWORK ARCHITECTURE

COMPLEX IRRIGATION NETWORK — STAGES 1 & 2



STAGE 1: THE HEADWORKS

Source & Storage — Mass volume management at the primary water source. Heavy-duty **Plunger Valves** and **Butterfly Valves** handle high static pressures to regulate initial intake velocity safely.



STAGE 2: PRIMARY TRANSMISSION

The Backbone — Bulk water transported across tens or hundreds of kilometres. **Surge Anticipator Valves** and **Air Release Valves** prevent pipeline bursts by venting trapped air and mitigating water hammer effects.

NETWORK ARCHITECTURE

COMPLEX IRRIGATION NETWORK — STAGES 3 & 4



STAGE 3: DISTRIBUTION NETWORK

Secondary & Tertiary Zones — Automated **Flow Control Valves** split main flow into precise volumetric chunks. **Pressure Reducing Valves (PRVs)** dynamically lower incoming line pressure. **Intelligent Digital Controllers** stream real-time telemetry to central control rooms.



STAGE 4: ON-FARM DISTRIBUTION

Micro-Irrigation Stage — IoT-enabled **Smart Solenoid Valves** respond to programmed schedules or direct soil moisture sensor signals, transforming bulk pipeline pressure into targeted field application.

SMART VALVE BENEFITS

ADVANTAGES OF SMART VALVES IN IRRIGATION NETWORKS

Reduced Energy Consumption

Precise flow regulation minimises pressure losses, reducing electricity demand at pumping stations.

Automated Pressure Management

Pressure-reducing and control valves stabilise the network, preventing pipe bursts and water hammer.

Leakage & NRW Reduction

IoT and SCADA integration enables network isolation, anomaly detection, and instant leak response.

Precision Water Delivery

Smart flow valves dynamically regulate delivery based on real-time soil and weather data, eliminating over-irrigation.

LIST OF REFERENCES

REFERENCES OF SMART IRRIGATION SYSTEM TO INCREASE CROP YIELD

Fully automated irrigation system helped Andhra Pradesh Tobacco farmers earn 43000/- more per ha with an improved productivity of 12% and leaf grade by 5%

Key Results and Impact

By upgrading from manual guesswork to sensor-driven automation, the project achieved incredible numbers:

- **59% Water Saved:** Precision watering cut down over half of the previous water waste.
- **12% Productivity Boost:** Better water control directly improved the overall yield per hectare.
- **Higher Leaf Quality:** The leaf ripeness and overall grade improved by 5%, allowing farmers to command higher prices.
- **Increased Profits:** The farmers earned an average of **₹43,000 more per hectare**.

<https://www.cultivate.com/casestudies/cultivates-fully-automated-irrigation-system-helped-telangana-tobacco-farmers/>

LIST OF REFERENCES

OTHER REFERENCES OF SMART IRRIGATION SYSTEM TO INCREASE CROP YIELD

Irrigation System Designed with SCADA and Wireless Sensor Network Applied to the Colombian Environment

Indian Journal of Science and Technology, Vol 11(34), DOI: 10.17485/ijst/2018/v11i34/131454, September 2018
ISSN (Print): 0974-6846 | ISSN (Online): 0974-5645.

Smart irrigation system using PLC, SCADA, and fuzzy control

Edelweiss Applied Science and Technology, Vol. 8, No. 6, 9101-9120, DOI: 10.55214/25768484.v8i6.3947, 2024
ISSN: 2576-8484

Automatic Irrigation System using Programmable Logic Controller

International Journal of Electrical & Electronic Engineering & Telecommunications, Special Issue, Vol. 1, No. 1, March 2015
ISSN 2319 – 2518

2nd Indo-Global Irrigation Summit
24-25 June 2026, New Delhi, India



VALVE TECHNOLOGY

ELECTROSTEEL VALVES



Since 1984

Valve Manufacturing

Purpose-Built Performance

Each valve is engineered for demanding water infrastructure environments — from municipal networks to high-pressure hydroelectric systems.

Global Manufacturing

Three state-of-the-art facilities worldwide enable streamlined production, faster delivery, and consistent quality at scale.

Research and Development

Focused on creating new technologies and upgrading existing products and processes, we have two dedicated Research and Development centres at Nuoval, Italy and West Bengal, India.

Trusted Globally

Our global footprint serves diverse infrastructure needs with precision and reliability — wherever your project is located.

2nd Indo-Global Irrigation Summit
24-25 June 2026, New Delhi, India



ICID • CIID

PRODUCT RANGE

ELECTROSTEEL VALVE RANGE

Plunger Valve



DN 80 - DN 1800
PN 10-16-25-40-64
As per: EN1074-1/5
Operation: Gearbox, Actuated
(Electric, Pneumatic), Hydraulic

Diaphragm Valve



DN 50 - DN 1200
PN 10-16-25
As per: EN1074-1/5
Operation: Pressure Reduction,
Flow Control, Pressure Relief,
Float/Altitude Control, Solenoid

Resilient Seated Gate Valve



DN 40 - DN 1000
PN 10-16-25-40
As per: EN1074-1/2, IS 14846
Operation: Manual, Gearbox,
Electric Actuated

Double Eccentric Butterfly Valve



DN 200 - DN 2400
PN 10-16-25-40
As per: EN 593, IS 13095
Operation: Gearbox, Actuated
(Electric, Pneumatic), Hydraulic

PRODUCT RANGE

ELECTROSTEEL VALVE RANGE

Swing Check Valve



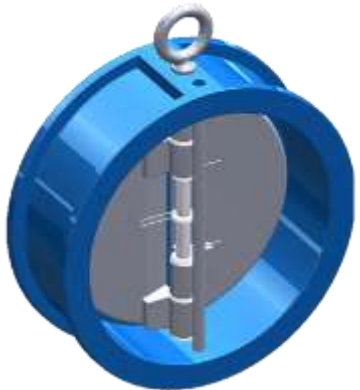
DN 50 - DN 600
PN 10-16-25-40
As per: EN1074-1/4

Tilting Disc Check Valve



DN 200 - DN 1400
PN 10-16-25
As per: EN1074-1/4
Operation: With Lever & Weight,
With Shock Absorber

Dual Plate Check Valve



DN 50 - DN 600
PN 10-16-25-40
As per: EN1074-1/4

Double Chamber Air Valve



DN 50 - DN 200
PN 10-16-25-40
As per: EN 1074-1/3, IS 14845
Operation: Air Release, Air
Suction, Venting while Operation,
Combination

PRODUCT RANGE

INTELLIGENT DIGITAL CONTROLLERS (IDC)

IDC is the compact, smart and flexible microcontroller, available with integrated cloud connectivity: controlling and viewing your application just got easier.

IDC is designed to manage automatic diaphragm/piston control valves and needle (plunger) valves, with an open, modular system and with pre-loaded applications for the main control functions.

The range of applications that can be created with IDC becomes more versatile than ever: the functions can be various and configurable according to needs.

Control Functions

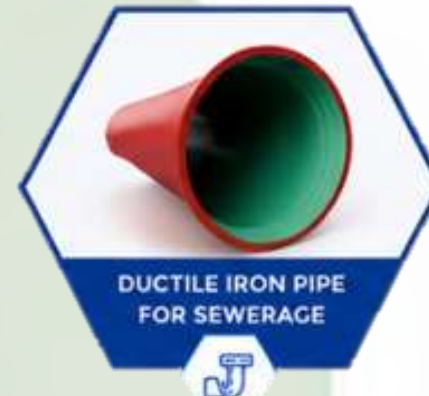
- Rate of flow control
- Rate of flow control based on supplied tank level
- Blending
- Pressure control
- Pressure control based on flow rate and/or critical point
- Opening degree regulation

FULL PORTFOLIO

ELECTROSTEEL - COMPLETE PRODUCT PORTFOLIO

From raw materials to finished products, Electrosteel delivers a complete pipeline ecosystem of pipes, fittings, and precision valves. By managing the entire manufacturing process in-house, we ensure unmatched quality and reliability.

Partner with us for a trusted, single-source solution engineered for water infrastructure projects of any scale.





T.I.S.
AN ELECTROSTEEL ENTERPRISE

2nd Indo-Global Irrigation Summit
24-25 June 2026, New Delhi, India

**BUILT ON HERITAGE.
FLOWING INTO THE FUTURE.**
~ SUSTAINABLE WATER INFRASTRUCTURE FOR GENERATIONS ~



TIMELESS HERITAGE
Bowls, pots and tumblers that carried water – the essence of life for ancient civilizations.





LEGACY OF STRENGTH
The same materials, carrying forward a legacy of durability, ingenuity and trust.



FLOWING INTO THE FUTURE
Blue symbolizes water – our promise to deliver sustainable solutions with reliability, everywhere.

STRONGER TODAY. SUSTAINABLE TOMORROW.

