

- RESIDENTIAL MODELS (Apartments, villas, etc...)
- COMMERCIAL MODELS (Offices, Warehouses, Buildings, Industry, etc...)

NEW**ETHERNET Included**

LCD Screen 6 Lines 24 characters – 3 colours

Weekly Timer included

- **RESIDENTIAL MODELS** (Apartments, villas, etc...)
- **COMMERCIAL MODELS** (Offices, Warehouses, Buildings, Industry, etc...)

FEATURES

-**LEAK MONITORING** on 1 water network

Residential: Leak flow rate monitoring from 1 L/h (DN15), 2 L/h (DN20-25)

Commercial: Leak flow rate monitoring from 10 L/h (DN15-40), 25 L/h (DN50-80), 40 L/h (DN100)

- Connection of 1 water meter (DN15-DN100)
 - Connection of 1 motorised valve (Option)
 - Connection of a temperature probe (Option)
- Trigger on temperature outside high/low threshold limits

-**BUZZER** high-power integrated (adjustable duration)

-**PIPE BURST DETECTIONS**, rapid shut-offs

-**DAILY CONSUMPTION MONITORING**

Shut-off on consumption alert (enable/disable)
Adjustable alert thresholds

-**PULSE EMITTER MONITORING**

Shut-off on emitter alert (enable/disable)
Adjustable parameters

-**AUTO-ADJUSTMENT of Leak Thresholds;** Adjustable on two levels (adapts to building consumption)

-**TIMER HEBDO** 3 programmes horaire

Automatic network Open / Close

-**VALVE anti-seizure function**

- **Leak Location Assistance**

CONNECTIONS

1 PULSE EMITTER INPUT

1 FIRE ALARM INPUT opens the water network instantly in case of alarm trigger

1 REMOTE ON/OFF PUSH-BUTTON INPUT

(Open / Close / Reset)

1 Flood Detector INPUT

1 Temperature Probe INPUT

1 MONITORING BYPASS INPUT (disables monitoring for 1-4 hours)

1 VALVE OUTPUT (Open)

1 VALVE OUTPUT (Close)

1 Dry contact OUTPUT Alert relay (NO or NC)

1 24Vdc OUTPUT External siren/ Light indicator

DATALOG: Log recording on SD card
(without Modbus)

OPTIONS:

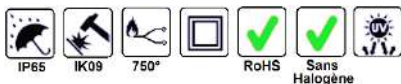
Bluetooth smartphone connection, etc...

- MODBUS RS 485
- Remote 24Vdc 100dB siren, remote alert indicator
- Gateway (SMS sending)
- SD Card (Software Update)

COMPOSITION

1 Polycarbonate enclosure

dimensions L215xH210xP105mm + watertight door



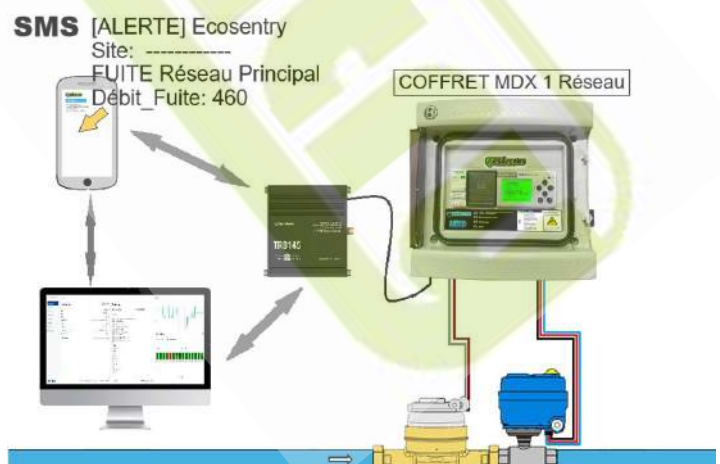
- Protection circuit breaker
- Custom PLC 24Vdc MDX - 3 color LCD screen
- 230Vac/30VA 24Vdc power supply + Buzzer
- Terminal block
- Meter DN15 to DN150



ETHERNET Included

SIMPLE INSTALLATION

WEB GATEWAY





RESIDENTIAL	VERSION MXD-R1.01 MODBUS
COMMERCIAL	VERSION MXD-T1.01MODBUS

- ② During the AUTO-ADJUSTMENT period, leak thresholds (max volume across the different flow rate level bands) are automatically set to volumes of maximum recorded values, increased by 80%.
- ③ The burst flow rate is set manually according to the meter size (Dn).

FEATURES	MDX R1.01 / T1.01 ETHERNET or MODBUS RS485 (option)
① =Local setting and from BMS (with Ethernet/Modbus option) Ethernet included	
Polycarbonate enclosure 215x210x105mm + watertight door IP65	YES
Protection circuit breaker (without Modbus or Ethernet option)	YES
LCD screen backlight: 6 lines of 24 characters (3 colours by state: On, Alarm, Menu)	YES
Power consumption screen ON / screen OFF	1w / 0.3w
Integrated buzzer (triggered on Alert) (adjustable duration, 10 min default)	YES
Password 1 / COMMANDS access (changeable)	YES
Password 2 / COMMANDS-SETTINGS access (changeable)	YES
Password 3 / Administrator reserved	YES
Backup on mains failure (Data memory 10 years)	YES
Leak flow rate monitoring from (L/h): Detection delay on monitoring start (180 sec, adjustable)	1 (dn15-version RT1,01) 10 (dn15-40) 30 (dn50-80) 40 (dn100)
LEAK detected → 1st Alert - SHUT-OFF deactivable	YES
Temperature measurement: Alert when threshold exceeded outside min-max range	YES
Pipe burst detection (rapid shut-off)	YES
Flood detection (flood sensors optional)	YES
AUTO-ADJUSTMENT command for leak thresholds (adjustable duration), 2 adjustment levels: ②	YES ①
MANUAL command for burst flow rate: ③	YES
TIMER: Automatic network open/close	YES
ON/OFF command (open/close) (standard or progressive opening)	YES ①
RESET command (open):	YES ①
FORCED RUN command (1 – 4h), default setting 2h	YES ①
Fault Acknowledgement (buzzer off)	YES
Daily consumption monitoring:	YES
-Manual setting of consumption alert threshold:	YES
-Shut-off on consumption alert (on/off setting):	YES
Pulse emitter monitoring (on/off setting):	YES
-Max time without pulses (96h, adjustable)	YES
-Shut-off on emitter alert (on/off setting):	YES
Shut-off device selection: (0=no device, 1=Cut-off device installed)	YES
Configurable dry contact alert relay output (alert selection) (NO or NC)	YES

FEATURES ① =Local control and control via BMS/BEMS with Ethernet connection included (Modbus optional)	MDX R1.01 / T1.01 ETHERNET or MODBUS RS485 (option)
Total daily cumulative consumption (LITRES)	YES
Total monthly cumulative consumption (m3)	YES
Meter INDEX (adjustable synchronisation on PLC)	YES ①
Minimum flow rate recorded during the day (L/h) (since 00:00):	YES ①
Current flow rate (L/h):	YES ①
Recorded leak flow rate (L/h):	YES ①
Log of the last 8 recorded leaks (leak flow rate) (hours, minutes, day and month)	YES
LEAK Alert on main network:	YES ①
Pipe burst Alert:	YES ①
CONSUMPTION Alert:	YES ①
General network SHUT-OFF // (RESET command from BMS)	YES ①
EMITTER Alert:	YES ①
FIRE Alert:	YES ①
TEMPERATURE alert: (optional probe)	YES ①
FLOOD Alert: (optional flood sensor)	YES ①
Leak threshold auto-adjustments (On/Off status) // (COMMAND from BMS) (thresholds automatically adapt to set pulse weight) (2 AUTO-ADJUSTMENT LEVELS)	YES ①
On or Off status (valve open/valve closed) / (COMMAND from BMS)	YES ①
Forced Run (On/Off status):	YES ①
TIMER (Etat On/Off) : (Timer ouverture/automatic network open/close)	YES ①
Shut-off on consumption alert (On/off status):	YES ①
Shut-off on emitter alert (On/off status):	YES
Pulse emitter monitoring (On/off status):	YES ①
Date, Time (adjustable)	YES ①
Program Error / Error number / Software version	YES
DATALOG with mini SD optional (only without Modbus)	YES
INPUTS / OUTPUTS Ethernet included	MDX R1.01 / T1.01 ETHERNET or MODBUS RS485 (option)
Main emitter input (E1)	YES
Temporary monitoring stop input (2h) (via timer or push-button, optional)	YES -OPTION
Flood sensor input (optional) / Temperature probe input (optional)	YES -OPTION
Fire alarm input (loop break)	YES
Temperature probe input (optional)	YES -OPTION
Input for open/close/reset via remote push-button or radio remote control	YES -OPTION
Open / close outputs (valve / solenoid valve)	YES
24Vdc output (max 5W) External siren, Light indicator, GSM transmitter	YES
Sortie contact sec (alert relay) (NO or NC)	YES
MODBUS RS485	YES
BLUETOOTH optional (control / configuration from smartphone)	YES

SUPERVISION via gateway

MDX R1.01 / T1.01 ETHERNET
or MODBUS RS485 (option)

With Supervision Gateway (Ethernet included or optional Modbus RS485)

SMS ALERT sending (alert type, leak flow rate, etc...)

YES

Remote viewing and control via web gateway

YES

INDEX / event archiving to be done from the BMS

YES

Network status display

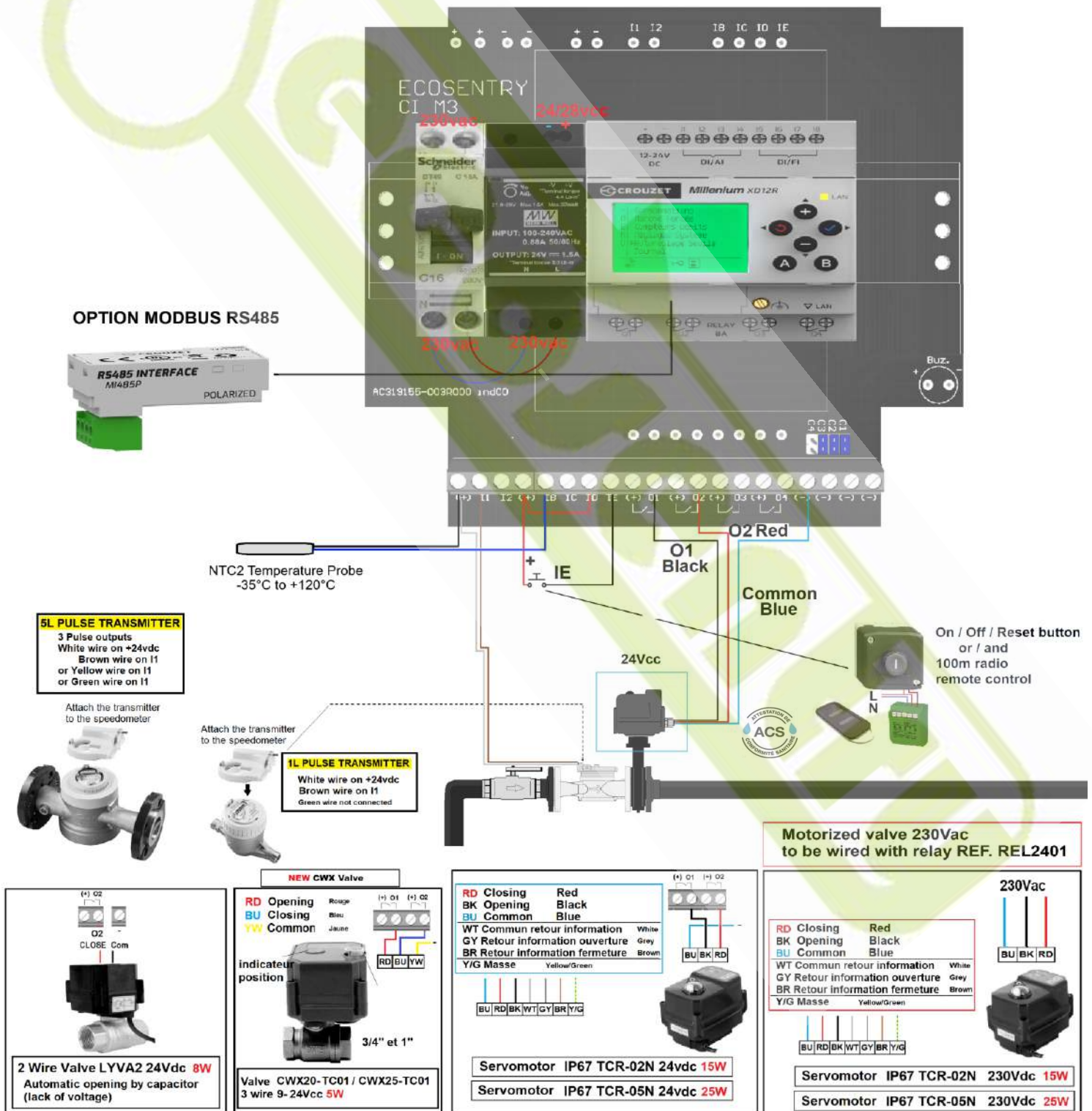
YES

Remote control of Commands (R1): On, Off, Reset, Leak threshold auto-adjustments, Forced Run

YES

Display of Alerts, Leak flow rates, timestamped logs

YES



General Features

Ethernet Modbus TCP/IP (Client /// Server)*	Yes (16 IP range /// 24 words + 16 bits)
* Client possible only with FBD programming language	
Modbus RTU RS485 (Client /// Server)*	Yes via interface MI485 or MI485P
* Client possible only with FBD programming language	(16 devices /// 24 words + 16 bits)
Webserver	Yes (Front face display, PLC status, Diagnosis, Run/stop, Update application, Download datalogs)
Datalog	On SD card* - 24 data channel (Not compatible with Modbus RTU RS485 interface) * SD card

Power Supply

Nominal voltage	12 → 24 V $\overline{\text{---}}$	24 V $\overline{\text{---}}$
Operating limits	10.8 → 28.8 V $\overline{\text{---}}$	20.4 → 28.8 V $\overline{\text{---}}$
Max. absorbed power	2W @ 12 V $\overline{\text{---}}$ 3W @ 28.8 V $\overline{\text{---}}$	1.5W @ 20.4 V $\overline{\text{---}}$ 1.5W @ 28.8 V $\overline{\text{---}}$
Immunity to micro power cuts	1 ms	
Power supply earthing	None	
Reverse polarity protection	Yes	
Power Monitoring	Yes Voltage value available through the Function Block "FB Status"	

Inputs

Used as Digital Inputs

Input voltage	0-28.8 V $\overline{\text{---}}$	
Input current	I1...I4 ≈ 0.24 mA @ 10.8 V $\overline{\text{---}}$ ≈ 0.27 mA @ 12 V $\overline{\text{---}}$ ≈ 0.45 mA @ 20.4 V $\overline{\text{---}}$ ≈ 0.53 mA @ 24 V $\overline{\text{---}}$ ≈ 0.64 mA @ 28.8 V $\overline{\text{---}}$ I5...I8 ≈ 1.13 mA @ 10.8 V $\overline{\text{---}}$ ≈ 1.31 mA @ 12 V $\overline{\text{---}}$ ≈ 2.55 mA @ 20.4 V $\overline{\text{---}}$ ≈ 3.07 mA @ 24 V $\overline{\text{---}}$ ≈ 3.78 mA @ 28.8 V $\overline{\text{---}}$	I1...I4 ≈ 0.45 mA @ 20.4 V $\overline{\text{---}}$ ≈ 0.53 mA @ 24 V $\overline{\text{---}}$ ≈ 0.64 mA @ 28.8 V $\overline{\text{---}}$ I5...I8 ≈ 2.55 mA @ 20.4 V $\overline{\text{---}}$ ≈ 3.07 mA @ 24 V $\overline{\text{---}}$ ≈ 3.78 mA @ 28.8 V $\overline{\text{---}}$
Input impedance	(I1...I4): 40 K Ω (I5...I8): 13.4 K Ω	
Logic 1 voltage threshold	> 8.5 V $\overline{\text{---}}$	> 12 V $\overline{\text{---}}$
Making current at logic state 1	0.19 mA (I1...I4) 0.79 mA (I5...I8)	0.27 mA (I1...I4) 1.31 mA (I5...I8)
Logic 0 voltage threshold	< 5 V $\overline{\text{---}}$	
Release current at logic state 0	0.11 mA (I1...I4) 0.29 mA (I5...I8)	
Response time	1 to 2 cycle time (normal input)	
Sensor type	Contact or 3-wire PNP	
Input type	Resistive	
Conforming to IEC/EN 61131-2	Type 1	

Isolation between power supply and inputs	None
Isolation between inputs	None
Protection against polarity inversions	Yes
Status indicator	On Display (LCD) Only on LCD base
Cable length	≤100m (Shielded)

Used as High Speed Inputs

Quantity	4 High-Speed inputs → from I5 to I8	
Input voltage	From 12 V _{DC} to 24 V _{DC}	24 V _{DC}
Voltage tolerance	From 10.8 V _{DC} to 28.8 V _{DC}	From 20.4V to 28.8 V _{DC}
Input impedance	13.4 KΩ	
Logic 1 voltage threshold	≥ 8.5 V _C (with duty cycle 50/50)	≥ 12 V _C (with duty cycle 50/50)
Making current at logic state 1	> 1 mA	> 1.5 mA
Logic 0 voltage threshold	≤ 5 V _C (with duty cycle 50/50)	
Release current at logic state 0	< 0.1 mA	
Maximum counting frequency	• 4 independent counters: 5 kHz* • Function: Up, Down, Cumul, Dir, Independant & Codeur Ph, Ph2, Indexed * with Ton / Toff = 50% ± 5%	
Cable length	≤100m (shield twist cable)	

Used as Analog Inputs

Quantity	4 analogs inputs → from I1 to I4	
Measuring range	0 V _{DC} → 10 V _{DC} 0 V _{DC} → V power supply	
Input impedance	40 KΩ	
Maximum value without destruction	28.8 V _{DC} Max	
Input type	Resistive	
Resolution	12 bits at maximum input voltage (10 bits at 10V)	
Value of LSB	7 mV	
Conversion time	Controller cycle time	
Maximum error at 25 °C (77 °F)	± 5 % of full scale at 25 °C	
Maximum error at 55 °C (131 °F)	± 6.5 % of full scale at 55 °C	
Repeat accuracy at 55 °C	± 2 %	
Isolation between analog channel and power supply	None	
Protection against polarity inversions	Yes	
Potentiometer control	10 KΩ max.	
Cable length	Max. 10 m (shield twist cable)	

Outputs

Relay Outputs

Quantity	4 relays outputs, from O1 to O4 (Normally open)	N/A
Max. breaking voltage	250 V _{AC} 30 V _{DC}	N/A
Max. Breaking current	8 A @ 230 V _{AC} (resistive) 8A @ 30 V _{DC} (resistive)	N/A
Mechanical life	1x 10 ⁷	N/A
Electrical durability	Resistive load at 85 °C: 8 A, 250 V _{AC} , 50 K Cycles	N/A
Minimum switching capacity	100 mA (at minimum voltage of 12V)	N/A
Maximum operating rate	10Hz	N/A
Voltage for withstanding shocks	2kV	N/A
Response time	Make = 1 cycle time + 8 ms Release = 1 cycle time + 5 ms	N/A

MX*12RD7ET (12 → 24 V_{DC})

Voltage drop	N/A
Min. load	N/A
Response time	N/A
Built-in protections - Short circuit proof	N/A
Built-in protections - Over load protection	N/A
Built-in protections - Over voltage protection	N/A
Built-in protections - Short circuit current limitation	N/A
Polarity inversion protection	N/A
Isolation between power supply and outputs	N/A
Isolation between outputs	N/A
Wiring	N/A
Status indicator	N/A
Cable length	N/A
PWM frequency	N/A
PWM cyclic ratio	N/A
PWM accuracy at 120 Hz	N/A
PWM accuracy at 500 Hz	N/A

Communication

Ethernet connection	Type RJ45, 10/100 Mbit/s, MDI/MDIX
Ethernet LED indicator	Green LED
Addressing	Static or dynamic (DHCP server / Auto IP)
Protocol supported	Discovery (PLC on network detection) CrouzetSoft communication via Ethernet (SSL/TLS) MODBUS TCP Server MODBUS TCP Client (FBD only)
Cable length	Maximum length between 2 devices: 100 m / 3937 inch
Ethernet earthing	Yes, refer to the installation guide supplied with the product

Processing Characteristics

Programming software	CrouzetSoft
Maximum Number of I/O	24 DI + 20 DO + 8 AI + 8 AO
Program size function blocks (FBD)	- Function blocks: typically 1000 blocks - Macro blocks: 127 max. (255 blocks per macro and on main program)
Number of lines in Ladder	250 lines
LCD display	- MXD: Display with 6 lines of 24 characters - Backlight 3 colors: White, Green, Orange - MXB: No display. Power/Status LED indicator

MX*12RD7ET (12 → 24 V_{DC})

Timer block accuracy	0.5 % ± 2 cycle times
Start up time on power up	< 5 s
Self tests	• Test firmware integrity (checksum memory) • Stability of the internal power supply • Check the conformity of the device configuration with the configuration in the application program.

General & Environment Characteristics

Certifications	CE, cULus
Environmental certifications	REACH, ROHS
Conformity with the EMC directive (in accordance with 2014/35/UE)	IEC/EN 61000-6-1 (Residential, commercial, and light-industrial environments) IEC/EN 61000-6-2 (Industrial) IEC/EN 61000-6-3 (Residential, commercial, and light-industrial environments) IEC/EN 61000-6-4 (Industrial) Nota : For MX*12RD7ET, MX*12SD1ET, IEC 61000-4-29, criteria B for analog inputs
Earthing	No
Protection rating	In accordance with IEC/EN 60529: • IP40 on front panel • IP20 on terminal block
Overvoltage category	2 in accordance with IEC/EN 60664-1
Pollution	Degree: 2 in accordance with IEC/EN 61131-2
Max operating Altitude (m)	Operation: 2000 Transport: 3000
Mechanical resistance	Immunity to vibrations IEC/EN 60068-2-6, test Fc Immunity to shock IEC/EN 60068-2-27.15 g peak, 11 ms duration
Resistance to electrostatic discharge	IEC 61000-4-2 Level III (AD: ± 8 kV and CD: ± 4 kV), Criteria B
Resistance to HF interference	Immunity to radiated electrostatic fields IEC 61000-4-3 Electrical fast transients IEC 61000-4-4 Surge IEC 61000-4-5 Conducted Susceptibility IEC 61000-4-6, Voltage dips As per IEC61131-2
Conducted and radiated emissions	CISPR11 Class B
Operating temperature	-20 → +55 °C (-4 → 131 °F)
Storage temperature	-30 → +70 °C (-22 → 158 °F)
Relative humidity	10-95 % no condensing
Screw terminals connection capacity	• Euro type terminal • Wire Size 1 x 24 to 12 (AWG) • Solid wire Range: 1*2.5 mm² or 2*1.5 mm² • Flexible wire Range: 1*2.5 mm² or 2*1.5 mm²
Screw tightening Torque	0.4 N. m. (3.54 lb. in) (Including earth terminal)
Clearance and creepage	IEC 60664, IEC 61131-2, IEC 61010

MX*12RD7ET (12 → 24 V $\overline{\text{---}}$)

Dimensions (W x H x D) (mm)	72 x 90 x 63.1 for bases with display 72 x 90 x 61.1 for bases without display	
Weight (g)	225 for bases with display 195 for bases without display	203 for bases with display 172 for MXB for bases without display
Enclosure type	4 M	
DIN Rail mounting	Mounting in 35 mm symmetrical DIN rail (see with modular enclosures	e
Panel Mounting	Flat panel mounting by screws (see installa	

Other Expansions Capabilities

Compatible expansion only if supplied with **same 24 V $\overline{\text{---}}$ Power Supply** than base

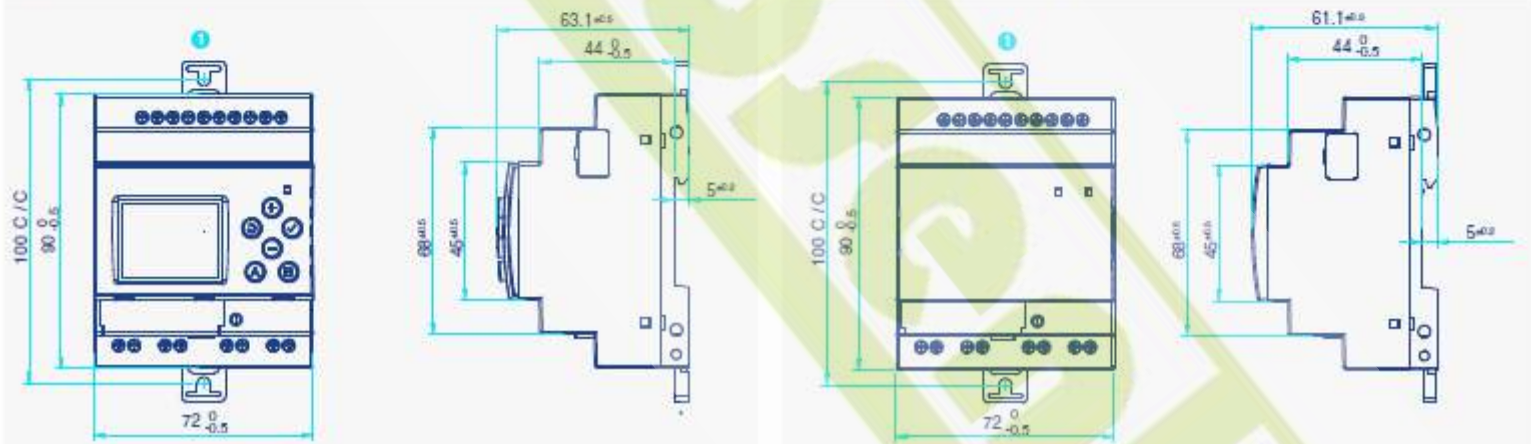
MXA	24 V $\overline{\text{---}}$, 2 Analog (V/mA) outputs, 35 mm MXAO02D1
MXR	24 V $\overline{\text{---}}$, 4 DI, 4 relays outputs, 35 mm MXR08U1
Digital expansions Relay	24 V $\overline{\text{---}}$, 8 DI, 8 relays outputs, 70 mm MXR16U1

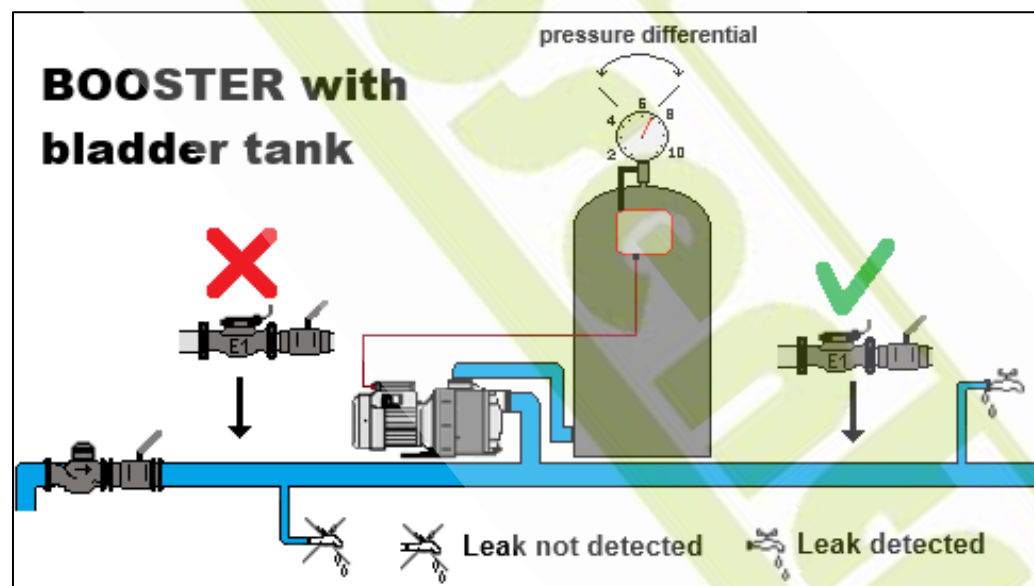
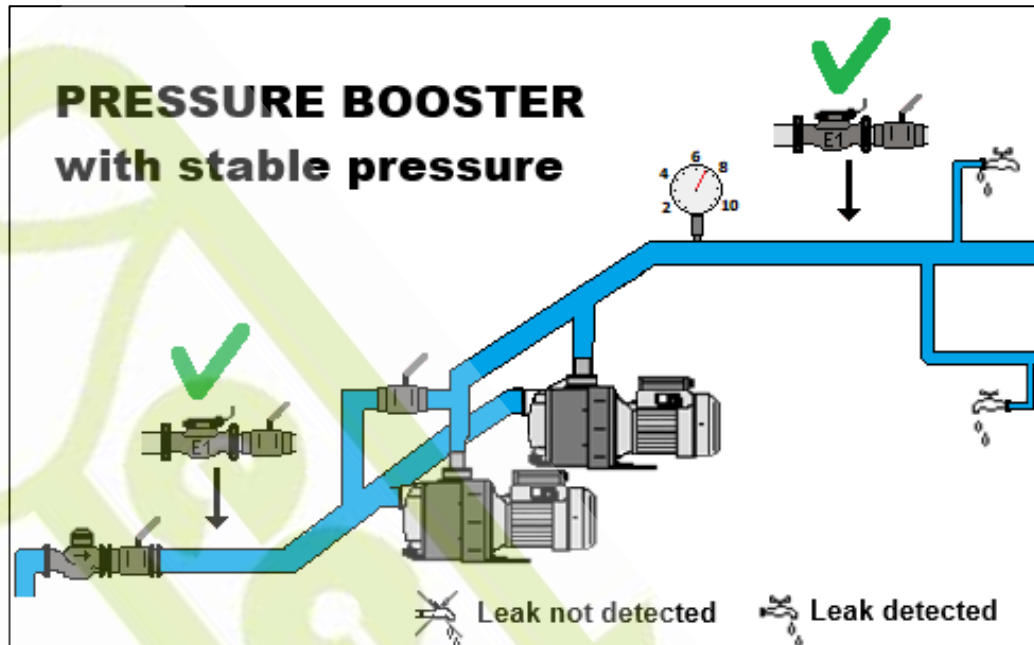
Product Dimensions
Front and Side

24 V $\overline{\text{---}}$ / 12 → 24 V $\overline{\text{---}}$

With display - version 70 mm

Without display - version 70 mm



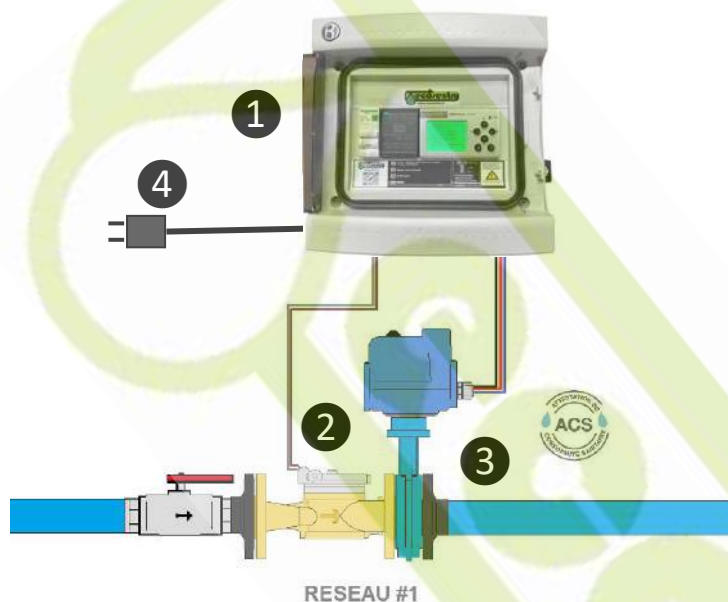


WARNING

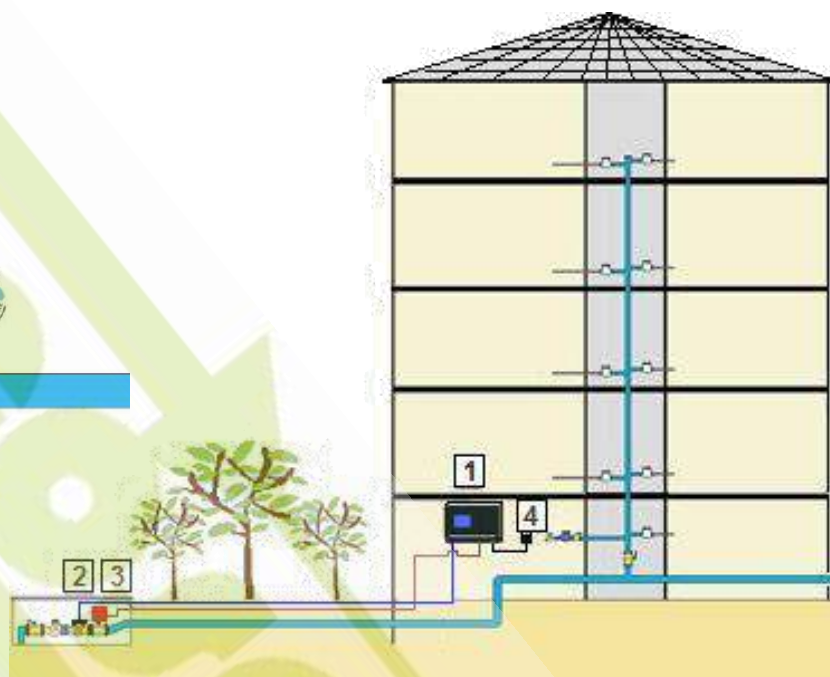
Ef booster pumps with expansion vessels are installed on the network, do NOT install main emitter E1 upstream of them.

The high/low pressure differential setting of the booster pumps must be as short as possible, in order to avoid a leak flow rate drop at low pressure.

Leaks occurring before main emitter **E1** cannot be detected.



EASY INSTALLATION


Progressive valve opening (programmable)
 (except LYVA2)

Meter SIZE	2 Meter	3 Shut-off
Dn 15	A	J E
Dn 20	B	J E
Dn 25	C	F
Dn 32	C	F
Dn 40	C	F
Dn 50 FLANGED	D	G
Dn 65 FLANGED	D	G
Dn 80 FLANGED	D	G
Dn 100 FLANGED	D	G

A		J		LYVA2	2-wire 8W
B		E		CWX-TC01	3-wire 5W
C		F		TCR02N IP67	7-wire 15W Regulated 3W resistance
D		G		TCR05N IP67	7-wire 25W Regulated 3W resistance