

At - IV

If ensure any changes in P&ID / Instrument Sch shall be reflected in datasheet

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1	11.12.09	GENERALLY REVISED AS PER M/s NTPC COMMENTS	SBJ	MAR	BSC
0	13.08.09	SUBMISSION FOR APPROVAL	SBJ	MAR	BSC
REV.	DATE	DESCRIPTION	DRN.BY	CHD.BY	APPD.BY

R E V I S I O N S

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:



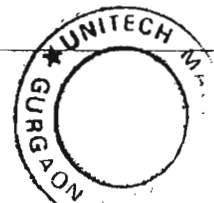
UNITECH MACHINES LIMITED
PLOT NO. 35P, SCETOR - 44
GURGAON - 122002

PACKAGE:

FIRE PROTECTION SYSTEM

TITLE:

DATASHEET - PRESSURE GAUGE



DRAWN	CHECKED	APPROVED	DATE	JOB NO.
SBJ	MAR	BSC	13.08.09	P-269
BHEL Doc. NO. PE-V0-314-552-A067			UML Doc. NO. 44 of 84 P269-D-520	REV. 1 SHEET 1 OF 2



UNITECH MACHINES LIMITED, GURGAON

Title : Data Sheet - Pressure Gauge

Project : 2X750MW Pragati-III, CPP

Package : Fire Protection System

PRESSURE GAUGE

1	Make	General Instruments Consortium , Delhi
2	Model No.	BSPG-V-15-AL-S-4-15NTM-0~16-A-L
3	Service	Water
4	Type / Sensing Element	Bourdon
5	Process condition	
5.1	Working pressure	8.8 kg/cm ²
5.2	Design pressure	12 kg/cm ²
5.3	Design temperature	50 deg. C.
6	Dial size	150 mm nominal dia
7	Scale	Black lettering on white background in 270 Deg. Arc.
8	Pointer	Micrometer adjustable
9	Blow out disc	Provided
10	Window	Shatterproof glass
11	Case	Weatherproof to IP67 as per IS:13947, Die cast Aluminium, with screwed Aluminium bezel ring
12	MOC	
12.1	Element	SS 316
12.2	Socket	SS 316
12.3	Movement	SS 304
13	Process connection	½ " NPT(M) bottom
14	Range	0 -16 kg/cm ²
15	Over-range protection	130 % of FSD
16	Accuracy	+/- 1% of FSD
17	SS tag plate	Provided
18	Accessories	Snubber & other instrument fittings shall be as per approved Instrument Hook-up Drg.
19	Quantity & Location	As per approved P & ID
20	Catalogue	Enclosed (3 nos. sheets)



Client : BHEL

BHEL Doc. No. : PE-V0-314-552-A067

UML Doc. No. : P269-D-520, Rev 1

Page : 1 of 1

Cat IV

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0	13.08.09	SUBMISSION FOR APPROVAL	SBJ	MAR	BSC
REV.	DATE	DESCRIPTION	DRN.BY	CHD.BY	APPD.BY
R E V I S I O N S					

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 - LEVEL GAUGE

DRAWN	CHECKED	APPROVED	DATE	JOB NO.
SBJ	MAR	BSC	13.08.09	P-269
BHEL Doc. NO. PE-V0-314-552-A072			UML Doc. NO. P269-D-524	REV. 1 SHEET 1 OF 2



UNITECH MACHINES LIMITED, GURGAON

Title : Data Sheet – Level Gauge

Project : 2X750MW Pragati-III, CPP

Package : Fire Protection System

Level Gauge

1	Make	V. Automat & Instruments(P) Ltd, Delhi
2	Model No.	RLG-1650-1630-311-VA2500
3	Service	Water
4	Type	Reflex(Toughened borosilicate glass)
5	Process condition	
5.1	Design pressure	12 kg/cm ²
5.2	Design temperature	50 deg. C.
6	Material of construction	
6.1	Chamber	Forged Carbon Steel
6.2	Valve body	Forged Carbon Steel
6.3	Cover Plate	Forged Carbon Steel
6.4	Process connection	Forged Carbon Steel
6.5	Scale	SS 304
7	Tank Height	4.134 meters
8	C to C distance	1650 mm
9	Visibility	1630 mm
10	Process connection	1" ANSI, 150 #
11	Accuracy	+/- 2 % of Full scale range
12	Over range protection	125 % of Full scale range
13	Orientation	Side-Side
14	Drain valve	15 NB, CS
15	Vent Plug	15 NB, CS
16	Accessories	As per approved Instrument Hook-up Dia.
17	Quantity & Location	As per approved P & ID
18	Catalogue	Enclosed (5 nos. sheets)



Client : BHEL

BHEL Doc. No. : PE-V0-314-552-524

UML Doc. No. : P269-D-524, Rev 1

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REV.	DATE	DESCRIPTION	DRN.BY	CHD.BY	APPD.BY

R E V I S I O N S

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

CUSTOMER: PRAGATI POWER CORPORATION LIMITED

CONSULTANT: *Cat IV*
13.01.2010
 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 - LEVEL INDICATOR

DRAWN	CHECKED	APPROVED	DATE	SCALE	JOB NO.
SBJ	MAR	BSC	13.08.09	NTS	P-269
BHEL Doc. NO. PE-V0-314-552-A071			UML Doc. NO. P269-D-523		REV. 1
					SHEET 1 OF 2

**UNITECH MACHINES LIMITED, GURGAON**

Title : Data Sheet – Level Indicator

Project : 2X750MW Pragati-III, CPP

Package : Fire Protection System

Level Indicator

1	Make	V. Automat & Instruments(P) Ltd, Delhi
2	Model No.	40C
3	Service	Water
4	Type	Float and Chord
5	Process condition	
5.1	Design pressure	12 kg/cm2
5.2	Design temperature	50 deg. C.
6	Tank Height	9.7 meters
7	Range	0 to 9.7 meters
8	Pointer	CS epoxy painted with red indication
9	Scale	Aluminium channel with plastic letters fixed
10	Material of construction	
10.1	Pulley	SS 304
10.2	Housing	Cast aluminium
10.3	Float	SS 316
10.4	Float chord	SS 316
10.5	Anchor tension assembly	CS
10.6	Anchort bar	CS
10.7	Spring assembly	MS
11	Process connection	1" ANSI, 150#
12	Resolution	50 mm
13	Accuracy	50 mm
14	Graduation	100 mm
15	Scale width	70 mm
16	Letter height	40 mm
17	Quantity & Location	As per approved P & ID
18	Accessories	As per approved Instrument Hook-up dia.
19	Catalogue	Enclosed (5 nos. sheets)



Client : BHEL

UML Doc. No. : P269-D-523, Rev 1

BHEL Doc. No. : PE-V0-314-552-523

Page : 1 of 1

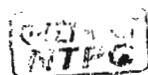
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2	19.02.10	GENERALLY REVISED AS PER M/s NTPC COMMENTS	SKS	RAVI/MAR	BSC
1	25.01.10	GENERALLY REVISED AS PER M/s NTPC COMMENTS	SBJ	MAR	BSC
0	13.08.09	SUBMISSION FOR APPROVAL	SBJ	MAR	BSC
REV.	DATE	DESCRIPTION	DRN.BY	CHD.BY	APPD.BY

R E V I S I O N S

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

CUSTOMER:



PRAGATI POWER CORPORATION LIMITED

TRANS NO.....

- ☐ I APPROVED RELEASE FOR FABRICATION/CONSTRUCTION
☒ II APPROVED RELEASE FOR FABRICATION/CONSTRUCTION
 SUBJECT TO CORRECTION OF COMMENTS/IMPLICATIONS

CONSULTANT:

DATE.....

(SIGNATURE)

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:

DATA SHEET - DIFFERENTIAL PRESSURE GAUGE

DRAWN	CHECKED	APPROVED	DATE	JOB NO.
SBJ	MAR	BSC	13.08.09	P-269
BHEL Doc. NO. PE-V0-314-552-A068			UML Doc. NO. P269-D-521	SHEET 3 OF 3

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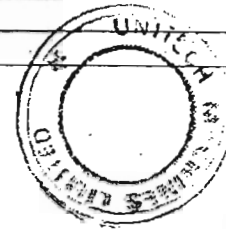
Title : Data Sheet – Differential Pressure Gauge

Project: 2X750MW Pragati-III, CPP

Package: Fire Protection System

DIFFERENTIAL PRESSURE GAUGE

1	Make	General Instruments Consortium , Delhi
2	Model No.	DPG-B-S-15-S4-S6-A-15NTM-0~2-A-L
3	Service	Water
4	Type / Sensing Element	Bellow
5	Process condition	
5.1	Design pressure	12 kg/cm2
5.2	Design temperature	50 deg. C.
6	Dial size	150 mm nominal dia
7	Scale	Black lettering on white background in 270 Deg. Arc.
8	Pointer	Micrometer adjustable
9	Blow out disc	Provided
10	Window	Toughened glass with rubber ring
11	Case	SS304, Weatherproof to IP67 as per IS:13947
12	Bezel Ring	Bayonet
13	MOC	
13.1	Element	SS 316
13.2	Socket	SS 316
13.3	Movement	SS 304
14	Process connection	½ " NPT(M), 2 Nos, Bottom
15	Range	0 -2 kg/cm2
16	Accuracy	+/- 1% of FSD
17	SS tag plate	Provided
18	Accessories	As per approved Instrument Hook-up Drg.
19	Quantity & Location	As per approved P & ID
20	Catalogue	Enclosed (3 nos. sheets)

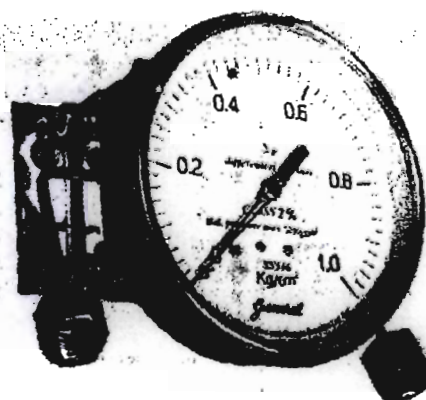


Client : BHEL	UML Doc. No. : P269-D-521, Rev 3
BHEL Doc. No. : PE-V0-314-552-521	Page : 2 of 2

General

Differential Pressure Gauges

Differential pressure gauges are used for measuring differential pressure across filters, strainers, columns, reactors, ID / FD fans, blowers and for flow measurement. A set of two stainless steel bellows or two diaphragms enables direct reading of the actual differential pressure. Each port can withstand the full static pressure without any damage.

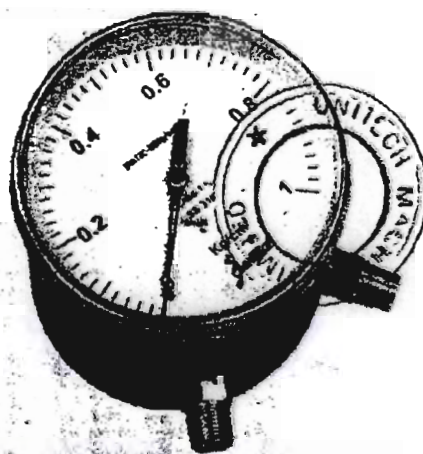


Features

- Bellow / Diaphragm (double diaphragm design) type construction
- Static pressure upto 300 kg/cm² (higher static pressure on request)
- All SS internals
- Screwed / Flanged connection
- Chemical seal unit (optional) for process suitability
- Accuracy $\pm 1\%$ FSD (bellow) / $\pm 2\%$ FSD (diaphragm) (1.6% FSD on request)
- Glycerine filled case as an option
- Microswitch type contacts as required

Specifications

Dial	: 6" Nominal / 4" (Only for diaphragm type)
Case & Bezel	: Diecast aluminium / SS304 / SS316, weatherproof to IP-67 (IS:13947 Part 1)
Window	: Toughened Glass with rubber ring
Pointer	: Light weight, micrometer adjustable
Sensing	: Bellow / diaphragm in SS316 / SS316L / Monel
Other wetted parts	: SS316 / SS316L / Monel
Movement	: SS304
Connection	: 1/2" NPT (M) or flanged
Range	: As customer requires (Minimum 0 to 160 mm WC)
Static Pressure	: Up to 300 kg/cm ² max. (higher static pressure on request)
Accuracy	: $\pm 1\%$ FSD for bellow type and $\pm 2\%$ FSD for diaphragm type (1.6% FSD on request)
Blow out disc	: Provided (top of the case)
Temperature suitability	: 20°C to 60°C Ambient, 20°C to 60°C Process
Optional	: Chemical seal unit Glycerine filled case Microswitch type contacts



Under Technical Collaboration with M/s. Gauges Bourdon, U.K.

www.generalinstruments.net

How to Order

TYPE : DPG-B

* Specify material & size in the bracket e.g. SN [SS316, 1/2" NPT(F) x 1/2" NPT(M)]

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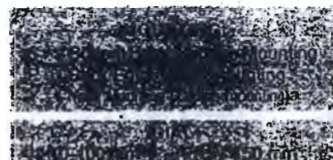
8.5

General

Differential Pressure Gauges Diaphragm Type

How to Order

TYPE : DPG-D



CASE
A1 - Die-cast Aluminium
S4 - SS304
S6 - SS316

DIAPHRAGM
S6 - SS316
HC - Hastelloy C-276
HB - Hastelloy B
M - Monel 400

MOVEMENT
A - SS304



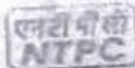
Mounting Brackets
B1 - M 18 x 1.5
B2 - M 20 x 1.5
B3 - M 22 x 1.5
B4 - M 24 x 1.5
B5 - Any other

Range
0 - 0.5 kg/cm² 0 - 0.5 kg/cm²
0 - 1 kg/cm² 0 - 0.25 kg/cm²
0 - 2 kg/cm² 0 - 0.125 kg/cm²
0 - 5 kg/cm² 0 - 0.03125 kg/cm²



* Specify material & size in the bracket e.g. SN [SS316, 1/2" NPT(F) x 1/2" NPT(M)]

Under Technical Collaboration with M/s. Gauges Bourdon, U.K.



NTPC LIMITED
(A Govt. of India Enterprise)
CONSULTANCY WING

TRANSMIT NO. **239**
DATE **12/4/10**
AKASH
(DATE)

- ☐ APPROVED FOR RELEASE FOR FABRICATION/CONSTRUCTION
☐ APPROVED FOR RELEASE FOR FABRICATION/CONSTRUCTION
SUBJECT TO MODIFICATION OF COMMENTS/REVISIONS
AS NOTED BY THE ENGINEERING DEPARTMENT
☐ NOT APPROVED FOR RELEASE FOR FABRICATION/CONSTRUCTION
AT THE PRESENT STAGE
☒ FOR APPROVAL AND RELEASE FOR FABRICATION/CONSTRUCTION
BY THE DESIGNING OFFICE

APPROVAL CONFIRMED HEREIN BY THE CONTRACTOR OF HIS
AUTHORISED REPRESENTATIVE FOR CORRECTNESS OF
DESIGN AND DATA AND HIS RESPONSIBILITY FOR CORRECTNESS OF
DESIGN AND DATA

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REV.	DATE	DESCRIPTION	DRN.BY	CHD.BY	APPD.BY
0	28.10.09	SUBMISSION FOR APPROVAL	SBJ	MAR	BSC

REVISIONS

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 SWITCH**

DRAWN	CHECKED	APPROVED	DATE	SCALE	JOB NO.
SBJ	MAR	BSC	28.10.09	NTS	P-269
BHEL Doc. NO. PE-V0-314-552-A066			UML Doc. NO.		REV. 0
					SHEET 1 OF 2



UNITECH MACHINES LIMITED, GURGAON

Title : Data Sheet - Pressure Switch

Project : 2X750MW Pragati-III, CPP

Package : Fire Protection System

PRESSURE SWITCH

1.0	Make	Indfos Industries Limited, Ghaziabad
1.1	Model No.	B4 64 S XSC XPC XNH XFS 0.7/14 Kg/Cm ²
1.2	Service	Water
1.3	Type	Diaphragm Sealed Piston Actuator
1.4	Process condition	
1.4.1	Working pressure	8.8 kg/cm ²
1.4.2	Design temperature	50 deg. C.
1.5	Sensing element	SS-316 Diaphragm
1.6	Wetted Parts	SS-316
1.7	Process connection	½ " NPT(M) through adapter
1.8	Max. permissible temp.	150 deg.C.
1.9	Enclosure material	Die cast aluminium, black powder coated
1.10	Enclosure protection	Weather proof conforming to IP-66 as per IS:2147
1.11	Cable entry	Plug and Socket
1.12	Switch type	2 SPDT, Snap action micro switch
1.13	Contact rating	15 A 250 V AC, 0.5 A 125 V DC, 0.25 A 250 VDC, 6A 30 VDC
1.14	Range	0.7 to 14 kg/cm ²
1.15	Differential	2.52 kg/cm ² (fixed and max.)
1.16	Max. Proof pressure	65 kg/cm ²
1.17	Repeatability	+/- 0.5%
1.18	Set point	Adjustable throughout the range
1.19	Actuation	4.5 rising, 6.5 falling
1.20	Accessories	
1.20.1	XSC	SS 316 Adaptor for connection size ½" NPT(M) X ½" NPT(M)
1.20.2	XPC	7 Pin Plug in Connector
1.20.3	XNH	SS-304 tag plate
1.20.4	XFS	Factory set point(4.5 rising, 6.5 falling)
1.18	Quantity & Location	As per approved P & ID
1.19	Catalogue	Enclosed (9 nos. sheets)

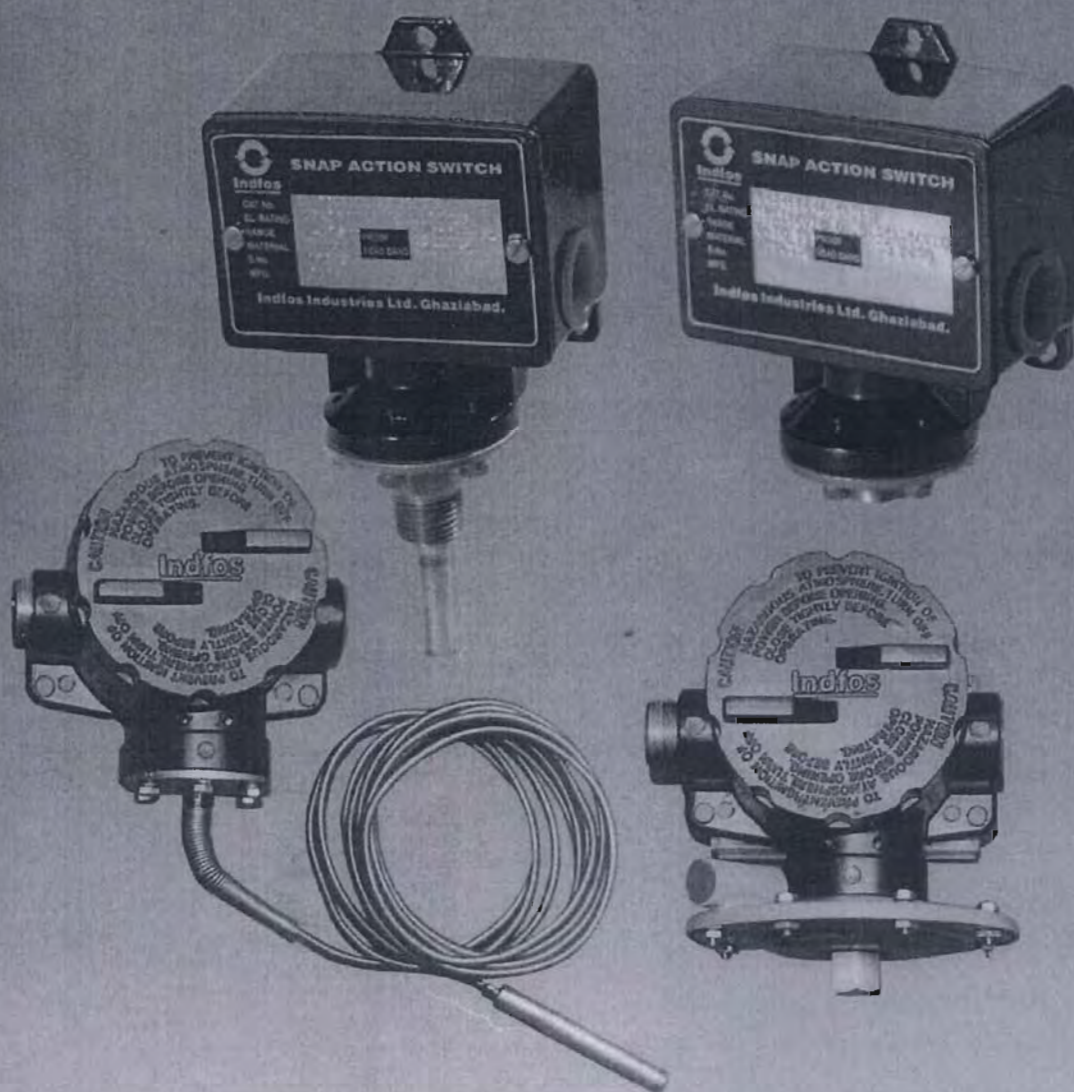
Client : BHEL

BHEL Doc. No. : PE-V0-314-552-A066

UML Doc. No. : P269-D-519, Rev 0

Page : 2 of 2

PRESSURE / DIFFERENTIAL PRESSURE & TEMPERATURE SWITCHES TYPE B-SERIES



Indfos

INDFOS INDUSTRIES LIMITED
2749, G.F., Street No. 13,
Ranjit Nagar
Near W.P. Nagar Bus Stop,
New Delhi-110 008

INDFOS INDUSTRIES LIMITED

706-707, Surya Kiran, 19, Kasturba Gandhi Marg, New Delhi - 110 001, INDIA
Tel.: 91-11-23316196/97/98, 91-120-2567936/37 • Fax: 91-11-23316331, 91-120-2568109
E-mail : indfos@satyam.net.in, inddelhi@bol.net.in

B SERIES SWITCHES

B Series Switches utilises diaphragm sealed piston actuator as the sensing element. The rugged diaphragm sealed piston actuator provides set point repeatability of $\pm 0.5\%$. The enclosure is die-cast aluminium and is available in weather proof and explosion proof versions (Table A). A wide variety of SPDT and Dual (2) SPDT snap action switches are available to meet many electrical load requirements (Table B). Applications include : Pumps, Compressors, Heat Exchangers, Boilers, Marine Equipment, Lube Systems, Filters, Degreasers, Evaporators, Recovery System, Ground Support Equipments, Textile Machinery, Heating & Air Conditioning Systems, Food Processing, Heat Tracing, Fire Fighting, Bottling, Bulk Conveying Systems, Packing & Filling, Furness, Blowers and Air Dryers etc.

A. ENCLOSURE	
B4	Pressure switch type 400 watertight enclosure to meet weather proofness to IP : 66 as per IS : 13947 (Part I) 1993.
B7	Pressure switch type 700 explosion proof enclosure to meet to gas gr. IIA & IIB as per IS : 2148 1981.
B7 IIC	Pressure switch type 700 explosion proof enclosure to meet to gas gr. IIC as per IS : 2148 1981.
D4	Differential pressure switch type 400 watertight enclosure to meet weather proofness to IP : 66 as per IS : 13947 (Part I) 1993.
D7	Differential pressure switch type 700 explosion proof enclosure to meet to gas gr. IIA & IIB as per IS : 2148 1981.
D7 IIC	Differential pressure switch type 700 explosion proof enclosure to meet to gas gr. IIC as per IS : 2148 1981.
T4	Temperature switch type 400 watertight enclosure to meet weather proofness to IP : 66 as per IS : 13947 (Part I) 1993.
T7	Temperature switch type 700 explosion proof enclosure to meet to gas gr. IIA & IIB as per IS : 2148 1981.
T7 IIC	Temperature switch type 700 explosion proof enclosure to meet to gas gr. IIC as per IS : 2148 1981.

Ambient operating limit - 30° C to 65° C for all Switches.

B. SWITCH TYPE				
Sl. No.	TYPE	ELE. RATING	CODE	
			1 SPDT	2 SPDT
1.	Low Force	10A 125/250/480 VAC, 1/8 HP 125 VAC, 1/4 HP 250 VAC	10*	
2.	Narrow Dead Band	15 A 125/250 VAC, 0.4A 120 VDC	20	61
3.	Ammonia Service	5 A 125/250 VAC	21	65
4.	Hermetically Sealed Switch, Narrow Dead Band	5A 125/250 VAC, 2.5A 28 VDC	22	67
5.	Heavy Duty AC	22A 125/250 VAC	23	
6.	Genral Purpose	15A, 125/250/480 VAC, 0.5A 125 VDC, 0.25A 250 VDC, 6A 30 VDC	24	64
7.	Heavy Duty DC	10A 125 VAC OR DC	25	66
8.	Sealed Environment Proof	15A 125/250 VAC, 0.4A 125 VDC	26	62
9.	High Temperature 300 Deg. F (150 Deg.C)	15A 125/250 VAC	27	63
10.	Gold Plated Contacts	1A 125 VAC, 1A Res./0.5A Ind. 28VDC	31	70
11.	Hermetically Sealed Switch	11A 125/250 VAC, 5A 30 VDC	32	68
12.	Hermetically Sealed Switch, Gold Plated Contacts	1A 125 VAC, 0.5 A 24 VDC	42	71
13.	Variable Dead Band	15A 125/250 VAC	50	

* Available in pressure ranges of 2.5 - 25 mm H₂O and 5.0 - 50 mm H₂O only.

PRESSURE SWITCHES DEAD BAND CHART FOR B400 / B700 SWITCHES WITH BUNA N DIAPHRAGM

S.NO.	MICROSWITCH →	10	20,26 27	21,24, 31,33	22	25	32,42	50		61,62,	64,65 70	67	68,71
	RANGE ↓		MAX. DEAD BAND					MIN.	MAX.	MAX. DEAD BAND			
LOW PRESSURE RANGE mm H ₂ O													
1	25 mm H ₂ O	2	6										
2	50 mm H ₂ O	3	7										
3	250 mm H ₂ O		13	51	26	89	72	9	38	21	81	41	114
4	750 mm H ₂ O		16	64	51	112	89	11	51	26	102	82	142
5	1500 mm H ₂ O		33	89	76	157	127	22	64	54	142	122	203
6	2500 mm H ₂ O		41	140	102	244	196	27	102	64	224	163	305
7	3750mm H ₂ O		64	216	153	381	305	43	165	102	330	244	483
8	+/-375mm H ₂ O		19	64	31	112	89	11	51	31	102	49	142
9	+/- 750mm H ₂ O		15	64	38	112	89	11	51	26	102	61	142
VACCUUM RANGE mm Hg													
10	- 760 mm Hg		18	76	38	132	107	12	56	31	122	61	173
COMPOUND RANGE mm Hg / Kg/cm ²													
11	- 760 mm Hg /		25	76	46	135	107	19	64	41	122	74	170
	1Kg/cm ²		0.05	0.11	0.10	0.18	0.15	0.04	0.07	0.08	0.17	0.2	0.24
12	- 760 mm Hg /		38	153	61	254	213	30	114	61	244	98	330
	2Kg/cm ²		0.06	0.14	0.09	0.25	0.20	0.05	0.11	0.09	0.23	0.15	0.32
13	- 760 mm Hg /		76	229	114	305	305	63	178	122	356	183	483
	4Kg/cm ²		0.11	0.35	0.16	0.61	0.49	0.08	0.28	0.17	0.56	0.26	0.81
PRESSURE RANGE Kg/cm ²													
14	1Kg/cm ²		0.02	0.11	0.07	0.18	0.15	0.01	0.07	0.04	0.17	0.11	0.23
15	2Kg/cm ²		0.04	0.11	0.07	0.18	0.15	0.02	0.07	0.06	0.17	0.11	0.23
16	4 Kg/cm ²		0.07	0.25	0.14	0.44	0.35	0.05	0.18	0.11	0.39	0.23	0.56
17	7 Kg/cm ²		0.12	0.35	0.32	0.61	0.49	0.08	0.25	0.19	0.56	0.51	0.79
18	14 Kg/cm ²		0.21	0.92	0.53	1.55	1.28	0.14	0.63	0.34	1.48	0.85	2.04
19	28 Kg/cm ²		0.5	1.7	0.8	3.0	2.4	0.4	1.1	0.8	2.7	1.2	3.8
20	42 Kg/cm ²		0.8	2.1	1.6	3.7	2.96	0.5	1.4	1.2	3.4	2.6	4.7
21	70 Kg/cm ²		2.1	7.8	5.6	13.5	10.8	1.3	4.9	3.4	12.4	9.0	17.6
22	110 Kg/cm ²		3.2	12.0	9.0	21.0	16.1	2.0	6.0	5.1	19.2	14.2	27.2
23	140 Kg/cm ²		3.2	12.0	9.0	21.0	16.1	2.0	6.0	5.1	19.2	14.2	27.2
24	210 Kg/cm ²		4.2	16.5	16.2	28.9	23.2	2.6	11.3	6.8	26.5	25.9	37.0

DIFFERENTIAL PRESSURE SWITCHES DEAD BAND CHART FOR D400 / D700 SWITCHES WITH BUNA N DIAPHRAGM

S.NO.	MICROSWITCH	20,26, 27	21,24, 31,33	22	25	32,42	50		61, 62	64,65 70	67	68,71
	RANGE	MAX. DEAD BAND					MIN	MAX.	MAX. DEAD BAND			
LOW D.P. RANGE		mm H ₂ O										
1	250 mm H ₂ O	13	51	26	89	72	9	38	21	81	41	114
2	750 mm H ₂ O	15	64	51	112	89	11	51	25	102	81	142
3	1500 mm H ₂ O	33	89	76	157	127	23	64	53	142	122	203
4	2500 mm H ₂ O	41	140	102	244	196	28	102	64	224	163	305
5	3750 mm H ₂ O	64	216	152	381	305	46	165	102	330	244	483
HIGH D.P. RANGE		Kg/cm ²										
5	1Kg/cm ²	0.07	0.35	0.10	0.61	0.49	0.05	0.25	0.11	0.56	0.16	0.77
6	2Kg/cm ²	0.14	0.35	0.20	0.61	0.49	0.11	0.25	0.23	0.56	0.32	0.77
7	4 Kg/cm ²	0.28	0.42	0.39	0.70	0.60	0.21	0.32	0.45	0.68	0.63	0.92
8	7 Kg/cm ²	0.7	1.4	1.0	2.5	2.0	0.5	1.1	1.1	2.3	1.6	3.1
9	14 Kg/cm ²	1.1	2.8	1.5	4.9	3.9	0.7	1.8	1.7	4.5	2.4	6.3
10	28 Kg/cm ²	1.4	4.2	2.0	7.4	5.9	1.1	2.8	2.3	6.8	3.2	9.4
11	42 Kg/cm ²	2.8	10.6	3.9	18.3	14.8	2.1	8.1	4.5	16.9	6.3	23.7

Notes :

- Switches May Generally be set between 15% and 100% of nominal range on increasing pressure and 5% and 90% of nominal range on falling pressure.
- The set and reset points must fall within the adjustable range.

Deadbands for optional diaphragms

- Viton : Multiply Buna N value by 1.4
- Ethlon : Multiply Buna N value by 1.2
- SS-316 : Multiply Buna N value by 1.7
- Monel : Multiply Buna N value by 1.7

PRESSURE / VACCUUM SWITCHES

B Series switches are designed to handle pressure from vacuum to 210 kg/cm². These are designed for high proof pressures. B Series switches use a diaphragm sealed piston actuator. As the pressure on the calibrated piston increases, the adjusted spring force is over-come and the snap action switch is actuated. The piston is sealed from the process by a diaphragm. Choice of diaphragm materials offer compatibility with virtually any medium. Stainless steel diaphragm is also available as an option from 12.5 - 250mm H₂O to 7.0 - 140 kg/cm².

C. ACTUATOR SEAL (1), (8)					
CODE	DIAPHRAGM MATERIAL	MAX TEMP °C	RANGE		
			VAC & mmH ₂ O	0-140 kg cm ²	210 kg cm ²
B	BUNA-N	65	•	•	•
V	VITON	150	•	•	
T	TEFLON	65 (2)	•	•	•
S (7)	SS-316	150	•	•	

NOTE :

- (1) Process connection size is 1/4" NPT (F) for all ranges.
- (2) Max. Temperature can be increased to 150° using option XTV.
- (3) Order option XHX for 7 kg/cm² max. pressure in mm H₂O ranges.
- (4) These ranges are not available with SS Diaphragm
- (5) These range available with SS-316 diaphragm with viton gasket for sealing.
- (6) These ranges also available with process connection size of 1/2" MPT(M)
- (7) Max. Pressure for SS diaphragm is 165 kg/cm²
- (8) Other diaphragm material like SS-316L, Monel etc. can also be provided on specific request.
- * These ranges are available with microswitch Type 10 only.

D. ADJUSTABLE RANGE	PROOF PRESSURE
VACCUUM	
(-) 760-0 mm Hg	16 kg/cm ² (4)
COMPOUND	
(-) 375-(+) 375 mm H ₂ O	1.4 kg/cm ² (3), (4)
(-) 760-(+) 760 mm H ₂ O	1.4 kg/cm ² (3), (4)
(-) 1-(+) 1kg/cm ²	16 kg/cm ² (4)
(-) 1-(+) 2kg/cm ²	16 kg/cm ² (4)
(-) 1-(+) 4kg/cm ²	16 kg/cm ² (4)
WATER COLUMN	
2.5-25 mm H ₂ O*	1.4 kg/cm ² (3), (4)
5.0-50 mm H ₂ O*	1.4 kg/cm ² (3), (4)
12.5-250 mm H ₂ O	1.4 kg/cm ² (3)
37.5-750 mm H ₂ O	1.4 kg/cm ² (3)
75-1500 mm H ₂ O	1.4 kg/cm ² (3)
125-2500 mm H ₂ O	1.4 kg/cm ² (3)
187.5-3750 mm H ₂ O	1.4 kg/cm ² (3)
PRESSURE	
0.05-1.0 kg/cm ²	33 kg/cm ²
0.1-2.0 kg/cm ²	33 kg/cm ²
0.2-4.0 kg/cm ²	33 kg/cm ²
0.35-7.0 kg/cm ²	65 kg/cm ²
0.7-14.0 kg/cm ²	65 kg/cm ²
1.4-28.0 kg/cm ²	170 kg/cm ²
2.1-42.0 kg/cm ²	170 kg/cm ²
3.5-70.0 kg/cm ²	800 kg/cm ² (6)
5.5-110.0 kg/cm ²	800 kg/cm ² (5), (6)
7.0-140.0 kg/cm ²	800 kg/cm ² (5), (6)
10.5-210.0 kg/cm ²	800 kg/cm ² (4), (6)

DIFFERENTIAL PRESSURE SWITCHES

B Series differential pressure switches are designed for high or low differential pressure ranges from 12.5-250 mm H₂O to 4.2-42 kg/cm² (Table F). The low range differential pressure switches are diaphragm actuated. Process pressure acts on both sides of a diaphragm and ensures true response. The PSI range Differential pressure switches consist of two identical calibrated pistons which are sealed from the process by diaphragms.

E. ACTUATOR SEAL *				
CODE	DIAPHRAGM MATERIAL	MAX TEMP °C	RANGE	
			mmH ₂ O	Kg/cm ²
B	BUNA-N	65	•	•
V	VITON	150	•	•
T	TEFLON	65	•	•
S(9)	SS-316	150	•	•

(9) Available upto 6 kg/cm².

* Other diaphragm material like SS-316L, Monel etc. can also be provided on specific request.

F. ADJUSTABLE RANGE	MAX. STATIC PRESSURE
LOW PRESSURE	
12.5-250 mm H ₂ O	3800 mm H ₂ O (10),(11),(12)
75-750 mm H ₂ O	3800 mm H ₂ O (10),(11),(12)
150-1500 mm H ₂ O	3800 mm H ₂ O (10),(11),(12)
250-2500 mm H ₂ O	3800 mm H ₂ O (10),(11),(12)
375-3750 mm H ₂ O	3800 mm H ₂ O (10),(11),(12)
HIGH PRESSURE	
0.1-1 kg/cm ²	33 kg/cm ² (13)
0.2-2 kg/cm ²	33 kg/cm ² (13)
0.4-4 kg/cm ²	33 kg/cm ² (13)
0.7-7 kg/cm ²	65 kg/cm ²
1.4-14 kg/cm ²	65 kg/cm ²
2.8-28 kg/cm ²	65 kg/cm ²
4.2-42 kg/cm ²	130 kg/cm ²

(10) Max. Proof pressure is 1.4 kg/cm².

(11) Order option XHX for 2.8 kg/cm² max. static pressure and 11.2 kg/cm² proof pressure.

(12) These ranges are available with SS-316 diaphragm with viton gasket for sealing.

(13) These ranges are available with SS diaphragm with teflon O ring for sealing.

TEMPERATURE SWITCHES

B Series temperature switches are designed to maintain temperatures at desired set points. A wide range of temperature selection from -40°C to 400°C is offered to meet many applications. Temperature switches are available in direct mounting type as well as remote mounted capillary type.

The direct mounting type series is available in different stem lengths from 70 mm to 305 mm (Table H).

The remote mounted switches have SS 316 capillary, length of which can vary from 1.5 to 7.5 meters (Table G). Capillary armouring is standard.

Thermowell bushings are available for capillary type switches. A split rubber grommet allows easy installation and adjustment of immersion length. Order option X 69 C.

G. REMOTE MOUNTED THERMAL SYSTEM

CODE	CAPILLARY LENGTH (14)	STYLE
T05030	1.5 Meters	SS-316 Capillary with SS-304 armouring. 76 mm long/9.5 mm dia bulb
T10030	3.0 Meters	
T15030	4.5 Meters	
T20030	6.0 Meters	
T25030	7.5 Meters	

H. DIRECT MOUNT THERMAL SYSTEM

CODE	STEM LENGTH (14)	STYLE
TS027	70 mm	9.5 mm dia SS-316 stem with ½" NPT (M) connection
TS040	102 mm	
TS060	152 mm	
TS090	229 mm	
TS120	305 mm	

A wide temperature range selection is offered (TABLE I). The vapour pressure system ensures quick response and ± 1% repeatability.

I. ADJUSTABLE RANGE	MAX. TEMP.
- 40 to 16°C	205°C
- 20 to 40°C	205°C
25 to 95°C	205°C
65 to 125°C	205°C
70 to 170°C	260°C
110 to 190°C	260°C
175 to 275°C (15)	370°C
260 to 400°C (15)	480°C

(14) For stem length and capillary length other than the standard, Please contact our nearest sales office.

(15) Available in remote mounted style only.

TEMPERATURE SWITCHES DEAD BAND CHART FOR T400 / T700 SWITCHES

S.NO.	MICROSWITCH →	20,26, 27	21,24, 31,33	22	25	32,42	50	61,62,	64,65 70	67	68,71
	RANGE (DEG. C) ↓	MAX. DEAD BAND					MIN.	MAX.	MAX. DEAD BAND		
1	20 TO 95	1.9	8.9	5.0	28.0	13.0	1.4	6.7	3.1	14.0	20.0
2	65 TO 125	1.7	6.7	5.0	20.0	13.0	1.2	4.7	2.2	10.6	20.0
3	70 TO 170	1.7	6.7	5.0	20.0	13.0	1.4	4.7	3.1	10.6	20.0
4	110 TO 190	1.7	6.7	5.0	20.0	13.0	1.4	4.7	3.1	10.6	20.0
5	175 TO 275	2.5	8.9	5.6	28.0	19.0	1.8	6.7	4.0	14.0	28.0
6	260 TO 400	4.4	16.7	12.8	-	27.8	4.0	13.3	7.0	26.7	44.5
7	- 20 TO 40	1.7	6.7	4.2	22.0	11.0	1.2	4.7	2.2	10.6	17.0
8	- 40 TO 16	1.1	4.4	3.3	15.6	8.9	0.8	3.1	1.8	7.1	14.0

Notes :

- All deadbands are in degree centigrades only.
- Set point and reset points must fall within the adjustable range.

ORDERING

To order desired Model write your option in this form

B4 24 B	XMD	3.5/7.0 kg/cm ² - PRESSURE SWITCH	ENCLOSURE (TABLE A)
D4 24 V	XTA	75/750 mm.H ₂ O - DIFF. PRESSURE SWITCH	SWITCH TYPE (TABLE B)
T4 24	TS027	XTW 20/95°C - TEMPERATURE SWITCH	ACTUATOR SEAL/THERMAL SYSTEM
			PRESSURE SWITCHES (TABLE C)
			DIFF. PRESSURE SWITCHES (TABLE E)
			TEMPERATURE SWITCHES (TABLE G, H)
			OPTIONS (TABLE J)
			RANGE
			PRESSURE SWITCHES (TABLE D)
			DIFF. PRESSURE SWITCHES (TABLE F)
			TEMPERATURE SWITCHES (TABLE I)

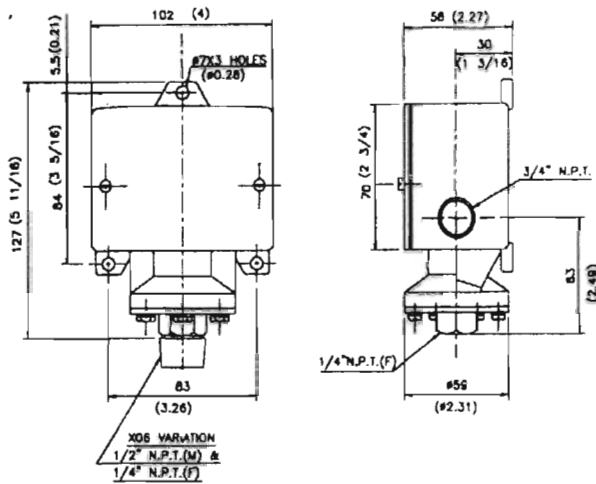
OPTIONS / ACCESSORIES LIST

CODE	DESCRIPTION
XHX	High Static Pressure
XJL	Al 1/2"NPT cable entry bushing
XJM	SS 1/2"NPT cable entry bushing
XCHC	Chained Cover
X69C	Sliding bushing
XK3	Terminal block for 1SPDT switches in expln. proof housing only.
XBP	Wall mounting bracket
XTM	2" pipe mounting bracket
XNH	SS tag plate
XSC	Adaptor for connection size SS
XFS	Factory set point
XCG	Nickel plated brass weatherproof cable gland
XCH	AL. Weatherproof cable gland
XCI	SS weatherproof cable gland
XCJ	Nickel plated brass explosionproof cable gland IIA & IIB
XCK	AL. Explosion proof cable gland IIA & IIB
XCL	SS. Explosion proof cable gland IIA & IIB
XCM	Nickel plated brass explosionproof cable gland IIC
XCN	AL explosion proof cable gland IIC
XCO	SS explosionproof cable gland IIC
XPC	Plug in connector
X2108	Special option for Terminal block in weather proof housing
XSN	Snubber
XSYES	Syphon Carbon Steel
XSYES	Syphon Stainless Steel
XGS	Gauge saver SS
X6B	Oxygen cleaning
XSP	SS cable entry plug
XTV	150deg C process temp. for Teflon diaphragm for PSI range
XTW	Thermowell
XIS	Indicating Scale
XCC	Temperature switch with copper bulb & capillary with SS-304 armouring
XPM	Switches with 20" lead wires
X2B	Breather Drain
X2GC	2 Way Gauge Cock
X3GC	3 Way Gauge Cock
X2VM	2 Valve Manifold
X3VM	3 Valve Manifold
X5VM	5 Valve Manifold
X2NV	2 Way Needle Valve

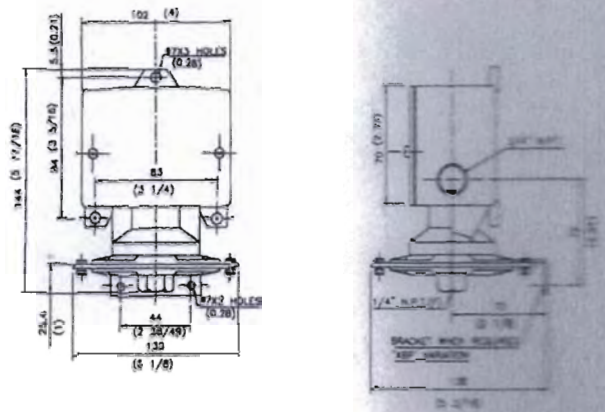
DIMENSIONS

TYPE 400 DIMENSIONS :

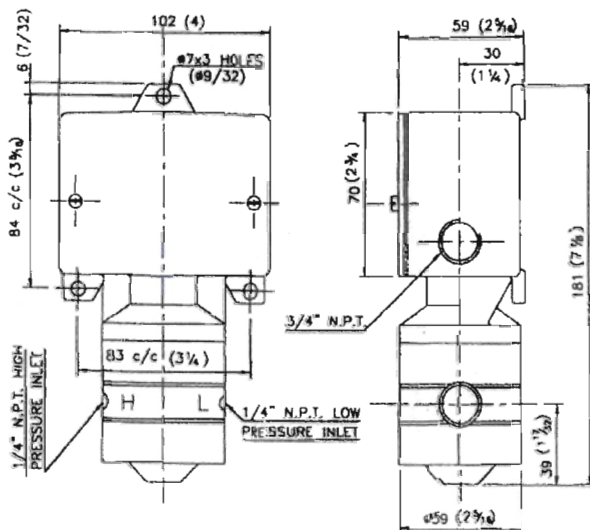
Pressure Switch - Kg/Cm² Range



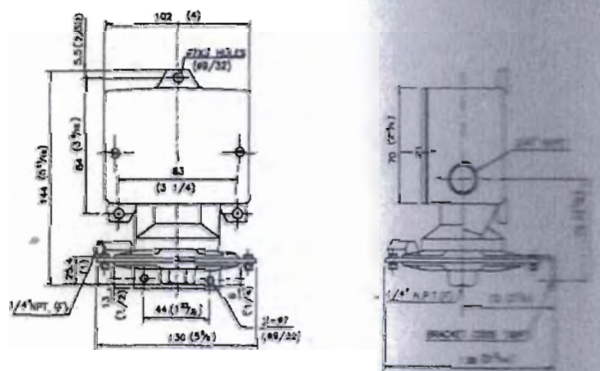
Pressure Switch - mm H₂O Range



Diff. Pressure Switch - Kg/Cm² Range

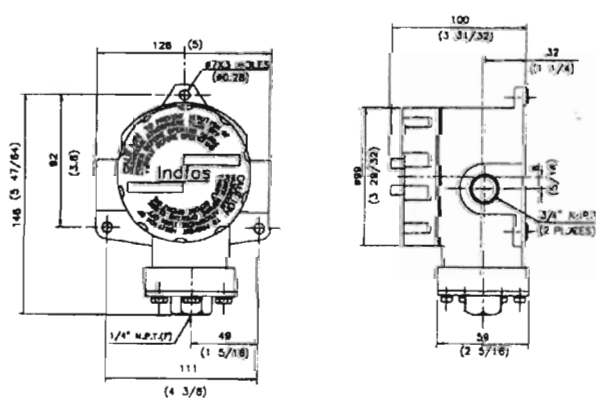


Diff. Pressure Switch - mm H₂O Range

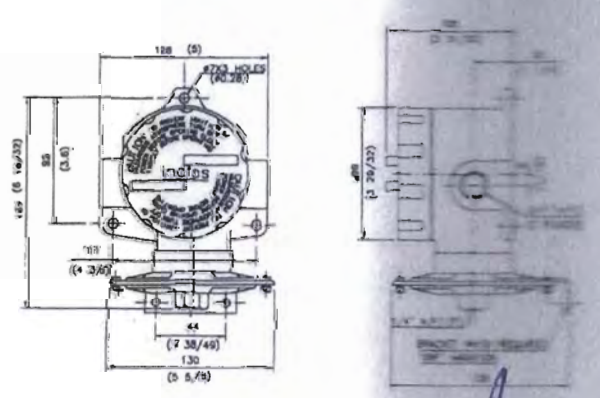


TYPE 700 DIMENSIONS :

Pressure Switch - Kg/Cm² Range



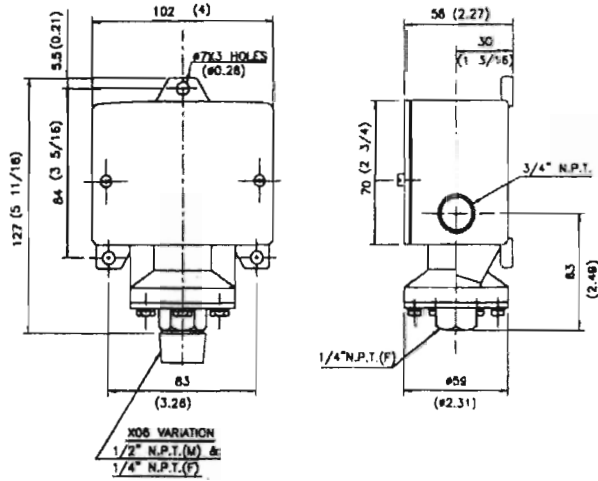
Pressure Switch - mm H₂O Range



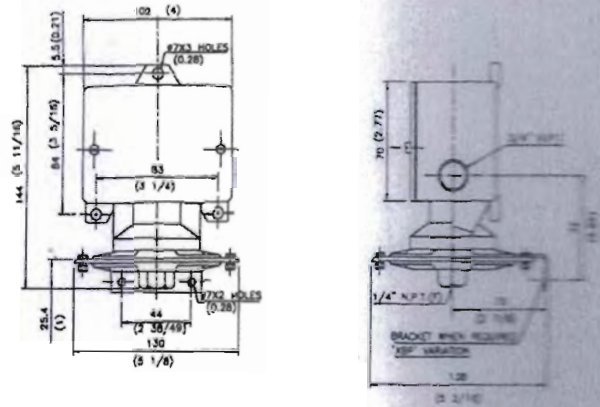
DIMENSIONS

TYPE 400 DIMENSIONS :

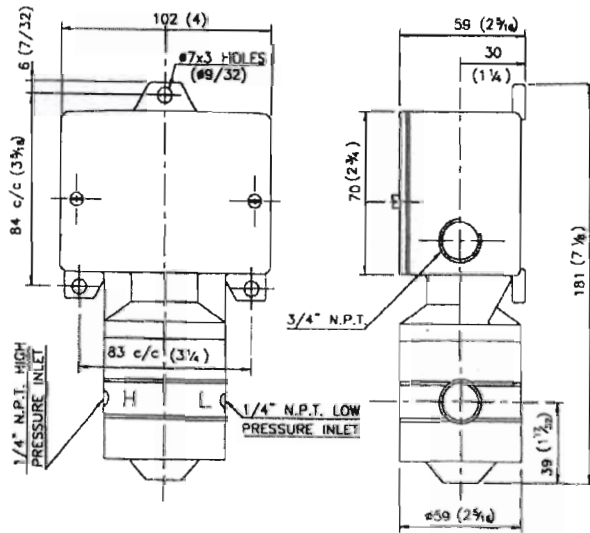
Pressure Switch - Kg/Cm² Range



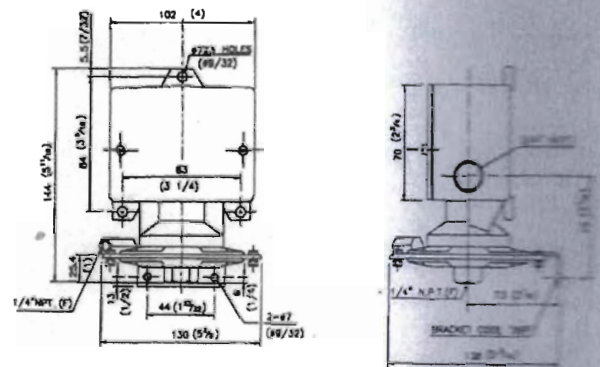
Pressure Switch - mm H₂O Range



Diff. Pressure Switch - Kg/Cm² Range

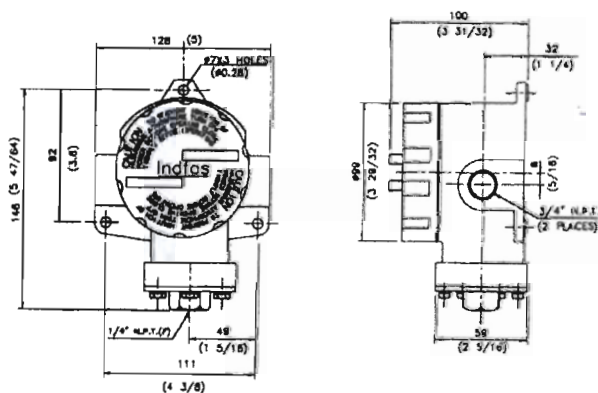


Diff. Pressure Switch - mm H₂O Range

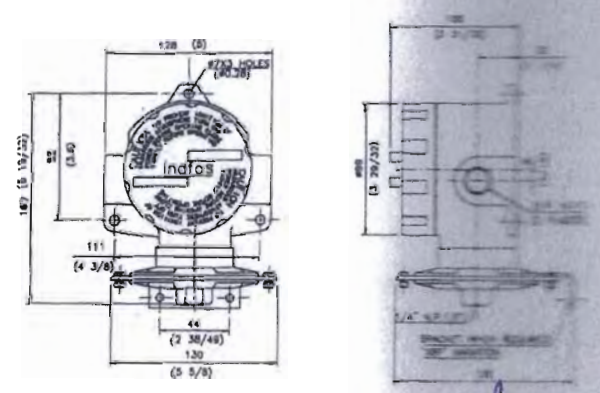


TYPE 700 DIMENSIONS :

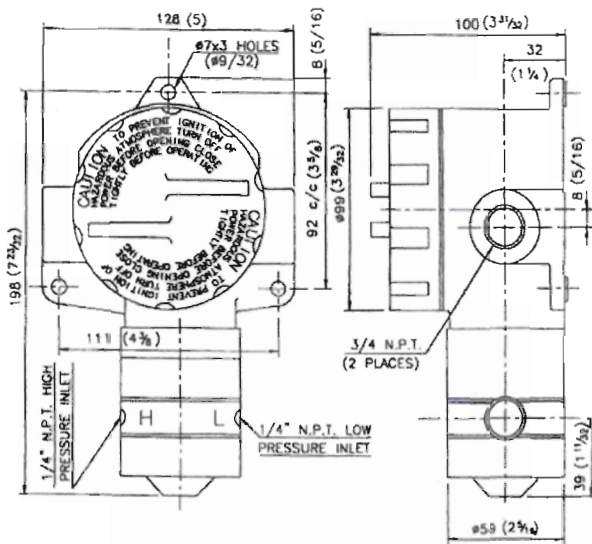
Pressure Switch - Kg/Cm² Range



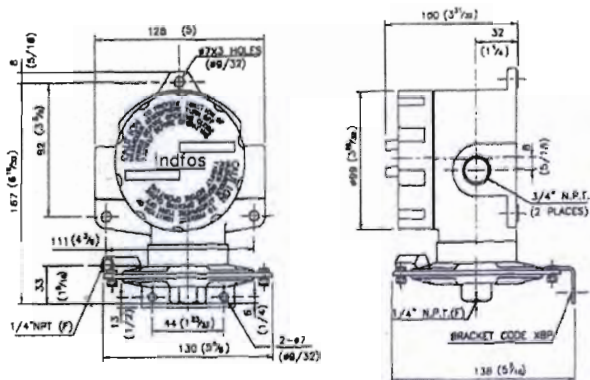
Pressure Switch - mm H₂O Range



Diff. Pressure Switch - Kg/Cm² Range



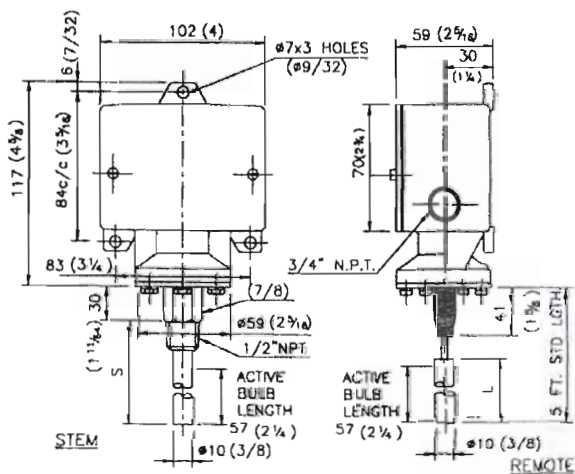
Diff. Pressure Switch - mm H₂O Range



TEMPERATURE SWITCHES

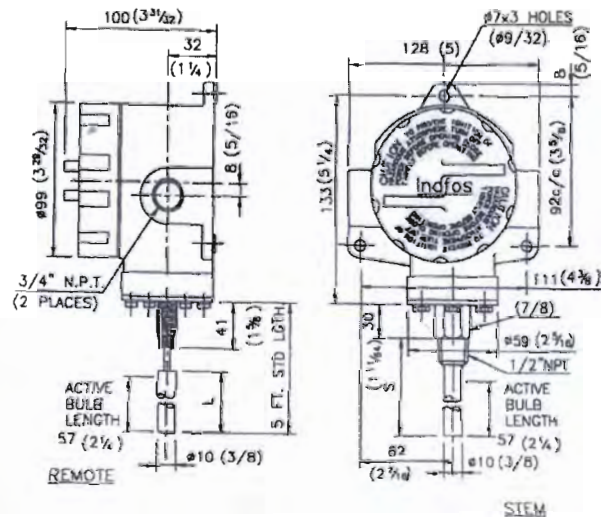
TYPE 400 Dimensions

Remote Mount / Direct Mount



TYPE 700 Dimensions

Remote Mount / Direct Mount



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Tel.: (022) 26887136, 26861237 Fax: (022) 26862953 E-mail: indfosmm@vsnl.com

Available at :

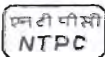
Works :

• B-20-21, Industrial Area, Site No. 3, Meerut Road, Ghaziabad (U.P.) - 201 003. Tel.: (0120) 2712016, 2712134 Fax: (0120) 2712023 E-mail: indfos_mkt@mantraonline.com

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CAT-3 Sahul
27/8/10
868
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1/20/10
Cast IV

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0	09.08.10	SUBMISSION FOR APPROVAL		PK	SB	AKS
REV.	DATE	DESCRIPTION		DRN BY	CHD BY	APPD BY
R E V I S I O N S						
CUSTOMER						
 PRAGATI POWER CORPORATION LIMITED						
CONSULTANT						
 NTPC CONSULTANCY WING						
PROJECT						
PRAGATI - III COMBINED CYCLE POWER PROJECT 2X750 MW AT BAWANA, DELHI						
CLIENT						
 BHARAT HEAVY ELECTRICALS LTD POWER SECTOR PROJECT ENGINEERING MANAGEMENT NEW DELHI						
PACKAGE						
FIRE PROTECTION SYSTEM						
 UNITECH MACHINES LIMITED 1/11 HOUSE, PLOT NO. 35P, SECTOR-44 GURGAON, HARYANA-122002.						
TITLE						
DATA SHEET FOR ACTUATOR GATE VALVE						
DRAWN	CHECKED	APPROVED	DATE	SCALE	JOB NO.	
PK	SB	AKS	09.08.10	NTS	P-269	
RHEL DRC NO			UML DRC NO		REV	SHEET
PE-V0-314-552-A084			P269-D-A084		00	1 OF 4

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UNITECH MACHINES LIMITED, GURGAON

Title	Data Sheet for Actuator for 150 NB Gate Valve
Project	Fire Detection & Protection System for 2x750 MW Pragati III, CCP

DATA SHEET FOR GATE VALVE 150 NB

SLNO	DESCRIPTION	UNITS	DATA
01	ACTUATOR MANUFACTURER	----	ROTORK CONTROLS (I) PVT. LTD
02	Torque Range & RPM	Kg-M	2.48 -6.22, 48 RPM
03	Duty Cycle		60 starts per Hr (S2-15 Min)
04	Enclosure (TENV)		IP-68
05	Average/Nominal Output	Kw	0.27
06	Rated Voltage	V	415V
07	Rated Frequency	Hz	50
08	No of Phase		3
09	ADMISSIBLE Voltage FLUCTUATION	%	+/-10%
10	ADMISSIBLE FREQUENCY FLUCTUATION	%	+/-5%
11	Admissible Voltage & Freq variation	%	±10 (ABS)
12	Average Load	A	1.7
13	Locked Rotork Current	A	6.0
14	Full Load Speed	RPM	2880
15	Insulation Class		F
16	Power Factor		0.60
17	Average Load Efficiency	%	37
18	Admissible Amb Temp	Deg C	-30 to +70
19	Temp rise over Amb Temp	Deg C	70
20	Type		Syncropak Actuator (With Integral Starter)
21 A	Cable Gland Size : Power- (1 No) Double Compression Cable Gland		¾" BSC- (3CX 2.5 Sqmm) CU/PV Insulated OD 14 +/- 2
21B	Cable Gland Size : Control- (1 No) Double Compression Cable Gland		¾" BSC- (3CX 2.5 Sqmm) CU/PV Insulated OD 14 +/- 2
22	Gear box lubrication		Alpha SP68 or SAE EP 80
23	Position Limit Switch	Nos	2NO+2NC-4 Nos
24	Torque Switch	Nos	2NO+2NC-2 Nos
25	Rating of Switch	A	5A 240VAC, 0.5A (inductive)/220VDC
26	Position Transmitted-On/Off duty		NA
27A	Space Heater Power Supply		160V AC, 1 Phase, 50Hz (internally fed)
27B	Space Heater Terminal Suitable	-	2Cx 2.5 Sq.mm/CU/PV
28	Thermostat	3 Nos	Provided
29	Internal Wiring		With suitable voltage grade copper wire, 650 V (PVC-1.5mm ²)

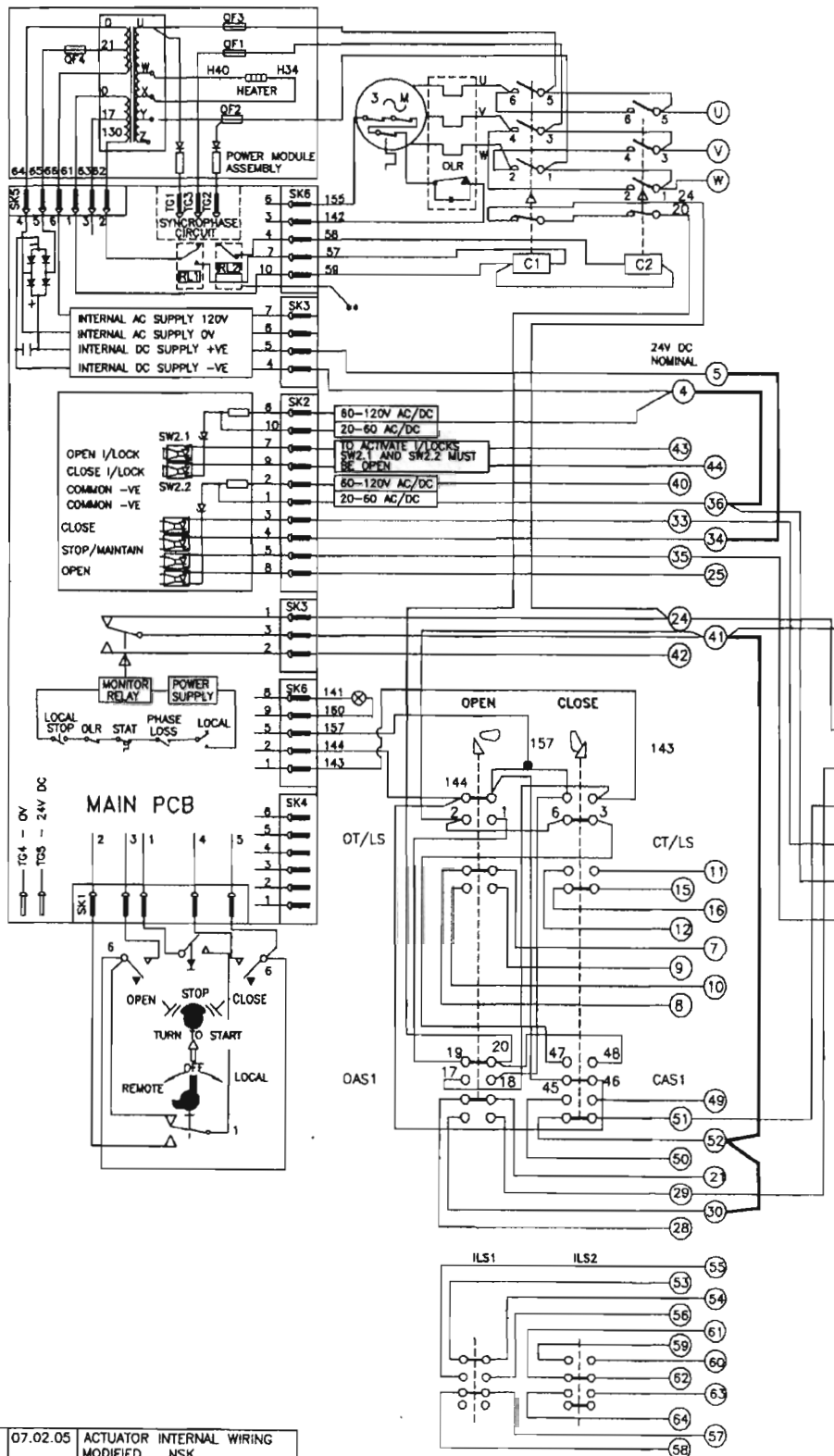
4Client	BHEL Doc. No.:	UML Doc. No.	Rev.	Date of Submission	Sheet No.
BHEL	PE-V0-314-552-A084	P269-D-A084	00	09.8.2010	Page 2 of 4

 UNITECH MACHINES LIMITED, GURGAON	
Title	Data Sheet for Actuator for 150 NB Gate Valve
Project	Fire Detection & Protection System for 2x750 MW Pragati III,CCP

30	Control CKT Diagram		WD 1687Z00CP3+CLI																				
31	Weight	Kg	60 (Approx)																				
32	Motor Suitable For On-Off/ Inching		On off.																				
33	Motor Type & Ref Std		Squirrel Cage Induction, IS 325																				
34	OLR Set Value	A	1.8																				
35	Plug & Socket (Integral Mounted on the Actuator)		2 Nos 9 pin plug & socket to suit 4 pair X 0.5 Sqmm Type G Instrumentation cable, OD Maximum 18.5 mm																				
36	The color coding of cable for 9 pin Plug & Socket suitable for 4 pair G type cable		<table><tr><td>PIN No</td><td>Cable Colors</td></tr><tr><td>A (1)</td><td>Blue</td></tr><tr><td>B(2)</td><td>Red</td></tr><tr><td>C(3)</td><td>Grey</td></tr><tr><td>D(4)</td><td>Yellow</td></tr><tr><td>E(5)</td><td>Green</td></tr><tr><td>F(6)</td><td>Brown</td></tr><tr><td>G(7)</td><td>White</td></tr><tr><td>H(8)</td><td>Black</td></tr><tr><td>J(9)</td><td>Shield</td></tr></table>	PIN No	Cable Colors	A (1)	Blue	B(2)	Red	C(3)	Grey	D(4)	Yellow	E(5)	Green	F(6)	Brown	G(7)	White	H(8)	Black	J(9)	Shield
PIN No	Cable Colors																						
A (1)	Blue																						
B(2)	Red																						
C(3)	Grey																						
D(4)	Yellow																						
E(5)	Green																						
F(6)	Brown																						
G(7)	White																						
H(8)	Black																						
J(9)	Shield																						
37	Material of Hand Wheel Hub		SG Iron																				
38	Painting Shade		RAL 5012(Blue)																				
39	Single Phase & Wrong Phase Sequence Protection		Yes																				
40	Local Mechanical Indication (0-100%)		Provided																				

4Client	BHEL Doc. No.:	UML Doc. No.	Rev.	Date of Submission	Sheet No.
BHEL	PE-V0-314-552-A084	P269-D-A084	00	09.10.2010	Page 3 of 4

CIRCUIT IS DRAWN FOR A VALVE IN THE FULLY CLOSED POSITION WITH POWER OFF



CIRCUIT DIAGRAM No.
1687Z00CP3

TRANSFORMER TAPPING OPTIONS

PT.No. 31400 (TYPE AA)

TAP	NOM50/60HZ	50HZ	60HZ
W	220/230	176-242	198-259
X	380/400	304-418	342-446
Y	415/420	332-457	374-487
Z	440/480	352-484	396-517

ALL FUSES QF1, QF2, QF3 & QF4 - 500MA
MAX EXTERNAL LOAD ON TERMINALS
4 & 5 TO BE 6W

O - OPEN
C - CLOSE
C1 & C2 - CONTACTOR COILS
T/LS - TORQUE / LIMIT SWITCH
AS1 - AUXILIARY LIMIT SWITCH
ILS1 & ILS2 - INDEPENDENT LIMIT SWITCHES
- LINK SUPPLIED BY ROTORK

WIRES ARE IDENTIFIED AT EACH END BY
TERMINAL No. (OR) BY WIRE No. AS SHOWN

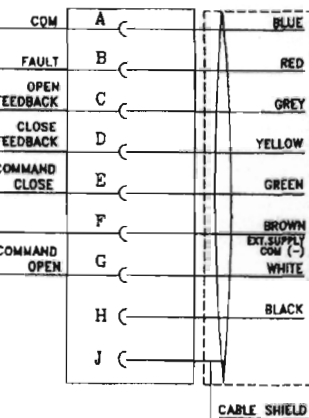
FOR TYPICAL REMOTE CONTROL INDICATING,
MONITORING AND ALARM CIRCUITS
SEE PUBLICATION RCIE 34

CONTROL SIGNAL THRESHOLD VOLTAGES TO BE
MINIMUM 'ON' = 20V
MAXIMUM 'OFF' = 3V
MINIMUM CONTROL SIGNAL 300ms

E.S.D. CONTROL SIGNAL VOLTAGE MUST BE
EQUAL TO OR GREATER THAN ALL OTHER
CONTROL SIGNAL VOLTAGES.

** COUPLING RELAYS RL1&RL2 ARE
INTERPOSED BETWEEN LOGIC CIRCUIT
AND CONTACTOR COIL.

SOCKET ON ACTUATOR FOR PLUG IN CONNECTION



CUSTOMER END CABLE CONNECTION TO DDC MIS
* EXTERNALLY FED 24V DC CONTROL SUPPLY.

CONENCT RESTRAINT WIRE TO
TERMINAL NO. 38

CONTACT DEVELOPMENT DIAGRAM

SWITCH	TERMINALS	OPEN	INTERMEDIATE	CLOSE
OT/LS	7-8			
	9-10			
CT/LS	11-12			
	15-16			
OAS1	21-28			
	29-30			
CAS1	49-50			
	51-52			

■ INDICATES CONTACT MADE

C - OVER LOAD RELAY
P - PLUG & COSKET +
MID TORQUE TRIP FEATURE
3 - THREE THERMOSTATS
ON MOTOR

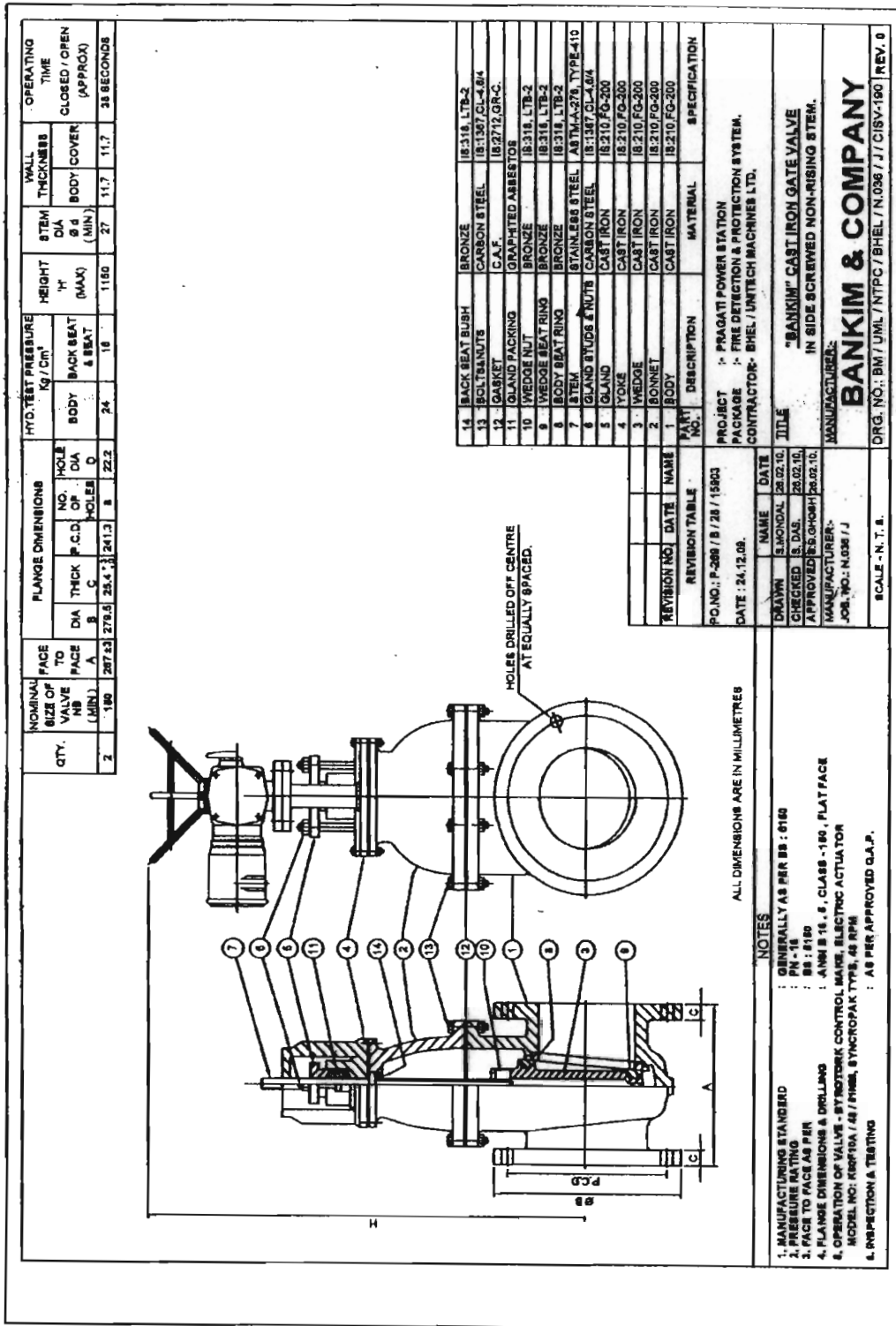
ON/OFF

CIRCUIT DIAGRAM No.
1687Z00CP3

3	07.02.05	ACTUATOR INTERNAL WIRING MODIFIED NSK
2	19.10.2K	MID TRAVEL TORQUE TRIP FACILITY MTR ADDED.
1	20.09.2K	OLR&CONTROL SUPPLY INTROD. IN MONITOR RELAY CIRCUIT. BLACK WIRE MADE AS SPARE TERMINAL. RL1& RL2 NOTE INTROD. AS PER CUSTOMER REQUIREMENT.
NO.	DATE	REVISION

DRAWN
NSK 19.10.2000
CHECKED
NSM 19.10.2000

ROTORK ROTORK CONTROLS (I) LTD.
28B INDESTATE (N)
MADRAS 600 098.



IV

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2	18.02.10	GENERALLY REVISED AS PER M/s NTPC COMMENTS 13.01.10	RAVI	MAR	BSC
1	11.12.09	GENERALLY REVISED AS PER M/s NTPC COMMENTS	SBJ	MAR	BSC
0	13.08.09	SUBMISSION FOR APPROVAL	SBJ	MAR	BSC
REV.	DATE	DESCRIPTION	DRAWN BY	CHECKED BY	APPROVED BY

R E V I S I O N S

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

CUSTOMER: PRAGATI POWER CORPORATION LIMITED

CONSULTANT: NTPC - CONSULTANCY WING

CLIENT: BHARAT HEAVY ELECTRICALS LTD
NEW DELHI

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

PACKAGE: FIRE PROTECTION SYSTEM

TITLE: DATA SHEET - SOLENOID VALVE

DRAWN	CHECKED	APPROVED	DATE	SCALE	
SBJ	MAR	BSC	13.08.09	NT5	
BHNL Doc. NO. PE-V0-314-552-A069			UML Doc. NO. P269-D-526		REV. 2
					SHEET 1 OF 2

**UNITECH MACHINES LIMITED, GURGAON**

Title : Data Sheet – Solenoid Valve

Project : 2X750MW Pragati-III, CPP

Package : Fire Protection System

Solenoid valve

1	Make	ROTEX
2	Type	2/2 way internal pilot operated, diaphragm type, Normally closed
3	Valve Code + Solenoid Code	24102-12-4R-B5-M6-S2+24V-DC-22-H
4	Media/Service	Water
5	Operating pressure range	1 – 20 Kg/cm ²
6	Seat/Seal Material	Viton
7	Body Material	SS 316
8	Coil Insulation	Class 'H'
9	Coil Voltage	24V DC (Min. Pick-up Voltage - 19.20 V DC Max. Tolerated Voltage – 28.80 V DC)
10	Coil size	I
11	No. Of coils	1
12	Coil Enclosure	Weatherproof as per IP-67
13	Process Connection	½" NPT (F)
14	Electrical Connection	Plug & Socket type
15	Orifice	NW = 12mm
16	Power Consumption	8 Watt
17	Manual Override	Provided
18	Application Area	Non Hazardous
19	Operation Philosophy	To remote operation for Deluge Valve and HPT tank pressure release
20	Quantity & Location	As per approved Instrument Schedule and P&ID
21	Inspection & Testing	As per approved datasheet
22	Catalogue	Enclosed (3 No sheets)

Client : BHEL

BHEL Doc. No. : PE-V0-314-552-A069

UML Doc. No. : P269-D-526 Rev 2

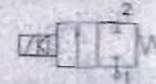
Page : 2 of 2

2/2 INTERNAL PILOT, DIAPHRAGM OPERATED, INLINE SOLENOID VALVE

TYPE PRESSURE TYPE PRESSURE TYPE PRESSURE TYPE PRESSURE

24101 0.5-10 bar

NC



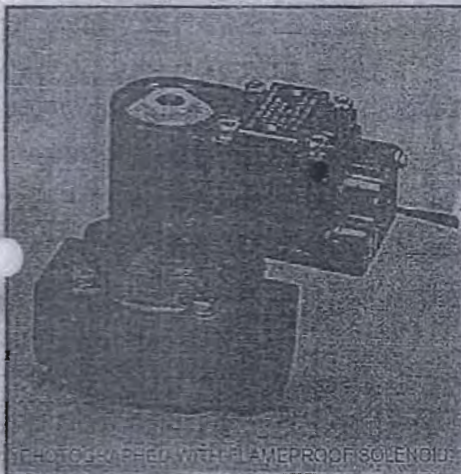
24102 1-20 bar

NO



24201 0.5-10 bar

24202 1-20 bar



FEATURES

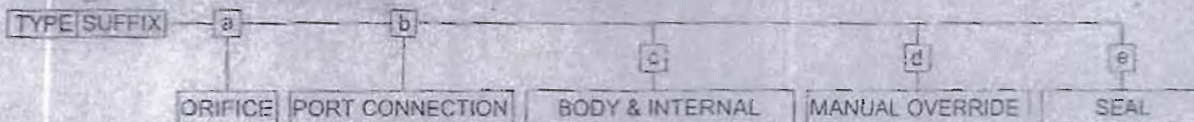
- Internal Pilot Operated.
- Line mounted valve.
- Normally Closed / Normally Open.
- Special versions may be developed on request
- Suitable for air, water, gas, liquid, oil.

CONNECTIONS

TYPE	INLET	OUTLET
24101, 24102	1	2
24201, 24202	2	1

ORDERING CODE

VALVE CODE For options available : Refer page G-5, page G-4 for a.



SOLENOID CODE

For options available : Refer page G-5.

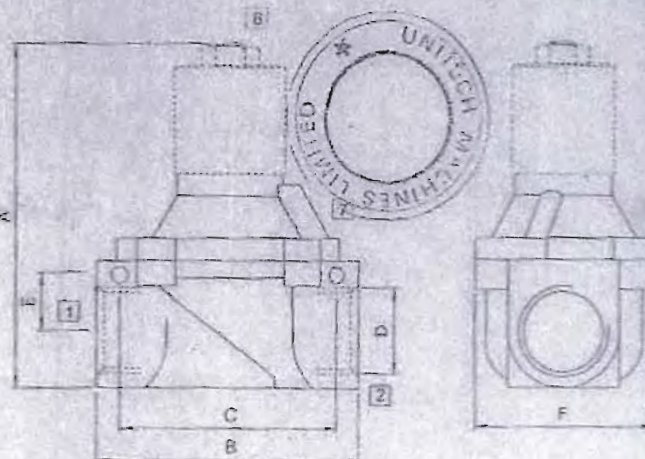
ORDERING EXAMPLE

Standard Version 24101-25-8G-+220V-50Hz.

Special Version 24101-25-8G+220V-50Hz-30-H.

DIMENSIONS

TYPE	A	B	C	D	E	F
24101	122	65	-	1/2"	-	50
24102	195	110	90	3/4"	22	75
24201	135	110	90	1"	22	75
24202	159	135	115	1 1/2"	29	92
24101	183	165	-	2"	-	165
24102	148	110	90	3/4"	22	75
24102	148	110	90	1"	22	75
24202	172	135	115	1 1/2"	29	92



OLD MODEL EQUIVALENT

OLD SOLENOID ENCLOSURE	REPLACED WITH	OLD MODEL	REPLACED WITH
Flameproof in steel pressure enclosure	Plug in moulded or flying lead moulded	S1424C	S1424, S144, S145
Flameproof in steel pressure enclosure	terminal box Al. cast or SS cast	S1425, S1426, S1427	S0318, S1424, S1442, S1450
Plug in flameproof	Plug in moulded		S7450-6
Explosion proof in steel pressure enclosure	Explosion proof in Al. pressure die cast/SS cast		S0318

VALVE CONSTRUCTION

Case No.	55302
Case Title	55302 Electroless Nickel Plated
Specimen	55302
File No.	55302
Order #	612, 24, 27, 36, 42, 48, 72, 110, 125, 220, 242, 256
Order #	DC 50 Hz 60Hz

SOLENOID ENCLOSURE

SOLENOID WEATHERPROOF		FLAMEPROOF SOLENOID (IP 67)			
TYPE	CODE	TYPE	CABLE ENTRY		
			3/4" NPT	1/2" NPT	M20x1.5
INDOOR		FLYING CABLE Exem, IP 67			
FLYING CABLE EXEM, IP 67	85	FLYING CABLE EXEM, IP 67	85	86	87
FLYING CABLE EXEM, IP 67	82	JUNCTION BOX			
FLYING CABLE EXEM, IP 67	83	Exd IIC, T4 OR T5 OR T6, IP 67			
PLUG IN	22	Side cable entry	36	37	39
INDOOR AND OUTDOOR		INTRINSICALLY SAFE COIL WITH CIRCUIT, Ex Ia IIC T6, IP 67			
		Side cable entry	40	41	42
LOW POWER INTRINSICALLY SAFE COIL, Ex Ia IIC T6, IP 67		LOW POWER INTRINSICALLY SAFE COIL, Ex Ia IIC T6, IP 67			
FLYING CABLE EXEM, IP 67	15	TERMINAL BOX	60	61	68
FLYING CABLE EXEM, IP 67	16	FLAMEPROOF	71	72	73
FLYING CABLE EXEM, IP 67	19	PLUG IN	65 CH		
FLYING CABLE EXEM, IP 67	70	FLYING CABLE EXEM, IP 67	CAR FENTS PG5		

Refer to Page 32 to 36 for Solenoid enclosure and specifications.

SPARES ORDERING CODE

VALVE SPARES

TYPE SUFFIX ORIFICE PORT CONNECTION

BODY AND INTERNALS MATERIAL MANUAL OVERRIDE SEAL SPARE CODE

Plunger Assembly Plunger with seats and springs.

Seal Kit Set of O-Rings, Seals excluding the plunger seats

Repair Kit Set of O-Rings, plunger assembly, all moving and wearing components, fasteners.

Manual Override Assembly Manual Override with spring & O ring.

Spare Part Description			
Plunger Assembly	30	Repair Kit	99
Seal Kit	99	Manual Override Assembly	97

SPARE SOLENOID

VOLTAGE	CURRENT	SOLENOID ENCLOSURE			
			APPROVAL	INSULATION	SPECIAL VERSION

The information regarding the solenoid can be found from the catalogue or from the label affixed on the ROTEX solenoid.



ORDERING OPTIONS

VALVE CODE

TYPE SUFFIX

a		b		c			d		e			
ORIFICE		PORT CONNECTION				BODY & INTERNAL			MANUAL OVERRIDE		SEAL	
		SIZE	BSP	NPT	FLANGE	BODY	INTERNAL	CODE	Push Button	✱	NBR	✱
7mm	7	1/4"	2G	2R	-	Aluminium	Standard	✱	Nil	M0	EPDM	S1
10mm	10	3/8"	3G	3R	-	Aluminium	SS304	B1	MA, LA	M2	VITON	S2
12mm	12	1/2"	4G	4R	4F	Brass	Standard	B2	Screw Driver	M6	NEOPRENE	S3
20mm	20	3/4"	6G	6R	6F	Brass	SS304	B3	Lever	M4		
25mm	25	1"	8G	8R	8F	SS304	Standard	B4				
40mm	40	1 1/2"	12G	12R	12F	SS316	SS316	B5				
50mm	50	2"	16G	16R	16F							
65mm	65	2 1/2"	20G	20R	20F							

NOTE : SEAL MATERIAL WILL BE GENERALLY SELECTED BY ROTEX DEPENDING UPON MEDIA, MEDIA PRESSURE AND

NOTE: SEAL MATERIAL WILL BE GENERALLY SELECTED BY ROTEX DEPENDING UPON MEDIA, MEDIA PRESSURE AND MEDIA TEMPERATURE.

SOLENOID CODE

VOLTAGE

CURRENT

		a				b		c	
		CONSTRUCTION				INSULATION		SPECIAL VERSION	
		GENERAL PURPOSE/WEATHER PROOF		FLAMEPROOF SOLENOID (IP 67)		CLASS F	✱	Nil	✱
		TYPE		TYPE		CLASS H	H	Manual Reset	MR
				Cable entry		CLASS C	C	Ammonia	AM
				3/4"ET 1/2"NPT				Oxygen	OX
								Intrinsically Safe	IS
								Refinery	PC
								Nuclear	NP
								Corrosive environment	CO
								Temp. Class	T6
								Latching	LC
								Limit Switch	LS
								Valve position non contact	NS
								Cryogenic	SZ



Atlas Copco

Rev	Date	Description	Prepd By	Checked By
0	18.09.09	Submitted for Approval.		



NTPC Limited
(A Govt. of India Enterprise)
CONSULTANCY WING

TRANS NO. **087-29601**
DATE **20.7.10**
DIGITALLY SIGNED
DATE: 2010-07-07 17:00:05:30

QI. APPROVED/RELEASED FOR FABRICATION
QII. APPROVED/RELEASED FOR FABRICATION
SUBJECT TO INCORPORATION OF C
MODIFICATIONS AS NOTED
DRAWING/DOCUMENT
QIII. NOT APPROVED FOR FABRICATION
AFTER INCORPORATION OF
MODIFICATIONS

Submitted for Approval.

Submitted for Approval for Sr nos 3 to 5

Submitted for Approval for Sr nos 3



Digitally signed
By: [Signature]
Date: 2010-07-07 17:00:05:30

APPROVED HEREIN NEITHER
CONSTITUTES AN ENDORSEMENT
NOR A GUARANTEE OF THE
PERFORMANCE PARTICULARS AND CONFORMANCE
SPECIFICATIONS APPROVED SCHEMES AND STANDARDS
DOES IT LIMIT THE PURCHASERS RIGHT UNDER THE CONTRACT
II NO CHANGE IN APPROVED DRAWING/DOCUMENTS IS PERMITTED WITHOUT
OWNER'S CONCURRENCE IN WRITING.

Pragati - III Combined Cycle Power Project,
1500MW (Nominal) At Bawana ,Delhi

Consultant : NTPC - Consultancy Wing



Bharat Heavy Electrical Ltd
Power Sector Project Engineering Management
New Delhi



Atlas Copco India Ltd
Svea Nagar, Mumbai Pune Road, Dapodi
Pune 411 012

Prepd	Chkd	Scale
Engr	Dept Head	Date: 6.07.10
Drg / Doc Title	Technical Data Sheet for Instruments	
	Job No : 314	
ACIL Doc No	15622 00 018	Rev 03
BHEL Doc No	PE-VO-314-555-A106	Rev 03

Atlas Copco
Pressure Gauges

SR.NO.	Description	Offered
1	Make	A. N. Instruments
2	Model	6SSPGAD
3	Type	Direct Indicating
4	Mounting	Male bottom entry
5	Dial Size	150 mm
6	Case Material	Die Cast Aluminium Stove (With Epoxy Coating) Enameled Black
7	Dial Colour	White With Black letter
8	Bezel Ring	Screwed
9	Window Material	Shatterproof Glass
10	Enclosure	Weatherproof IP 65
11	Pressure Element	Bourdon
12	Element Material	SS 316
13	Socket Material	SS 316
14	Accuracy	+/- 1% FSD
15	Connection	1/2" NPT (M)
16	Movement Material	SS 304
17	Over Range Protection	130% FSD
18	Blow Out Protection	Provided
19	Zero Adjustment	Provided
20	Accessories Per Pressure gauge	1) Socket, carbon steel, GI dipped, 1/2" NPT (F), weldable 1" length, - 1No 2) 1/2" NPT (M) X 1/2" Weldable sch 40, seamless, SS316 6" Length Nipple -1no 3) 1/2" globe valve, socket weldable, forged C.S. body, SS trim, - 1 no. 4) 2 valve manifold SS316, 1/2" NPT (F) X 1/2" NPT (F) Drain port - 1 no.
21	Qty.	28 Nos

Tag No.	Service	Range
QFB 12 CT 301	Cooling Water Return Line Inst Air comp 1	0-16 Kg/Cm2
QFB 12 CT 302	Cooling Water Supply Line Inst Air comp 1	0-16 Kg/Cm2
QFB 12 CT 303	Air Dryer 1 cooling water supply line	0-16 Kg/Cm2
QFB 12 CT 304	Air Dryer 1 cooling water return line	0-16 Kg/Cm2
QFB 12 CT 305	Air Dryer 1 outlet	0-16 Kg/Cm2
QFB 10 CT 306	Instrument Air receiver 1	0-16 Kg/Cm2
QFB 10 CT 307	Instrument Air receiver 2	0-16 Kg/Cm2
QFB 12 CT 308	Air Dryer 2 outlet	0-16 Kg/Cm2
QFB 12 CT 309	Air Dryer 2 cooling water return line	0-16 Kg/Cm2
QFB 12 CT 310	Air Dryer 2 cooling water supply line	0-16 Kg/Cm2
QFB 12 CT 311	Cooling Water supply Line Inst Air comp 2	0-16 Kg/Cm2
QFB 12 CT 312	Cooling Water Return Line Inst Air comp 2	0-16 Kg/Cm2
QFB 12 CT 313	Cooling Water return Line Inst Air comp 3	0-16 Kg/Cm2
QFB 12 CT 314	Cooling Water supply Line Inst Air comp 3	0-16 Kg/Cm2
QFB 12 CT 315	Air Dryer 3 cooling water return line	0-16 Kg/Cm2
QFB 12 CT 316	Air Dryer 3 cooling water supply line	0-16 Kg/Cm2
QFB 12 CT 317	Air Dryer 3 outlet	0-16 Kg/Cm2
QFB 12 CT 318	Instrument Air Receiver 3	0-16 Kg/Cm2
QFB 12 CT 319	Water inlet header	0-16 Kg/Cm2

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QFB 12 CT 320	Water outlet header	0-16 Kg/Cm2
QEB 10 CP 301	Plant Air Receiver 1	0-16 Kg/Cm2
QEB 10 CP 302	Plant Air Compressor 1 outlet	0-16 Kg/Cm2
QEB 10 CT 303	Cooling Water Supply Line Plant Air comp 1	0-16 Kg/Cm2
QEB 10 CT 304	Cooling Water Return Line Plant Air comp 1	0-16 Kg/Cm2
QEB 10 CT 305	Cooling Water return Line Plant Air comp 2	0-16 Kg/Cm2
QEB 10 CT 306	Cooling Water supply Line Plant Air comp 2	0-16 Kg/Cm2
QEB 10 CT 307	Plant Air Compressor 2 outlet	0-16 Kg/Cm2
QEB 10 CT 308	Plant Air receiver 2	0-16 Kg/Cm2



Digitally signed
by Nisha Rai
Date:
2010-07-07
17:00+05:30

[Handwritten signature]

83

Atlas Copco
TEMPERATURE GAUGES

Sr.No.	Description	Offered
1	Make	A. N. Instruments
2	Model	6 RMSTAV
3	Type	Rigid Stem, Mercury In Steel
4	Dial Size	150 mm
5	Bulb Connection	1/2" NPT (M),
6	Mounting	Vertical with Bottom Entry
7	Zero Adjustment	Provided
8	Case Material	Die Cast Aluminium (With Epoxy Coating)
9	Accuracy	+/- 1% FSD
10	Bulb & Stem Material	SS 316
11	Bulb Fitting Type	Adjustable Gland
12	Bulb O. D	10 mm
13	Stem O. D	10 mm
14	Over Range Protection	120% FSD
15	Protection Class	Weather Proof As Per IP 65
16	Thermowell	SS Bar Stock
17	Well Material	SS 316
18	Well I.D.	12 mm
19	Well O.D.	18 mm
20	Thermowell Bulb Connection	1/2" NPT (F)
21	Process Connection	1/2" NPT (M)
23	Instrument Range	As Per List
24	Accessories Per Gauge	1) Socket, carbon steel, GI dipped, 1/2" NPT (F), weldable 1" length, - 1No
25	Qty.	28 Nos

Tag No.	Service	Range
QFB 12 CT 301	Cooling Water Return Line Inst Air comp 1	0 - 100 Deg.C.
QFB 12 CT 302	Cooling Water Supply Line Inst Air comp 1	0 - 100 Deg.C.
QFB 12 CT 303	Air Dryer 1 cooling water supply line	0 - 100 Deg.C.
QFB 12 CT 304	Air Dryer 1 cooling water return line	0 - 100 Deg.C.
QFB 12 CT 305	Air Dryer 1 outlet	0 - 100 Deg.C.
QFB 10 CT 306	Instrument Air receiver 1	0 - 100 Deg.C.
QFB 10 CT 307	Instrument Air receiver 2	0 - 100 Deg.C.
QFB 12 CT 308	Air Dryer 2 outlet	0 - 100 Deg.C.
QFB 12 CT 309	Air Dryer 2 cooling water return line	0 - 100 Deg.C.
QFB 12 CT 310	Air Dryer 2 cooling water supply line	0 - 100 Deg.C.
QFB 12 CT 311	Cooling Water supply Line Inst Air comp 2	0 - 100 Deg.C.
QFB 12 CT 312	Cooling Water Return Line Inst Air comp 2	0 - 100 Deg.C.
QFB 12 CT 313	Cooling Water return Line Inst Air comp 3	0 - 100 Deg.C.
QFB 12 CT 314	Cooling Water supply Line Inst Air comp 3	0 - 100 Deg.C.
QFB 12 CT 315	Air Dryer 3 cooling water return line	0 - 100 Deg.C.
QFB 12 CT 316	Air Dryer 3 cooling water supply line	0 - 100 Deg.C.
QFB 12 CT 317	Air Dryer 3 outlet	0 - 100 Deg.C.
QFB 12 CT 318	Instrument Air Receiver 3	0 - 100 Deg.C.
QFB 12 CT 319	Water inlet header	0 - 100 Deg.C.
QFB 12 CT 320	Water outlet header	0 - 100 Deg.C.
QEB 10 CP 301	Plant Air Receiver 1	0 - 100 Deg.C.
QEB 10 CP 302	Plant Air Compressor 1 outlet	0 - 100 Deg.C.
QEB 10 CT 303	Cooling Water Supply Line Plant Air comp 1	0 - 100 Deg.C.
QEB 10 CT 304	Cooling Water Return Line Plant Air comp 1	0 - 100 Deg.C.
QEB 10 CT 305	Cooling Water return Line Plant Air comp 2	0 - 100 Deg.C.

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QEB 10 CT 306	Cooling Water supply Line Plant Air comp 2	0 - 100 Deg.C.
QEB 10 CT 307	Plant Air Compressor 2 outlet	0 - 100 Deg.C.
QEB 10 CT 308	Plant Air receiver 1	0 - 100 Deg.C.



(85)

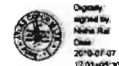
9/9

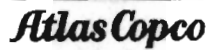


Flow Indicator ✓

Sr. No.	Description	Offered
1	Make	Eureka
2	Model	BPF-MS-80-PG-3
3	Type	Byepass Type Rotameter
4	Rotameter Measuring Tube	Borosilicate Glass
5	Rotameter Float	AISI SS 316
6	Rotameter Retainers	AISI SS 316
7	Orifice Plate	AISI SS 316
8	Rating	ANSI 300 # WNRF
9	Orifice Flange Assembly	ASTM A105, Rating : ANSI 300#WNRF
10	Flanges	Orifice type flanges
11	Accuracy	+/- 2 % of full flow
12	Measuring range	8 - 40m3/hr
13	No of Tappings	Two per Flange, 180 Deg Apart
14	Tapping Connections	1 / 2 " NPT (F)
15	Flow Rate Max.	36 m3/hr
16	Medium	Cooling Water
17	Accessories	1) Gasket, Stub(ASTM-A-193 Gr 87), 2) Nut (ASMT-A-194 Gr. 2H), Jack Screw
18	Quantity	2 nos

Sr.No.	Tag No.	Application
1.	QFB 12 CF 301	Cooling water -Inlet header
2.	QFB 12 CF 302	Cooling water Outlet header





FLOW SWITCH

Sr. No.	Description	Offered
1	Make	Switzer
2	Model	BGM-50-M-TH-33-Z
3	Type	Paddle Type
4	Max. Flow	240 LPM (water)
5	Switch setting	60 LPM
6	Process Connection	1" BSPM
7	Material Of Construction	Brass Body / Ph. Br. Bellow / 316SS paddle
8	Case Material	Die Cast Aluminum
9	Electrical Connection	¾" ET
10	Process Temperature Limit	100 Deg. C
11	Repeatability	+/- 2 % FSR
12	Micro switch type / rating	2 NO + 2 NC / 15A, 230V AC potential free
13	Line Pressure	8 kg/cm ²
14	Line Temperature	45 Deg C
15	Flow details	Flow Media:- Cooling Water, Flow maximum:- 240 LPM, Flow Normal :- 150 LPM, Max Fluid Pressure 10 Bar , Max Fluid Temperature 50 Deg. C
16	Line Size	50NB
17	Protection	Weather proof IP-66
18	Accessories	1) 1 " BSP Industrial Grade Plug & socket-1 No. 2) SS Tag Plate
19	Qty	5 Nos.

Sr.No.	Tag No.	Application
1.	QFB 12 CT 201	Inst Air Comp1 Cooling Water Outlet
2.	QFB 12 CT 202	Inst Air Comp2 Cooling Water Outlet
3.	QFB 12 CT 203	Inst Air Comp3 Cooling Water Outlet
4.	QEB 12 CT 201	Plant Air Comp1 Cooling Water Outlet
5.	QEB 12 CT 202	Plant Air Comp2 Cooling Water Outlet



Digitally signed
by Nitin Rai
Date:
2010-07-07
17:01+05:30



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

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

CUSTOMER	PPCL
VOLUME - III	ANNEXURE-I
REV	00

VOLUME – III
ANNEXURE-I
DEVIATION FORMAT

TENDER ENQUIRY REFERENCE:-

SL NO	VOULME/ SECTION	PAGE NO.	CLAUSE NO.	TECHNICAL SPECIFICATION / TENDER DOCUMENT	COMPLETE DESCRIPTION OF DEVIATION	COST OF WITHDRAWAL OF DEVIATION	REFERENCE OF PRICE SCHEDULE ON WHICH COST OF WITHDRAWAL OF DEVIATION IS APPLICABLE	NATURE OF COST OF WITHDRAWAL OF DEVIATION (POSITIVE/ NEGATIVE)	REASON FOR QUOTING DEVIATION
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[illegible][illegible]

NAME	DESIGNATIONS VOLUME-III	SIGN & DATE	

1. For self manufactured items of bidder, cost of withdrawal of deviation will be applicable on the basic price (i.e. excluding taxes, duties & freight) only.
2. For directly dispatchable items, cost of withdrawal of deviation will be applicable on the basic price including taxes, duties & freight.
3. All the bidders have to list out all their Technical & Commercial Deviations (if any) in detail in the above format.
4. Any deviation not mentioned above and shown separately or found hidden in offer, will not be taken cognizance of.
5. Bidder shall submit duly filled unpriced copy of above format indicating "quoted" in "cost of withdrawal of deviation" column of the schedule above along with their Techno-commercial offer, wherever applicable.
6. Bidder shall furnish price copy of above format along with price bid.
7. The final decision of acceptance/ rejection of the deviations quoted by the bidder shall be at discretion of the Purchaser.
8. Bidders to note that any deviation (technical/commercial) not listed in above and asked after Part-I opening shall not be considered.
9. For deviations w.r.t. Payment terms, Liquidated damages, Firm prices and submission of E1/ E2 forms before claiming 10% payment, if a bidder chooses not to give any cost of withdrawal of deviation loading as per Annexure-VIII of GCC, Rev-06 will apply. For any other deviation mentioned in un-priced copy of this format submitted with Part-I bid but not mentioned in priced copy of
10. Any deviation mentioned in priced copy of this format, but not mentioned in the un-priced copy, shall not be accepted.
11. All techno-commercial terms and conditions of NIT shall be deemed to have been accepted by the bidder, other than those listed in unpriced copy of this format.
12. Cost of withdrawal is to be given separately for each deviation. In no event bidder should club cost of withdrawal of more than one deviation else cost of withdrawal of such deviations which have been clubbed together shall be considered as NIL.
13. In case nature of cost of withdrawal (positive/negative) is not specified it shall be assumed as positive.
14. In case of discrepancy in the nature of impact (positive/ negative), positive will be considered for evaluation and negative for ordering.