

PRAGATI POWER CORPORATION LIMITED

1500(N) MW PRAGATI-III CCPP



TECHNICAL SPECIFICATION OF FIELD INSTRUMENTS FOR FIRE PROTECTION SYSTEM & COMPRESSED AIR SYSTEM

SPECIFICATION NO.: - PE-TS-314-522-A001



**BHARAT HEAVY ELECTRICALS LIMITED
POWER SECTOR
PROJECT ENGINEERING MANAGEMENT
PPEI BUILDING, NOIDA (U.P.)
INDIA**

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**PRAGATI-III CAPP
(1500 MW)
FIELD INSTRUMENTS FOR
FPS & CAS**

SPECIFICATION No: PE-TS-314-522-A001

CUSTOMER

PPCL

VOLUME - IIB

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**VOLUME – II B
SECTION – A
INTENT OF SPECIFICATION**

	PRAGATI-III CCPP (1500 MW) FIELD INSTRUMENTS FOR FPS & CAS	SPECIFICATION No: PE-TS-314-522-A001	
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1.0 INTENT OF SPECIFICATION

- 1.1 This specification covers the supply of field instruments as specified, comprising engineering, duly packed for transportation, delivery to site, loading, unloading at site & handover to customer as required for Fire Protection System & Compressed Air System as mentioned in the different sections of this specification for 1500 MW Pragati-III CCPP.
- 1.2 The bidder shall be responsible for providing all material, equipment & services, which are required to fulfil the intent of ensuring operability, maintainability, reliability and complete safety of the complete work covered under this specification, irrespective of whether it has been specifically listed herein or not..
- 1.3 It is not the intent to specify herein all the details of design and manufacture. However, the equipment shall conform in all respects to high standards of design, engineering and workmanship and shall be capable of performing the required duties in a manner acceptable to purchaser who will interpret the meaning of drawings and specifications and shall be entitled to reject any work or material which in his judgement is not in full accordance herewith.
- 1.4 The extent of supply under the contract includes all items shown in the drawings, notwithstanding the fact that such items may have been omitted from the specification or schedules. Similarly, the extent of supply also includes all items mentioned in the specification and /or schedules, notwithstanding the fact that such items may have been omitted in the document.
- 1.5 The general term and conditions, instructions to tenderer and other attachment referred to elsewhere are made part of the tender specification. The equipment materials and works covered by this specification is subject to compliance to all attachments referred to in the specification. The bidder shall be responsible for and governed by all requirements stipulated herein.
- 1.6 While all efforts have been made to make the specification requirement complete & unambiguous, it shall be bidders' responsibility to ask for missing information, ensure completeness of specification, to bring out any contradictory / conflicting requirement in different sections of the specification and within a section itself to the notice of BHEL and to seek any clarification on specification requirement in the format enclosed under Vol-III of the specification. In absence of any such clarifications, in case of any contradictory requirement, the more stringent requirement as per interpretation of Purchaser/Customer shall prevail and shall be complied by the bidder without any commercial implication on account of the same. Further in case of any missing information in the specification not brought out by the prospective bidders as part of pre-bid clarification, the same shall be furnished by Purchaser/ Customer as and when brought to their notice either by the bidder or by purchaser/ customer themselves. However, such requirements shall be binding on the successful bidder without any commercial & delivery implication.
- 1.7 The bidder's offer shall not carry any sections like clarification, interpretations and /or assumptions.
- 1.8 Deviations, if any, should be very clearly brought out clause by clause in the enclosed schedule along with the cost of withdrawal; otherwise, it will be presumed that the bidder's offer is strictly in line with NIT specification.



	PRAGATI-III CCPP (1500 MW) FIELD INSTRUMENTS FOR FPS & CAS	SPECIFICATION No: PE-TS-314-522-A001	
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- 1.9 In case all above requirements are not complied with, the offer may be considered as incomplete and would become liable for rejection.
- 1.10 Unless specified otherwise, all through the specification, the word bidder shall have same meaning as successful bidder / vendor.
- 1.11 The standard quality plan is included in this specification to enable the bidder to understand the extent of inspection and testing requirements to execute this job. The successful bidder has to follow the quality plan as minimum requirement during manufacturing and testing.



PRAGATI-III CCPP
(1500 MW)
FIELD INSTRUMENTS FOR
FPS & CAS

SPECIFICATION No: PE-TS-314-522-A001

CUSTOMER PPCL

VOLUME - IIB SECTION B

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VOLUME – II B
SECTION – B
PROJECT INFORMATION

Clause No.	PROJECT INFORMATION			
1.00.00	PROJECT INFORMATION			
1.01.00	Introduction Pragati Power Corporation Ltd. (PPCL) New Delhi, is a company owned by Government of Delhi. PPCL is presently operating Pragati CCPP (330MW), PPCL is planning to setup a Natural Gas/Regasified Liquefied Natural Gas (RLNG) based combined cycle power plant of nominal capacity of 1500 MW named as Pragati-III Combined Cycle Power Project. Location The site is located at the outskirts of Delhi at Latitude of 28° 35' N and Longitude of 77° 12' E. The site is adjacent to 400kv substation at Bawana. Configuration Pragati III combined cycle power project, shall have 2 x (2 GT + 2 HRSG + 1 ST) - Multi shaft Configuration Note : (a) Combination of two(2) Gas Turbines and one Steam Turbine shall be construed as one combined cycle module. (b) In multishaft combined cycle configuration, each Gas Turbine and Steam Turbine of the Module shall drive its own dedicated Electric Generator. The power generated at this power station shall be evacuated through 400KV transmission system. Further to the information given in the following paragraphs, bidders are advised to visit project site and collect data on local conditions to enable them make a fully compliant bid and successful execution of the Contract.			
1.02.00	Approach to Site			
1.02.01	Road Approach The Site is approachable from GT road as well by ring road via Rohini & Delhi college of Engineering.			
1.02.02	Air port Indira Gandhi International Air port, Delhi is about 20 kms away from project site.			
1500 MW PRAGATI - III CCPP Doc. No:- CW-CM-9472-C-O-M-001		TECHNICAL SPECIFICATION SECTION-VI, PART-A		VOLUME-II
				PAGE 1 of 15



Clause No.	PROJECT INFORMATION			
1.03.00	Land Availability The land identified for the project is in physical possession of PPCL Bidders are advised to visit the plant site for getting acquainted with the conditions prevailing at site.			
1.04.00	Fuel Availability RLNG/Natural Gas would be used as the main fuel for the project.			
1.04.01	Natural Gas Employer shall make RLNG / Natural Gas available at a pressure of about 40 Kg/cm ² at a terminal point near Plant Boundary. Expected composition of RLNG/ Natural Gas shall be as indicated at Annexure-I.			
1.05.00	Water Availability Make up water for the plant shall be treated sewage water drawn from Rithala sewage treatment plant.			
1.06.00	Quality of Raw Water Raw Water Analysis from above source is enclosed at Annexure - II.			
1.07.00	Meteorological Data Important meteorological data as obtained from Safdarjund Obsevatory, Delhi based on observations from year 1951 to 1980 is enclosed at Annexure-III.			
1.08.00	Wind Design Criteria Criteria for Wind resistant design of structures and equipment shall be as per Annexure-IV.			
1.09.00	Earthquake Design Criteria Criteria for earthquake resistant design of structures and equipment shall be as per Annexure-V.			
1500 MW PRAGATI - III CCPP Doc. No:- CW-CM-9472-C-O-M-001		TECHNICAL SPECIFICATION SECTION-VI, PART-A	VOLUME-II	PAGE 2 of 15



PRAGATI-III CCPP
(1500 MW)
FIELD INSTRUMENTS FOR
FPS & CAS

SPECIFICATION No: PE-TS-314-522-A001

CUSTOMER

PPCL

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SECTION C

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VOLUME – II B
SECTION – C
SCOPE OF SUPPLY



**PRAGATI-III CCPP (1500 MW)
FIELD INSTRUMENTS FOR
FPS & CAS**

DOCUMENT NO.: PE-TS-314-522-A001

VOLUME- IIB

SECTION-C

REV. 0

SHEET 1 OF 2

GENERAL

This specification covers the supply of field instruments as specified, comprising engineering, duly packed for transportation, delivery to site, loading, unloading at site & handover to customer as required for Fire Protection System & Compressed Air System as mentioned in the different sections of this specification for 1500 MW Pragati-III CCPP.

1. SUPPLY SCOPE

S No.	Item Description	Quantity	Remarks
A. FIRE PROTECTION SYSTEM			
1	TRANSMITTER (PRESSURE, TEMPERATURE, LEVEL, FLOW, DIFF-PRESSURE ETC.)		
a	PRESSURE TRANSMITTER	5	YOKOGAWA MODEL: EJA430A-E-Y'-S4A-92EA
b	LEVEL TRANSMITTER (ULTRASONIC TYPE)	5	HAWK MEASUREMENT PVT. LTD., AUSTRALIA MODEL: SULTAN SERIES
c	LEVEL TRANSMITTER (DP TYPE)	5	YOKOGAWA MODEL: EJA210A-EMWA1A5A-92EN
2	LOCAL GAUGES (PRESSURE, TEMPERATURE, LEVEL, FLOW, DIFF-PRESSURE ETC.)		
a	PRESSURE GAUGE	5	General Instruments Consortium, Delhi Model: BSPG-V-15-AL-S-4-15NTM-0-16-A-L
b	LEVEL GAUGE	5	V. AUTOMAT & INSTRUMENTS (P) LTD., DELHI MODEL: RLG-1650-1630-311-VA2500
	LEVEL INDICATOR	5	V. AUTOMAT & INSTRUMENTS (P) LTD., DELHI MODEL: 40C
c	DIFF-PRESSURE GAUGE	5	General Instruments Consortium, Delhi Model: DPG-B-S-15-S4-S6-A-15NTM-0-2-A-L
3	PROCESS ACTUATED SWITCHES (PRESSURE, LEVEL, FLOW, DIFF-PRESSURE ETC.)		
a	PRESSURE SWITCH	13	Indfos Industries Ltd., Ghaziabad. Model: B4 64 S XSC XPC XNH XFS 0.7/14 KG/CM2



**PRAGATI-III CCPP (1500 MW)
FIELD INSTRUMENTS FOR
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SHEET 2 OF 4

4	ACTUATORS OF ALL TYPES (HYDRAULIC, PNEUMATIC & MOTORISED) FOR EACH TYPE, MODEL & RATING		
a	MOTORISED	1	ROTORK CONTROLS (I) PVT. LTD.
5	COMPLETE SOLENOID VALVE OF EACH TYPES	4	ROTEX MODEL: 24102-12-4R-B5-M6-S2-24V-DC-22-H
B. COMPRESSED AIR SYSTEM			
1	LOCAL GAUGES (PRESSURE, TEMPERATURE, LEVEL, FLOW, DIFF-PRESSURE ETC.)		
a	PRESSURE GAUGE	5	A.N. Instruments Model: 6 SSPGAD
b	TEMPERATURE GAUGE	5	A.N. Instruments Model: 6 RMSTAV
c	FLOW GAUGE	5	EUREKA Model: BPF-MS-80-PG-3
2	PROCESS ACTUATED SWITCHES (PRESSURE, LEVEL, FLOW, DIFF-PRESSURE ETC.)		
a	FLOW SWITCH	5	SWITZER Model: BGM-50-M-TH-33-Z

Further, for instrument detailed technical parameters, pl. refer Section-D.

2. PACKING

Bidder to note that proper packing shall be provided ensuring safety to the instruments.

3. MAKES OF EQUIPMENTS / ITEMS

Bidder to note that makes shall be as specified above only.

4. DRAWINGS / DOCUMENTS

Bidder to note that engineering documents like Technical Data sheet & Quality Plan needs not be submitted by bidder. However, bidder to ensure supply of instruments as per documents attached under Section – D.

Bidder to furnish the stamped copy of these documents as a token of acceptance.

5. INSPECTION & TESTING

Bidder to furnish the Certificate of Conformance & other test certificates as required by end customer during acceptance of material. Also, bidder to withstand the guarantees as specified in commercial part of specification.



PRAGATI-III CCPP
(1500 MW)
FIELD INSTRUMENTS FOR
FPS & CAS

SPECIFICATION No: PE-TS-314-522-A001

CUSTOMER PPCL

VOLUME - IIB SECTION D

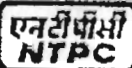
REV 00

VOLUME – II B
SECTION – D
TECHNICAL DATA SHEET & QUALITY PLAN

Note: Handheld calculator to be supplied (01 No). Cat - TV

HART calculator Universal type is provided by BHEL - EDH with main plant package and will not be supplied in individual package.

Amr
Amr K. Long
BHEL - PEM

 NTPC Limited (A Govt. of India Enterprise) CONSULTANCY WING	
TRANS NO. <u>CT-33.0</u> DATE <u>09/11/2010</u>	☐ I. APPROVED/RELEASED FOR FABRICATION/CONSTRUCTION. ☐ II. APPROVED/RELEASED FOR FABRICATION/CONSTRUCTION SUBJECT TO INCORPORATION OF COMMENTS/ MODIFICATIONS AS NOTED RESUBMIT REVISED DRAWING/DRAWING. ☐ III. NOT APPROVED RESUBMIT REVISED DRAWING/DRAWING.
This drawing and design is the property of NTPC Limited and must not be copied or left without their permission in writing. (DATE)	

0	11.02.10	SUBMISSION FOR APPROVAL	CONSTRUCTION DETAILS ASSEMBLY	BSC
REV.	DATE	DESCRIPTION	PRD BY	APPD BY
		RELEASED FOR FABRICATION		

PROJECT: 2 x 750 MW, PRAGATI III, COMBINED CYCLE PROJECT

CUSTOMER: PRAGATI POWER CORPORATION LIMITED

CONSULTANT: NTPC - CONSULTANCY WING

CLIENT:  BHARAT HEAVY ELECTRICALS LTD
POWER SECTOR
PROJECT ENGINEERING MANAGEMENT
NEW DELHI

VENDOR:  UNITECH MACHINES LIMITED
PLOT NO. 35P, SCETOR - 44
GURGAON - 122002

PACKAGE: FIRE PROTECTION SYSTEM

TITLE: DATASHEET - PRESSURE TRANSMITTER

PREPARED	CHECKED	APPROVED	DATE	JOB NO.
RAVI	MAR	BSC	11.02.10	P-269
BHEL Doc. NO. PE-V0-314-552-A080		UML Doc. NO. P269-D-A080		REV. 0
				SHEET 1 OF 6

ENDORSEMENT SHEET FOR DATA SHEET/ CONFIGURATION DRAWING			
TO BE FILLED IN BY SUPPLIER AT TIME OF SUBMISSION		To be filled in by NTPC	
PROJECT NAME	 Project: 54000 MW for 2x350 MW PSR/207/66/KAWANA/1888-RETA 1890 PTD. 01/07/2009		
CONTRACT NO.			
PACKAGE NO.			
MAIN SUPPLIER	Unitech Machine Limited		
MANUFACTURER NAME	Yokogawa India Limited, Bangalore		
MAJOR EQUIPMENT DETAILS:			
NAME OF EQUIPMENT:	Pressure Transmitter, Model No.		
BOM WITH MODEL NO. ENCLOSED AT:	EJA430A-EA54A-92EA		
ANY OTHER IMPORTANT PARAMETER			
REF. APP. DRG. NO.	PROJECT/ PKG. SPECIFIC DRG. NO.		
DT. 0000-405-PEL-Y-000	DT.		
Rev. No. 0.0 DTD. 1/06/2007			
I CERTIFY that the item/ component is identical to that considered for reference DS approval. (If there are minor changes in the item/ component with respect to that considered for reference DS approval, however the same affect the reference DS approval, as indicated below/ in attached sheet. a) Deviation - i) Page No - 12 of 19 Hand held Calibration - 1/06/2007		APPROVED BY: SIGN: NTPC (Date & Seal)	
SIGN: (MAIN SUPPLIER/ CONTRACTOR) DATE: 11-02-10		SIGN: (SUB-CONTRACTOR/ MANUFACTURER) DATE: 3-2-2010	

FOR NAME: 01-PEL-W12/F1-20



**UNITECH MACHINES LIMITED, GURGAON**

Title : Data Sheet – Pressure Transmitter

Project : 2X750MW Pragati-III, CPP

Package : Fire Protection System

S.No	Location	Range	Qty	Tag No.	Remark
1	On discharge header of HP-01	0.3-30 bar	1	9SGA10CP001	
2	On discharge of HP-01	0.3-30 bar	1	9SGA10CP002	
3	On discharge header of HP-02	0.3-30 bar	1	9SGA20CP001	
4	On discharge of HP-02	0.3-30 bar	1	9SGA20CP002	
5	On discharge of diesel engine driven HP-03	0.3-30 bar	1	9SGA30CP001	
6	On discharge of diesel engine driven HP-03	0.3-30 bar	1	9SGA30CP002	
7	On discharge header of SP-01	0.3-30 bar	1	9SGC20CP001	
8	On discharge of SP-01	0.3-30 bar	1	9SGC20CP002	
9	On discharge of diesel engine driven SP-02	0.3-30 bar	1	9SGC10CP001	
10	On discharge of diesel engine driven SP-02	0.3-30 bar	1	9SGC10CP002	
11	On discharge of JP-01	0.3-30 bar	1	9SGA40CP001	
12	On discharge of JP-02	0.3-30 bar	1	9SGA50CP001	
13	On Common Hydrant Header	0.3-30 bar	1	9SGA35CP001	
14	On Common Spray Header	0.3-30 bar	1	9SGC25CP001	
15	On Hydro pneumatic tank	0.3-30 bar	1	9SGA01CP001	
16	On Hydro pneumatic tank	0.3-30 bar	1	9SGA01CP002	
17	On discharge of Air compressor-1	0.3-30 bar	1	9SGA55CP001	
18	On discharge of Air compressor-2	0.3-30 bar	1	9SGA55CP002	

Client : BHEL

UML Doc. No. : P269-D-A080, Rev 0

BHEL Doc. No. : PE-V0-314-552-A080

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Yokogawa India Limited



203 Somdutt Chambers II
9, Bhikaji Cama Place
New Delhi - 110 066, India

Tel: 91-11-26108740, 26103873
Fax: 91-11-26167985

YOKOGAWA

YIL Document No. 07/01/AW/IR	Date: 01 / 06 / 07
NTPC Document No.: 105-PEI-1000	
Vendor Name: YOKOGAWA	
Vendor Document Ref.:	Date: 01 / 06 / 07

**REFERENCE DATA SHEET FOR PRESSURE,
DIFFERENTIAL PRESSURE, FLOW & LEVEL
TRANSMITTERS**

YOKOGAWA MAKE

FOR ALL NTPC PROJECTS.

THIS DOCUMENT IS APPLICABLE

TO

**PRESSURE, DIFFERENTIAL PRESSURE & REMOTE SEAL
TRANSMITTERS SUPPLIED BY M/s YOKOGAWA.**

	PROJECT ENGG.-C&I	
APPROVED		
	31.07.07	R.K. Singh
(SIGN)	(DATE)	NAME
VALID UPTO: 30.07.10		
DATE		

Rev No. : 00 01 / 06 / 2007 Initial Release

1 Of 19

Registered Office :
Plot No. 96, Electronics City Complex
Hosur Road, Bangalore - 560 100, INDIA



Reference data sheet - 4:

YOKOGAWA

Application: A) Steam and water gauge pressure measurement (medium pressure).
B) Instrument / service air pressure measurement.

MAKE : YOKOGAWA, JAPAN.

MODEL : EJA430A-E 'Y' S4A-92EA.
(For Y refer table-1).

TYPE OF TRANSMITTER : Microprocessor based 2-WIRE, HART compatible gauge pressure transmitter.

PRINCIPLE OF SENSER : Silicon resonant type.

ACCURACY : a) $\pm 0.075\%$ of calibrated span for turn down ratio 1:1 to 10:1.
b) $\pm (0.025 + 0.05 X / \text{SPAN})\%$ of span for span below X. Where X equals 43 PSI for capsule code A, 200 PSI for capsule code B, including combined effects of zero-based linearity, hysteresis and repeatability.

OUTPUT : 4-20 mA super imposed digital signal based on HART protocol.

TURN DOWN RATIO : Dependent on 'Y' and shall be as per table-1.

SPAN LIMIT : Dependent on 'Y' and shall be as per table-1.

OVER PRESS / STATIC PRESS : Dependent on 'Y' and shall be as per table-1.

STABILITY : $\pm 0.1\%$ of URL over a 5 year period.

ZERO AND SPAN DRIFT : $\pm (0.084\% \text{ SPAN} + 0.017\% \text{ URL})$ per 28 deg C change in temp.

POWER SUPPLY : 10.5 - 42 VDC.

LOAD IMPEDANCE : 570 Ω at 24 VDC.

ELECTRICAL CONNECTION : Plug and socket type, (3 pin gold plated socket on Trx. housing and crimping type plug on other side).

PROJECT ENGG.-C&I	
APPROVED	
(SIGN)	NAME
31.07.07	R. K. Samal
30.07.10	
VALID UPTO	DATE

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PROCESS CONNECTION	: 1/2" NPT (F).	YOKOGAWA
HOUSING	: DIE CAST ALUMINIUM with polyurethane coating, IP-67.	
AMBIENT TEMP.	: - 30° C to + 80° C.	
PROCESS TEMP.	: - 40° C to + 120° C.	
DIAPHRAGM	: Hastelloy C.	
ALL WETTED PARTS	: SS316.	
FILLED FLUID	: SILICONE OIL.	
DIAGNOSTICS DETAIL	: Self diagnostics in the transmitter with diagnostic indication on the local display.	
SPAN & ZERO ADJUSTMENT	: Zero & Span adjustment can be done anywhere within the range. It can be done either manually through Push buttons or remotely through Hand held configurator.	
ACCESSORIES	: 2 inch pipe bracket for mounting SS tag plate with all relevant data engraved.	
TYPE TEST REPORT AS PER BS-6447/ IEC-60770.	: As per contract.	
Hand held calibrator	: Shall be provided as per specification requirement.	

PROJECT ENGG.-C&I	
APPROVED	
(SIGN)	NAME
31.07.07	(DATE)
VALID UPTO 30.07.10	DATE

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Handwritten signature

TABLE-1

YOKOGAWA

SENSOR CODE 'Y'	MAXIMUM SPAN (URL)	MINIMUM SPAN	TURN DOWN RATIO POSSIBLE	TURN DOWN USED (meeting accuracy reqn.)	ZERO & SPAN DRIFT	OVER PRESS LIMITS
A	30 bar	0.3 bar	100:1	Ideally should be less than 15:1	Refer above	45 bar
B	140 bar	1.4 bar	100:1	Ideally should be less than 15:1	Refer above	210 bar

NOTE-1 : 'Y' has to be selected in line with process range and considering turn down ratio/accuracy limitation. Suitability of over pressure limits should be checked for the process (over pressure should be 1.5 times the max. operating pressure).

NOTE-2 : Special approvals / requirements for hazardous area applications should be considered additionally based on application. Accordingly model code shall be changed.

NTPC		PROJECT ENGG.-C&I	
APPROVED:			
(SIGN)	31.07.07	(DATE)	NAME
(by) ID UPTO		30.07.10	DATE



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Note:--

BHEL/UNITECH to ensure Counter Thread on
Process Sides shall match with thread on
Instrument.

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01	23.07.10	GENERALLY REVISED AS PER COMMENTS	AK	MAR	BSC
0	30.01.10	SUBMISSION FOR APPROVAL	RAVI	MAR	BSC
REV.	DATE	DESCRIPTION	PRD.BY	CHD.BY	APPD.BY

R E V I S I O N S

PROJECT: *Submittal 9/9/10*
2 X 750 MW, PRAGATI III, COMBINED CYCLE PROJECT

CUSTOMER:

PRAGATI POWER CORPORATION LIMITED

CBF-318
3/9/10

Co I

CONSULTANT:

NTPC - CONSULTANCY WING

AC

CLIENT:



BHARAT HEAVY ELECTRICALS LTD

POWER SECTOR
PROJECT ENGINEERING MANAGEMENT
NEW DELHI

VENDOR:



UNITECH MACHINES LIMITED

PLOT NO. 35P, SCETOR - 44
GURGAON - 122002

PACKAGE:

FIRE PROTECTION SYSTEM

TITLE:

DATA SHEET - LEVEL TRANSMITTER (ULTRASONIC TYPE)

PREPARED	CHECKED	APPROVED	DATE		JOB NO.
RAVI	MAR	BSC	30.01.10		P-269
BHEL Doc. NO. PE-YO-314-552-A078			UML Doc. NO. P269-D-A078		REV 01
					SHEET 1 OF 5



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UNITECH MACHINES LIMITED

COMPLAINEE REPORT

General Comments:-

DOC. No. PE-V0-514-552-A078 Rev-0 dated 30.01.2010 DATASHEET - LEVEL TRANSMITTER (ULTRASONIC)		
1	Item not listed in approved sub-vendor list. M/s Unitech to get the mfrg. approved from NTPC	HAWK Measurement Pty Ltd, Australia for Level Transmitter (Ultrasonic Type) meets the specification and moreover they have the latest technology on Ultrasonic like Foundation Field Bus, Profibus etc. Further, Hawk measurement is already approved in NTPC Mauda (2X500MW) Station Piping Package and IGSTPP, Jhajjar (3x500MW) Station piping package. The approval of NTPC attached herewith for above.

23-07-2010

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एन टी पी सी लिमिटेड
भारत सरकार का उद्यम

NTPC Limited

A Govt. of India Enterprise
(Formerly National Thermal Power Corporation Ltd.)

Registered Office/Corporate Centre, Noida

E.O.C. Plot No. A8A, Sector-24, Noida (U.P.) - 201 301
Tele No. 0120 - 2410747 / 2596338, Fax No. 0120 - 2410411
eMail : mpchokkanathan@ntpceoc.co.in; sujeet@ntpceoc.co.in

Ref.No. CC:PEV:9561:131-02:01

Date : 07.08.2009

M/S UNITEC MACHINES LTD.

UM HOUSE PLOT-35P, SEC-44

GURGAON

KA; Mr. Sh. R. Iyer CGM-Projects

email : r.iyer@unitechmachines.com

1. Mr Vijai Tayal

Sr. Project Manager

M/S UNITEC MACHINES LTD.

UM HOUSE PLOT-35P, SEC-44 GURGAON

email : vijay.tayal@unitechmachines.com

Sub: Mauda (2X500 MW), - Station Ppg Pkg. NOA No: CS-9561-131-2/FC/NOA-5341 - : Sub Vendor

Approval of M/s Hawk Measurement Pty Ltd, Australia for the supply of Ultrasonic Type Level Transmitter.

Dear Sir,

This is with reference to M/s Unitech Machines Limited, Gurgaon proposal vide letter P-271/1885 dated July 29, 2009. In this regards following may please be noted.

NTPC agrees to the proposal for supplying Ultrasonic Type Level Transmitter (Sultan series) from M/s Hawk Measurement Pty Ltd, Australia, having work address as-15-17 Maurice Court, Nunawading, Vic 3131, Australia.

Actual item to be supplied shall be as per technical specification/data sheet/QP requirements.

Item is to be treated as Cat-II item for inspection. Please submit QP inline with above requirement.

This is for your information and necessary action please

Thanking you,

Yours Sincerely,

(Signature)

(Sujeet Kumar)

ACDE (PE-MVD-T/F) For AGM & CTF (M,D,V&U TF)



प्रमाणित की व्यवस्था विभाग, प्लॉट नं.- ए 8ए, सेक्टर-24, गार्ड हाउस नं.- 13, नोएडा (उ.प्र.) पिन-201 307

टेलिफोन नं.- 0120-2410333, 2410116 फैक्स-0120-2410136, 2410137

पंजीकृत कार्यालय: एनटीपीसी भवन, स्टाफ कॉम्प्लेक्स, 7 इन्स्टीट्यूशनल एरिया, लोधी रोड, नई दिल्ली-110 003

टेलिफोन नं.- 011-24361018 फैक्स-011-24361018, वेबसाइट: www.ntpc.co.in

ENGINEERING OFFICE COMPLEX, Plot No. A-8A, Sector-24, Post Box No: 13, Noida (UP), Pin-201 307

Telephone No: 0120-2410333, 2410116 Fax-0120-2410136, 2410137

Registered Office: NTPC Bhawan, Scope Complex, 7 Institutional Area, Lodhi Road, New Delhi-110 003

Telephone No 011-24360100 Fax-011-24361018 Website: www.ntpc.co.in



एन टी पी सी लिमिटेड
भारत सरकार का निगम

NTPC Limited

A Govt of India Enterprise
Formerly National Thermal Power Corporation Ltd.

आधिकारिक कार्यालय: Corporate Centre, Noida

Ref No. CC:PEJ:0330:131:01

Date: 16.10.2009

M/s Unitech Machines Ltd.
'UM' House, Plot No.- 35 P
Sector- 44, Gurgaon

Kind Attn: Mr. Avinash Kumar, H.O.D (Design)

Sub: IGSTPP, Jhajjar (3x500MW) –Station Piping Package
- Ultrasonic Type Level Transmitters from M/s Hawk Measurement Pty Ltd, Australia

Dear Sir,

This has the reference to the subject proposal received thru UML mail dated 29.08.09.
M/s Unitech Machines proposal to supply Ultrasonic Type Level Transmitters from M/s Hawk Measurement Pty Ltd, Australia is acceptable to NTPC for the subject Project Package.
However the item may be as per NTPC Tech Spec / NTPC Appd Data Sheet requirements.

Item may be treated as Cat-II item for inspection. Kindly submit the QAP inline with the requirements

This is for your kind information and necessary action please.

Thanking you,

Yours faithfully,

(Atul Shrivastava)

CTF (Jhajjar & Vallur TF)

Page 1 of 1
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Engineering Division
ISO 9001:2008 Certified



AiBayaMi-ki kayaa-laya pirsar, PleeT naM - e 8e, saO@Ti-24, paosT baa@sa
naM - 13, naaOeOa (j p) ipna-201 307
Tollafaa naM - 0120-2410333, 2410116 fO@sa-0120-2410136, 2410137
pMjaikRt kayaa-laya: enaTiplsaI Savana, skaop kamplaa@sa, 7 (nsTITUyaUSarala
eiryaa, laaoQal racO, naI- adllei-140 003
Tollafaa naM - 011-24361018 fO@sa-011-24361018, vaobasaa(T www.ntpc.co.in,
ENGINEERING OFFICE COMPLEX, Plot No. A-8A, Sector-24, Post Bag No. 113, Rohta (UP), Pin- 201 307
Telephone No: 0120-2410333, 2410116 Fax: 0120-2410136, 2410137
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Page 1 of 1

**UNITECH MACHINES LIMITED, GURGAON**

Title : Data Sheet – Level Transmitter(Ultrasonic type)

Project : 2X750MW Pragati-III, CPP

Package : Fire Protection System

Level Transmitter (Ultrasonic type)

1.0	Manufacturer	: HAWK Measurement Pvt Ltd, Australia
2.0	Model No.	: SULTAN SERIES
3.0	Type	: Ultrasonic – Non contact type 2 Wire
4.0	Transmitter- AWR2SB H X X X:	
5.0	Quantity	: 04 Nos.
5.1	Power Supply	: 24V DC
5.2	Display	: 2 line x 8 digit alphanumeric LCD Display
5.3	Zero & Span	: Provided on transmitter
5.4	False Echo & diagnostic	: In built and self diagnostic
5.5	Housing	: Polycarbonate with IP 65 Class Protection
5.6	Output	: 4-20 mA output, 500 Ohms., with HART protocol compatible through HART communicator
5.7	Mounting	: Field mounting
5.8	Accuracy	: $\pm 0.25\%$ of calibrated span (FS)
5.9	Repeatability	: 3 mm of Calibrated Span.
5.10	Ambient temperature	: -30 Deg. C. to +65 Deg. C.
5.11	Temperature compensation	: In built
5.12	Electrical Connection / Cable entry	: Plug & Socket Type
6.0	Sensor – AWR130T4TB20XC15XX	
6.1	Quantity	: 04 Nos.
6.2	Measuring range	: 11 mtr.
6.3	Calibrated range	: 0 to 9.71 mtrs.
6.4	Blanking distance	: 0.5 Mtr. (Maximum)
6.5	Material housing	: Polypropylene with Teflon face for corrosion resistant
6.6	Operating temperature	: -20 Deg. C. to +80 Deg. C.
6.7	Operating pressure	: 1.3 bar (absolute)
6.8	Protection	: IP 68
6.9	Pulse frequency	: 30 KHZ.
6.10	Mounting	: Top vertically on sump
6.11	Process connection	: 2" BSP Threaded
6.12	Catalogue	: Enclosed

Client : BHEL

BHEL Doc. No. : PE-V0-314-552-A078

UML Doc. No. : UML-D-A078

Page : 5 of 5





A higher level of performance

Data Sheet

Sultan 234 - Acoustic Wave Technology

Solids / Liquids level and position measurements to 182m (597ft)

Principle of Operations

The SULTAN 234 emits a high powered acoustic wave transmit pulse which is reflected from the surface of the material being measured. The reflected signal is processed using specially developed software to enhance the correct signal and reject false or spurious echoes.

The transmission of high powered acoustic waves ensures minimal losses through the environment where the sensor is located. Due to the high powered emitted pulse, any losses have far less effect than would be experienced by traditional ultrasonic devices. More energy is transmitted hence more energy is returned. Advanced receiver circuitry is designed to identify and monitor low level return signals even when noise levels are high. The measured signal is temperature compensated to provide maximum accuracy to the outputs and display.

Primary Areas of Applications

• Waste water/water:

River level, wet wells, inlet screens, tanks, sumps, pump stations, water towers, dams, basin levels, chemical storage, etc.

• Mining:

Crushers, surge bins, ore passes, conveyor profile, blocked chute, stockpile, stackers, reclaimers, storage silos etc.

• **Power Stations:** Boiler bunkers, raw coal bunkers, ash pits, fly ash silos, etc.

• Others:

Food, Cement, Plastics, Grain, Chemicals, Paper, Irrigation, Quarries

Function

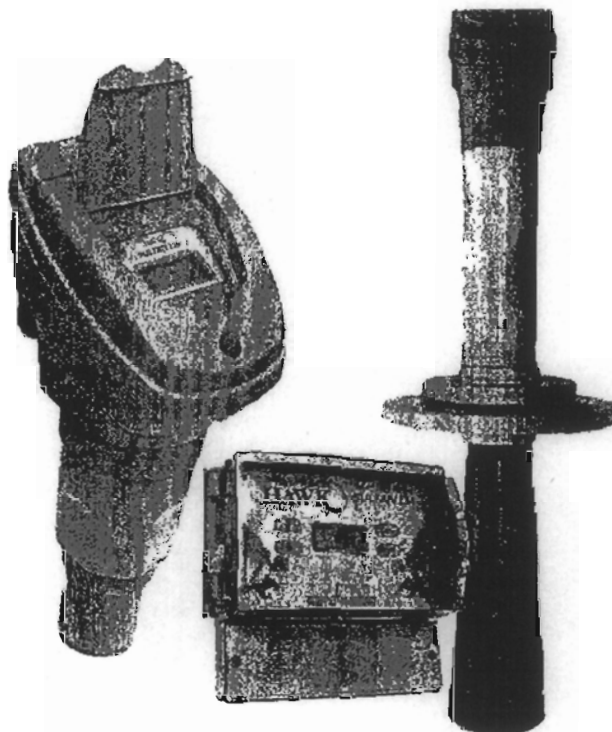
The Sultan 234 is a non intrusive acoustic wave transmitter with flexibility, used for measuring level of liquids, slurries and solids

Universal Supply

- 2 Wire Loop Powered
- 3 Wire DC
- 4 Wire AC/DC

Certifications

ATEX, SAA/IECEX, CE, (CSA, FM pending)



Features:

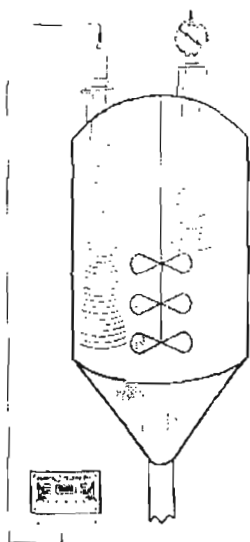
- Non contact measurement
- High Power even with two wire loop supply
- Low cost per point
- Wide range of communications: DeviceNet, GosHawk, HART, Modbus, Profibus DP, Foundation Fieldbus, Profibus PA
- Pump Control x5 pumps
- Auto compensation for dust, steam and losses
- Protection class IP67, NEMA 4X, IP68/Tanks
- Programmable safe mode
- High temperature compensation
- GSM/GPRS for remote monitoring
- Differential average level / 2 transducers

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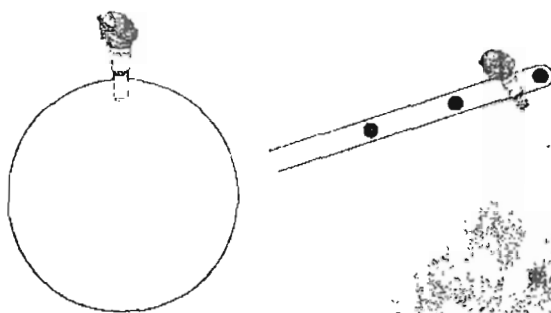
(26)

Typical Applications

Conical Shape Vessels

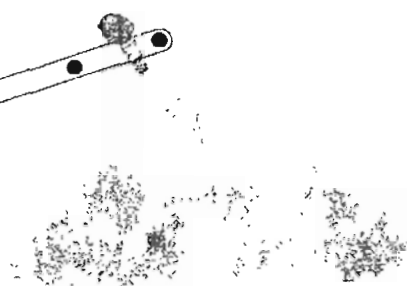


Horizontal Cylindrical/Ball Tanks



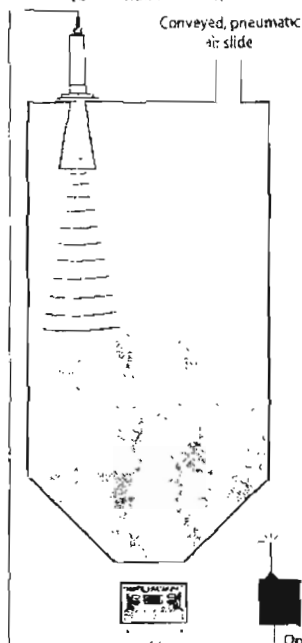
Sultan Acoustic Wave Transmitter

Stocking by Stocking
R...



Solids Vessels

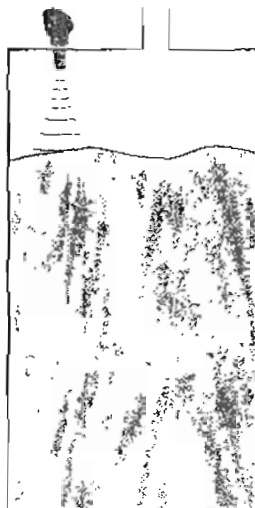
High/Low/Continuous level
(Granular/Powder)



Optional
Remote GSM/CDMA

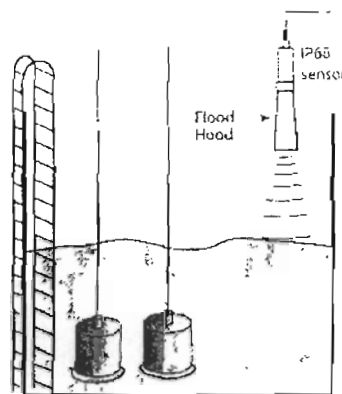
Storage Tanks

High/Low/Continuous level
(Liquid/Chemical)



Sewage Wet Well

High/Low/Continuous level
Up to 5 Pumps



Remote
Amplifier

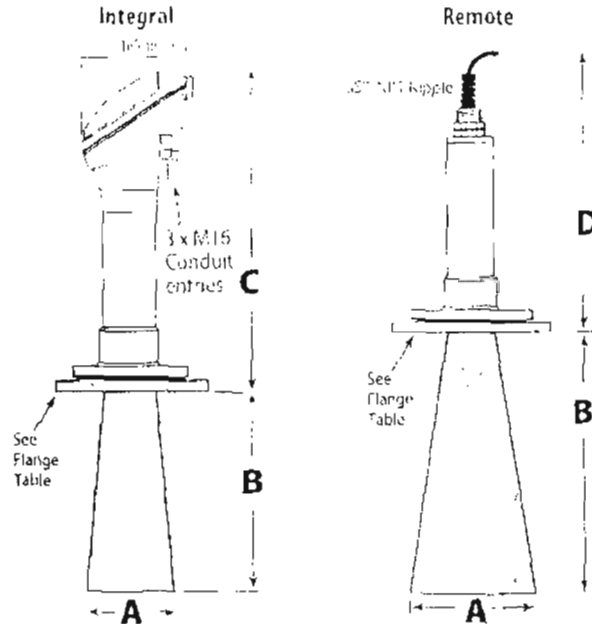
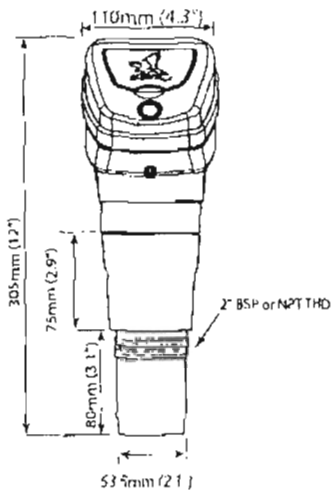


Panel Mount



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Integral Unit
AWI2SX30/40/50
AWI234SX30/40/50



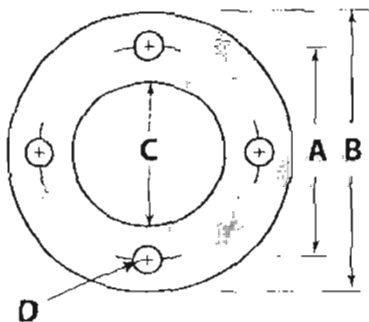
All horns must protrude into the vessel by at least 50 mm (2 inches) past the mounting nozzle

Integral Transmitter Table				
Model	Selected Flange	A mm in.	B mm in.	C mm in.
AWI 5 kHz	10"		455 17.9	840 33.1
AWI 10 kHz	10"		415 16.3	540 21.3
	"8"		280 11.0	540 21.3
AWI 15 kHz	10"		455 17.9	440 17.3
	"8"		280 11.0	440 17.3
AWI 20 kHz	4"		280 11.0	390 15.4
AWI 30 kHz	4"		280 11.0	350 13.8

*8" is non standard. Please contact factory before selecting

Remote Transducer Table				
Model	Selected Flange	A mm in.	B mm in.	C mm in.
AWI 5 kHz	10"		455 17.9	1560 61.4
AWI 10 kHz	10"		415 16.3	1560 61.4
	"8"		280 11.0	1560 61.4
AWI 15 kHz	10"		455 17.9	1560 61.4
	"8"		280 11.0	1560 61.4
AWI 20 kHz	4"		280 11.0	1560 61.4
AWI 30 kHz	4"		280 11.0	1560 61.4

*8" is non standard. Please contact factory before selecting



FLANGE TYPE:

A = ANSI Flange

J = JIS Flange

D = DIN Flange

Others Available

STANDARD ANSI/DIN/JIS FLANGE DIMENSIONS

SIZE	FLANGE TYPE	A (PCD) mm in.	B (OD) mm in.	C (ID) mm in.	D (Hole) mm in.
4"	FA4	190.5 7.5	228 9.0	100 4	19 0.75
	FD4	180 7.0	220 8.7	100 4	18 0.7
	FJ4	175 6.9	210 8.4	100 4	15 0.6
10"	FA10	362 14.3	406 16.0	250 10	25 1.0
	FD10	350 13.8	395 15.6	250 10	22 0.85
	FJ10	355 14.0	400 15.7	250 10	23 0.9

NON STANDARD ANSI/DIN/JIS FLANGE DIMENSIONS

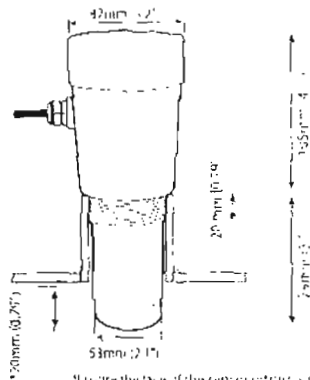
6"	FA6	241 9.5	279.5 11.0	150 6	22 0.85
	FD6	240 9.4	285 11.2	150 6	22 0.85
	FJ6	240 9.4	280 11.0	150 6	19 0.75
8"	FA8	298.5 11.8	343 13.5	200 8	22 0.85
	FD8	295 11.6	340 13.4	200 8	22 0.85
	FJ8	290 11.4	330 13.0	200 8	19 0.75

Note: Other flange sizes available upon request.

Dimensions

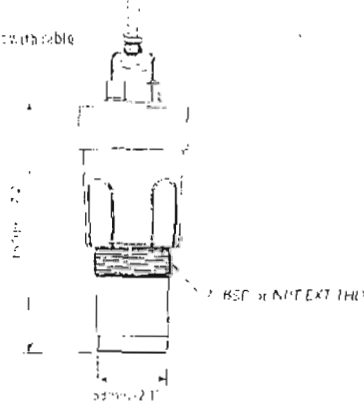
2 inch Remote Mounting Dimensions

Screwtop with integral junction box



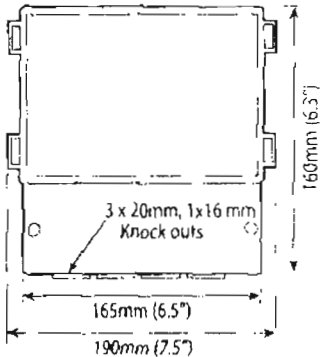
*Locate the "eye" of the sensor at least 20mm from the vessel by more than 20mm

IP68 Sealed unit with cable



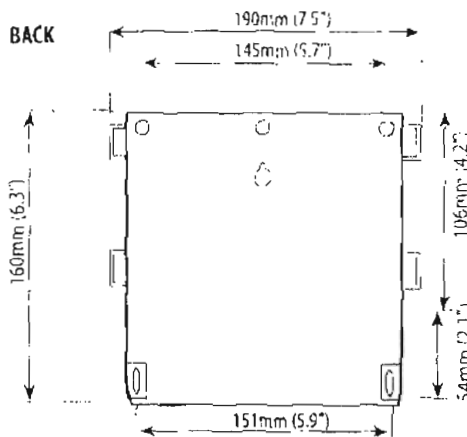
REMOTE ENCLOSURES - Field Mount AWR2, AWR234

FRONT



DIN Rail or screw mountable

BACK

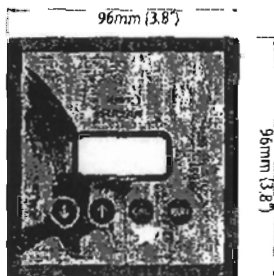


SIDE

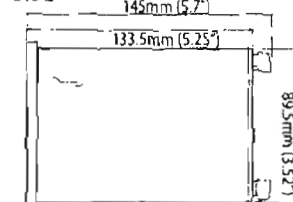


Panel Mount

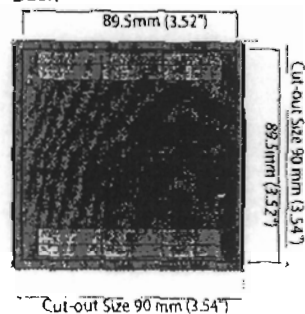
Front



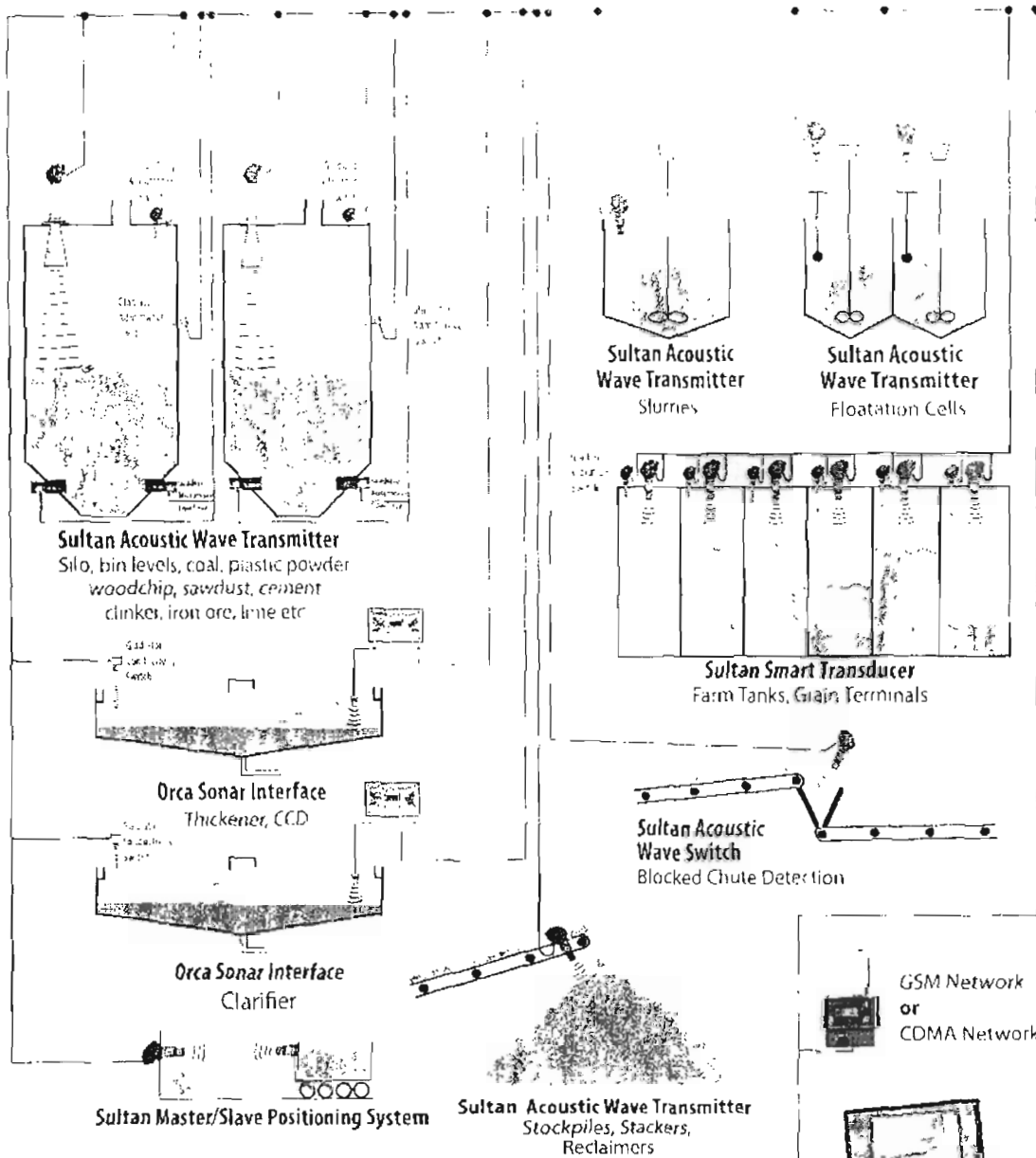
Side



Back



Modbus and Profibus



GSM or CDMA Network

- Typically up to 31 transmitters or switches per string.
- Maximum 250 transmitters or switches
- Using GSM/CDMA network transmitters and switches can be monitored, calibrated remotely.
- Alarm status, diagnostics can be monitored
- Support from factory engineering for customer application problems

(Limited Modbus query rate for Switches only)

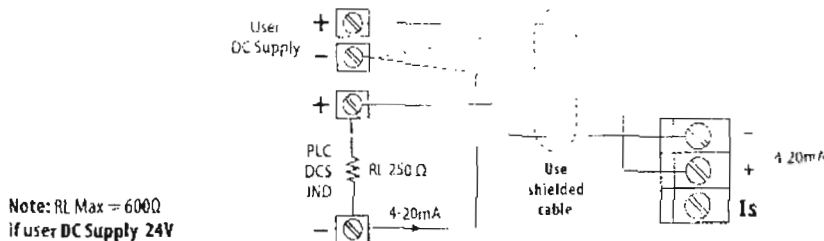


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Wiring Diagrams

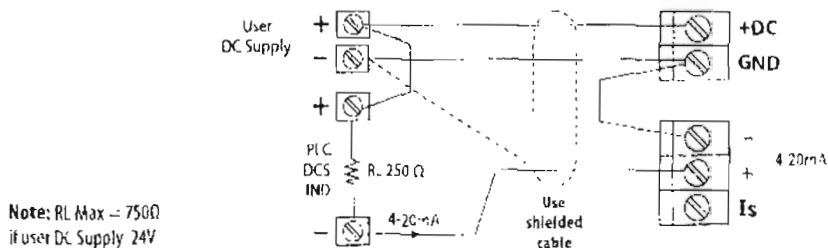
Terminal Connections for DC Supply – Model dependant

a) 2 Wire DC Loop Powered

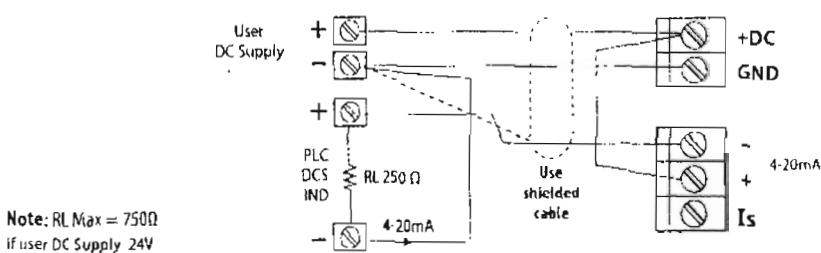


Terminal Connections for DC Supply – Model dependant

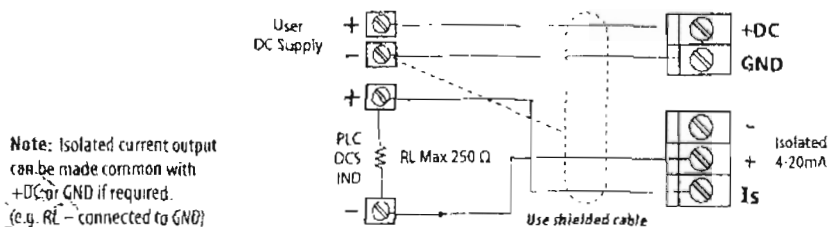
b) 3 Wire DC – Modulating from Common User Supply (RL to +DC)



c) 3 Wire DC – Modulating from Common User Supply (RL to GND)

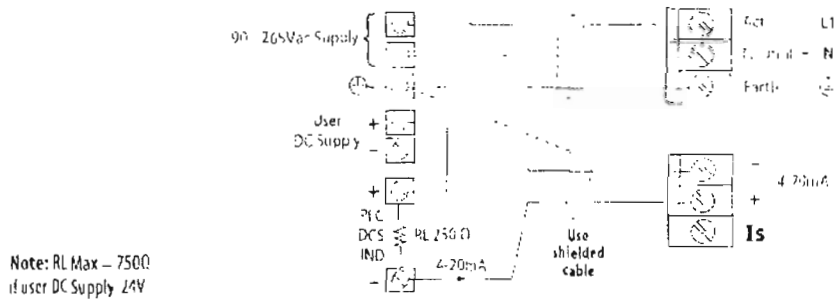


d) 4 Wire DC – Driving from Internal Isolated Supply (Is)

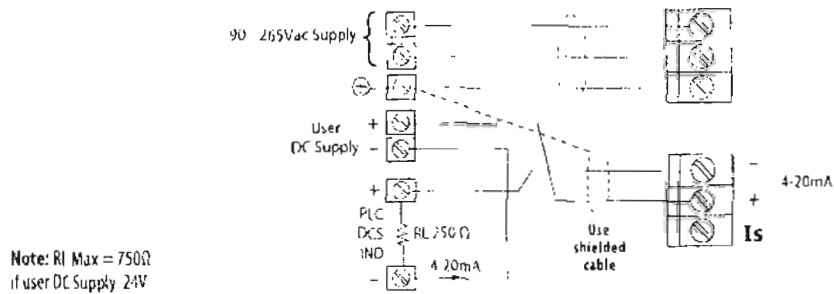


Terminal Connections for AC Supply – Model dependant

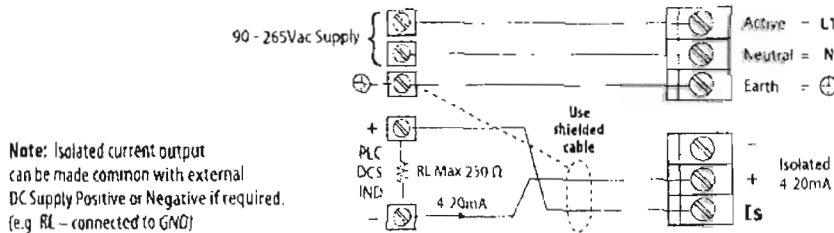
e) Modulating from User's External DC Supply (RL to Pos.)



f) Modulating from User's External DC Supply (RL to Neg.)



g) 4 Wire AC – Driving from Internal Isolated Supply (Is)



AW Series Transmitter Integral Version (2 Relays)

NC	COM	NO	A	B	5V	NC	COM	NO
L1	N	⊕	-	+	Is	-	+	
AC-IN			4-20mA			DC-IN		

AW Series Transmitter Remote, Field or Panel Version (5 Relays)

SULTAN 234 REMOTE TRANSMITTER														
RELAY 1			RELAY 2			RELAY 3			RELAY 4			RELAY 5		
NC	COM	NO	NC	COM	NO	NC	COM	NO	NC	COM	NO	NC	COM	NO
ANALOG			TRANSDUCER			COMMS			DC-IN			AC-IN		
Is	+	-	RED	BLK	BLU	WHT	Test	B	A	-	+	⊕	N	L1
4-20mA												12-30VDC 90-265 VAC		

Part Numbering

Sultan AW Remote Electronics

Model

AWR2 Remote 2 Wire, Housing / Facia Display, Connection Board, Process Module, No relays

AWR234 Remote 2/3/4 Wire 5 relays, Housing / Facia Display, Connection Board, Process Module, 5 relays

AWR234 Remote 2/3/4 Wire 5 relays, Housing / Facia Display, Connection Board, Process Module, 5 relays for Flow

Housing

S Standard polycarbonate electronics housing

P Panel Mount Housing

Power Supply

B 24 VDC standard

C 48 VDC for 2/3/4 units only

U Universal AC power supply (90-260 VAC input) for 2/3/4 units only

Output Configuration (PC comms Goshawk standard)

S Switch only, 5 relays for AWR234 only

X 4-20mA analogue output module, includes Modbus comms

H HART 2 wire only

I HART Isolated 4 wire 2/3/4 only

W Modbus Comms only (not available for 2 wire Sultan)

P Profibus DP***

E Ethernet

D Devicenet

Z Special Request

Internal HawkLink Modem (not available with ATEX 0/20 approval)

X Not Required

G2 GSM Frequency 800/1900 MHz/19200 Baud for USA, Canada, Argentina, Chile for Sultan 234 only

G4 GSM Frequency 900/1800 MHz/19200 Baud for Australia, Europe, Chile for Sultan 234 only

Approval Standard

X Not Required

A0 Intrinsic Safe (AWR2 only) IECEx Zone 0 (Ex ia IIA T4) / ATEX (Grp II Cat I GD) IP67 EEx ia IIA T4

Position Unit / Crane Master Options for Sultan 234 Only

PS Position Slave

CM Crane Master

X Not required

AWR2 S B X G4 X X



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Sultan AW Remote Transducer

Model

AWR1 Acoustic Wave Remote Transducer

Transducer Frequency

- 50 50kHz for applications up to 5m, available in 2" only
- 40 40kHz for applications up to 7m, available in 2" only
- 30 30kHz for applications up to 11m for 2" and 15m for 3" (4" cone is recommended for 3" units)
- 20 20kHz for applications up to 20m, available in 3" only (4" cone is recommended)
- 15 15kHz for applications up to 30m, available in 3" only (4" cone is recommended)
- 10 10kHz for applications up to 40m, available in 3.5" only (4" cone is recommended)
- 09 9kHz for high power extended range applications up to 170m (4" cone is recommended)
- 05 5kHz for applications up to 60m maximum, available in 3.5" only (4" cone is recommended)
- 04 4kHz for high power extended range applications up to 170m (4" cone is recommended)

Process Temperature - Facing material selection

- S Standard Temperature Dry Atmosphere only, (Polypropylene face) for 4, 5, 9, 10 and 15kHz only
- I Standard Temperature Wet Atmosphere, (Teflon face)
- Y High Temperature Wet and Dry Atmosphere 150C, (Titanium face) for 10kHz only
- Z Special Request

Transducer Housing Material

- 4 Polypropylene, not available for 2"
- 6 Tefzel for 2" (standard) For 3" Teflon please contact factory

Thread Standards

- X Not Required (Standard Flange Mount, see flange & cone selection)
- TB BSP
- TN NPT

Mounting Thread Sizes

- X Not Required (Standard Flange Mount, see flange & cone selection)
- 20 2" thread for 50,40,30 kHz in Tefzel housing only
- 30 3" thread on the back cap for 30,20,15 kHz only. For 15kHz use "B" type flange
- 50 3.5" thread on the end cap for 10 and 5kHz only

Approval Standard

- X Not Required
- A0 Intrinsic Safe: IECEx Zone 0 (Ex ia IIA T4)ATLX (Grp II Cat 1 GD IP67 EEx ia IIA 14)
- A1 ATEX Encapsulated (Grp II Cat 2 GD EEx m II IP68)
- A20 ATEX Dust (Grp II Cat 1 D T85C IP67)
- A21 ATEX Dust (Grp II Cat 2 D T85C IP67)
- A22 ATEX Dust (Grp II Cat 3 D T85C IP67)

Connection

- C IP68 Sealed unit with cable
- S Screwtop with integral junction box (available only for 2" units)

Cable Length

- 6 6m cable (Standard)
- 15 15m cable
- 30 30m cable
- 50 50m cable
- X Not Required

Mounting Accessories

- X Not Required
- CS Cable Suspension for remote 50/40/30/20kHz only
- Position Unit /Crane Master/Software Options
- PS Position Slave
- FP Fast Pulsing
- X Not Required

AWR1 30

T

J

X

X

X

C

6

X

X

Part Numbering

Sultan AW Integral Transmitter

Model

AW12 Integral 2 Wire, Housing / Facia Display Connection Board Process Module, No relays
 AW1234 Integral 2/3/4 Wire, Housing / Facia Display Connection Board Process Module, 3 relays
 AW1234 Integral 2/3/4 Wire, Housing / Facia Display Connection Board Process Module, 3 relays for flow

Housing

S Standard Valox 357U moulded electronics housing

Power Supply

B 24 VDC standard

C 48VDC for 2/3/4 only

U Universal AC power supply (90-260 VAC input) and 12-30VDC, For 2/3/4 only

Transducer Frequency

50 50kHz for applications up to 5m, available in 2" only

40 40kHz for applications up to 7m, available in 2" only

30 30kHz for applications up to 11m for 2" and 15m for 3" (4" cone required for 3" units)

20 20kHz for applications up to 20m, available in 3" only (4" cone required)

15 15kHz for applications up to 30m, available in 3" only (10" cone required)

10 10kHz for applications up to 40m, available in 3.5" only (10" cone required)

09 9kHz for high power extended range applications up to 170m (10" cone required)

05 5kHz for applications up to 60m maximum, available in 3.5" only (10" cone required)

04 4kHz for high power extended range applications up to 170m (10" cone required)

Process Temperature - Facing material selection

S Standard Temperature Dry Atmosphere only: (Polyolfin face)

T Standard Temperature Wet Atmosphere, (Teflon face)

Y High Temperature Wet and Dry Atmosphere 150C, (Titanium face) for 10kHz only

Transducer Housing Material

4 Polypropylene

6 Tefzel for 2" (standard). For 3" Teflon please contact us

Thread Standards

X Not Required (Standard Flange Mount, see flange & cone selection)

FB BSP

TN NPT

Mounting Thread Sizes

X Not Required (Standard Flange Mount, see flange & cone selection)

20 2" thread for 50,40,30 kHz in Tefzel housing only

30 3" thread on the back cap for 30, 20, 15 kHz only For 15kHz use "B" type flange

50 3.5" thread on the end cap for 10 and 5kHz only

Output Configuration (PC commis Goshawk standard)

S Switch only, 5 relays for AWR234 only

X 4-20mA analogue output module, 2/3/4 includes Modbus commis

H HART 2 wire only

I HART Isolated 4 wire 2/3/4 only

W Modbus Commis only (not available for 2 wire Sultan)

P Profibus DP

E Ethernet

D DeviceNet

Z Special Request

Approval Standard

X Not Required

A0 Intrinsic Safe: IECEx Zone 0 (Ex ia IIA T4) / ATEX (Grp II Cat I GD IP67 EEx ia IIA T4)

A22 ATEX Dust (Grp II Cat 3 D T85C IP67)

Position / Crane master/Software Options for Sultan 234 Only

PS Position Slave

CM Crane Master

X Not required

AW12



T 4 X X X X X

Sultan 234 Series

10

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Flange Selection

1	Flange
	Dimension Standard
A	ANSI
D	DIN
J	JIS
Z	Special Request
	Flange Sizes
2N	2" NPT flange
2B	2" BSP flange
3	3" acoustically isolated flange
4	4" acoustically isolated flange
6	6" acoustically isolated flange
8	8" acoustically isolated flange
10	10" acoustically isolated flange
Z	Special Request
	Flange Mounting Position
A	Cone Mounted
B	Transducer Body Mounted for polyurethane cone
C	Angle flange
	Flange Material
4	Polypropylene
6	Teflon
Z	Special Request

Cone Selection

C	Focalizer Cone
	Cone Size
02N	Adaptor for 2" NPT sensor to fit into 4" cone (included)
02B	Adaptor for 2" BSP sensor to fit into 4" cone (included)
03	3" cone for 30, 20 and 15kHz transducers with 1B30 or 1N30 threads
04	4" cone, 30 and 20kHz 3" transducer
06	6" cone, 30 and 20kHz 3" transducer
08-15	8" cone, 15kHz
08-10	8" cone, 10kHz
10-15	10" cone, 15kHz
10-09	10" cone, 9kHz
10-10	10" cone, 10kHz
10-04	10" cone, 4kHz
10-05	10" cone, 5kHz
	Cone Material
4	Polypropylene
6	Teflon
7A	Carbon Fibre. Comes attached to ANSI Carbon Fibre Flange
7D	Carbon Fibre. Comes attached to DIN Carbon Fibre Flange
7J	Carbon Fibre. Comes attached to JIS Carbon Fibre Flange
8	Polyurethane. Flange needs to be transducer Body Mounted
Z	Special Request

C 04 - 4

Specifications

Frequency

- 5kHz, 10kHz, 15kHz, 20kHz, 30kHz, 40kHz, 50kHz
(19 are long range versions of 5/10)

Operating Voltage

- 12 - 30Vdc (residual ripple no greater than 100mV)
- 90 - 265Vac 50/60Hz
- 48Vdc, 48Vac, 90Vac 50/60Hz

Power Consumption

- < 3W @ 24Vdc
- < 10VA @ 240Vac
- < 1W @ 48Vdc, < 7VA @ 48Vac, 90Vac

Analog Output

- 4 - 20mA (750 ohms @ 24Vdc User supply, 250 ohms internally driven)

Communications

- Goshawk, HART, Modbus, Profibus DP, DeviceNet
(Foundation Fieldbus & Profibus PA pending)
- Multidrop mode can address 1 - 250 units over 4 wires

Relay Output: (2) Integral (5) Remote

- Form 'C' (SPDT) contacts, rated 0.5A at 240Vac non-inductive
- All relays have independently adjustable dead bands
- Remote failsafe test facility for one relay

Blanking Distance

- 50kHz = 0.25 m (10")
- 40kHz = 0.30 m (12")
- 30kHz = 0.35 m (14")
- 20kHz = 0.45 m (17")
- 15kHz = 0.60 m (24")
- 10/9kHz = 1.0 m (39")
- 5/4kHz = 1.5 m (59")

Maximum Range

- 5 m (16ft) 50kHz liquids
- 7 m (22ft) 40kHz liquids
- 10 m (33ft) 30kHz liquids, 5m (16ft) solids
- 20 m (65ft) 20kHz liquids/slurries, 10m (33ft) solids
- 30 m (98ft) 15kHz liquids/slurries, 20m (65ft) solids
- 50 m (165ft) 10kHz liquids/slurries/powders/solids
- 60 m (196ft) 5kHz liquids/slurries/powders/solids
- 180 m (588ft) 4/9 kHz for extended range

Resolution

- 1 mm (0.04") 50, 40, 30, 20, 15, 10, 5kHz
- 4 mm (0.2") 9, 4kHz

Electronic Accuracy

- $\pm 0.25\%$ of maximum range

Operating Temperature

- Integral System -40°C (-40°F) to 80°C (176°F)
- Remote electronics -40°C (-40°F) to 80°C (176°F)
- Remote transducer -40°C (-40°F) to 80°C (176°F)
- -40°C (-40°F) to 175°C (Hi-Temp, 10kHz version)

Transducer/Amplifier Separation

- up to 1000m using specified extension cable

Cable

- 4 conductor shielded twisted pair instrument cable
- Conductor size dependent on cable length
- BELDEN 3084A, DEKORON or equivalent
- Max. BELDEN 3084A = 500m (1640 ft)
- Max. DEKORON H D183AA002 = 550m (1980 ft)

Maximum Operating Pressure

- -0.25 PSI to -0.5 Bar

Beam Angle

- 7.5° without focaliser 50kHz/40kHz/30kHz
- 4° with focaliser 50kHz/40kHz
- 6° with focaliser 30kHz/20kHz/15kHz/10kHz/5kHz
- 10° with focaliser 9kHz/4kHz

Display

- 2 line x 8 digit alphanumeric LCD

Memory

- Non-Volatile (No backup battery required)
- >10 years data retention

Enclosure Sealing

- Integral System IP67
- Remote Electronics IP65 (Nema 4x)
- Remote Transducer IP68

Cable Entries

- Integral: 3 x M16 Glands
- Remote: 3 x 20mm, 1 x 16mm knock outs

Mounting

- ANSI, JIS or DIN Flange
- 4 in/100mm to 10 in/250mm
- 2in BSP Thread / NPT Thread

Typical Weight

Sultan AW System with appropriate flange and cone

Frequency (in kHz)	kg	lb
4/5	4 or 5kHz Transducer	13 28.6
9/10	9 or 10kHz Transducer	10 22.0
15	15kHz Transducer	8 17.6
20/30	20 or 30kHz (3") Transducer	3 6.6
30/40/50	30 (2"), 40 or 50kHz Transducer	1 2.2

Configuration

	kg	lb
R6	Remote system with 6m cable	1 2.2
R15	Remote system with 15m cable	3 6.6
R30	Remote system with 30m cable	6 13.2
R50	Remote system with 50m cable	10 22.0

Additional product warranty and application guarantees upon request

Technical data subject to change without notice.

Contact

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Note: Electrical Connection shall be plug & socket type. which is not clearly indicated in Catalogue.

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01	20.03.10	SUBMISSION FOR APPROVAL AS PER DISCUSSION	RAVI	MAR	BSC
0	11.02.10	SUBMISSION FOR APPROVAL	RAVI	MAR	BSC
REV.	DATE	DESCRIPTION	PRD.BY	CHD.BY	APPD.BY

R E V I S I O N S

PROJECT: 2 x 750 MW, PRAGATI III, COMBINED CYCLE PROJECT
CONSULTANCY WING

CUSTOMER:	TRANS NO. 62	☐ I. APPROVED/RELEASED FOR FABRICATION/CONSTRUCTION ☐ II. APPROVED/RELEASED FOR FABRICATION/CONSTRUCTION SUBJECT TO INCORPORATION OF COMMENTS/MODIFICATIONS AS NOTED HEREIN/REVISED DRAWING/DOCUMENT ☐ III. NOT APPROVED FOR FABRICATION/CONSTRUCTION AFTER INCORPORATION OF COMMENTS/MODIFICATIONS AS NOTED HEREIN/REVISED DRAWING/DOCUMENT
	DATE: 12/14/10	
CONSULTANT:	(DATE)	UNITECH CONSULTANCY WING

CLIENT:	 BHARAT HEAVY ELECTRICALS LTD POWER SECTOR PROJECT ENGINEERING MANAGEMENT NEW DELHI
---------	--

VENDOR:	 UNITECH MACHINES LIMITED PLOT NO. 35P, SCETOR - 44 GURGAON - 122002
---------	--

PACKAGE: FIRE PROTECTION SYSTEM

TITLE: DATA SHEET - LEVEL TRANSMITTER (DP TYPE)

PREPARED	CHECKED	APPROVED	DATE	JOB NO.
RAVI	MAR	BSC	11.02.10	P-269
BHEL Doc. NO. PE-V0-314-552-A079		UML Doc. NO. P269-D-A079		REV. 01
				SHEET 1 OF 3

[Handwritten signature]



UNITECH MACHINES LIMITED, GURGAON

Title : Data Sheet – Level Transmitter (DP Type)

Project : 2X750MW Pragati-III, CPP

Package : Fire Protection System

S.No	Location	Range	Qty	Tag No.	Remark
1	On Hydro pneumatic Tank	0-1715 mmWC	1	9SGA01CL001	
2	On Hydro pneumatic Tank	0-1715 mmWC	1	9SGA01CL002	



Client : BHEL	UML Doc. No. : P269-D-A079, Rev 1
BHEL Doc. No. : PE-V0-314-552-A079	Page : 3 of 3

Data sheet for the Flange Mounted Differential Pressure Transmitter

Model No. EJA210A-EMWA1A5A-92EN

Calibration Range : 0 – 1715 mmWC

Model	EJA210A-EMWA1A5A-92EN
Make	YOKOGAWA
Type of Transmitter	Microprocessor based 2-wire HART compatible differential Pressure Transmitter.
Principle of Sensor	Silicon Resonant type.
Accuracy	±0.075% of span
Output	4-20mA superimposed digital signal based on HART protocol.
Measurement Span	100-10000mmWC
Calibration Range	0 – 1715 mmwc
Working pressure limits	2.7KPa to flange rating.
Rangeability	100 : 1
Stability	±0.1% of URL per 60 months.
Power Supply	10.5 to 42VDC
Load Impedance	570Ω at 24VDC
Electrical connection	Plug & Socket type.
Process Connection – High pressure side	2-inch ANSI CLASS 150,
Process Connection – Low pressure side	¼-inch NPT (F) on the cover flanges.
Housing	Die Cast Aluminum with poly urethane paint.
Ambient Temperature	-30°C to +80°C
Process Temperature	-40°C to +120°C
Diaphragm	Hastelloy-C
All Wetted Parts	SS316
Filled Fluid	Silicon Oil.
Diagnostics Details	Self diagnostics in the transmitter with diagnostics indication on the local display.
Span & Zero Adjustment	Remote as well as manually adjustable.
Zero Elevation & Suppression	Standard feature, within Lower & Upper Range Limits
Degree of Protection	IP67

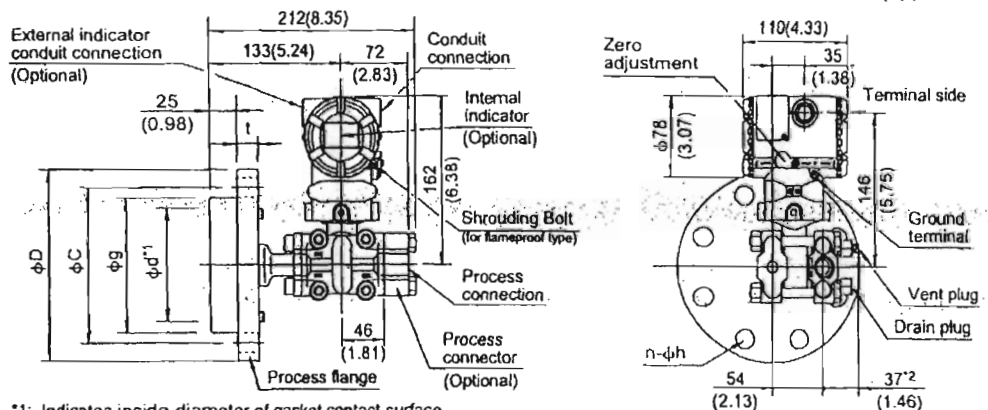


Drawings

Model EJA210A Flange Mounted Differential Pressure Transmitter

DP Transmitter

Unit: mm(approx. inch)



*1: Indicates inside diameter of gasket contact surface.

*2: When Optional code K1, K2, K5, or K6 is selected, add 15 mm(0.59 inch) to the value in the figure.

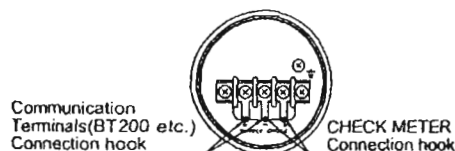
Flange size: 3-inch (80mm)

Flange Nominal Diameter and Rating	ϕD	ϕC	ϕg	ϕd	t	Bolt Holes	
						No. (N)	Dia. (ϕh)
JIS 10K	185(7.28)	150(5.91)	130(5.12)	90(3.54)	18(0.71)	8	19(0.75)
JIS 20K	200(7.87)	160(6.30)	130(5.12)	90(3.54)	22(0.87)	8	23(0.91)
ANSI Class150	190.5(7.50)	152.4(6.00)	130(5.12)	90(3.54)	23.9(0.94)	4	19.1(0.75)
ANSI Class300	209.6(8.25)	168.1(6.62)	130(5.12)	90(3.54)	28.5(1.12)	8	22.4(0.88)
JPI Class150	190(7.48)	152.4(6.00)	130(5.12)	90(3.54)	24(0.94)	4	19(0.75)
JPI Class300	210(8.27)	168.1(6.62)	130(5.12)	90(3.54)	28.5(1.12)	8	22(0.87)
DIN PN 10/16	200(7.87)	160(6.30)	130(5.12)	90(3.54)	20(0.79)	8	18(0.71)
DIN PN 25/40	200(7.87)	160(6.30)	130(5.12)	90(3.54)	24(0.94)	8	18(0.71)

Flange size: 2-inch (50mm)

Flange Nominal Diameter and Rating	ϕD	ϕC	ϕg	ϕd	t	Bolt Holes	
						No. (N)	Dia. (ϕh)
JIS 10K	155(6.10)	120(4.72)	100(3.94)	61(2.40)	16(0.63)	4	19(0.75)
JIS 20K	155(6.10)	120(4.72)	100(3.94)	61(2.40)	18(0.71)	8	19(0.75)
ANSI Class150	152.4(6.00)	120.7(4.75)	100(3.94)	61(2.40)	19.1(0.75)	4	19.1(0.75)
ANSI Class300	165.1(6.50)	127(5.00)	100(3.94)	61(2.40)	22.4(0.88)	8	19.1(0.75)
JPI Class150	152(5.98)	120.8(4.75)	100(3.94)	61(2.40)	19.5(0.77)	4	19(0.75)
JPI Class300	165(6.50)	127(5.00)	100(3.94)	61(2.40)	22.5(0.89)	8	19(0.75)
DIN PN 10/16	165(6.50)	125(4.92)	100(3.94)	61(2.40)	18(0.71)	4	18(0.71)
DIN PN 25/40	165(6.50)	125(4.92)	100(3.94)	61(2.40)	20(0.79)	4	18(0.71)

Terminal Configuration



Terminal Wiring

SUPPLY	Power supply and output terminal
CHECK	External indicator(anmeter) terminal
⏏	Ground terminal

YOKOGAWA
Yokogawa Electric Corporation

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SD 01C21C02-01E

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General Specifications

GS 01C21C01-00E

Model EJA210A and EJA220A Flange Mounted Differential Pressure Transmitters

DP Sharp

The high performance flange mounted differential pressure transmitter models EJA210A and 220A can be used to measure levels of densities of solidifying or precipitating liquids. Both output a 4 to 20 mA DC signal corresponding to the measured differential pressure. Models EJA210A and 220A also feature remote setup and monitoring through communications with the BRAIN™ terminal and CENTUM CS™ or μ XL™ or HART® 275 host.

■ STANDARD SPECIFICATIONS

Refer to GS 01C22T02-00E for FOUNDATION Fieldbus communication type and GS 01C22T03-00E for PROFIBUS PA communication type marked with "◇".

□ PERFORMANCE SPECIFICATIONS

Zero-based calibrated span, linear output, wetted parts material code 'S' for 3-inch flange flush type and 4-inch flange extended type.

Reference Accuracy of Calibrated Span
(including the effects of zero-based linearity, hysteresis, and repeatability)

$\pm 0.075\%$ of Span

For spans below X,

$\pm [0.025 + 0.05 \frac{X}{\text{Span}}] \% \text{ of Span}$

where X equals:

Capsule X kPa (inH₂O)

M 10 {40}

H 100 {400}

Ambient Temperature Effects
Total Effects per 28 °C (50 °F) Change

Capsule	Effect
M	$\pm [0.224\% \text{ Span} + 0.056\% \text{ URL}]$
H	$\pm [0.14\% \text{ Span} + 0.028\% \text{ URL}]$

Static Pressure Effects

Total Effects per Change
 $\pm [0.028\% \text{ Span} + 0.007\% \text{ URL}]$ per 0.69 MPa {100 psi}

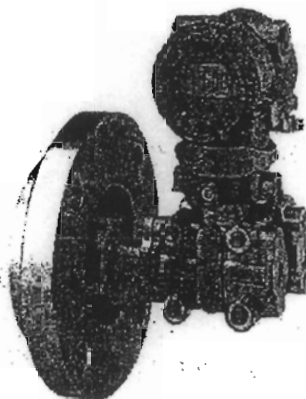
Effect on Zero (can be corrected at line pressure)
 $\pm 0.007\%$ of URL per 0.69 MPa {100 psi}

Stability

$\pm 0.1\%$ of URL per 60 months

Power Supply Effects "◇"

$\pm 0.005\%$ per Volt (from 21.6 to 32 V DC, 350 Ω)



□ FUNCTIONAL SPECIFICATIONS

Span & Range Limits

Measurement Span and Range	kPa	inH ₂ O (ID1)	mbar (ID3)	mmH ₂ O (ID4)
M Span	1 to 100	4 to 400	10 to 1000	100 to 10000
M Range	-100 to 100	-400 to 400	-1000 to 1000	-10000 to 10000
H Span	5 to 500	20 to 2000	50 to 5000	0.05 to 5 kgf/cm ²
H Range	-500 to 500	-2000 to 2000	-5000 to 5000	-5 to 5 kgf/cm ²

NOTE ①-⑤

URL is defined as the Upper Range Limit from the table above.

Zero Adjustment Limits

Zero can be fully elevated or suppressed, within the Lower and Upper Range Limits of the capsule.

External Zero Adjustment "◇"

External zero is continuously adjustable with 0.01 % incremental resolution of span. Span may be adjusted locally using the digital indicator with range switch.

Output "◇"

Two wire 4 to 20 mA DC output with digital communications. BRAIN or HART FSK protocol are superimposed on the 4 to 20 mA signal.

Failure Alarm

Output status at CPU failure and hardware error;

Up-scale: 110%, 21.6 mA DC or more (standard)

Down-scale: -5%, 3.2 mA DC or less

-2.5%, 3.6 mA DC or less (Optional code /F1)

Note: Applicable for Output signal code D and E

YOKOGAWA ◆

Yokogawa Electric Corporation
2-9-32 Nakacho, Musashino-shi, Tokyo, 180-8750 Japan
Phone: 81-422-52-5690 Fax: 81-422-52-2018

GS 01C21C01-00E
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21st Edition Oct. 2008



Damping Time Constant (1st order)

The sum of the amplifier and capsule damping time constant must be used for the overall time constant. Amp damping time constant is adjustable from 0.2 to 64 seconds.

Model	EJA210A		EJA220A	
Capsule (Silicone Oil)	M	H	M	H
Time Constant (sec.)	0.4	0.4	0.4	0.4

Ambient Temperature Limits

(approval codes may affect limits)

-40 to 85 °C (-40 to 185 °F)

-30 to 80 °C (-22 to 176 °F) with LCD Display

Process Temperature Limits

(approval codes may affect limits)

-40 to 120 °C (-40 to 248 °F)

Ambient Humidity Limits

5 to 100 % RH @ 40 °C (104 °F)

Working Pressure Limits (Silicone Oil)

2.7 kPa abs (0.38 psia) to flange rating (see graph below)

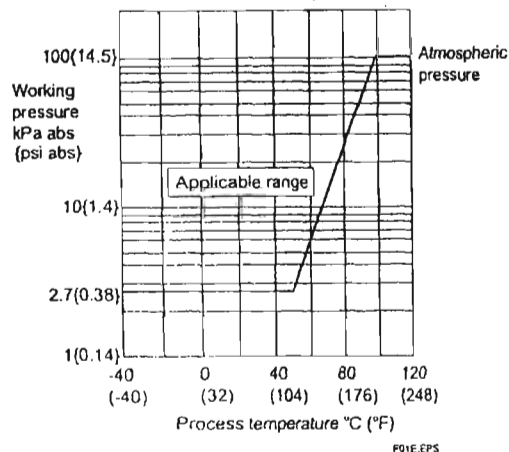


Figure 1. Working Pressure and Process Temperature

EMC Conformity Standards "◇" CE, N200

EN61326-1 Class A, Table2 (For use in industrial locations)

EN61326-2-3

European Pressure Equipment Directive 97/23/EC

Sound Engineering Practice

Supply & Load Requirements

(Safety approvals may affect electrical requirements)

With 24 V DC supply, up to a 570 Ω load can be used. See Figure 2.

Supply Voltage "◇"

10.5 to 42 V DC for general use and flameproof type

10.5 to 32 V DC for lightning protector (Optional code /A)

10.5 to 30 V DC for intrinsically safe, Type n, nonincendive, or non-sparking type

Minimum voltage limited at 16.4 V DC for digital communications, BRAIN and HART

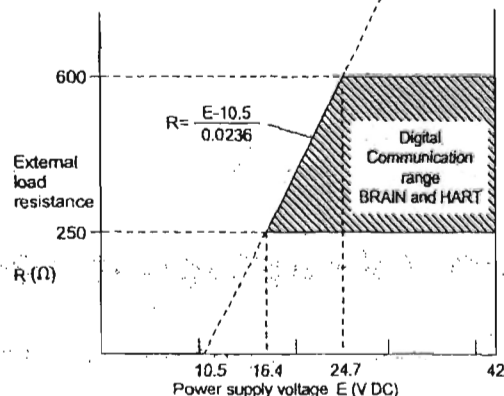


Figure 2. Relationship Between Power Supply Voltage and External Load Resistance

Load (Output signal code D and E)

0 to 1335 Ω for operation

250 to 600 Ω for digital communication

Communication Requirements "◇"**BRAIN****Communication Distance**

Up to 2 km (1.25 miles) when using CEV polyethylene-insulated PVC-sheathed cables. Communication distance varies depending on type of cable used.

Load Capacitance

0.22 μF or less (see note)

Load Inductance

3.3 mH or less (see note)

Input Impedance of communicating device

10 kΩ or more at 2.4 kHz.

Note: For general-use and Flameproof type.

For intrinsically safe type, please refer to 'OPTIONAL SPECIFICATIONS'.



□ PHYSICAL SPECIFICATIONS

Wetted Parts Materials

High side:

See wetted parts materials of the model code

Low side:

Diaphragm

Hastelloy C-276

Cover flange

SCS14A

Process connector

SCS14A

Capsule Gasket

Teflon-coated SUS316L

Vent and Drain Plug

SUS316

Process Connector Gasket

PTFE Teflon

Non-wetted Parts Materials

Bolting

SCM435, SUS630, or SUH660

Housing

Low copper cast-aluminum alloy with polyurethane paint (Munsell 0.6GY3.1/2.0)

Degrees of Protection

IP67, NEMA4X, JIS C0920 immersion proof

Cover O-rings

Buna-N

Name plate and tag

SUS304 or SUS316 (option)

Fill Fluid

Silicone, Fluorinated oil(option)

Weight

10.7 kg(23.6 lb) (Model EJA210A with 3" ANSI 150 flange; without integral indicator and process connector.)

16.1 kg(35.5 lb) (Model EJA220A with 4" ANSI 150 flange, X₂=100, without integral indicator and process connector.)

Connections

Refer to the model code to specify the process and electrical connection type. The high pressure side will be a flange connected, low pressure side is threaded.

Process Connection of Low Side Cover Flange: DIN 19213 with 7/16 inch × 20 unf female thread.

< Settings When Shipped > "◇"

Tag Number	As specified in order ^{*1}
Output Mode	'Linear' unless otherwise specified in order
Display Mode	'Linear' unless otherwise specified in order
Operation Mode	'Normal' unless otherwise specified in order
Damping Time Constant ^{*2}	'2 sec.'
Calibration Range Lower Range Value	As specified in order
Calibration Range Higher Range Value	As specified in order
Calibration Range Units	Selected from mmH ₂ O, mmAq, mmWG, mmHg, Pa, hPa, kPa, MPa, mbar, bar, gf/cm ² , kgf/cm ² , inH ₂ O, inHg, ftH ₂ O, or psi (Only one unit can be specified)

T02E/PS

*1: Up to 16 alphanumeric characters for BRAIN and 8 characters for HART including '-' and '.' will be entered in the amplifier memory. If specified Tag includes other characters than above, it will not be entered in the amplifier memory.

*2: If using square root output, set damping time constant to 2 sec. or more.

< Related Instruments > "◇"

Power Distributor; Refer to GS 01B04T01-02E or

GS 01B04T02-02E

BRAIN TERMINAL; Refer to GS 01C00A11-00E

< Reference >

1. Teflon; Trademark of E.I. DuPont de Nemours & Co.
2. Hastelloy; Trademark of Haynes International Inc.
3. HART; Trademark of the HART Communication Foundation.
4. FOUNDATION; Trademark of Fieldbus Foundation.
5. PROFIBUS; Registered trademark of Profibus Nutzerorganisation e.v., Karlsruhe, Germany.

Material Cross Reference Table

SUS316L	AISI 316L
SUS316	AISI 316
SUS304	AISI 304
S25C	AISI 1025
SCM435	AISI 4137
SUS630	ASTM630
SCS14A	ASTM CF-8M

T02E/PS

6. Other company names and product names used in this material are registered trademarks or trademarks of their respective owners.

< Specification Conformance >

The model EJA210A/220A maintains a specification conformance to at least 3 σ.

