





# Highly accurate field instrumentation for the process industry.

The 100 Series is a range of economical, yet highly accurate, process instruments for use in field applications where a robust, weatherproof IP67 unit will provide the best solution.

All models feature simple programming, large display and input linearisation for increased accuracy.

## Contrec is proud to be the benchmark for process and petroleum instrumentation.

The company was formed over 30 years ago to develop the first electronic flowmeter displays, and today Contrec instruments are installed in thousands of applications, in every continent and in most countries around the world. We are fully certified to ISO 9001:2008 and our equipment carries the latest approvals. We continually develop and test our products to comply with international standards on accuracy and also to the changing demands and requirements of our customers. We have assembled a professionally managed team with over 50 years experience in applying flow solutions, who are focused on satisfying our customers needs and expectations.

## Instruments can be used for the following functions:



#### **FLOW**

#### MODELS 102A / 102D / 103D / 104D

A range of accurate Rate Totalisers designed to operate with virtually any pulse/frequency generating flow meters. Models feature high/low alarms and can be powered externally or locally. Rate and totals can be displayed in different engineering units. Model 102A accepts an analogue input.



#### **BATCH**

#### **MODEL 114D**

Accurate and reliable, this controller is designed for flow applications where precise control of batch quantities is required. The controller will accept pulse or frequency flow signals and provides one or two stage valve control. Controller requires a DC power supply.



#### LEVEL

#### **MODEL 120A**

An accurate level instrument which accepts signals from a wide range of sensors, transmitters and probes, and displays a large level bar graph and tank contents. Solid state relay outputs provide up to four level alarms and requires a loop power supply.



#### **PROCESS**

#### **MODEL 150A**

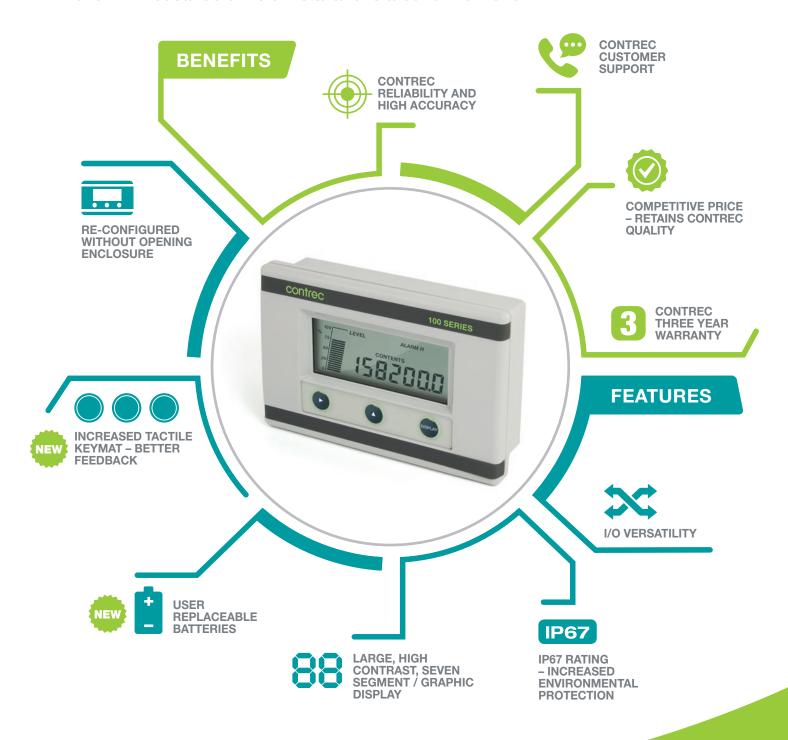
This versatile instrument accepts signals from a wide range of transducers and transmitters, and displays a large bar graph with a scaled process variable. Solid state relay outputs provide up to four level alarms and requires a loop power supply.

Please refer to specifications table on the back page. Data sheets are available from our website.



## We are Contrec. World leaders in flow instrumentation.

Proven in thousands of field installations around the world.



### **Technical Specification & Order Codes**

	102A	102D	103D	104D	114D	120A	150A
Application			î			ì	
Analogue to Frequency	1						
Frequency to Analogue				1			
Flow	1	1	1	1			1
Batching					1		
Level						1	1
Process							1
Input							
Analogue	1					1	1
Frequency		/	1	1	1		
Features							
Linearisation	1	1	1	1		1	1
Bargraph						1	1
Totalisation	1	1	1	1	1		
Outputs							
Analogue (2 wire)				1			
Alarm/Relay	1 or 2*		1 or 2*	1 or 2*	2	4	4
Pulse/Frequency	1*		1*	1*			
Power Supply							
Loop powered	1			1		1	1
DC powered			1		1		
Battery (back-up**)		1	**	**	**		
Specifications							
Uncertainty (% of span)	0.05%					0.05%	0.05%
Update time	0.5 secs					0.5 secs	0.5 secs
Voltage drop (max)	2.5V					2.5V	2.5V
IP67/Nema 4X	1	1	1	1	1	1	1

<sup>\*</sup>Choose between second alarm or pulse output

### **General Specifications**

#### **Operating**

**Temperature Limits:** −20 to +60°C,

 $-4 \text{ to } +140^{\circ}\text{F}$ 

#### **Enclosure**

Overall Size: 98mm (3.9") height x 152mm (6.0") width x 43mm (1.7mm) depth Protection: IP67 (Nema 4X) watertight

Cable Entry: By cable gland Materials: Polycarbonate and ABS

#### Display

Batch Total: 7 digit 10mm (0.4") high LCD

(continuously powered)

Preset: 5 digit 8.5mm (0.33") high LCD

(continuously powered)

K-factor Range: The pulses per unit of measure (eg. pulses/ gallon) is programmable in the range of 0.0001 to 999,999

#### **Battery Backup**

Type: 2 x Lithium battery packs

Function: The batteries will provide backup power for the instrument if no DC or loop power is available. The batteries will not power the sensor (if power is required) or solenoid outputs

#### **Mounting Options**

Wall: Unit supplied with universal mounting bracket as standard

Panel: Unit supplied with panel mounting brackets

Pipe: A galvanised metal bracket enables the unit to be attached to a 51mm (2") vertical or horizontal pipe

#### Instruments within the Contrec family:

#### 100 Series

Accurate process instruments for field mounting applications

#### 200 Series

Intrinsically safe, precise and reliable process instruments

#### 400 Series

Rugged and dependable batch and flow control solutions

#### 505 Series

Next generation flow instruments for a variety of applications

#### 515 Series

Precise flow and batch control for more complex applications

#### 1000 Series

Robust load computers for petroleum and chemical applications

#### TRAC 40

Vehicle mount custody transfer approved registers







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#### **Contrec Systems PTY Ltd**

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## Highly accurate field instrumentation for hazardous areas.

The 200 Series is a range of intrinsically safe, highly accurate, process instruments for use in field applications where a robust, weatherproof IP67 unit will provide the best solution.

All models feature simple programming, large display and input linearisation for increased accuracy.

## Contrec is proud to be the benchmark for process and petroleum instrumentation.

The company was formed over 30 years ago to develop the first electronic flowmeter displays, and today Contrec instruments are installed in thousands of applications, in every continent and in most countries around the world. We are fully certified to ISO 9001:2008 and our equipment carries the latest hazardous area approvals. We continually develop and test our products to comply with international standards on accuracy and also to the changing demands and requirements of our customers. We have assembled a professionally managed team with over 50 years experience in applying flow solutions, who are focused on satisfying our customers needs and expectations.

## Instruments can be used for the following functions:



#### **FLOW**

#### MODELS 202A / 202D

A range of accurate Rate Totalisers designed to operate with virtually any pulse/frequency generating flowmeters. Models feature high/low alarms and can be powered externally or locally. Rate and totals can be displayed in different engineering units. Model 202A accepts an analogue input.



### **BATCH**

#### MODEL 214D

Accurate and reliable, this controller is designed for flow applications where precise control of batch quantities is required. The controller will accept pulse or frequency flow signals and provides one or two stage valve control. 214D controller requires a DC power supply.



### LEVEL

#### **MODEL 220**

An accurate level instrument which accepts signals from a wide range of sensors, transmitters and probes. Displays a large level bar graph and tank contents. Solid state relay outputs provide up to four level alarms and requires a loop power supply.



#### **PROCESS**

#### **MODEL 250**

This versatile instrument accepts signals from a wide range of transducers and transmitters, and displays a large bar graph with a scaled process variable. Solid state relay outputs provide up to four programmable alarms and requires a loop power supply.

Please refer to specifications table on the back page. Data sheets are available from our website.



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Proven in thousands of field installations around the world.



### **Technical Specification & Order Codes**

	202A	202D	214D	220	250			
Application				`				
Flow	1	1	1		1			
Batching			1					
Level				1				
Temperature					/			
Pressure					/			
Process					/			
Input								
Analogue	1			1	1			
Frequency		✓	1					
Features								
Linearisation	✓	✓		1	<b>√</b>			
Bar graph				✓	✓			
Totalisation	✓	✓	1					
Outputs								
Analogue (2 wire)		✓						
Alarm/Relay	✓	✓	✓	✓	✓			
Pulse/Frequency	✓	✓						
Power Supply								
Loop powered	✓	✓		✓	✓			
DC powered		✓	✓					
Battery (back-up**)		<b>√</b>	**					
Specifications								
Uncertainty (% of span)	0.05%	0.00%	0.00%	0.05%	0.05%			
Update time (seconds)	0.5			0.5	0.5			
Voltage drop (max)	2.5V	2.5V	2.5V	2.5V	2.5V			
IP67/Nema 4X	✓	✓	✓	<b>√</b>	✓			
Intrinsically Safe								
ATEX	II 2G Ex ia IIB T4 Gb							
IECEx	Ex ia IIB T4 Gb							
CSA NRTL/C		Cla	ass 2, Group C &	& D				

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#### 200 Series

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#### 505 Series

Next generation flow instruments for a variety of applications

#### 515 Series

Precise flow and batch control for more complex applications

#### **LC Series**

Robust load computers for petroleum and chemical applications

#### TRAC 40

Vehicle mount custody transfer approved registers







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## We are Contrec.

## World leaders in flow instrumentation.

# Highly accurate field controllers for the oil and gas industry.

This industry provides one of the most diverse and challenging environments for instrumentation to operate in. The constantly changing demands and the need to provide solutions which will not only return faultless reliability in the most harsh operating conditions, but also deliver the high accuracy and performance expected when measuring these valuable commodities.

Contrec has been taking care of oil and gas applications for over 30 years and was one of the first electronic preset controller manufacturers to gain custody transfer approvals for the loading of oil products onto road tankers, rail and barge applications.

The 515 Series utilises a common, advanced hardware and the functionality is determined by software which is specifically tailored to individual applications. With over 50 applications already created, and a wealth of input types available, our ability to linearise these flowmeter inputs ensures Contrechelp to make good flowmeters even better.

# The 515 Series is easy-to-use, easy to understand and offers exceptional flexibility over many applications.

This controller is the most advanced model in the 500 Series range. It has more inputs and outputs of higher accuracy, giving it greater capability and configurability to suit a wide range of applications.

There are multiple frequency and analog inputs which makes the controller suitable for applications that require extra external sensors for temperature, pressure, density, level devices, and many other applications.

The 515 Series is capable of operating in a wide temperature ranges and its 'plug and play' option card makes enhancements easy to undertake without reprogramming. The behaviour of the instrument is determined by the function software which is selected from an increasing list of applications in the 500 Series Program Manager.

## Instruments can be used for the following functions:



#### FI OW

Contrec flow computers are designed to operate with either liquid or gas flows. Accepting either analog or pulse signals from flowmeters with additional inputs from temperature, pressure and density transmitters, the 515 has inbuilt correction tables for most fluids or custom fluids can easily be handled. All models give rate, total and accumulated total and have a variety of output options.



#### **BATCH**

We offer a broad range of batch control options. From single product batching using simple on/off valves, to dual stream blending controllers with temperature correction to API/ASTM standards to give precise nett and gross volumes. Our batch controllers can provide flow control using modulating valves or variable speed pumps, and can be used for ratio control of two flows. All our batch controllers are suitable for use in hazardous areas.



### **CUSTOM**

Our range does not finish at traditional flow and batch applications. Contrec have solved custom requests from many clients including meter proving, density computers, additive injection and gas tariff calculators. If your application doesn't fit one of the many existing application packs, we are happy to carry out an evaluation to look at the possibility of creating a new solution to match your specifications.



## Proven in thousands of field installations around the world.

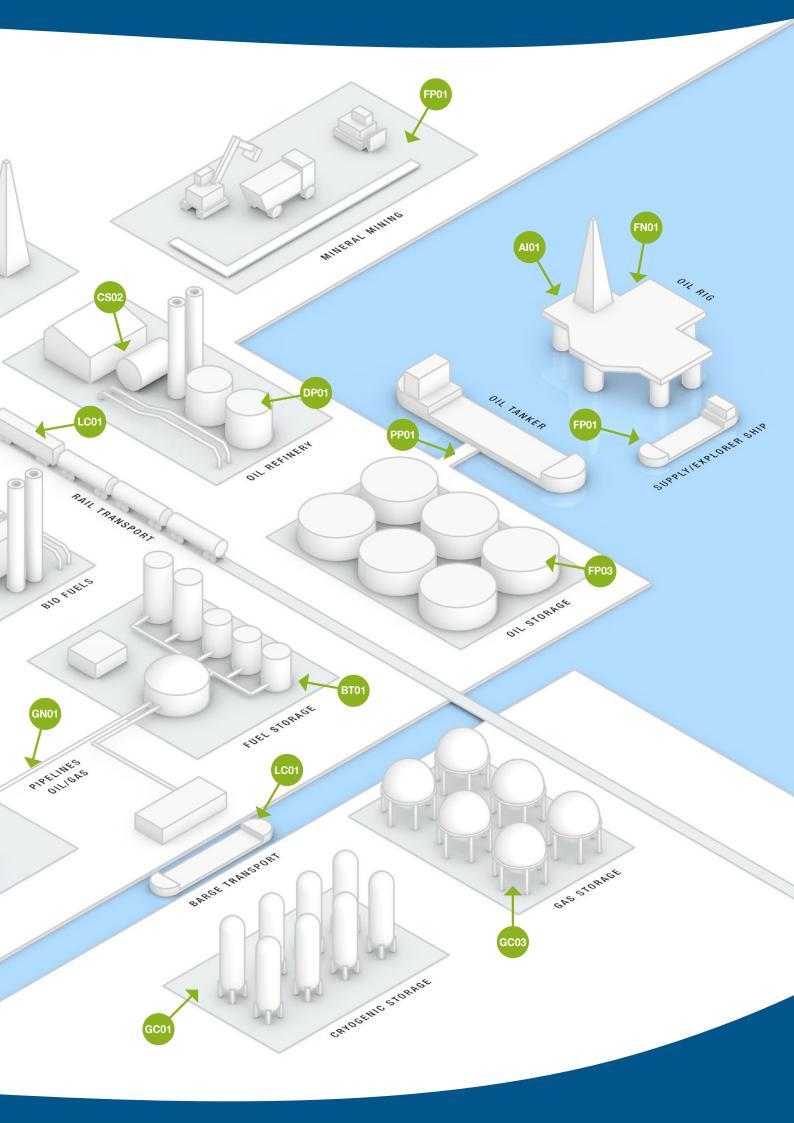


### **Critical Environments**

Contrec instruments are flexible and can be mounted in a variety of ways. For safe area or control room environments, the 515 Series can be supplied as a panel mount device along with a weatherproof IP65 front fascia. For installations where the unit would be exposed to the elements, but not in a designated hazardous area, we can supply a variety of field mount enclosures and supply the Contrec unit fitted and pre-wired ready for installation and commissioning. For conditions where there is a risk of explosion or just when the operating conditions require the ultimate in rugged protection, we can supply the controller mounted in our Zone 1 ATEX/CSA (IECEx pending) enclosure. This housing provides a large viewing area and full operation of all the instrument's features are by large, heavy duty, stainless steel push buttons.





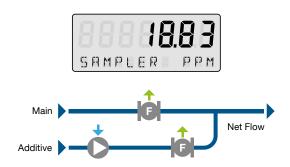


## These are some of the 50 Available Applications

## Additive Injection Controller (A101)

This application is designed to control the injection of additive chemicals with respect to a main flow. Tailored for volumetric frequency flowmeters it will operate with positive displacement dosing pumps controlling the dosing rate via either an output pulse or 4-20mA signal.

- . Suited for injection ratios from 10 to 10000 PPM
- Adjustable sampling method deals with the inherent problems of measurement and control of pulsating injections
- · Continual calculation of main flow and required dosing rates

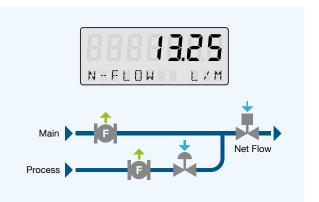


### Batch/Ratio Process Controller (BRO1)

The BR01 application is a Batching Ratio Controller for delivery of preset quantities at preset ratios using volumetric frequency inputs.

Batch control can operate in preset or on-off modes, while flow control can be set to various loop control modes.

- · Single or dual stage control
- . No-flow, leakage and overflow error detection
- Remote RUN/STOP/RESET



## Net Oil Flow Computer (FNO1)

This application calculates the net oil content in petroleum production fluids containing water. The net oil volume is corrected to a reference temperature according to ASTM D1250-04. The instrument uses the frequency signal from a mass flowmeter along with temperature and density analog inputs.

- Calculates the Net Oil content in petroleum production fluids containing water
- . Volume correction according to ASTM D1250-04
- · Uses temperature and density inputs for volume correction



## Petroleum Consumption Flow Computer (FP01)

The FP01 application measures the flow and consumption of a petroleum fluid.

The two-channel frequency flow input enables the instrument to calculate the delta net volume that is used by a consuming device.

- Caters for a wide range of petroleum products including crude, lube, refined and LPG
- · Allows for volume correction of general and user fluids



## Natural Gas Flow Computer (GNO1)

This application measures the volume, mass and gross heat content of natural gas. The instrument uses a frequency volume flow input and analog temperature and pressure sensor inputs.

- AGA-8 Natural Gas detail characterisation method calculations for gas compositions with up to 21 components
- · Allows quadrature flow input for ISO 6551 level B pulse security
- · Allows for non-linear correction

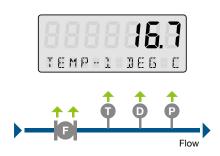


### Pressurised Petroleum Flow Computer (PP01)

The PP01 application measures the flow of a pressurised petroleum fluid according to ASTM D1250-04. The frequency flow inputs can accept a quadrature signal for ISO 6551 level B pulse security.

An analog pressure, temperature and/or density input allows for volume correction to reference conditions.

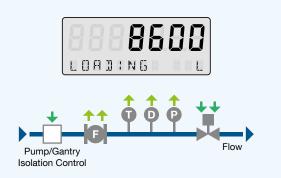
- Pressure and temperature compensation to ASTM D1250-04
- · Caters for a wide range of petroleum products including crude, lube, refined and LPG



## Single Arm Load Computer (LC11)

This application is a Single Arm Load Computer with digital valve control for the reliable and accurate delivery of preset quantities of products measured by mass flowmeters. The volume frequency flow input can accept a single or quadrature signal for ISO 6551 level B pulse security. The load computer can operate in a Preset or On/Off mode.

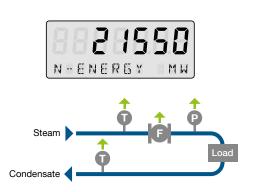
- Tailored for Volumetric flowmeters
- · Simple five key operation with easy access to common batch presets
- · Allows quadrature flow input to ISO 6551 level B pulse security
- · Batches in Volume total
- · Preset, On-Off or Release (tuning) batch modes



## Steam to Condensate Computer (CS02)

The CSO2 application accurately accounts for returning condensate energy when calculating the net energy in a closed 'steam to condensate' system. The volume, mass and energy content of steam and condensate lines are calculated by using an analog volume flow in conjunction with a temperature and/or pressure inputs.

- Tailored for closed 'Steam to Condensate' systems
- Accurately calculates Net Energy by accounting for energy in returning condensate
- Calculations based on 100% steam to condensate conversion
- Programmable condensate pressure value accessible via Modbus





















Comments

ID-Tag Interface

PI Flow Control

PI Flow Control

ID-Tag Interface

Flow1 +/- Flow2

ASTM D1250-04

Control for Digital Valves

ASTM D1250, Flow1 – Flow2

ASTM D1250, ISO 6551, LPG

ASTM D1250-04, ISO 6551

Ideal & General Equations

Water & other fluids

Water (IAPWS-IF97)

Water & other fluids

With strapping table

Pulse Density Input

Additional Logging

API Manual, Chapter 4.5

IAPWS-IF97

ASTM D1250, etc.

These ports can be used for remote data reading, printouts and for initial application loading of the instrument.

#### **Isolated Outputs**

The opto-isolated outputs can re-transmit any main menu variable. The type of output is determined by the nature of the assigned variable. Totals are output as pulses and rates are output as 4-20mA signals. One output is standard, a second output is available as an option.

#### **Relay Outputs**

The relay alarms can be assigned to any of the main menu variables of a rate type. The alarms can be fully configured including hysteresis. Two relays are standard with additional two relays available as an option.

#### **Software Configuration**

The controller can be further tailored to suit specific application needs including units of measurement, custom tags, second language or access levels. A distributor can configure these requirements before delivery.

Instrument parameters including units of measurement can be programmed in the field, according to the user access levels assigned to parameters by the distributor.

A free download is available from our website www.contrec.co.uk





515 Series Applications

Secure Batch Controller - Volumetric Frequency Flow

Dual Stage Batch & Flow Control - Volumetric Frequency Flow

Dual Stage Batch & Radio Control - Volumetric Frequency Flow

Additive Injection Controller - Volumetric Frequency Flow

Blending / Ratio - Volumetric Frequency Flow, Analog Control

" - Volumetric Analog Flow, Analog Control

- 2 Input, Freq or Analog (Mass)

- 2 Channel Analog Flow

- 2 Input, Freq or Analog (Energy)

Batch Based Blending - Volumetric Frequency Flow, DCV Control

Secure Blending Controller - Frequency Flow (V), DCV Control

Add or Subtract Flow - 2 Input, Freq or Analog (Volumetric)

Petroleum Flow - Quadrature Input, Temperature Correction

Petroleum Consumption - 2 Channel Frequency Flow

Net Oil (Water Cut) - Mass Frequency Flow

**General Gas Computers** 

Heat/Energy Computers

**Level Monitors** 

**Steam Computers** 

**Other Applications** 

Natural Gas

" - Analog Flow

Pressurised Petroleum Flow - Quadrature Input

General Gas - Single or Quadrature Frequency Flow

- Stacked DP Mass Flowmeter

" - Stacked DP Meter (ISO 5167/Cones)

- Stacked DP Volumetric Flowmeter

Natural Gas (AGA-8) - Single or Quadrature Frequency Flow

- Stacked DP Mass Flowmeter

- Volumetric Analog Flow

- DP Meter (Mass Span)

- DP Meter (ISO 5167/Cones)

- DP Meter (Volumetric Span)

- Stacked DP Meter (ISO 5167/Cones)

- Analog Flow

Heat/Energy Calculator - Volumetric Frequency Flow

Heat/Energy Calculator - Mass Analog Flow

Steam Computer - Volumetric Frequency Flow

Condensate & Steam Computer - Analog Flow

Mass Flow - Frequency Input With Master Proving

Open Channel - Frequency Velocity, Analog Level

Density Converter - Generic Gas Equations

Volumetric Analog Flow

- DP Meter (Mass Span) - DP Meter (ISO 5167/Cones)

Generic Liquid and Petroleum

Single Tank Level Monitor - Analog level

Load Computer - Volumetric Frequency Flow

- Volumetric Analog Flow

- Volumetric Analog Flow

- Mass Frequency Flow

- Mass Analog Flow

- Mass Frequency Flow

- Mass Analog Flow

Temperature Compensated Batch Controller

Description

**Batch Controllers** 

**Batch/Flow Controllers** 

**Control Computers** 

Flow Computers

Pack No.

BATCH

**BS01** 

BT01

**BF01** 

**BF02** 

BF03

**BF04** 

**BR01** 

**BR02** 

**BR03** 

**BR04** 

AI01

LOAD

LC01

CR01

CR02

**CB01** 

**CB02** 

FLOW

FA01

**FA02** 

FA03 FP01

FP02

FP03

FN01

PP01

GAS

GC01

GC02

GC03

GC04

**GC06** 

**GN01** 

**GN02** 

GN03

**GN04** 

HEAT

HC01

HC02

HC03

HC04

HC06

HC12

LEVEL

LM01

**STEAN** 

SC01 SC02

SC03

**SC04 CS02** 

OTHER

**DG01** 

DP01

MP01

OC01

CONTROL

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