FORCE - Riot Control
ROBOTIC NOZZLE CATALOG

MORE FORCE THAN EVER BEFORE
F50R-LT

- Heavy duty industrial robotic nozzle
- Stainless steel 316L pipe and worm-gears
- Industrial robotic brushless DC motors (BLDC)
- Laser-welded IP68 motor enclosures
- M12 fully sealed IP67 multi-connectors
- Position feedback accuracy better than 1/100°
- Up to 38°/sec rotation speed
- Over 360° horizontal movement (set any range by software)
- Over 180° vertical movement (set any range by software)
- Integrated JETRANGE nozzle tip provides a focused, high-impact jet
- Interchangeable flow discs (baffles) to accommodate your flow requirements
- 50 mm internal pipe diameter
- Virtually maintenance-free
- Light Weight: 15 Kg including nozzle
- Max flow: 2000 lpm @ 10 bars (530 US gallons @ 145 psi; 120 m3/hr)
- Max reach: 65 meters

Part Number(s):
F50R-LT
integrated nozzle included
## Reaction force data, flow and reach

FORCE50 with JETRANGE Nozzle

### Data for FORCE50 with 43 mm flow disc

<table>
<thead>
<tr>
<th>Pressure (Bar)</th>
<th>Flow (Lit/min)</th>
<th>Reaction Force (N)</th>
<th>Effective reach (meter)</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>1370</td>
<td>690</td>
<td>45</td>
</tr>
<tr>
<td>7</td>
<td>1620</td>
<td>960</td>
<td>50</td>
</tr>
<tr>
<td>10</td>
<td>1940</td>
<td>1370</td>
<td>55</td>
</tr>
<tr>
<td>12</td>
<td>2100</td>
<td>1650</td>
<td>55</td>
</tr>
</tbody>
</table>

Reach data is approximate and may vary due to actual conditions.

**NOTE!** For dimensioning of stand-pipes and support brackets use minimum a factor 5. (For 12 bar 1650x5=8750 N)
Flow with various flow discs (nozzle baffles)
*The following chart is approximate, and actual figures may vary.

UNIFIRE FORCE 50 remote control water cannon w Jetrange Nozzle
 Reach with various flow discs (nozzle baffles) 
*The following chart is approximate, and actual figures may vary.

Meter reach at 35° elevation angle

UNIFIRE FORCE 50 remote control water cannon w Jetrange Nozzle
FORCE50
with INTEG50 jet/spray tip

- Heavy duty industrial robotic nozzle
- Integ 50 firefighting robotic tip (see Integ 50)
- Stainless steel 316L pipe and worm gears
- Industrial robotic brushless DC motors (BLDC)
- Laser-welded IP68 motor enclosure
- M12 fully sealed IP67 multi-connectors
- Position feedback accuracy better than 1/100°
- Up to 38°/sec rotation speed
- Over 360° Horizontal Movement (set any range by software)
- Over 180° Vertical Movement (set any range by software)
- 50 mm internal pipe diameter
- Virtually maintenance-free
- Light weight: 18 Kg (40 lbs.) including nozzle
- Max Flow: 2000 lpm @ 10 bars (530 US gallons @ 145 psi; 120 m3/hr)
- Max Reach: 65 meters
- Connection by 2” male BSP or flange (ANSI, DIN, JIS)
The Unifire F50-ST is designed as compact robotic side turret nozzle for mounting under riot control vehicles for protecting the vehicle from approach. It can be controlled in an oscillating pattern or by control dial. The green plate depicted in the renderings above represents the undercarriage of the vehicle—the motor and gears remain fully protected and invisible.

SPECIFICATIONS:
- Inside Ø: 50 mm
- Outlet Ø: 26mm - Flow up to 1200 lpm/10 bar
- 167 mm tall
- 213 mm from center to end of motor cover
- Material: 316 stainless steel, bronze gear wheel
- BLDC motor in welded stainless steel enclosure
- Connection by two M12 connectors for each motor
- Rotation speed up to 38°/second
- Connection to the vehicle by flange with 10 x (M5x16) screws.
- Connecting pipe dimension on the vehicle is 54 x 2 mm

Part Number(s):
F50R-ST
TARGA PLC compact version for installation in dry, clean environment. Customer specific requirements are easily implementable. Up to 6 x BLDC divers. In addition up to 8 x analogue and digital inputs and outputs, all generic and definable to your individual specifications.

SPECIFICATIONS:

- IP20 Steel cabinet (must be installed dry and dust protected)
- Stainless steel 316L
- 225 x 125 x 125 mm
- Display and with push-button panel for setup and system diagnosis
- TARGA Robotic Nozzle PLC supports up to 6 x BLDC drivers
- Large number of digital and analogue inputs and outputs
- Simple quick installation with M12 multi-connectors
- Connect pressure and flow gauges, push-button controls, “panic-button”, etc.
- Fully programmable and expandable
- USB-port for simple program upgrade
- 24 VDC / 2 + 20A fuse
- Average consumption: less than 100 W

Part Number(s):
TARGA2
TARGA3
TARGA4
TARGA5
TARGA6
TARGA Robotic Nozzle PLC dimensions
225 x 225 x 125 mm

Simple re-program by inserting USB stick with new software.

Text as example only. Actual text will reflect each individual system setup.
TARGA PCB connection plan

P1-P4: Incoming 24VDC + 2x gnd and on PCB fuses (type automotive flat)

K1-K6: 6 channels, high resolution BLDC motors with optional encoders
PCB’s for BLDC control mounts in MK1 - MK6.

J1: External sensor bus I2C and SPI
J2: USB
J3: 2 H-bridges, 4 digital outputs Electronically protected @4,8A Alarm on error
J4: 4 analogue outputs (4A)
J5: RS485 (Optional profibus, modbus, DMX etc)
J6: 2x CAN bus (UNican and optional CANopen)
J7 0-5VDC (Vcc=5VDC)
J8 0-5VDC (Vcc=5VDC)
J9 0-5VDC (Vcc=5VDC)
J10: 4 digital inputs (Vcc=12VDC)
The following controllers are our standard solutions. The TARGA PLC, however, allows Unifire to offer an extremely wide variety of system controllers, including most commercially available solutions.

If you require a special solution for your applications, we can offer it. Contact us to learn more.
GENERAL DESCRIPTION

The POINTER is Unifire’s unique, synchron control device designed to provide a simple and intuitive human interface for controlling the Unifire’s robotic nozzles.

The robotic nozzle’s movements exactly follow and match the position of the POINTER.

The base is fitted with potentiometer to provide exact position values to the TARGA PLC, which in turn aim the robots to exactly the same horizontal and vertical angles as the POINTER. The hand-grip has a trigger switch at the front. The switch has a spring return. The switch will be connected directly to the vehicle’s discharge valve. The water is discharged when the trigger is held, and stops when the trigger is released.

SPECIFICATIONS

- 142 x 130 x 70 mm (above the panel into which it is mounted)
- Material: Chrome plated brass base; heavy duty plastic grip cover on a 4 mm stainless steel plate
- 5-pin M12 connector connect to the TARGA PLC
- 3-pin M12 connector to route the trigger button to discharge valve control
- Standard rotation range: +70°/-20° vertical, 270° horizontal

Part Number(s):
PTR101
PTR110 (with nozzle tip controller)
pin configuration control:
P1  brown - analogue in Rotation
P2  white - 5V
P3  blue - GROUND (0)
P4  black - analogue in Vertical
P5  grey - not connected

pin configuration trigger
P1  brown
P2  not connected
P3  blue
The VIPER by Caldaro is a capacitive grip joystick which only activates when fully gripped by the operator, preventing accidental nozzle movement.

Progressive speed control, trigger button to control a valve, and three definable buttons.

Designed to suit the most demanding applications in terms of mechanical strength and environmental requirements.

Typically for heavy duty applications, such as mining, wash-down and construction applications, where robustness and reliability are essential.

CANbus connection.

Trigger on index finger and three (3) definable buttons
DIgITAL Joystick

- Simple & Economical Digital Joystick
- Basic Functions: Up, Down, Left, Right.
- Optional separate, additional switches to expand functionality, such as nozzle spray pattern, valve control, record/play (additional costs may apply, please inquire)
- Simple mounting in dash or panel

Part Number(s):
FOR00219
GENERAL DESCRIPTION

Unifire’s Force Web control system is unique on the market.

Web based, Unifire’s robotic nozzles, and indeed entire networks of nozzles and peripheral devices—such as CCTV cameras, lights, valves, tank level data, etc.—can now all be securely monitored and controlled over any web browser—Smart Phone, Tablet, Laptop, PC, Mac, or over the Internet.

Install off-the-shelf tablets in a vehicle to control Unifire’s robotic nozzles & tips, open and close valves, view tank levels, monitor the status of all systems and peripherals, view troubleshooting guides and videos, and much more.
CABLES with M12 Connectors

- M12 shielded cables for Unifire BLDC mMotors & joysticks
- Quick & simple installation
- Extremely well sealed when connected
- 5 meters (standard).
- Connect two or more joystick cables to extend to any length, in 5-meter increments
- BLDC motors require 2 cables each—one 5 pin (PN: M1255) and one 3 pin (PN: M1253)
- Unifire joysticks require a 5 pin M12 cable (PN: M1255)
- Spiral joystick cables available in 2 and 5 meter lengths
- Power cable: PN FOR00415 (inquire for price)

Part Number(s):
M1255
M1253 (3 pin for power)
FOR00415 (power cable)
ROBOTIC NOZZLE PACKAGES

PACKAGES - TAILORED TO YOUR NEEDS

Unifire’s systems are modular and highly flexible.

The following packages are just some of our best-selling system configurations.

But the possibilities are endless.

Whether you’re looking to use your own joystick, or you require a special controller, or if you want a complex, fully-networked and fully automatic fire detection and suppression system—we can easily do that!

Just contact us at sales@unifire.com for a system that’s tailored exactly for you.
Robotic Nozzle: F50R-LT
F50R-LT 316L stainless steel robotic nozzle with BLDC motors & Integrated JETRANGE 50 nozzle tip. Max. 2000 lpm @ 10 bars (530 gpm @ 145 psi) Range of Motion: 360° horizontal, 180° vertical (±90°)

Robotic Tip: JETRANGE 50
Integrated JETRANGE 50 nozzle tip provides a focused, high-impact jet. Interchangeable flow discs (baffles) to accommodate your flow requirements.

PLC: TARGA2
TARGA2 Robotic Nozzle PLC. 2 BLDC drivers. Programmable with several analogue and digital inputs and outputs. Integrated setup panel.

Controller: PTR101
POINTER Synchron controller with trigger button for triggering valve open/closed.

Cables M12 cable kit
Each BLDC motor requires two M12 cables (1 x 5 pin + 1 x 3-pin). POINTER requires 1 x M12 5-pin cable and 1 x M12 3-pin to valve. Standard cable length is 5 meters.

Packages presented as examples only. Infinite number of combinations are possible.

Part Number(s):
F50R-LT
TARGA2
PTR101
3 x M1255
3x M1253
1x M1253
1 x FOR00415 power cable
# Robotic Nozzle Package 13

<table>
<thead>
<tr>
<th>Component</th>
<th>Description</th>
<th>Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Robotic Nozzle</td>
<td>2 x F50R-LT 316L stainless steel robotic nozzle with BLDC motors &amp; Integrated JETRANGE 50 nozzle tip.</td>
<td>Max. 2000 lpm @ 10 bars (530 gpm @ 145 psi) Range of Motion: 360° horizontal, 180° vertical (±90°)</td>
</tr>
<tr>
<td>PLC</td>
<td>1 x TARGA4 Robotic Nozzle PLC. 4 BLDC drivers. Programmable with several analogue and digital inputs and outputs. Integrated setup panel.</td>
<td></td>
</tr>
<tr>
<td>Controller</td>
<td>2 x PTR101 POINTER Synchron controller with trigger button for triggering valve open/closed.</td>
<td></td>
</tr>
<tr>
<td>Cables</td>
<td>Motor &amp; Power cable kit</td>
<td>Each BLDC motor requires two M12 cables (1 x 5 pin + 1 x 3-pin). Joystick requires 1 x M12 5-pin cable for charging &amp; tethered communication. Standard cable length is 5 meters each.</td>
</tr>
</tbody>
</table>

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Packages presented as examples only. Infinite number of combinations are possible.

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**Part Numbers**
- F50R-LT
- TARGA4
- PTR101
- M1255
- M1253
- FOR00415 (power cbl)

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**ROBOTIC NOZZLE PACKAGE 12**

<table>
<thead>
<tr>
<th>Component</th>
<th>Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Robotic Nozzles</td>
<td>2 x F50R-LT + 2 x F50-ST F50R-LT 316L stainless steel robotic nozzle with BLDC motors &amp; Integrated JETRANGE 50 nozzle tip; &amp; 2 F50-ST Side Turrets. Max. 2000 lpm @ 10 bars (530 gpm @ 145 psi) Range of Motion: 360° horizontal, 180° vertical (±90°)</td>
</tr>
<tr>
<td>PLC</td>
<td>1 x TARGA6 TARGA6 Robotic Nozzle PLC. 6 BLDC drivers. Programmable with several analogue and digital inputs and outputs. Integrated setup panel.</td>
</tr>
<tr>
<td>Controller</td>
<td>2 x PTR101 POINTER Synchron controller with trigger button for triggering valve open/closed.</td>
</tr>
<tr>
<td>Cables</td>
<td>Motor &amp; Power cable kit Each BLDC motor requires two M12 cables (1 x 5 pin + 1 x 3-pin). Joystick requires 1 x M12 5-pin cable for charging &amp; tethered communication. Standard cable length is 5 meters each.</td>
</tr>
</tbody>
</table>

Part Numbers
- F50R-LT
- F50-ST
- TARGA6
- PTR101
- M1255
- M1253
- FOR00415 (power cbl)

Packages presented as examples only. Infinite number of combinations are possible.

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# ROBOTIC NOZZLE PACKAGE 14

<table>
<thead>
<tr>
<th>Robotic Nozzle:</th>
<th>F50R-LT</th>
<th>F50R-LT 316L stainless steel robotic nozzle with BLDC motors &amp; Integrated JETRANGE 50 nozzle tip. Max. 2000 lpm @ 10 bars (530 gpm @ 145 psi) Range of Motion: 360° horizontal, 180° vertical (±90°)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Robotic Tip:</td>
<td>JETRANGE 50 (integrated)</td>
<td>Integrated JETRANGE 50 nozzle tip provides a focused, high-impact jet. Interchangeable flow discs (baffles) to accommodate your flow requirements.</td>
</tr>
<tr>
<td>PLC:</td>
<td>TARGA2</td>
<td>TARGA2 Robotic Nozzle PLC. 2 BLDC drivers. Programmable with several analogue and digital inputs and outputs. Integrated setup panel.</td>
</tr>
<tr>
<td>Controller:</td>
<td>FOR00207</td>
<td>PI CANbus joystick with position feedback, record/play, progressive control. nozzle dial</td>
</tr>
<tr>
<td>Cables</td>
<td>M12 cable kit</td>
<td>Each BLDC motor requires two M12 cables (1 x 5 pin + 1 x 3-pin). Joystick requires 1 x M12 5-pin cable. Standard cable length is 5 meters each.</td>
</tr>
</tbody>
</table>

Packages presented as examples only. Infinite number of combinations are possible.

Part Number(s):
- F50R-LT
- TARGA2
- FOR00207
- 3 x M1255
- 2x M1253
- 1 x FOR00415 power cable

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BENEFITS OF UNIFIRE’S ROBOTIC NOZZLES
## Feature

<table>
<thead>
<tr>
<th>Feature</th>
<th>Benefits to You</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Extremely simple to Install</strong></td>
<td>Installers of Unifire’s monitors will be pleasantly surprised at how easy installation is. All electric connection points on standard systems feature M12 multi-connectors for simple connection, in a snap. In minutes you’ll be up and running. Installing a water cannon has never been so easy.</td>
</tr>
<tr>
<td><strong>Light Weight &amp; Compact</strong></td>
<td>Unifire’s Force water cannons are extremely compact and light weight, for easier installation, less bulk, simpler handling, etc.</td>
</tr>
<tr>
<td><strong>Virtually Maintenance-Free</strong></td>
<td>Unifire’s water cannons require virtually no maintenance. Never grease them. Never paint them. Just a dash of TLC, and Force water cannons provide you with worry free operation for years and years.</td>
</tr>
<tr>
<td><strong>Stainless Steel 316L construction</strong></td>
<td>Robust, corrosion-free, no paint to scratch or fade, ideal for use with sea water, chemical additives, harsh environments, light weight, extremely durable &amp; long lasting.</td>
</tr>
<tr>
<td><strong>Highest Quality on the Market</strong></td>
<td>Unifire’s equipment is made to be the highest quality monitors available. This increases performance, longevity and life cycle, ease of use and enhances the overall user experience.</td>
</tr>
<tr>
<td><strong>Unsurpassed Performance</strong></td>
<td>Expect a much better performance, range, control and overall experience over any other water cannon in the size range.</td>
</tr>
<tr>
<td><strong>One-Hand Joystick Operation with Nozzle Control on Tip of Joystick Shaft</strong></td>
<td>Simple, light weight joystick can be moved around and used where you want. Totally intuitive, simple to use, and yet powerful, full of features, and highly accurate control.</td>
</tr>
<tr>
<td><strong>Natural Record / Play</strong></td>
<td>Allows the operator to record a pattern in real time, and play it back whenever desired. Just hit “record”, use the cannon as you wish, quit recording. Just hit “play” to repeat in a loop until you take over again.</td>
</tr>
<tr>
<td>Feature</td>
<td>Benefits to You</td>
</tr>
<tr>
<td>------------------------------------------------------------------------</td>
<td>--------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Advanced Position Feedback [Indicators on the Joystick Itself]</td>
<td>Allows the operator to know how the cannon and nozzle are positioned before spraying water, even when the cannon is not in view. Saves water and avoids spraying water where you don’t want it.</td>
</tr>
<tr>
<td>Progressive, Multi-Directional Movement</td>
<td>Want to move the cannon up/right diagonally? Want to be able to precisely control the speed by how hard you press the joystick shaft in any direction? Welcome to Unifire. Unlike many water cannons that allow movement in only one direction at a time, or only one or two speeds, Unifire’s controls are natural, multi-directional and progressive. From so slowly you can barely see the movement, to up to 40 degrees rotation per second, and everything in between, no water cannon on the market comes close to the ease and beauty of control as Unifire’s Force series water cannons.</td>
</tr>
<tr>
<td>High-Speed Movement Capabilities</td>
<td>For some applications, you may want to be able to move the cannon very quickly. Unifire’s water cannons provide the option of high-speed motors for very rapid cannon movement.</td>
</tr>
<tr>
<td>Full Spherical Coverage (360° horizontal rotation / 180° vertical; easily limited by limit bolts)</td>
<td>Allows the manufacturer and user maximum range of motion. And, with Unifire’s simple to set limit bolts, you can easily limit the cannon’s up/down and left/right movements for a perfect-fit solution.</td>
</tr>
<tr>
<td>Soft- Stops for No-Wear-Or-Tear on motors / gears / end positions</td>
<td>Unifire’s Force water cannons automatically learn during calibration the end positions that you set with the limit bolts, and they never hit them again. This feature of “soft stops”, which are controlled by Unifire’s advanced software, avoids wear and tear on gears and motors, since there are no mechanical jolts or impacts. This also significantly extends the life cycle of the products.</td>
</tr>
<tr>
<td>Highly accurate positioning</td>
<td>Need to control a water cannon with a high degree of accuracy for special applications? Unifire offers systems capable of controlling with an accuracy of more than one-one-hundredth (1/100th) of a degree!</td>
</tr>
<tr>
<td>Feature</td>
<td>Benefits to You</td>
</tr>
<tr>
<td>----------------------------------------------</td>
<td>-----------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>The most advanced electronics on the market</td>
<td>Some customers require special “bells and whistles”. Want to create a network of water cannons which are controlled automatically by infrared cameras and computers? Want to control them over the Internet? Fiber optics? Wireless radio remote? Off the shelf 3rd party joysticks? Special protocols and interfaces? Want Unifire to control valves, lights, and other electronic devices? Unifire has you covered with its state-of-the-art electronics systems that provide power and flexibility you will find nowhere else on the market.</td>
</tr>
<tr>
<td>BLDC motors</td>
<td>Robotic precision control is now standard on Unifire’s Force water cannons with brushless motors. 10,000 hours life expectancy, and much higher torque, precision and speed than standard DC motors offered by our competitors, BLDC motors take Unifire’s already world-renowned nozzles to a level unseen in the industry—until now!</td>
</tr>
<tr>
<td>CANOPEN communication and numerous other protocols</td>
<td>Vehicle builders will be thrilled to know that Unifire’s control systems allow for communication with other on board systems and control devices, over a wide variety of standard communication protocols and interfaces. This makes Unifire’s systems the most flexible on the market and allows virtually unlimited possibilities to work with other systems, such as lights, valves, auto-leveling devices and much, much more.</td>
</tr>
<tr>
<td>Service via USB / Email</td>
<td>Ever heard of a water cannon that can record all activity on a built-in USB port? Welcome to the future of fire fighting. Simply plug in a flash stick into the USB port, record, and send the file to Unifire for instant analysis and trouble-shooting. Unifire will know exactly what the issue is and how to solve it, in a “flash!”</td>
</tr>
</tbody>
</table>

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Advanced Robotic Nozzle Technologies