

# Product Overview



## About QUALITROL®

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QUALITROL manufactures substation and transformer monitoring and protection devices used by electric utilities and OEM manufacturing companies. It is the global leader in sales and installations of transformer asset protection equipment, fault recorders, and fault locators. Established in 1945, QUALITROL produces thousands of different types of products on demand, customized to meet unique requirements.

### QUALITROL Brand Defines Reliability

#### Reliable engineering and design

- Custom, one-of-a-kind design made to exact customer requirements
- Huge historical engineering library (maintained and grown over 60 years)
- Dedicated engineers for custom product design and modification

#### Reliable products

- Works the first time out of the box
- Made to last
- Products sold worldwide for use in all environments

#### Reliable manufacturing

- Only high durability materials and components
- Custom manufactured
- On demand production
- Latest manufacturing techniques

#### Reliable service

- Any product, any time, any where customer needs service
- On site support, worldwide
- Certified field engineers
- Extensive and expert historical product identification knowledge to get the correct replacement product

### QUALITROL Service and Support

#### QUALITROL field services

QUALITROL provides on-site commissioning/ start-up and comprehensive maintenance contracts to all customers worldwide. To further improve reliability, an extended warranty is available on selected products commissioned by QUALITROL.

#### QUALITROL educational services

QUALITROL professional training prepares operations, maintenance, and engineering personnel to install, test, configure, operate and maintain QUALITROL products.

#### QUALITROL accelerated delivery

QUALITROL provides accelerated delivery on many products and services including replacements, spare parts and repairs.



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## Direct Mount Thermometers

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150 / 151

### QUALITROL 150/151 Direct mount thermometers

#### Application

For temperature indication where the point of measurement (the well or pocket) is on the side of the apparatus and can be easily viewed.

#### Features

- Bi-metal measurement with resettable maximum pointer
- 4 inch (100mm) dial face
- Power is not required for function

#### Options

- Various temperature ranges
- Tank connection style, probe length and diameter, compatible well
- Sealed or vented lens



44611

### AKM 44611/48471 Direct mount thermometers

#### Application

For temperature indication where the point of measurement (the well or pocket) is on the top of the apparatus and can be easily viewed.

#### Features

- Bi-metal measurement with resettable maximum pointer
- Power is not required for function

#### Options

- Various temperature ranges
- Tank connection style, probe length and diameter, compatible well
- Sealed or vented lens



**Direct Mount Thermometers**



**QUALITROL 165/167 and AKM 47080**  
Direct mount thermometers

**Application**

For temperature indication with integrated control and alarm functions. Designed for use where the point of measurement (the well or pocket) is on the side of the apparatus and can be easily viewed.

**Features**

- Bi-metal measurement with resettable maximum pointer
- 5 inch (130mm) dial face
- Up to 2 fully adjustable switches (contacts) for control and alarms (165/167 has one additional fixed switch)

**Options**

- Temperature ranges applicable for oil (liquid) or winding (winding simulation requires heated well or QUALITROL Thermal plate)
- Up to 3 switches
- Tank connection style and probe length, compatible well
- Electrical connection type, connector cable type and wire colors
- 0-5VAC electronic output for remote monitoring



**AKM 44612/44622/44617/44618**  
Direct mount thermometers

**Application**

For temperature indication with integrated control and alarm functions. Designed for use where the point of measurement (the well or pocket) is on the top of the apparatus and can be easily viewed.

**Features**

- Bi-metal measurement with resettable maximum pointer
- Up to 2 user adjustable switches (contacts) for control and alarms

**Options**

- Temperature ranges applicable for oil (liquid) or winding
- Up to 2 user-adjustable switches (contacts)
- Tank connection style
- Electrical connection type
- Pt100 electronic output for remote monitoring
- Integrated heater for winding simulation

### Direct Mount Thermometers

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#### QUALITROL 121

##### Direct mount thermometers with flexible probe

###### Application

For temperature indication with integrated control and alarm functions. Designed for use where the point of measurement (the well or pocket) is on the side or top of the apparatus and can be easily viewed.

###### Features

- Bourdon tube measurement with resettable maximum pointer
- Flexible head for side or top mount applications
- Up to 2 fully adjustable switches (contacts) and one additional fixed switch for control and alarm functions
- 5 inch (130mm) dial face with an angular dial span of 120° for easy viewing

###### Options

- Temperature ranges applicable for oil (liquid) or winding (winding simulation requires heated well or QUALITROL Thermal plate)
- Up to 3 switches
- Tank connection style and probe length, compatible well
- Electrical connection type, connector cable type and wire colors



#### QUALITROL 120

##### Direct mount thermometers

###### Application

For temperature indication with integrated control or alarm functions. Designed for use where the point of measurement (the well or pocket) is on the side of the apparatus and can be easily viewed.

###### Features

- Bourdon tube measurement with resettable maximum pointer
- Up to 4 user adjustable switches (contacts) for control and alarms
- 6 inch (150mm) dial face with an angular dial span of 90° for easy viewing
- Built in spring loaded pointer for switch field testing

###### Options

- Temperature ranges applicable for oil (liquid) or winding (winding simulation requires heated well or QUALITROL Thermal plate)
- Up to 4 switches
- Probe length and compatible well
- Electrical connection type, connector cable type and wire colors



## Remote Mount Thermometers



### QUALITROL 105 Remote mount thermometers

#### Application

For temperature indication with integrated control and alarm functions. Designed for use where the point of measurement (the well or pocket) is not easily viewed by personnel requiring separate or remote indication.

#### Features

- Bourdon tube based capillary measurement with resettable maximum pointer
- Up to 2 user adjustable switches (contacts) and one additional fixed switch for control and alarms
- 5 inch (130mm) dial face with an angular dial span of 120° for easy viewing
- Low profile probe can be dressed for use in dry type transformers

#### Options

- Temperature ranges applicable for oil (liquid) or winding (winding simulation requires heated well or QUALITROL Thermal plate)
- Up to 3 switches
- Tank connection style, probe length, and compatible well
- Capillary length, material and protective housing
- Electrical connection type, connector cable type and wire colors



### QUALITROL 104/TR6000 Remote mount thermometers

#### Application

For temperature indication with integrated control and alarm functions. Designed for use where the point of measurement (the well or pocket) is not easily viewed by personnel requiring separate or remote indication.

#### Features

- Bourdon tube based capillary measurement with resettable maximum pointer
- Up to 4 user adjustable switches (contacts) for control and alarms
- 6 inch (150mm) dial face with an angular dial span of 90° for easy viewing
- Built in spring loaded pointer for switch field testing
- Fine measurement adjustment on dial face

#### Options

- Temperature ranges applicable for oil (liquid) or winding (winding simulation requires heated well or QUALITROL Thermal plate)
- Up to 4 user adjustable switches (contacts)
- Mounting style, tank connection style, probe length, capillary (length, material, protective housing), compatible well
- Electrical connection type, connector cable type and wire colors
- SCADA output (0-1mA or 4-20mA) with integrated power supply

### Remote Mount Thermometers



AKM OTIWTI™

#### OTIWTI™

#### Remote mount thermometers (AKM)

##### Application

For temperature indication with integrated control and alarm functions. Designed for use where the point of measurement (the well or pocket) is not easily viewed by personnel requiring separate or remote indication.

##### Features

- AKM bellows measurement with resettable maximum pointer
- Up to 6 fully independent and user adjustable switches (contacts) for control and alarms
- Switches can be specified by switch type, hysteresis range, and set point, without limitation of sequential set points.
- Internal winding temperature simulation without heated well
- 6 inch (150mm) dial face with an angular dial span of 260° for maximum ease of measurement interpretation
- Built in lever for switch field testing

##### Options

- Temperature ranges applicable for oil (liquid) or winding (winding temperature simulation does not require heated well)
- Up to 6 user adjustable switches with independent switch types
- Mounting style, tank connection style, probe length, capillary (length, material, protective housing), compatible well (pocket)
- SCADA outputs (0-1mA, 4-20mA, Pt 100, and Cu 10), analog and digital remote indicators

### Pressure Relief Devices



#### QUALITROL 201/202/205

#### Small pressure relief devices

##### Application

For overpressure protection on transformers, load tap changers and other related liquid-filled electrical apparatus.

##### Features

- Standard models have a one-piece brass housing with stainless steel spring, pull ring and viton o-ring seal
- Models have fixed or field adjustable pressure settings and are available with maximum flow rates from 35 SCFM to 200 SCFM
- Available dual sealing submersible design made entirely from stainless steel for special applications

##### Options

- Operating pressure and relief flow rate
- Visual indicator style
- Tank connection and sealing systems





**Pressure Relief Devices**



206



206 WITH SHIELD

**QUALITROL 206 MPRD**  
**Medium pressure relief devices**

**Application**

For overpressure protection on oil filled transformers, load tap changers, and other related electrical apparatus.

**Features**

- Uniquely designed tip/side gasket that seals under repeated operations
- Available stainless steel directional shield for controlling hot oil and gas discharge
- Up to 2 switches for alarm and control
- Integrated gas bleed system

**Options**

- Operating pressure
- Directional shield
- Up to 2 alarm switches
- Gasket material and indicator style



LPRD



LPRD WITH SHIELD

**QUALITROL 208/213/216 LPRD**  
**Large pressure relief devices**

**Application**

For overpressure protection on oil filled transformers, load tap changers, and other related electrical apparatus.

**Features**

- QUALITROL pioneered dual gasket amplifies overpressure force for reliable operation and resealing
- Up to 2 latching or momentary switches for alarm and control
- Stainless steel hardware and operating valve, operation indication pin
- Stainless steel or aluminum with corrosion resistant hood finish and powder coating for long life

**Options**

- Operating pressure, gasket material and type, hood material, Indicator style and color
- Up to 2 latching or momentary switches (single or double pole form C, high DC, or low current gold contacts)
- Electrical connection style
- Gas bleed system
- Directional shield and piping options for controlling hot oil and gas discharge

### Pressure Relief Devices

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XPRD

#### QUALITROL XPRD Extra protection relief devices

##### Application

For overpressure protection on critical oil filled transformers, load tap changers, and other related electrical apparatus for maximum safety and environmental protection.

##### Features

- Highest flow rate for quick relief of overpressure
- Standard integrated directional shield with 8 inch diameter outlet to maximize flow rate and control hot oil and gas discharge
- Corrosion resistant stainless steel directional shield, hardware, and operating valve

##### Options

- Operating pressure, Gasket material, indicator style
- Up to 2 latching or momentary switches (single or double pole form C, high DC, or low current gold contacts)
- Electrical connection style
- Gas bleed system
- PVC and aluminum piping options for controlling hot oil and gas discharge

### Pressure Controls

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146

35650

#### QUALITROL 146 & AKM 35650/47500 Pressure or vacuum switches

##### Application

For pressure and/or vacuum alarming on transformers equipped with nitrogen blanket systems and other related electrical apparatus.

##### Features

- Reliable alarming for rising or falling pressure
- Numerous configurations available for many applications
- Available with cut off valve for field testing of switches

##### Options

- Operating pressure or vacuum and operation on rising or falling pressure/vacuum
- Up to 3 switches, switch testing port
- Mounting style



**Pressure Controls**



**QUALITROL 141/148**  
Pressure or vacuum switches

**Application**

For pressure and/or vacuum alarming on transformers equipped with nitrogen blanket systems and other related electrical apparatus.

**Features**

- Reliable alarming for rising or falling pressure
- Numerous manifolds and configurations available for many applications

**Options**

- Operating pressure or vacuum and operation on rising or falling pressure/vacuum
- Indication, pressure relief, and sampling port
- Manifold style, switch enclosure and mounting style
- Up to 2 switches



**QUALITROL 050**  
Pressure or vacuum indicators

**Application**

For pressure or vacuum indication on transformers and other related apparatus.

**Features**

- Clear visual indication of internal pressure condition

**Options**

- Pressure/vacuum range
- Unit of measure and dial style
- Liquid filled for high vibration



**QUALITROL 070/351**  
Pressure or vacuum bleeders

**Application**

For pressure and/or vacuum control in transformers or other electrical apparatus.

**Features**

- Field adjustable pressure or vacuum setting
- Available with local indication (QUALITROL 070)

**Options**

- Pressure and vacuum settings
- Single or dual (pressure and vacuum, vacuum only, pressure only)
- Mounting style and sampling valve

### Rapid Pressure Rise Relays



#### QUALITROL 900/910 RPRR Rapid pressure rise relays

##### Application

For transformer and other electrical apparatus protection. Device sends an alarm when a dangerous sudden pressure rise condition has occurred. This alarm can be used to trip the transformer offline preventing further damage or purely as an indicator of an event.

##### Features

- QUALITROL pioneered standard in detection and alarming of destructive sudden pressure events
- Models designed for use in oil or gas space
- 100% tested for pressure rate release point

##### Options

- Horizontal or vertical mounting
- Seal in relay (QUALITROL 909) for latching alarm or trip signal
- Electrical connection types, cable size, lengths and wire colors
- Gas bleed system
- Field test kit (KIT-013) and factory test fixture (FIX-601)
- Flange or thread mounting



#### QUALITROL 930 Electronic pressure monitors

##### Application

For use on transformer and load tap changer tanks to sense dangerous fast or slow (static) pressure increases and provide alarm and trip functions.

##### Features

- Field adjustable fast pressure rise and slow pressure settings
- User selectable contacts for momentary or seal-in actuation with front panel LEDs status indicators
- Constant milliamp output proportional to tank pressure for remote indication or for use with SCADA systems
- 3 transducer versions available with various logic schemes for greater flexibility and reliable trip functionality

##### Options

- Heavy duty transducers for high humidity applications and/or weather proof enclosure for mounting outside the control cabinet
- Single sensor or multi-sensor logic
- QUALITROL 900/910 retrofit mounting plate
- SCADA outputs (0-1 or 4-20mA)



## Transformer Monitors



505

### QUALITROL 505 ETM Electronic transformer monitor

**Application**

For remote and local monitoring of essential oil filled transformer parameters.

**Features**

- 5 relays (1 dedicated for heater control)
- 3 current loop outputs (0-1 or 4-20mA selectable), MODBUS and DNP protocol outputs over RS-485
- Up to 3 RTD inputs, 1 current transformer (CT) input for calculated winding
- Universal power supply

**Options**

- 4-20mA input
- Weatherproof enclosure with or without heater or control cabinet panel mount
- Oil RTD, ambient RTD and clamp on CT



509 ITM

### QUALITROL 509 ITM Intelligent transformer monitor

**Application**

For remote and local monitoring of all critical oil filled transformer parameters including cooling system control and load tap changer monitoring.

**Features**

- 10 relays (1 dedicated for heater control, 1 dedicated for system status) for alarm and control based on up to 8 modular inputs of various types
- 4 magnetically isolated current loop outputs (0-1 or 4-20mA selectable)
- RS-232 local setup, RS-485 remote communication, fiber optic (RS-485) communications and Ethernet ports
- USB port for local setup and data logging download
- Cooling monitor model (509-200) for advanced control or load tap changer monitor (509-300) model for detailed performance monitoring

**Options**

- Integrated data logging (up to 20 parameters) and event recording (up to 8 events) with shared 32MB memory
- Ethernet port and/or fiber optic communications output (RS485)
- Weatherproof enclosure with or without heater, 19" rack mount or control cabinet panel mount
- Oil RTD, ambient RTD, clamp on CT, pressure transducer, oil level transmitter, and other various input modules
- MODBUS / DNP / ASCII / IEC 61850 / IEC 60870 protocols

### Transformer Monitors



509 DW



#### QUALITROL 509 DW

##### Intelligent transformer monitor with direct winding

###### Application

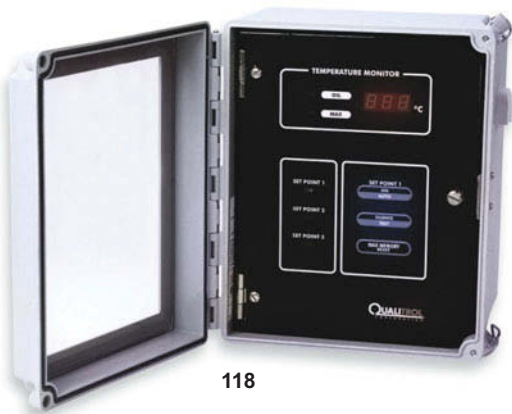
For remote and local monitoring of all critical oil filled transformer parameters including cooling system control and load tap changer monitoring. Special model for real time comparison of calculated and direct winding temperatures.

###### Features

- All the features of the QUALITROL 509 ITM
- Real time comparison of calculated and direct ('hot spot') winding temperatures for verification of transformer operation to OEM specification
- Up to 8 modular inputs of various types and up to 16 additional fiber optic temperature inputs via digital port when combined with optical hot spot modules
- Cooling monitor model (509-200) for advanced control or load tap changer monitor (509-300) model for detailed performance monitoring

###### Options

- All options available on the QUALITROL 509 ITM
- Neoptix® T2™ temperature sensors, fiber optic extension cables, optical feedthrough, tank wall plate style (bolt-on or weld-on) and junction box
- Optical hot spot module (up to 8 fiber inputs per module) for constant monitoring
- Portable fiber optic thermometer for single probe verification and monitoring



118

#### QUALITROL 118 ETM

##### Electronic dry type transformer monitor

###### Application

For remote and local monitoring of dry-type, ventilated or cast coil transformers.

###### Features

- Up to 5 relays for fan control, alarming and trip functions based on hottest phase temperature
- Fan exerciser to reduce fan wear
- Maximum temperature memory
- 0-1 or 4-20mA output for integration with SCADA systems

###### Options

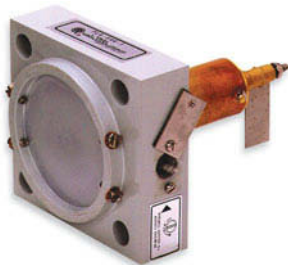
- Plated steel enclosure
- RS-485 communication link with MODBUS or Square D® compatible protocols
- Insulated or non-insulated type K thermocouples
- VAC or universal power supply



## Flow Indicators



092



### QUALITROL 092 Flow indicators

#### Application

For indication and alarms based on flow through a pipe. Designed for use on forced oil cooling systems to indicate and alarm for confirmation of proper flow.

#### Features

- Magnetic couple for leak free operation
- Wide array of configurations to fit almost any application

#### Options

- Fixed or adjustable torque for various flow rates
- Mounting style
- Electrical connection type, cable type, color and length
- Dial legends and style

## Gas Accumulation Indicators



038

VLV-602-1

KIT-005-1

### QUALITROL 038 Gas accumulation indicators

#### Application

For use on conservator style transformers to indicate and alarm when undesired gases, typically a result of internal arcing, have been detected and have accumulated in volume past an alarm set point.

#### Features

- Provides continuous indication of the total accumulated gases
- SPDT switch provides a latching alarm when the accumulated gas displaces a greater volume of oil than the switch set point
- 6 inch (152.5mm) dial face is set at 15° angle to be easily viewed from the base of the transformer or related apparatus

#### Options

- Sampling valve kit (VLV-602-1) allows gas samples to be drawn off more easily at the base of the transformer tank
- Sampling syringe kit (KIT-005-1) provides useful tools and hardware to take measured samples of gas
- Electrical connection type, cable type, color and length

### Position Indicators

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#### QUALITROL 081/082/008/009 Position indicators

**Application**

Position indicators for voltage regulators and load tap changers for many legacy devices.

**Features**

- Custom configured and designed for major OEM replacement parts

**Options**

- Electrical connection type
- Mounting and position mechanism
- Dial type

### Breaker Condition Monitors

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#### HATHAWAY CBT 200/400 Portable circuit breaker test kits

**Application**

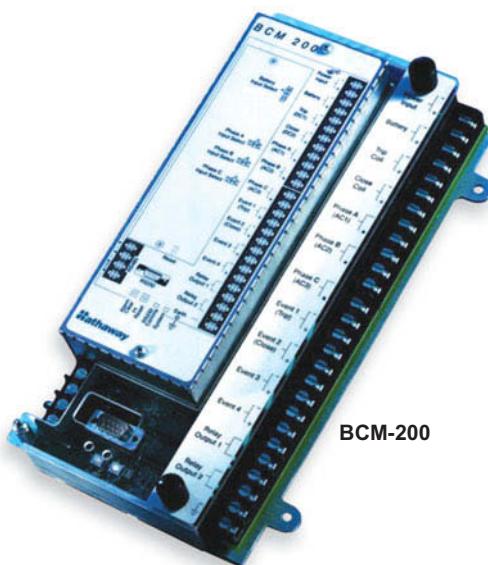
For timing and testing medium and high voltage circuit breakers with three phase and independently operated single phase mechanisms.

**Features**

- Precisely measures circuit breaker performance for comparison manually or automatically to manufacturer's specification
- Portable and rugged for substation use
- PC interface to permanently archive results

**Options**

- Dynamic microhm interface
- Linear and rotary travel transducers



#### HATHAWAY BCM 200/200E On-line breaker condition monitors

**Application**

Permanently installed on medium or high voltage circuit breakers to monitor performance of breaker operation and alarm when changes occur. Units suitable for three phase and independently operated single phase mechanisms.

**Features**

- Small size for mounting inside circuit breaker marshalling kiosks
- Automatic comparison of each operation against a master "finger print" operation to detect changes in performance
- Enables extended routine circuit breaker maintenance intervals and integration into condition based maintenance strategies

**Options**

- Number of inputs
- SF6 gas density monitoring (with QUALITROL 149-400 or other SF6 gas density monitor with 4-20mA output)
- Pre-wired weather proof enclosure
- Wireless communications to substation hub/control house





## SF6 Gas Density Monitors



149-400

### AKM 149-400 SF6 gas density monitors with 4-20mA

#### Application

For critical SF6 gas density monitoring on circuit breakers to prevent dangerous low level of insulating gas during operation. Designed for use where local (via dial) and remote (via electronic analog output) indication is required for alarm and control functions.

#### Features

- Independent and continuous 4-20mA or 0-1mA gas density output is ambient temperature compensated based on the ideal gas law
- Redundant mechanical based local indication with optional bi-metal ambient temperature compensation and switches for alarm and control functions
- Designed for use with the Hathaway BCM for comprehensive circuit breaker monitoring

#### Options

- Up to 3 switches (contacts)
- Pressure ranges, dial style and layout
- 4-20mA or 0-1mA electronic output
- Electrical connection style and tank connection style



38920

### AKM 38750/38920/38960 Large SF6 gas density monitors

#### Application

For SF6 gas density monitoring on circuit breakers to prevent dangerous low level of insulating gas during operation. Designed for use where local indication is required with switches available for alarm and control functions.

#### Features

- Mechanical based local indication with optional bi-metal ambient temperature compensation and switches for alarm and control functions
- 3.5 inch (88.9 mm) dial face with several pressure range options
- Vibration mounting and rugged stainless steel case for long life

#### Options

- Up to 3 factory set switches (contacts)
- Pressure ranges, dial style and layout
- Electrical connection style and tank connection type

### SF6 Gas Density Monitors

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149



47209

#### QUALITROL 149 & AKM 47209 Small SF6 gas density monitors

##### Application

For SF6 gas density monitoring on circuit breakers to prevent dangerous low level of insulating gas during operation. Designed for use where only local indication is required.

##### Features

- Mechanical based local indication with optional bi-metal ambient temperature compensation
- Compact design for space restricted applications
- Rugged stainless steel case for long life

##### Options

- Pressure ranges
- Dial style and layout
- Tank connection type

### Oil Level Indicators

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030



020



46969

#### QUALITROL 020/030 & AKM 46969/44680 Small oil level indicators

##### Application

For cost effective indication of oil or liquid level. Primarily used on oil filled transformers, load tap changers, conservator tanks and other related apparatus where the point of measurement is easily viewed.

##### Features

- 2 inch or 3 inch (50mm or 76.2mm) dial face with lever drive (radial) float arm
- Clear liquid level indication with max-min or custom markings on a high contrast dial face

##### Options

- Float travel ranges from min to max markings for various tank configurations
- Tank connection (flange) style, materials, dial style and dial layout
- Field replaceable case (dial) can be exchanged without lowering oil level or compromising tank seal (QUALITROL 030)



**Oil Level Indicators**



**QUALITROL 035**  
Small oil level indicators

**Application**

For indication of oil or liquid level with switches (contacts) for control or alarm functions. Primarily used on oil filled transformers, load tap changers, conservator tanks and other related apparatus where the point of measurement is easily viewed.

**Features**

- 3.75 inch (95.25mm) dial face with lever (radial) or heavy duty gear driven float arm for use in various tank geometry
- Field replaceable case (dial) can be exchanged without lowering oil level or compromising tank seal
- Up to 2 adjustable SPDT switches
- Magnetically coupled for leak free operation

**Options**

- Universal replacement case for field replacement
- Float travel ranges from min to max markings for various tank configurations
- Tank connection (flange) style, materials, dial style and dial layout
- Electrical connection types, cable size, lengths and wire colors



**QUALITROL 032/042/045 & AKM 44712/34725**  
Large oil level indicators

**Application**

For highly visible indication of oil or liquid level with switches (contacts) for control or alarm functions. Primarily used on oil filled transformers, load tap changers, conservator tanks and other related apparatus.

**Features**

- 6 inch (150mm) dial face with lever (radial) or heavy duty gear driven float arm for use in various tank geometry
- 032/042 feature a field replaceable case (dial) which can be exchanged without lowering oil level or compromising tank seal
- Up to 2 adjustable SPDT switches (032/042 features rotatable lens for switch testing)
- Magnetically coupled for leak free operation

**Options**

- Universal replacement case for field replacement (032/042/045)
- Float travel ranges from min to max markings for various tank configurations
- Tank connection (flange) style, materials, dial style and dial layout
- Electrical connection types, cable size, lengths and wire colors
- Resistive (potentiometer) or 4-20mA electronic output for remote indication and SCADA system integration

## Oil Level Indicators

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### AKM 34725/44712/38750 Large oil level indicators

#### Application

For highly visible indication of oil or liquid level with switches (contacts) for control or alarm functions. Primarily used on oil filled transformers, load tap changers, conservator tanks and other related apparatus.

#### Features

- 10 inch (250mm) dial face with lever (radial) or heavy duty gear driven float arm for use in various tank geometry
- Up to 2 adjustable SPDT switches
- Magnetically coupled for leak free operation

#### Options

- Float travel ranges from min to max markings for various tank configurations
- Tank connection (flange) style, materials, dial style and dial layout
- Electrical connection types, cable size, lengths and wire colors
- Resistive (potentiometer) or 4-20mA electronic output for remote indication and SCADA system integration



### QUALITROL 013/006-12 Vertical oil level indicators

#### Application

For top mounted indication of oil or liquid level. Primarily used on oil filled transformers, load tap changers, conservator tanks and other related apparatus where the point of measurement is easily viewed.

#### Features

- Color-coded, bi-directional indication for quick interpretation of level
- Magnetically coupled for leak free operation

#### Options

- Indication style
- Float travel
- Housing and materials



**Oil Level Indicators**



**QUALITROL 015**  
Vertical oil level indicators

**Application**

For top mounted indication of oil or liquid level with switches (contacts) for control or alarm functions. Primarily used on oil filled transformers, load tap changers, conservator tanks and other related apparatus where the point of measurement is easily viewed.

**Features**

- Easy-to-read display with at a glance indication (red for danger, yellow for caution, green for safe)
- Magnetically coupled for leak free operation
- Field adjustable switch (contact) for control and alarm functions

**Options**

- Gas sampling valve and kit (KIT-008-1)
- Switch setting
- Float travel ranges for various tank configurations with various corresponding dials



**QUALITROL 049**  
Vertical oil level switches

**Application**

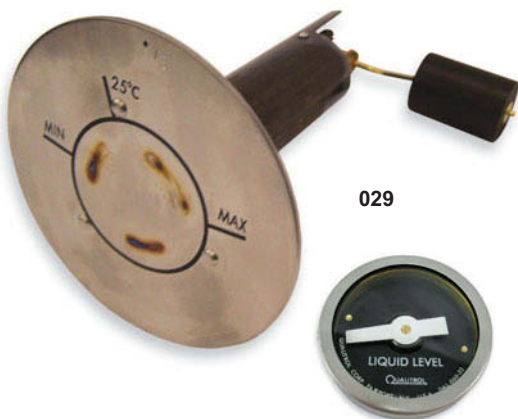
For control or alarm functions based on oil or liquid level. Primarily used on hermetic transformers, load tap changers, conservator tanks and other related apparatus where no local indication is necessary and a top mounted solution is most convenient and accessible.

**Features**

- UL and CSA approved switch
- Magnetically coupled for leak free operation

**Options**

- Gas sampling valve and kit (KIT-008-1)
- Switch setting
- Float travel ranges for various tank configurations



**QUALITROL 029**  
Vertical oil level indicators

**Application**

Weld-on oil (liquid) level indicators. Primarily used in vault transformers where the most rugged indication is required.

**Features**

- Separate handheld device for indication to eliminate potential leaks and damage to traditional oil level indicator cases
- Separate indicator functions on a magnetic couple for leak free operation

**Options**

- Float travel ranges from min to max markings for various tank configurations
- Flange markings and layout

### Oil Level Indicators



#### AKM OLR Remote mechanical oil level indicators

##### Application

For oil level indication with integrated control and alarm functions. Designed for use where the point of measurement is not easily viewed by personnel requiring separate or remote indication.

##### Features

- The flexible capillary tubing allows the indicator to be placed in a convenient location away from the actual measurement point
- Up to 4 switches can be integrated into the device for control and alarm functions
- Remotely indicates oil (liquid) level without power

##### Options

- Up to 4 switches and/or 4-20mA electronic output for remote indication and SCADA integration
- Tank connection (mounting flange) for mounting points on the side, top or bottom of the vessel
- Float arm and capillary length
- Dial scale, type and colors



#### QUALITROL 039 Remote electronic oil level indicators

##### Application

For continuous oil level indication with integrated control and alarm functions. Designed for use where the point of measurement is not easily viewed by personnel requiring separate or remote indication.

##### Features

- Up to 2 switches (contacts) for control and alarm functions
- 0-1 or 4-20mA continuous remote output for integration into SCADA systems
- Case sensor assembly (with dial) is designed for use with QUALITROL 032 or 042 oil level indicator flange styles for easy retrofit applications

##### Options

- 3 oil level indicator model for consolidation of 3 indications into one robust IP54 enclosure
- Float travel ranges from min to max markings for various tank configurations
- Tank connection (flange) style, materials, dial style and dial layout
- Heater for enclosure
- Up to 2 switches



**Fault Locators**



**MARK VI**

**HATHAWAY MARK VI**  
Traveling wave fault locator

**Application**

For pinpoint fault location on inter-connected high voltage lines of any length to within +/- 150 meters of actual fault location. Works on lines with tapped loads, non-uniform construction and series and parallel compensation.

**Features**

- Double ended measurement with automatic data consolidation to a central location for distance to fault calculation and display on a single screen
- Data download and consolidation via modem or Ethernet link
- Up to 8 lines can be monitored on one TWS device, ideal for substations with common relay rooms

**Options**

- DNP 3.0 interface to SCADA channel to feed data to third party software



**DSFL**

**HATHAWAY DSFL**  
Traveling wave fault locator

**Application**

For pinpoint fault location on inter-connected high voltage lines of any length to within +/- 150 meters of actual fault location. Works on lines with tapped loads, non-uniform construction and series and parallel compensation.

**Features**

- Double ended measurement with automatic data consolidation to a central location for distance to fault calculation and display on a single screen
- Data download and consolidation via modem or ethernet link
- Compact size, monitors up to 2 lines, ideal for distributed substations

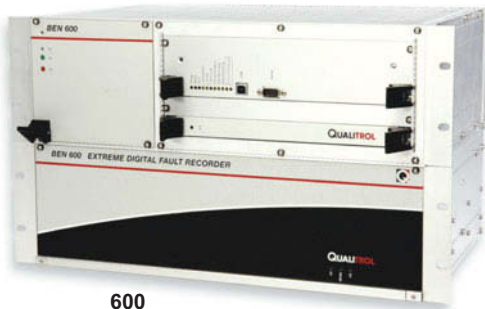
**Options**

- DNP 3.0 interface to SCADA channel to feed data to third party software

## Digital Fault Recorders



6000



600

### BEN 6000 / 600 Extreme digital fault recorders

#### Application

For extreme digital fault recording and power generation monitoring with multifunctional capabilities, all contained in one device. Capable of disturbance system monitoring, power generation dynamic monitoring, fault recording, synchrophasor measurement, sequence of events recording and/or class A power quality monitoring.

#### Features

- Highest immunity and most accurate fault recorder available
- Up to 192 analog channels and 384 digital channels in a central or distributed architecture

#### Options

- Class A power quality
- Phasor measurement
- Impedance based fault location
- IEC 61850 Goose messaging
- Remote acquisition units



6000 PORTABLE

### BEN 6000 PORTABLE Portable extreme digital fault recorder

#### Application

For extreme mobile digital fault recording and power generation monitoring with multifunctional capabilities, all contained in one device. Designed for temporary or quick application of disturbance system monitoring, power generation dynamic monitoring, fault recording, synchrophasor measurement, sequence of events recording and/or class A power quality monitoring.

#### Features

- Highest immunity and most accurate mobile fault recorder available
- 16 analog and 16 digital channels, expandable via remote acquisition units

#### Options

- Class A power quality
- Phasor measurement
- Impedance based fault location
- IEC 61850 Goose messaging
- Remote acquisition units





Digital Fault Recorders



IDM

**HATHAWAY IDM**  
Digital fault recorder

**Application**

For digital fault recording and dynamic monitoring with multifunctional capabilities, all contained in one device. Can be used as digital fault recorder, disturbance system monitor, continuous fault recorder, synchrophasor measurement unit, impedance based fault locator and power quality monitoring.

**Features**

- Comprehensive fault recording capabilities with backward compatibility for all legacy products

**Options**

- Power quality
- Phasor measurement unit
- Impedance based fault location



IDM PORTABLE

**HATHAWAY IDM PORTABLE**  
Portable digital fault recorder

**Application**

For mobile digital fault recording and dynamic monitoring with multifunctional capabilities, all contained in one device. Designed for temporary or quick application of digital fault recording, disturbance system monitoring, continuous fault recording, synchrophasor measurement, impedance based fault location and power quality monitoring.

**Features**

- Comprehensive fault recording capabilities with backward compatibility for all legacy products

**Options**

- Power quality
- Phasor measurement unit
- Impedance based fault location



IDM UPGRADE

**HATHAWAY IDM UPGRADE**  
Digital fault recorder upgrade kits

**Application**

For upgrading legacy Hathaway products. Upgrade any Hathaway DFR1200, DFR I, II, IIB and IMS range to current Hathaway IDM digital fault recorder functionality.

**Features**

- Comprehensive fault recording and dynamic monitoring capabilities

**Options**

- Power quality
- Dynamic monitoring
- Phasor measurement unit
- Impedance based fault location

### Power Quality Monitors

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QWAVE LIGHT

#### QWAVE LIGHT Voltage quality monitor

##### Application

Voltage quality monitoring device for distribution substation monitoring and basic compliance reporting.

##### Features

- 3 channel monitoring
- DIN rail mounting metal enclosure



QWAVE

#### QWAVE Power quality monitor

##### Application

Power quality monitoring for distribution substations.

##### Features

- 6 channel monitoring

##### Options

- Mounting style (19 inch rack mounting, DIN rail or portable)



QWAVE PREMIUM

#### QWAVE PREMIUM Power quality monitor

##### Application

Power quality monitoring for trouble shooting and critical applications in distribution substations and industrial applications.

##### Features

- 8 channel monitoring
- Continuously record 1180 parameters (min, max, avg) for 10min (frequency in 10 seconds, harmonic reports in 3 second intervals)
- Customized record time intervals (1 min – 24 hours)

##### Options

- Transient recording (500 kHz or 10 MHz)



## Alarm Annunciation and Event Recording



4100

### SER4100 Alarm annunciation and event recording

**Application**

Versatile high speed distributed microprocessor-based data acquisition system designed to monitor and record, in real time, changes of state of customer supplied field inputs to a resolution of one millisecond. Wherever high speed equipment, fast process reactions or complex system interactions are involved the SER4100 makes identifying problems simple, minimizing unplanned outages and maximizing production.

**Features**

- Field proven reliability
- Highly scalable modular design
- Distributed architecture
- Flexible multitasking communications

**Options**

- Site specific configuration and customization
- Partially or fully redundant systems

## Alarm Annunciator



BETALARM

### BETALARM 4 Alarm annunciator

**Application**

Visual and audible warning of process alarm conditions with group repeat relay outputs and options for individual repeat outputs and MODBUS communications.

**Features**

- Cost effective general purpose alarm annunciation that can be tailored to suit almost any application
- Up to 256 alarm windows in a single fascia. 3 different window sizes available with 6 different window colors and customer printable window inscriptions
- Field programmable for any standard ISA alarm sequence in any window

**Options**

- Individual repeat relays
- Serial alarm communications bus
- Custom enclosures and mounting arrangements

## QUALITROL Field Services

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### Application

Start up, preventive maintenance and repair services on QUALITROL products for customers who want to ensure the most reliable start up and operation.

### Features

- Physical inspection, configuration, calibration, verification of functionality and commissioning report
- With proper start up by certified QUALITROL field engineers receive extended warranty on select products

### Options

- Comprehensive preventive maintenance contracts
- On-site commissioning
- Equipment start up and troubleshooting



## QUALITROL Education Services

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### Application

Customer product training in commissioning, set up and operations for operations, engineering and maintenance departments.

### Features

- Hands on training with full product demonstration and practice
- All class room instruction and labs followed by quizzes and tests to ensure comprehension

### Options

- Customized content to customer needs
- Conducted on site or in central locations





	Pole Top Transformers	Pad Mount Transformers	Vault Transformer	Small Distribution Transformers	Large Distribution Transformers	Small Power Transformers	Large Power Transformers	Dry Type Transformers	Load Tap Changers	Voltage Regulators	Circuit Breakers and Other Gas Insulated Equipment	Non-Transformers Applications
<b>QUALITROL 150/151</b> Direct mount thermometers		•	•	•					•	•		•
<b>AKM 44611/48471</b> Direct mount thermometers		•	•	•								•
<b>QUALITROL 165/167 &amp; AKM 47080</b> Direct mount thermometers			•	•	•	•				•		•
<b>AKM 44612/44622/44617/44618</b> Direct mount thermometers		•	•	•	•	•						•
<b>QUALITROL 121</b> Direct mount thermometers with flexible probe			•	•	•	•				•		•
<b>QUALITROL 120</b> Direct mount thermometers			•	•	•	•						•
<b>QUALITROL 105</b> Remote mount thermometers					•	•	•	•	•			•
<b>QUALITROL 104/TR6000</b> Remote mount thermometers				•	•	•	•	•	•			•
<b>OTIWTI™</b> Remote mount thermometers (AKM)				•	•	•	•	•	•			•
<b>QUALITROL 201/202/205</b> Small pressure relief devices	•	•	•							•		•
<b>QUALITROL 206</b> Medium pressure relief devices		•	•	•		•				•		•
<b>QUALITROL LPRD/208/213/216</b> Large pressure relief devices				•	•	•	•		•			•
<b>QUALITROL XPRD</b> Extra protection relief devices				•	•	•	•		•			•
<b>QUALITROL146 &amp; AKM 35600/47500</b> Pressure or vacuum switches		•	•	•	•	•	•		•	•		•
<b>QUALITROL 141/148</b> Pressure or vacuum switches			•	•	•	•	•		•	•		•
<b>QUALITROL 050</b> Pressure or vacuum indicators		•	•	•	•	•	•		•	•		•
<b>QUALITROL 070/351</b> Pressure or vacuum bleeders		•	•	•	•	•	•		•	•		•
<b>QUALITROL 900/910</b> Rapid pressure rise relays			•	•	•	•	•		•	•		•
<b>QUALITROL 930</b> Electronic pressure monitors					•	•	•		•			•
<b>QUALITROL 118 ETM</b> Electronic dry type transformer monitor								•				
<b>QUALITROL 505 ETM</b> Electronic transformer monitor				•	•	•	•		•			

# Asset Protection Product Applications

	Pole Top Transformers	Pad Mount Transformers	Vault Transformer	Small Distribution Transformers	Large Distribution Transformers	Small Power Transformers	Large Power Transformers	Dry Type Transformers	Load Tap Changers	Voltage Regulators	Circuit Breakers and Other Gas Insulated Equipment	Non-Transformers Applications
<b>QUALITROL 509 ITM</b> Intelligent transformer monitor					●	●	●		●			
<b>QUALITROL 509 DW</b> Intelligent transformer monitor w/direct winding					●	●	●	●	●			
<b>QUALITROL 092-035</b> Flow indicators					●	●	●					●
<b>QUALITROL 038</b> Gas accumulation indicators					●	●	●					●
<b>QUALITROL 081/082/008/009</b> Position Indicators									●	●		
<b>HATHAWAY BCM 200/200E</b> On-line breaker condition monitors											●	
<b>HATHAWAY CBT 200/400</b> Portable circuit breaker test kits											●	
<b>QUALITROL 149-400</b> SF6 gas density monitors with 4-20mA											●	●
<b>AKM 38750/38920/38960</b> Large SF6 gas density monitors											●	●
<b>QUALITROL 149 &amp; AKM 47209</b> Small SF6 gas density monitors											●	●
<b>QUALITROL 020/030 &amp; AKM 46969/44680</b> Small oil level indicators		●	●	●						●		●
<b>QUALITROL 035</b> Small oil level indicators		●	●	●		●			●	●		●
<b>QUALITROL 032/042/045 &amp; AKM 44712/34725</b> Large oil level indicators				●	●	●	●		●	●		●
<b>AKM 34725/44712/34750</b> Large oil level indicators					●	●	●		●			●
<b>QUALITROL 013/006-12</b> Vertical oil level indicators		●	●	●					●	●	●	●
<b>QUALITROL 015</b> Vertical oil level indicators	●	●	●	●		●			●	●		●
<b>QUALITROL 049</b> Vertical oil level switches	●	●	●	●		●			●	●		●
<b>QUALITROL 029</b> Vertical oil level indicators			●									
<b>AKM OLR</b> Remote mechanical oil level indicators					●	●	●		●			●
<b>QUALITROL 039</b> Remote electronic oil level indicators					●	●	●		●			●



*Our sales and design engineers work closely with your product designers to achieve the specific solution for your individual application needs. And we test them to ensure that they will endure.*





**So much depends on you and your equipment,  
depend on the durability and quality of QUALITROL.**

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