e-Front runners

FUJI ELECTRIC

Fuji Electric France S.A.S.

A New Generation Of Pressure Transmitters

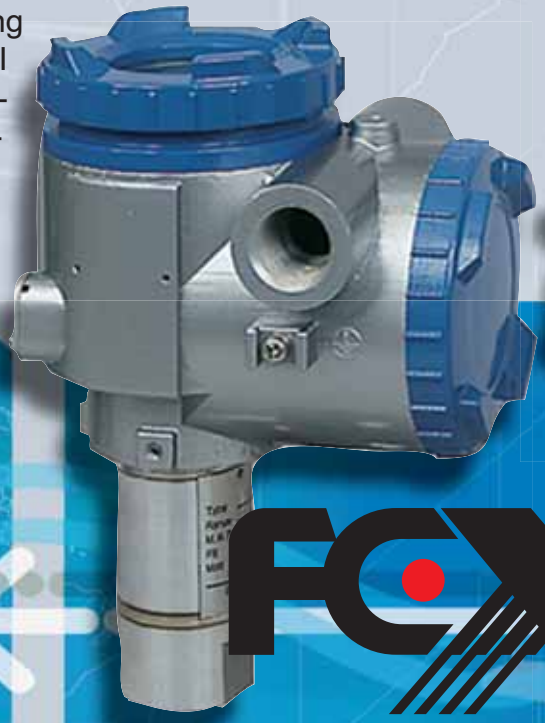
FCX-AII V5

ECNO : 610e

A New Transmitter at the edge of Technology

As a leader in the field of pressure measurement, Fuji Electric has an installed base of more than 1 000 000 FCX transmitters all around the world. Using leading edge technology in silicon chip manufacturing, FCX transmitters incorporate a high performance micro capacitance silicon sensor. In response to customer request, Fuji Electric has developed a new pressure transmitter : the FCX-AII V5.

The FCX-AII V5 is a high performance transmitter, designed to solve the toughest of applications where special materials and design are needed. Offering a variety of measuring ranges, the FCX-AII V5 is built and configured to meet individual application requirements in most markets.



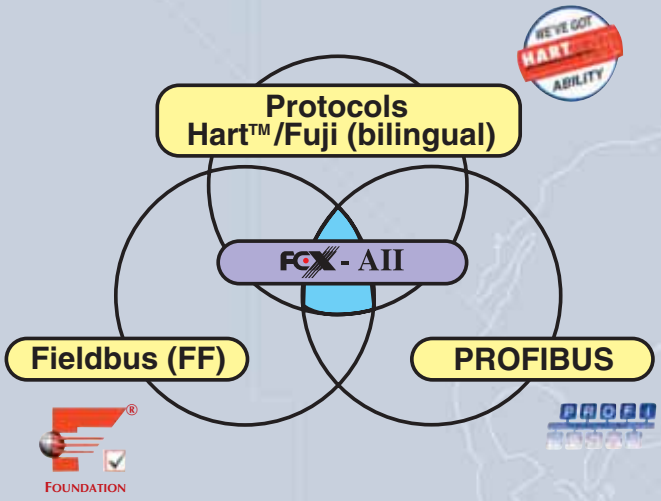
FCX-AII V5

Our facility at Fuji Electric France was formed in 1995 and within 18 months was accridited with ISO quality certification AFAQ in November 1997. The last update of the ISO 9001 : 2000 standard was successfully completed in October 2003 and provides quality assurance for our sales and manufacturing activities.

AFAQ ISO 9001

Approvals

SIL - PED
NAMUR-
NACE
GOST - ATEX
FM - CSA - JIS



The FCX-AII V5 pressure transmitter is “Smart” and provide 4-20mA & superposed digital signals and use bilingual language capability which uniquely provide Hart® and Fuji protocol as a standard.
In addition, it can be supplied to communicate using either Foundation Fieldbus H1 or Profibus PA protocols.

The Fuji Electric hand held communicator (HHC) is a very useful configuration tool for the FCX-AII V5 transmitter. As a menu driven device the HHC can be used to remotely display and configure transmitter parameters :

- **Principle programmable parameters :**
  - Zero
  - Span
  - Burnout
  - Output signal
  - Auto diagnostic
  - Type of output signal (linear / √)
  - Damping
  - Current generation
  - Tag
  - Model number of the transmitter
- **Liquid crystal display using 4 lines and 16 characters**
- **Intrinsically safe**
- **Printer as an option**

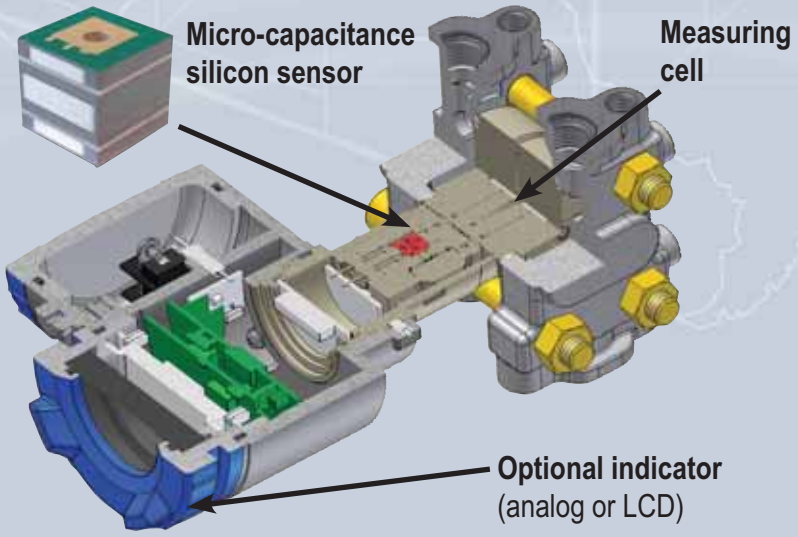
Using the Hart® communication protocol, the FCX-AII V5 transmitter can also be configured by any Hart® protocol compatible hand held communicator.

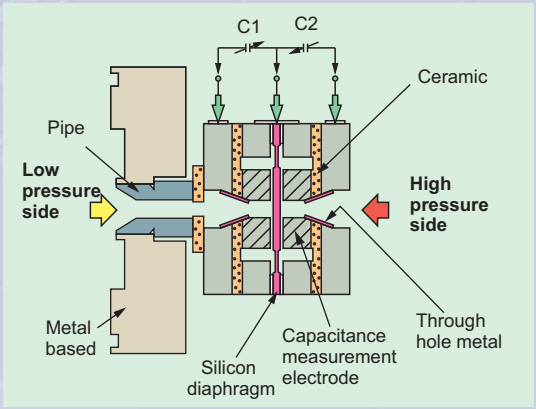
The FCX-AII V5 pressure transmitter can also be configured using Hart® communication based software “Hart® Explorer” connected to your Laptop or PC.
Configuration of the above parameters is possible and the settings can also be saved for future reference. It’s also possible to measure and record process values.
The interface between the PC and the transmitter is performed by a mini modem USB/Hart® to guarantee the communication between the PC and the 4 to 20 mA loop of the transmitter.

Micro capacitance based technology

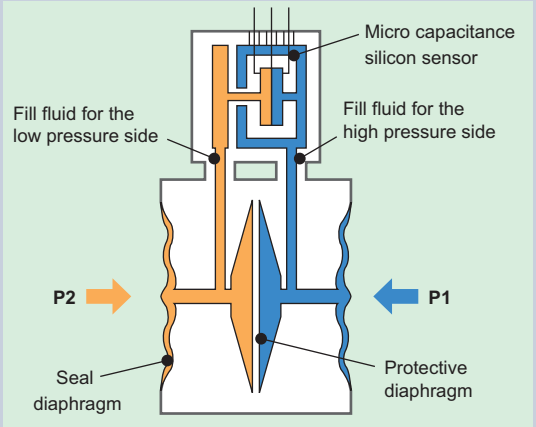
- ACCURACY : Standard ± 0.065% of calibrated span
  Optional ± 0.04% of calibrated span
- Long term STABILITY : ± 0.1% of max. span/10 years
- Differential Pressure Transmitters for static pressure up to 1035 bar (15 000 PSI)

Based on our extensive silicon chip manufacturing experience, Fuji Electric developed the unique micro capacitance silicon sensor as the centrepiece of FCX-AII V5 transmitters.
As a measuring diaphragm material, the sensor uses a single crystal silicon that has minimal hysteresis and fatigue which improves the transmitter's characteristics improving long term stability and reliability. The FCX-AII V5 transmitters comply with manufacturing quality control according ISO 9001 requirements.





The differential pressure is applied on the silicone sensor and changes the two capacitance values of the sensor. It is assembled floating in the measuring cell neck and improves the static pressure and temperature characteristics.
The effect of differential pressure on the sensing element fluctuates the two micro-capacitance measurement electrodes.



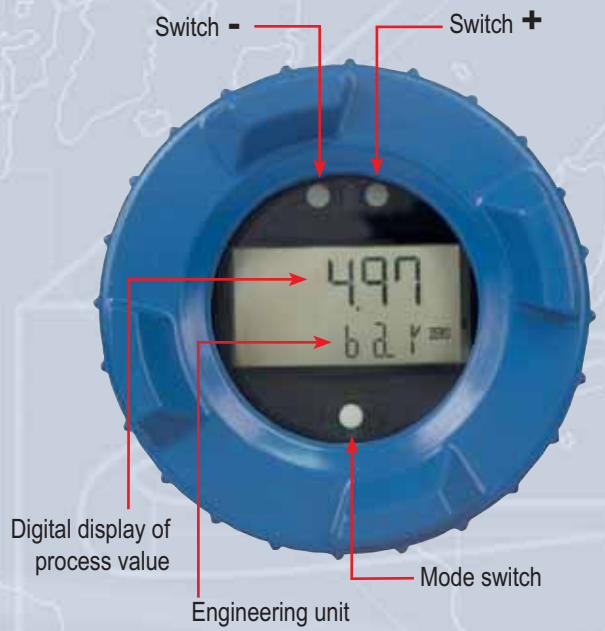
Many Additionnal Configurations

Digital Indicator :

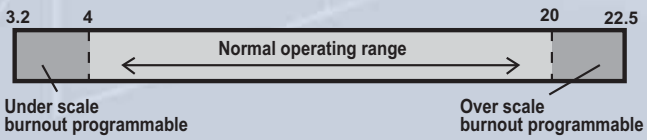
The FCX-AII V5 transmitter can be fitted with an optional local analogue, or digital indicator. The digital indicator is based on LCD technology and shows the information on 2 lines each of 6 digits and also includes 3 switches. The indicator can be used to show the output signal in engineering units, as a percentage or as a current in mA (this is useful for flow indication on a differential pressure transmitter).

Features :

- Zero/Span calibration without reference pressure service
- Linear or square root signal
- Damping
- Configuration on the digital indicator
- Zero/Span calibration
- Self diagnosis
- Output circuit calibration
- Direction and value of burnout...



Burnout current :



In conformance with the recommendations of NAMUR NE 43, the output of the transmitter can be driven to a specific value should the transmitter experience an internal failure. The standard output signal limits are 3,2 to 22,5 mA. In case of a transmitter failure, the burnout direction can be down scaled (3,2 to 4 mA) or up scaled (20 to 22,5 mA), being programmable.

Maintenance functions :

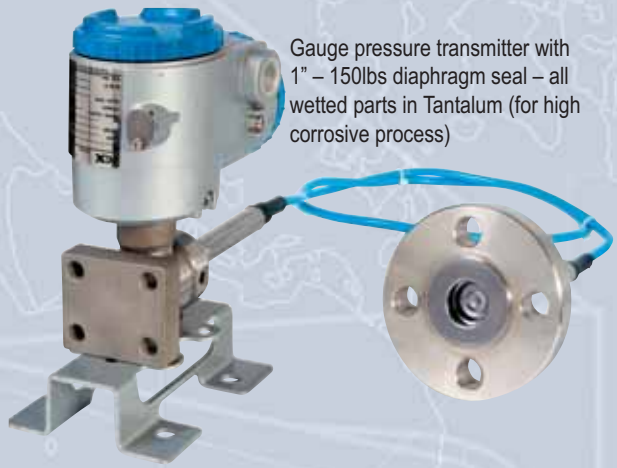
The calibration parameters are saved in the transmitter. At any time it is possible to come back to the factory calibration of the transmitter.

Min and max temperatures are stocked in the transmitter memory. It is always possible to visualize the values in a specific menu on the screen of the hand held communicator.

All the adjustment functions of the transmitter can be locked by a password (the external adjusting screw is also locked).

Special Applications

Pressure measurement



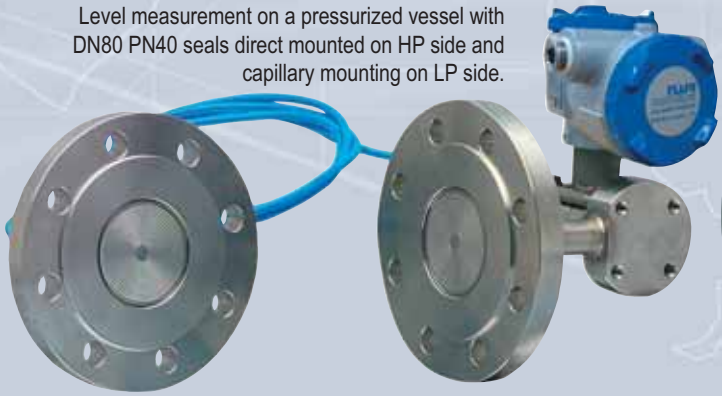
Gauge pressure transmitter with 1" – 150lbs diaphragm seal – all wetted parts in Tantalum (for high corrosive process)

Pressure measurement with DN 50 PN 40 diaphragm seal.

Pressure measurement for sanitary, pharmaceutical …, remote seal without dead volume

Level measurement

Level measurement on a pressurized vessel with DN80 PN40 seals direct mounted on HP side and capillary mounting on LP side.

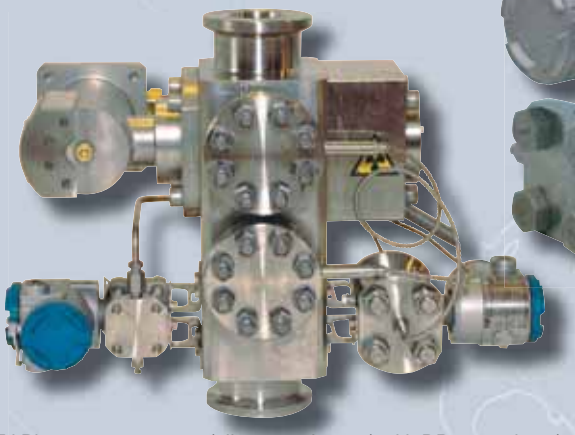


Level measurement with an extended diaphragm seal.

Differential pressure or level measurement for special applications, wetted parts are gold plated, gasket face with spigot.

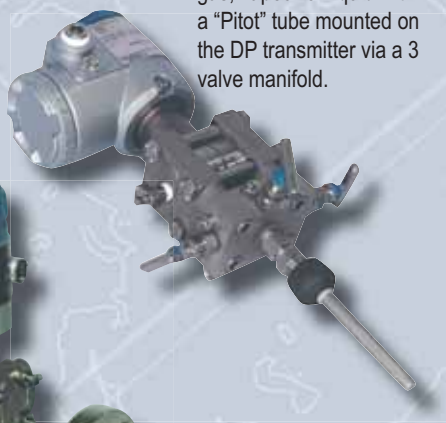
Level transmitter DN 80/P N40 - short design suitable for applications where installation space is restricted

Flow measurement



Tri Phase measurement (oil, gas and water) with DP transmitter (static pressure up to 1035 bar) on a venturi and static pressure correction via GP transmitter. *(PhaseWatcher Vx developed by Framo Engineering AS & Schlumberger).*

Flow measurement for Off-Shore applications, static pressures up to 1035 bar, stainless steel 316 housing option.



Flow measurement on gas, vapour or liquid with a “Pitot” tube mounted on the DP transmitter via a 3 valve manifold.

Integrated orifice, direct mounted on a DP transmitter for very low flow measurement for gas or liquid.

Custom built transmitter

Fuji Electric’s French manufacturing plant represents an extensive investment in specialised manufacturing plant and machinery. This allows us to produce custom built transmitters to meet very specific applications.

TIG welding :
TIG (Tungsten Inert Gas) welding technology guarantees robust and reliable assemblies. These specialised welding facilities enable us to assemble the diaphragm seals, the capillaries and directly mount the seals on the transmitters.
All welds are checked by a Helium tester to guarantee the integrity of the weld.

Machining Facilities :
The numerous machining centres and specialist machines enable Fuji Electric to offer a very flexible production capability and to offer pressure transmitters with unbeatable delivery times.

CAD Facilities :
New diaphragm seal designs and specific process connections are developed by the team of technicians and engineers meeting customer specifications, via state of the art Computer Aided design technology.

Calibration Benches :
All Fuji Electric transmitters are calibrated on computer based automatic benches. The modern design of these high accurate benches ensure that even the slightest error is detected.

Clean Room :
The manufacturing of the silicon measuring cell is the centrepiece of all FCX AII/CII transmitters. The assembly of the measuring cell is conducted in a class 10 000 clean room which provides the highest level of assurance. This facility adds to the design, machining, assembling and calibration of our product and allows us to control all aspects of the quality and guaranteed performance.

Specifications

Transmitters type								
	Differential pressure kPa (mbar)	**Gauge pressure kPa (bar)**	**Absolute pressure kPa (bar)**	**Level transmitter kPa (mbar)**	**Remote seal transmitter kPa (mbar)**	**Gauge pressure kPa (bar)**	**Absolute pressure kPa (bar)**	**Remote seal transmitter kPa (bar)**
Maximum span	1 (10) 6 (60) 32 (320) 130 (1300) 500 (5000) 3000 (30000) 20000 (200000)	130 (1,3) 500 (5) 3000 (30) 10000 (100) 50000 (500)	16 (0,16) 130 (1,3) 500 (5) 3000 (30) 10000 (100)	32 (320) 130 (1300) 500 (5000)	According transmitter version	130 (1,3) 500 (5) 3000 (30) 10000 (100)	130 (1,3) 500 (5) 3000 (30)	130 (1,3) 500 (5) 3000 (30) 10000 (100)
Model	**FKC**	**FKG**	**FKA**	**FKE**	**FKB/D/M**	**FKP**	**FKH**	**FKH/P**
Datasheet n°	EDSF6-134	EDSF5-92	EDSF5-91	EDSF7-68	EDSF6-05	EDSF5-98	EDSF5-97	EDSF6-06
Rangability	100 : 1 depending of the maximum span					16 : 1 depending of the maximum span		
Accuracy of adjusted span	Up to ±0.04% / standard ±0.065% (others : please refer to the datasheets)					±0.1%	±0.2%	±0.1% or ±0.2%
Temperature limits	-40 to + 120°C (process) -40 to +85°C (ambient)					-40 to + 100°C (process) -40 to +85°C (ambient)		
Wetted parts material	SS 316L Hastelloy-C® Monel® Tantalum (Please refer to the datasheets for more details)					SS 316L		
Output signal &power supply	4-20mA DC + Fuji et Hart® protocols / 10.5 to 45V DC (power supply)							
Communication	FUJI / HART® protocols (standard) / Fieldbus Foundation H1 or Profibus PA (option)							
Environmental protection	CEI IP67 and NEMA 4X							
Hazardous area certifications	Intrinsic safety and flame proof areas (ATEX, FM, CSA...) (Please refer to the datasheets for more details)							
Available functions	1/ Burnout according NAMUR NE43 recommandation 2/ Linearization function (14 points) to linearize the output signal							
Options	1/ Local analog or digital indicator, 2/ Arrestor (lightning protection), 3/ Stainless steel (SS 316) electronics housing, 4/ NACE requirements, 5/ High process temperature, vacuum service (for level and remote seal transmitters), 6/ Chlorine service,				7/ Diaphragm with gold or gold/ceramic for hydrogen applications, 8/ Stainless steel bolts and nuts, 9/ PTFE process cover gasket, 10/ Tag plate, 11/ Side vents			

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