CARREMM CONTROLS

- **Industrial I.T. Hardware, Software, Data Acquisition & Process Solution**

- **Combustion Gas Controls, Regulators, Meters and Control Systems**

- **Temperature & Process Controls**

- **Recorders & Data Loggers, Calibration Equipment**

- **HVAC Sensors & Transmitters**

- **Emission Combustion Analyzers & Process Monitors**

- **Liquid Analysis Instruments, Filtration Systems**

- **Controls and Meters**

January 2020

CARREMM CONTROLS	HVAC, Automation Control Valves, Boiler & Burner Systems NIST Pressure & Temperature Calibration Services Service & Calibration of Emission-Combustion Analyzers

acme ENGINEERING PRODUCTS	**Ambient Gas Detection Systems**	**A.J. Antunes & Co.** — easterseals Crossroads industrial services — **Air & Gas Pressure Switches Digital Freezestats**
ASCO	**Solenoid Valves, Pressure Switches & Temp. Detectors**	CARLO GAVAZZI — **Automation Controls & Sensors**
Danfoss	**Variable Speed Drives**	**DUNGS® Combustion Controls** — **Air & Gas Pressure Switches Valves**
Dwyer	**Photohelic, Magnehelic Pressure and Differential Switches and Transducers**	EFF — **Ball Valves**
FoxThermal Precision Mass Flow Measurement An ONICON Brand	**Mass Flow Meters**	Fuji Electric — **Temp. & Process Controls, Recorders, Drives and Flow Meters**
	Pressure Gauges, Diaphragm Seals, Temperature Meters	krom schroder — **Air & Gas Pressure switches, Sol. Valves, Regulators & Burners**
Marshall Excelsior MEC Gas Connections	**Gas Pressure Regulators**	**MAXITROL** company — **Pilot Regulators for Natural and L.P. Gas**
NEOVALVES Ltd.	**Ball Valves & Lubricated Plug Valves**	**Pietro Fiorentini®** — **Gas Pressure Regulators & Meters**
Protection Controls, Inc. Electrical Flame Safety Equipment	**Burner Controls, Ignition System and Flame Rods**	**RTC** — **Direct-Fired Heating and Temperature Control**
SIEMENS	**Actuators, Burner/ Combustion & Boiler Controls, Regulators, & Valves**	testo — **Combustion Analyzers; Humidity, Temperature, Pressure, Data Logging, Electrical & Thermal Imagers**

**ISO 9001:2015
QUALITY MANAGEMENT SYSTEM
CERTIFICATIED COMPANY**

Please visit www.carremmcontrols.com for more products.

Service; Application Expertise; Value; Customer Satisfaction:
Carremm Controls Limited is a proven and respected representative of quality process, HVAC & Combustion products.
Our service is geared towards assisting you, the customer, to best apply and maintain the products shown in this short form catalogue.
Expanding horizons through related product lines will allow us to service you better. We have related product lines that are not shown.
If you do not see what you require in this catalogue, please call us at (905) 569-0335 or visit www.carremmcontrols.com.

The **LMV3** Linkageless Burner management system that provides all supervisory functions required for forced draft burners of medium to high capacity (up to 5 million Btu) operating on a dual fuel and VFD driven combustion blower motor – using integrated communication interfaces – affords convenient diagnostics, parameter settings and incorporation on the automation system level.

Integrated in the LMV37.420A basic unit are:
- The burner control, including gas valve proving
- Electronic fuel / gas ratio control with a maximum of 2 actuators
- Using Highest Torque motor: SQM33.510A9 with 3 different cable lengths
- Standard variable speed drive (VSD) control

The LMV3 is a microprocessor-based burner management system with matching system components for the control and supervision of forced draft burners of medium to high capacity.
The following components are integrated in the basic unit of the LMV27.1
- Burner control complete with valve proving system
- LMV36 available with two fuel combustion curves
- Electronic fuel / air ratio control system for a maximum of 2 actuators
- Modbus interface through plug-in adaptor
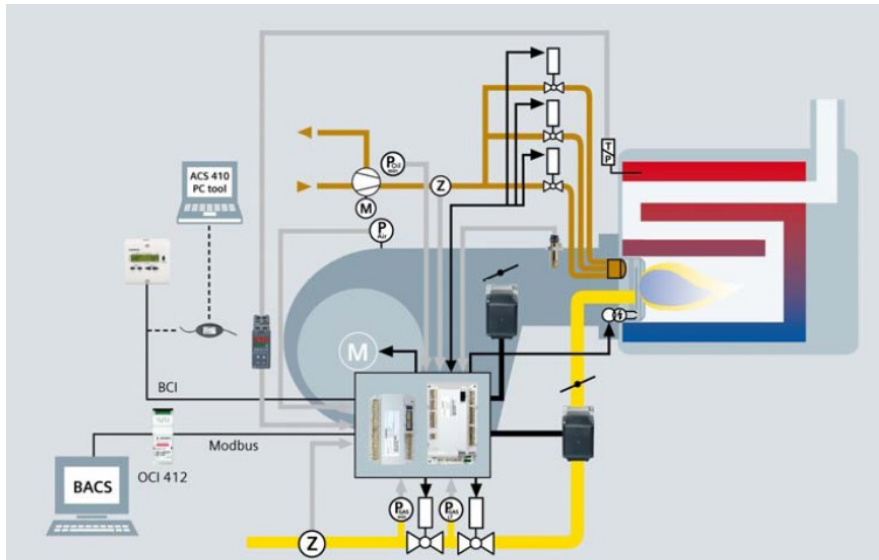
Operation and programming of the burner management system takes place either via the display and operating unit (AZL2) or the PC tool, Ionization Flame Rod or QRA UV Scanner. By making use of the Modbus functionality of the LMV3, the system can be integrated into a data network based on a Modbus system.
This facilitates implementation of the following applications:
- Visualization of plant states
- Plant control
- Logging

LMV51 Siemens Linkageless Combustion Control System for Forced Draft Burners is a complete Flame Safeguard, Combustion Ratio Control, Leak Valve Proving Control and P.I.D. Load Controller.

LMV52 has the additional feature of Oxygen Trim and a total of five motor channels and one 4-20mA modules for Variable speed drive fan motor control.

The LMV51-52 is a microprocessor-based burner management system with matching system components for the control and supervision of forced draft burners of medium to large capacity.

The following components are integrated in the basic unit of the LMV51-52:

- Burner control with gas valve proving system

- Electronic fuel/air ratio control system for a maximum of 5 actuators, 1 VSD and one 4-20mA outputs for variable speed drive controls on two fuel curves

- Optional PID temperature/pressure controller (load controller)

- Oxygen (O_2) trim capabilities on the LMV52

- Systems components are interconnected via bus systems

- Safety-related digital output of the systems are monitored via a feedback network

- Flame supervision:

  - Universal infrared flame detectors: (QRI)

  - Continuous operations: ionization probes

  - Intermittent operation: photo-resistive flame detectors (QRB)

- The AZL52 (LCD) display;

  - Menu-driven operation for straightforward operations and diagnoses

  - For diagnoses; the AZL52 shows the type of fault and the point in time the fault occurred

  - Parameters setting levels: burner/boiler manufacture and heating engineer are password protected to prevent unauthorized access

  - Basic setting levels: plant operator for onsite (no password required)

  - Using the ACS450 software, the AZL52 can be used as an interface for building management systems or PC

- When designing the fuel trains, the burner/boiler manufacturer can choose from a total of 7 valve families

- A large number of individual parameterization choices (program times, configuration of inputs/outputs, etc.) to make optimum adaptations to the specific application

- The universal SQM4 actuators are driven by stepper motors and it can be positioned with a high resolution

Infrared Detectors QRI Scanner:
The QRI is suited for burners of any capacity, either in continuous or intermittent operation
- Used for the supervision of gas, oil or coal flames
- Detector with infrared sensitive flame detecting element
- Integrated flame signal amplifier
- Designed for frontal and lateral (90°) illumination.
- Suited for use with LMV51 and 52 burner controls.
- Secured to the burner with a flange and clamp

QRI4 U.V. Scanner
Self-check scanner for LMV5

Ultra-Violet (U.V) Scanners
The Ultra-Violet radiation emitted by gas or oil flames is used to generate the flame signal
- Detector has U.V. sensitive cell with 2 electrodes
- Ignites when illuminated with radiation, triggering a current in the flame detector circuit
- Types of Operation; intermitted or continuous
- Used with LF series, LG series and LMV series

QRA75 U.V. Scanner
Self-check scanner for LMV 5

QRA2(1) U.V. Scanner
Plastic Housing with side viewing detector with flange and clamp (LMV3)

QRA4.U U.V. Scanner
Housing made of aluminum, with NPSM thread connection (LMV3)

RAR9(1) - Selenium Photocell Detector
Oil Photocell scanner for LMV3

The **actuators** of the SQM45, SQM48 series, are used to electronically drive fuel, air dampers, FGR dampers and other auxiliary equipment on the burner.
When used in connection with burner controls or electronic fuel /air ration control, the associated controlling elements are controlled depending on the burner output.

SIEMENS BURNER, COMBUSTION CONTROLS & BOILER CONTROLS
UNIVERSAL PURGE & MODULATION

LME7 BURNER CONTROL
The **LME7** is a microprocessor-based burner control with matching system components for the control and supervision of forced draft burners of medium to high capacity. LME7 are used for the startup and supervision of 1- or 2-stage gas forced draft burners in intermittent operation.
The flame supervision is supervised with ionization probe is optional with UV flame detector QRA2, QRA4.U or QRA10.

Integrated in the LME7 basic unit are:
- Two Basic models available: Purge & Modulation.
- One purge control replaces numerous competitors models
- Parameters are Password Protected By OEM
- Burner control, Programmable Purge, P.O.C, TFI for pilot and main, Air Flow Switch
- Only LME72... / LME73...: Control for one actuator
- Lockout reset button (info button)
- 3 multi-color signal lamp LED for operations, recycle and fault notifications
- Optional: Analog inputs for load controller DC 0-10V, DC 0/4-20mA, 0-135 Ω
- Recycle function
- Air pressure supervision with function check of air pressure switch during start and switch operation (gas).

The LME 75 is a Microprocessor-based unit with matching system components for controlling and supervision of forced draft burners of medium to large capacity
Features:

- Undervoltage detection · Electrical remote lockout reset facility
- Accurate control sequence thanks to digital signal handling
- Multicolor indication of fault status and operational status messages
- Air pressure supervision with function check of air pressure switch during start and operation (depending on PME75/PME76 and the respective parameterization)
- Limitation of restarts · Parameterizable, controlled intermittent operation after a maximum 24 hours of continuous operation (parameter 239 = 1) e.g., for applications involving an LFS1 flame safeguard and its QRA2/QRA4/QRA10 flame detector
- Continuous operation (parameter 239 = 0)
- BC interface
- The parameters for the LME75/LME76 can be set via the display or the ACS410
- Plug-in space for PME75/PME76

SIEMENS VKG SERIES
NATURAL GAS BUTTERFLY VALVES

VKG Series threaded butterfly valves control the flow of natural Gas, Propane, Butane, or Air
Features:

- UL approved, ½" to 4" NPT threaded
- **Full** (VKG10), **Medium** (VKG20), or **Reduced** (VKG30) port versions available to optimize pressure drop and flow control
- Shaft supported by precision bearings for repeatable performance
- Low leakage rate at full closed position without a beveled disk
- Low pressure drop at the full open position
- Corrosion-resistant for outdoor applications
- Clear position indication on a 2" laser-etched, anodized dial
- 90° clockwise or counterclockwise rotation
- Manual kits available for fixed position adjustment (see below)
- Crank arm kit available for linkage applications (see below)

AGA92.3 Crank Arm Kit

AGA92.2 Course Adjusting Manual Kit
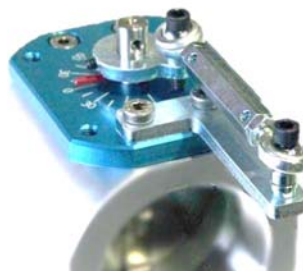
AGA92.1 Fine

VA... Valve Actuator Assemblies

RWF55 BOILER FEEDWATER CONTROL
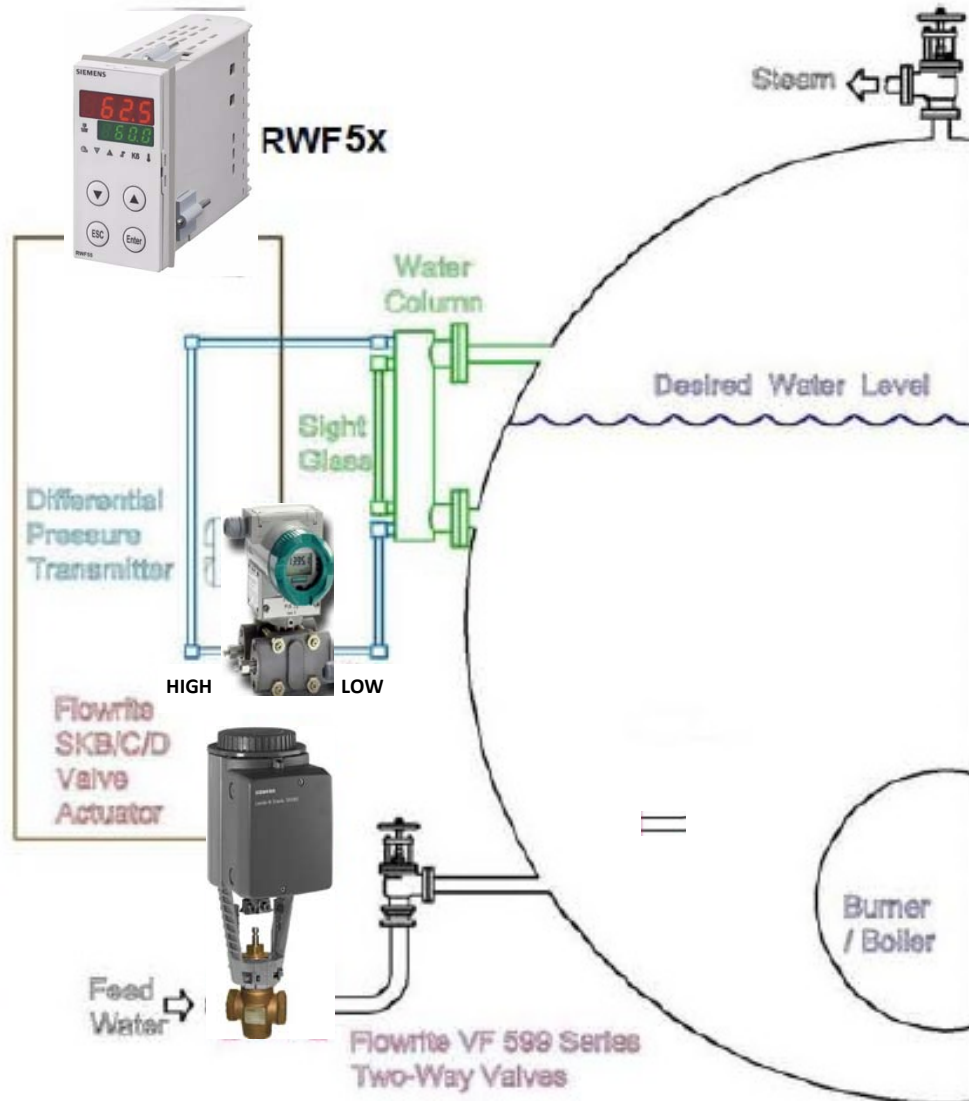
RWF55 Universal Boiler/ Burner Temperature/ Pressure Controller

Outputs include:

- On-Off Limit Control
- Position Pulsing Control
- 2 stage operating mode
- Analog proportional control
- Programmable SPST alarm

Inputs include:

- 3 separate analogue inputs
- Actual Value; Second Value for Set-point shift
- 3rd Input for Outdoor reset or additional set-point shift value.
- Binary Inputs: allow for operating mode change over and set-point changeover or shift.
- RWF55 also has 24vdc supply, optional Modbus communication and standard auto/manual function.

SIEMENS CONTROL VALVES, 3 WAY MIXING / DIVERTING VALVES, BUTTERFLY VALVES, GLOBE VALVES

- Direct-coupled valves and actuators
- Manual Override
- Spring return fail-safe
- Position switches and analog signals
- 100:1 Position resolution
- Visual and electronic position indication
- Control signals selectable: 4-20 mA/ 0-10Vdc
- 24Vac
- 3 position operation

SKP15 Safety Shutoff Valve actuator is used on any VGG Single Gas Valve and any VGD Double Gas Valve.

- Function as on-off actuators with 12sec opening and .8 sec closing operation
- Available in 110v 50-/60hz CSA/FM/UL approved or CE 220vac 50/60hz units, with or without end switches
- The actuator and valve assembly are NEMA 4 rated with the AGA66 valve gasket, -15 to 60C rated with 100% duty cycle at 23VA consumption.
- Also available with P.O.C.– O.T. (Proof of closure over travel) end switches
- CSA 6.5 C/I Approved Safety Shutoff Valve Actuator
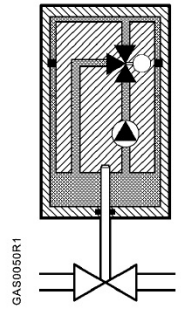
Figure 1. SKP15… Operation.

SKP25 Gas Pressure Regulator & Safety Shutoff Valve Actuator can be used as a combination device to reduce the size of a conventional industrial gas train.

- Three spring sizes (0-8", 6-48", 40-100" WC)
- Covers a 0-100"wc outlet range with no pressure droop.
- SKP25.411U1 covers a 1.5 to 20 psi outlet range
- When used with a downstream high gas pressure switch, the SKP25 will hold the gas at the safety shut-off valve in the event of a high gas pressure condition, therefore eliminating the need for vent valve and vent line.
- Function as a; zero governor & SSOV; or 1:1 air/gas pressure proportion & SSOV
- Actuators are approved as regulators and as gas actuators, and are available with or without end switches
- CSA 6.5 C/I Approved Safety Shutoff Valve Actuator
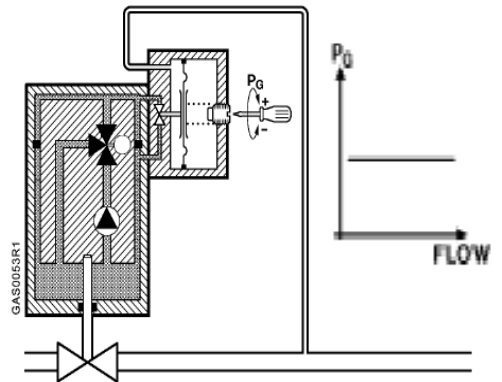
Figure 1. SKP25… Operation.

CSA 6.5 SSOV, CSA 6.3 APPLIANCE REGULATOR

SKP55 is an air to gas, 1 to 1 mass flow actuator & SSOV.

- Ideal for recuperative burners with preheated air, burners with varying air or gas nozzles in the burner head, burners with non representative pressures relative to flow, and burners with negative air pressure levels
- Permissible air to air, and gas to gas pressure difference is 0.1"wc minimum setting, and 80"WC on maximum setting
- Low fire bias range –0.4" to +.4"WC
- The SKP55 is ideal for preheated combustion applications where a 1:1 gas to air flow is required
- CSA 6.5 C/I Approved Safety Shutoff Valve Actuator
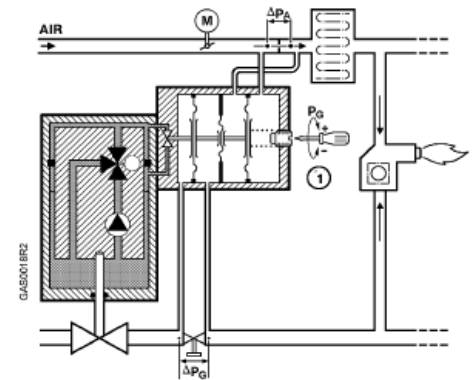
Figure 1. SKP55… Operation.

CSA 6.3 APPLIANCE REGULATOR

The **SKP75** is an air to gas ratio actuator (0.4:1 to 9:1), constant pressure regulator & SSOV so that it functions and serves as a complete combustion ratio control package.

- Minimum air pressure signal is 0.2"wc; maximum air signal when Pg/Pa < 2 = 20"wc, when Pg/Pa >2 maximum air signal is 12"wc.
- Minimum downstream gas pressure is 0.4"wc, max. gas pressure downstream is 40"wc.
- Both series are available in 110 and 220vac options with end switches
- Ideal for premix infrared applications and forced draft burners
- CSA 6.5 C/I Approved Safety Shutoff Valve Actuator
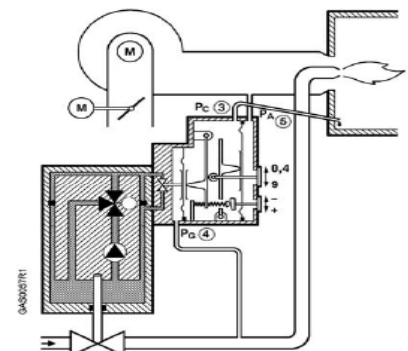
Figure 1. SKP75… Operation.

CSA 6.3 APPLIANCE REGULATOR

SIEMENS GAS VALVES:
SINGLE, DOUBLE AND OIL VALVES

Siemens offers: gas trains and conventional motorized gas safety shut-off valves; combination gas valves with pressure regulating zero governor air/gas proportionators, ratio controllers and mass air flow gas actuators & SSOV valves; and Biogas double-valve bodies consist of two safety shut-off valves in series. VRD Biogas valves compatible with up to 1% H2S.

- VGG sizes: 1/2" to 3" NPT
- VGD sizes: 1" to 3" NPT, Flanged sizes from 1/2" to 6"
- VRD sizes: 1-1/2" & 2" NPT, Flanged sizes from 2-1/2" to 6"

| **VGG10 Single Gas Valve** | **VGD20 Double Gas Valve** | **VGD20 Double Gas Valve** | **VGD40 Double Gas Valve** | **VRD40 Biogas Double Valve** |

VOG SERIES — OIL VALVES WITH PROOF OF CLOSURE (POC)

The **VOG15** is an electro-hydraulically actuated three-way oil valve designed to provide safety shut-off control for industrial and commercial burner applications. The VOG is designed to be used as a two or three way valve on industrial and commercial burners for No. 2 to No. 6 Fuel oil. There is a normally closed port that is rated for a safety shut-off function and is used for recirculation of oils that are heavier.
UL429, FM 7400, CSA C22.2 no.1 Approved

- 110/120VAC
- Piping Connections: 3/4" NPT
- Comes with 1/2" Bushings & 3/4" Plug for 2-way Operation
- Proof Of Closure (POC) with Over Travel
- Max Oil Pressure: 300 PSIG
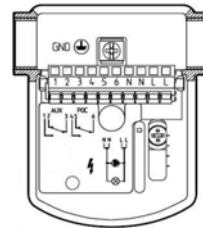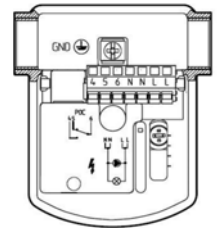
VOG15.012U1   VOG15.011U1

SIEMENS PRECISION & ECONOMY MODULATION MOTORS

SQM40/ SQM41 - Economy Actuators for Air and Gas Dampers are actuators that are suited for driving of flow control valves, and butterfly valves.

- Dampers or other applications which require rotary motion
- Running Time from 15 to 30 Seconds.
- Torque up to 10Nm
- The type of Boards are: Electronic Version, 3 switches; Basic Version, 6 Cam switches; Basic Version, 6 Cam switches, 1 Relay

SQM5 Series High Precision Damper motors are available with over 300 stops in a 90 degree shaft rotation

- Running times between 8-50 seconds
- Torque range is 90 to 400"/lbs
- Operating on line voltage bumping signal, 0-135ohm, 4-20Ma, 0-20Ma , 0-10vdc signal
- Motors are NEMA 3S & 3R rated with optional feedback signals, master-slave operation and linearized shunting outputs

VKF Direct Coupled Wafer Valves

- Direct Coupled SQM50 Motors to 1/2" NPT through to 8" NPT valves
- Rated from 5 to 25 psi. Other options also available
- The SQM Series of Motors can also be direct coupled to ball valves for steam, oil and other special applications

SQN 7 Miniature Series Precision Damper Motors are available with over 100 stops in a 90 degree shaft rotation and running times between 3.5 to 25sec.

- Torque is 22"/lbs
- Motors have 2 limit and 1 auxiliary switch available through 160 degree rotation

OpenAir Electric Damper Actuators are direct-coupled for modulating dampers; Spring and Non-Spring return.

GMA series - Spring return, uses advanced brushless DC motors technology with stall protection, Bi-directional fail-safe spring return, manual override and available in 62 in-lbs torque.

GDE/GLB series - **Non-Spring return,** self-adapting capability for maximum flexibility in damper positioning, manual override and offset and slope adjustment and independently adjustable dual auxiliary switches are available. These actuators are used in constant or variable air volume installations for control of HVAC dampers up to 44 in-lbs or 88 in-lbs of torque.

SIEMENS PRE-ASSEMBLED VALVES & SERVOS

| **Pre-packaged servo, air valve or air damper** | **Pre-packaged servo & thread NPT gas flow control valve** | **Pre-packaged servo & fuel oil valve** | **Pre-packaged servo & FGR or Bio-gas fuel valve** |

INDUSTRIAL FLAME RODS & IGNITERS

8-32 NC THREAD
REMOVABLE TERMINAL
1.05
1.00
'A' DIM.
0.49
'B' DIM.*
7/8 HEX
1/2-14 NPT
.125 DIA.
1/2-14 NPT

8-32 NC THREAD
REMOVABLE TERMINAL
1.10
0.78
'A' DIM.
0.51
0.39
'B' DIM.*
13/16 HEX
14MM X 1.25MM THREAD
.100 DIA.
14MM X 1.25MM THREAD
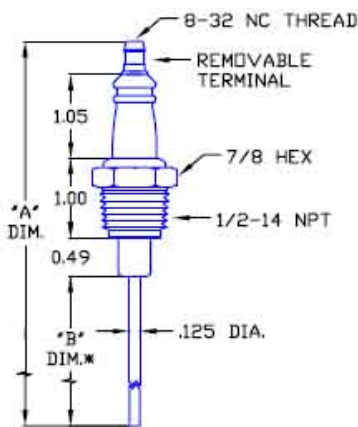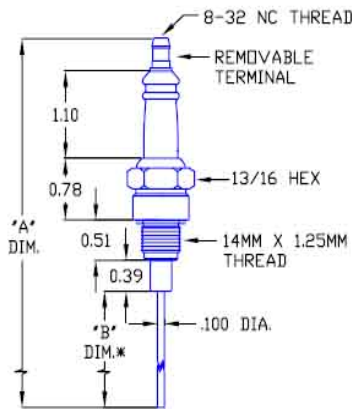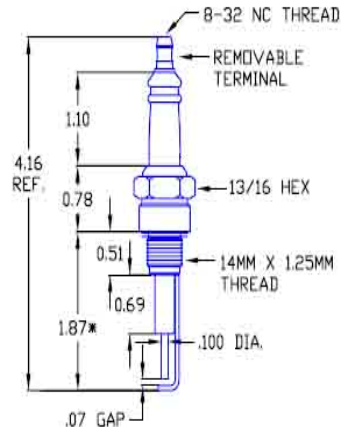
8-32 NC THREAD
REMOVABLE TERMINAL
4.16 REF.
1.10
0.78
0.51
0.69
1.87*
13/16 HEX
14MM X 1.25MM THREAD
.100 DIA.
.07 GAP
14MM X 1.25MM THREAD

Custom sizes and markings on ceramics also available

7256 Series
Flame Safeguard Controls Industrial Burner Controls are robust electro-mechanical controls for automatic and manual operated process gas fired burners.
- Solid State Flame Pak Amplifier
- Plug-in, interchangeable relays and Power Transformers
- Flame Rod and/or Ultra-Violet sensing
- Flame Failure Alarm
- Trail for Ignition timing cycle (15 sec, 10 sec, or 5 sec)

PCII Ultra Violet U.V. Scanners

6642 Series
Multi and Single Burner Flame Safeguard Controls are available in single or multi-burner configurations. Multiple burners can be ignited and supervised as a zone off a common gas train.
- Purge and trial for ignition timings
- Automatic and manual light-off sequences
- PROTECTOFIER monitors and responds to the presence or absence of flame
- TIMOFIER Optional control for automatic system purge and/or ignition trial timing
- TELEFIER Built-in flame-fault indicator light

TELEFAULT II FIRST-OUT ANNUNCIATOR, GUARDED PLANT CONTROL
The TELEFAULT -II is a 1/4 Din First Out Indicator capable of monitoring 8 normally closed circuits on either a 24VAC, 120VAC or 240VAC circuit.
With a control alarm relay, first out LED's, alarm silence and alarm reset push buttons, the TELEFAULT is aN annunciator package complete with a power interruption circuit capable of differentiating a first-out limit and a system first out open limit.

TYPICAL WIRING DIAGRAM
(Shown with 115V limit circuit)
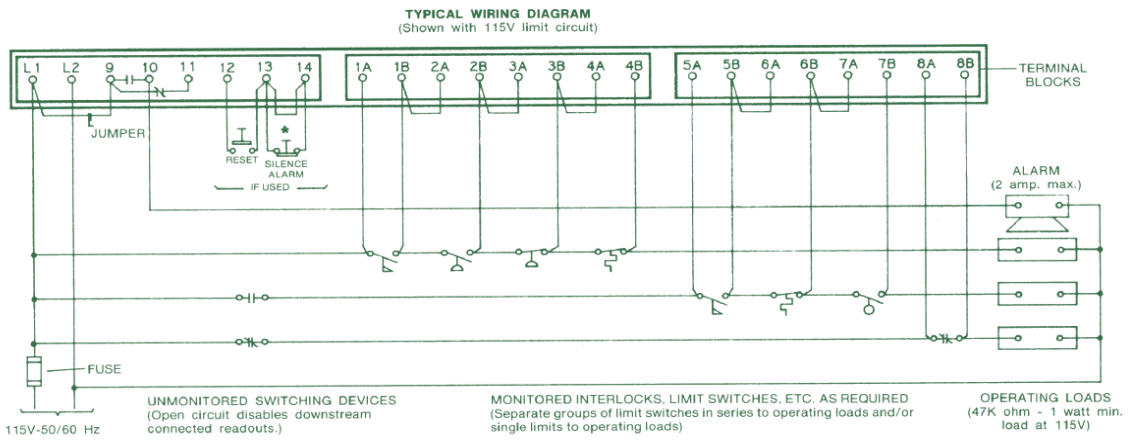
LDU Gas Valve Proving Control
The LDU is a gas valve leak proving system designed for use in gas fired plants utilizing 2 safety shut-off valves.
The LDU with the use of a gas pressure switch sensing between the 2 valves, performs a leak test of the safety shutoff valves before burner start up, shut down or both, and prevents the start of the burner if one of the gas valves is leaking.
In certain jurisdictions the LDU concept will alleviate the need for a vent valve and vent line.
- Checks both shutoff valves for leak before start-up and/or after shutdown
- Cost effective
- Improve system safety
- Approved globally
- Easy to read dial for progress
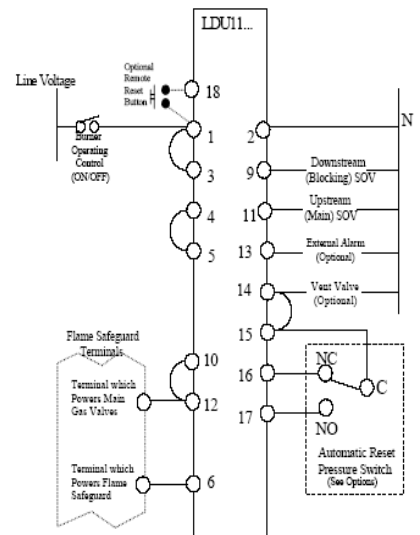
ROOF TOP - DIRECT FIRED - AIR MAKEUP DIGITAL TEMPERATURE CONTROL SYSTEMS
Complete with proportional gas valves & air temperature sensors
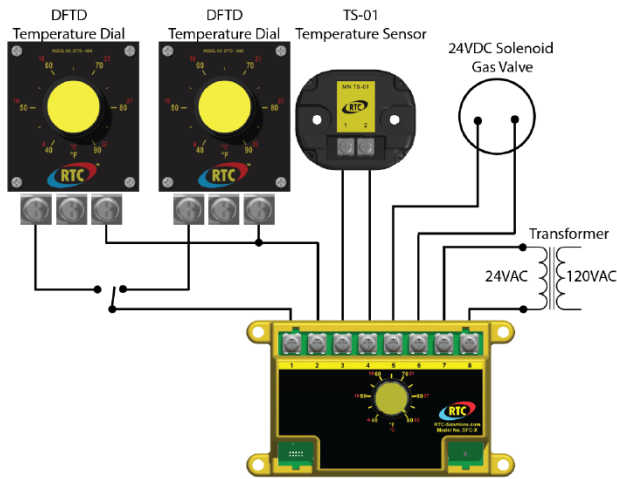
DISCHARGE AIR TUBE
- Galvanized Construction
- Available in standard sizes 8.5" and 12"

DIRECT FIRED HEATER TEMPERATURE CONTROL COMPLETE KIT
Contains: (1) DFC-X, (1) TS-01, (1) DFTD & (5) Temperature Overlays

DFC-X
- Built in 10 second Low Fire Start Timer
- Rated for -40°F (-4°C)
- 0-24VDC Modulating Output
- Direct replacement for DFC-1 & DFC-2

TS-01
- Direct replacement for DFTS
- 40°F-250°F (4°C - 121°C)

DFTD WITH 5 OVERLAYS
- 5 Temperature ranges with one dial; from 40-250°F

CAPABLE CONTROLS
UNIVERSAL IGNITION CONTROLS, HOT SURFACE IGNITION, DIRECT SPARK & INTERMITTENT PILOT

UNIVERSAL INTERMITTENT PILOT IGNITION CONTROL
MODEL 2X - MODEL 2X - SPARK/RECTIFICATION TYPE

The 2X series are microprocessor based controls, suited for new and replacement applications. It is designed for indirect burner ignition and supervision and can be used with all gases.
- 24VAC Operation
- Highly stable flame sensing & Low Spark noise operation
- Programmable characteristics, trial time, purge time, retries and recycle delay are configurable
- Operation with or without electric vent damper
- For use in one or two probe systems
- CSA - 189126 - 1815774 Approved - US & Canadian
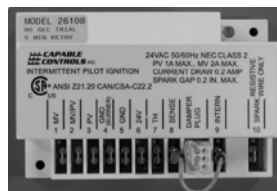
UNIVERSAL DIRECT SPARK IGNITION CONTROL
MODEL 2X - SPARK/RECTIFICATION TYPE

The 2X series are microprocessor based controls, suited for new and replacement applications. Control wiring is standardized to retrofit easily into existing applications. The valve drive relay is long-life rated extended, for mechanical and electrical operations.
- 24VAC Operation
- Highly stable flame sensing & Low Spark noise operation
- Programmable characteristics, trial time, purge time, retries and recycle delay are configurable
- For use in one or two probe systems
- CSA - 189126 - 1815774 Approved - US & Canadian

SMART HOT SURFACE IGNITION CONTROL (HSI)
MODEL SERIES 8X

The 8X series is a microprocessor based INTELLIGENT Hot Surface Ignition control. Internal circuit monitors system gas valve, wiring and HSI element, shutting down the system in the event of a failed or short circuit.
- Power Input - 120-240V & 24VAC
- Universal Models are DIP Switch field programmable for pre-purge, inter-purge time, warm-up time, trail time and total number of trails.
- For use with integral or remote probe sensor
- CSA-C22.2 Approved/ANSI Z21.20 - US & Canadian

DANFOSS VLT DRIVES

Danfoss VLT Drives are used in HVAC, Refrigeration, Material handling or Textile, water and wastewater and Food and Beverage applications.

The VLT® HVAC Drive is designed to bring optimized process control to all heating, ventilation and air conditioning (HVAC) applications. Easy to use and with built-in intelligence, the drive is fast and cost-effective to commission. It features a wide range of functions specifically developed for use with, for example, pumps, fans and compressors to save energy, meet environmental regulations and reduce costs in modern buildings.

The compact design of the VLT® HVAC Drive and its efficient heat management system mean it is ideal for applications where drive space is restricted. A selection of safety features, such as Safe Torque Off and Safe Maximum Speed, protect both applications and their operators.

Maximum uptime is ensured as this robust drive offers problem-free operation in harsh environments. Enclosures are available up to IP 66 (depending on the model).
And a special coating is available as an option to provide extra protection for circuit boards. Integrated DC chokes and RFI filters safeguard installations by minimizing harmonic distortion and electromagnetic interference.

Applications; Pumps, Fans, Compressors

YASKAWA DRIVES

Yaskawa is the world's largest manufacturer of AC drives for industrial automation and OEM equipment.

These AC drives incorporate the latest technological advancements in AC motor speed control, made possible by experience and dedication to quality in design and manufacturing.

These adjustable frequency drives offer the greatest selection of size and performance available, with power ranges from fractional HP to 1750 HP. Yaskawa AC Drives provide the benefits of network communications, support by software tools for parameter management, custom software options, and new ease of installation. Because all adjustable frequency drives are rigorously tested, Yaskawa ensures that quality and reliability are designed in and built in.

MICROMASTER 440 – Technical Data

The MICROMASTER 440 has been specially designed for those applications which require broader functionality and a greater dynamic response than is usually the case.
The sophisticated vector control system ensures a uniformly high drive quality, even when sudden load changes occur.
Fast response inputs and positioning deceleration ramps allow movement to target positions even without an encoder.
Due to an integrated brake chopper, it works with outstanding precision, even during braking and short declaration ramps.
All this is possible within a power range starting at 0.12 kW (0.16 HP) and going up to 250 kW (350 HP).

Atmospheric Pressure
Inlet Pressure
Outlet Pressure

SD-Type
Safety Diaphragm
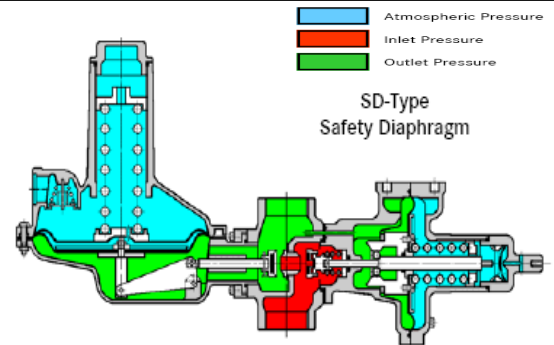
PROBLEM:

Current installations have internal safety relief valves, which have vent lines piped outdoors.
Current installation also have no proactive maintenance procedure to check vent lines.

SAFETY SLAM-SHUT VALVE

SOLUTION:

Bryan Donkin utilize ball check as a <u>vent limiting device</u>, along with Slam Shut or Over Pressure Cut-Off Valve (OPCO),
which monitors the downstream outlet pressure and closes off gas supply should the working diaphragm become ruptured.

**BRYAN DONKIN SERIES 240, 260 & 274 REGULATORS ARE NOW Z21.80/
CSA 6.22 APPROVED**

RMG 240, 260 AND 270 SERVICE REGULATOR

- Sizes: 1/2" to 2" NPT
- Inputs: 1 to 125psi
- Outputs: 4"to 6 psi
- Capacities: up to 16000 scfh
- Full Internal Relief

- Options: OPCO, UPCO , T Type (Thermal)
- Optional : Safety Diaphragm

PIETRO FIORENTINI
GAS GOVERNORS / REGULATORS

Features:

- 3 Models: 2PSIG Inlet; 5PSIG Inlet; 10PSIG Inlet
- Safe, Reliable and High Performance
- Residential to Industrial
- Indoor Ventless and Outdoor applications
- Complete Bubble-tight lock-up
- Internal vent limiter: non removable, for indoor and outdoor installations
- External vent limiter for indoor installations (As approved by Local Codes and Standards)
- Double diaphragm for added safety and greater reliability of service
- Suitable for use with Natural Gas, LPG, and other non-corrosive, clean gas
- Inlet Pressure: 3" W.C. to 2 PSIG CSA approved
- 500:1 Turndown
- Outlet pressure: 2" W.C. to 14" W.C. for CSA Class I
- Outlet pressure: 2" W.C. to 1 PSIG for CSA Class II
- Outlet pressure: 2" W.C. to 4.25 PSIG for non-CSA
- Connection: 1/2"NPT to 4" ANSI Flange
- CSA 6.22 & CSA 3.6

B34R SERVICE REGULATOR

- Sizes: 1-1/4", 1-1/2" & 2" NPT
- Inputs 7"wc to 125psi
- Outputs 3" to 7.3 2psi
- Capacities: up to 10,000 scfh
- Features: Internal Relief

CL34 SERVICE REGULATOR

- NPT and Flange Connections
- Spring Loaded Pilot Internal Relief Valve assembly
- Outputs: 0.75 to 60psi
- Capacities: up to 80,000 scfh

**CARREMM CONTROLS ALSO OFFERS METER CALIBRATION AND VERIFICATION SERVICES
TO WEIGHTS AND MEASURE CANADA, OR N.I.S.T. STANDARDS.**

VALVE AUTOMATION

LIMIT SWITCH— BALL VALVE ASSEMBLIES

FEATURES

- Size / Pressure Range: ¼"—1" NPT: 2,000 PSI, 1-1/4" –2"NPT : 1,500 PSI
- Natural Gas Rated Ball Valves for generator isolation
- 304 Stainless Steel Namur Shaft
- IP67, Type 4.4 Weatherproof
- Diecast Aluminum Enclosure
- 2 SPDT Mechanical Switches, 5A 125-250VAC
- 0-90º Indicator (yellow-open, red-closed)

BLOW DOWN VALVES

FEATURES

- System can include a panel with symmetrical timer for accurate and reliable boiler blow down
- Carbon steel valve with raised motor mount for heat dissipation
- CSA approved motor
- CRN registered valves

3-PIECE BALL VALVES

STANDARD FEATURES (B04, B04S, B05, AND B05S SERIES)

- Pressure rating: 1000 PSI WOG for 1/4" through 4"
- Investment cast body and cap, blow-out rust proof stem/ full port
- Female NPT ends (B04/B05), socket weld ends (B04S/B05S)
- Material - ASTM A351 CF8M (316SS) and 316LSS caps on socket weld
- Locking handle
- CRN numbers are available

DIRECT MOUNT FEATURES (B05 & B05S SERIES)

- High cycle, live loaded, triple stem seal consisting of carbon filled PTFE thrust washer, Viton O-ring, 15% RTFE chevron packing, live loaded Belleville washers, packing nut mechanically locked to stem
- Direct mounting pad for ISO STD 5211

2-PIECE BALL VALVES

STANDARD FEATURES (B01, B02, AND B03 SERIES)

- Pressure Ratings: B01 - 1000 PSI; WOG 1/4"-2", B02 - 2000 PSI; WOG 1/4"-1 1/4" 1500 PSI; WOG 1 1/2"-2" 1300 PSI; WOG 2 1/2"-4", B03 - 1000 PSI; WOG 1/4" -2"
- Investment Cast Body and Cap, Blow -out proof stem/full port
- Female NPT threaded on both ends, locking handle
- Material - ASTM A351-CF8M(316SS)
- CRN Numbered valves are also available

DIRECT MOUNT FEATURES (B03 SERIES)

- High cycle, live loaded, triple stem seal consisting of carbon filled PTFE thrust washer, Viton O-ring, 15% RTFE chevron packing, live loaded Belle-ville washers, packing nut mechanically locked to stem
- Direct mounting pad for ISO STD 5211

ELECTRIC ACTUATORS

LOW, MEDIUM AND HIGH TORQUE SPECIFICATIONS:

- **Output Torque: From** 100 IN-LB to 1500IN-LBS, **Various cycle time options, Duty Cycle:** 25%

Solenoid Valves for Gas and Air

VAS and VCS - Solenoid Valve

- Safeguarding and Controlling the air and gas supply to Gas Burners
- Safety shut-off for gaseous fuels

VAG - Gas/Air Ratio Control with Built-in Solenoid Valve

VAD - Gas Pressure Regulator with Built-in Solenoid Valve

VAV - Variable Gas/Air Ratio Control

- All-purpose servo regulator for gaseous media with integrated safety valve

VR - Solenoid Valve for Air - On/Off or High/Low control for Air

Air/Gas Ratio Regulators

- Maintains constant gas/air ratio to optimize combustion
- Internal low fire by-pass available
- Wide regulating range
- Inlet pressure up to 3 psi
- Outlet pressures up to 48"wc
- For continuous, high-low, and pre-heated air applications

IC 40 and IC50- Actuator

- Used in continuously-controlled burners and in step-by-step controlled burners
- Complex applications with programmable functions for flexible adjustment to the process with statistics and error history
- Mounted directly onto Butterfly valves

Gas Filters, Orifice Assemblies, Ball Valves, Pressure Gauges

GFK Filters, VAV Orifice & VAM Limit Orifice

- Pressure Gauges Sizes 1/2" to 4"
- Gas Filters, Max Operating Pressure to 60 psi
- Orifice plate assemblies allow precise flow of natural gas & air
- Ball valves with maximum operating pressures to 60psi
- Pressure gauge assemblies with push to test cock.

IFD 258 Burner Control

- Automatic burner control ignites and monitors gas burners
- For direct spark burners of unlimited capacity, and intermittent operation
- Flame control with UV sensor or Ionization sensor
- Immediate fault lock-out or restart, Switchable function
- Continuous Self-testing for faults

BCU Burner Control

- Include dual sensor/dual amplifier (for Intermittent or continuous piloted burners)
- Flame control with UV sensor or ionization sensor
- Auto-cycling of the burner on 24-hour period
- Optional Network control and monitoring via Profibus Industrial network
- Integrated Ignition Transformer
- Proof of closure switch Monitoring
- BCSoft Software can be used to configure and monitored

Pilot Burners

- Safe operation of ignition, ionization and of gas burners
- Forced air supply pilot burner with separate igniter and flame rod and spark and sensor electrodes
- Capacity: 6830 to 23900 BTU/h (2 to 7 kW)
- Gas Type: natural gas, town gas or LPG.
- Length of burner tube: 6/4 to 40/4 inch (150/100 to 1000/100mm)

BIO/ZIO Burners

- Lightweight modular construction
- Direct ignition and ionization control
- Low NOX production
- Capacities from 130,000 BTU/Hr to 17,000,000 BTU/Hr
- Custom version for different gases
- Multiple flame shapes
- For air temperatures to 840°F (450°C)
- Low maintenance
- Direct firing or radiant tube
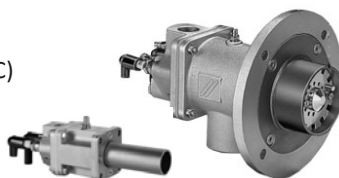
Pressure Reducing Regulators

- Low and Medium Pressure regulators
- High regulating precision with various types of gaseous media
- Sizes from 1/2 inch to 4 inches
- Springs available for outlet pressure adjustments
- Inlet pressure up to 60 psi
- Outlet pressures adjustments up to 100"wc
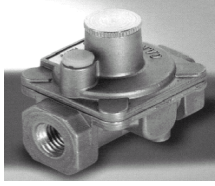
RV SERIES POPPET DESIGN

The poppet model RV Series is designed primarily for main burner and pilot load applications. Typical applications include residential and commercial cooking appliances, hearth products, pilot lines, and residential water heaters.
They are rated for up to 1/2 psi (35 mbar).

GASES:
Suitable for natural, manufactured, mixed gases, liquefied petroleum gases and LP gas-air mixtures.

Model	Pipe Size
RV12	1/8"
RV20	1/4", 3/8"
RV47	3/8", 1/2"
RV48	1/2", 3/4"

LEVER ACTING DESIGN

325 Series regulators are for 2 psi and 5 psi piping systems.
Models available for appliance main burner or pilot applications and as line pressure regulators.

GASES:
Suitable for natural, manufactured, mixed gases, liquefied petroleum gases and LP gas-air mixtures.

Type	Model/Pipe Size	PSI
Appliance	325-3 (3/8", 1/2") 325-5A (1/2", 3/4", 1") 325-7 (1 1/4", 1 1/2")	10
Line Regulator	325-3L (3/8", 1/2") 325-5AL (1/2", 3/4", 1") 325-7L (1 1/4", 1 1/2")	2
Line Regulator with OPD	325-3L47 (3/8", 1/2") 325-3L48 (1/2") 325-5AL48 (1/2", 3/4") 325-5AL600 (3/4", 1") 325-7L210D (1 1/4", 1 1/2")	5

ZERO GOVERNORS

Zero Governor regulators are used for flow control of burners, nozzle mixers, mixing tees, and proportional pre-mixers.
GASES:
Suitable for natural, manufactured, mixed gases, liquefied petroleum gases and LP gas-air mixtures.

Model	Pipe Size
R400Z(F)*	3/8", 1/2"
R500Z*	1/2", 3/4"
R600Z	3/4", 1"
210DZ	1", 1 1/4", 1 1/2"
210EZ	1 1/2", 2"
210GZ	2 1/2", 3"
210JZ	4" Flanged

MODULATOR /REGULATOR VALVES

MR valves perform dual function of modulation and pressure regulation.
GASES:
Suitable for natural, manufactured, mixed gases, liquefied petroleum gases and LP gas-air mixtures. H, H-1 models for use with liquefied petroleum or LP gas-air mixture.

Sizes	Models
1", 1 1/4", & 1 1/2" Pipe Size	MR212D, MR212D-2, MR251D
1 1/2", 2", 2 1/2", & 3" Pipe Size	MR212E, MR212E-2, MR251E, MR212G, MR212G-2, MR251G
3/8" & 1/2" Pipe Size	MR410, MR410-1, MR410H-1
1/2" & 3/4" Pipe Size	MR510, MR510-1, MR510H-1
3/4" & 1" Pipe Size	MR610, MR610-1, MR610H-1

Neo Gas Ball Valves
- Ball Valves for Natural Gas and other Media Services
- CGA approved Ball Valves and Stainless Steel Ball Valves for Steam and other special services
- Sizes: 1/4|" NPT to 6"NPT
- Ball Valves with Proof of Closure (P.O.C.)
- CSA Approved

Lubricated Plug Valves & Three-Way Plug Valves
- For Gas, Propane and Oil
- Three-Way Valves are available for Isolating Flow
- Sizes are available from 1/2"NPT to 6"NPT
- Lubricated Plug Valves with Proof of Closure (P.O.C.)

MARSHALL EXCELSIOR PRESSURE REGULATORS

MODEL 1133 — Pressure Regulator
The 1133 is a direct operated pressure reducing regulator used in commercial and industrial applications such as furnace and burners where accuracy and sensitivity is critical.
The regulator utilizes a balanced diaphragm design that provides for the sensitivity and accuracy.
- 2"NPT (Standard)
- Low Model "L" 60 psi Max
- High Model "H" 125 psi Max

MODEL 1289 — Back Pressure Relief Regulator
The Type 1289 Backpressure Regulator functions as a high flow relief valve with an adjustable set point. The P289 can be used in place of a standard relief valve to provide protection against over pressurization in the downstream system.
- 1" & 2"NPT
- Max relief inlet pressure for 1" NPT is 100 psig
- Max relief inlet pressure for 2" NPT is 25 psig

TURBINE, ROTARY & DIAPHRAGM METERS

ELSTER S2 TURBINE METER
- Flow meter for gas measurement in compliance with DIN 33800
- Rate of flow is indicated by a mechanical totalizer in units of volume (cubic meters at flowing conditions) under prevailing pressure and temperature
- The gas flow is constricted to a definite cross-section and drives a coaxially mounted turbine wheel
- The speed of the turbine wheel, which is proportional to the flow rate, is reduced by gearing and transmitted to the mechanical digital index
- Typically 20:1 Turndown

ROTARY METERS RM2000 STD CTR
- Rotary displacement meter is designed for gas volume measurement in gas installations
- STD CTR meters register the non-compensated, displaced gas volume in actual cubic feet (cf).
- The ability to rotate the counter module in 90° increments allows the meter to be mounted in any orientation, while still offering full accessibility when reading the counter.

DOMESTIC, COMMERCIAL & TEST DIAPHRAGM METERS
- Readings in both Metric and Imperial
- Available ranges from 250 SCFH
- Optional Remote Display

FOX FT2A THERMAL MASS FLOW METER

Thermal mass flow meter and temperature transmitter with inline and insertion options for gas applications.

Features:

- SCFM, NM3/hr, Lbs/hr, Kg/hr and more
- 100:1 turndown typical range
- Measures process gas temperature
- 4 to 20mA for flow & temperature; pulse output for flow/total
- Communication options: USB port, Isolated RS485 Modbus, BACnet MS/TP, Profibus-DP, DeviceNet or Ethernet Modbus TCP
- Insertion and in-line models
- Welded 316 SS sensor or optional Hastelloy C276 sensor
- Microprocessor based, field programmable electronics
- On-board 2 line x 16 character, backlit display
- NIST traceable calibration
- Low-end sensitivity for leak detection
- Negligible pressure drop
- FM & FMc Class I, II, III, Div 2, Groups A, B, C, D, E, F, G T4A hazardous locations
- NEMA 4X and CE approved

The Fox Thermal FT2A mass flow meter and temperature transmitter measures two important process variables in one rugged instrument. Measuring gas flow rate in standard units without temperature or pressure compensation.

Display for flow rate, total, elapsed time, process gas temperature, and alarms. The display is also used in conjunction with the Configuration Panel to configure flow meter settings, pulse output frequency scaling, pipe area, zero flow cutoff, flow filtering (damping), display configurations, diagnostics and high or low alarm limits.

Also Available: FT1 Mass Flow Meter

1800 Series Water Series
- cold water, hot water, condensate, boiler feed, heating systems, cooling systems
- 1/2 " through 12 " sizes.
- Only the turbine is immersed, resulting in reliable and long lasting performance.

BTU Meters :
- Platinum temperature sensors for the highest accuracy
- Special multi-wing turbine flowmeter with wide flow range for precise reading
- Full range of reliable power sources: 1 year battery, 6 year lithium battery or 24V converter
- Tamper proof seals

UNITED PROCESS CONTROLS
OXYFIRE OXYGEN SENSOR

This In-Situ Oxygen Sensor measures oxygen concentrations directly in the "High Heat" zones of high temperature furnaces, boilers and incinerators. They are intrinsically safe, requiring no electrical input power, and generating only a low milivolt output

The OxyFire sensors allow for continuous, accurate oxygen measurement and control in the combustion zone. Reduction in excess O_2 will reduce emissions of combustion by-products such as SO_2, NO_2 and CO. The products perform with little maintenance. Sensor endurance in the aggressive environment of a container glass furnace is typically 18 months. Replacement is a simple process which can be performed by on-site personnel. UPC Applications Engineers can assist customers in selecting the proper oxygen sensor technology and sensor placement within the furnace for optimal usage.

Users have been able to reduce fuel by up to 1-2% for every 1% reduction in Excess Oxygen

- Available in a number of standard lengths up to 48" (1200 mm)
- Field performance can be easily verified using integral verification gas port
- "B", "S", and "R" thermocouples available
- Alumina, Silicon Carbide, HR160 Alloy and Zirconia protection sheaths
- Temp Range: 1000 °F (min) to 3000 °F (max) / 538° (min) to 1649°C (max)
- Longest life available
- Classified configurations available
- 12-month warranty

CARREMM CONTROLS OFFERS CUSTOM PANEL FABRICATION, PLEASE CONTACT US FOR MORE INFORMATION.

- Enclosure Fabrication
- Custom Process Applications
- In-House Design and Electrical Schematic Drawing
- Easy, ready-to-install Control Systems
- ESA/CSA Approvals
- Programming and set-up

HYDRONIC HEATING SYSTEM SET

Testo Hydronic Heating System Smart Probe Set contains three instruments designed for use on a hydronic heating system to determine gas flow and static pressure, measure temperature of radiators with an IR probe, and to measure pressure leak-down tests in piping systems.

Features:
- Measures manifold gas pressure, pressure drop, air flow, (with optional pitot tube), pipe and radiator temperatures
- Measures temperature of pipes in heating and cooling systems with accurate and stable NTC temperature sensor
- Operates with iOS or Android smart devices such as smart phones, tablets, etc.
- Remotely read the measurements from multiple probes using the Testo *Smart Probe App*
- The App creates custom reports which can be saved and /or shared by email
- For all HVAC and refrigeration technicians and contractors

VAC CLIMATE SET

Testo VAC Climate Smart Probe Set provides a combination of four instruments needed to test and balance a multi-outlet ventilation system. Two types of anemometers give you the capacity to measure in-duct air flow and the flow from each vent. Using the IR temperature probe for surface temperature will show you motor and electrical equipment conditions and an easy check of each outlet. The thermo-hygrometer will provide an assessment of the humidity and dew point concerns throughout the system.

Features:
- Measures air velocity, temperature, relative humidity, wet bulb/dew point and calculate volume flow
- Kit includes instruments to measure, balance, troubleshoot and optimize ventilation systems performance
- Operates with iOS or Android smart devices such as smart phones, tablets, etc.
- Remotely read the measurements from multiple probes using the Testo *Smart Probe App*
- The App creates custom reports which can be saved and/or shared by email
- For all HVAC and refrigeration technicians and contractors

A/C & REFRIGERATION SET

Testo A.C. & Refrigeration probe set is a combination of four instruments to measure high-side and low-side refrigerant pressure & temperatures of A/C and Refrigeration systems.

Features:
- Low-loss A/C & Refrigeration system checks.
- No hose required
- Configured to be used during commission, servicing
- Operates with iOS or Android smart devices such as smart phones, tablets, etc.
- Remotely read the measurements from multiple probes using the testo *Smart Probe App*
- The App creates custom reports which can be saved and/or shared by email

Carremm Controls offers in house calibration services using NIST certified span gases.
Third party leasing available. Contact us, for more information.

TESTO 340 - COMBUSTION ANALYZER

TESTO 340 is a flue gas analyzer used for industrial emission measurements.
The testo combustion analyzer is an easy-to-use flue gas analyzer that can be fitted with up to four different gas sensors. Perform an automated quick leak check before your test. Display graphic representation of sensor calibration data. The ultimate combustion tuner for boiler and burner as well as engine tuning.
There are probes for every application.
Standard probes are specially designed for engine or burner/boiler applications
Industrial probe with length to 9 feet and temperatures up to 3200°F.

Features
- Automatic CO-dilution sensor protection
- Pre-calibrated gas sensors for quick and easy change
- Plug and play sensor technology
- Cell choice of: O_2, CO, CO low, NO, NO low, NO_2 or SO_2
- Integrated pressure difference and air flow measurement for mass flow calculations
- All sensors read at the same time
- Infrared printing
- Bluetooth option (Upgrade)
- 18 fuels to choose from

TESTO 350 - PORTABLE EMISSION ANALYZER

TESTO 350 is ideal for professional exhaust analysis and industrial emission measurements.
The Testo is a portable emission analyzer is made up of two separate units, the **Control Unit** and **Analysis Box**. The **Control Unit** (separate product) is used to control emission measurements and displays real-time colour graphics. There are four different applications in the menu to choose from; burner, gas turbine, motors and user-defined applications. The **Analysis Box** contains the sensor system and the electronics that are needed to perform emission measurements. An opening on the underside of the analyzer gives you access to all relevant service and wearing parts such as sensors, pumps and filters. The Analysis Box can be controlled by the Control Unit via Bluetooth , USB or CANCase from a PC or Notebook.

Features
- Kits available; Boiler & burner, Engine, Turbine or Process
- Dilution sensor protection
- Thermoelectric chiller automatically conditions the gas sample
- Test up to six gases simultaneously, or swap sensors out for additional parameters
- Cell choice of: O_2, CO, CO low, NO, NO low, NO_2, SO_2, HC, H_2S
- Pre-calibrated gas sensors for quick and easy change
- Plug and play sensor technology
- Continuous temperature compensation
- Automatic flow-controlled pump
- User configured testing programs
- User defined O_2 reference
- Probes types:
  > Standard
  > Engine
  > Industrial

Carremm Controls offers in house calibration services using NIST certified span gases.
Third party leasing available. Contact us for more information.

A contemporary combustion analyzer also makes all work steps as easy as possible for you, both before and after the measurement, as well as in terms of the measurement itself. The user-friendly Testo 300 was developed with precisely this objective in mind. It is not just decades of experience in measuring technology. With smart-touch operation, robust construction and e-mailing of reports, the Testo 300 will quickly become your indispensable companion for all measuring tasks involving heating.

Operation via Smart-Touch
The Smart-touch display responds immediately, allowing intuitive operation.

Emailing of Reports
Convenient creation of documentation directly on site. Send reports to the office or customers via WiFi

Keep an Eye on Measuring Values
Large 5" HD screen to display all system parameters

Get the Results Faster
Clearly structured menus for all relevant measurements are stored in the instrument ready to guide you efficiently through the application

Ready to Use Right Away
No more waiting time, In Standby mode the Analyzer is ready to measure at the touch of a button

Completely Worry-Free
The Testo 300 has quality sensor technology, measures high CO values up to 30,000 ppm and comes standard with the longest warranty in the industry

Features:
- Draft and pressure measurement
- 02 Range: 0 to 21 Vol.%
- CO Range (without H2 Compensation): 0 to 4,000 ppm
- CO Range (with H2 Compensation): 0 to 8,000 (0 to 30,000) ppm
- No Range: 0 to 3,000 ppm

- Wifi connection for emailing data
- Calculations: CO2, Efficiency (Eta)
- USB Interface for data transfer to PC
- User defined Fuels

Testo 330i Combustion Analyzer

Testo 330i has the combination of the basis of the flue gas analyzer and revolutionary handling. The operation of the instrument and the display of the measurement values takes place by Bluetooth via Testo 330i app on Smartphone/tablet.

Features:
- O_2, CO, optional NOx, temperature, pressure
- Flue gas probe attachment ,TestoFix probe mount
- CO range (H_2-compensated):0 to 8000ppm
- CO range (not H_2-compensated): 0 to 4000ppm
- NO range: 0 to 3000ppm
- Measures CO up to 30,000ppm (dilution system)
- Long life sensors (up to 6 years CO & O_2)
- Robust, completely sealed plastic housing

Testo 330i App :
- The App turns your Smartphone/tablet into the display of the Testo 330i
- For ISO and Android
- Requires Bluetooth on device with ISO 7.1 or Newer/ Android 4.3 or newer
- Create measurement reports, add photos and comments to these, and send them by e-mail.

TESTO GAS LEAK DETECTOR & AMBIENT CO MONITOR

TESTO 316-1 - GAS LEAK DETECTOR

Testo 316-1 gas leak detector quickly detects and help pinpoint the exact position of a leak.
Hairline cracks in pipes, old and worn out gaskets, even the tiniest of gas leaks in a natural gas pipe can cause a problem. The new testo 316-1 leak detector will help you pinpoint the exact position of a leak when the leak has already been detected using a leak measuring device, for example.

Features:
- Flexible measurement probe for inaccessible pipes
- TopSafe case protects from dirt and impact (optional)
- Audible alarm if limit value is exceeded
- Optical alarm
- Measuring Range: 0 to 10,000 ppm CH4
- Lowest response thresholds: 100 ppm
- 1st alarm: from 200 ppm CH4 (LED yellow)

TESTO 317-3 - AMBIENT CARBON MONOXIDE MONITOR

Testo 317-3 CO monitor provides fast and easy ambient carbon monoxide testing.
This air quality tester measures and displays CO from 0 - 1999 PPM and gives warning of excessive levels with adjustable audible and visual alarms.
This can be used for contractors and building inspectors as it will detect the presence of carbon monoxide (CO) in ambient air and warns users, both visually and audible about dangerous CO concentrations during furnace and boiler service and maintenance, weatherization audits or home inspections.

Features
- For residential and commercial combustion applications
- Self-test mode verifies CO sensors at all times without the need for test gas
- Three CO sensor year warranty
- No zeroing required! Self-check function verifies accurate CO measurement
- Visual and audible alarm warms you of dangerous CO concentrations
- Programmable high and low alarm options
- HOLD and MAX settings
- Easily clips to your belt for hands-free convenience
- Earphone jack for loud environments

Stand-Alone Gas Monitor (Detectors)

UniSet Stand-Alone Gas Monitor (Detector)
Gas Detected: CO, NO_2, O_2, H_2, CH4 (Methane), C3H8 (Propane), NH3, H_2S, Cl_2

TwinSet Stand-Alone Dual Gas Monitor (Detector)
Gas Detected: CO/CO, CO/CO_2, CO/NO_2, CO/COMB

Versatile and cost-effective way of detecting two gases simultaneously by a single Controller

Features:
- High-accuracy Electrochemical Cell sensor for toxic gases and Catalytic (Pellistor) for flammables
- 3 or 4-stage SPDT relay outputs with LED status indicators
- NEMA 3 Robust Enclosure
- Microprocessor-based control
- 10-Step Bar-Graph Display of gas levels
- Programmable time delays to avoid nuisance alarms
- Optional 4-20mA, 0-1V DC, -5V DC or 0-10V DC analog output
- Optional remote sensor

Applications:
- Energy savings through the intermittent operation of ventilation equipment in enclosed areas
- Commercial or industrial locations where a sudden build-up of toxic and/or flammable gases may occur
- Car Parking and Bus Maintenance Garages, Tunnels, Warehouses, Factories Food Processing and Bottling Plants, Wastewater Treatment Plants, Steel Mills, Cryogenic laboratories and Incineration Rooms
- Stand-alone with relay outputs or analog outputs for direct connection to the existing Building Management System (BMS) or DDCS

Wireless MultiSet Gas Detection and Control System

Scalable system using Wireless Sensor-Transmitters communicating with a central Control Panel
Gas Detected: CO, NO_2, O_2, H_2, CH4 (Methane), C3H8 (Propane), NH3, H_2S, Refrigerant Gases

Features:
- FCC/IC/ETSI/CE approved RF modules for up to 32 remote sensor-transmitters
- The communication between the Control Panel and the remote sensor-transmitters is accomplished through a 900 MHz or 2.4 GHz wireless network
- Relay outputs or zoned 4-20mA outputs from Control Panel
- NEMA 3 Robust Enclosure
- Microprocessor-based control
- "Plug-and-play"

Applications:
- Energy savings through the intermittent operation of ventilation equipment in enclosed areas
- Garages, Tunnels, Warehouses and other enclosed commercial locations where a hazardous build-up of gases may occur
- Ideal for retrofit of existing buildings to improve safety and conserve energy
- Designed for multiple stage projects

QuadSet Refrigerant Gas Monitor - Detectors

Scalable system using Wireless Sensor-Transmitters communicating with a central Control Panel
Gas Detected: R-11, R-12, R-22, R-23, R-114, R-123, R-134A, R-402A, R-404A, R-407A, R-407C, R-407C, R-408A, R-409A, R-410A, R500, R502, R507A, NH3

Features:
- High-accuracy refrigerant-specific NDIR sensor
- Up to 4 points of detection
- Diffusion or sample draw
- 4-line LCD included and Removable Keypad available
- 3-Stage relay output with LED status indicators
- Optional - 4 to 20mA output
- Easy to install and maintain
- Meets and exceeds ANSI/ASHRAE 15-1994

Applications:
- Suitable for control of emergency ventilation systems and for personnel protection
- Refrigerant leak or spill detection from chiller, pipes, compressors and valves
- Commercial or industrial facilities using chillers or refrigerant units, food plants, meat-packing plants and cryogenic plants
- Direct connection to the existing building management systems (BMS) or DDCS

FUJI ZKM INSITU OXYGEN ANALYZER

FUJI ZKM OXYGEN ANALYZER

Features:
- Measures Oxygen in non-combustible gas
- Measuring method: Zirconium oxide sensor
- Measuring range: 0 to 50 vol% O_2 (in 1 vol% O_2 steps from 2 to 50)
- Repeatability: Within ±0.5%FS
- Linearity: Within ±2%FS
- Response time: Within 4 to 7 sec, for 90% (from calibration gas inlet)
- Analog output: 4 to 20mA DC or 0 to 1V DC
- Measured gas temperature: −20 to +800ºC (-4 to 1472ºF)
- Gas temp: up to 1500°C with Ejector ZTA
- Measured gas pressure: −3 to +3kPa (−306 to +306mmH2O)

- Field-replaceable sensor element
- 6 contact outputs
- Combustion efficiency display, auto-calibration, blowdown, RS485 options
- Enclosure options: ZKM1 (IP66/NEMA 4) and ZKM2 (IP67/NEMA 4X)
- Max. cable length between analyzer and detector: 20m (65 ft)
- FM approved

MODEL JD-2 AIR DIFFERENTIAL SWITCH

The JD-2 has a sensitive diaphragm,
single pole double throw snap action electrical switch,
visible on-off indicator in an aluminum housing.
Springs are adjustable and have duel scales calibrated in mm or
inches of water

SPECIFICATIONS
Differential Vacuum
Pressure. Maximum
Pressure Surge: 3 psi
Maximum Ambient
Temperature:140F/60C
Minimum Ambient Temperature:
-40F to –40C ,-40F/-40C

DIMENSIONS
Diameter 4.02"
Depth   4.00"
Height   5.00"

SPRING RANGES

MODELS	W.C.	mm
JD-2 Blue	0.07- 1.7"	(2 mm to 43 mm)
JD-2 Grey	0.1 - 4.0"	(3 mm to 102 mm)
JD-2 Purple	0.1 - 10"	(3 mm to 250 mm)
JD-2 Red	0.1 - 24"	(3 mm to 600 mm)
JD-2 Orange	5.0 - 35"	(125 mm to 875 mm)

MODEL SMD AIR DIFFERENTIAL SWITCH

SPECIFICATIONS	RANGES		AVAILABLE
Differential Vacuum	W.C.	mm	CONNECTIONS
Pressure Maximum	0.17-6"	(4.25 mm to 100 mm)	1/4"Compression
Pressure Surge: 20"WC	0.17-12"	(4.25 mm to 200 mm)	1/4" Hose Barb
Ambient Temperature:-40F to 170F			1/8" NPT

Also available Manual Reset Air Switch MR series
0.5" to 12" W.C. Pressure rise or fall
Set point adjustable

MODEL SML AIR DIFFERENTIAL SWITCH

	RANGES		AVAILABLE
SPECIFICATIONS	W.C.	mm	CONNECTIONS
Differential Vacuum	0.05-1"	(1.25 mm to 25 mm)	1/4"Compression
Pressure Maximum	0.05-9"	(1.25 mm to 225 mm)	1/4" Hose Barb
Pressure Surge: 20"WC			1/8" NPT
Ambient Temperature:-40F to 170F			

DIMENSIONS
Diameter 4.56"
Height 2.24"

Air Sensing Tubes also available Part Number: 00200-0724

VENTLESS SINGLE GAS PRESSURE (MODEL G)

SPECIFICATIONS
Max Surge Pressure:15psi,
Operating Pressure: 2psi - Manual Reset and 6psi - Automatic Reset
Maximum Ambient Temperature: 140F/60C - Min. Temp. -40F/-40C
NEMA 4 Outdoor Kit Available

LOW GAS PRESSURE				HIGH GAS PRESSURE			
MANUAL RESET (LGP-G)		AUTOMATIC RESET (RLGP-G)		MANUAL RESET (HGP-G)		AUTOMATIC RESET (RHGP-G)	
W.C.	mbar	W.C.	mbar	W.C.	mbar	W.C.	mbar
1-20"	3-50	0.5-4.0"	1.3-10	2-20"	5-50	0.8-4"	2-10
5-30"	12.5-75	1-20"	2.5-50	8-35"	20-87	2-20"	5-50
7-55"	17.5-137	5-30"	12.5-75	10-60"	25-150	5-35"	12.5-87
		1-4 PSI	0.7-0.28 (Bar)				

GAS PRESSURE & GAS DIFFERENTIAL SWITCHES SINGLE & DOUBLE GAS PRESSURE SWITCHES (MODEL A)

SPECIFICATIONS
Maximum Surge Pressure:10psi
Maximum Ambient Temperature: 140F/60C Min. Temp. -40F/-40C
Select High and Low Ranges from the selection above.

MODELS		HIGH GAS PRESSURE		LOW GAS PRESSURE	
MANUAL RESET	AUTOMATIC RESET	W.C.	mm	W.C.	mm.
LGP-A	RLGP-A	2-16"	50- 400	1 - 6"	25-150
HGP-A	RHGP-A	5-28"	125-700	2 - 14"	50-350
HLGP-A	RHLGP-A	10-50"	250-1250	6 - 24"	150-600
				10 - 50"	250-1250

HIGH RANGE SINGLE GAS PRESSURE SWITCHES(MODEL H)

SPECIFICATIONS
Max. Surge Pressure: 35psi. Ambient Temp.-40F-40C to 140F/60C

MODLES		RANGES			
MANUAL RESET	AUTOMATIC RESET	HIGH GAS PRESSURE		LOW GAS PRESSURE	
LGP-H	RLGP-H	PSI	Bar	PSI	Bar
	RHGP-H	1-7	0.06-0.48	1-7	0.06-0.48
		6-15	0.41-1.03	6-15	0.41-1.03

GAS PRESSURE SWITCHES DPDT SINGLE & DOUBLE (MODEL D)

SPECIFICATIONS
DPDT Elec. Switch Maximum Surge Pressure: 10psi
Ambient Temp.-40F-40C to 140F/60C

MODELS		HI GAS PRESSURE		LOW GAS PRESSURE	
MANUAL RESET	AUTOMATIC RESET	W.C.	mm	W.C.	mm
LGP-D	RLGP-D	5-28"	125-700	2-14"	50-350
HGP-D	RHGP-D	10-50"	250-1250	10-50"	250-1250
HLGP-D	RHLGP-D				

ANTUNES CONTROLS
DIGITAL FREEZESTAT

The DF is a digital freezestat that senses the temperature in an Air Make-Up System and shuts down the system if the preset temperature is not reached within a specified time.

- ¼" spade terminal connection

- Adjustable time and temperature inputs

- Complies with UL 873

Ventless Pressure Switches are adjustable switches for automatic burner controls

NEMA 4 Enclosure Rating

SPDT Pressure switches require no auxiliary power. Suitable for making or breaking a circuit. Tripped switches are indicated by a neon light after set point is exceeded.

- Gas or Air Differential Pressure switches
- 1/4"FNPT or Flange (O-Ring) Connection for Gas Switches
- 1/4"NPT or double hose connection for Differential switches
- Manual or Automatic Reset Gas Switches
- Gas Switches Set Points from 1" to 200"WC
- Differential Switches set points from 0.16" to 60.0"WC

Double Solenoid Valves

Integrates two solenoid valves in one compact fitting.

Max. operating pressure up to 500 mbar (50 kPa). Fast closing.

Fast opening (DMV-D/11) or slow opening (DMV-DLE/11) with adjustable fast stroke for start gas volume.
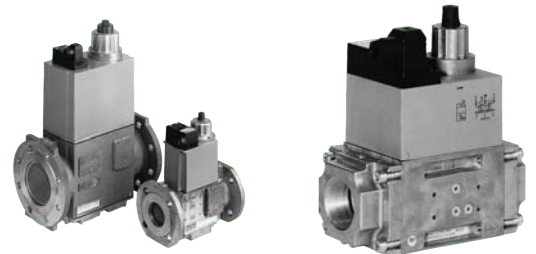
ASCO COMBUSTION SENSORS AND VALVES

Series K3A Gas Shutoff Valves; Low pressure Direct Acting

Direct acting (K3A, 4, 5, 7) and internal pilot operated (K3A6) valves providing on-off control of fuel gas.

- Valve Response Time:
  Opening Time: Less than 1 second
  Closing Time: Less than 1 second
- Two way, Normally closed
- aluminum body direct operated and pilot operated solenoid gas valves.

8214G Series Gas Shutoff Valves

- 3/8" to 2" NPT
- Watertight Encl.
- NEMA 4 & 4X. SOL
- Two-way Normally Closed
- Die-cast aluminum body
- Zero differential piloted diaphragm are designed to control the flow of fuel gases in main or pilot line app.
- In industrial and commercial gas burner systems.

Series AH2D Manual Reset Actuator, use w/ V710.
Specifications:

- **Power Requirement:** 220 VA max.
- **Closing Time:** One second max.
- **Opening Time:**
  Fast Opening: 14 seconds max.
  Slow Opening: 26 seconds max.
  Note: Opening time is double between -30°F and -40°F ambient.
  Opening time increased 20% when operating on 50Hz.
- **Enclosure:**
  Type 1, 2, 3, 3S, 4, 12, and 13 Combination General Purpose, Watertight, Dusttight and Driptight.
- **Ambient Temperature:**-40°F to 150°F (-40°C to 66°C)
- **Electrical: Actuator: Standard voltages:**
  24, 120, 240 volts, AC, 60 Hz (or 110, 220 volts AC, 50 Hz)

Series 8215G Aluminum Body Solenoid Valve

- Direct Acting or Piloted
- 3/8" to 1/2" NPT
- 0-50PSI Shutoff Valve
- 120VAC
- Lightweight, low-cost, valves for air service
- Ideal for low pressure applications
- Provides high flow, Cv up to 138(Kv 188)
- Air and vacuum service

A/GP SERIES STAINLESS STEEL GAGE PRESSURE TRANSMITTER
- 1% Accuracy
- Overload Limit 200% full scale
- Enclosure (IP65) NEMA 4, 304 SS Wetted Parts
- Polycarbonate metalized surface case
- Response Time 10 msec
- Operates in any position
- Ambient/Medium temp. –40+85c
- Pressure Connection 1/4" NPT
- Supply Voltage 12-30vdc 20mA max load
- Output 2 wire 4-20mA, max load =U-12v/0.02 A.
- Range –30Hg/15psi, 0-30psi, 60, 100, 160, 250,500psi

SITRANS DSIII PRESSURE TRANSMITTER
2-Wire transmitter
Output signal is a load-independent direct current of 4-20mA proportional to input pressure.
- Ranges from 0 - 100"W.C. & 0 - 250"W.C.with Display
- Measures: Absolute pressure corrosive & non-corrosive gases, vapors & liquids

J6 SERIES
- Vacuum - Pressure Applications
- Ranges: -30Hg to 6000 psi
- NEMA 4 Enclosure Rating
- Adjustable Deadband
- Pressure Maximum up to 10,000 psi
- 1/4" & 1/2"NPT
- Ambient Temperature: -40F to 170F
- NEMA 4 Process pressure switch

J21K SERIES
- Vacuum - Pressure - Differential Applications
- -30Hg to 90 psid ranges
- NEMA 4X Enclosure Rating
- Adjustable Deadband
- Pressure Maximum up to 300 psi
- 1/4" & 1/2"NPT
- Ambient Temperature: -40F to 170F
- SPDT snap action switch

ECONOMY PROCESS SWITCH FOR GASES AND LIQUIDS COMPATIBLE WITH NYLON OR BRASS AND SILICON
POTTER PS Series Pressure Switch
- UL Listed & CSA Approved
- Dimensions 4.75" x 2.25" x 4 3/8" High,
- Enclosure NEMA 4, Cover Die cast metal, Base– Plated Steel
- Pressure connection, 1/2" npt
- Adjustable range IPS10, IPSB10 4-20 psi
- Adjustable range IPS40 IPSB40 10-175 PSI
- Maximum Pressure— 250 psi, Max temp –40/180F (-40/80C)
- Maximum Media temp 32/250F (0-121C)
- Factory Adjustment– IPS10,IPSB10 - Operates on pressure increase @ 6 psi +/- 1 psi, Differential 0-2 psi
- Factory Adjustment– IPS40,IPSB40 - Operates on pressure increase @ 40 psi +/- 3 psi, Differential 2 psi @ 20

DIFFERENTIAL LOW PRESSURE SERIES
- Standard accuracy is +/- 0.50% FSO
- Current Output Signal: 2-wire loop powered (Standard)
- Voltage Output Signals: 0-5 VDC/ 0-10VDC Field selectable; 3-wire
- Each unit has 8 field selectable, Uni or Bidirectional pressure range from 0.01"w.c. up to 0-40" w.c.
- Zero Function: Pushbutton Zero Function
- Operating Temperature Range: -4 to 185°F (-20 to 85°C)
- Operating Humidity Range: 10 to 95% RH, non-condensing
- Media Types: Dry air or inert non-conductive gases
- Enclosure Material /Flammability Rating: Flame Retardant Polycarbonate; UL94-5VA
- Wiring Connections: Finger Pushbutton (Spring) Terminal Blocks; accepts 16-24 AWG wires
- Conduit Knockouts: Watertight Cordgrip Installed (1/2" NPT Conduit fittings accepted when Cordgrip removed)
- Pressure Fitting Material: Nickel Plated Brass or Stainless Steel
- Tubing Size Accepted: 1/4" O.D. x 0.170" I.D. Poly Tubing
- Options include a LCD display, a Pitot Tube and Din Rail Clip
- Contact us if you require a higher accuracy as this series is also offered with +/- 0.25% and specific configurations

MAGNEHELIC DIFFERENTIAL PRESSURE GAUGES

The Magnehelic is the industry standard to measure fan and blower pressures, filter resistance, air velocity, furnace draft, pressure drop across orifice plates, liquid levels with bubbler systems, and pressures in fluid amplifier or fluidic systems.

- Used for high accuracy
- It quickly indicates low air or non-corrosive gas pressures.
- Resists shock, vibration and over-pressures
- Accuracy: +/- 2 % of full scale
- Pressure Limits: - 20" Hg to 15 Psig
- Temperature Limits: 20 to 140 ˚ F

PHOTOHELIC DIFFERENTIAL PRESSURE GAUGES

The Series A3000 Photohelic® switch/gages combine the functions of a precise, highly repeatable pressure switch combined with a pressure gage employing the durable, time-proven Magnehelic® gage design. The Photohelic® switch/gauge measures and controls positive, negative or differential pressures of air and compatible gases.

- 3-in-1 instrument allows the reduction of several instruments with one product
- Gauge reading is continuous and unaffected by switch operation, even during power loss
- Electromechanical relays with gold over silver contacts - ideal for dry circuits
- Accuracy: ±2% of full scale at 70°F (21.1°C)
- Pressure Limits: -20" Hg to 25 psig
- Temperature Limits: 20 to 120°F.

EXPLOSION-PROOF DIFFERENTIAL PRESSURE SWITCH

The Model 1950 has an integral explosion-proof and weather-proof housing.

- Weather-proof include drain plug and O-ring seal in cover
- Service: Air and non-combustible, compatible gases
- Temperature Limits: - 40 to 140°F (-40 to 60° C)
- Pressure Limits: Continuous—45" w.c. (0.11 bar) Surge—10psi (0.69 bar)
- Enclosure Rating: IP64, NEMA 3,7&9 Hazardous atmospheres and Rain tight
- Switch Type: Single-pole double-throw
- Electrical Rating: 15A @ 125, 250, 480 VAC, 60Hz

PRESSURE, TEMPERATURE
PROCESS AND DIAPHRAGM GAUGES

Special Services Gauges
- 2.5" to 4.5" Dials
- 1/4" & 1/2" NPT Bottom and Back mount sockets
- 316 Stainless Steel sockets
- Available in dry and liquid fill.

Multi Angle, Adjustable Thermometer
- 9" Case,
- 3-1/2" or 6" Stem
- Temperature Ranges from –40F to 300F
- Commercial, Institutional and Industrial use

HVAC Quality Gauges
- 4.5" Dials
- Ranges from 0-15PSI to 0-5,000PSI
- Bottom mount
- Stainless Steel Case
- Accuracy Grade 1A +/- 1%

LOW PRESSURE DIAPHRAGM GAUGES
- Brass or Stainless Steel Diaphragm Gauges
- 2.5" Dial; 1/4" NPT
- 4.5" Dial 1/2" NPT
- Ranges 0-10"wc To 0-200"wc, 0-5 psi

The Fuji Electric PXF temperature controller was developed as a successor to the PXR. It is equipped with multiple input and output options as well as sophisticated control functions making is suitable for a wide range of applications. You can use any input among RTD, thermocouples, voltage, current, and mV. Switching the input is an easy parameter change.
The PXF series features highly accurate input indication.

Features:

- 1/4, 1/8 or 1/16 DIN sizes
- Universal input: Thermocouple, RTD, voltage, current, mV
- Available options for Outputs: Relay, SSR Drive, Current, Voltage, Retransmission
- Up to 3 Alarm Contacts
- Option for RS-485 Communication
- Power Supply: 24VAC/DC or 100-240 VAC
- Improved input indication accuracy, up to ±0.2%
- 0.1 to 99 second control cycle
- Improved input indication accuracy, up to ±0.2%

- On/Off control & PID controls with auto tuning
  > PID, 2-degrees-of-freedom PID, & fuzzy
  > Open-loop supported PID2 control
- Ramp soak function (simple program control)
  > 64 steps x 1 pattern
  > 32 steps x 2 patterns
  > 16 steps x 4 patterns
  > 8 steps x 8 patterns
- Directly connect to a PC with optional USB cable
  > This will bus-power the unit

- *Also Available: Valve Motor Drive Controllers with 50MS Sampling speed, and Option for Position feedback*

PXR SERIES
Advance Self-Tuning Temperature and Process Controllers

- Sizes: 1/32 DIN, and 1/16 Socket series still available
- PID with fuzzy control of self-tuning
- 16 Ramp/soak segments
- LED display

- Digital Input
- Auto-tune
- Timer function
- Heater burnout alarm

YOKOGAWA
MANUAL RESET, HIGH LIMIT TEMPERATURE
AND PROCESS CONTROLLERS

HIGH LIMIT TEMPERATURE, PROCESS AND MANUAL RESET CONTROLLER
CONFIGURABLE AS EITHER A HIGH OR LOW LIMIT CONTROLLER

UT150L LIMIT CONTROLLER	UT35A-L DIGITAL INDICATING CONTROLLER
- 1/16 DIN Small, Space-Saving Package - FM approved - High or low limit controller - Sharp and Large 4-digit LED Display - IP65 Splash-Proof - Dust-Proof Front Panel - Universal Input: Thermocouples, RTDs, DC current and voltage - Limit Control Function Specifications: 1 set point, high- or low-limit control type, and latching limit action - Retransmission Output (Optional) - Two-Alarm Relay Outputs (Optional) - RS485 Communication Function (Optional) MODBUS, PC-Link & Ladder protocols are supported	- 1/4 DIN Limit Controller - FM approved - High or low limit control - Latching limit action - One setpoint - Universal Inputs: Thermocouples, RTDs, DC current and voltage - Three alarm outputs - Two Digital Inputs - Retransmission Output: PV or set point output as 4 to 20mA - Communications Options; RS-485 and Ethernet - Safety Drip-proof front panel (IP66 compatible) - 65 mm depth controller - 14-segment large colour LCD Display

PHL PAPERLESS RECORDER

The compact Fuji Electric PHL paperless recorder is an 9- or 18-channel recorder that displays data on a 5.7" TFT color LCD. The Fuji Electric PHL paperless recorder features a wide variety of display modes to allow users to view data as trends (horizontally or vertically), bar graphs, analog meters, digital/numeric output, totalized output, event summaries, and more. Switch between modes quickly and easily with the 8-key front panel. The adjustable-time screen-saver function extends the life of the display and reduces power consumption. Users can record up to 12 types of thermocouples, 5 types of RTDs, and DC voltage/current input on one unit. The Fuji Electric PHL paperless recorder can literally record years of data with a 1GB (max) Compact Flash card.

Free PC support software allows you to configure the Fuji Electric PHL paperless recorder from a PC and view historical data stored on the compact flash card. Fuji Electric PHL paperless recorders come standard with math and totalizing functions. Optional Ethernet communications allows for FTP transfer of files stored on the recorder's Compact Flash card and for live monitoring of all inputs and alarm status via HTTP. Fuji Electric PHL paperless recorders include USB configuration cable, waterproof gasket for the front face, noise filter for the power supply, PC support software, instruction manual, and panel mounting brackets.

Features:

- Long Term Data Storage: Up to 1.5 years in Compact Flash
- Saved Data playback: Saved data in Memory card can be easily called out and played back on display
- Math and totalization: These functions are available as standard.
- Communications Option: RS485 (MODBUS RTU protocol) or Ethernet
- Screen saver: Period of non-operation exceeds the setting value of parameter, recorder turns off the backlight of LCD.
- PC support software (Data Viewer/Parameter Loader): CD-ROM and loader cable included with recorder
- Compact size: 160 x 144 x 185mm (6.3" x 5.7" x 7.4") (WxHxD) (Panel mount), 1.5 kg (3 lbs.) compact size
- 9-point and 18-point recording: 12 types of thermocouples, 5 types of RTDs and voltage/current input are available

ORDERING CODE

PHL [1][B][1][2]-[E][1][ ][V] (digits 4 5 6 7 8 9 10 11 12 13)

Digit	Specifications	Note	
4	<Number of input points>		
	9		1
	18	Note 2	2
11	<Alarm (relay) output/DI input>		
	Without		0
	With	Note 1	1
12	<Communication>		
	Without any communication		Y
	With RS485, Alarm and DI input	Note 3	R
	With Ethernet communication		E
	With Ethernet, RS485, Alarm and DI input	Note 3	W

Note 1 : Cannot be selected if 2 is selected for the forth digit (the number of input points is 18).
Note 2 : Cannot be selected if 1 is selected for the 11th digit.
Note 3 : Alarm outputs are open-collector transister output.

SIXTH SENSE PAPERLESS RECORDERS

PHL PAPERLESS RECORDER

Features
- 6.1" Color TFT LCD, 640x480 pixel resolution
- 18 isolated analog input channels
- Low-cost 6-channel model
- Plug & play supported I/O cards, 6 slots
- User configurable I/O card
- Expandable modular architecture

- Simple setup & operation; Easy-access function keys
- Automatic shut off prolongs LCD life and saves power
- Only 6.9" depth behind panel
- Displays vertical trend, horizontal trend, bar graph, numerical
- Data saved on compact flash card or PC
- Ethernet and optional RS-232/422/485
- 18-bit A-D analog input, 15-bit D-A analog output
- Sampling rate within 200msec for all channels
- Portable/bench-top assembly kit available
- Includes mathematics, counter & totalizer

[V][G][A][A] – [B][C][D][E] – [F][G][H] – [3][J][K]

To create an ordering code fill in the boxes above with the appropriate number and/or letter from the corresponding box below.

Box A: Model
06= VG06 (1-6 input channels)
18= VG18 (1-18 input channels)

Box B: Power
4 = 90-250 VAC, 47-63 Hz
6 = 11-18 VDC
7 = 18-36 VDC

Box C: Analog Input Card
1 = 1 channel
2 = 2 channel
3 = 3 channel
4 = 4 channel
5 = 5 channel
6 = 6 channel
A = 9 channel
B = 12 channel
C = 15 channel
D = 18 channel

Box D: Digital Input Card
0 = None
1 = 6-channel
2 = 12-channel

Box E: Digital Output/Relay Card
0 = None
1 = 6 relay
2 = 12 relay

Box F: Communication
0 = Standard Ethernet interface
1 = RS232/422/485 (three in one) + Ethernet interface

Box G: PC Software
1 = Free basic software Observer I for non-communication application
2 = Extensive software Observer II for communication via RS-232/422/485 or Ethernet

Box H: Firmware
0 = Basic function
1 = With Mathematics, Counter & Totalizer

Box I: Storage Media
3 = 2GB CF card

Box J: Case/Mounting
1 = Standard panel mounting
2 = Bench top/portable style with handle

Box K: Special Option
0 = None
1 = 24VDC auxiliary power supply (for transmitter, 6 inputs)

PHA & PHC INKJET STRIP CHART RECORDER

PHA & PHC SERIES ORDERING INFORMATION

P	H	A	A	A	0	0	4	–	E	B	C	D	V

To create an ordering code fill in the boxes above with the appropriate number and/or letter from the corresponding box below.

Box A: Recording Points
66= 6 continuous
76= 6 dotting
88= 12 dotting
98= 12 continuous

Box B: Chart Paper Illumination
A = Without
B = With

Box C: Alarm Output/Ext. Control
0 = Without
1 = 6-point alarm output/3-point external control
2 = 12-point alarm output/3-point external control

Box D: Transmission Function
Y = Without
R = With RS-485

P	H	C	A	A	0	0	3	–	B	C	D	E	V

To create an ordering code fill in the boxes above with the appropriate number and/or letter from the corresponding box below.

Box A: Recording Points
76 = 6 dotting recording
33 = 3 continuous recording
66 = 6 continuous recording

Box B: Power Supply
A = 85-150V AC 50/60Hz
E = 150-300V AC 50/60Hz

Box C: Chart Paper Illumination
A = Without
B = With

Box D: Alarm Output/Ext. Control
0 = Without
1 = 6-point alarm output/3-point external control

Box E: Transmission Function
Y = Without
R = With RS-485

PHA & PHC

Features
- 180mm wide, 20m long chart paper
- 6 or 12 input channels
- 320ms measuring cycle
- Thermocouple, DC voltage, RTD & DC current input signal
- Chart speed:
  5 to 300mm/hr (continuous trace)
  301 to 1500mm/hr (intermittent trace)
- ±0.15% indication accuracy
  (+1 digit without compensation error)
- ±0.25% of measuring range recording accuracy
- ±0.1% chart speed accuracy
- Paper expansion and contraction not included

PHE INKJET STRIP CHART RECORDER

PHE ORDERING INFORMATION

P	H	E	A	B	C	D	2	–	E	E	F	E	V

To create an ordering code fill in the boxes above with the appropriate number and/or letter from the corresponding box below.

Box A: Recording Points
1 – 1 continuous recording
2 – 2 continuous recording

Box B: Input Signal for Ch. 1
X – B Thermocouple
R – R Thermocouple
S – S Thermocouple
K – K Thermocouple
E – E Thermocouple
J – J Thermocouple
T – T Thermocouple
N – N Thermocouple
W – W Thermocouple
L – L Thermocouple
U – U Thermocouple
P – PN Thermocouple
H – Pt100Ω RTD
A – DC 1-5V
B – DC 4-20mA with shunt resistor
C – DC 10-50mA with shunt resistor
M – DC ±50mV
Q – DC ±500mV
V – DC ±5V
F – DC ±50V

Box C: Input Signal for Ch. 2
Y – None
X – B Thermocouple
R – R Thermocouple
S – S Thermocouple
K – K Thermocouple
E – E Thermocouple
J – J Thermocouple
T – T Thermocouple
N – N Thermocouple
W – W Thermocouple
L – L Thermocouple
U – U Thermocouple
P – PN Thermocouple
H – Pt100Ω RTD
A – DC 1-5V
B – DC 4-20mA with shunt resistor
C – DC 10-50mA with shunt resistor
M – DC ±50mV
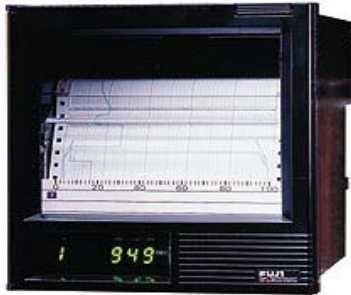Q – DC ±500mV
V – DC ±5V
F – DC ±50V

Box D: Power Supply
3 – 100V/120V AC, 50/60 Hz
4 – 200V/240V AC, 50/60 Hz

Box E: Scale Range
5Y – One channel
55 – Two channels

Box F: Alarm Output
0 – None
1 = 1-ch. recorder, 2-point/no external control
A = 1-ch. recorder, 2-point/with external control
2 = 2-ch. recorder, 4-point/no external control
B = 2-ch. recorder, 4-point/with external control

Features
- Inkjet Printing Technology without physical contact with the paper eliminates mechanical wear and provides crisp, color recordings
- Meets your budgetary demands
- Available in One- or Two-Channel
- Continuous Trace
- More capabilities your application demands
- Continuous Analog Trending on the Same Axis
- Built with Polymer Plastic Mold Technology
- The recorder is lightweight and durable
- The PHE Offers many of the features found in Higher-Priced Instruments
- You get more recorder for your dollar
- Three-Year Warranty

MRC 5000 CIRCULAR CHART RECORDER

Features
- Up to two mechanical relay outputs for each pen
- RS485 Communications Option
- Setup/Calibration seal protects the unit against unauthorized changes
- Universal inputs and power supply
- NEMA 3 (NEMA 4X optional)
- UL, C-UL, CE and FM (limit model)
- 2 year factory warranty

MRC 7000 CIRCULAR CHART RECORDER

Features
- Isolated process input offers protection from electrical noise
- Up to two programmable alarms per pen
- Sensor-break and error-fault detection
- Display/chart and process filtering
- On/Off and PID control
- Programmable output action on sensor break/error condition

- Auto/manual control with bumpless transfer
- Digital communications via RS-485 port
- 24V DC transmitter power supply or use with a mA DC input
- CSA, UL, and CE approval
- Universal input
- 3 Year Factory Warranty

FUTURE DESIGN
PAPERLESS RECORDER AND HI-LIMIT CONTROLLERS

MCT4 PAPERLESS RECORDER

Features:
- Touch screen/smart device interface
- Up to 3 PID loops - 1 may be FM limit
- Paperless recorder
- Data storage & viewing
- Flexible file management
- Email/SMS on alarm
- Remote access

- Dynamic screens/options configuration
- Automated program entry and control
- Data logging
- Historical data viewer
- Chart trend view
- User-based security
- Full audit trail entries
- Digital signatures
- Mechanical and soft alarms

HIGH LIMIT CONTROLS

FM Approved High Limit Controls

L91   L41   Series 7L

Series 7L Features:
- DIN Rail or Surface Mount
- Compact - Simple - Reliable Design
- Easy to Use
- Remote Reset Digital Event Input
- Output: 5A Form C Relay (SPDT)
- Low Voltage Power Input avail-

L91 & L41 Features:
- Universal Temperature Input
- Configurable Display Logic - SAFE
- Remote Reset Digital Input
- Simple to Use & Configure

- Up to 2 Outputs
- PC Configurable
- Serial Communications (option)
- Meets NFPA 86.8.16.6 to display temperature and set point

TEMPERATURE DATA LOGGER - TEMP 101A

Features:
- 10 Year Battery Life
- ±0.5°C (±0.9°F) Accuracy
- Multiple Start/Stop Function
- Ultra High Speed Download
- 1 Million Reading Storage Capacity
- Precision RTD Sensing Element
- Battery Life Indicator
- Programmable High and Low Alarms
- N.I.S.T. Traceable

Applications:
- Refrigerator and Freezer Monitoring
- Vaccine Monitoring
- Warehouse Mapping
- HVAC
- General Purpose Temperature Recording

Specifications:
- Temperature Sensor: Precision RTD Element
- -40°C to +80°C (-40°F to +176°F)

CURRENT DATA LOGGER - PROCESS 101A

Features:
- 10 Year Battery Life
- 4Hz Reading Rate
- Multiple Start/Stop Function
- Ultra High Speed Download
- 1 Million Reading Storage Capacity
- Battery Life Indicator
- Programmable High and Low Alarms
- N.I.S.T. Traceable
- Field Upgradeable

Applications:
- 4 to 20mA Recording
- pH Recording
- Low Level DC Current Monitoring
- Photovoltaic Studies
- General Purpose Current Recording

Specifications:
- Measure Range: -2 to 30mA
- Two Range: 20mA and ± 160mA

TESTO DATA LOGGERS

TESTO 175-H1 DATA LOGGGER

Testo 175-H1 2-channel temperature and humidity data logger with external humidity sensor. The testo 175 H1 continuously records temperature and humidity values and shows the dewpoint in the display. The indoor climate is well monitored, emphasizing the need for targeted ventilation and air exchange. The external probe stands out thanks to faster reaction times in comparison to probes installed inside the housing.

Features:
- Large memory for 1 million measurement values and large easy-to-read display
- Up to 3 years battery life at 15 min. meas. rate
- Perfect for monitoring and documenting storage, transportation, or a building's temperature, humidity and air conditioning
- NTC/capacitive humidity sensor

TESTO 176-T4 DATA LOGGGER

Testo 176-T4 data logger can measure the temperature at up to four different sites simultaneously (4-channel). Super size memory for up to 2,000,000 readings. Extremely wide range. Ideal for professional use in many different fields.

Features:
- Memory for 2,000,000 readings/up to 8 yrs battery life
- Measures/logs temperature at four sites simultaneously
- Extremely wide measuring range from –328° to 1832 °F
- Data transfer to PC for analysis/logging. Select from three software programs. Free ComSoft Basic download
- Thermocouple Type T, Type K, Type J connectable

**Carremm Controls offers certified/calibrated temperature sensors
and NIST in house and on-site temperature calibration services**

THERMOCOUPLES & RTDS

Stock Thermocouple or RTD is mounted in a 1/4" npt sheath of 316 stainless steel or (in the case of K thermocouples) inconel.
Assemblies are completed with a 1/2" npt hex process fitting with an aluminum NEMA 4 rated process head with ceramic terminal strip.
Single and duplex (dual) sensors are stock, but custom lengths and sizes are available.
Stock length are 3.4", 5.5" , 8.5" 11.5",14.5" , 18" & 24" .

TRANSMITTERS, SENSORS & THERMOWELLS

Temperature Transmitters can be supplied mounted in a standard process head with 1/4" stainless steel O.D. stem complete with an appropriate sensor of any calibration. J,K,T,E thermocouple calibration and Pt 100, 500 and 1000 ohm RTD's.

316 Stainless steel Thermowells
Used for specialty process applications in a variety of lengths, bore sizes and process fittings.

DEADWEIGHT TESTER

**Carremm Controls offers certified/calibrated pressure sensors
and NIST in house and on-site pressure calibration services**

HYDRALITE HYDRUALIC DEADWEIGHT TESTER

The HydraLite Hydraulic Deadweight Tester is a primary standard that features a re-entrant type measuring piston and cylinder assembly that helps maintain accuracy as the test pressure increases.
The HL Series tester is designed for rapid interchanging between high and low pistons and is NIST traceable and accurate to ±0.05% using non-magnetic die-cast alloy or aluminum weights calibrated to international standard gravity at 9.80665 m/s2.
The unit is also available as a deadweight gauge for accurate measurements and use as a comparison standard.
Low center of gravity the HL tester is an easy-to-use and portable primary standard capable of offering laboratory accuracy in the field.

Features:
- Presure Range 100 to 22,500 kPa (10 to 3,000 psi)
- Accuracy to ±0.05% of Indicated Reading
- Available units psi, kg/cm2, bar, kPa
- Interchangeable Weights Models are available with dual piston/cylinder assemblies that utilize one weight set.
- Includes Compact Screw Pump with Ratchet Handle
- Designed for use in the field and is completely self-contained within the cover of the unit.
- Positive Over-pressure Protection Prevents Piston Damage
- NIST Traceable All units are supplied with certifications that are traceable to NIST.

**CARREMM CONTROLS OFFERS CERTIFIED/CALIBRATED PRESSURE SENSORS and N.I.S.T.
IN HOUSE AND ON-SITE PRESSURE CALIBRATION SERVICES**

GE DRUCK DPI 104 CALIBRATION KITS

GE Druck DPI-104 pressure gauge is a micro-processor controlled digital test gauge that combines precision and functionality in a compact, robust, and simple to use package. The GE Druck DPI 104 pressure gauge matches advanced silicon sensor technology with several convenient design features resulting in an accurate, versatile yet affordable digital test gauge

GE Druck DPI-104 is included as a standard component in these test and calibration kits;
- Low Pressure Pneumatic Test Kit
- Pneumatic Test Kit
- Hydraulic Test Kit
- Pneumatic and Hydraulic Test Kit

GE Druck DPI 104 Calibration Kit with PV210

Low Pressure Pneumatic Test Kit
Includes: DPI 104; ranges to 30 psi (2 bar), PV 210 low pressure pneumatic test pump, hose, adaptors, seal kit and case

GE Druck DPI 104 Calibration Kit with PV211

Pneumatic Test Kit Includes:
DPI 104; ranges to 300 psi (20 bar), PV 211 pneumatic test pump, hose, adaptors, seal kit and case.

GE Druck DPI 104 Calibration Kit with PV212

Hydraulic Test Kit Includes:
DPI 104; ranges to 15,000 psi (1000 bar), PV 212 hydraulic test pump, hose, adaptors, seal kit and case.

GE Druck DPI 104 Calibration Kit with PV411A

**Pneumatic and Hydraulic Test Kit Includes:**
DPI 104; ranges to 10,000 psi (700 bar), PV 411A combined pneumatic and hydraulic test pump, hydraulic reservoir, hose, adaptors, seal kit and case.

TESTO 745 - NON-CONTACT AC VOLT METER

Testo 745 Non-contact voltage tester is ideally suited for fast checking of any suspected fault sources. It filters high-frequency interfaces signals and has two-stage sensitivity settings.

Features:
- Voltage range up to 1,000 VAC
- Waterproof and dustproof according to IP 67
- Adjustable for phase detection or voltage indication
- Visual and acoustic signal
- Measuring point illumination
- Adjustable sensitivity
- Filter for high-frequency interference signals
- Built-in LED flashlight illuminates test area
- Differentiates hot from neutral in AC outlets
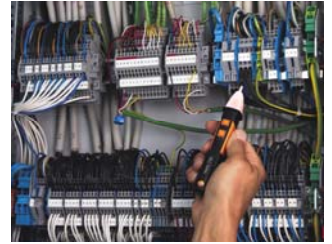
TESTO 760 - DIGITAL MULTIMETER

Testo 760 Digital multi-meter family comprises three models for all important electrical measuring tasks. Function keys replace the traditional dial on all three instruments. Incorrect settings are impossible as it will automatically detect based on the measuring sockets and by the illumination of the function keys.

Features:
- Protection class: IP 64
- Continuity testing & Diode test
- 760-1 Model is the standard version for all daily measuring tasks; voltage range up to 600 V AC/DC
- 760-2 Model is differentiated by a larger current measuring range, the true root mean square measurement- TRMS and a low-pass filter; voltage range up to 600 V AC/DC
- 760-3 Model has the highest specification and in addition to the other two models, it has a voltage range of up to 1,000V AC/DC and higher measuring ranges for frequency and capacitance

TESTO 750 - VOLTAGE TESTER

The Testo 750 Voltage Tester is the high performance model in a convenient and reliable voltage tester family. In addition to the unique fibre-optic technology, the single pole voltage testing, the torch for measuring point illumination and the all-round LED display, it also has an LC Display where the value currently being measured is shown.

Features:
- LC display showing the reading
- Clear, patented all-round LED display
- In accordance with DIN EN 61243-3:2010 and CAT III
- RC trigger function and vibrating load buttons

ENERGY/POWER METERS

WM14-96 "BASIC VERSION ENERGY METER"

- Class 1 (active energy)
- Class 2 (reactive energy)
- Accuracy ±0.5 F.S. (current/voltage)
- Power analyzer
- Energy measurements: kWh and kvarh
- TRMS meas. of distorted sine waves (voltages/currents)
- Power supply: 24V, 48V, 115V, 230V, 50-60Hz; 18 to 60VDC
- Protection degree (front): IP65
- Front dimensions: 96x96mm
- Optional RS422/485 serial port

WM5-96 "MODULAR SMART POWER QUALITY ANALYZER"

- Class 0.2 (current/voltage)
- ARM® powered
- Measured energies (imported/exported): kWh and kvarh
- Current and voltage inputs with auto ranging capability
- Energy measurements according to ANSI C12.20, CA 0.5,
- Harmonics source detection
- Data stamping of up to 10,000 events: alarm, min, max, digital input status, digital output status as remote control, resets
- 4 independent communication ports

SENSORS

CAPACITIVE

All Tripleshield™ sensors are tested to withstand electrostatic discharges up to 40 KV, line transients up to 4 KV, and airborne noise (ie. cellular phones) up to 15 V/m. Capacitive sensors will detect most materials - conductive and non-conductive.

LEVEL

The ranges of the Level Sensors are able to detect conductive and non-conductive liquids, granulates, grains, and plastics. There are sensors and control relays for both on/off control and continuous monitoring of levels. There are conductive probes amplifiers and magnetic level probes, as well as capacitive level, ultrasonic level, and

INDUCTIVE

There are inductive sensors and proximity switches available in both digital (SCR, transistor) and analog outputs. There are the following cylindrical inductive sensors and switches have the following material: plastic housing, stainless steel housing, thermoplastic polyester housing.

PHOTOELECTRIC

Used on packaging machinery and automatic door systems, amongst other applications. Available in diffuse reflective, background suppression, retoreflective, polarized, through beam, clear object detection and colour recognition. Also available is fiber-optic and optical types

ULTRA SONIC

UA Series ultrasonic sensors are intended for distance measurement and object detection in tough environments. There are output types of discrete outputs for presence and absence detection and analog outputs that require a measurement of the target object with 0 -10 VDC or 4-20 mA outputs. There is also a more advanced sensor that include teach functions, which allow the set-point to be configured with the push of a button and via Windows-based software for applications where greater control of sensor parameters and variables is required.

DRIVES

VariFlex2 Series

- Sensorless vector control (with high starting torque) or V/F control
- Speed control via front panel (digitally or via an adjustable knob)
- PID function
- I/O function (2 input/1 output insulated)
- DIN rail or panel mounting and remote Keypad available
- RS232 or RS485 MODBus available through an option card

SAFETY LIGHT CURTAINS

Carlo Gavazzi's has a range of light curtains in various heights (161mm up to 1650 mm / 6.3 inches – 65 inches) and are available with finger, hand and body resolutions. The light curtains are TUV and CUL approved. Carlo Gavazzi light curtains are suitable for use in applications up to category 4. Features include fixed and floating blanking, cascade operation (SB4M), external device monitoring, and on their body resolution curtains they also feature a muting function with built-in muting sensors.

SWITCHING

CONTACTORS

Contactors and Overloads for switching currents up to 900A(600HP@480VAC). All contactors are available with coil voltages and come standard with built-in auxiliary outputs. Interlock and wiring kits are available to turn 2 standard contactors into reversing contactors. Ranges includes Definite Purpose Contactors up to 50A in 1pole, 1pole&shunt, 2pole & 3pole(can be reversing starters) configurations.

MECHANICAL RELAYS

There are Mechanical Relays for switching loads up to 30A with a wide selection of coil voltages and also available in plug-in and PCB mounting. Most relays come standard with a push-to-test button and LED indicator.

SOLID STATE RELAYS

There are Solid State Relays (SSR's) with direct copper bonding technology for increased life and reliability. There are horsepower ratings and ranges include single phase relays up to 125 A and 3 phase relays up to 75A. They are available with both digital and analog inputs (4-20mA or 0-10V). There are also SSR's with a built-in heatsink.

CURRENT, VOLTAGE & PHASING MONITORS

These monitors are used in a wide range of applications for protecting motors against the damaging effects of single phasing and overloads. They are used widely for monitoring instrumentation signals (4-20mA, 0-10V). Current transformers have secondary output as follows, 0-1A, 0-5A,4-20mA, 0-10A.

POWER SUPPLIES

Power Supplies can range up to 480 Watts. Input voltage can be 120/220V and supple DC voltage output. Outputs can range from 5 VDC, 12 VDC, 15 VDC, 24 VDC, and 48 VDC. For high currents, 120W, 240W, & 480W can be used parallel mode. Detachable wiring terminals are also available. 3-phase power supplies are available in the following outputs: 120W, 240W, 480W & 960W. They can be powered by either 3-phases or 2-phases at a slight de-rating and available with an adjustable 24VDC output. Other features include diagnostic LED's, power factor correction and power ready outputs, with parallel function on all models except the 120W version.

TESTO 557 - DIGITAL MANIFOLDS

Testo 557 digital manifold is suitable for all measurements on refrigeration system or heat pump. The manifold has a robust 4-way valve block with additional connection possibilities such as a vacuum pump or a refrigerant bottle.

Features:
- App integration via Bluetooth for fast and convenient monitoring and reporting on site
- Wireless connection allows users to read off the measurement data on a Smartphone or tablet
- The App allows the list of stored refrigerants to be updated
- External vacuum probe supports evacuation of the system with highly precise measurement
- 250 hours of battery life
- 60 most common refrigerants are stored in the instrument, subsequent updates possible via the App
- Calculation of superheating and sub cooling in real time; no manual calculation needed

TESTO 316-3 - REFRIGERANT LEAK DETECTOR

Testo 316-3 refrigerant leak detector can detect all most common agents and locate even the smallest leaks. Comes with automatic zero setting to locate leaks in contaminated rooms. It can detect; CFCs, HFCs and FCs.

Features:
- Highly sensitive <4 g/a allows the detector of the smallest of leaks
- Detects all common refrigerants
- Immediate readiness with no-pre settings
- LED indicator of leakage with simultaneous audible alarm
- Easy-to-use one-button operation

TESTO AMBIENT AIR METER

TESTO 435 AMBIENT AIR IAQ METER

Testo 435 is a multifunction measurement instrument for ventilation and indoor air quality. This can determine the Indoor air quality in the workplace and is an important factor in storage and production processes. It also signals if the HVAC systems is working at optimum energy level or needs to be adjusted. Large selection of optional probes

Features:
- **435-1**: 2-line, back-lit display, User-defined fast function keys
- **435-2**: Instrument memory up to 10,000 readings, Includes PC software for analysis, archiving and reporting data, Radio probes for temperature and humidity, Protection class IP54
- **435-3**: IAQ probe for assessing Indoor Air Quality, Thermal probes, vane measurement and built-in differential pressure probe for Pitot tube measurement, Radio probe for temperature, Protection class IP54
- **435-4**: Measure and store up to 10,000 readings, PC software for analyzing, archiving and documenting data, Radio probe for temperature and humidity, Protection class IP54
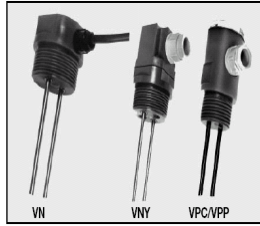
Level Sensors Conductive
### Types VN, VNY, VPC, VPP

Multi Level Float Switches

The sensor is designed to work directly without model AL101 or model AL201 alarms.

- The float switch is factory-sealed and explosion-proof.
- It is approved for hazardous locations, Class 1, Division 1, Groups B, C, D.
- Explosion-proof housings are an optional accessory.
- 1 to 4 electrodes
- Isolated or insolated electrodes
- Cable or screw connection
- 1/2", 1" or 1 1/2" pipe thread

Level Sensors Amplifier, Conductive
Type S 197 (Charging/Discharging)
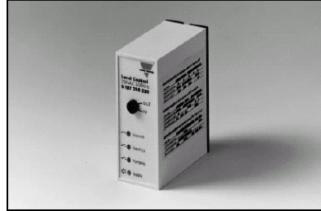
- Controller for conductive liquids
- Controls min/max and indicates over and under alarm
- Filling or emptying function selectable
- Fixed sensitivity
- 2 x 5 A 250 VAC relay outputs, SPST
- 4 LED indications: Pump running, power supply ON, alarm high (HiHi) and alarm low (LoLo)
- AC power supply: 24 VAC, 115 VAC and 230 VAC

Portable ultrasonic flow meter for non-invasive transit time flow measurement
Portaflow-C
Features

- Part number FSCS10A4-00Y
- 0 to ±32m/s (0 to ±105ft/s) flow velocity range
- 0.5 to 236 inch pipe diameter range
- -40 to 392°F (-40 to 200°C) fluid temp
- ±1% accuracy
- 1 second response time
- USB port serial communication
- Data logging via SD memory card
- Heat quantity measurement function
- Digital signal processing Improves anti-bubble characteristics
- Sound velocity measuring function eliminates temperature and pressure errors and enables easy setup for unknown materials
- Compact and light-weight (just 2.3 lbs)
- 4.7 inch colour graphic display

The Portaflow-C applications include:

- Flow measurement systems
- Backup for an already installed flow meter system
- Water supply and sewage treatment
- Boiler-water / feed-water supplies
- Cooling water or oil
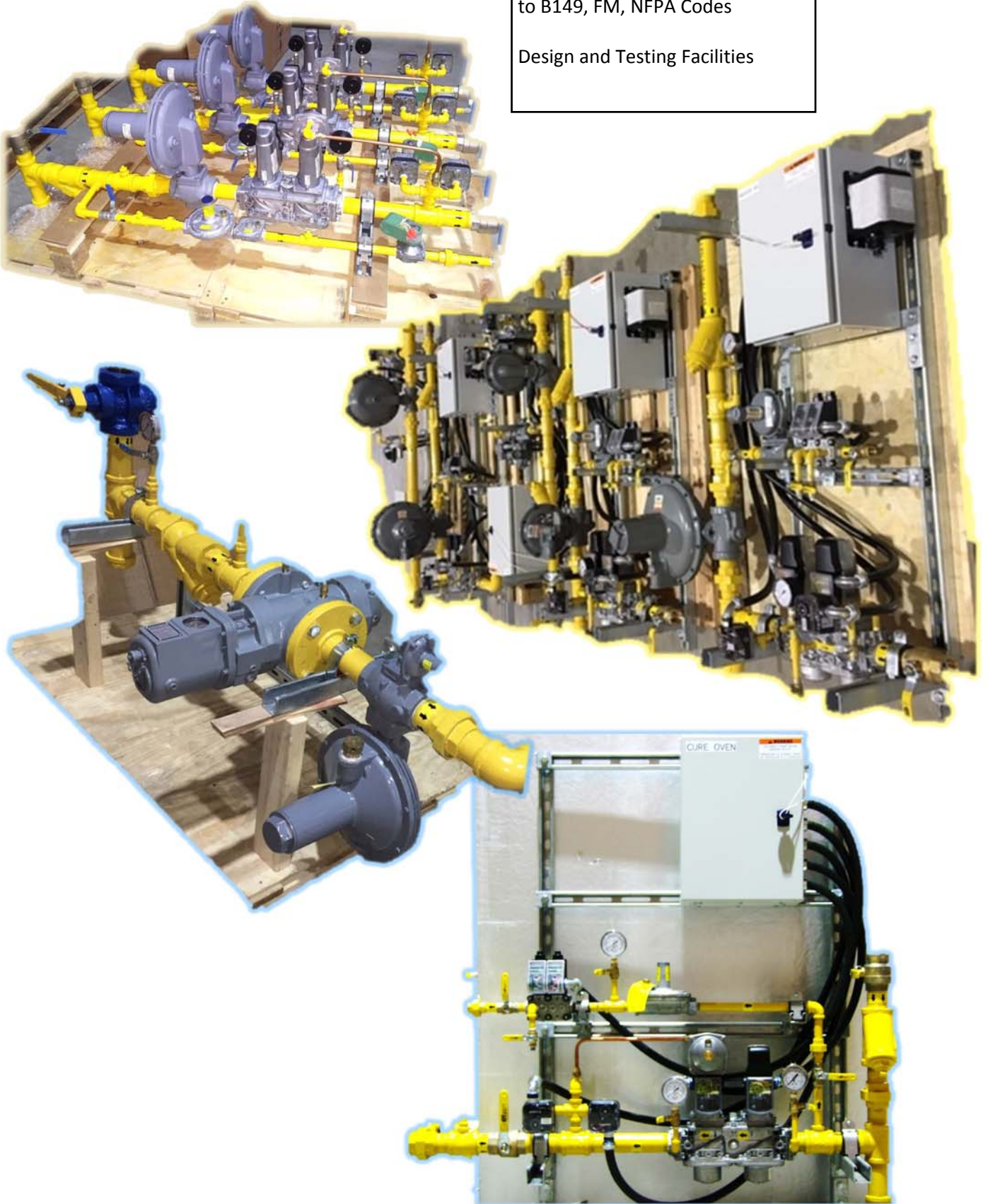- De-ionized water for semiconductor manufacturing

Pump Controllers

Pump controllers are installed to automatically operate a pump to control the level of a liquid in a tank. They are used in conjunction with Ktech multi–level float switches and use two contacts to start and stop the pump. A relay circuit switches power to the fractional horsepower pump motor or to the solenoid valves. Use additional contacts to indicate an alarm condition. These alarms provide an audible and visual signal. The audible signal can be muted after which the warning light remains on until the alarm condition is corrected. Controllers are manufactured to customer requirement.

Features Available: main disconnect switch, thermo magnetic motor protector, single pole circuit breaker and overload relay, across-the-line contactor, control transformer, pump alternator, power, alarm and pump on pilot lights, hand/auto selector switch.

Gas Train Design and Fabrication to B149, FM, NFPA Codes

Design and Testing Facilities