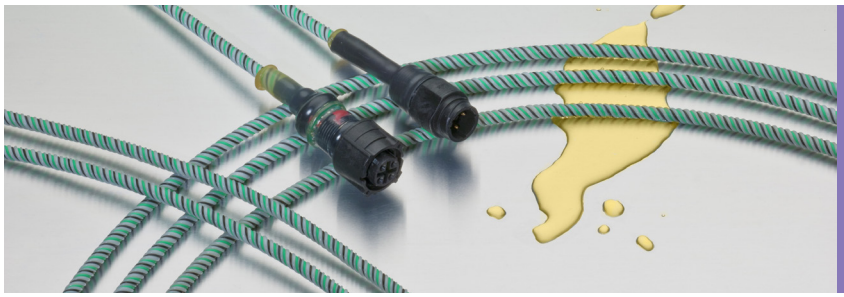
LIQUID LEAK DETECTION SYSTEMS
CHEMICAL DIVISION

FG-AC

Digital Acids Sense Cable

Product Datasheet



- Full addressable, Locating
- Flashing LED
- Microchip Integrated
- Pre-Connected
- Anti-Corrosion Material

General

The FG-AC digital acid sense cable detects and pin-points the presence of acid liquid along its entire length.
The FG-AC sense cable is designed to be connected to either the FG-SYS or the FG-NET digital units.
The FG-AC sense cable is installed in critical areas in order to provide permanent protection to limit the financial consequences of an undetected acid leak. The typical application is in laboratories, fab plants, cleanrooms, etc.
The FG-AC sense cable is made in tested material resistant to corrosion which is abrasive-resistant.
Clean and dry immediately the cable after the acid leak, FG-AC can be reused with long product life. It is still recommended to install FG-AC in a dry and clean environment for an efficient detection.

Features & Benefits

FEATURES

- Available in standard lengths of 3, 7 and 15 metres.
- The embedded microchip allows an independent digital transmission to the digital unit.
- The flashing LED on microchip permits quick visual identification of the cable status:
  - Green LED: normal status, no alarm raised;
  - Red LED: leak detection on the cable;
  - LED off: cablebreak on this or any preceding cables.
- Ingenious design: The 4 PVDF conducted helical construction - compression-connected on an extruded central core, insensitive to dust and metal particles contamination, prevents false alarms.
- Small diameter, light, flexible and in an easily identifiable green and white colours.
- Special fixing clips available to fasten the sense cables.
- A set of Belden 8723 jumper cables and connection accessories gives continuity to each circuit.

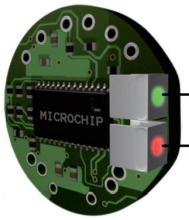
BENEFITS

- Detects and pin-points the location of an acid leak to the nearest metre along the length of the cable.
- Detects and localizes cablebreak on the cable.
- Short drying time.
- Reused after leaks.
- Easy installation with pre-finished male and female connectors.
- Flexible design: in both liner and sector mode (via FG-DTC box).

Technical Data

Compatibility	Digital units: FG-SYS E & F; FG-NET Diversion box: FG-DTC
Maximum Temperature Exposure	85°C
Maximum Length of Digital Sense Cable per Unit	Up to 120 lengths of FG-AC, connected to 3 circuits
Connector Type	FCI-Clipper
Weight	25g per metre without connector
Sense Cable Diameter	8mm with PVDF jacket (without connector)
Four Sensor Wires Diameter	1,2 mm with PVDF jacket
Core Material	Flame-retardant low-smoke PEBD-based polymer
Liquid Quantity to Active Alarm	50-100mm on the sense cable
Drying Time	10 seconds after drying the sense cable
Breaking Strength for Sense Cable	Minimum 75 kg
FG-AC Colour	White and green

Cutting Charts

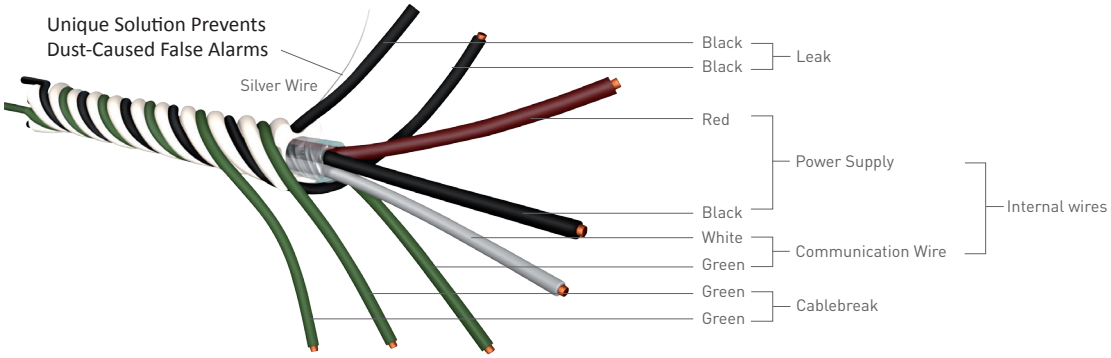


Microchip Embedded in Female Connector :

Green LED: Normal Status

Red LED: Leak Detected on the Cable

Female Connector With Addressable Electronic Module :



Technical Information

A= The cable resists in the presence of the liquid considered.
B= The cable resists corrosion well.
C= The cable resists, but undergoes a slow corrosion.

Note: In all cases, it is advised to exploit information of leak detection, to identify the escape of acid liquid, to repair and wash detecting cable FG-ACS contaminated during a normal time, to ensure better a performance of the system in time.
This list is not exhaustive; for other chemical bodies, specific concentrations or temperatures, consult us.

Acetic acid	A	Hydrochloric acid	C	Glucose	A
Alcohols	A	Benzene	A	Hydrocarbons	A
Ammoniac	C	Chloroform	A	Sea water	A
Nitric acid	A	Gasoline	A	Sodium sulfate	A
Silver nitrate	A	Ethanol	A	Sodium hydroxide	C
Hydrogen peroxide	A	Hydrofluoric acid	A	Salicylic acid	A
Carbonic acid	A	Formic acid	A	Sulphuric acid	A
Ferrous chloride	A	Freon	A	Toluene	A
Calcium Carbonate	A	Tar	A	Potassium hydroxide	C

Identification Codes

FG-AC15	Digital acids sense cable in 15m length with connectors
FG-AC7	Digital acids sense cable in 7m length with connectors
FG-AC3	Digital acids sense cable in 3m length with connectors
Accessories	
FG-CLC	Leader cable 3,5 m with female connector
FG-NC(x)	Belden jumper cables in variety of lengths (x): 3, 7, or 15 metres
FG-TMC	Modular end termination plug
FG-DTC	Diversion box
CFC100	100 hold-down clips with cold adhesive glue
ES40	40 signal tags

Certificates

FG-AC is a part of FG-SYS digital system, it meets the requirements of all European Stan-dards in EN 50081 and EN 50082 EMC.
FG-SYS digital system meets the TÜV requirements, according to IEC 61010-1/A2.
FG-SYS digital system is UL Listed.

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FG-AC_SG_v1.2.1_122013

LIQUID LEAK DETECTION SYSTEMS
CONSTRUCTION DIVISION

FG-EC

Digital Water And Base Liquids Sense Cable

Product Datasheet

- Full Addressable, Locating
- Flashing LED
- Microchip Integrated
- Pre-Connected

General

The FG-EC digital water sense cable detects and pin-points the presence of water and basic liquids along its entire length.
The FG-EC is designed to be connected to the FG-SYS and FG-NET digital units.
The FG-EC sense cable is installed in critical areas in order to provide permanent protection to limit the financial consequences of an undetected leak.
The FG-EC sense cable is made in tested material which is abrasive-resistant. It is still recommended to install FG-EC in a dry and clean environment for an efficient detection and improve the product's life time.

Features & Benefits

FEATURES

- Available in standard lengths of 3, 7 and 15 metres.
- The embedded microchip allows an independent digital transmission to the digital unit.
- The flashing LED on the microchip permits quick visual identification of the cable status:
  - Green LED: normal status, no alarm raised;
  - Red LED: leak detection on the cable;
  - LED off: cablebreak on this or any upstream cable.
- Ingenious design: 4 PEHD conducted helical construction - compression-connected on an extruded central core, insensitive to dust and metal particles contamination, prevents false alarms.
- Small diameter, light, flexible and in an easily identifiable light blue colour.
- Special fixing clips available to fasten the sense cables.
- A set of Belden 8723 jumper cables and connection accessories gives continuity to each circuit.
- FG-EC can also be manufactured in low smoke and zero halogen (LSZH) material for smoke reduction and low toxicity.

BENEFITS

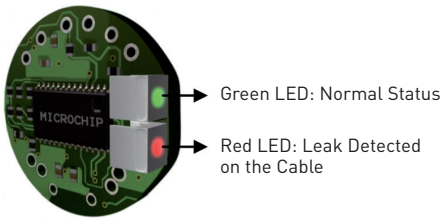
- Detects and pin-points the location of a water/base leak to the nearest metre along the length of the cable.
- Detects and localizes cablebreak on the cable.
- Short drying time.
- Reused after leaks, long product life.
- Easy installation with pre-finished male and female connectors.
- Flexible design: in both liner and sector mode (via FG-DTC box).

Technical Data

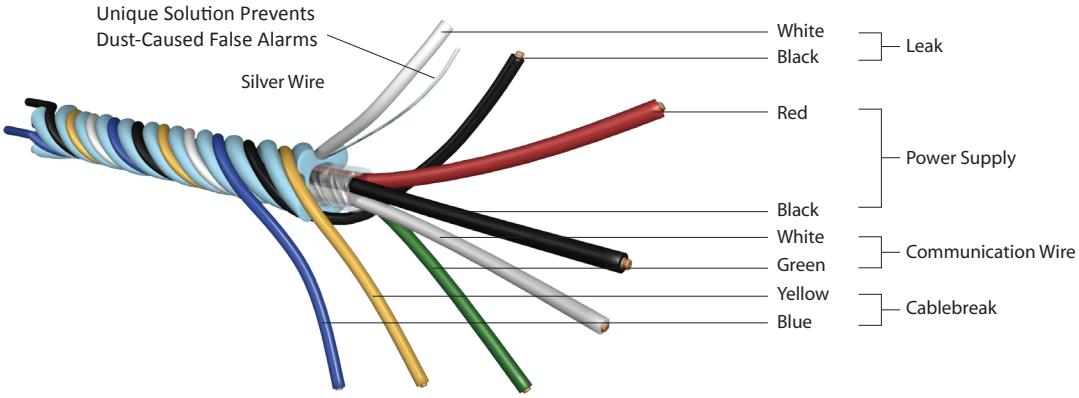
Compatibility	Digital units: FG-SYS E & F; FG-NET Diversion box: FG-DTC
Maximum Temperature Exposure	65°C
Maximum Length of Digital Sense Cable per Unit	Up to 120 lengths of FG-EC, connected to 3 circuits
Connector Type	FCI-Clipper
Weight	25g per metre without connector
Sense Cable Diameter	7,5 mm with PEHD jacket (without connector)
Four Sensor Wires Diameter	1,2 mm with PEHD jacket
Core Material	Flame-retardant low-smoke PEHD-based polymer
Liquid Quantity to Active Alarm	50-100mm on the sense cable
Drying Time	10 seconds after drying the sense cable
Breaking Strengh for Sense Cable	Minimum 75 kg
FG-AC Colour	Light blue

Cutting Charts

Microchip Embedded in Female Connector



Female Connector With Addressable Electronic Module



Identification Codes

FG-AC15	Digital acids sense cable in 15m length with connectors
FG-AC7	Digital acids sense cable in 7m length with connectors
FG-AC3	Digital acids sense cable in 3m length with connectors
Accessories	
FG-NC(x)	Leader cable 3,5 m with female connector
FG-TMC	Modular end termination plug
FG-DTC	Diversion box
CFC100	100 hold-down clips with cold adhesive glue
ES40	40 signal tags

FG-EC_SG_v1.2.1_122013

Certificates

FG-EC as a part of FG-SYS system, meets the requirements of all European Standards in EN 50081 and EN 50082 EMC.
FG-SYS system meets the TÜV requirements, according to IEC 61010-1/A2.
FG-SYS system is UL Listed.

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LIQUID LEAK DETECTION SYSTEMS

FG-SYS

Digital Unit for Leak Detection and Location

Product Datasheet

- Digital, Fully Addressable
- Instant Locating of Fault
- Dedicated Monitoring Software
- MODBUS/JBUS Connection
- Optional Extension Relays

General

The FG-SYS digital unit is designed to be used with all TTK digital sense cables, for water, bases, acid and hydrocarbon leak detection.
In the event of a fault on the sense cables (leak or cable break):

Primary responses from the FG-SYS unit:

- An audible alarm is triggered, the indicator light changes from green to red and a relay is activated.
- The display on the panel shows the leak location (to the nearest 1 metre) and fault's details (type of fault, leak or cable break), with time and date.

Secondary optional advanced responses:

- Dedicated monitoring software: TOPSurveillance installed on a computer will show dynamic drawings highlighting the location of the faults;
- Report to the BMS via a JBUS/MODBUS protocol.

The FG-SYS digital unit will reset automatically once the leak or the default is cleared.

Features & Benefits

FEATURES

- Available in two versions – Rack and wall mounted.
- 3 outputs are available, can be used independently.
- Up to 120 lengths of sense cables can be managed independently by the unit.
- 30 events history log allows to track leaks and cable breaks.
- 2 interface types for connection to building management and process control systems:
  - Two independent serial interfaces, each of them can be set for RS232 or RS422/485.
  - 9 relay contacts: 8 configurable relays + 1 specific relay for power interruption.
  - 8 relay positions are defined by a LED indicator.
  - Total programmable relays (can be extended to max 64 relays).
- Password is required for security.

BENEFITS

- Pin-point location of a leak (to 1 metre).
- Each sense cable is addressable and can be customized by assigning a specific identity and name.
- Multiple simultaneous leaks can be detected (120 cables = 120 alarms).
- Three different types of sense cables (for detecting conductive & hydrocarbon liquids) can be connected on the same panel for a truly bespoke system.
- Cable break faults can be detected (to the nearest cable).
- When a cable break occurs, the system maintains its integrity and keeps monitoring all cables installed before that break.
- Compatible with existing monitoring systems (Trend BMS etc.)
- Extension and upgrade of the system is easy. No additional power source or zoning panels are required.
- Minimum maintenance required.

Buttons Functions

"ACQ"	Allows manual acknowledgement of the audible alarm. This key is also used in the main menu and history record, to validate and to return to the previous screen.
"T"est	Launches the FG-SYS system test and cables scan. The display will show the numbers, names and lengths for each connected sensing cable.
"M"enu	Settings menu for cables names, date & time, sound alarm, relays, language, passwords and others. This menu is password protected.
"H"istory	Access to the events log registering the 30 last alarms sorted by date in a FIFO memory.

Technical Data

Compatibility	Sense cables: Digital + Analogue sense cables: FG-EC, FG-AC, FG-OD, FG-ECS, FG-ACS. Diversion boxes: FG-DTC, FG-DTCS, FG-DOD
Maximum Length of Sense Cable	1800 meters (600 meters per circuit)
Accuracy	+/- 1 meter
Operating Languages	English, French, German
Weight	2 Kg. for FG-SYS E; 3 Kg. for FG-SYS F
Dimensions	200x250x100mm (Wall mounted, F); 4U and 19" (Rack mounted, E)
Supply Voltage	100-240VAC, 50/60Hz, 15W
Working Temperature Range	0°C to 50°C
Working Humidity	5% to 95% non-condensing
Relay Types	Single contact NO-NC
Alarm Relays	Eight programmable relays for leaks and/or breaks with status LED, plus one power fail relay
Supported Protocol	Modbus RS232, RS422, RS485, available on two independent interfaces
Maximum Switching Voltage	150 V AC and 220 V DC
Maximum Switching Capacity	60 VA or 30 W

Digital Unit Status

Normal Operating Condition: The FG-SYS digital unit doesn't detect any problem.

Leak Detection: a leak occurs on one of the monitored zones; a signal light turns to red, an audible alarm sounds, a de-energized relay is activated; the LCD display shows the time and date of the alarm with the area name and the leak location in metres.

Cable Break: When the FG-SYS digital unit detects a circuit break on one of the monitored circuits; a signal light turns to red, an audible alarm sounds, a de-energized relay is activated; the LCD display shows the time and date of the alarm with the area name and the damaged cable number.

Technical Information

Terminal Block Wiring :

- Power: 100-240VAC 50/60Hz 15W. Power connector M+F.
- Circuits 1,2,3: 4 pts connector for leader cable FG-CLC.
- Relays: 8 relays with 3 pts connectors(COM, NO, NC) programmable.
- Serial interfaces 1&2: Screw terminals with RS232 or RS422/485 for JBUS/MODBUS communication to BMS, and for external relays or PC Computer.

Identification Codes

FG-SYS F (Wall Mounted)	FG-SYS Digital Unit Wall Mounted in Metal Enclosure
FG-SYS E (Rack mounted)	FG-SYS Digital Unit Rack Mounted in 19" & 4U
FG-EC, FG-AC or FG-OD	Digital Sensing Cables in 3m, 7m, and 15m lengths (3, 7, and 12m for FG-OD)
Accessories	
FG-CLC	Leader Cable (Belden ref. 8723 in 3.5m lengths)
FG-TMC	End termination plug
FG-DTC	"T" Branch, Diversion Box
FG-DOD	OD bus interface

Certifications

FG-SYS digital unit meets the requirements of all European Standards in EN 50081-1 (92) and EN 50082-1 (92) (report reference n° 8080612-CQPE/1 dated 14/09/1998)
FG-SYS digital unit meets the TÛV requirements, according to IEC 61010-1/A2.
FG-SYS leak detection and locating system is UL Listed.

All the connections in the FG-SYS digital unit must be done with the power supply switched off.
Read carefully the installation procedure for the FG-SYS digital unit.

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