

MTA Throttle valve

Don’t just throttle.
Measure. Control. Understand.

THE DECISION

Don’t just throttle.Measure. Control. Understand.

Why simply limit a discharge when you can actively control it, document it and, where necessary, supplement it with quality data?

MTA Throttle valve

A systems-based approach to modern drainage and water protection projects.

Intelligent flow control.
Monitor water quality.

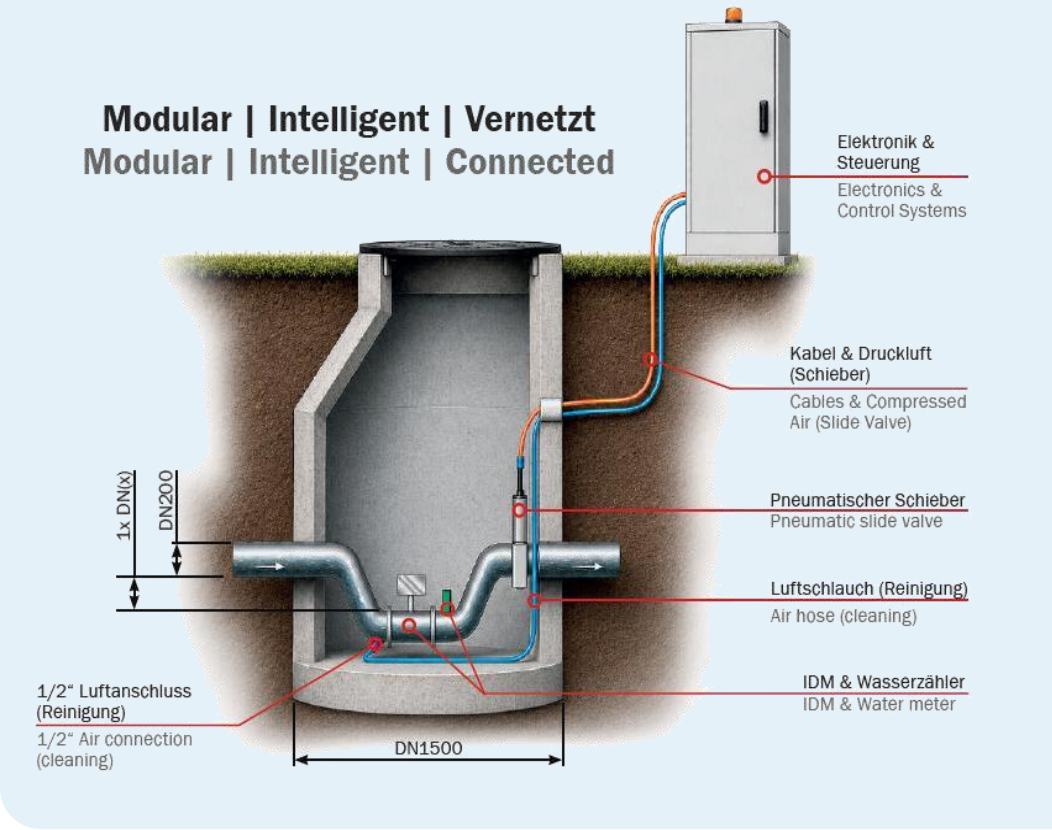
The innovative system solution for:

- Hydraulic control
- Reliable measurement data
- With project-specific expansion options

Active flow control

Reliable data rather than assumptions

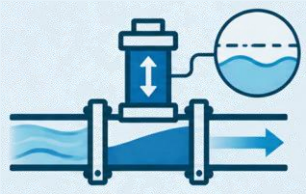
Optional water quality monitoring



Why this solution should be included in the planning

01 Mastering hydraulics

The actual volume flow is measured continuously and controlled to a project-specific setpoint.



02 Making operations transparent

The flow rate and the volume transferred can be tracked. Operational and quality data can be integrated as an option.



03 Plan for tendering

The type of shaft, pipe diameter, measurement, throttling device and control system form a system solution designed specifically for the project.



Measurement + Control + Documentation + Expandability

The conflict of objectives in drainage planning

Incoming water flows are dynamic.
The capacity of downstream infrastructure is limited.

Use the retention volume

Basins, storage channels and reservoirs should be drained in a controlled manner – not at any speed.



Comply with the limit values

Permitted discharge volumes and throttled outflows are derived from the planning and approval process.



Protect the following systems

Sewers, sewage treatment works or other systems must not be subjected to hydraulic loads exceeding the agreed limits.



Planning question: How can the flow be kept under control when

Not every throttle is an active control mechanism

PASSIVE

Static throttle valve

A fixed flow cross-section creates a hydraulic throttling effect. The flow rate also depends on the available head pressure.

MECHANICAL

Hydraulic-mechanical throttle

Depending on the design, the component responds to hydraulic conditions without necessarily measuring the actual flow rate directly.

MEASUREMENT-DRIVEN

Actively controlled system

A measured value is compared with a setpoint. The throttling device is actively controlled and the throttling effect is measured again.

The comparison is based on principles. Specific competing products must be assessed on the basis of their technical specifications.

Why the actual flow rate is crucial

When the cross-sectional area of the opening remains constant, the flow rate typically increases with the applied pressure difference.
Active control can adjust the free cross-sectional area so as to optimise the maximum flow rate.





The key difference

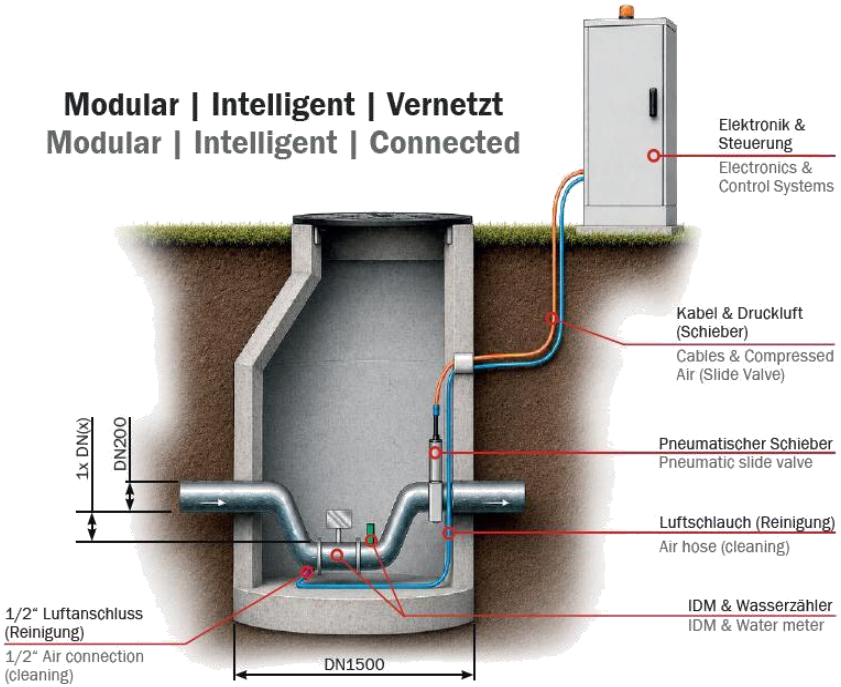
The MTA throttle valve regulates the flow based on the actual measured flow rate – within the hydraulically and technically permissible operating limits.

The system does not throttle indiscriminately – it regulates based on measured values.

Measure. Evaluate. Adjust.

An integrated IDM* measures the actual flow rate in a still section of pipe. The innovative software compares the actual value with the specified maximum value, and the integrated SIMATIC controller from Siemens adjusts the pneumatic slide valve so that limit values are adhered to in good time.

*) IDM = Inductive flow meter



A closed-loop control system rather than a fixed opening

01

Target

Q_{should} from project specification



02

Measure

IDM tracks Q_{is}



03

Compare

Software evaluates ΔQ



04

Adjust

Adjustment of free cross-section



05

Check

IDM reviews the results



Continuous measurement and control cycle

What is prescribed – and what is regulated by MTA Throttle valve?

PLANNING & APPROVAL

Define the permissible setpoint value for the throttling flow Q_{should}, as well as hydraulic operating conditions, installation requirements, and test and verification criteria.

MTA THROTTLE VALVE

Measures the actual flow rate and controls the damper in a closed-loop control system to maintain the specified setpoint. All data is recorded and can also be accessed online if required.

Demonstrably comply with requirements and regulate them automatically.

Wastewater: The benefits of active flow control

01 / RETENTION

Rainwater & combined sewer water

Controlled emptying of rainwater retention and storage facilities; controlled discharge into the downstream sewer network.



02 / NETWORK

Sewers & stormwater drains

Flow restriction towards overloaded sub-networks or downstream special structures.



03 / PLANT

Plants & Sewage Treatment Works

Support the hydraulic loading of plants and treatment stages as specified in the design.

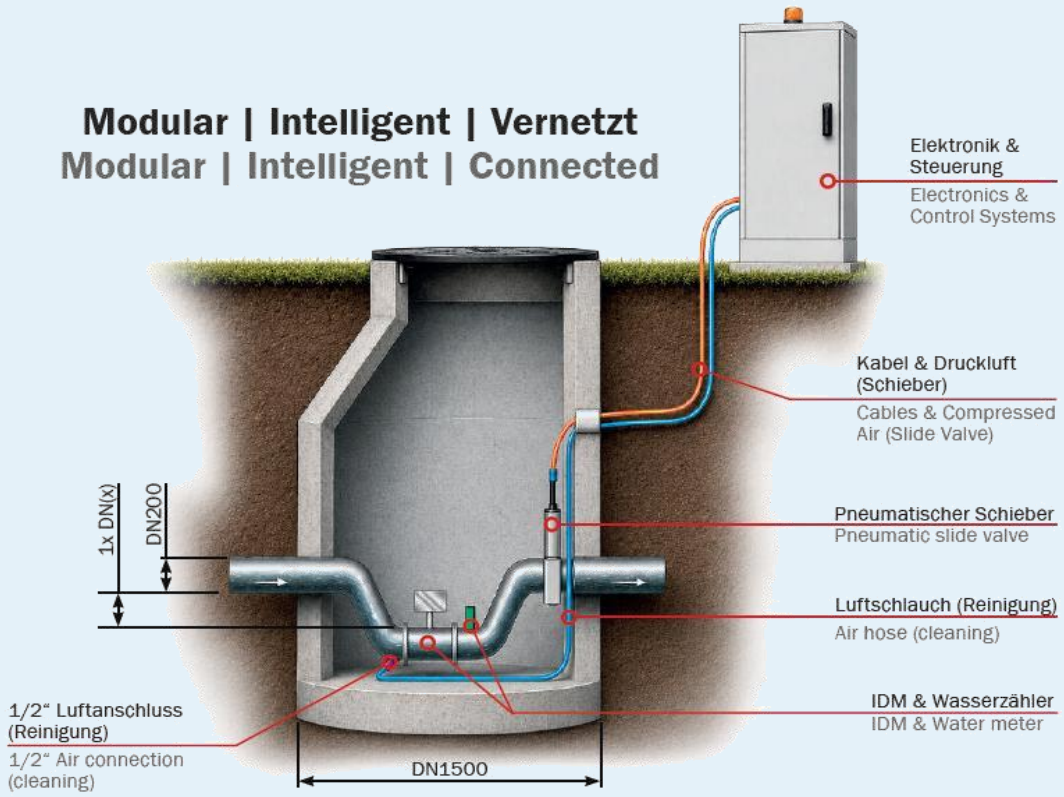


Goal: To actually comply with the discharge figures derived from the hydraulic design.

Comparison with static throttle valves

Criterion	Simple static throttle	MTA throttle valve
Key feature	Fixed throttle cross-section	Measured flow rate Q_{is}
Water level	The discharge varies with Δh	Active adjustment of the free pipe cross-section
Quantity statement	Additional measurement required	IDM records volume and quantity
Adjustability	A mechanical, usually manual, adjustment is required	Setpoint can be defined in the control system
Operation & Cleaning	Depending on the design and maintenance	Targeted compressed-air cleaning of the culvert area
Integration	Options depending on the design	SIMATIC Remote Control + optional external connection
Alarms and Documentation	In most cases, no information is provided to operators	Alerts sent to specified contacts; long-term storage of all data

MTA Throttle Valve – System Information



The complete system

- Manhole (DN and material configurable)
- For pipes from DN100 to DN500
- Measuring principle: inductive flow measurement
- Pneumatic throttle valve control
- Measured and controlled variable: volumetric flow (IDM), setpoint/actual value control
- Control accuracy: ±0.25%
- Automatic self-cleaning

Basic system and optional extensions

STANDARD

IN THE BASIC SYSTEM

- Complete system including electronics
- Local operation / HMI
- Configurable setpoint and intervention values
- Continuous readjustment
- SINEMA Remote Connect as the system platform

OPTIONAL

DEPENDING PROJECT SPECS

- Remote access to data via a web interface
- Alerting of user-defined contacts
- Data storage
- Connection to PLCs / control systems
- Integration of additional sensors for quality assessment and monitoring

The base system is also customised to meet specific project requirements

Configurations in the basic system

01	Hydraulics	Q_{should}, Q_{min} / Q_{max}, Water levels, pressure conditions, backwater
02	Structure	Concrete or PE possible; geometry, installation depth and accessibility
03	Medium	Rainwater, mixed water or waste water; check for solids and chemical stress
04	System limits	IDM measurement range, controllability, throttle/pipe pressure and materials
05	Interfaces	Energy supply, control systems
06	Control limits	Intervention limits, intervals, self-cleaning in the culvert area

A checklist for enquiries makes project planning easier

Extensions for the basic system

01	Cloud integration	All readings and notifications can be accessed anytime, anywhere
02	Interfaces	Connection to control systems / PLCs possible
03	Air conditioning	Control cabinet available with optional heating or integrated cooling
04	User levels	Various authorisations and alarm contacts are available as options
05	Sensors	Additional sensors can be integrated for monitoring purposes

Rainwater & Agriculture: Protection measures specifically for ecologically sensitive areas



01 Mastering hydraulics

Retention basins and discharge channels require controlled discharge.

02 Water quality and characteristics

Run-off, turbidity, salts and nutrient inputs can alter the composition.

Rainwater & Agriculture: more than just reduction

Criterion	Purely hydraulic throttling	MTA throttle valve + measurement options
Flow rate	Pure throttling effect	Actual-value-based control on Q_{should}
Volume balance	Cannot be known directly without measurement	IDM: Flow rate and volume transferred
Water quality	Additional measuring point required	Sensors and analysers can be integrated as an option
Notable events	Often not visible without sensors	Trends from documentation + alarm concepts available
Planning & Installation	Considering components separately (throttle & sensors)	Project-based system integration
Remote information	Not always available	External access, PLC integration – scalable and expandable
Reaction to any abnormalities	Not available	Alerts sent to specified contacts, immediate automatic control

Sensors for water quality management

Standard in the basic system

Parameters	Unit	What is monitored?	Benefits for the operator
Temperature	°C	Water temperature	Assessment of operating conditions
Conductivity	µS/cm or mS/cm	Dissolved ions in water	Detection of changes in water composition

Optional extensions

Parameters	Unit	What is monitored?	Benefits for the operator
Ammonium	NH_4-N, mg/l	Nitrogen pollution	Indications of sewage inflow
Nitrate	NO_3-N, mg/l	Nitrate nitrogen	Monitoring of nutrient loading
eChlorid	Cl^-, mg/l	Chloride content	Identification of saline tributaries
Phosphate	PO_4-P or PO_4^{3-}, mg/l	Dissolved Orthophosphate	Control of nutrient inputs
Total phosphorus	Total P (TP)	Total phosphorus content	Assessment of the total phosphorus load

Sensors (Example)



Reference sensor Endress+Hauser Memosens CAS41E

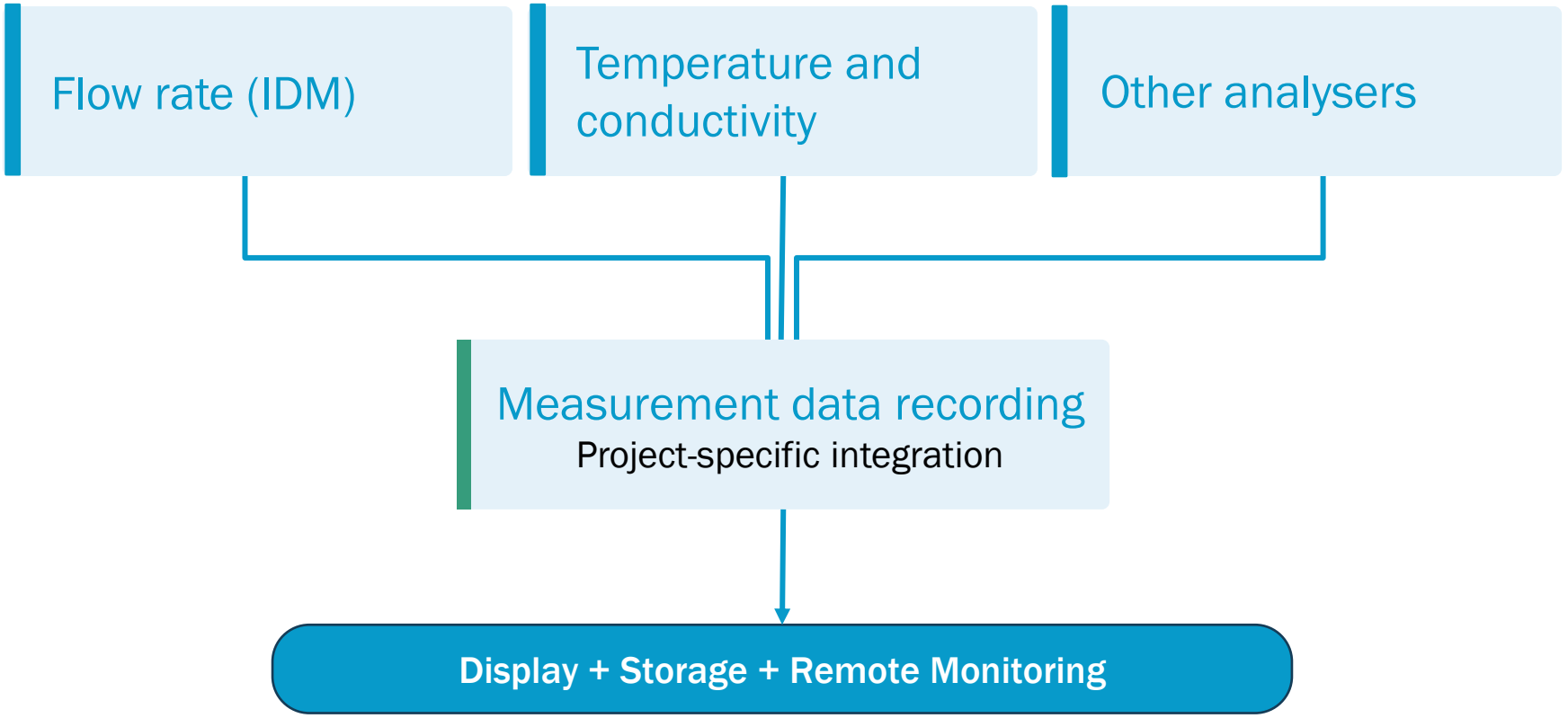
Compact multi-parameter sensor for efficient monitoring

Three freely configurable electrode slots allow for the flexible combination of both measuring and compensation electrodes within a single sensor. Depending on the configuration, selected dissolved substances in the medium can be continuously monitored, changes in composition detected, and measured values compared over time.

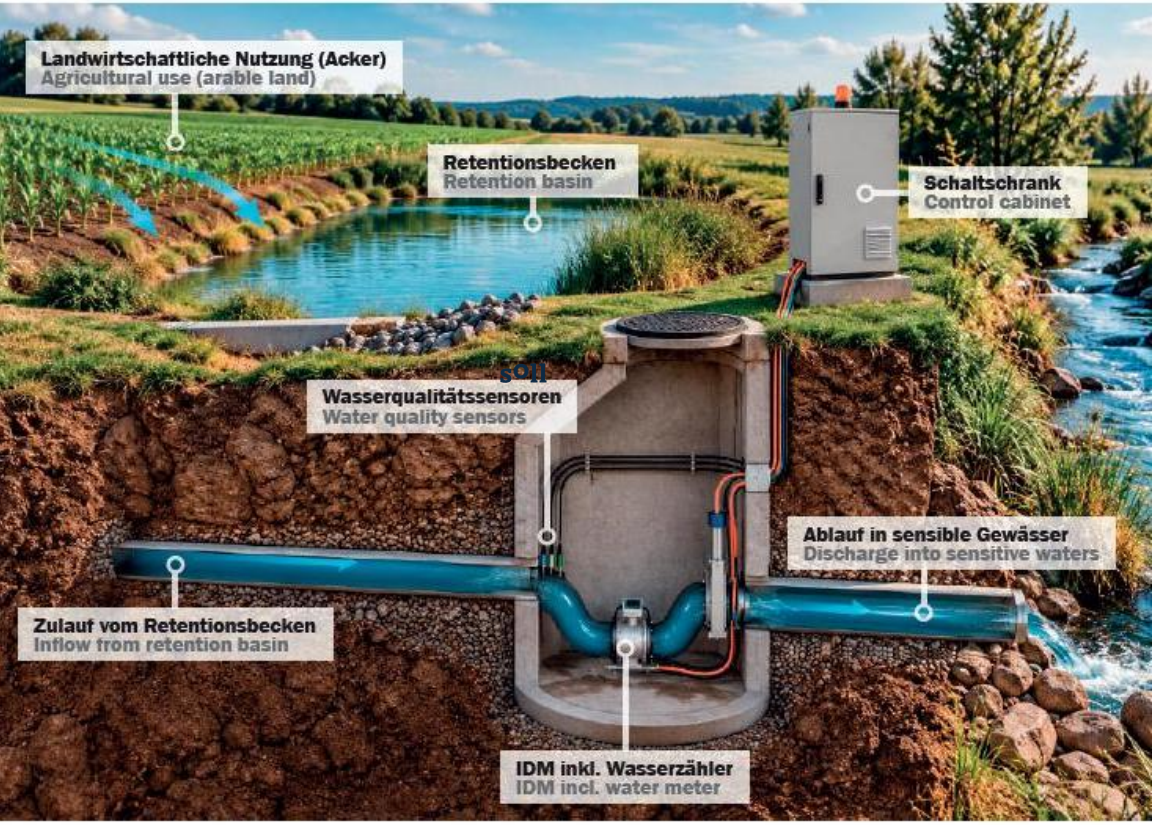
Parameters	Unit	Measuring range	What is this value useful for?
Ammonium	NH_4-N, mg/l	0–1.000 mg/l	Indications of nitrogen pollution
Nitrate	NO_3-N, mg/l	0–1.000 mg/l	Monitoring of nutrient loading
Potassium	K+, mgl	0–1.000 mg/l	Identification of saline tributaries
Chloride	Cl^-, mg/l	0–1.000 mg/l	Control of nutrient inputs

Characteristic	Information according to manufacturer's data sheet
Electrode positions	3 freely configurable positions for measurement and compensation electrodes
Permissible process temperature	2–40 °C
Max. permissible overpressure	500 mbar (0,5 bar)
Maintenance/Calibration	Interchangeable electrodes; multi-point in-process calibration

Equipment principle – Schematic diagram



Example: Retention basin upstream of sensitive receiving water body



01 The reservoir buffers the inflow from rainfall

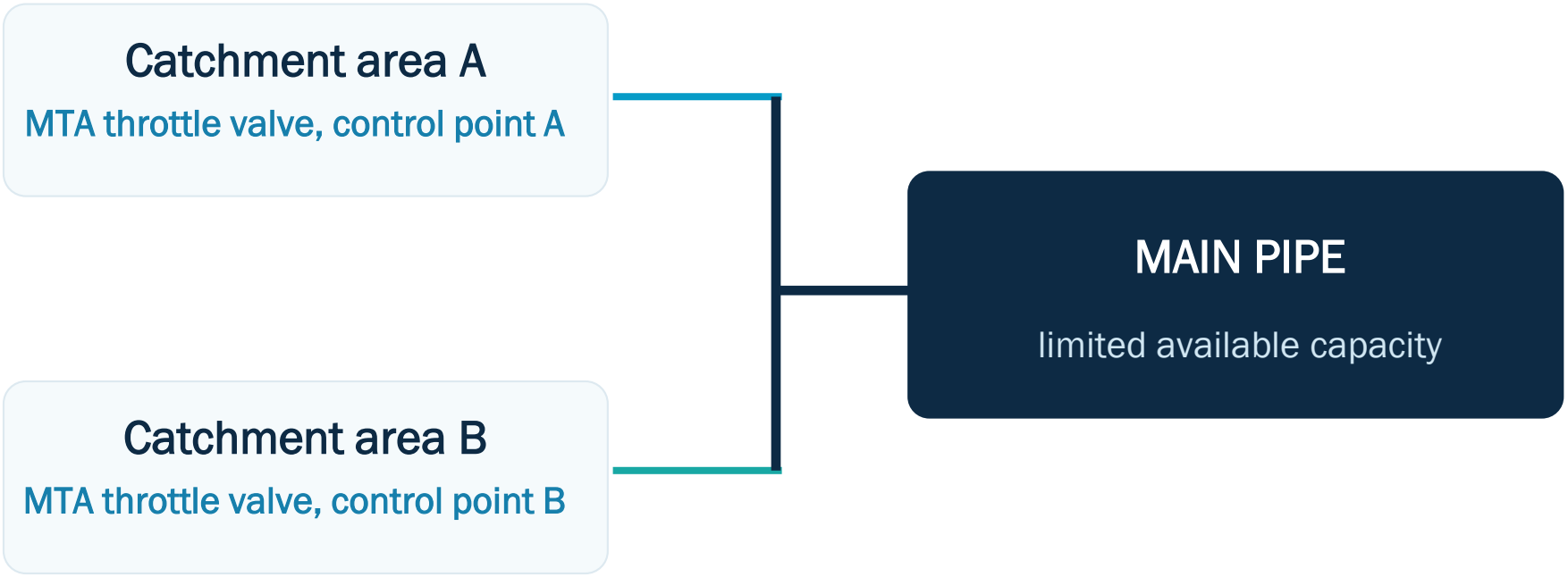
02 MTA throttle valve measures Q_{is} and controls Q_{should}

03 State sensors, including pH, turbidity and conductivity

04 Quality sensors: nitrate, ammonium, phosphate

05 Values for monitoring and operational decisions

Complex networks: controlled supply rather than overload



Target values coordinated during the planning stage at several discharge points can make it easier to control the overall flow into a main sewer.

What engineering companies need for work

Type	Details
Q_{should}	Based on hydraulic calculations, an official decision or the operator's specifications
Piping & Hydraulics	DN Inlet/outlet, Q_{min}/Q_{max}, heights, backwater, operating conditions
Structure	Site plan, longitudinal section, shaft/installation dimensions, accessibility
Medium	Type of water/wastewater, solids and chemical load
Integration	Power supply, external PLC, remote access, alarm and data requirements
Sensors	Parameters, measurement ranges, limit values, intervals

For the call for tenders: Setting out requirements

Type	Details
Measurement principle	Continuous IDM flow rate measurement and integrated flow measurement
Control principle	Automatic setpoint/actual flow control via an actively controlled throttling device
Hydraulics	A fully filled, suitable test section and a design verified for operational conditions
Operation	Configurable cleaning interval for the measuring section and local operation
Integration	Defined interfaces, data and alarm functions, including via remote access (SIM card required)
Acceptance	Functional testing, setpoint/control verification and documentation

Why use the MTA throttle valve?

01	**More control**	Active adjustment rather than a fixed aperture alone
02	**Measurable impact**	Actual flow rate and flow measurement
03	**System integration**	Co-ordinated measurement technology, control systems, pneumatics & ducting
04	**Projectable**	Shaft, hydraulics and interfaces as required
05	**Future-proof**	Optional quality measurement and data integration

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