ABSOLUTE PRESSURE TRANSMITTER (DIRECT MOUNT TYPE)

DATA SHEET

The FCX-AII absolute pressure transmitter (Direct mount type) accurately measures absolute pressure and transmits proportional 4 to 20mA signal.

The transmitter utilizes the unique micromachined capacitive silicon sensor with state-of-the-art microprocessor technology to provide exceptional performance and functionality.



FEATURES

1. High accuracy

0.2% accuracy for all calibrated spans is the standard feature for all AP models covering 8.125 to 3000kPa {0.13 to 30bar} high pressure range. Fuji's micro-capacitance silicon sensor assures this feature for all suppressed calibration ranges without additional adjustment.

2. Minimum inventory

Electronics unit, communication module, local indicators and electronics housing are interchangeable among all FCX-AII models.

3. Fuji/HART bilingual communication module

The communication module is "bilingual" to speak both Fuji proprietary protocol and HART. Any HART compatible devices can communicate with FCX-AII series transmitters.

4. Application flexibility

Example features that render the FCX-AII suitable for almost any process applications includes:

- Full range of hazardous location approvals
- Built-in RFI filter and lightning arrester
- 5-digits LCD meter
- The maximum span of each sensor can be converted to in different units using below factors.
- 5. Burnout current flexibility (Under Scale: 3.2 to 4.0mA, Over Scale: 20.0 to 22.5mA)

Burnout signal level is adjustable using Model FXW Hand Held Communicator (HHC) to comply with NAMUR NE43.

SPECIFICATIONS

Functional specifications

Туре:	4 to 20mA with digital signal
Service:	Liquid, gas, or vapour
Span, range, and	overrange limit:

Туре	Span limit [kPa abs] {bar abs}		Range limit [kPa abs]	Overrange limit
туре	Min.	Max.	{bar abs}	[MPa] {bar}
FKHD02	8.125	130	0 to 130	0.5
	{0.08125}	{1.3}	{0 to 1.3}	{5}
FКН□03	31.25	500	0 to 500	1.5
	{0.3125}	{5}	{0 to 5}	{15}
FKH□04	187.5	3000	0 to 3000	9
	{1.875}	{30}	{0 to 30}	{90}

Output signal: 4 to 20mA DC with digital signal superimposed on the 4 to 20mA signal.

Power supply: Transmitter operates on 10.5V to 45V DC at transmitter terminals.

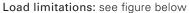
10.5V to 32V DC for the units with optional arrester

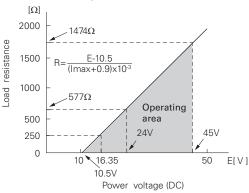
EDSX5-97h Date Aug. 10, 2011

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FCX-AIII Series

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Note: For communication with FXW, min. of 250 Ω required.

Hazardous locations: SEE TABLE 3 Zero/span adjustment:

	Zero and span are adjustable either from
	the HHC ⁽¹⁾ . Zero is also adjustable exter-
	nally from the adjustable screw.
Damping:	Adjustable electrical damping
	The time constant is adjustable between
	0.06 to 32.0 seconds.
Zero elevation/s	uppression:
	Zero may be elevated within the specified
	range limit of each sensor model.
Normal/reverse	action:
	Configurable from HHC ⁽¹⁾ .
Indication:	Analog indicator or 5-digit LCD meter, as
	specified.
Burnout direction	: Selectable from HHC ⁽¹⁾
	If self-diagnostic detect transmitter failure,
	the analog signal will be driven to either
	"Output Hold", "Output Overscale" or
	"Output Underscale" modes.
"Output Hold	1":
	Output signal is hold as the value just
	before failure happens.
"Output Ove	rscale":
	Adjustable within the range 20.0mA to
	22.5mA from HHC ⁽¹⁾
"Output Und	erscale":
	Adjustable within the range 3.2mA to
	4.0mA from HHC ⁽¹⁾
3.2 4	20 22.5 [mA]
$\overline{}$	Over scale

Under scale Normal operating range Probable over range

Output Limits comforming the NAMUR NE43 by order.

Temperature limit: Ambient: -40 to +85°C

(-20 to +80°C for LCD indicator)
 (-40 to +60°C for arrester option)
 For explosionproof units (flameproof or intrinsic safety), ambient temperature must be within the limits specified by each standard.

Process: -40 to +85°C for silicone fill sensor

Storage: -40 to +90°C

Humidity limit: 0 to 100% RH

Communication: With HHC⁽¹⁾ (Model FXW, consult Data Sheet No. EDS8-47), following items can be remotely displayed or configured.

Note: HHC's version must be higher than 7.0 (or FXW □□□□1–□4), for FCX -AⅢ.

Local configurator with LCD display (option):

Local configurator with 3 push button and LCD display can support following items.

Items	By communication with FXW		By local configurator (with 3 push button)	
	Display	Set	Display	Set
Tag No.	V	V	V	V
Model No.	V	V	V	V
Serial No. & Software Version	V	_	v	_
Engineering unit	V	V	v	V
Range limit	V	_	v	_
Measuring range	V	V	v	V
Damping	V	V	v	V
Output mode	V	_	v	_
Burnout direction	V	V	v	V
Calibration	V	v	v	V
Output adjust	_	v	_	V
Data	v	—	v	_
Self diagnoses	V	_	v	_
Printer (In case of FXW with printer option)	v	_	_	_
External switch lock	V	V	V	V
Transmitter display	V	V	V	V
Linearize	V	V	—	_
Rerange	v	v	v	V
Saturate current	v	v	v	V
Write protect	v	v	v	V
History – Calibration history – Ambient temperature history	v v		v v	

EMC Conformity: EN61326-1: 2006 €

Performance specifications

Accuracy rating:	(including linearity, hysteresis, and re- peatability).		
	ter than 1/10 of URL: ±0.2% of span		
For spans below			
± (0.1 +	0.1 <u>0.1 × URL</u>) % of span		
Stability:	$\pm 0.2\%$ of upper range limit (URL) for 10		
	years		
	(In case of 6th digit code "3", "4")		
Temperature eff	ect:		
	Effect per 28°C change between the limits of -40°C and +85°C		
	Zero shift: ± (0.4 + 0.2 <u>URL</u>)%/28°C		
	Total effect: ± (0.475 + 0.2 URL)%/28°C		
Overrange effect	: Zero shift, 0.3% of URL for any overrange		
	to maximum limit		
Update rate:	60 msec		
Step response:	Time constant. 0.08 s (at 23°C)		
	Dead time: about 0.12 s		
	(without electrical damping)		
Mounting position	on effect:		
	Zero shift, less than 0.1kPa for a 10° tilt		
	in any plane.		
	No effect on span. This error can be		
	corrected by adjusting zero.		
Dielectric streng	th:		
	500V AC, 50/60Hz 1 min., between circuit		
	and earth.		
Insulation resist	ance:		
	More than 100M Ω at 500V DC.		
Internal resistance for external field indicator:			
	12Ω or less		

Physical specifications

Electrical connections: G1/2, 1/2-14NPT, Pg13.5, or M20 x 1.5 conduit, as specified.

Process connections:

1/2-14 NPT, 1/4-18NPT, Rc1/2 or Rc1/4 as specified.

Process-wetted parts material:

Material code (7th digit in "Code symbols")	Process cover	Diaphragm	Wetted sensor body	Vent/drain
V	316 stainless steel	316L stainless steel	316 stainless steel	316 stainless steel

Non-wetted parts material:

	Electronics housing: Low copper die-cast
	aluminum alloy (standard), finished
	with polyester coating, as specified.
	Fill fluid: Silicone oil
	Mounting bracket: 304 stainless steel
Environmental	protection:
	IEC IP67 and NEMA 4X
Mounting:	On 60.5mm (JIS 50A or 2B) pipe using
	mounting bracket, direct wall mounting,
	or direct process mounting.
Mass{weight}:	Transmitter approximately 2.2kg without
	options.
	Add; 0.5kg for mounting bracket

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Optional features

Indicator:	A plug-in turnable analog indicator (2.5% accuracy)
	An optional 5 digits LCD meter is also
	available.
Local configurato	or with LCD display:
	An optional 5 digits LCD meter with 3
	push buttons can support items as using
	communication with FXW.
Arrester:	A built-in arrester protects the electronics
	from lightning surges.
	Lightning surge immunity: 4KV (1.2×50µs)
Degreasing:	Process-wetted parts are cleaned, but the
	fill fluid is standard silicone oil. Not for use
	for oxygen or chlorine measurement.
NACE specificati	on:
	Metallic materials for all pressure bound-
	ary parts comply with NACE MR-01-75.
Customer tag:	A stainless steel tag for customer tag data is wired to the transmitter.

ACCESSORIES

Hand held communicator:

(Model FXW, refer to Data Sheet No.EDS 8-47)

CODE SYMBOLS

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D FM, Flameproof (or explosionproof) (*4) (Note 4) H FM, Intrinsic safety and nonincentive (Note 4) Y FM, Combined of flameproof and intrinsic safety (*4) (Note 3) X ATEX Intrinsic safety (Note 3) R ATEX Type n ATEX Combined of flameproof and intrinsic safety (*3) (Note 3) R IECEx Scheme, Flameproof (*3) (Note 3) T IECEx Scheme, Intrinsic safety (Note 4) J CSA, Flameproof (or explosionproof) (*4) (Note 4) J CSA, Flameproof (or explosionproof) (Note 4) J CSA, Flameproof (or explosionproof) (Note 4) J CSA, Flameproof (or explosionproof) (Note 4) J None NePSI, Intrinsic safety (Note 4) J V NEPSI, Intrinsic safety (Note 5) S None (Note 5) Special applications and fill fluid Treatment Filled liquid Filled liquid Freatment Y None (standard) Silicon oil Silicon oil B Y None (standard) Silicon oil None (1/2 -14NPT) <td></td> <td></td> <td></td> <td>) (*1)</td> <td>(Note 1)</td>) (*1)	(Note 1)
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V FM Combined of flameproof and intrinsic safety (*4) (Note 4) X ATEX Flameproof (*3) (Note 3) K ATEX Intrinsic safety (Note 3) P ATEX Type n ATEX Combined of flameproof and intrinsic safety (*3) (Note 3) R TECES Scheme, Flameproof (*3) (Note 3) (Note 3) T IECEX Scheme, Flameproof (*4) (Note 4) J CSA, Flameproof (or explosionproof) (*4) (Note 4) J CSA, Intrinsic safety and nonincentive NEPSI, Flameproof (or exprosionproof) S NEPSI, Flameproof (or exprosionproof) NEPSI, Stainless tag V NePSI, Combined of flameproof and intrinsic safety V Verses tag Special applications and fill fluid Treatment Filled liquid Y None (standard) Silicon oil None (Standard) Silicon oil V None (1/2 -14NPT) None (1/2 -14NPT) A Rc1/2 C 1/4-18NPT V None (1/2 -14NPT) Rc1/2 (Note 6)					
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T IECEx Scheme, Intrinsic safety (Note 4) CSA, Flameproof (or explosionproof) (*4) (Note 4) J CSA, Intrinsic safety and nonincentive F NEPSI, Intrinsic safety U NEPSI, Intrinsic safety V NEPSI, Intrinsic safety U NEPSI, Intrinsic safety V NEPSI, Combined of flameproof and intrinsic safety None Ves (stainless steel) Q Process at applications and fill fluid Treatment Filled liquid None Special applications and fill fluid Treatment Filled liquid None Silicon oil Silicon oil Silicon oil Silicon oil Silicon oil V None (standard) Silicon oil V Process adaptor None (1/2 -14NPT) Rc1/2 C None (1/2 -14NPT) A Rc1/2 C I/4 -18NPT cOther options> (*6) (Note 6) L Instruction manual unattached				i intrinsic salety (*3)	
E CSA, Flameproof (or explosionproof) (*4) (Note 4) J CSA, Intrinsic safety and nonincentive NEPSI, Flameproof (or exprosionproof) NEPSI, Intrinsic safety NEPSI, Combined of flameproof and intrinsic safety U NEPSI, Intrinsic safety NePSI, Combined of flameproof and intrinsic safety V NEPSI, Combined of flameproof and intrinsic safety V Ves (stainless steel) Optional specification Stainless tag None Y B V Y None (standard) Silicon oil Silicon oil Silicon oil V V V V V V V Special applications and fill fluid Treatment Filled liquid None (standard) Silicon oil Silicon oil V V None (1/2 -14NPT) A Rc1/2 C (Note 6) L Other options> (*6) L					(11010-0)
F NEPSI, Flameproof (or exprosionproof) NEPSI, Intrinsic safety NEPSI, Combined of flameproof and intrinsic safety None Yes (stainless steel) Yes (stainless stag None Yes Yes <td< td=""><td>E</td><td>+</td><td></td><td>of) (*4)</td><td>(Note 4)</td></td<>	E	+		of) (*4)	(Note 4)
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A Mounting bracket None Yes (stainless steel) Optional specification Stainless tag None Y B Y Special applications and fill fluid Treatment Y None (standard) Silicon oil Degreasing NACE specification Silicon oil V Process adaptor None (1/2 -14NPT) A Rc1/4 B C V Other options> (*6) L C				ad intrincic octation	
A None C Yes (stainless steel) Optional specification Stainless tag None B Yes B Yes Yes (Note 5) Special applications and fill fluid Treatment Filled liquid None (standard) Silicon oil Degreasing Silicon oil NACE specification Silicon oil V Process adaptor None (1/2 -14NPT) A A Rc1/4 B Rc1/2 C (Note 6) L				iu intrinsic satety	
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Y Stainless tag None Yes (*5) Special applications and fill fluid Treatment Filled liquid None (standard) Silicon oil Degreasing Silicon oil NACE specification Silicon oil V Process adaptor None (1/2 -14NPT) Rc1/4 B Rc1/2 C 1/4-18NPT Cother options> (*6) (Note 6) L Cother options> (*6) (Note 6)					
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B Yes	Y				
Y Special applications and fill fluid Treatment Filled liquid None (standard) Silicon oil Degreasing Silicon oil NACE specification Silicon oil Process adaptor None (1/2 -14NPT) A Rc1/2 C 1/4-18NPT <	B		Yes } (*5)		(Note 5)
Y Treatment Filled liquid G None (standard) Silicon oil Degreasing Silicon oil NACE specification Silicon oil Y Process adaptor None (1/2 -14NPT) Rc1/4 B Rc1/2 C 1/4-18NPT Other options> (*6) L Instruction manual unattached	1		Special applications and fill fluid		
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G Degreasing Silicon oil N	Y	(
Process adaptor Y Process adaptor A Rc1/2 C Rc1/2 C 1/4-18NPT Other options> (*6) L Instruction manual unattached	G	;			
Y None (1/2 -14NPT) A Rc1/4 B Rc1/2 C 1/4-18NPT Other options> (*6) (Note 6) L Instruction manual unattached (Note 6)	N	╟╌┿╍┿╍┿╍┥	NACE specification	Silicon oil	
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C 1/4-18NPT Cother options> (*6) (Note 6) L Instruction manual unattached		A			
<pre></pre> <pre><</pre>					
L Instruction manual unattached			1/4-18NPT		
					(Note 6)
		L	Instruction manual unattached		
Note1: (*1) Available for 4th digit code "5".	Note1	: (*1) Availab	le for 4th digit code "5".		

Note1: (*1) Available for 4th digit code "5". Note3: (*3) Available for 4th digit code "6", "8".

Note4: (*4) Available for 4th digit code "6".

Note5: (*5) Customer tag number can be engraved on standard stainless steel name plate. If extra tag plate is required select "Yes".

Note6: (*6) If other option is not necessary, 21st digit code is blank. In case of 21st digit code is blank, instruction manual attached.

OUTLINE DIAGRAM (Unit:mm)

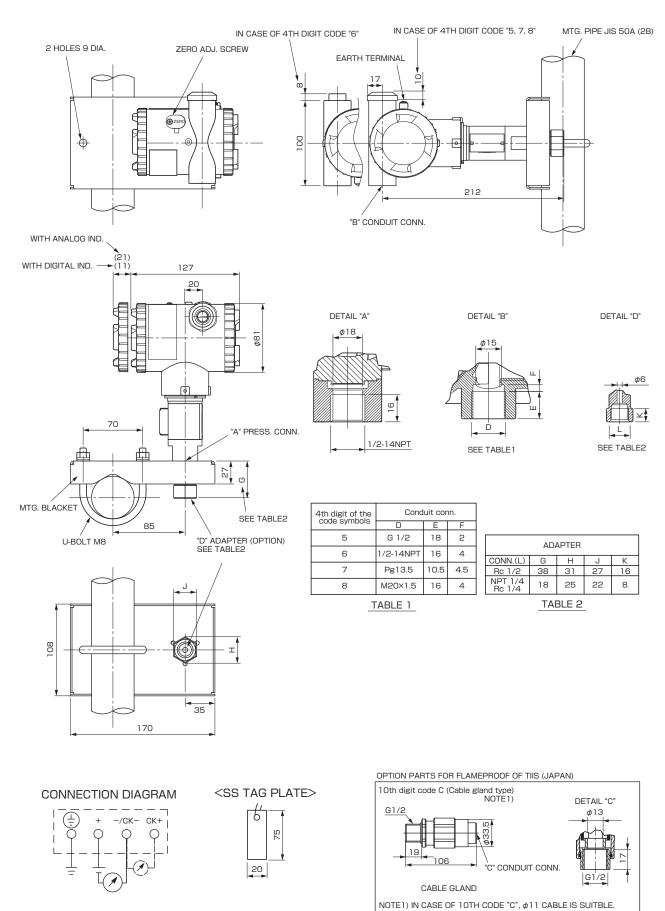


TABLE 3

Authorities	Intrinsic safety		
ATEX	Ex II 1 G Ex ia IICT5 Tamb = -40°C to +50°C Ex ia IICT4 Tamb = -40°C to +70°C		
		nA, Pi=0.66W, Arrester), Li=0.6	mH (Without analog indicator), 'mH (With analog indicator)
Factory Mutual	Class Div.1 Groups A, T4 Entity Type 4X		
	Mode	el code	Tarah
	9th digit	13th digit	- Tamb
	A,B,D	Y,G,N	-40°C to +85°C
	L,P,1,2	Y,G,N	-20°C to +80°C
	Q,S,4,5	Y,G,N	-20°C to +60°C
	E,F,H	Y,G,N	-40°C to +60°C
	Entity Parameters Vmax=28V, Imax Ci=35.98nF, Li=0	=94.3mA, Pi=	0.66W,
CSA	Temp Code T4 Entity Parameters Vmax=28V, Imax	F, G Tamb max = + Tamb max = + :: :=94.3mA, Ci= rester),Li=0.6ml	
TIIS	Ex ia IIC T4 Tamb max = +60 Entity Parameters Ui=28V, li=94.3n Ci=38.4nF, Li=0.1	:: nA, Pi=0.66W,	
IECEx Scheme		+50°C :: nA, Pi=0.66W, Arrester), Li=0.6	mH (Without analog indicator), 'mH (With analog indicator)
NEPSI	Ex ia IIC T4 Ex d IIB+H ₂ T6 / E <u>Mode</u> 9th digit	x ia IIC T4 el code 13th digit	Tamb
	A,B,D	Y,G,N	-40°C to +85°C
	L,P,1,2	Y,G,N	-20°C to +80°C
	Q,S,4,5	Y,G,N	-20°C to +60°C
	E,F,H	Y,G,N	-40°C to +60°C
	Entity Parameters Ui=42.4V, li=113 Ci=35.98nF, Li=0	: mA, Pi=1W,	1

Authorities		Flamepro	of
ATEX	Ex II 2 GD Ex d IICT6 IP66, Tamb = -40°C Ex d IICT5 IP66, Tamb = -40°C	to +65°C /67 T100°C	
Factory Mutual	Class I Div.1 Groups B, T6 Type 4X Class II III Div.1 Groups E, T6 Type 4X Tamb max = +60	F, G	
CSA	Class I Div.1 Groups C, Class II Div.1 Groups E, Class III Div.1 Note) "Seal Not F	F, G	sure is allowed.
IECEx Scheme	Ex d IICT5 IP66/6 Tamb = -40° C to Ex d IICT6 IP66/6 Tamb = -40° C to	57 5 +85°C 57	
TIIS	Ex do IIB+H ₂ T4 Tamb max = +60 Maximum proce		0°C
NEPSI	$Ex d IIB+H_2T6$ Tamb = -40°C to	o +60°C	
Authorities		Type n Nonincenc	
ATEX	Ex II 3 GD EEx nL IIC T5 Tai EEx nL IIC T4 Tai Specific Paramete Model without ar Ui=42.4V, Ii=113 Ci=25.18nF, Li=0 Model with arres: Ui=32V, Ii=113m Ci=35.98nF, Li=0 EEx nAL IIC T5 T	mb = -40°C to ers: rester: mA, Pi=1W, 0.694mH ter: IA, Pi=1W, 0.694mH	+70°C
	EEx nAL IIC T4 T Specific Paramete Model without ar Umax=42.4V, Im Model with arres: Umax=32V, Ima	amb = -40°C to ers: rester: nax=113mA, Pm ter:	o +70°C nax=1W,
Mutual	Specific Paramete Model without ar Umax=42.4V, In Model with arres Umax=32V, Ima Class I II III Div.2 Groups A, T4 Entity Type 42	iamb = -40°C to ers: rester: nax=113mA, Pm ter: x=113mA, Pma: B, C, D, F, G	o +70°C aax=1W, x=1W
Mutual	Specific Paramete Model without ar Umax=42.4V, In Model with arres Umax=32V, Ima Class I II III Div.2 Groups A, T4 Entity Type 42	amb = -40°C to ers: rester: nax=113mA, Pm ter: x=113mA, Pma; B, C, D, F, G K	o +70°C nax=1W,
Factory Mutual (pending)	Specific Paramete Model without ar Umax=42.4V, Im Model with arres Umax=32V, Ima Class I II III Div.2 Groups A, T4 Entity Type 43 Mode 9th digit A,B,D	amb = -40°C to ers: rester: nax=113mA, Pm ter: x=113mA, Pma: B, C, D, F, G K el code 13th digit Y,G,N	5 +70°C hax=1W, x=1W Tamb -40°C to +85°C
Mutual	Specific Paramete Model without ar Umax=42.4V, Im Model with arres' Umax=32V, Ima Class I II III Div.2 Groups A, T4 Entity Type 43 Mode 9th digit	amb = -40°C to ers: rester: nax=113mA, Pm ter: x=113mA, Pma: B, C, D, F, G K el code 13th digit	b +70°C liax=1W, k=1W Tamb

CSA

CSA Class I	
Class I Div.2 Groups A, B, C, D Class II Div.2 Groups E, F, G Class III Div.2 Temp Code T5 Temp Code T5 Temp Code T4 Temp Code T4 Temp Code T4 Temb max = +50°C Temp Code T4 Temb max = +70°C Entity Parameters: Vmax=28V, Ci=25.18nF (Without Arrester), Ci=35.98nF (With Arrester), Li=0.694mH	

▲ Caution on Safety
 *Before using this product, be sure to read its instruction manual in advance.

Fuji Electric Co., Ltd.

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