

AUTROL®

DUON System Co., Ltd. since 1989

Smart Transmitter Pressure, Temperature, Level





Brand AUTROL

Manufacturer DUON System Co., Ltd.

DUON System has been offered the stable & reliable DCS(Distribute Control System) on the various applications around 70 projects successfully since the foundation in 1989 year. During the time, the most intelligent instrumentation necessary on the application to communicate each other. DUON System established its own R&D and developed the core series as the brand AUTROL to measure Pressure, Temperature and Level on the applications as Smart Transmitter and supplied with its own technology since foundation.

DUON System is the 1st & unique pioneer as smart transmitter manufacturer in Korea, we have been supplied more than 32 countries successfully based on international quality assurance program & its standards along with the patents of AUTROL series.

We, DUON System Co., Ltd. as family, try to step up the next level with its own R&D & stable performed device. Harmonizing with Autrol Smart Transmitter will give you trust partnership based on reliable technology.

Major Customers



Certificates Code



Reference Code



AUTROL Smart Transmitter Series

Field Instrument for Process & Factory Automation

Pressure Products

APT3500



+/- 0.04%
DPT, PT, LT

APT3100



+/- 0.075%
DPT, PT, LT

APT3200



+/- 0.075%
PT (GP, AP)

APT3700N



Nuclear Application
DPT, PT, LT

APT3500N



Chemical Seal Products

APT3500-L



Special Coating

APT3100-L



Extension

APT3200-L



direct

APT3700N-L



Nuclear Application

APT3500N-L



Special Material

Temperature & Indicator Products

ATT2100



Field mount

ATT2200



Panel (din rail) mount

ATT2250



Head mount

AI-100



Ex Field Indicator

Accessory



Manifold



HART modem



STT software

Level Products

ALT6100



Guided Wave Radar

ALT6200/6210



Radar
6.3 Ghz, 26 Ghz

ALT6300



Ultrasonic

ALT6400



Float ball

ALT6500



Magnetostrictive

ALT6600



Capacitance

APT3500

Smart Pressure Transmitter

Differential/ Gauge/ Absolute

High Static

Bottom Connection



Type		Differential (DPIT), Gauge/ Absolute (PIT), Level pressure (LIT), Flow Pressure (FIT), High Static pressure		
Certificate		SIL2 (TUV, FMEDA), Ex d, Ex ia, ATEX, IEC, TR CU(EAC), DNV-GL, CE, RoHS2, KCs, IP66		
Feature		4 to 20mA, Digital Signal, Loop Powered, HART 7, Fieldbus Foundation, Inert Oil, HAST-C, Monel, Tantal, Gold plate		
		High Accuracy $\pm 0.04\%$ of CS, Rangeability 100:1 turndown, Stability ($\pm 0.125\%$ URL for 60 months) External Buttons, 3 lines LCD display, Failure Mode, Trim, Unit changeable, Self Diagnostic Function		
Span	min.	DPT 0.0625 kPa , HS 0.65 kPa , GP 0.0625 kPa , AP 2.5 kPa		
	max.	DPT 14,000 kPa , HS 2100 kPa , HS GP 40,000 kPa , GP 14,000 kPa , AP 2500 kPa		
Static	max.	DPT 25 MPa , HS 32 MPa , HS GP 75 MPa , GP 25 MPa , AP 2.5 MPa		
Application		Steam, Oil & Gas(Upstream, Downstream), PetroChemical, Sticky liquid, High Static Pressure, Resistance Spiking Pressure, Oxygen, Hydrogen, Chlorine		
Points Features		DPT, FT, Low Pressure	High Static Pressure, External Stress	Direct Bottom Connection

APT3700N

Smart Pressure Transmitter in Nuclear Application

Differential/High Static



Gauge/Absolute



Remote Chemical Seal



Type		Differential (DPIT), Gauge/ Absolute (PIT), Level pressure (LIT), Flow Pressure (FIT), High Static pressure
Certificate		NEP, KEPIC-EN, Class 1E Seismic Category I , II , III , Ex d, KCs, IP66/67, NEMA 4X
Testing List		IEEE 323-1983/2003, IEEE 344-1997/2004, EMI/EMC Regulatory Guide 1.180 r1, V&V, Environmental, Thermal Aging, Radiation (100 Gy=10000 rad), TID Co-60 2221 ci, 2.7g ZPA Seismic
Feature		4 to 20mA, Loop Powered, HART 5, Monel diaphragm
		Accuracy+/- 0.25% of CS, Rangeability 100:1 turndown, Stability +/- 0.25% URL for 24 months
		External Buttons, 3 lines LCD display, Failure Mode, Trim, Unit changeable, Self Diagnostic Function
Span	min.	DPT 0.075 kPa , HP 0.373 kPa , GP 0.075 kPa , AP 2.5 kPa
	max.	DPT 6,895 kPa , HP 2,068 kPa , GP 41,370 kPa , AP 2,500 kPa
Static	max.	DPT 13.79 MPa , HP 31.02 MPa , GP 51.71 MPa , AP 3,000 kPa
Application		Korea : S, T, Q Class (Depending on Radiation) UAE : BNPP (Barakah Nuclear Power Plant) Jordan & Pakistan : Research Institutions
Points Features		DPT, FT, Low Pressure Gauge, Absolute Remote Seal, High Temp, Sea Water

APT3100

Smart Pressure Transmitter

Differential / High Static / Flow Totalizer

Gauge / Absolute

Multi-Planar



Type		Differential (DPIT), Gauge/ Absolute (PIT), Level pressure (LIT), Flow Pressure (FIT), High Static pressure		
Certificate		SIL 2 (TUV, FMEDA), Ex d, Ex ia, FM, ATEX, IEC, TR CU(EAC), INMETRO, CE, RoHS2, BV, LR, KR, DNV-GL, ABS, KCs, NEMA 4X, IP66/67		
Feature		4 to 20mA, Digital Signal, Loop Powered, HART 5, HART-C diaphragm		
		High Accuracy+/- 0.075%(+/- 0.04%) of CS, Rangeability 100:1 turndown, Stability +/- 0.125% URL for 36 months External Buttons, 3 lines LCD display, Failure Mode, Trim, Unit changeable, Self Diagnostic Function		
Span	min.	DPT 0.075 kPa , HP 0.373 kPa , GP 0.075 kPa , AP 2.5 kPa		
	max.	DPT 6,895 kPa , HP 2,068 kPa , GP 41,370 kPa , AP 2,500 kPa		
Static	max.	DPT 13.79 MPa , HP 31.02 Mpa , GP 75 MPa , AP 5,250 kPa		
Application		Oil & Gas(Upstream, Downstream), PetroChemical, Water Treatment, Water Tank, Marine & Offshore,		
Points Features		DPT, PT, FT (APT3100-F for additional Pulse Signal for Relay, Selectable Pulse Scale & Width)	Low Gauge	Multi-Planar (Triple Process Connections)

APT3200

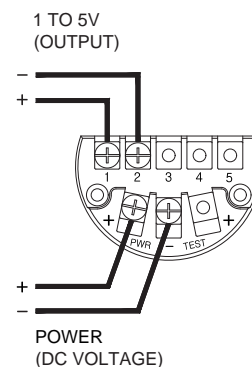
Smart Pressure Transmitter

Gauge / Absolute

Flush Welding Adapter

Submersible

Low Voltage



Type		Gauge/ Absolute(PIT), Level pressure(LIT)		
Certificate		SIL 2 (TUV, FMEDA), Ex d, Ex ia, FM, ATEX, IEC, TR CU(EAC), INMETRO, CE, RoHS 2, BV, LR, KR, DNV-GL, ABS, KCS, NEMA 4X, IP66/67		IP66/67
Feature		4 to 20mA, Digital Signal, Loop Powered, HART 5, 7, HART-C diaphragm.		1 to 5 V output Signal, HART configuration ability
		High Accuracy $\pm 0.075\%$ ($\pm 0.04\%$) of CS, Rangeability 100:1 turndown, Stability $\pm 0.125\%$ URL for 36 months, External Buttons, 3 lines LCD display, Failure Mode, Trim, Unit changeable, Self Diagnostic Function		
Span	min.	GP 0.06 kPa , AP 2.5 kPa , Submersible 6 kPa (610 mmH ₂ O)		
	max.	GP 60,000 kPa , AP 15,000 kPa , Submersible 200 kPa (20,390 mmH ₂ O)		
Working Pressure	max.	GP 75,000 kPa , AP 30,000 kPa (up to 1.5 to 2 times than max Calibrated Span)		
Application		Oil & Gas (Up & Down stream), Petrochemical, Water Treatment, Water Tank, Marine & Offshore, Vessel		Oil & Gas (Upstream, External Battery/ Solar power supply)
Points Features		High Gauge Pressure	Using welding Adapter for easy installation & cleaning	Submersible. (Water & Slurry)
				1 to 5 V output Signal (4 wires)

Remote Chemical Seal

Pressure type

PFA, ETFE, Gold coating



APT3100 LED

Two Remote Capillary



Two Remote Extension Capillary



Clamp Connection



Special Cooling



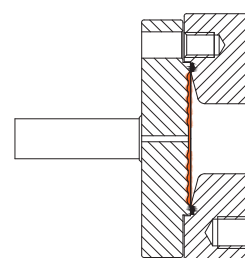
APT3200 LFD



Capillary + Direct



Large Volume filling

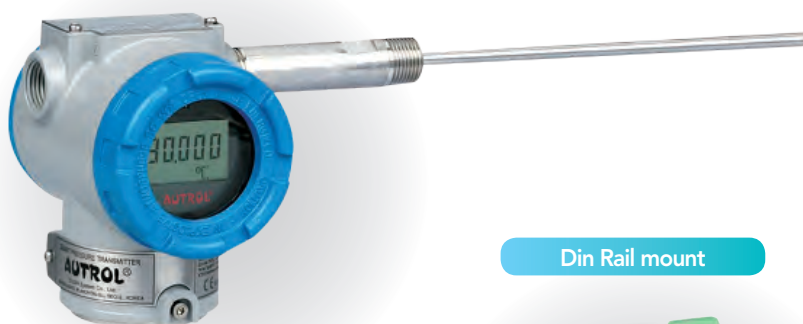


Type	Direct, Capillary, Single, Couple, Binocular type
Certificate	Follow the model spec
Feature	Best 0.15% of CS, normal +/- 0.2 of CS (APT3500) or +/- 0.25% of CS (APT3100, APT3200)
	Thread, Clamp, Direct, Capillary, SS Amored, PVC + SST Amored, Low volum filling
	HAST-C, Tantal, Gold Plate, PTFE, ETFE, PFA coating on Diaphragm
Testing	Helium leak test, Vacuum service, Dual Sealing, Special for Low Span Pressure
Filling Oil	Silicon 200, Silicone 704, Silicone 705, Halocarbon 6.3, Flourine Oil, Special Oil
Application	High/Low Temperature, Restriction area, Sticky fluid, Low pressure level, Sanitary, Corrosion application.

ATT2100, ATT2200, ATT2250

Smart Temperature Transmitter

Ex Field mount



ATT2100

Din Rail mount



ATT2200

Head mount



ATT2250

Type	Ex Field mount	Din Rail mount	Head mount
Input	RTD (2, 3, 4 wires, $\alpha=0.00385$), T/C (B, E, J, K, N, R, S, T), mV, ohm		
Feature	4 to 20mA, Digital Signals, Loop Powered, HART 5, 7		
	RTD Stability for 24 months (+/- 0.12 % of reading or 0.15 degC whichever is greater)		
Certificate	Ex d, FM, ATEX, DNV, KCs		Ex ia, ATEX
Span	RTD : -200 to 650 deg C , T/C : - 200 to 1820 deg C		
Accuracy	Digital/ Analogue Accuracy of SPAN (+/- 0.03%) + (Digital Accuracy / SPAN x 100) Digital Accuracy - RTD : max +/- 0.17 deg C , T/C : max +/- 0.77 deg C		
Ambient Temp.	-40 to 85 deg C		
Points Features	External Buttons, 3 lines LCD display, Failure Mode, Trim, Unit changeable	Self Diagnostic Function	Universal size, Ex ia

Smart Level Transmitter



4 to 20mA, HART 7 or Ability, External Buttons, Fast Response, Self-Diagnostic functions

MODEL	ALT6100	ALT6200	ALT6210
Type	Contact	Non-Contact	Non-Contact
Technology	Guided Wave Radar	6.3 Ghz Radar	26 Ghz Radar
Accuracy	+/- 3mm, +/- 0.03% of SC whichever is greater	+/- 10 mm	+/- 3 mm
Feature	Rod, Coaxial, Cable, High Pressure & Temperature	Horn antenna 3 ~ 8 inches Rod antenna available	Horn antenna 2, 3, 4 inches Seal antenna 3, 4 inches Encapsule, Parabolic antenna
Certificate	Ex d, KCs, IP66/67		
Range	0.15 to 20 meter	0.5 to 30 meter	0.5 to 35 meter (special 70 meter)
Application Condition	Low Viscosity, Less Emulsion or Foam	Swell, Wave, Noise, High Viscosity, Foam	Noise, High Viscosity, Foam, Less Wave
Point Feature	Liquid Application	Wide Beam Angle	Narrow & Straight Beam Angle
		(Check the frequency related law on Open Tank application)	



4 to 20mA, HART 7 or Ability, External Buttons, Fast Response, Self-Diagnostic functions

MODEL	ALT6300	ALT6400	ALT6500	ALT6600
Type	Non-Contact	Contact	Contact	Contact
Technology	Ultrasonic	Float ball	Magnetostrictive	Capacitance
Accuracy	+/- 10 mm	+/- 15 mm	+/- 1 mm, +/- 0.01 % of CS whichever is greater	+/- 0.5% of Full Scale
Feature	Extension up to 600 mm	25 mm, 50 mm Float Ball size	Interface	PVC coating
Certificate	IP66/67	Ex d, KCs, IP66	Ex d, KCs, IP66	Ex d, KCs, IP66
Range	5 meter (extra 10 meter)	0.1 to 4 meter	4 meter	0.15 to 4 meter
Application Condition	Simple tank, High Viscosity Avoid pressure & noisy application	Liquid, Foam, Less Sticky/ Sludge, No Vacuum	High accuracy, Foam, Sticky, No Sludge, No Vacuum max 20 bar in Tank, up to 100 deg C	max 20 bar in Tank, up to 100 deg C Sticky, Corrosive, less Foam
Point Feature	Echo Pulse	Competitive Price	High Resolution	Sticky (High Viscosity)/ Liquid/ Solid application, Resistance Corrosion

AI100

Smart Field Indicator



Functions

- 4~20mA Loop Power
- LCD Display
- Low Voltage Drop
- Intuitive User Interface
- Flexible Wide Range. (-99999 to 99999)
- Easy Calibration
- User Define Units, Modified Various Units
- 2 External Buttons to configuration

Applications

- Chemical, Steel, Paper, Thermal
- Oil & Gas
- Petro-chemical, Water treatment plants
- Connect with all AUTROL series
- Great performance with Level series

Manifold

Accessory

Flange type



2 ways manifold
Block & Bleed T-bar



3 ways manifold
Block & Equalizer T-bar



5 ways manifold
Block, Bleed & Equalizer T-bar

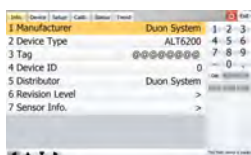
Remote type



- * Every Manifold & Gauge Root Valve is tested with the nitrogen @ 100 psig (68 bar) for leakage at the seat to a maximum allowable leak rate of 0.1 scc/min
- * SST 316, PTFE (Graphite) O-ring, 6,000 psig @ 38 degC, - 54 to 232 degC, 1/2" NPT female threads B1.20.1
- * Depending on case, model & spec can be changed. Please consults to manufacturer.

Communicator

Accessory



STT software

Intuitive User Interface, Easy configuration for all AUTROL series, Configuration manufacturer's device specifications, Based on Window operation.



HART Modem

Easy connect with all AUTROL series, Available connecting with HART device



UMPC

Light weight Window operation. Available STT software, HART Modem

AUTROL Application Plants



Oil & Gas

Up Stream, Crude Oil, Storage, Oil Field, Natural Gas, NG, LNG, PNG, CNG, Petroleum



Petrochemical Refinery

Hydrocarbon, Chlorine, Oxygen, Desulfurization, Boiler, H₂S, N₂, Monomer Recovery, SBR Polymerization, Polyolefin, SBR, NB-Latex



Thermal & Complex Power Plant

EDS, Feedwater, Boiler, Lube Oil, Hydrogen, PPS, NH₃, gas compressor, Demi & Low Water, Hotwell, Cold Reheater Drain port, DFPT Oil Level, SCW, DFPT, CVP Separator, HPBP-UPU, RH-HPU Oil tank.



Nuclear Power Plant

Mild Harsh zone, Sea Water, CTCS & Debris Filter, Feed Water Pump, Heater, Tank, Condensate Polishing, EDG, AAC



Biomass

Wood Chip, Corn, Sugar Mill, Glycerin



Vessel

BWMS, BWTS, Boiler, Diesel Pump, SCR, Oil discharge, Monitoring, LNG, Cargo Oil, FPSO



Aero Space Industry

Fuel injection, Coolant, Jet Engine test, Hydraulic, hydrogen, Thrust test, Cargo,



Marine & Offshore

Boiler, Diesel Pump



Food & Beverage & Water

Beverage, Milk, Water treatment, Ice Cream, Glycerin, Recycle Water



Sewage Treatment

Sewage & Purifier System, Condensate Polishing



Skids

EDS, Feedwater, Boiler, Lube Oil, Hydrogen, PPS, NH₃, gas compressor, Demi & Low Water, Hotwell, Cold Reheater Drain port, DFPT Oil Level, SCW, DFPT, CVP Separator, HPBP-UPU, RH-HPU Oil tank.



SWRO, Desalination

SWRO, Desalination, CTCS & Debris Filter

AUTROL Production Line



AUTROL R&D Center




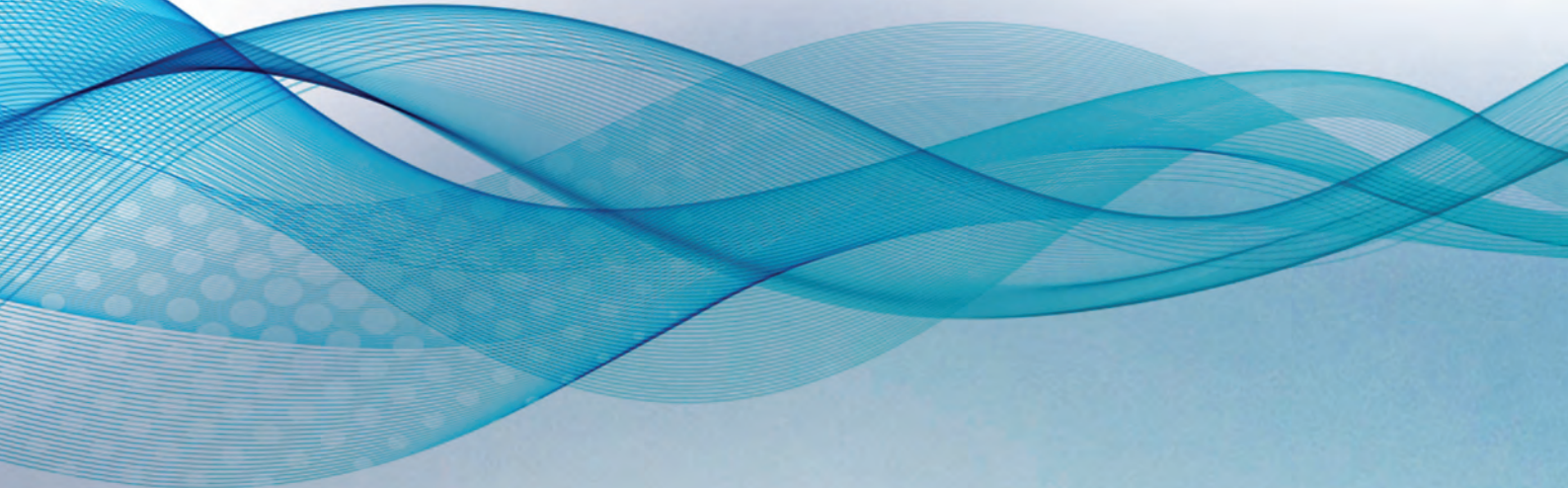
Company Profile

HISTORY

Established & Incorporated as Korea WAD(Westinghouse Automation Division) System Co., Ltd.	1989
Registered Trade Business License at Korea International Trade	1990
Technical Partnership with WESTINGHOUSE, USA	
Qualified Bidder on KEPCO (Korea Electric Power Corporation)	1992
Qualified Bidder on Foreign Materials of Public Procurement Service	
Registered to AFTAK(Association of foreign Trading Agents of Korea)	1996
Authorized manufacturer for power generating components by KEPCO	
Established & Registered R&D Depart. at Korean Government	1998
Launching Autrol brand	
Renewal & registered as DUON System Co., Ltd.	1999
Authorized supplier for power generating components by KEPCO	
Approved principal agent of KECA	
Registration for electrical service & manufacturer	2000
Authorized as venture estimation excellent company by SMBA	
Relocation Office & Factory (60-31 Gasan-dong, Seoul, Korea)	2001
Authorized Military alternative service affiliation in R&D 병특지정	
Awarded an Exportation Estimation Excellent Company by SMBA	
Awarded Safety Instrumentation by Prime Minister.	2003
Patent approvals #0397425 for pressure device	
Certified intermediated(2nd) Productivity Efficient Maturity	2005
Winning Prj, Singori & Wolsong Nuclear power plant all 1 & 2 units, APT3700N, all S class	2006
Patent approvals # for electrical device	
Winning Prj, Singori Nuclear power plant 3 & 4 units, APT3700N, all Q class	2008
Certified specialized Parts & Element company by KKEM(부품소재전문기업, 지식경제부)	
Approved device for Korea District Heating Corp.(지역난방공사)	
Certified Exportation Estimation Excellent Company	
Certified Seal of Excellent by KOTRA	2009
Certified INNO-BIZ Enterprise by SMBA	
Registration of manufacturing company for protection device	2010
Achieved Milion-dollar exportation amount	
Winning Prj, SinUljin Nuclear power plant 1 & 2 units, APT3700N, all Q, T class	
Awarded 'Best Partner' by South Power plants	
Verified Promising Export Firm by SMBA	
Winning Prj, India nuclear power plant APT3100, APT3200	2011
Winning Prj, BNPP Barakah Nuclear Power Plant, UAE through KEPCO, APT3700N-S, T, Q class	2012
Price Contract with POSCO	
Emergency generator application through HHI on BNPP, UAE	
Winning Prj, Young Heung Thermal power plant 5 & 6 unit (BOP)	
Achieved 3 Milion-dollar exportation amount	
Price contract of Seoul City Gas	
Winning Prj, Ann Dong Natural Gas power plant through GS E&C	
Price contract with LG Electronics, GWR	
Winning Prj, Dang Jin 9 & 10 units, GWR 120EA	2013
Approved vendor on GS E&C	
Winning Prj, Samcheok Green Power boiler through Hyundai E&C, ATT2200, 4098ea	
Winning Prj, TaeAn Thermal power plant 9 & 10 unit, BOP	2014
Winning Prj, Bukpyung Thermal power plant 1 & 2 unit, ALT6100 GWR	
Winning Prj, Samcheok Green power 1 & 2 unit, GWR	
Price Contract with Korea District Heating Corp.	
Dang Jin BOP project through GS E&C	
Awarded Qualified Supplier of Pressure & Level instruments by KOSPO, KOWEPO, KOMIPO, EWP, KOSEP	
Winning Prj, Jordan nuclear research & institution facility, APT300N, DaeWoo E&C	
Approved vendor on Hyundai Oil Bank	
First shipment of APT3700N shipped to BNPP, UAE	2015
Moved to new place 298-29, Gongdan-ro, Gunpo-si, Gyeonggi-do, KOREA. 15809	
Awarded an Exportation Estimation Excellent Company by SMBA	2016
Awarded New Technology manufacturer by MOTIE(산업통산자원부)	
Capacitance, Ultrasonic smart transmitter	

APPROVALS

- 1996**
 - Approved ISO900
- 2000**
 - Registered HART Communication
- 2001**
 - Approved CE 0344 by TUV
- 2002**
 - Awarded Excellent Quality certificate(EM) by KATS(국가기술표준원)
 - Qualified New Technology by KATS (산업통상자원부 국가기술표준원)
 - Approved performance type test by KOSHA Ex d
- 2003**
 - Awarded the Grand Prize of Safety Instruments by KOSHA(한국산업안전보건공단)
 - Approved Ex d APT3200 by KOSHA
 - Approved Ex ia APT3200 by KTL
- 2004**
 - Approved KEPIC-EN, Class 1E #EN-236
 - Certified device on public utility
 - Acquired the Patent rights
- 2005**
 - Approval CSA Ex d
 - Approved NEP (New Excellence Product) Certificate APT3100
- 2006**
 - 1st registered Temperature Transmitter(ATT2300F) device in Domestic on Foundation Fieldbus
 - Acquired NEP (New Excellence Product) Certificate for APT3200
 - Approved FM APT3100
 - Approved ATEX APT3100
- 2007**
 - Certified Excellent Product (Public Procurement Service)
 - Certified manufacturer for Class 1E Pressure Transmitter device.
- 2008**
 - Approved GOST APT3100, APT3200, ATT2100
 - Approved NEP (New Excellent Product by MCIE(산업자원부))
- 2009**
 - Launched ALT6100 Guided Wave Radar Level Transmitter
- 2010**
 - Approved NT (New Technology) Certificate
 - Approved Marine & Offshore Certificate by ABS
 - Patent approvals# for level device
- 2011**
 - Approved BV, DNV, LR for Marine & Offshore & Vessel
 - Approved ATEX Ex ia
 - Approved INMETRO
 - Approved A class of ALT6100 (Nuclear Grade)
 - Approved NEP (New Excellent Product by MCIE)
- 2012**
 - Launched AI100 Ex d Digital Indicator
 - Launched ALT6200 Non-Contact Radar Level Transmitter
- 2013**
 - Approved ISO 14001, OHSAS 18001
 - Launched APT3500
- 2014**
 - Registered Fieldbus Foundation, APT3500
 - Approved ATEX Ex d & Ex ia
 - Registered APT3500 on Fieldbus Foundation
- 2015**
 - Approved TR CU(EAC) Ex d & Ex ia
- 2016**
 - Launching New Level series Float, Magnetostrictive, Capacitance, Ultrasonic devices
- 2017**
 - Approved IEC, ATEX Ex ia
 - Approved SIL2 (Safety Integrity Level) for pressure devices



1st & Unique Manufacturer of Smart Transmitter in Korea

1st Official Registrant on HART & FF in Korea

1st Only Registrant of Patents approval for Smart Transmitter in Korea.

1st Only Qualified & Approved manufacturer of
Smart Transmitter on Nuclear application in Korea.

AUTROL[®]
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