

# Connected Components Building Blocks

## Pump Control Profile



*Connected Component Building Blocks provide the overhead so you can concentrate on making your machine the best in the market*

### Connected Components Building Blocks

Connected Components Building Blocks (CCBB) from Rockwell Automation® provide you with the information you need to quickly and easily implement common control tasks in your machine design.

Take advantage of best practice based examples with:

- Lists of compatible materials
- Panel and wiring drawings
- Status and diagnostic control programs and HMI screens
- Quick start guide
- All available on DVD, CC-QR001B-MU-C

### Pump Control

Today's pump systems need to be efficient and reliable, while providing enough flexibility to meet the demands of your application. The Pump Control solution, featuring the Allen-Bradley® PowerFlex™ 400 AC Drive, is designed to optimize efficiency and provide protection to prevent equipment damage and increase pump system reliability.

The Pump Control CCBB allows you to build a stand-alone component or include the pump control building block as a part of a more complex system. The built-in pump features can be used in conjunction with customized user created logic to meet the demands of most pumping applications. Combine the PowerFlex 400 AC Drive with your pump/motor, MicroLogix™ 1400 controller, and PanelView™ Component operator interface for an integrated solution.

### Solution Specific Advantages

- Independently control and monitor up to 8 pumps with capability for coordinated multi-pump control with various design benefits
- Initial ramp control provides fast acceleration up to minimum speed, preventing damage to the pump
- Final ramp control provides a soft close of ball check valves in vertical piping systems, avoiding damaging effects
- Flow compensation adjusts the pressure reference according to pump speed, without a flow sensor, to prevent over pressure conditions and improve efficiency
- Advanced sleep mode senses low demand conditions and will boost system pressure prior to issuing a stop command, preventing the pump from short cycling "on-off"
- Low/no-flow detection is based on pump speed and/or power consumption, eliminating the need for a flow sensor while preventing damage to the pump
- Dry mode detection can indicate a lack of water or liquid in the pump, preventing damage to the pump
- Run out detection can indicate a leak in the system, preventing damaging effects
- Seamless integration with existing Connected Component Building Blocks
- Use straightforward industry standard PLC programming
- PanelView Component provides an operator interface solution that can communicate over Ethernet and multiple other networks to provide system control and diagnostics

LISTEN.  
THINK.  
SOLVE.

# Connected Components For Pump Control

## SENSING

### Pressure Switch (836E)

- Microprocessor based with no moving parts – longer life, higher degree of accuracy and less downtime
- Unique housing design and invertible display allow sensor to be rotated for ease of wiring and optimal viewing of LCD display
- Simple and quick setup using on-board buttons or optional configuration software



### Pushbutton (800F)

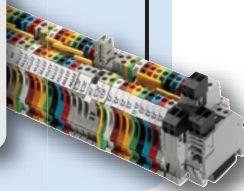
- Modular design
- Unparalleled flexibility
- Unmatched low-voltage switching
- Easy installation for time and cost savings



## CONNECTIVITY

### Terminal Block (1492-J)

- Self-locking screw clamp allows tight connection
- Superior jumpering capability
- Four-sided funnel wire guides for easy wire installation
- Designed for DIN rail mounting with a full range of accessories and specialty blocks



We offer products suited for applications around the world. Below are some options:

### IEC Miniature Circuit Breaker (1492-SP)

- Rated 0.5 A ... 63 A and 240/415 VAC and 48 VDC
- 1 pole, 2 pole, 3 pole, 1 pole + N and 3 pole + N versions
- Bus bars available, 1 phase, 2 phase, 3 phase, and 4 phase
- Auxiliary contact and shunt trip modules available
- VDE certification

### UL489 Listed Miniature Circuit Breaker (1489)

- Rated 0.5 A ... 40 A and 480Y/277 VAC, 240 VAC, 48 VDC
- 1 pole, 2 pole, 3 pole versions
- Bus bars available, 1 phase, 2 phase, 3 phase
- Auxiliary contact and shunt trip modules available



### Power Supply (1606-XL)

- 15W-960W output (@24V DC)
- 1, 2 or 3 phase voltage input
- Quick-connect spring clamp or screw terminals
- Built-in reserve power up of 150% of nominal current



## POWER

We offer products suited for applications around the world. Below are some options:

### Circuit Breakers (140U)

- Compact size, 30% reduction in panel
- Field installable accessories while maintaining UL 489
- Dual ratings – UL 489, IEC 60947-2

### Disconnect (194R)

- Panel space savings – smaller footprint
- High fault withstanding rating – up to 200kA with UL Class J and CC fuses
- Superior short circuit protection – Type 2 coordination

### Molded Case Circuit Breakers (140UE)

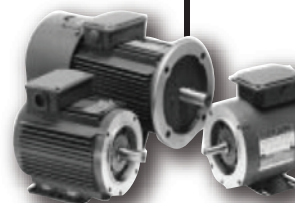
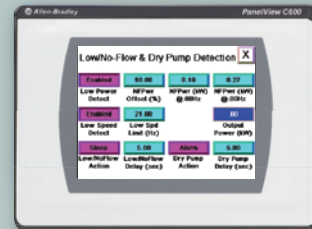
- Field installable accessories while maintaining IEC 60947-2
- KEMA-KEUR approval
- Multiple levels of interrupting capacity available

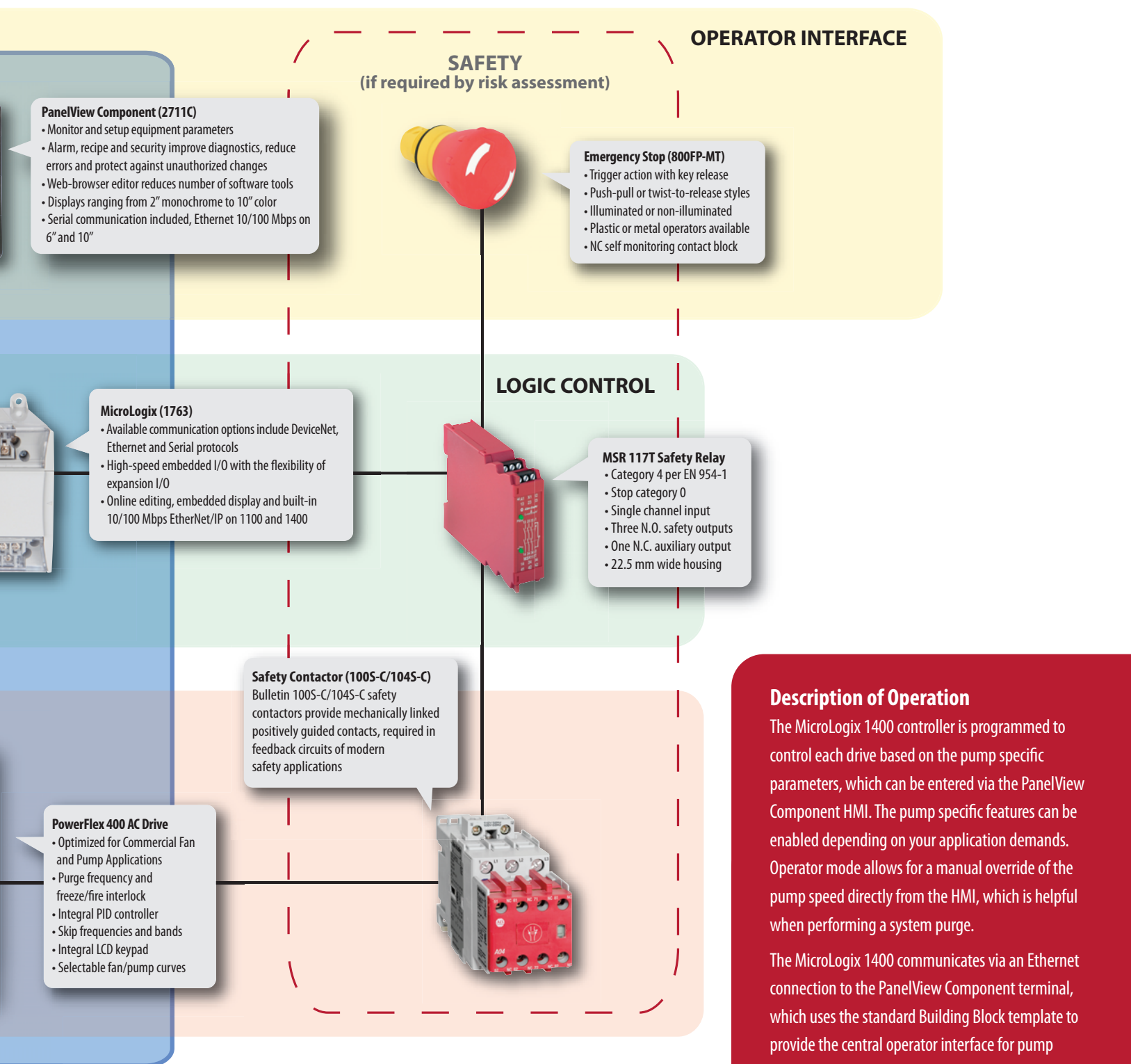
### Load Switches (194E)

- 16...100A
- 3 or 6 pole switch configurations for OFF-ON or Change-over applications
- Front/Door or Base/DIN rail mounting
- Wide choice of actuators, all with IP66 protection degree

### Power Distribution Blocks (1492-PDE)

- UL recognized, CSA certified, CE compliant
- IP20 from the front
- Multi-pole assembly possible with easily gangable units
- High fault SCCR up to 100 kA





## Description of Operation

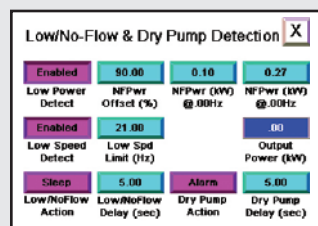
The MicroLogix 1400 controller is programmed to control each drive based on the pump specific parameters, which can be entered via the PanelView Component HMI. The pump specific features can be enabled depending on your application demands. Operator mode allows for a manual override of the pump speed directly from the HMI, which is helpful when performing a system purge.

The MicroLogix 1400 communicates via an Ethernet connection to the PanelView Component terminal, which uses the standard Building Block template to provide the central operator interface for pump control and monitoring. Pump specific status and fault information is displayed on the HMI providing greater diagnostic information.

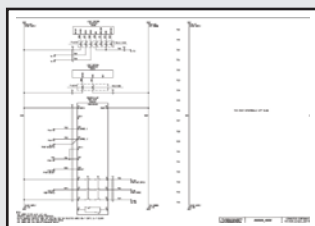
In addition to the HMI control, you can easily create custom code for each of the 8 pumps in the provided RSLogix 500 application code. The custom code gives you the flexibility to meet your specific application needs.

*Above is a typical representation of the components used in this system solution.  
Your requirements could vary based on your specific machine needs.*

## Building Block Tools



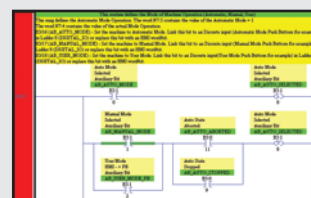
HMI Screen



CAD Drawing



Quick Start



Ladder Logic Code

## Applications

- Water/Waste Water
- Centrifugal Pump Systems Designed to Maintain Pressure

## Connected Components Solution

The following sample bill of materials lists core products. For a complete solution bill of materials (includes power circuit components, control circuit components, sensors and pushbuttons) order the Connected Components Building Blocks DVD, CC-QR001\_-MU-C.

CCBB Pump Control Basic Products		
Quantity	Catalog Number	Description
1	1766-L32BXBA	MicroLogix 1400, 12 digital fast 24V DC inputs, 8 digital 24V DC inputs, 6 relay outputs, 3 fast 24V DC outputs, 3 normal 24V DC outputs, 4 Analog (12 bits) inputs, 2 Analog (12 bits) outputs, 24V DC power
1	1763-NC01	Cable: MicroLogix 1100 Channel 0 (8-pin DIN) to RS485 (6-pin Phoenix)
1	22C-D6P0N103	PowerFlex 400, Fan & Pump Drive. 480V AC, 3 PH. 6 Amps. 3 HP, Frame Size C, IP20 (Open). Fixed Keypad. RS485 (without Brake IGBT)
1	AK-U0-RJ45-TB2P	PowerFlex 4_Class DSI RJ45 Terminal Blocks _ RJ45 two position terminal block (6 pieces) with two 120 Ohm terminating resistors (loose)
1	CM211-NV00336BXZHA	CM211 - NEMA Severe Duty Inverter Motors, 3 HP, 3600 RPM, Foot Mounted, Frame Size is 182T
1	2711C-T6C	PanelView Component 6" Color (Transmissive CSTN) Touchscreen
1	2711P-CBL-EX04	Ethernet CAT5 crossover cable (industrial grade) 4.3 m (14 ft)
1	1606-XLP90E-2	Compact Power Supply, 24-28V, 90 W, 2-Phase 480V AC wide range Input Voltage
CCBB Pump Control Products for Programming		
Quantity	Catalog Number	Description
1	9324-RLM0100ENE	RSLogix Micro Starter (English) CD-ROM
1	9306-4EXP02ENE	DriveExplorer for NT/2000/XP
1	1203-USB	Smart serial to SCANport/DPI adapter

For additional information, please visit [www.rockwellautomation.com/go/connected](http://www.rockwellautomation.com/go/connected)

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